TOSHIBA
Leading Innovation

SEMICONDUCTOR GENERAL CATALOG

Optical Semiconductor Devices

Visible LEDs
Photosensors
Photocouplers and Photorelays
Fiber-Optic Devices (TOSLINK™)
Image Sensors

2011/9 SCE0004L

Visible LEDs

Dual-Color LED Lamps

Part Number	Source Color	Optical Characteristics (Ta = 25°C)						Absolute Maximum DC Forward Current Rating I_F (mA) @Ta = 25°C	Typical Applications
		Intensity (mcd) I_F = 20 mA		Viewing Angle 2θ1/2 (°)	Typical Emitting Wavelength		Lens Color		
		Min	Typ.		λd (nm)	λp (nm)			
TLRMHGH48T(F)	Red	476	1100	30/35	626	636	Transparent (Lens diameter: ϕ5 mm)	50 (Total)	Message boards
	Green	272	500		571	574			
TLRMHGH48M(F)	Red	272	450	45/50	626	636	Milky white diffused (Lens diameter: ϕ5 mm)	50 (Total)	
	Green	153	220		571	574			

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

High-Brightness LED Lamps (ϕ5)

Part Number	Source Color	Optical Characteristics (Ta = 25°C)						Absolute Maximum DC Forward Current Rating IF (mA) @Ta = 25°C	Typical Applications
		Intensity (mcd) IF = 20 mA		Viewing Angle 2θ1/2 (°)	Typical Emitting Wavelength		Lens Color		
		Min	Typ.		λd (nm)	λp (nm)			
TLRME20CP(F)	Red	4760	12000	7	626	636	Red transparent	50	Pilot lamps (narrow range)
TLSH20TP(F)		4760	11000		613	623	Transparent	50	
TLRMH20TP(F)		2720	9000		626	636	Transparent	50	
TLSE20TP(F)		2720	9000		613	623	Transparent	50	
TLRME20TP(F)		2720	8000		626	636	Transparent	50	
TLRE20TP(F)		2720	7000		630	644	Transparent	50	
TLSH38TP(F)		2720	6500	12	613	623	Transparent	50	
TLRMH38TP(F)		1530	4800		626	636	Transparent	50	
TLSH17TP(F)		1530	4500	20	613	623	Transparent	50	
TLRMH17TP(F)		850	3200		626	636	Transparent	50	
TLRH17TP(F)		850	2000		630	644	Transparent	50	
TLSE17TP(F)		850	3000		613	623	Transparent	50	
TLRME17TP(F)		850	2400		626	636	Transparent	50	
TLRE17TP(F)		476	1500		630	644	Transparent	50	
TLRMK37TP(F)		1530	5600	23	626	636	Transparent	50	
TLSH16TP(F)		850	1900	25	613	623	Transparent	50	Message boards Backlighting
TLSH16CP(F)		476	1500		613	623	Red transparent	50	
TLRMH16TP(F)		476	1500		626	636	Transparent	50	
TLRMH16CP(F)		476	1300		626	636	Red transparent	50	
TLSE16TP(F)		476	1500		613	623	Transparent	50	
TLSE16CP(F)		476	1000		613	623	Red transparent	50	
TLRME16TP(F)		272	1200		626	636	Transparent	50	
TLRE16TP(F)		272	800		630	644	Transparent	50	
TLRME16CP(F)		272	800		626	636	Red transparent	50	
TLRE16CP(F)		153	600		630	644	Red transparent	50	
TLRME17DP(F)		153	500		626	636	Red diffused	50	
TLRMK16TAP(F)		1530	5400	30	626	636	Transparent	50	
TLSE30TP(F)		272	1000	30	613	623	Transparent	50	
TLRE30TP(F)		153	600		630	644	Transparent	50	
TLSH30TP(F)		476	1300	33	613	623	Transparent	50	
TLRMH30TP(F)		476	950		626	636	Transparent	50	
TLRH30TP(F)		272	680		630	644	Transparent	50	
TLRMH30MP(F)		272	600	40	626	636	Milky white diffused	50	
TLRE25TP(F)		47.6	150	75	630	644	Transparent	50	Backlighting (wide range)
TLRE11TP(F)		8.5	20	130	630	644	Transparent	50	
TLOH20TP(F)	Orange	4760	15000	7	605	612	Transparent	50	Pilot lamps (narrow range)
TLOE20TP(F)		4760	10000		605	612	Transparent	50	
TLOH38TP(F)		2720	7500	12	605	612	Transparent	50	
TLOH17TP(F)		1530	5000	20	605	612	Transparent	50	
TLOE17TP(F)		1530	4500		605	612	Transparent	50	
TLOE17CP(F)		1530	3500		605	612	Orange transparent	50	
TLOH16TP(F)		850	2300	25	605	612	Transparent	50	Message boards Backlighting
TLOH16CP(F)		850	2100		605	612	Orange transparent	50	
TLOE16TP(F)		850	2000		605	612	Transparent	50	
TLOE16CP(F)		476	1600		605	612	Orange transparent	50	
TLOE30TP(F)		476	1400	30	605	612	Transparent	50	
TLOH30TP(F)		476	1600	33	605	612	Transparent	50	
TLOE25TP(F)		153	350	75	605	612	Transparent	50	Backlighting (wide range)
TLOE11TP(F)		27.2	65	130	605	612	Transparent	50	

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

High-Brightness LED Lamps (ϕ5) (Continued)

Part Number	Source Color	Optical Characteristics (Ta = 25°C)						Absolute Maximum DC Forward Current Rating IF (mA) @Ta = 25°C	Typical Applications
		Intensity (mcd) IF = 20 mA		Viewing Angle 2θ1/2 (°)	Typical Emitting Wavelength		Lens Color		
		Min	Typ.		λd (nm)	λp (nm)			
TLYH20TP(F)	Yellow	4760	13000	7	587	590	Transparent	50	Pilot lamps (narrow range)
TLYE20TP(F)		2720	9500		587	590	Transparent	50	
TLYH38TP(F)		2720	7000	12	587	590	Transparent	50	
TLYH17TP(F)		1530	4800	20	587	590	Transparent	50	
TLYE17TP(F)		850	3000		587	590	Transparent	50	
TLYE17CP(F)		850	3000		587	590	Yellow transparent	50	
TLYK37TP(F)		2720	6800	23	590	594	Transparent	50	
TLYH16TP(F)		850	2200	25	587	590	Transparent	50	Message boards Backlighting
TLYH16CP(F)		850	2000		587	590	Yellow transparent	50	
TLYE16TP(F)		476	1500		587	590	Transparent	50	
TLYE16CP(F)		476	1200		587	590	Yellow transparent	50	
TLYE30TP(F)		476	1300	30	587	590	Transparent	50	
TLYK16TAP(F)		2720	5900	30	590	594	Transparent	50	
TLYH30TP(F)		476	1350	33	587	590	Transparent	50	
TLYE25TP(F)		85	300	75	587	590	Transparent	50	Backlighting (wide range)
TLYE11TP(F)		15.3	45	130	587	590	Transparent	50	
TLPYE23TP(F)	Pure yellow	2720	8000	5	580	583	Transparent	50	Pilot lamps (narrow range)
TLPYE19TP(F)		476	2000	18	580	583	Transparent	50	
TLPYE18TP(F)		272	750	30	580	583	Transparent	50	Message boards Backlighting
TLGE23TP(F)	Green	2720	7000	5	571	574	Transparent	50	Pilot lamps (narrow range)
TLGU23TP(F)		1530	4000		571	574	Transparent	30	
TLGE19TP(F)		476	1300	18	571	574	Transparent	50	
TLGE19CP(F)		476	1100		571	574	Green transparent	50	
TLGE18TP(F)		272	700	30	571	574	Transparent	50	Message boards Backlighting
TLGE18CP(F)		153	500		571	574	Green transparent	50	
TLGU18TP(F)		85	200		571	574	Transparent	30	
TLGU18CP(F)		47.6	180		571	574	Green transparent	30	
TLGU13CP(F)		47.6	120	45	571	574	Green transparent	30	
TLGU13DP(F)		27.2	70	55	571	574	Green diffused	30	
TLGE25TP(F)		27.2	90	75	571	574	Transparent	50	Backlighting (wide range)
TLGE11TP(F)		8.5	20	130	571	574	Transparent	50	
TLFGE23TP(F)	Fresh green	1530	5000	5	565	568	Transparent	50	Pilot lamps (narrow range)
TLFGE19TP(F)		272	800	18	565	568	Transparent	50	
TLFGE19CP(F)		272	800		565	568	Green transparent	50	
TLFGE18TP(F)		85	300	30	565	568	Transparent	50	Message boards Backlighting
TLPGE23TP(F)	Pure green	850	3000	5	558	562	Transparent	50	Pilot lamps (narrow range)
TLPGU23TP(F)		476	1600		558	562	Transparent	30	
TLPGE19TP(F)		153	500	18	558	562	Transparent	50	
TLPGE18TP(F)		85	200	30	558	562	Transparent	50	Message boards Backlighting
TLPGU18TP(F)		27.2	90		558	562	Transparent	30	
TLPGU13CP(F)		27.2	80	45	558	562	Green transparent	30	
TLPGU13DP(F)		15.3	35	55	558	562	Green diffused	30	
TLPGE11TP(F)		2.72	8	130	558	562	Transparent	50	Backlighting (wide range)

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

High-Brightness LED Lamps (ϕ3)

Part Number	Source Color	Optical Characteristics (Ta = 25°C)						Absolute Maximum DC Forward Current Rating	Typical Applications
		Intensity (mcd) IF = 20 mA		Viewing Angle 2θ1/2 (°)	Typical Emitting Wavelength		Lens Color	IF (mA) @Ta = 25°C)	
		Min	Typ.		λd (nm)	λp (nm)			
TLSH50T(F)	Red	2720	4700	16	613	623	Transparent	50	Pilot lamps
TLRH50T(F)		850	2000		630	644	Transparent	50	
TLSE50T(F)		1530	3500		613	623	Transparent	50	
TLRME50C(F)		1530	3500		626	636	Red transparent	50	
TLRME50T(F)		850	2500		626	636	Transparent	50	
TLRE50T(F)		850	2200		630	644	Transparent	50	
TLSE53T(F)		272	800	45	613	623	Transparent	50	
TLRME53T(F)		272	600		626	636	Transparent	50	
TLRE53T(F)		153	400		630	644	Transparent	50	
TLRME68TG(F) Δ		85	330	80	626	636	Transparent	50	Backlighting (wide range)
TLRME68CG(F) Δ		85	260		626	636	Red transparent	50	
TLSE62T(F)		85	200		613	623	Transparent	50	
TLRH62T(F)		47.6	180		630	644	Transparent	50	
TLRME62T(F)		47.6	180		626	636	Transparent	50	
TLRE62T(F)		47.6	120		630	644	Transparent	50	
TLRME68DG(F) Δ		47.6	140	100	626	636	Red diffused	50	
TLRE60T(F)		15.3	45	120	630	644	Transparent	50	
TLOE50C(F)	Orange	2720	7000	16	605	612	Orange transparent	50	Pilot lamps
TLOH50T(F)		1530	5800		605	612	Transparent	50	
TLOE50T(F)		1530	4500		605	612	Transparent	50	
TLOE53T(F)		272	1000	45	605	612	Transparent	50	
TLOH62T(F)		153	550	80	605	612	Transparent	50	Backlighting (wide range)
TLOE62T(F)		153	350		605	612	Transparent	50	
TLOE60T(F)		27.2	100	120	605	612	Transparent	50	
TLYH50T(F)	Yellow	1530	4400	16	587	590	Transparent	50	Pilot lamps
TLYE50T(F)		1530	3500		587	590	Transparent	50	
TLYE50C(F)		1530	3500		587	590	Yellow transparent	50	
TLYE53T(F)		272	800	45	587	590	Transparent	50	
TLYH68TG(F) Δ		272	520	80	587	590	Transparent	50	Backlighting (wide range)
TLYH62T(F)		153	400		587	590	Transparent	50	
TLYE68TG(F) Δ		85	340		587	590	Transparent	50	
TLYE68CG(F) Δ		85	300		587	590	Yellow transparent	50	
TLYE62T(F)		85	250		587	590	Transparent	50	
TLYE68DG(F) Δ		47.6	150	100	587	590	Yellow diffused	50	
TLYE60T(F)		27.2	85	120	587	590	Transparent	50	
TLPYE50T(F)	Pure yellow	850	2500	16	580	583	Transparent	50	Pilot lamps
TLPYE53T(F)		153	450	45	580	583	Transparent	50	
TLPYE62T(F)		47.6	150	80	580	583	Transparent	50	Backlighting (wide range)
TLGU50T(F)	Green	476	1200	10	571	574	Transparent	30	Pilot lamps
TLGE50T(F)		476	1500	16	571	574	Transparent	50	
TLGU53T(F)		47.6	170	40	571	574	Transparent	30	
TLGU53C(F)		47.6	150		571	574	Green transparent	30	
TLGE53T(F)		153	400	45	571	574	Transparent	50	
TLGU53D(F)		27.2	80	50	571	574	Green diffused	30	Backlighting (wide range)
TLGU62T(F)		27.2	70	80	571	574	Transparent	30	
TLGE68TG(F) Δ		47.6	155		571	574	Transparent	50	
TLGE68CG(F) Δ		47.6	110		571	574	Green transparent	50	
TLGE62T(F)		47.6	110		571	574	Transparent	50	
TLGE68DG(F) Δ		15.3	45	100	571	574	Green diffused	50	
TLGE60T(F)		15.3	50	120	571	574	Transparent	50	
TLFGE50T(F)	Fresh green	272	1000	16	565	568	Transparent	50	Pilot lamps
TLFGE50C(F)		272	1000		565	568	Green transparent	50	
TLFGE53T(F)		85	200	45	565	568	Transparent	50	
TLFGE68CG(F) Δ		27.2	70	80	565	568	Green transparent	50	Backlighting (wide range)
TLFGE62T(F)		27.2	70		565	568	Transparent	50	
TLFGE68DG(F) Δ		15.3	30	100	565	568	Green diffused	50	
TLPGU50T(F)	Pure green	153	450	10	558	562	Transparent	30	Pilot lamps
TLPGE50T(F)		153	600	16	558	562	Transparent	50	
TLPGU53T(F)		27.2	80	40	558	562	Transparent	30	
TLPGU53C(F)		27.2	70		558	562	Green transparent	30	
TLPGE53T(F)		47.6	130	45	558	562	Transparent	50	
TLPGU53D(F)		15.3	40	50	558	562	Green diffused	30	Backlighting (wide range)
TLPGE62T(F)		15.3	45	80	558	562	Transparent	50	
TLPGU62T(F)		8.5	25		558	562	Transparent	30	

Δ: Mount flush with PCB

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

High-Brightness LED Lamps (Other)

Part Number	Source Color	Package Size (mm)	Optical Characteristics (Ta = 25°C)						Absolute Maximum DC Forward Current Rating IF (mA) @Ta = 25°C	Typical Applications
			Intensity (mcd) IF = 20 mA		Viewing Angle 2θ1/2 (°)	Typical Emitting Wavelength		Lens Color		
			Min	Typ.		λd (nm)	λp (nm)			
TLSE27C(F)	Red	Oval 5 x 5.8	272	750	30/50	613	623	Red transparent	50	Message boards
TLRH27T(F)			153	450	40/70	630	644	Transparent	50	
TLRME27C(F)			153	400	30/50	626	636	Red transparent	50	
TLRE27C(F)			85	300		630	644	Red transparent	50	
TLOE27C(F)	Orange		272	800	30/50	605	612	Orange transparent	50	
TLYH27T(F)	Yellow		272	900	40/70	587	590	Transparent	50	
TLYE27C(F)			272	650	30/50	587	590	Yellow transparent	50	
TLGE27C(F)	Green		85	250	30/50	571	574	Green transparent	50	
TLRE28C(F)	Red	Oval 4.3 x 5	85	200	80/50	630	644	Red transparent	50	
TLRME28C(F)			85	200		626	636	Red transparent	50	
TLSE28C(F)			85	300		613	623	Red transparent	50	
TLYH28C(F)	Yellow		272	750	70/50	587	590	Yellow transparent	50	
TLYE28C(F)			153	350	80/50	587	590	Yellow transparent	50	
TLOE28C(F)	Orange		153	500		605	612	Orange transparent	50	
TLGH28C(F)	Green		47.6	170	70/50	571	574	Green transparent	50	
TLGE28C(F)			47.6	150	80/50	571	574	Green transparent	50	
TLOE33CP(F)	Orange	Arched 5 x 2.5	1530	4000	10	605	612	Orange transparent	50	Backlighting
TLYE33CP(F)	Yellow		1530	3500		587	590	Yellow transparent	50	
TLPYE33CP(F)	Pure yellow		476	1400		580	583	Yellow transparent	50	
TLFGE33CP(F)	Fresh green		153	400		565	568	Green transparent	50	
TLGE33CP(F)	Green		272	800		571	574	Green transparent	50	
TLGE33TP(F)			476	1300		571	574	Transparent	50	

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Surface-Mount LED Lamps (1608)

Part Number	Source Color	Package Size (mm)	Optical Characteristics (Ta = 25°C)						Packaging Specification
			Intensity Iv (mcd)		Typical Emitting Wavelength		Viewing Angle 2θ1/2 (°)	IF (mA)	
			Min	Typ.	λd (nm)	λp (nm)			
TLRE1008A(T04)/(T05) ☆	Red	1.6(L) x 0.8(W) x 0.6(H) (PCB type)	27.2	70	630	644	130 to 135	20	Embossed tape Tape No.: T04 4-mm pitch 4000 pcs/reel
TLSE1008A(T04)/(T05) ☆	Red		47.6	135	613	623			
TLOE1008A(T04)/(T05) ☆	Orange		47.6	150	605	612			
TLYE1008A(T04)/(T05) ☆	Yellow		27.2	105	587	590			
TLPYE1008A(T04)/(T05) ☆	Pure yellow		27.2	100	580	583			
TLGE1008A(T04)/(T05) ☆	Green		27.2	70	571	574			
TLFGE1008A(T04)/(T05) ☆	Fresh green		15.3	40	565	568			
TLPGE1008A(T04)/(T05) ☆	Pure green		4.76	18	558	562			
TLSU1008A(T04)/(T05) ☆	Red		27.2	60	623	636	100 to 110		Tape No.: T05 2-mm pitch 8000 pcs/reel
TLOU1008A(T04)/(T05) ☆	Orange		27.2	78	605	612			
TLAU1008A(T04)/(T05) ☆	Amber		8.5	30	592	596			
TLYU1008A(T04)/(T05) ☆	Yellow		8.5	30	587	590			
TLGU1008A(T04)/(T05) ☆	Green		8.5	30	571	574			
TLPGU1008A(T04)/(T05) ☆	Pure green		1.53	6	558	562			
TLRH1032(T14,F)/(T15,F) ☆	Red	1.6(L) x 0.8(W) x 0.45(H) (ESC type)	25	56	630	644	135 to 140	20	Embossed tape Tape No.: T14 4-mm pitch 4000 pcs/reel
TLRMH1032(T14,F)/(T15,F) ☆	Red		40	85	626	636			
TLSH1032(T14,F)/(T15,F) ☆	Red		63	160	613	623			
TLOH1032(T14,F)/(T15,F) ☆	Orange		100	200	605	612			
TLYH1032(T14,F)/(T15,F) ☆	Yellow		40	100	587	590			
TLGH1032(T14,F)/(T15,F) ☆	Green		25	60	571	574			Tape No.: T15 2-mm pitch 8000 pcs/reel
TLFGH1032(T14,F)/(T15,F) ☆	Fresh green		10	25	565	568			

- ☆: Dry-packed
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

See-Through LEDs in a 1608 Package for Indicator Applications

Part Number	Source Color	Package Size (mm)	Optical Characteristics (Ta = 25°C)						Packaging Specification
			Intensity Iv (mcd)		Typical Emitting Wavelength		Viewing Angle 2θ1/2 (°)	IF (mA)	
			Min	Typ.	λd (nm)	λp (nm)			
TLRV1034(T22 * ☆)	Red	1.6(L) x 0.8(W) x 0.4(H) (See-through)	4	15	630	644	140	5	Embossed tape Tape No.: T22 4-mm pitch 5000 pcs/reel
TLRMV1034(T22 * ☆)	Red		4	20	626	636			
TLSV1034(T22 * ☆)	Red		10	30	613	623			
TLOV1034(T22 * ☆)	Orange		10	38	605	612			
TLYV1034(T22 * ☆)	Yellow		10	25	587	590			
TLPYV1034(T22 * ☆)	Pure yellow		10	23	580	583			
TLGV1034(T22 * ☆)	Green		4	14	571	574			
TLFGV1034(T22 * ☆)	Fresh green		2.5	8	565	568			
TLPGV1034(T22 * ☆)	Pure green		1.6	3.5	561	562			
TLEGD1034(T22 * ☆)	Green		32	70	528	518	150	5	
TLBD1034(T22 * ☆)	Blue		8	20	470	468			
TLWD1034(T22 * ☆)	White		40	100	♠0.31/0.30		130/150		
TLGH1034(T22 * ☆)	Green		40	70	571	574	140	20	
TLFGH1034(T22 * ☆)	Fresh green		25	40	565	568			
TLPGH1034(T22 * ☆)	Pure green		10	20	561	562			

☆: Dry-packed

*: New product

♠: CIE1931 (chromaticity coordinate) (typ.)

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Surface-Mount LED Lamps (2125)

Part Number	Source Color	Package Size (mm)	Optical Characteristics (Ta = 25°C)						Packaging Specification
			Intensity Iv (mcd)		Typical Emitting Wavelength		Viewing Angle 2θ1/2 (°)	IF (mA)	
			Min	Typ.	λd (nm)	λp (nm)			
TLRE1002A(T02) ☆	Red	2.0(L) x 1.25(W) x 1.1(H)	27.2	70	630	644	130 to 140	20	Embossed tape Tape No.: T02 4-mm pitch 3000 pcs/reel
TLSE1002A(T02) ☆	Red		47.6	140	613	623			
TLOE1002A(T02) ☆	Orange		47.6	180	605	612			
TLYE1002A(T02) ☆	Yellow		27.2	105	587	590			
TLPYE1002A(T02) ☆	Pure yellow		27.2	70	580	583			
TLGE1002A(T02) ☆	Green		27.2	70	571	574			
TLFGE1002A(T02) ☆	Fresh green		8.5	25	565	568			
TLPGE1002A(T02) ☆	Pure green		4.76	18	558	562			
TLRU1002A(T02) ☆	Red		4.76	45	630	644	120 to 130		
TLSU1002A(T02) ☆	Red		27.2	60	623	636			
TLOU1002A(T02) ☆	Orange		27.2	78	605	612			
TLAU1002A(T02) ☆	Amber		8.5	30	592	596			
TLYU1002A(T02) ☆	Yellow		8.5	30	587	590			
TLGU1002A(T02) ☆	Green		8.5	30	571	574			
TLPGU1002A(T02) ☆	Pure green		1.53	6	558	562			

☆: Dry-packed

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Surface-Mount LED Lamps (ϕ3.6 Lens-Top)

Part Number	Source Color	Package Size (mm)	Optical Characteristics (Ta = 25°C)						Packaging Specification
			Intensity Iv (mcd)		Typical Emitting Wavelength		Viewing Angle 2θ1/2 (°)	IF (mA)	
			Min	Typ.	λd (nm)	λp (nm)			
TLRM1050(T20) ☆	Red	5.2(L) x 5.2(W) x 4.0(H) with ϕ3.6 lens	630	1800	630	644	35	20	Embossed tape Tape No.: T20 8-mm pitch 400 pcs/reel
TLRMM1050(T20) ☆	Red		1000	2000	626	636			
TLSM1050(T20) ☆	Red		1600	2800	613	623			
TLOM1050(T20) ☆	Orange		1600	3500	605	612			
TLYM1050(T20) ☆	Yellow		1600	3000	590	592			
TLRM1052(T20) ☆	Red	5.2(L) x 5.2(W) x 4.0(H) with 3.6 x 4.4 Oval lens	630	1200	630	644	30/85		
TLRMM1052(T20) ☆	Red		630	1300	626	636			
TLSM1052(T20) ☆	Red		1000	1900	613	623			
TLOM1052(T20) ☆	Orange		1000	2200	605	612			
TLYM1052(T20) ☆	Yellow		1000	1900	590	592			
TLRMH1050(T20) ☆	Red	5.2(L) x 5.2(W) x 4.0(H) with ϕ3.6 lens	272	700	626	636	30	20	
TLSH1050(T20) ☆	Red		476	1400	613	623			
TLOH1050(T20) ☆	Orange		476	1500	605	612			
TLYH1050(T20) ☆	Yellow		476	1000	587	590			
TLGH1050(T20) ☆	Green		272	600	571	574			
TLFGH1050(T20) ☆	Fresh green		85	250	565	568			
TLEGD1050(T20) ☆	Green		476	1300	528	518	40		
TLBD1050(T20) ☆	Blue		153	400	470	468			
TLRMH1052(T20) ☆	Red	5.2(L) x 5.2(W) x 4.0(H) with 3.6 x 4.4 Oval lens	153	450	626	636	30/85	20	
TLSH1052(T20) ☆	Red		272	900	613	623			
TLOH1052(T20) ☆	Orange		476	1000	605	612			
TLYH1052(T20) ☆	Yellow		272	750	587	590			
TLGH1052(T20) ☆	Green		153	400	571	574			
TLFGH1052(T20) ☆	Fresh green		85	190	565	568			
TLEGD1052(T20) ☆	Green		272	850	528	518	30/75		
TLBD1052(T20) ☆	Blue		85	300	470	468			
TLRMF1050(T20) ☆	Red	5.2(L) x 5.2(W) x 4.0(H) with ϕ3.6 lens	250	700	626	636	30	20	
TLSF1050(T20) ☆	Red		630	1400	613	623			
TLOF1050(T20) ☆	Orange		630	1500	605	612			
TLYF1050(T20) ☆	Yellow		630	1000	587	590			
TLGF1050(T20) ☆	Green		400	900	571	574			
TLFGF1050(T20) ☆	Fresh green		160	370	565	568			
TLPGF1050(T20) ☆	Pure green		100	180	558	562			
TLRMF1052(T20) ☆	Red	5.2(L) x 5.2(W) x 4.0(H) with 3.6 x 4.4 Oval lens	160	450	626	636	30/85	20	
TLSF1052(T20) ☆	Red		400	900	613	623			
TLOF1052(T20) ☆	Orange		400	1000	605	612			
TLYF1052(T20) ☆	Yellow		250	750	587	590			
TLGF1052(T20) ☆	Green		250	600	571	574			
TLFGF1052(T20) ☆	Fresh green		100	280	565	568			
TLPGF1052(T20) ☆	Pure green		63	140	558	562			

☆: Dry-packed

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Mini PLCC LED Lamps (Flat-Top)

Part Number	Source Color	Package Size (mm)	Optical Characteristics (Ta = 25°C)						Packaging Specification
			Intensity Iv (mcd)		Typical Emitting Wavelength		Viewing Angle 2θ1/2 (°)	IF (mA)	
			Min	Typ.	λd (nm)	λp (nm)			
TLRF1060(T18) ☆	Red	2.2(L) x 1.4(W) x 1.3(H)	40	100	630	644	100	20	Embossed tape Tape No.: T18 4-mm pitch 3000 pcs/reel
TLSF1060(T18) ☆	Red		100	200	613	623			
TLOF1060(T18) ☆	Orange		100	220	605	612			
TLYF1060(T18) ☆	Yellow		63	180	587	590			
TLPYF1060(T18) ☆	Pure yellow		40	100	580	583			
TLGF1060(T18) ☆	Green		40	80	571	574			
TLFGF1060(T18) ☆	Fresh green		25	50	565	568			
TLPGF1060(T18) ☆	Pure green		10	20	558	562			
TLRM1060(T18) * ☆	Red		160	350	630	644	120		
TLRMM1060(T18) * ☆	Red		160	450	626	636			
TLSM1060(T18) * ☆	Red		250	650	613	623			
TLOM1060(T18) * ☆	Orange		250	650	605	612			
TLYM1060(T18) * ☆	Yellow		250	600	590	592			
TLEGD1060(T18) ☆	Green		63	150	528	518	110	20	
TLBD1060(T18) ☆	Blue		25	60	470	468			
TLCBD1060(T18) ☆	Ice blue		40	90	♠0.2/0.3			10	
TLWD1060(T18) ☆	White		40	90	♠0.31/0.30				

☆: Dry-packed ♠: CIE1931 (chromaticity coordinate) (typ.) *: New product

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

PLCC SMD LED Lamps (Flat-Top)

Part Number	Source Color	Package Size (mm)	Optical Characteristics (Ta = 25°C)						Packaging Specification
			Intensity Iv (mcd)		Typical Emitting Wavelength		Viewing Angle 2θ1/2 (°)	IF (mA)	
			Min	Typ.	λd (nm)	λp (nm)			
TLRK1100C(T11) ☆	Red	3.5(L) x 2.8(W) x 1.9(H)	100	300	630	644	120	20	Embossed tape Tape No.: T11 4-mm pitch 2000 pcs/reel
TLRMK1100C(T11) ☆	Red		160	400	626	636			
TLSK1100C(T11) ☆	Red		250	500	613	623			
TLOK1100C(T11) ☆	Orange		250	500	605	612			
TLYK1100C(T11) ☆	Yellow		160	400	590	592			
TLRH1100D(T11) ☆	Red		63	150	630	644			
TLRMH1100D(T11) ☆	Red		63	150	626	636			
TLSH1100D(T11) ☆	Red		160	260	613	623			
TLOH1100D(T11) ☆	Orange		160	270	605	612			
TLYH1100D(T11) ☆	Yellow		100	220	587	590			
TLGH1100B(T11) ☆	Green		63	150	571	574			
TLFGH1100B(T11) ☆	Green		40	70	565	568			
TLPGH1100B(T11) ☆	Green		16	35	558	562			
TLRE1100D(T11) ☆	Red		40	120	630	644			
TLSE1100D(T11) ☆	Red		63	210	613	623			
TLOE1100D(T11) ☆	Orange		63	210	605	612			
TLYE1100D(T11) ☆	Yellow		63	180	587	590			
TLGE1100D(T11) ☆	Green		40	100	571	574			
TLFGE1100D(T11) ☆	Fresh green		25	45	565	568			
TLPGE1100D(T11) ☆	Pure green		10	25	558	562			
TLEGD1100B(T11 ☆	Green		100	200	528	518			
TLBD1100B(T11 ☆	Blue		40	70	470	468			
TLBA1100B(T11) ☆	Blue		4	7	465	428		10	
TLCBD1100B(T11 ☆	Ice blue		32	90	♠0.2/0.3				
TLWD1100B(T11 ☆	White		63	180	♠0.32/0.31			20	
TLEGF1100C(T11 * ☆	Green	3.5(L) x 2.9(W) x 1.9(H)	400	700	528	518			
TLBF1100C(T11 * ☆	Blue		200	300	470	468			
TLWF1100C(T11 * ☆	White (Color temperature: 6500 K)		1000	1600	♠0.31/0.30				
TLWNF1100C(T11 * ☆	White (Color temperature: 5000 K)		1000	1600	♠0.345/0.35				
TLWLF1100C(T11 * ☆	White (Color temperature: 3000 K)		800	1160	♠0.44/0.40				
TLRH1106(T11) ☆	Red	3.5(L) x 2.8(W) x 1.9(H)	160	380	630	644		50	
TLRMH1106(T11) ☆	Red		160	380	626	636			
TLSH1106(T11) ☆	Red		250	500	613	623			
TLOH1106(T11) ☆	Orange		250	600	605	612			
TLYH1106(T11) ☆	Yellow		250	450	587	590			
TLGH1106(T11) ☆	Green		100	200	571	574			
TLRM1108(T11) * ☆	Red	3.5(L) x 2.9(W) x 1.9(H)	630	1300	630	644			
TLRMM1108(T11) * ☆	Red		630	1600	626	636			
TLSM1108(T11) * ☆	Red		1000	2400	613	623		50	
TLOM1108(T11) * ☆	Orange		1000	2500	605	612			
TLYM1108(T11) * ☆	Yellow		1000	2200	590	592			
TLEGF1108(T11 * ☆	Green	3.5(L) x 2.9(W) x 1.9(H)	1000	2000	528	518			
TLBF1108(T11 * ☆	Blue		400	560	470	468			
TLWF1108(T11 * ☆	White (Color temperature: 6500 K)		2000	3200	♠0.31/0.3				
TLWNF1108(T11 * ☆	White (Color temperature: 5000 K)		2000	3200	♠0.345/0.35				
TLWLF1108(T11 * ☆	White (Color temperature: 3000 K)		1600	2500	♠0.44/0.4			40	
TLWF1109(T11 * ☆	White (Color temperature: 6500 K)		2000	3200	♠0.31/0.3				
TLWNF1109(T11 * ☆	White (Color temperature: 5000 K)		2000	3200	♠0.345/0.35				
TLWLF1109(T11 * ☆	White (Color temperature: 3000 K)		1600	2500	♠0.44/0.4				

☆: Dry-packed

*: New product

♠: CIE1931 (chromaticity coordinate) (typ.)

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

See-Through LEDs for Lighting Applications

Part Number	Source Color	Package Size (mm)	Optical Characteristics (Ta = 25°C)								Packaging Specification
			Luminous Flux F (lm)		♠ Typical Chromaticity		Ra	Forward Voltage V_F (V)	Viewing Angle 2θ1/2 (°)	I_F (mA)	
			Min	Typ.	Cx	Cy					
TL19W01A-NA * ☆	White (Color temperature: 5000K)	3.8(L) × 3.1(W) × 0.65(H)	(100)	115	0.345	0.355	65 typ.	3.25	140	300	Embossed tape Tape No.: T32 8-mm pitch 1000 pcs/reel
TL19W01A-D * ☆	White (Color temperature: 6500K)		(80)	100	0.313	0.329	70 min				
TL19W01A-N * ☆	White (Color temperature: 5000K)		(80)	105	0.345	0.355					
TL19W01A-L * ☆	White (Color temperature: 3000K)		(70)	95	0.434	0.403			130		
TL19W01A-D1 * ☆	White (Color temperature: 6500K)		(70)	90	0.313	0.329	80 min				
TL19W01A-N1 * ☆	White (Color temperature: 5000K)		(70)	95	0.345	0.355					
TL19W01A-L1 * ☆	White (Color temperature: 3000K)		(60)	85	0.434	0.403					
TL19W01A-LL1 * ☆	White (Color temperature: 2700K)		(60)	80	0.458	0.410					
TL19W01A-N2 * ☆	White (Color temperature: 5000K)		(70)	90	0.345	0.355	88 min				
TL19W01A-L2 * ☆	White (Color temperature: 3000K)		(60)	80	0.434	0.403					
TL21W02-D * ☆	White (Color temperature: 6500K)	2.5(L) × 2.1(W) × 0.65(H)	(30.3)	48	0.313	0.329	70 min	3.25	150	150	Embossed tape Tape No.: T34 8-mm pitch 2000 pcs/reel
TL21W02-N * ☆	White (Color temperature: 5000K)		(36.0)	51	0.345	0.355					
TL21W02-L * ☆	White (Color temperature: 3000K)		(30.3)	46	0.434	0.403			140		
TL21W02-D1 * ☆	White (Color temperature: 6500K)		(30.3)	45	0.313	0.329	80 min				
TL21W02-N1 * ☆	White (Color temperature: 5000K)		(30.3)	47	0.345	0.355					
TL21W02-L1 * ☆	White (Color temperature: 3000K)		(30.3)	42	0.434	0.403					
TL21W02-LL1 * ☆	White (Color temperature: 2700K)		(25.5)	40	0.458	0.410					
TL21W01-D * ☆	White (Color temperature: 6500K)	2.5(L) × 2.1(W) × 0.65(H)	(12.7)	20	0.313	0.329	70 min	3.1	140	60	Embossed tape Tape No.: T34 8-mm pitch 2000 pcs/reel
TL21W01-N * ☆	White (Color temperature: 5000K)		(15.1)	22	0.345	0.355					
TL21W01-L * ☆	White (Color temperature: 3000K)		(12.7)	18	0.434	0.403			130		
TL21W01-D1 * ☆	White (Color temperature: 6500K)		(12.7)	18	0.313	0.329	80 min				
TL21W01-N1 * ☆	White (Color temperature: 5000K)		(12.7)	20	0.345	0.355					
TL21W01-L1 * ☆	White (Color temperature: 3000K)		(10.7)	16	0.434	0.403					
TL21W01-LL1 * ☆	White (Color temperature: 2700K)		(10.7)	15	0.458	0.410					

☆: Dry-packed

*: New product

♠: CIE1931 (chromaticity coordinate) (typ.)

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photosensors

Infrared LEDs

Part Number	Part Number with Rank	Package	Electrical/Optical Characteristics (Ta = 25°C)								Applications
			Radiant Intensity			Radiant Power			Peak Emission Wavelength (nm)	Half-Value Angle (°)	
			Min (mW/sr)	Max (mW/sr)	I_F (mA)	Min (mW)	Max (mW)	I_F (mA)			
TLN108(F)	—	TO-18CAN with lens	10	—	50	—	—	—	940	±8	Optoelectronic switches
TLN105B(F)	—	ϕ5	12	—	50	—	—	—	950	±23.5	Remote controls
TLN110(F)	—	ϕ5	15	—	50	—	—	—	940	±8	Optoelectronic switches
TLN115A(F)	—	ϕ5	15	—	50	—	—	—	950	±21	Remote controls
	TLN115A(B,F)		19	—							
TLN231(F)	—	ϕ5	35	—	50	—	—	—	870	±16	Fiberless optical transmissions, optoelectronic switches
TLN233(F)	—	ϕ5	46	—	50	—	—	—	870	±13	
TLN119(F)	—	ϕ3	2.5	10	20	—	—	—	945	±30	Optoelectronic switches
	TLN119(B,F)		4.2	10							
TLN238(F)	—	ϕ3	40	—	50	—	—	—	870	±18	Fiberless optical transmissions, optoelectronic switches
TLN117(F)	—	Small side-view package	2	—	20	—	—	—	940	±15	Optoelectronic switches
	TLN117(C,F)		5	18.7							
TLN1050 ☆	—	ϕ3.6 with lens	32.5	115	100	—	—	—	870	±20	Fiberless optical transmissions, Infrared lighting
TLN1108 ☆	—	PLCC	10	35	100	—	—	—	870	±60	

☆: Dry-packed

Note: I_F = forward current

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Phototransistors

Part Number	Part Number with Rank	Package	Electrical/Optical Characteristics (Ta = 25°C)							Applications
			Light Current			Dark Current		Peak Sensitive Wavelength (nm)	Half-Value Angle (°)	Impermeable to Visible Light	
			Min (μA)	Max (μA)	E (mW/cm^2)	Max (μA)	V_{CE} (V)				
TPS601A(F)	—	TO-18CAN with lens	100	—	0.1	0.2	30	800	±10	—	Optoelectronic switches
	TPS601A(A,F)		100	300							
	TPS601A(B,F)		200	600							
	TPS601A(C,F)		400	1200							
TPS610(F)	—	ϕ5	100	—	0.1	0.1	24	800	±8	—	
TPS611(F)	—	ϕ5	30	—	0.1	0.1	24	900	±8	●	
TPS615(F)	—	ϕ3	20	150	0.1	0.1	24	800	±30	—	
	TPS615(B,F)		34	85							
	TPS615(C,F)		60	150							
	TPS615(BC,F)		34	150							
TPS616(F)	—	ϕ3	10	75	0.1	0.1	24	900	±30	●	
	TPS616(B,F)		17	42.5							
	TPS616(C,F)		30	75							
	TPS616(BC,F)		17	75							
TPS622(F)	—	Small side-view package	27	—	0.1	0.1	24	870	±15	●	
	TPS622(A,F)		27	80							
	TPS622(B,F)		55	165							

Note: E = radiant incidence; V_{CE} = collector-emitter voltage

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photodiodes

Part Number	Package	Electrical/Optical Characteristics (Ta = 25°C)							Applications
		Short-Circuit Current		Dark Current		Peak Sensitive Wavelength (nm)	Half-Value Angle (°)	Impermeable to Visible Light	
		Min (μA)	E (mW/cm²)	Max (nA)	V_R (V)				
TPS703(F)	Side-view package	0.9	0.1	30	10	960	±65	●	Remote controls
TPS704(F)		0.5	0.1	30	10	1000	±65	●	

Note: E = radiant incidence; V_R = reverse voltage

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photo-ICs (Analog Output)

Part Number	Package	Electrical/Optical Characteristics (Ta = 25°C)										Applications
		Light Current					Dark Current		Peak Sensitive Wavelength (nm)	Half-Value Angle (°)	Impermeable to Visible Light	
		Part Number with Rank	Min (μA)	Max (μA)	Ev (lx)	V_{CC} (V)	Max (μA)	V_{CC} (V)				
TPS820(B,F)	Side-view package	—	1500	6000	E = 0.1 mW/cm²	5	0.5	5	870	±15	●	Optoelectronic switches
TPS851(E ☆	Chip type	—	37	74	100	3	0.17	3.3	600	±55	—	Ambient light sensor
		TPS851(E,A	37	62								
TPS852(T)/ TPS852(K) ☆		—	27	54	100	3	0.1	3.3	600	±55	—	
		TPS852(A,T)/TPS852(A,K)	30	50								
TPS853(E ☆		—	37	74	100	3	0.1	3.3	600	±55	—	
		TPS853(E,A	42	70								
TPS856(T)/ TPS856(K) ☆			40	80	100	3	0.1	3	550	±55	—	
		TPS856(A,T)/TPS856(A,K)	44.1	73.7								
TPS859(T)/ TPS859(K) ☆		—	160	320	100	3	0.2	3	550	±55	—	
		TPS859(A,T)/TPS859(A,K)	180	300								

☆: Dry-packed

Note 1: V_{CC} = power supply voltage; Ev: Illuminance; E = radiant incidence

Note 2: (T) = For world wide except japan, (K) = For japan

- The products shown in italic are manufactured by Toshiba semiconductor (Thailand) Co.,Ltd.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photointerrupters (Phototransistor Output)

Part Number	Part Number with Rank	Package	Gap (mm)	Slit Width (mm)	Electrical Characteristics (Ta = 25°C)				Absolute Maximum Ratings (Ta = 25°C)	Applications
					Current Transfer Ratio					
					Min (%)	Max (%)	I_F (mA)	V_{CE} (V)	Collector-Emitter Voltage (V)	
TLP832(F)	—	PWB direct mounting	5	0.5	5	100	10	2	35	Printers, fax machines, copiers, image scanners, vending machines
TLP833(F)	—		5	0.5	5	100	10	2	35	
TLP831(F)	—		4.2	0.5 (Note 1)	5	100	10	2	35	
TLP830(F)	—		2	0.15	3	20	10	2	35	

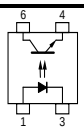
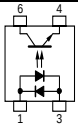
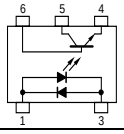
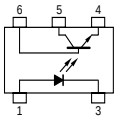
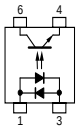
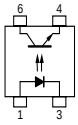
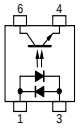
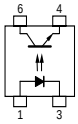
Note: PWB = printed wiring board; I_F = forward current; V_{CE} = collector-emitter voltage

Note 1: Horizontal slit

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photocouplers and Photorelays

Transistor Output

Part Number	Pin Configuration	Features	CTR				V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min (%)	Max (%)	@I_F / V_{CE} (mA) (V)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP124		Mini-flat MFSOP6 Low input drive current	—	100	1200	1/0.5	80		○	○				
			BV	200										
TLP126		Mini-flat MFSOP6 AC input Low input drive current	—	100	1200	±1/0.5			○	○				
TLP130		Mini-flat MFSOP6 AC input Internal base connection	—	50	600	±5/5	80		○	○				
			GB	100										
TLP131		Mini-flat MFSOP6 General-purpose Internal base connection	—	50	600	5/5	80		○	○				
			GB	100										
TLP137		Mini-flat MFSOP6 Low input drive current Internal base connection	—	100	1200	1/0.5			○	○				
			BV	200										
TLP180		Mini-flat MFSOP6 AC input SEMKO-approved TST part recommended	—	50	600	±5/5	80	3750	○	○	○(2)	△(2)	◎	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
TLP181		Mini-flat MFSOP6 General-purpose High CTR SEMKO-approved TST part recommended	—	50	600	5/5			○	○	△(2)	○(2)	◎	△
			GB	100										
			Y	50	150									
			GR	100	300									
			BL	200	600									
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
TLP184 **		SO6 (reinforced insulation) AC input	—	50	600	±5/5			△	△	△(2)	△(2)	△	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
TLP185 **		SO6 (reinforced insulation)	—	50	600	5/5			△	△	△(2)	△(2)	△	△
			GB	100										
			Y	50	150									
			GR	100	300									
			BL	200	600									
			YH	75	150									
			GRL	100	200									
			GRH	150	300									

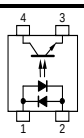
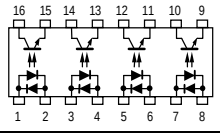
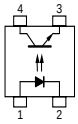
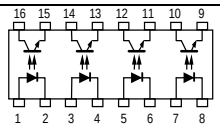
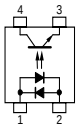
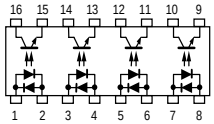
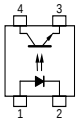
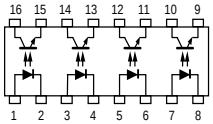
Note (1): Legend in the Safety Standards column:
BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2010
EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

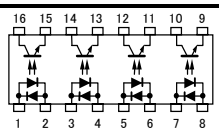
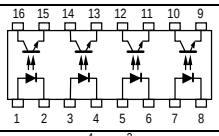
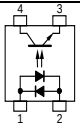
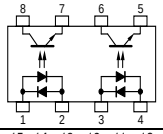
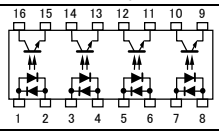
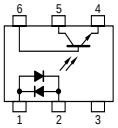
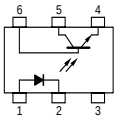
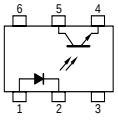
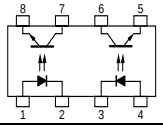
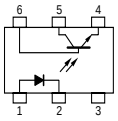
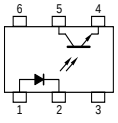
Transistor Output (Continued)

Part Number	Pin Configuration	Features	CTR				V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min (%)	Max (%)	@I_F / V_{CE} (mA) (V)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP280		SOP4 Lead pitch: 1.27 mm AC input SEMKO-approved TST part recommended	—	50	600	±5/5	80	2500	○	○	△(2)	○(2)	◎	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
TLP280-4		SOP16 4-channel version of the TLP280 Lead pitch: 1.27 mm AC input SEMKO-approved	—	50	600									
			GB	100										
TLP281		SOP4 Lead pitch: 1.27 mm General-purpose SEMKO-approved TST part recommended	—	50	600	5/5	80	2500	○	○	△(2)	○(2)	◎	△
			GB	100										
			Y	50	150									
			GR	100	300									
			BL	200	600									
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
			BLL	200	400									
TLP281-4		SOP16 4-channel version of the TLP281 Lead pitch: 1.27 mm SEMKO-approved	—	50	600									
			GB	100										
TLP284		SOP4 Lead pitch: 1.27 mm AC input General-purpose・High BVs Creepage distance: 5.0 mm (min) TST part recommended	—	50	600	±5/5	80	3750	○	○	△(2)	○(2)	○	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
TLP284-4		SOP16 4-channel version of the TLP284 Lead pitch: 1.27 mm AC input General-purpose・High BVs Creepage distance: 5.0 mm (min)	—	50	600				○	○				
			GB	100	600									
TLP285		SOP4 Lead pitch: 1.27 mm General-purpose・High BVs Creepage distance: 5.0 mm (min) TST part recommended	—	50	600	5/5	80	3750	○	○	○(2)	○(2)	◎	△
			GB	100										
			Y	50	150									
			GR	100	300									
			BL	200	600									
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
			BLL	200	400									
TLP285-4		SOP16 4-channel version of the TLP285 Lead pitch: 1.27 mm General-purpose・High BVs Creepage distance: 5.0 mm (min)	—	50	600				○	○		○	○	
			GB	100	600									

Note (1): Legend in the Safety Standards column:
BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2010
EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

- The pin configuration diagrams only show the general configurations of the circuits.
- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	CTR				V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min (%)	Max (%)	@I_F / V_{CE} (mA) (V)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP290-4 **		SO16 4-channel version equivalent of the TLP280 Lead pitch: 1.27 mm AC input	—	50	600	±5/5	80	2500	○	○		△(2)	△	△
			GB	100	600									
TLP291-4 **		SO16 4-channel version equivalent of the TLP281 Lead pitch: 1.27 mm	—	50	600	5/5			○	○		△(2)	△	△
			GB	100	600									
TLP320		DIP4 High input current AC input I_F = 150 mA	—	20	80	±100/1	55	5000	○	○	△	△	◎	△
TLP320-2		DIP8 Dual-channel version of the TLP320	—											
TLP320-4		DIP16 4-channel version of the TLP320	—											
TLP330		DIP6 High input current AC input I_F = 150 mA	—	20	80	±100/1	55	5000	○	○				
TLP331		DIP6 Low input drive current Internal base connection	—	100	1200	1/0.5	55	5000	○	○				
			BV	200										
TLP332		DIP6 Low input drive current No internal base connection	—	100										
			BV	200										
TLP504A		DIP8 General-purpose	—	50	600	5/5	55	2500	○					
			GB	100										
TLP531 (3)		DIP6 General-purpose Internal base connection	—	50	600	5/5	55	2500	○	○				
			GB	100										
			BL	200										
			GR	100	300									
			Y	50	150									
TLP532 (3)		DIP6 General-purpose High EMI immunity No internal base connection	—	50	600									
			GB	100										
			BL	200										
			GR	100	300									
			Y	50	150									

Note (1): Legend in the Safety Standards column:
BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2010
EN 60747-5-2-approved with optionV4 or D4

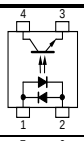
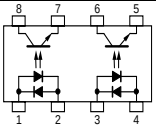
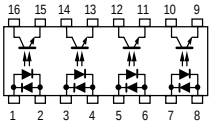
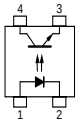
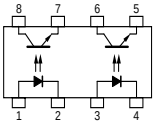
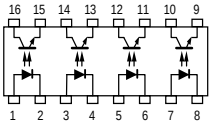
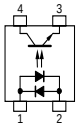
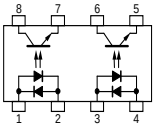
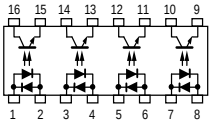
Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note (3): The products with the ranks Y and BL are limited in production. For details, please contact your nearest Toshiba sales representative.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

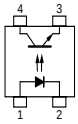
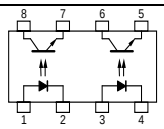
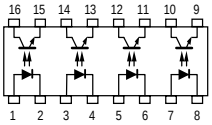
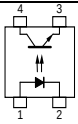
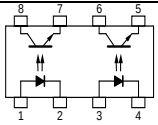
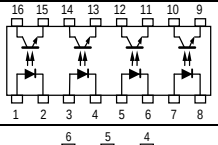
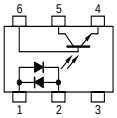
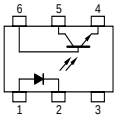
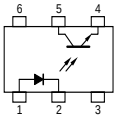
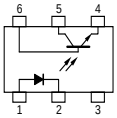
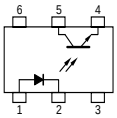
- The pin configuration diagrams only show the general configurations of the circuits.
- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Transistor Output (Continued)

Part Number	Pin Configuration	Features	CTR				V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min (%)	Max (%)	@I_F / V_{CE} (mA) (V)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP620 **TLP620F**		DIP4 AC input SEMKO-approved	—	50	600	±5/5	55	5000	○	○	△	○	◎	△
			GB	100										
TLP620-2		DIP8 Dual channel version of the TLP620 SEMKO-approved	—	50										
			GB	100										
TLP620-4		DIP16 4-channel version of the TLP620	—	50										
			GB	100										
TLP624		DIP4 Low input drive current	—	100	1200	1/0.5	55	5000	○		△	△	◎	△
			BV	200										
TLP624-2		DIP8 Dual channel version of the TLP624	—	100										
			BV	200										
TLP624-4		DIP16 4-channel version of the TLP624	—	100										
			BV	200										
TLP626		DIP4 Low input drive current AC input	—	100	1200	±1/0.5	55	5000	○		△	△	◎	△
			BV	200										
TLP626-2		DIP8 Dual channel version of the TLP626	—	100	1200	±1/0.5	55	5000	○		△	△	◎	△
			BV	200										
TLP626-4		DIP16 4-channel version of the TLP626	—	100										
			BV	200										

Note (1): Legend in the Safety Standards column:
BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2010
EN 60747-5-2-approved with optionV4 or D4

- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	CTR				V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min (%)	Max (%)	@I_F / V_{CE} (mA) (V)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP628		DIP4 High V_{CEO} V_{CEO} = 350 V	—	50	600	5/5	350	5000	○		△	△	△	△
			GB	100										
TLP628-2		DIP8 Dual channel version of the TLP628	—	50										
			GB	100										
TLP628-4		DIP16 4-channel version of the TLP628	—	50										
			GB	100										
TLP629		DIP4 High input current I_F = 150 mA DC input	—	20	80	100/1	55	5000	○		△	△	△	△
TLP629-2		DIP8 Dual channel version of the TLP629												
TLP629-4		DIP16 4-channel version of the TLP629												
TLP630		DIP6 AC input High isolation voltage	—	50	600	±5/5	55	5000	○					
			GB	100										
TLP631		DIP6 General-purpose Internal base connection	—	50	600	5/5	55	5000	○	○				
			GB	100										
			GR	100	300									
TLP632		DIP6 General-purpose High EMI immunity No internal base connection	—	50	600									
			GB	100										
			GR	100	300									
TLP731		DIP6 SEMKO-approved Internal base connection	—	50	600	5/5	55	4000	○	○	△	○	◎	△
			GB	100										
			GR	100	300									
TLP732		DIP6 SEMKO-approved No internal base connection	—	50	600									
			GB	100										
			GR	100	300									

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

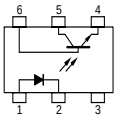
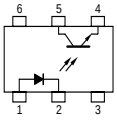
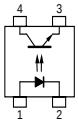
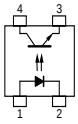
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2010

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Transistor Output (Continued)

Part Number	Pin Configuration	Features	CTR				V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min (%)	Max (%)	@I_F / V_{CE} (mA) (V)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP733 TLP733F		DIP6 SEMKO-approved Internal base connection	—	50	600	5/5	55	4000	○		△	○	◎	△
			GB	100										
			GR	100	300									
TLP734 TLP734F		DIP6 SEMKO-approved No internal base connection	—	50	600									
			GB	100										
			GR	100	300									
TLP781 (5) TLP781F (5)		DIP4 High isolation voltage UL-approved (double protection) SEMKO-approved	—	50	600	5/5	80	5000	○	○	△	○	◎	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
			BLL	200	400									
TLP785 ** (6) TLP785F ** (6)		DIP4 High isolation voltage UL-approved (double protection)	—	50	600	5/5	80	5000	○	○	△	△	△	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
			BLL	200	400									

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2010

EN 60747-5-2-approved with optionV4 or D4

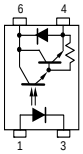
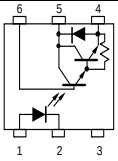
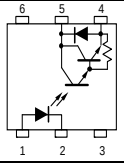
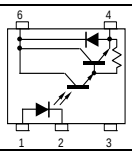
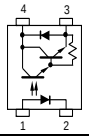
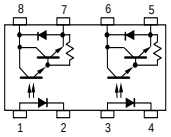
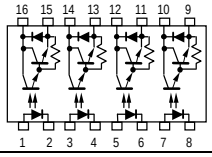
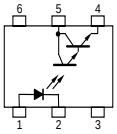
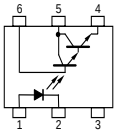
Note (5): For details of the TLP781 and TLP781F, please contact your nearest Toshiba sales representative.

Note (6): For details of the TLP785 and TLP785F, please contact your nearest Toshiba sales representative.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Darlington Transistor Output

Part Number	Pin Configuration	Features	CTR		V_{CE}(sat)		V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Min (%)	@I_F / V_{CE} (mA) (V)	Max (V)	@I_C / I_F (mA)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP127		Mini-flat MFSOP6 High V_{CEO}	1000	1/1	1.2	100/10	300	2500	○	○	○(2)	△(2)	◎	△
TLP371		DIP6 High V_{CEO} SEMKO-approved	1000	1/1	1.2	100/10	300	5000	○	○				
TLP372		DIP6 High V_{CEO} No internal base connection												
TLP373		DIP6 High V_{CEO} Long emitter-collector distance	1000	1/1	1.2	100/10	300	5000	○	○				
TLP523		DIP4 General-purpose	500	1/1	1.0	50/10	55	2500	○	○				
TLP523-2		DIP8 Dual channel version of the TLP523												
TLP523-4		DIP16 4-channel version of the TLP523												
TLP570		DIP6 General-purpose High EMI immunity	1000	1/1	1.2	100/10	35	2500	○					
TLP571		DIP6 General-purpose Internal base connection												

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

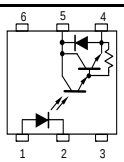
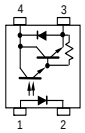
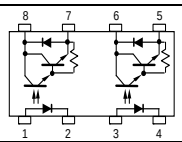
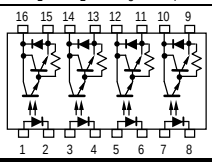
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Darlington Transistor Output (Continued)

Part Number	Pin Configuration	Features	CTR		V_{CE}(sat)		V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Min (%)	@I_F / V_{CE} (mA) (V)	Max (V)	@I_C / I_F (mA)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP572		DIP6 General-purpose Built-in R_{BE}	1000	1/1.2	1.2	100/10	55	2500	○					
TLP627		DIP4 High V_{CEO} SEMKO-approved	1000	1/1	1.2	100/10	300	5000	○	○	△	○	◎	△
TLP627-2		DIP8 Dual channel version of the TLP627 SEMKO-approved												
TLP627-4		DIP16 4-channel version of the TLP627												

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

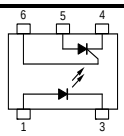
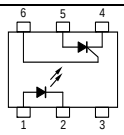
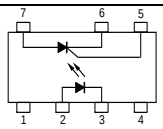
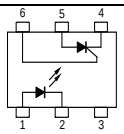
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Thyristor Output

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT}	Peak On-State Voltage, V_{TM}		Off-State Output Terminal Voltage V_{DRM} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Max (mA)	Max (V)	@I_{TM} (mA)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP148G		Mini-flat MFSOP6 General-purpose	10	1.45	100	400	2500	○	○				
TLP548J		DIP6 General-purpose Low trigger current	7	1.45	100	600		○	△				
TLP549J		DIP8 Long anode-cathode distance (SCR)	7	1.45	100	600		○	△				
TLP748J TLP748JF		DIP6 SEMKO-approved	10	1.45	100	600	4000	○	△		○	◎	

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

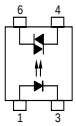
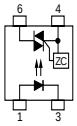
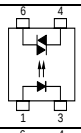
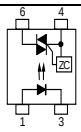
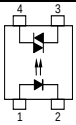
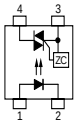
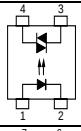
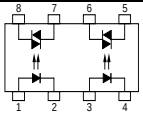
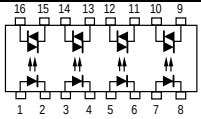
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Triac Output

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT}		Peak On-State Voltage, V_{TM}		Off-State Output Terminal Voltage V_{DRM} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Max (mA)	Max (V)	@I_{TM} (mA)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP160G		Mini-flat MFSOP6 Non-zero cross	—	10	2.8	70	400	2500	○	○	△(2)	○(2)		
			IFT7	7										
			IFT5	5										
TLP165J **TLP160J**			—	10			600		○	○	△(2)	○(2)		
			IFT7	7										
TLP161G		Mini-flat MFSOP6 Zero cross	—	10	2.8	70	400	2500	○	○	△(2)	○(2)		
			IFT7	7										
			IFT5	5										
TLP166J **TLP161J**			—	10			600		○	○	△(2)	○(2)		
			IFT7	7										
TLP163J		Mini-flat MFSOP6 Zero cross High impulse noise immunity V_N = 2000 V (typ.)	—	10		100			○	○	△(2)	△(2)		
TLP168J		Mini-flat MFSOP6 Zero cross	—	3		70			○	○				
TLP260J		Mini-flat MFSOP6 Non-zero cross	—	10	2.8	70	600	3000	○		△(2)	○(2)		
TLP261J		Mini-flat MFSOP6 Zero cross	—	10	2.8	70	600	3000	○		△(2)	○(2)		
TLP360J TLP360JF		DIP4 Non-zero cross	—	10	3.0	100	600	5000	○	○	○	△		
			IFT7	7										
TLP361J TLP361JF		DIP4 Zero cross	—	10	3.0	100	600	5000	○	○	○	△		
			IFT7	7										
TLP363J TLP363JF		DIP4 Zero cross High impulse noise immunity V_N = 2000 V (typ.)	—	10										
TLP525G		DIP4	—	10	3.0	100	400	2500	○	○				
TLP525G-2		DIP8 Dual channel version of the TLP525G	—	10										
TLP525G-4		DIP16 4-channel version of the TLP525G	—	10										

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

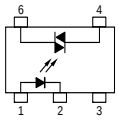
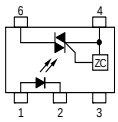
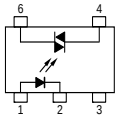
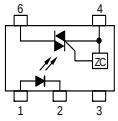
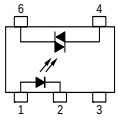
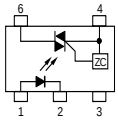
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

- The pin configuration diagrams only show the general configurations of the circuits.
- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Some of the photocouplers with triac output are also manufactured by Toshiba Semiconductor Thailand Co.,Ltd. For detailed information, please contact your nearest Toshiba sales representative.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT}		Peak On-State Voltage, V_{TM}		Off-State Output Terminal Voltage V_{DRM} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Max (mA)	Max (V)	@I_{TM} (mA)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP560G		DIP6 General-purpose Non zero cross	—	10	3.0	100	400	2500	○					
			IFT7	7										
			IFT5	5										
TLP560J			—	10			600							
			IFT7	7										
TLP561G		DIP6 General-purpose Zero cross	—	10	3.0	100	400		○					
			IFT7	7										
			IFT5	5										
TLP561J			—	10			600							
			IFT7	7										
TLP3022(S) TLP3022F(S)		DIP6 SEMKO-approved Non-zero cross	—	10	3.0	100	400	5000	○	○	△	○	◎	△
TLP3023(S) TLP3023F(S)			—	5										
TLP3052(S) **TLP3052F(S)**		DIP6 High V_{DRM} SEMKO-approved Non-zero cross	—	10			600							
TLP3042(S) TLP3042F(S)		DIP6 SEMKO-approved Zero cross	—	10	3.0	100	400	5000	○		△	○	◎	△
TLP3043(S) TLP3043F(S)			—	5										
TLP3062(S) TLP3062F(S)		DIP6 SEMKO-approved High V_{DRM} Zero cross	—	10			600							
TLP3063(S) TLP3063F(S)			—	5										
TLP3064(S) TLP3064F(S)		DIP6 SEMKO-approved Zero cross	—	3										
TLP3082(S) TLP3082F(S)		DIP6 Zero cross	—	10			800							
TLP3762(S) TLP3762F(S)		DIP6 Zero cross High impulse noise immunity V_N = 2000 V (typ.)	—	10			600							
TLP3782(S) **TLP3782F(S)**		DIP6 High impulse noise immunity V_N = 1500 V (typ.)	—	10			800		○		△	○		
TLP3783(S) **TLP3783F(S)**			—	5										
TLP762J TLP762JF		DIP6 SEMKO-approved Non zero cross	—	10	3.0	100	600	4000	○		△	○	◎	△
TLP763J TLP763JF		DIP6 SEMKO-approved Zero cross	—	10	3.0	100	600	4000	○		△	○	◎	△

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

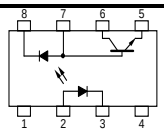
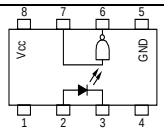
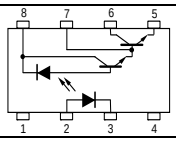
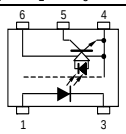
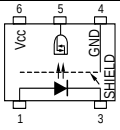
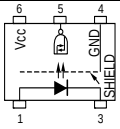
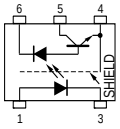
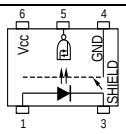
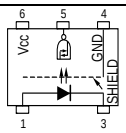
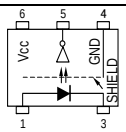
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Some of the photocouplers with triac output are also manufactured by Toshiba Semiconductor Thailand Co.,Ltd. For detailed information, please contact your nearest Toshiba sales representative.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

IC Output

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
6N135		DIP8 JEDEC-compliant	1M bit/s	7% Min	16		○					
6N136				19% Min								
6N137		DIP8 JEDEC-compliant High-speed	10M bit/s	700% Typ.	5	2500	○					
6N138		DIP8 JEDEC-compliant High CTR	300k bit/s	300% Min	1.6		○					
6N139				400% Min	0.5							
TLP104		SO6 (reinforced insulation) Topr (max) 125°C	Propagation delay time 550 ns (max)	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○	○		○(2)		
TLP105		Mini-flat MFSOP6	5M bit/s	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)		○	○	○(2)	△(2)		
TLP108		Mini-flat MFSOP6	5M bit/s	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○	○(2)	○(2)		
TLP109		SO6 (reinforced insulation)	1M bit/s	20% Min	16		○	○	△(2)	○(2)		
TLP109(IGM)			Propagation delay time 0.8 μs (max)	25% Min	10	3750	○	○	△	○(2)		
TLP116A		SO6 (reinforced insulation) Ultra-high-speed(20M Bd)	20M Bd	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		○	○	△(2)	○(2)		
TLP117		Mini-flat MFSOP6 Ultra-high-speed(50M Bd)	50M Bd				○	○	○(2)	○(2)		
TLP118		SO6 (reinforced insulation) Topr (max) 125°C Ultra-high-speed	20M Bd	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○	○		○(2)		

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

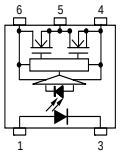
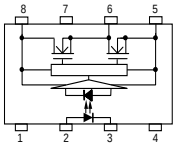
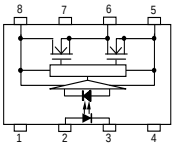
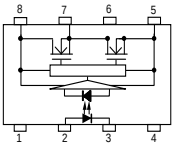
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP151		SO6 (reinforced insulation) Topr (max) 110°C Direct drive of a small power IGBT/MOSFET	Propagation delay time 0.7 μs (max)	Peak output current: ±0.6 A (Max)	I_{FHL} = 5 (max)	3750	○	○		○(2)		
TLP151A **			Propagation delay time 0.5 μs (max)				○	○		△(2)		
TLP155E **		SO6 (reinforced insulation) Topr (max) 100°C Direct drive of a small power IGBT/MOSFET	Propagation delay time 0.2 μs (max)	Peak output current: ±0.6 A (Max)	I_{FHL} = 7.5 (max)		○	○		○(2)		
TLP350 TLP350F		DIP8 Direct drive of a medium-power IGBT/MOSFET Low power dissipation	Propagation delay time 0.5 μs (max)	Peak output current: ±2.5 A (Max)	I_{FLH} = 5 (max)		○	○	○	○		
TLP350H TLP350HF		DIP8 Direct drive of a medium-power IGBT/MOSFET Low power dissipation Topr (max) 125°C	Propagation delay time 0.5 μs (max)	Peak output current: ±2.5 A (Max)	I_{FLH} = 5 (max)		○	○		○		
TLP351 TLP351F		DIP8 Topr (max) 110°C Direct drive of a small power IGBT/MOSFET Low power dissipation	Propagation delay time 0.7 μs (max)	Peak output current: ±0.6 A (Max)	I_{FLH} = 5 (max)		○	○	○	○		
TLP351A ** TLP351AF **		DIP8 Topr (max) 110°C Direct drive of a small power IGBT/MOSFET Low power dissipation	Propagation delay time 0.7 μs (max)	Peak output current: ±0.6 A (Max)	I_{FLH} = 5 (max)		△	△				
TLP351H TLP351HF		DIP8 Direct drive of a small power IGBT/MOSFET Low power dissipation Topr (max) 125°C	Propagation delay time 0.7 μs (max)	Peak output current: ±0.6 A (Max)	I_{FLH} = 5 (max)		○	○		○		
TLP352 ** TLP352F **		DIP8 Direct drive of a medium-power IGBT/MOSFET Low power dissipation Topr (max) 125°C	Propagation delay time 0.2 μs (max)	Peak output current: ±2.5 A (Max)	I_{FLH} = 5 (max)		△	△				
TLP358 TLP358F		DIP8 Direct drive of a medium-power IGBT/MOSFET Low power dissipation	Propagation delay time 0.5 μs (max)	Peak output current: ±6 A (Max)	I_{FLH} = 5 (max)		○	○	○	○		
TLP358H TLP358HF		DIP8 Direct drive of a medium-power IGBT/MOSFET Low power dissipation Topr (max) 125°C	Propagation delay time 0.5 μs (max)	Peak output current: ±6 A (Max)	I_{FLH} = 5 (max)		○	○	○	○		

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

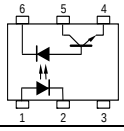
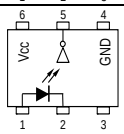
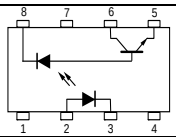
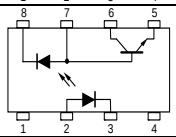
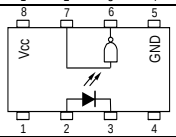
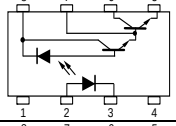
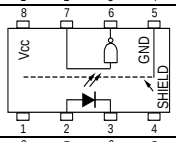
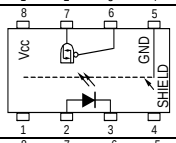
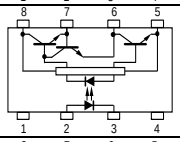
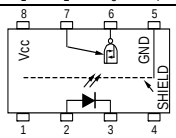
EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

IC Output (Continued)

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP512		DIP6 6-pin package version of the TLP550	1M bit/s	20% Min	16							
TLP513		DIP6 6-pin package version of the TLP552	10M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○					
TLP550		DIP8 No internal base connection High CMR	1M bit/s	10% min (19% (min) for rank O)	16			○				
TLP551		DIP8 Internal base connection	1M bit/s		16		○	○				
TLP552		DIP8 High-speed	10M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○					
TLP553		DIP8 Low input drive current	300k bit/s	400% Min	0.5	2500	○					
TLP554		DIP8 High-speed High CMR version of the TLP552	10M bit/s	Open-collector (Inverter logic)	I_{FHL} = 5 (max)		○	○				
TLP555		DIP8 Low input current High V_{CC} operation	5M bit/s	3-state output (Buffer logic)	I_{FLH} = 1.6 (max)		○	○				
TLP557		DIP8 Direct drive of a power transistor	Propagation delay time 5 μs (max)	Constant current output: 0.25 A	I_{FLH} = 5 (max)		○	○				
TLP558		DIP8 Inverted logic version of the TLP555	5M bit/s	3-state output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○				

Note (1): Legend in the Safety Standards column:

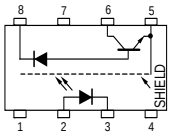
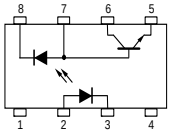
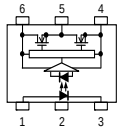
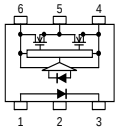
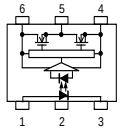
BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP559		DIP8 High CMR version of the TLP550 No internal base connection	1M bit/s	20% Min	16	2500	○	○				
TLP559(IGM)			Propagation delay time 0.8 μs (max)	25% Min	10							
TLP651		DIP8 High isolation voltage Internal base connection	1M bit/s	10% min (19% (min) for rank O)	16		○	○				
TLP700 TLP700F		SDIP6 Direct drive of a medium-power IGBT/MOSFET Low power dissipation SDIP version of the TLP350	Propagation delay time 0.5 μs (max)	Peak output current: ±2.0 A (Max)	I_{FLH} = 5 (max)		○	○	○	○		
TLP700A ** TLP700AF **		SDIP6 Direct drive of a medium-power IGBT/MOSFET SDIP version of the TLP352	Propagation delay time 0.2 μs (max)	Peak output current: ±2.5A (Max)	I_{FHL} = 5 (max)		△	△		△		
TLP700H TLP700HF		SDIP6 Direct drive of a medium-power IGBT/MOSFET Low power dissipation Topr (max) 125°C SDIP version of the TLP350	Propagation delay time 0.5 μs (max)	Peak output current: ±2.5A (Max)	I_{FLH} = 5 (max)		○	○		○		
TLP701 TLP701F		SDIP6 Direct drive of a small power IGBT/MOSFET Low power dissipation SDIP version of the TLP351	Propagation delay time 0.7 μs (max)	Output current: ±0.6 A (Max)	I_{FLH} = 5 (max)	5000	○	○	○	○		
TLP701A ** TLP701AF **		SDIP6 Direct drive of a small power IGBT/MOSFET Low power dissipation	Propagation delay time 0.7 μs (max)	Peak output current: ±0.6 A (Max)	I_{FHL}=5 (max)		○	○		○		
TLP701H TLP701HF		SDIP6 Direct drive of a small power IGBT/MOSFET Low power dissipation Topr (max) 125°C SDIP version of the TLP351	Propagation delay time 0.7 μs (max)	Peak output current: ±0.6 A (Max)	I_{FLH} = 5 (max)		○	○		○		
TLP705 TLP705F		SDIP6 Direct drive of a small power IGBT/MOSFET High-speed Low power dissipation	Propagation delay time 0.2 μs (max)	Output current: ±0.45 A (Max)	I_{FLH} = 8 (max)		○	○	○	○		
TLP705A ** TLP705AF **		SDIP6 Direct drive of a small power IGBT/MOSFET High-speed Low power dissipation	Propagation delay time 0.2 μs (max)	Peak output current: ±0.6 A (Max)	I_{FLH} = 7.5 (max)		○	○		○		

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

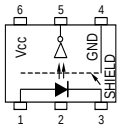
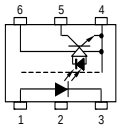
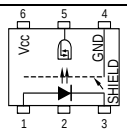
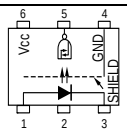
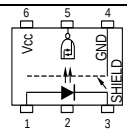
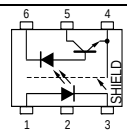
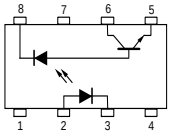
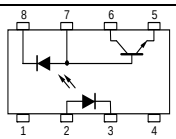
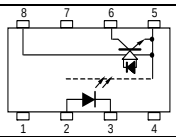
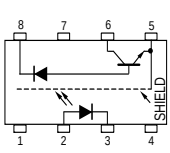
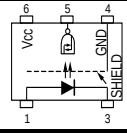
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

IC Output (Continued)

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP708 TLP708F		SDIP6 Topr (max) 125°C High-speed SDIP version of the TLP118	15 MBd	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○	○		○		
TLP714 ** TLP714F **		SDIP6 SDIP version of the TLP104	Propagation delay time 550 ns (max)	Open-collector output (Inverter logic)	I_{FHL}=5 (max)		○	○		○		
TLP715 TLP715F		SDIP6 Direct drive of an IPM High CMR	Propagation delay time 250 ns (max)	Totempole output (Buffer logic)	I_{FLH} = 3 (max)		○	○	○	○		
TLP716 TLP716F		SDIP6 High-speed SDIP version of the TLP116	15 MBd	Totempole output (Inverter logic)	I_{FHL} = 6.5 (max)		○	○	○	○		
TLP718 TLP718F		SDIP6 Direct drive of an IPM High CMR	Propagation delay time 250 ns (max)	Totempole output (Inverter logic)	I_{FHL} = 3 (max)		○	○	○	○		
TLP719		SDIP6 High CMR	1M bit/s	20% Min	16	5000	○	○	○	○		
TLP750 TLP750F		DIP8 High isolation voltage High CMR SEMKO-approved	1M bit/s	10% min (19% (min) for rank O)	16		○	○	△	○	◎	△
TLP751 TLP751F		DIP8 High isolation voltage Internal base connection SEMKO-approved	1M bit/s	10% Min	16		○	○	△	○	◎	△
TLP754 **		DIP8 DIP8 version of the TLP104	Propagation delay time 450 ns (max)	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		△	△		△		
TLP759 TLP759F		DIP8 IEC950 design standard version of the TLP559 SEMKO-approved	1M bit/s	20% Min	16		○	○	○	○	◎	△
TLP759(IGM) TLP759F(IGM)			Propagation delay time 0.8 μs (max)	25% Min	10							
TLP2066		Mini-flat MFSOP6 3.3-V power supply	20 MBd	Totempole output (Inverter logic)	I_{FHL} = 5 (max)	3750	○	○	○(2)	○(2)		

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

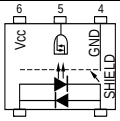
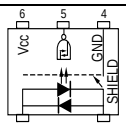
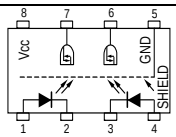
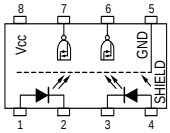
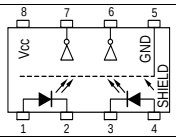
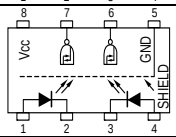
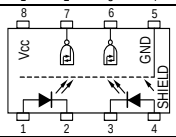
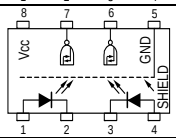
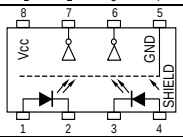
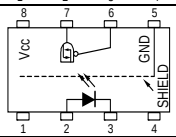
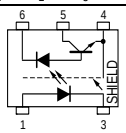
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP2095		Mini-flat MFSOP6 V_{CC} = 3.0 to 20 V	5 Mbit/s	Totempole output (Buffer logic)	I_{FLH} = 3 (max)	3750	○	○		○(2)		
TLP2098		Mini-flat MFSOP6 V_{CC} = 3.0 to 20 V	5 Mbit/s	Totempole output (Inverter logic)	I_{FHL} = 3 (max)		○	○		○(2)		
TLP2105		SO8 Dual channel version of the TLP105	5 MBd	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)	2500	○	○	△(2)	○(2)		
TLP2108		SO8 Dual channel version of the TLP108	5 MBd	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○	△(2)	○(2)		
TLP2116		SO8 Dual channel version equivalent for the TLP116	15 MBd	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		○	○	○(2)	○(2)		
TLP2118E **		SO8 Dual channel version equivalent for the TLP118	15 MBd	Open-collector output (Inverter logic)	I_{FHL}=5 (max)		○	○		○(2)		
TLP2160 **		2 channels in SO8 3.3-V/5-V power supply Topr (max) 125°C	20 MBd	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		△	△				
TLP2166A		SO8 3.3-V power supply Dual channel version equivalent for the TLP2066	15 MBd	Totempole output (Inverter logic)	I_{FHL} = 3 (max)		○	○	△(2)	○(2)		
TLP2167 **		SO8 3.3-V/5-V power supply Topr (max) 125°C	40 Mbps	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		△	△		△(2)		
TLP2168		SO8 3.3-V/5-V power supply Topr (max) 125°C	20M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)	3750	○	○		○(2)		
TLP2200		DIP8 Low input current High-speed High V_{CC} operation	5M bit/s	3-state output (Buffer logic)	I_{FLH} = 1.6 (max)	2500	○	○				
TLP2309 **		SO6 (reinforced insulation) 3.3-V/5-V power supply Topr (max) 110°C	1M bit/s	15% Min	10	3750	△	△		△(2)		

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

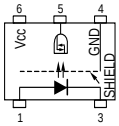
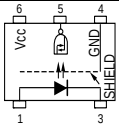
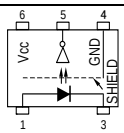
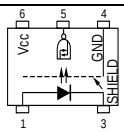
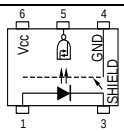
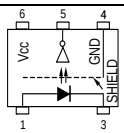
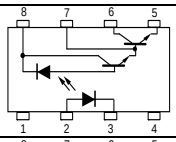
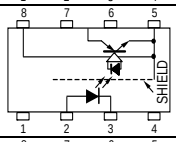
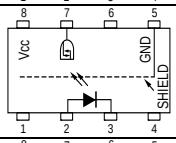
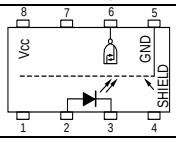
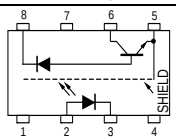
EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

IC Output (Continued)

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP2355 **		SO6 (reinforced insulation) V_{CC} = 3.0 to 20 V	5M bit/s	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)	3750	△	△		△(2)		
TLP2358 **		SO6 (reinforced insulation) V_{CC} = 3.0 to 20 V	5M bit/s	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		△	△		△(2)		
TLP2362 **		SO6 (reinforced insulation) Topr (max) 125°C	10M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		△	△		△(2)		
TLP2366 **		SO6 (reinforced insulation) 3.3-V/5-V power supply Topr (max) 125°C	20M Bd	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		△	△				
TLP2367 **		SO6 (reinforced insulation) 3.3-V/5-V power supply Topr (max) 125°C	40Mbps	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		△	△		△(2)		
TLP2368 **		SO6 (reinforced insulation) Topr (max) 125°C Ultra-high-speed	20M Bd	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		△	△				
TLP2403		SO8 Low input drive current SO8 version of the TLP553	300k bit/s	400% Min	0.5		○	○		○(2)		
TLP2404		SO8 Topr (max) 125°C SO8 version of the TLP104	Propagation delay time 450 ns (max)	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○	○		○(2)		
TLP2405		SO8 Low input current SO8 version of the TLP105	5M bit/s	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)		○	○		○(2)		
TLP2408		SO8 Low input current SO8 version of the TLP108	5M bit/s	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○		○(2)		
TLP2409		SO8 Topr (max) 125°C SO8 version of the TLP109	1M bit/s	20% Min	16		○	○		○(2)		

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

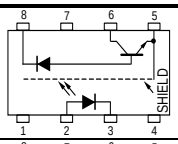
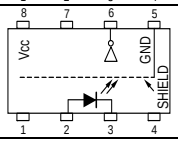
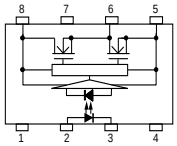
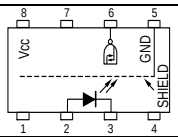
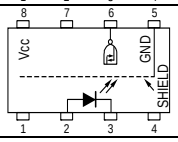
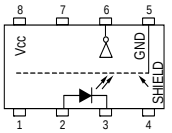
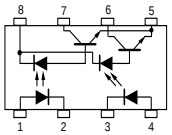
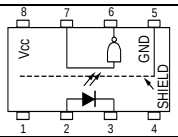
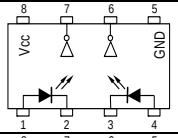
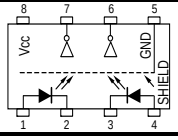
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP2409(IGM)		SO8 Topr (max) 125°C SO8 version of the TLP109(IGM)	Propagation delay time 0.8μs (max)	25% Min	10	3750	○	○				
TLP2418		SO8 Topr (max) 125°C High-speed SO8 version of the TLP118	20 MBd	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○	○		○(2)		
TLP2451		SO8 Direct drive of a small power IGBT/MOSFET Low power dissipation Topr (max) 125°C SO8 version of the TLP351	Propagation delay time 0.7μs (max)	Peak output current: ±0.6 A (Max)	I_{FLH} = 5 (max)		○	○		○(2)		
TLP2451A **			Propagation delay time 0.5μs (max)				○	○		△(2)		
TLP2466 **		SO8 3.3-V/5-V power supply Topr (max) 125°C	20 MBd	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		△	△				
TLP2467 **		SO8 3.3-V/5-V power supply Topr (max) 125°C	40 Mbps	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		△	△		△(2)		
TLP2468		SO8 3.3-V/5-V power supply Topr (max) 125°C	20M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		△	△		△(2)		
TLP2530		DIP8 Dual channel version of the 6N135 and the TLP550	1M bit/s	7% Min	16	2500	○	○				
TLP2531		DIP8 Dual channel version of the 6N136 and the TLP550	1M bit/s	19% Min	16		○	○				
TLP2601		DIP8 High CMR High-speed	10M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○	○				
TLP2630		DIP8 Dual channel version of the 6N137 and the TLP552	10M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○	○				
TLP2631		DIP8 High CMR DIP8 Dual channel version of the TLP554	10M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		○	○				

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

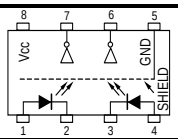
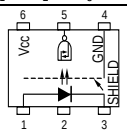
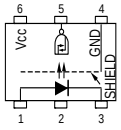
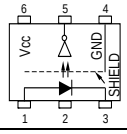
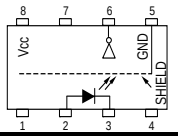
EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

IC Output (Continued)

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP2662 **		DIP8 3.3-V/5-V power supply Topr (max) 125°C Dual channel version of the TLP2962	10M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)	3750	△	△		△		
TLP2766 **		SDIP6 3.3-V/5-V power supply Topr (max) 125°C	20M bit/s	Totempole output (Inverter logic)	I_{FHL} = 5 (max)	5000	△	△		△		
TLP2767 **		SDIP6 3.3-V/5-V power supply Topr (max) 125°C	40Mbps	Totempole output (Inverter logic)	I_{FHL} = 5 (max)		△	△		△		
TLP2768 **		SDIP6 3.3-V/5-V power supply Topr (max) 125°C	20M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)		△	△		△		
TLP2962 **		DIP8 3.3-V/5-V power supply Topr (max) 125°C	10M bit/s	Open-collector output (Inverter logic)	I_{FHL} = 5 (max)	3750	△	△		△		

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

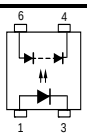
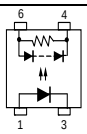
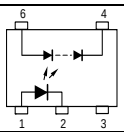
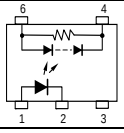
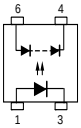
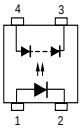
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photovoltaic Output

Part Number	Pin Configuration	Features	Short-Circuit Current (μA)			Open Voltage Voc (V)		BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min	@IF (mA)	Min	@IF (mA)		UL	c-UL	TÜV	VDE	BSI	IEC
TLP190B		Mini-flat MFSOP6	—	12	10	7	10	2500	○	○				
			C20	20										
TLP191B		Mini-flat MFSOP6 Built-in shunt regulator	—	24	20	7	20		○	○				
TLP590B		DIP6 General-purpose	—	12	10	7	10		○					
			C20	20										
TLP591B		DIP6 Built-in shunt regulator	—	24	20	7	20		○					
			C40	40										
TLP3902		Mini-flat MFSOP6 General-purpose	—	5	10	7	10		○	○				
TLP3904		SSOP4 General-purpose	—	5	10	7	10	1500	○					
TLP3914		SSOP4 High output	—	20					○					
TLP3924		SSOP4 High open-circuit voltage	—	4		30			○					

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

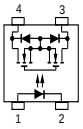
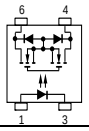
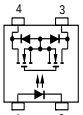
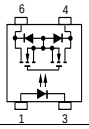
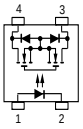
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photorelays (MOSFET Output, 1-Form-A)

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP170A		2.54SOP4 Lead pitch: 2.54 mm Low trigger current General-purpose	1	2	2	±0.4	60	1500	○	○				
TLP170D		2.54SOP4 Lead pitch: 2.54 mm Low trigger current General-purpose		8		±0.2	200		○	○				
TLP170G		2.54SOP4 Lead pitch: 2.54 mm Low trigger current General-purpose		50		±0.1	350		○	○				
TLP170J		2.54SOP4 Lead pitch: 2.54 mm Low trigger current General-purpose		60		±0.09	600		○	○				
TLP172A		2.54SOP4 Lead pitch: 2.54 mm High output current General-purpose	3	2	5	±0.4	60		○	○				
TLP172G		2.54SOP4 Lead pitch: 2.54 mm General-purpose		35		±0.11	350		○	○				
TLP173A		MFSOP6 General-purpose	2	50	3	±0.0.7	60	3750	○	○				
TLP174G		2.54SOP4 Lead pitch: 2.54 mm Current-limiting function Limit current: 150 to 300 mA	3	35	5	±0.12	350	1500	○	○				
TLP174GA							400		○	○				
TLP175A **		SO6 General-purpose Low trigger current	1	50	2	±0.1	60	3750	△	△				
TLP176A		2.54SOP4 Lead pitch: 2.54 mm High output current	3	2	5	±0.4	60	1500	○	○	△(2)	○(2)		
TLP176D		2.54SOP4 Lead pitch: 2.54 mm Low On-resistance		8		±0.2	200		○	○	△(2)	○(2)		
TLP176G		2.54SOP4 Lead pitch: 2.54 mm General-purpose SEMKO-approved		35		±0.12	350		○	○	△(2)	○(2)	○	△
TLP176GA		2.54SOP4 Lead pitch: 2.54 mm General-purpose					400		○	○			○	△
TLP179D		2.54SOP4 Lead pitch: 2.54 mm C_{OFF} 15 pF (typ.)		50		±0.05	200		○	○				

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

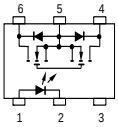
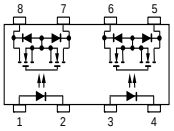
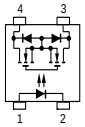
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- The devices highlighted in boldface are manufactured by fabs in Japan and/or Toshiba Semiconductor (Thailand) Co., Ltd.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP192A		2.54SOP6 Lead pitch: 2.54 mm High output current	2	2	5	±0.4	60	1500	○	○				
TLP192G		2.54SOP6 Lead pitch: 2.54 mm		35		±0.11	350		○	○				
TLP197A		2.54SOP6 Lead pitch: 2.54 mm High output current		2		±0.4	60		○	○				
TLP197D		2.54SOP6 Lead pitch: 2.54 mm Low On-resistance		8		±0.2	200		○	○				
TLP197G		2.54SOP6 Lead pitch: 2.54 mm SEMKO-approved		35		±0.12	350		○	○	△(2)	○(2)	○	△
TLP197GA		2.54SOP6 Lead pitch: 2.54 mm					400		○				○	△
TLP199D		2.54SOP6 Lead pitch: 2.54 mm C_{OFF} 15 pF (typ.)		50		±0.05	200		○	○				
TLP200D		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP176D	3	8	5	±0.2	200		○					
TLP202A		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP172A		2		±0.4	60		○					
TLP202G		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP172G		50		±0.11	350		○					
TLP206A		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP176A		2		±0.4	60		○					
TLP206G		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP176G		35		±0.12	350		○		△(2)	○(2)	○	△
TLP206GA		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP176GA					400		○				○	△
TLP209D		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP179D		50		±0.05	200		○					
TLP220A **		DIP4 General-purpose Reinforced insulation	2	2	5	±0.5	60	5000	△	△		△	△	
TLP220D **		DIP4 General-purpose Reinforced insulation		8		±0.25	200		△	△		△	△	
TLP220G **		DIP4 General-purpose Reinforced insulation		50		±0.1	350		△	△		△	△	
TLP220GA **		DIP4 General-purpose Reinforced insulation		35		±0.12	400		△	△		△	△	
TLP220J **		DIP4 General-purpose Reinforced insulation		60		±0.09	600		△	△		△	△	
TLP221A **		DIP4 General-purpose Reinforced insulation		0.2		±1.5	40		△	△		△	△	

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

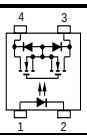
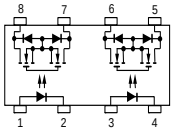
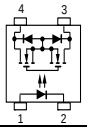
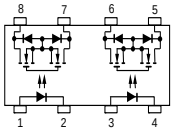
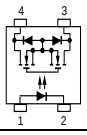
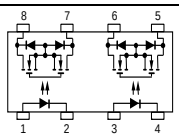
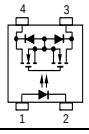
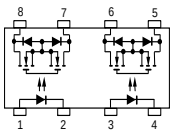
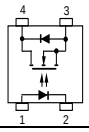
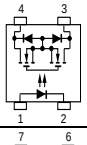
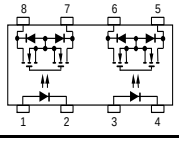
EN 60747-5-2-approved with optionV4 or D4

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photorelays (MOSFET Output, 1-Form-A) (Continued)

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP222A		DIP4 High output current General-purpose	3	2	5	±0.5	60	2500	○	○				
TLP222A-2		DIP8 Dual channel version of the TLP222A							○	○				
TLP222G		DIP4 General-purpose SEMKO-approved		50	5	±0.12	350		○	○			○	△
TLP222G-2		DIP8 Dual channel version of the TLP222G SEMKO-approved							○	○			○	△
TLP224G		DIP4 Current-limiting function Limit current: 150 to 300 mA SEMKO-approved		35	5	±0.12	350		○	○			△	△
TLP224G-2		DIP8 Dual channel version of the TLP224G SEMKO-approved							○	○			○	△
TLP224GA		DIP4 For modems Current-limiting function Limit current: 150 to 300 mA		35	5	±0.12	400		○					
TLP224GA-2		DIP8 Dual channel version of the TLP224GA Current-limiting function Limit current: 150 to 300 mA							○					
TLP225A		DIP4 For DC use only	5	1.1	10	0.5	60		○	○				
TLP227A		DIP4 General-purpose SEMKO-approved	3	2	5	±0.5	60		○	○				
TLP227A-2		DIP8 Dual channel version of the TLP227A SEMKO-approved							○	○				

Note (1): Legend in the Safety Standards column:

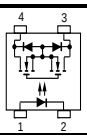
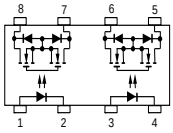
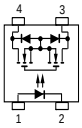
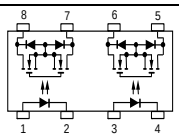
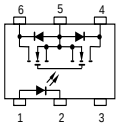
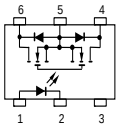
BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP227G		DIP4 General-purpose SEMKO-approved	3	35	5	±0.12	350	2500	○	○	△	○	○	△
TLP227G-2		DIP8 Dual channel version of the TLP227G SEMKO-approved							○	○	△	○	○	△
TLP227GA		DIP4 General-purpose SEMKO-approved	3	35	5	±0.12	400		○					
TLP227GA-2		DIP8 Dual channel version of the TLP227GA SEMKO-approved							○					
TLP592A		DIP6 High output current	3	2	5	±0.5	60		○					
TLP592G		DIP6 General-purpose		50		±0.12	350		○					
TLP597A		DIP6 High output current SEMKO-approved	3	2	5	±0.5	60		○					
TLP597G		DIP6 General-purpose SEMKO-approved		35		±0.12	350		○		○	△	◎	△
TLP597GA		DIP6 General-purpose SEMKO-approved					400		○					
TLP598AA		DIP6 High output current	3	2		±0.5	60		○					
TLP598GA		DIP6 Low On-resistance		12		±0.15	400		○					
TLP797GA TLP797GAF		DIP6 High isolation voltage	3	35		±0.12	400	5000	○		△	△	△	△
TLP797J		DIP6 High isolation voltage	5		10	±0.1	600		○	○	△	△	△	△
TLP797JF									○	○	△	△	△	△
TLP798GA		DIP6 Low On-resistance		12	5	±0.15	400		○		△	△	△	△

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

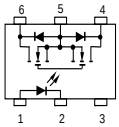
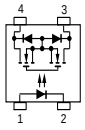
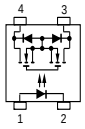
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photorelays (MOSFET Output, 1-Form-A) (Continued)

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP3100		2.54SOP6 Lead pitch: 2.54 mm Low On-resistance High output current: I_{ON} = 2.5 A (max) @Ta: up to 50°C For measuring instruments and power supply lines	3	0.05	5	±2.5	20	1500	○	○				
TLP3102		2.54SOP6 General-purpose High output current: I_{ON} = 2.5 A (max) @Ta: up to 50°C C-connection: I_{ON}(DC)=5.0A(Max)		0.06		±2.5	40		△	△				
TLP3103		2.54SOP6 General-purpose High output current: I_{ON} = 2.3A (Max) @Ta: up to 50°C C-connection: I_{ON}(DC)=4.6A(Max)		0.07		±2.3	60		△	△				
TLP3105		2.54SOP6 General-purpose High output current: I_{ON} = 1.4A (Max) @Ta: up to 50°C C-connection: I_{ON}(DC)=2.8A(Max)		0.2		±1.4	100		△	△				
TLP3110		2.54SOP4 Lead pitch: 2.54 mm Low CR C_{OFF}: 100 pF (typ.) For measuring instruments	4	1.2	5	±0.35	60		○					
TLP3111		2.54SOP4 Lead pitch: 2.54 mm Low CR C_{OFF}: 11 pF (typ.) For measuring instruments		20		±0.1	80		○					
TLP3113		2.54SOP4 Lead pitch: 2.54 mm Ultra-low CR: 15 pF · Ω C_{OFF}: 0.6 pF (typ.) For measuring instruments	4	35	5	±0.08	40		○					
TLP3114		2.54SOP4 Lead pitch: 2.54 mm Ultra-low CR: 10 pF · Ω C_{OFF}: 5 pF (typ.) For measuring instruments		3		±0.25			○					
TLP3115		2.54SOP4 Lead pitch: 2.54 mm Ultra-low CR: 10 pF · Ω C_{OFF}: 10 pF (typ.) For measuring instruments		1.5		±0.3			○					
TLP3116		2.54SOP4 Lead pitch: 2.54 mm Ultra-low CR: 10 pF · Ω C_{OFF}: 1 pF (typ.) For measuring instruments		15		±0.12			○					
TLP3116A		2.54SOP4 Lead pitch: 2.54 mm Ultra-low CR: 10 pF · Ω C_{OFF} 1.65 pF (typ.) 3.0 pF (max) For measuring instruments		9.5					○					

Note (1): Legend in the Safety Standards column:

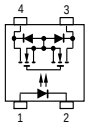
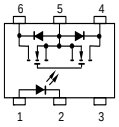
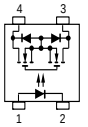
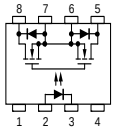
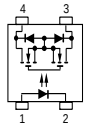
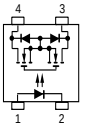
BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP3118		2.54SOP4 Lead pitch: 2.54 mm Low CR: 40 pF · Ω C_{OFF}: 2.5 pF (typ.) 3.5 pF (max) For measuring instructions	3	25	5	±0.04	80	1500	○					
TLP3119		Lead pitch: 2.54 mm Low CR: 30 pF · Ω C_{OFF}: 6.5 pF (typ.) 11 pF (Max) For measuring instruments		8		±0.2	80		○					
TLP3120		2.54SOP6 Lead pitch: 2.54 mm High output current I_{ON}: 1.25 A (max) For measuring instruments and power supply lines	5	0.15	5	±1.25	80		○	○				
TLP3121		2.54SOP4 Lead pitch: 2.54 mm Low CR: 30 pF · Ω For measuring instruments	4	1.2	5	±0.35	80		○	○				
TLP3122		2.54SOP4 Lead pitch: 2.54 mm High output current I_{ON}: 1 A (max) @Ta: up to 50°C For measuring instruments and power supply lines	3	0.7		±1	60		○	○				
TLP3123		2.54SOP4 Lead pitch: 2.54 mm High output current I_{ON}: 1 A (max) @Ta: up to 50°C For measuring instruments and power supply lines		0.13		±1	40		○	○				
TLP3125		2.54SOP8 Lead pitch: 2.54 mm Low On-resistance For measuring instruments	3	4	5	±0.2	400		○	○				
TLP3130		2.54SOP4 Lead pitch: 2.54 mm Ultra-low CR: 5 pF · Ω C_{OFF}: 1 pF (typ.) For measuring instruments	4	8	5	±0.16	20		○					
TLP3131		2.54SOP4 Lead pitch: 2.54 mm Ultra-low CR: 5 pF · Ω C_{OFF}: 5 pF (typ.) For measuring instruments		1.2		±0.3			○					
TLP3203		SSOP4 Ultra-low On-resistance R 0.18 Ω (typ.) High output current I_{ON}: 0.9 A (max)	3	0.22	5	±0.9	20		○					
TLP3212		SSOP4 Low CR: 20 pF · Ω C_{OFF}: 20 pF (typ.) For measuring instruments	5	1.5		±0.4	60		○					

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

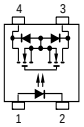
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photorelays (MOSFET Output, 1-Form-A) (Continued)

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP3213		SSOP4 Ultra-low CR: 15 pF · Ω C_{OFF}: 0.6 pF (typ.) For measuring instruments	4	35	5	±0.08	40	1500	○					
TLP3214		SSOP4 Ultra-low CR: 10 pF · Ω C_{OFF}: 5 pF (typ.) For measuring instruments		3		±0.25			○					
TLP3215		SSOP4 Ultra-low CR: 10 pF · Ω C_{OFF}: 10 pF (typ.) For measuring instruments		1.5		±0.3			○					
TLP3216		SSOP4 Ultra-low CR: 10 pF · Ω C_{OFF}: 1 pF (typ.) For measuring instruments		15		±0.12			○					
TLP3216A		SSOP4 Ultra-low CR: 10 pF · Ω C_{OFF} 1.65 pF (typ.) 3.0 pF (max) For measuring instruments		9.5					○					
TLP3217		SSOP4 Low CR C_{OFF}: 5 pF (typ.) For measuring instruments	5	12			80		○					
TLP3218		SSOP4 Low CR: 40 pF·Ω C_{OFF} 2.5 pF (typ.) 3.5 pF (max) For measuring instruments	3	25		±0.04	80		△					
TLP3219		SSOP4 Low CR: 30 pF·Ω C_{OFF} 6.5 pF (typ.) 11 pF (max) For measuring instruments		8		±0.2			△					
TLP3220		SSOP4 Peak off-state voltage: 100 V For measuring instruments	5	14	10	±0.08	100		○					
TLP3230		SSOP4 Ultra-low CR: 5 pF · Ω C_{OFF}: 1 pF (typ.) For measuring instruments	4	8	5	±0.16	20		○					
TLP3231		SSOP4 Ultra-low CR: 5 pF · Ω C_{OFF}: 5 pF (typ.) For measuring instruments		1.2		±0.45			○					
TLP3240		SSOP4 Ultra-low CR: 5 pF · Ω C_{OFF}: 0.45 pF (typ.) For measuring instruments	3	14		±0.12	40		○					
TLP3241		SSOP4 Ultra-low CR: 5 pF · Ω C_{OFF}: 0.7 pF (typ.) For measuring instruments		10		±0.14			○					

Note (1): Legend in the Safety Standards column:

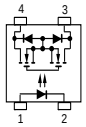
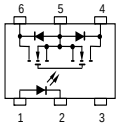
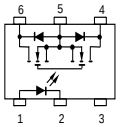
BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP3250		SSOP4 Ultra-low CR: 2.5 pF · Ω C_{OFF}: 0.8 pF (typ.) For measuring instruments	3	5	5	±0.2	20	1500	○					
TLP3275		SSOP4 C_{OFF} 12 pF (Typ.)		1.5		±0.3	50		○	△				
TLP3312		USOP4 C_{OFF} 20 pF (Typ.)		1.5		±0.4	60	500	△	△				
TLP3375		USOP4 C_{OFF} 12 pF (Typ.)		1.5		±0.3	50		△	△				
TLP3340 **		USOP4 Ultra-low CR: 5 pF · Ω COFF: 0.45 pF (typ.) For measuring instruments		14		±0.12	40		△	△				
TLP3341 **		USOP4 Ultra-low CR: 5 pF · Ω COFF: 0.7 pF (typ.) For measuring instruments		10		±0.14	40		△	△				
TLP3350 **		USOP4 Ultra-low CR: 2.5 pF · Ω COFF: 0.8 pF (typ.) For measuring instruments		5		±0.2	20		△	△				
TLP3542		DIP6 Low On-resistance High output current: I_{ON} = 2.5 A (max) For measuring instruments and power supply lines		0.1	10	±2.5	60	2500	○	○				
TLP3543 **		DIP6 High output current: I_{ON} = 4 A (Max) @Ta = 25°C		0.05	5	4	20		△	△				
TLP3544 **		DIP6 High output current: I_{ON} = 3.5 A (Max) @Ta = 25°C		0.06		3.5	40		△	△				
TLP3545 **		DIP6 High output current: I_{ON} = 3 A (Max) @Ta = 25°C		0.07		3	60		△	△				
TLP3546 **		DIP6 High output current: I_{ON} = 2 A (Max) @Ta = 25°C		0.2		2	100		△	△				

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

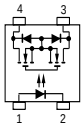
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photorelays (MOSFET Output, 1-Form-A) (Continued)

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP3553 **		DIP4 High output current: I_{ON} = 3 A (Max) @Ta = 25°C	3	0.075	5	3	20	2500	△	△				
TLP3554 **		DIP4 High output current: I_{ON} = 2.5 A (Max) @Ta = 25°C		0.11		2.5	40		△	△				
TLP3555 **		DIP4 High output current: I_{ON} = 2 A (Max) @Ta = 25°C		0.17		2	60		△	△				
TLP3556 **		DIP4 High output current: I_{ON} = 1 A (Max) @Ta = 25°C		0.67		1	100		△	△				

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

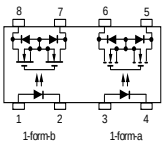
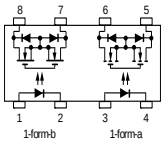
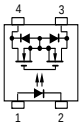
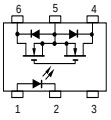
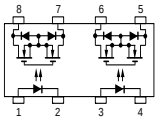
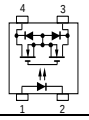
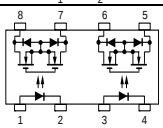
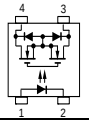
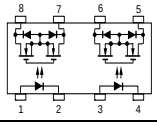
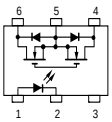
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Photorelays (MOSFET Output, 1-Form-B)

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max(mA)	R_{ON} Max (Ω)	R_{ON} @I_F (mA)	I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1) UL	c-UL	TÜV	VDE	BSI	IEC
TLP4006G		DIP8 General-purpose 1-Form-A/1-Form-B	3	25	1-Form-A 5 1-Form-B 0	±0.12	350	2500	○					
TLP4007G		DIP8 General-purpose 1-Form-A/1-Form-B		50		±0.1			○					
TLP4026G		2.54SOP8 Lead pitch: 2.54 mm General-purpose 1-Form-A/1-Form-B	3	25	1-Form-A 5 1-Form-B 0	±0.12	350	1500	○					
TLP4027G		2.54SOP8 Lead pitch: 2.54 mm General-purpose 1-Form-A/1-Form-B		50		±0.09			○					
TLP4172G		2.54SOP4 Lead pitch: 2.54 mm General-purpose 1-Form-B	3	50	0	±0.09	350		○					
TLP4176G		2.54SOP4 Lead pitch: 2.54 mm General-purpose 1-Form-B		25		±0.12			○					
TLP4192G		2.54SOP6 Lead pitch: 2.54 mm General-purpose 1-Form-B	3	50	0	±0.09	350		○					
TLP4197G		2.54SOP6 Lead pitch: 2.54 mm General-purpose 1-Form-B		25		±0.12			○					
TLP4202G		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP4172G 2-Form-B	3	50	0	±0.09	350		○					
TLP4206G		2.54SOP8 Lead pitch: 2.54 mm Dual channel version of the TLP4176G 2-Form-B		25		±0.12			○					
TLP4222G		DIP4 General-purpose 1-Form-B	3	50	0	±0.1	350	2500	○					
TLP4222G-2		DIP8 Dual channel version of the TLP4222G 2-Form-B							○					
TLP4227G		DIP4 General-purpose 1-Form-B SEMKO-approved	3	25	0	±0.15	350		○					
TLP4227G-2		DIP8 Dual channel version of the TLP4227G SEMKO-approved 2-Form-B							○					
TLP4592G		DIP6 General-purpose 1-Form-B	3	50	0	±0.1	350		○					
TLP4597G		DIP6 General-purpose 1-Form-B SEMKO-approved		25		±0.15			○					

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

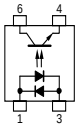
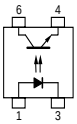
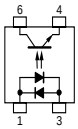
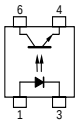
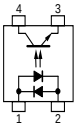
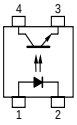
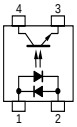
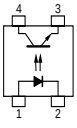
BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Products Manufactured by Toshiba Semiconductor Thailand Co., Ltd. (Transistor Output)

Part Number	Pin Configuration	Features	CTR				V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min (%)	Max (%)	@I_F / V_{CE} (mA) (V)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP180		Mini-flat MFSOP6 AC input SEMKO-approved	—	50	600	±5/5	80	3750	○	○	○(2)	○(2)	◎	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
TLP181		Mini-flat MFSOP6 General-purpose	—	50	600	5/5	80		○	○	○(2)	○(2)	◎	△
			GB	100										
			Y	50	150									
			GR	100	300									
			BL	200	600									
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
TLP184 **		SO6 (reinforced insulation) AC input	—	50	600	±5/5	80		△	△	△(2)	△(2)	△	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
TLP185 **		SO6 (reinforced insulation)	—	50	600	5/5	80		△	△	△(2)	△(2)	△	△
			GB	100										
			Y	50	150									
			GR	100	300									
			BL	200	600									
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
TLP280		SOP4 Lead pitch: 1.27 mm AC input SEMKO-approved	—	50	600	±5/5	80	2500	○	○	△(2)	○(2)	◎	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
TLP281		SOP4 Lead pitch: 1.27 mm General-purpose	—	50	600	5/5	80		○	○	△(2)	○(2)	◎	△
			GB	100										
			Y	50	150									
			GR	100	300									
			BL	200	600									
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
			BLL	200	400									
TLP284		SOP4 Lead pitch: 1.27 mm AC input General-purpose・High BVs Creepage distance: 5.0 mm (min)	—	50	600	±5/5	80	3750	○	○	△(2)	○(2)	◎	△
			Y	50	150									
			GR	100	300									
			BL	200	600									
			GB	100										
TLP285		SOP4 Lead pitch: 1.27 mm General-purpose・High BVs Creepage distance: 5.0 mm (min)	—	50	600	5/5	80		○	○	○(2)	○(2)	◎	△
			GB	100										
			Y	50	150									
			GR	100	300									
			BL	200	600									
			YH	75	150									
			GRL	100	200									
			GRH	150	300									
			BLL	200	400									

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

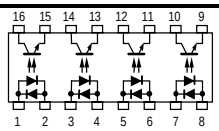
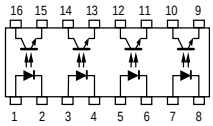
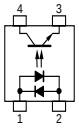
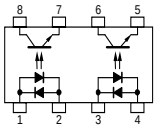
EN 60747-5-2-approved with optionV4 or D4

Although the photocouplers manufactured by Toshiba Semiconductor (Thailand) Co., Ltd. are generally sold outside of Japan, some of them are also available in Japan. For details, contact your nearest Toshiba sales representative.

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Pin Configuration	Features	CTR				V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Min (%)	Max (%)	@I_F / V_{CE} (mA) (V)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP290-4 **		SO16 4-channel version of the TLP280 Lead pitch: 1.27 mm AC input	—	50	600	±5/5	80	2500	△	△		△(2)	△	△
			GB	100										
TLP291-4 **		SO16 4-channel version of the TLP281 Lead pitch: 1.27 mm	—	50	600	5/5			△	△		△(2)	△	△
			GB	100										
TLP620 TLP620F		DIP4 AC input SEMKO-approved	—	50	600	±5/5	55	5000	○	○	△	○	◎	△
			GB	100										
TLP620-2		DIP8 Dual channel version of the TLP620 SEMKO-approved	—	50										
			GB	100										

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

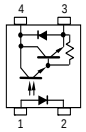
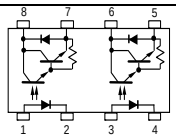
Although the photocouplers manufactured by Toshiba Semiconductor (Thailand) Co., Ltd. are generally sold outside of Japan, some of them are also available in Japan. For details, contact your nearest Toshiba sales representative.

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Products Manufactured by Toshiba Semiconductor Thailand Co., Ltd. (Darlington Transistor Output)

Part Number	Pin Configuration	Features	CTR		V_{CE}(sat)		V_{CEO} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Min (%)	@I_F / V_{CE} (mA) (V)	Max (V)	@I_C / I_F (mA)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP627		DIP4 High V_{CEO} SEMKO-approved	1000	1/1	1.2	100/10	300	5000	○	○	△	○	◎	△
TLP627-2		DIP8 Dual channel version of the TLP627 SEMKO-approved												

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

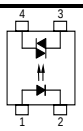
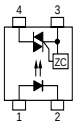
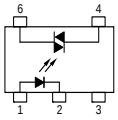
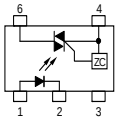
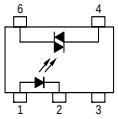
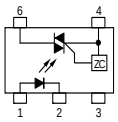
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Although the photocouplers manufactured by Toshiba Semiconductor (Thailand) Co., Ltd. are generally sold outside of Japan, some of them are also available in Japan. For details, contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Products Manufactured by Toshiba Semiconductor Thailand Co., Ltd. (Triac Output)

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT}		Peak On-State Voltage, V_{TM}		Off-State Output Terminal Voltage V_{DRM} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
			Rank	Max (mA)	Max (V)	@I_{TM} (mA)			UL	c-UL	TÜV	VDE	BSI	IEC
TLP360J TLP360JF		DIP4 Non-zero cross	—	10	3.0	100	600	5000	○	○	○	○		
			IFT7	7										
TLP361J TLP361JF		DIP4 Zero cross	—	10	3.0	100	600		○	○	○	○		
			IFT7	7										
TLP363J TLP363JF		DIP4 Zero cross High impulse noise immunity V_N = 2000 V (typ.)	—	10										
TLP560G		DIP6 General-purpose Non-zero cross	—	10	3.0	100	400	2500	○					
			IFT7	7										
			IFT5	5										
TLP560J			—	10			600							
			IFT7	7										
TLP561G		DIP6 General-purpose Zero cross	—	10	3.0	100	400		○					
			IFT7	7										
			IFT5	5										
TLP561J			—	10			600							
			IFT7	7										
TLP3022(S,T) TLP3022F(S,T)		DIP6 SEMKO-approved Non-zero cross	—	10	3.0	100	400	5000	○	○	△	○	◎	△
TLP3023(S,T) TLP3023F(S,T)			—	5										
TLP3052(S,T) TLP3052F(S,T)		DIP6 High V_{DRM} SEMKO-approved Non-zero cross	—	10			600							
TLP3042(S,T)		DIP6 SEMKO-approved Zero cross	—	10	3.0	100	400	5000	○		△	○	◎	△
TLP3043(S,T)			—	5										
TLP3062(S,T) TLP3062F(S,T)		DIP6 SEMKO-approved High V_{DRM} Zero cross	—	10			600							
TLP3063(S,T) TLP3063F(S,T)			—	5										
TLP3064(S,T)		DIP6 SEMKO-approved Zero cross	—	3										
TLP3082(S,T)		DIP6 Zero cross	—	10			800							
TLP3782(S,T) TLP3782F(S,T)		DIP6 High impulse noise immunity V_N = 1500 V (typ.)	—	10			800		○		△	○		
TLP3783(S,T) TLP3783F(S,T)			—	5										

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

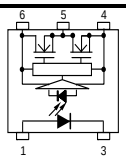
TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Although the photocouplers manufactured by Toshiba Semiconductor (Thailand) Co., Ltd. are generally sold outside of Japan, some of them are also available in Japan. For details, contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Other than those listed above, there are several triac-output photocouplers manufactured by Toshiba Semiconductor (Thailand) Co., Ltd. For details, contact your nearest Toshiba sales representative.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Products Manufactured by Toshiba Semiconductor Thailand Co., Ltd. (IC Output)

Part Number	Pin Configuration	Features	Data Rate (Typ. @NRZ)	Output/CTR	@$I_{F(IN)}$ (mA)	BVs 1 Minute (Vrms)	Safety Standards (1)					
							UL	c-UL	TÜV	VDE	BSI	IEC
TLP155E **		SO6 (reinforced insulation) Topr (max) 100°C Direct drive of a small power IGBT/MOSFET	Propagation delay time 0.2 μs (max)	Peak output current: ±0.6 A (Max)	I_{FHL} = 7.5 (max)	3750	○	○		○(2)		

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

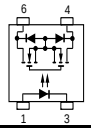
Although the photocouplers manufactured by Toshiba Semiconductor (Thailand) Co., Ltd. are generally sold outside of Japan, some of them are also available in Japan. For details, contact your nearest Toshiba sales representative.

Note (2): The EN60747-5-2 safety standard for compact packages is different from that for standard DIP packages. Since the mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Products Manufactured by Toshiba Semiconductor Thailand Co., Ltd. (MOSFET Output)

Part Number	Pin Configuration	Features	Trigger LED Current, I_{FT} Max (mA)	R_{ON}		I_{ON} Max (A)	V_{OFF} (V)	BVs 1 Minute (Vrms)	Safety Standards (1)					
				Max (Ω)	@I_F (mA)				UL	c-UL	TÜV	VDE	BSI	IEC
TLP175A **		SO6 General-purpose Low trigger current	1	50	2	±0.1	60	3750	△	△				

Note (1): Legend in the Safety Standards column:

BSI and IEC: ○: Approved (supplementary or basic insulation) ◎: Approved (reinforced insulation) △: Design which meets safety standard/approval pending as of June 2011

BSI: EN 60065 / EN 60950, IEC: IEC 60065 / IEC 60950

TÜV and VDE: ○: Approved △: Design which meets safety standard/approval pending as of June 2011

EN 60747-5-2-approved with optionV4 or D4

Although the photocouplers manufactured by Toshiba Semiconductor (Thailand) Co., Ltd. are generally sold outside of Japan, some of them are also available in Japan. For details, contact your nearest Toshiba sales representative.

** Under development: Specifications subject to change without notice. For the latest information, please contact your nearest Toshiba sales representative.

- The pin configuration diagrams only show the general configurations of the circuits.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Fiber-Optic Devices (TOSLINK™)

Simplex Optical Modules (General-Purpose Optical Modules)

Transmitting Module	Receiving Module	Data Rate (NRZ, Mb/s)	Emission Wavelength (nm)	Transmission Distance (m) (1)	Pulse Width Distortion (ns) (1)	Supply Voltage (V)	Operating Temperature (°C)	Compatible Optical Connector	Compatible Optical Fiber (μm)	Compatible Optical Fiber with Fiber-Optic Connectors (7)
TOTX1950(F) (2)	TORX1950(F)	DC to 10	650	Up to 50	± 30	5 ± 0.25	−40 to 85	JIS F05	APF (980/1000) NA = 0.5	LUCT1-TC1000-xxM (3) TOCP100-xxMBT (4)
TOTX1951(F)	TORX1951(F)	DC to 6	650	Up to 40	± 55	5 ± 0.25	−40 to 85	JIS F05	APF (980/1000) NA = 0.5	LUCT1-TC1000-xxM (3) TOCP100-xxMBT (4)
TOTX1952(F)	TORX1952(F)	DC to 10	650	Up to 10	± 30	5 ± 0.25	−40 to 85	JIS F05	APF (980/1000) NA = 0.5	LUCT1-TC1000-xxM (3) TOCP100-xxMBT (4))
TOTX1960(F)	TORX1950(F)	DC to 10	770	Up to 1000	± 30	5 ± 0.25	−40 to 85	JIS F05	PCF (200/230)	CF-1071 (HC-20/70) Series(5) OPC202HV Series (6)

- TOSLINK™ is a registered trademark of Toshiba Corporation in Japan and other countries.

Note (1) All values at Ta = 25°C
(2) The external resistor value must be chosed, based on the transmission distance.
(3) Manufactured by Asahi Kasei E-Materials.
(4) Manufactured by Toray Industries, Inc.
(5) Manufactured by Sumitomo Electric Industries (SEI), Ltd.
(6) Manufactured by Oki Electric Cable Co., Ltd.
(7) For details on optical fiber cables with connectors, contact the respective manufactures.

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(High-Speed Optical Modules)

Transmitting Module	Receiving Module	Data Rate (NRZ, Mb/s)	Emission Wavelength (nm)	Transmission Distance (m) (1)	Supply Voltage (V)	Operating Temperature (°C)	Compatible Optical Connector	Compatible Optical Fiber (μm)	Compatible Optical Fiber with Fiber-Optic Connectors (7)
TOTX1400(F)	TORX1400(F)	20 to 125	650	Up to 50	3.3 ± 0.3	−10 to 70	SMA	APF (980/1000) NA = 0.3	—
TOTX1701(F)	TORX1701(F)	20 to 125	650	Up to 20 (APF)	3.3 ± 0.3	−10 to 70	JIS F05	APF (980/1000) NA = 0.5	LUCT1-TC1000-xxM (3) TOCP100-xxMBT (4)
				Up to 100 (GI-PCF)				GI-PCF (200/230)	CF-1071 (HC-20/80) Series (5)

Note (1) All values at Ta = 25°C
(3) Manufactured by Asahi Kasei E-Materials.
(4) Manufactured by Toray Industries, Inc.
(5) Manufactured by Sumitomo Electric Industries (SEI), Ltd.
(7) For details on optical fiber cables with connectors, contact the respective manufactures.

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(Digital Audio Transmitting Modules)

Transmitting Module [12]	Data Rate (NRZ, Mb/s)	Emission Wavelength (nm)	Fiber output power (dBm) [1]	Pulse Width Distortion (ns) [1]	Supply Voltage (V)	Operating Temperature (°C)	Compatible Optical Connector	Compatible Optical Fiber (μm)	Compatible Optical Fiber with Fiber-Optic Connectors [7]
TOTX147A(F,T) [9] TOTX147A(F,TJ) [9]	DC to 15	650	−21 to −15	± 15	2.7 to 3.6	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TOTX147AL(F,T) [9] [10] TOTX147AL(F,TJ) [9] [10]	DC to 15	650	−21 to −15	± 15	2.7 to 3.6	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TOTX147APL(F,T) [10] [11] TOTX147APL(F,TJ) [10] [11]	DC to 15	650	−21 to −15	± 15	2.7 to 3.6	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TOTX177A(F,T) [9] TOTX177A(F,TJ) [9]	DC to 15	650	−21 to −15	± 15	5 ± 0.25	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TOTX177AL(F,T) [9] [10] TOTX177AL(F,TJ) [9] [10]	DC to 15	650	−21 to −15	± 15	5 ± 0.25	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TOTX177APL(F,T) [10] [11] TOTX177APL(F,TJ) [10] [11]	DC to 15	650	−21 to −15	± 15	5 ± 0.25	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]

Note (1) All values at Ta = 25°C

(7) For details on optical fiber cables with connectors, contact the respective manufactures.

(8) Manufactured by Mitsubishi Rayon Co., Ltd.

(9) Panel-mount type

(10) Shutter-equipped

(11) Mini-package type (fixed to printed circuit board)

(12) Optical modules with the (F,T) suffix are manufactured by Toshiba Semiconductor Thailand Co., Ltd. The ordering codes for these optical modules have the (F, TJ) suffix in Japan. For details, contact the your local Toshiba distributor.

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(Digital Audio Receiving Modules)

Receiving Module [12]	Data Rate (NRZ, Mb/s)	Maximum Receivable Power (dBm) [1]	Pulse Width Distortion (ns) [1]	Supply Voltage (V)	Operating Temperature (°C)	Compatible Optical Connector	Compatible Optical Fiber (μm)	Compatible Optical Fiber with Fiber-Optic Connectors [7]
TORX147(F,T) [9] TORX147(F,TJ) [9]	0.1 to 15	−24 Max	± 15	2.7 to 3.6	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TORX147L(F,T) [9] [10] TORX147L(F,TJ) [9] [10]	0.1 to 15	−24 Max	± 15	2.7 to 3.6	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TORX147PL(F,T) [10] [11] TORX147PL(F,TJ) [10] [11]	0.1 to 15	−24 Max	± 15	2.7 to 3.6	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TORX177(F,T) [9] TORX177(F,TJ) [9]	0.1 to 15	−24 Max	± 15	5 ± 0.25	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TORX177L(F,T) [9] [10] TORX177L(F,TJ) [9] [10]	0.1 to 15	−24 Max	± 15	5 ± 0.25	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]
TORX177PL(F,T) [10] [11] TORX177PL(F,TJ) [10] [11]	0.1 to 15	−24 Max	± 15	5 ± 0.25	−20 to 70	JEITA RC-5720C Square	APF (980/1000) NA = 0.5	RFA4011-xxx [8]

Note (1) All values at Ta = 25°C

(7) For details on optical fiber cables with connectors, contact the respective manufactures.

(8) Manufactured by Mitsubishi Rayon Co., Ltd.

(9) Panel-mount type

(10) Shutter-equipped

(11) Mini-package type (fixed to printed circuit board)

(12) Optical modules with the (F,T) suffix are manufactured by Toshiba Semiconductor Thailand Co., Ltd. The ordering codes for these optical modules have the (F, TJ) suffix in Japan. For details, contact the your local Toshiba distributor.

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Duplex Modules (General-Purpose Optical Modules)

Transceiving Module	Data Rate (NRZ, Mb/s)	Emission Wavelength (nm)	Transmission Distance (m) (1)	Pulse Width Distortion (ns) (1)	Supply Voltage (V)	Operating Temperature (°C)	Compatible Optical Connector	Compatible Optical Fiber (μm)	Compatible Optical Fiber with Fiber-Optic Connectors (7)
TODX2950(F) (2)	DC to 10	650	Up to 50	± 30	5 ± 0.25	−40 to 85	JIS F07	APF (980/1000) NA = 0.5	LUCT2-TC1000W-xxM (3) TOCP200-xxMBT (4)
TODX2951(F)	DC to 6	650	Up to 40	± 55	5 ± 0.25	−40 to 85	JIS F07	APF (980/1000) NA = 0.5	LUCT2-TC1000W-xxM (3) TOCP200-xxMBT (4)
TODX2952(F)	DC to 10	650	Up to 10	± 30	5 ± 0.25	−40 to 85	JIS F07	APF (980/1000) NA = 0.5	LUCT2-TC1000W-xxM (3) TOCP200-xxMBT (4))
TODX2960(F)	DC to 10	770	Up to 1000	± 30	5 ± 0.25	−40 to 85	JIS F07	PCF (200/230)	CF-2071 (HC-20/70) Series (5) OPC202HV Series (6)

Note (1) All values at Ta = 25°C

(2) The external resistor value must be chosed, based on the transmission distance.

(3) Manufactured by Asahi Kasei E-Materials.

(4) Manufactured by Toray Industries, Inc.

(5) Manufactured by Sumitomo Electric Industries (SEI), Ltd.

(6) Manufactured by Oki Electric Cable Co., Ltd.

(7) For details on optical fiber cables with connectors, contact the respective manufactures.

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(High-Speed Optical Modules)

Transceiving Module	Data Rate (NRZ, Mb/s)	Emission Wavelength (nm)	Transmission Distance (m) (1)	Supply Voltage (V)	Operating Temperature (°C)	Compatible Optical Connector	Compatible Optical Fiber (μm)	Compatible Optical Fiber with Fiber-Optic Connectors (7)
TODX2402(F)	20 to 250	650	Up to 50 (125M) Up to 20 (250M)	3.3 ± 0.3	−10 to 70 (125M) 0 to 60 (250M)	SMI	APF (980/1000) NA = 0.3	LPG-Z0005P Series (13)
TODX2701(F)	20 to 125	650	Up to 20 (APF)	3.3 ± 0.3	−10 to 70	JIS F07 (PN)	APF (980/1000) NA = 0.5	LUCT2-TC1000W-xxM (3) TOCP200-xxMBT (4)
			Up to 100 (GI-PCF)				GI-PCF (200/230)	CF-2071 (HC-20/80) Series (5)

Note (1) All values at Ta = 25°C

(3) Manufactured by Asahi Kasei EMD Corporation.

(4) Manufactured by Toray Industries, Inc.

(5) Manufactured by Sumitomo Electric Industries (SEI), Ltd.

(7) For details on optical fiber cables with connectors, contact the respective manufactures.

(13) Manufactured by Honda Tsushin Kogyo Co., Ltd.

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Image Sensors

CCD Linear Image Sensors

Part Number	Style	Photosenstitive Pixels (Picture Elements)			Sensitivity (Typ.) (V/lx · s)	Data Rate (Max) (MHz)	Other Features
		Type/Lamp	Effective Pixels	Size (μm)			
TCD1103GFG ☆	Lens reduction type	B/W	1500	5.5 x 64	79	2	Digital shutter Sample-and-hold
TCD1254GFG ☆			2500	5.25 x 64	103	2	
TCD1255GFG ☆			2500	5.25 x 21	35	2	
TCD1706DG			7400	4.7 x 4.7	15	25 x 4	
TCD1710DG			7500 x 2 Line		15	15 x 2	
TCD1711DG			7450		15	30 x 2	
TCD2563BFG		Color	5340 x 4 Line	5.25 x 8.4	R:22.6, G:28.0, B:17.0	Color:25, B/W:25 x 2	TDI
TCD2564DG			5400 x 3 Line	7 x 7	R:9.6, G:8.9, B:3.8	30 x 2	
TCD2565BFG			7500 x 4 Line	5.25 x 5.25	R:10.2, G:9.2, B:4.0, B/W:14.7	Color:35, B/W:35 x 2	2-line distance (color)
TCD2566BFG			5340 x 4 Line	Color:5.25 x 6.825 B/W:5.25 x 8.4	R:31.7, G:32.8, B:19.9, B/W:59.4	Color:35, B/W:35 x 2	TDI
TCD2710DG			7500 x 3 Line	9.325 x 9.325	R:9.3, G:14.5, B:4.8	30 x 2	
TCD2712DG			7500 x 3 Line	9.325 x 9.325	R:14.1, G:22.2, B:9.1	30 x 4	
TCD2713DG			7500 x 4 Line	9.325 x 9.325	R:13.1, G:18.4, B:7.6, B/W:23.8	Color:35 x 2, B/W:35 x 4	2-line distance (color)
TCD2715DG			7450 x 3 Line	4.7 x 4.7	R:5.7, G:5.2, B:2.2	30	
TCD2716DG			7450 x 3 Line	4.7 x 4.7	R:9.1, G:8.5, B:3.8	30 x 2	
TCD2717BFG			7500 x 4 Line	4.7 x 4.7	R:8.0, G:7.2, B:3.1	Color:35, B/W:35 x 2	2-line distance (color)
TCD2915BFG			10680 x 3 Line	2.625 x 8.4	R:5.6, G:7.0, B:4.3	20	
TCD2916BFG			10680 x 4 Line		R:6.7, G:7.0, B:4.3, B/W-H:17.4, B/W-H:11.3	Color:25, B/W:25 x 2	
TCD2964BFG			21360 x 6 Line	2 x 4	R:1.3, G:1.5, B:0.7	10	Overflow drain

☆: Dry-packed

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

CMOS Area Image Sensors

Part Number	Package	Features			
		Optical Format (Inches)	Total Pixel Count (PIX)	Color/Mono	Digital Signal Processor
TCM9001MD	Camera module	1/10	648 (H) x 492 (V) (VGA)	Color (RGB)	Yes
TCM9200MD	Camera module	1/4	1648 (H) x 1216 (V) (2.0M)	Color (RGB)	Yes

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Package	Resolution (DPI)	Applications	Remarks
16PIN GLCC	—	Barcode readers	
22PIN Cerdip	A3 600	Photocopiers, scanners	
22PIN CLCC	A4 600	Photocopiers, color scanners	
22PIN Cerdip			
22PIN CLCC			ES: OK
22PIN CLCC			ES: OK
68PIN Cerdip	A3 600		
22PIN Cerdip			
32PIN CLCC			
22PIN CLCC	A4 1200		
32PIN CLCC	A4 4800	Color scanners	

OVERSEAS SUBSIDIARIES AND AFFILIATES

(As of April 1, 2011)

Toshiba America Electronic Components, Inc.
- Irvine, Headquarters
  Tel: (949)623-2900 Fax: (949)474-1330
- Buffalo Grove (Chicago)
  Tel: (847)484-2400 Fax: (847)541-7287
- Duluth/Atlanta
  Tel: (770)931-3363 Fax: (770)931-7602
- El Paso
  Tel: (915)771-8156
- Marlborough
  Tel: (508)481-0034 Fax: (508)481-8828
- Parsippany
  Tel: (973)541-4715 Fax: (973)541-4716
- San Jose
  Tel: (408)526-2400 Fax: (408)526-2410
- Wixom (Detroit)
  Tel: (248)347-2607 Fax: (248)347-2602
- Bloomington
  Tel: (952)842-2400 Fax: (952)893-8031
- San Diego
  Tel: (858)385-5900 Fax: (858)674-7606

Toshiba Electronics do Brasil Ltda.
Tel: (011)2539-6681 Fax: (011)2539-6675

Toshiba Electronics Europe GmbH
- Düsseldorf Head Office
  Tel: (0211)5296-0 Fax: (0211)5296-400
- France Branch
  Tel: (1)47282181
- Italy Branch
  Tel: (039)68701 Fax: (039)6870205
- Spain Branch
  Tel: (91)660-6798 Fax: (91)660-6799
- U.K. Branch
  Tel: (0870)060-2370 Fax: (01252)53-0250
- Sweden Branch
  Tel: (08)704-0900 Fax: (08)80-8459

Toshiba Electronics Asia (Singapore) Pte. Ltd.
Tel: (6278)5252 Fax: (6271)5155

Toshiba Electronics Service (Thailand) Co., Ltd.
Tel: (02)501-1635 Fax: (02)501-1638

Toshiba Electronics Trading (Malaysia) Sdn. Bhd.
- Kuala Lumpur Head Office
  Tel: (03)5631-6311 Fax: (03)5631-6307
- Penang Office
  Tel: (04)226-8523 Fax: (04)226-8515

Toshiba India Private Ltd.
Tel: (0124)499-6600 Fax: (0124)499-6611

Toshiba Electronics Asia, Ltd.
- Hong Kong Head Office
  Tel: 2375-6111 Fax: 2375-0969
- Beijing Office
  Tel: (010)6590-8796 Fax: (010)6590-8791
- Chengdu Office
  Tel: (028)8675-1773 Fax: (028)8675-1065
- Qingdao Office
  Tel: (532)8579-3328 Fax: (532)8579-3329

Toshiba Electronics (Shenzhen) Co.,Ltd
Tel: (0755)2399-6897 Fax: (0755)2399-5573

Toshiba Electronics (Shanghai) Co., Ltd.
- Shanghai PUXI Branch
  Tel: (021)6139-3888 Fax: (021)6190-8288
- Hangzhou Office
  Tel: (0571)8717-5004 Fax: (0571)8717-5013
- Nanjing Office
  Tel: (025)8689-0070 Fax: (025)8689-0070

Toshiba Electronics (Dalian) Co., Ltd.
Tel: (0411)8368-6882 Fax: (0411)8369-0822

Tsurong Xiamen Xiangyu Trading Co., Ltd.
Tel: (0592)226-1398 Fax: (0592)226-1399

Toshiba Electronics Korea Corporation
- Seoul Head Office
  Tel: (02)3484-4334 Fax: (02)3484-4302
- Daegu Office
  Tel: (053)428-7610 Fax: (053)428-7617

Toshiba Electronics Taiwan Corporation
- Taipei Head Office
  Tel: (02)2508-9988 Fax: (02)2508-9999

TOSHIBA

TOSHIBA CORPORATION
Semiconductor & Storage Products Company

Website: http://www.semicon.toshiba.co.jp/eng