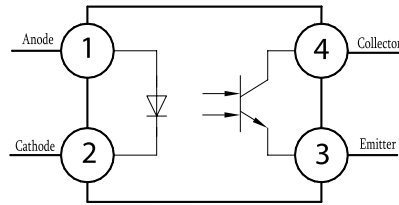


Phototransistor Optocoupler **multicomp**PRO



**RoHS
Compliant**

Features:

- Current transfer ratio
- (CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output (Viso =5000V rms)
- Collector - emitter breakdown voltage $BV_{CEO} \geq 80\text{V}$
- Operating Temperature: $-55^\circ\text{C} \sim 110^\circ\text{C}$
- VDE : 40034140
- UL : E340048
- CQC : CQC24001438922

Applications:

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as Fan Heaters, etc
- Signal transmission between circuits of different potentials and impedances

Mechanical Data

- Case: DIP-4L, DIP-4L(M), SMD-4L, SMD-4L(SS)
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Maximum Ratings: @ T_A 25°C unless otherwise specified.

	Parameter	Symbol	Value	Unit
Input	Forward Current	I_F	50	mA
	Peak Forward Current *1	I_{FM}	1	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	70	mW
Output	Collector Power Dissipation	P_C	150	mW
	Collector Current	I_O	50	mA
	Collector-Emitter Voltage	V_{CEO}	80	V
	Emitter-Collector Voltage	V_{ECO}	7	V

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Thermal Characteristics

Parameter	Symbol	Value	Unit
Total Power Dissipation	P _{TOT}	200	mW
Isolation Voltage ^{*2}	V _{ISO}	5000	Vrms
Rated Impulse Isolation Voltage	V _{IOTM}	8000	V
Rated Repetitive Peak Isolation Voltage	V _{IORM}	1500	V
Thermal Resistance Junction-to-Air	R _{θJA}	430	°C/W
Thermal Resistance Junction-to-Case	R _{θJC}	350	°C/W
Thermal Resistance Junction-to-Lead	R _{θJL}	368	°C/W
Operating Temperature	T _{OPR}	-55 ~ +110	°C
Storage Temperature Range	T _{STG}	-55 ~ +125	°C
Soldering Temperature ^{*3}	T _{SOL}	260	°C

Notes

1. Pulse width ≤ 1μs, Duty ratio: 0.001
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

Electrical Characteristics @ TA = 25°C unless otherwise specified

Parameter		Symbol	Test conditions	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V _F	I _F = 20mA	-	1.2	1.4	V
	Peak Forward Voltage	V _{FM}	I _{FM} = 0.5A	-	-	3.0	V
	Reverse Current	I _R	V _R = 4V	-	-	10	μA
	Input Capacitance	C _{in}	V _R = 0V, f = 1kHz	-	30	250	pF
Output	Collector-Emitter Dark Current	I _{CEO}	V _{CE} = 20V, I _F = 0	-	-	100	nA
	Collector-Emitter Breakdown Voltage	BV _{CEO}	I _C = 0.1mA, I _F = 0	80	-	-	V
	Emitter-Collector Breakdown Voltage	BV _{ECO}	I _E = 10μA, I _F = 0	7	-	-	V
Transfer Characteristics	Collector Current	I _C	I _F = 5mA, V _{CE} = 5V	2.5	-	30	mA
	Current Transfer Ratio	C _{TR}	I _F = 5 mA, V _{CE} = 5V	50	-	600	%
	Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _F = 20mA, I _C = 1mA	-	0.1	0.2	V
	Isolation Resistance	R _{IO}	V _{IO} = 500V DC 40~60% R.H.	1×10 ¹²	-	-	Ω
	Isolation current	R _{isc}	6000V DC, 40~60%R.H	-	-	2	μA
	Floating Capacitance	C _{IO}	V _{IO} = 0, f = 1MHz	-	0.6	1.0	pF

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Parameter		Symbol	Test conditions	Min.	Typ.	Max.	Unit
Transfer Characteristics	Cut-off frequency	f _c	V _{CE} = 5V, I _c = 2mA R _L =100Ω, -3dB	-	80	-	kHz
	Turn On Time	T _{on}	V _{CE} =2V, R _L = 100Ω I _C =2mA		4	18	
	Turn Off Time	T _{off}			3	18	

Rank Table of Current Transfer Ratio CTR

Rank Mark	Min. (%)	Max. (%)	Condition
L	50	100	$I_F = 5mA, V_{CE} = 5V$
X	100	200	
A	80	160	
B	130	260	
C	200	400	
D	300	600	
No mark	50	600	

Ratings and Characteristics Curves: (@ $T_A = 25^\circ C$ unless otherwise specified)

Fig.1 Allowable Forward Current vs. Ambient Temperature

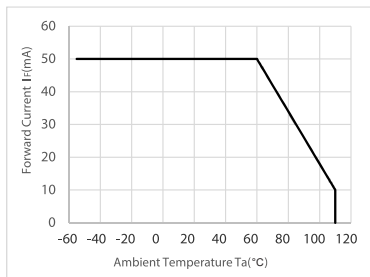


Fig.2 Allowable collector power dissipation vs. Ambient Temperature $T_A(^{\circ}C)$

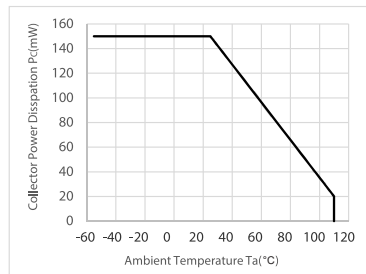


Fig.3 Relative Current Transfer Ratio vs. Forward Current

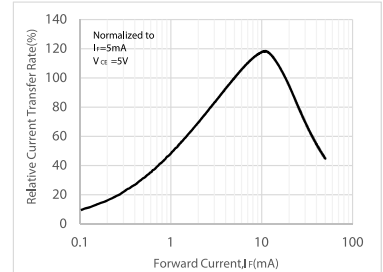


Fig.4 Forward Current vs. Forward Voltage

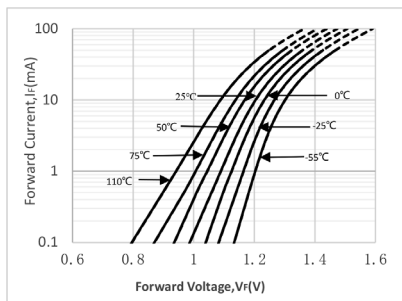


Fig.5 Collector Current vs. Collector-emitter Voltage

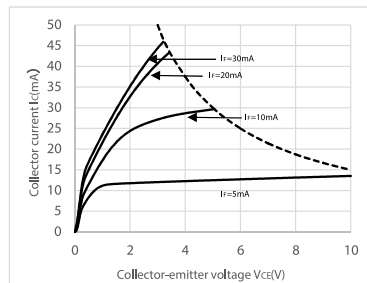
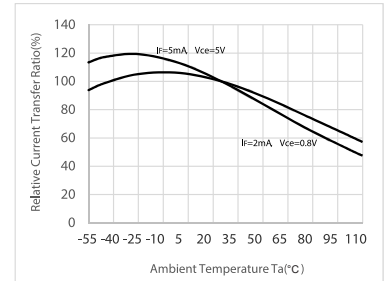


Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature



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Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

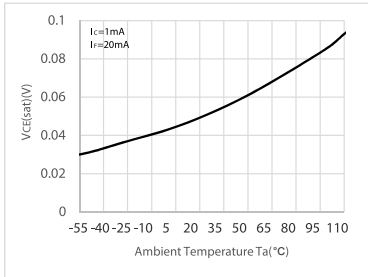


Fig.8 Collector Dark Current vs. Ambient Temperature

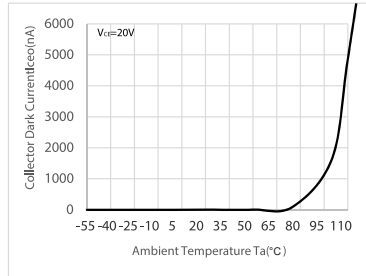


Fig.9 Response Time vs. Load Resistance

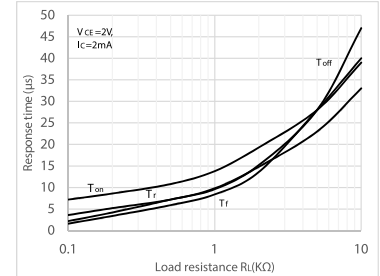


Fig.10 Frequency Response

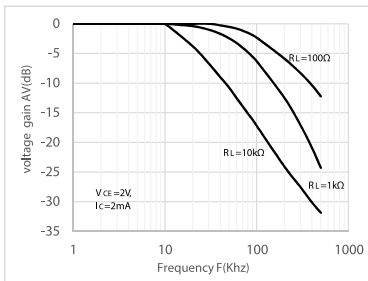


Fig.11 Collector-emitter Saturation Voltage vs. Forward Current

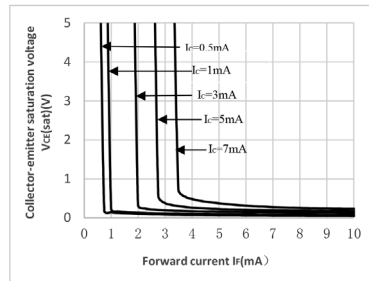
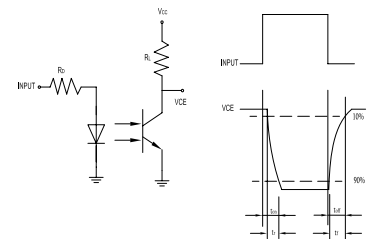
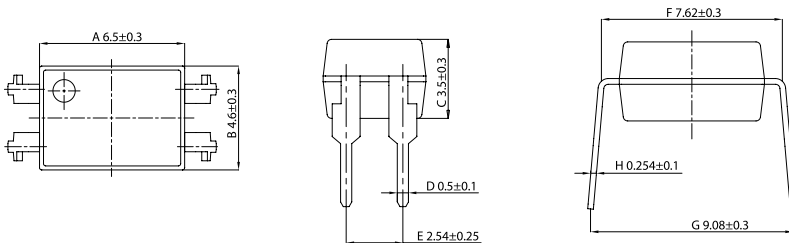


Fig.12 Switching Time Test Circuit & Waveforms



Outline Dimensions



Part Number Table

Description	Part Number
Phototransistor optocoupler, 50mA, 6V, 5000Vrms, DIP 4L, CTR 80 to 160%	BL817A
Phototransistor optocoupler, 50mA, 6V, 5000Vrms, SMD 4L, CTR 130 To 260%	BL817SB
Phototransistor optocoupler, 50mA, 6V, 5000Vrms, SMD 4L, CTR 300 To 600%	BL817SD

Dimensions : Millimetres

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