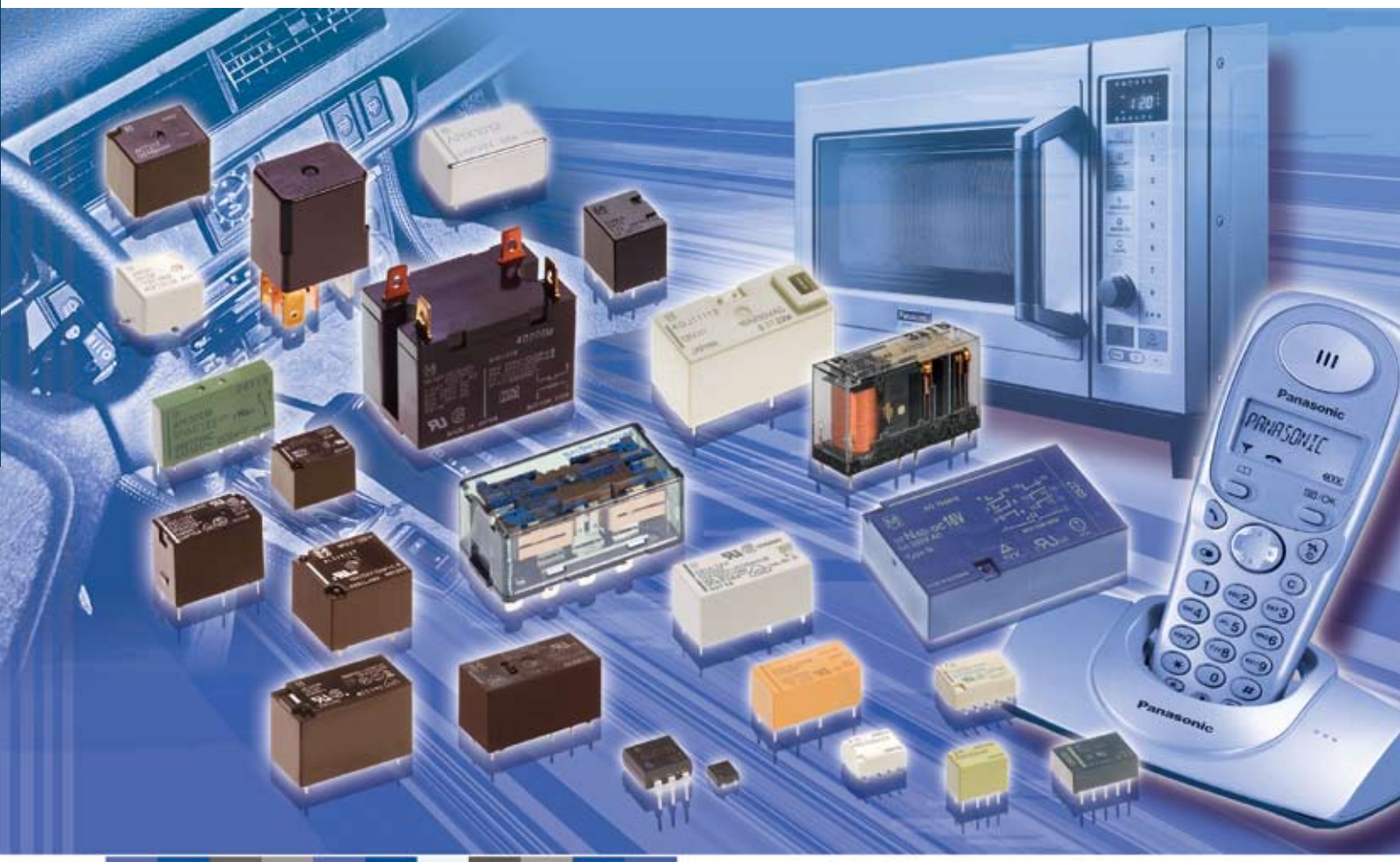
Panasonic

ideas for life



Short Form

Relays

09/2007

Panasonic Relay Technology
Innovation across the board.

Telecommunications, machine construction, measurement and control systems, automotive electronics, building security and installation – today there is virtually no branch of human activity that can exist without using modern relays. Panasonic Electric Works is able to meet both simple or complex demands from its vast range of sophisticated, economic switching technologies by offering the relay most appropriate to solving the specific application.

With over 30 years experience at the forefront of relay innovation and development, Panasonic today offers one of the world`s most comprehensive ranges of electro-mechanical and semiconductor types. Currently our product range extends from ultra-miniature SMD semiconductor types to robust, compact industrial devices. Load switching capability ranges from low-level signals to double-digit ampere values. Panasonic relays are available for all common mounting configurations with screw, PCB, solder or surface mount terminals to meet most demands of operating environments or conditions.

With its well established, comprehensive T and G series relays, we are making significant contributions within the field of global data transmission.

Panasonic power relays, particularly those of the J, L and C series, are not only used in mains isolation applications, but also in diverse ranges of consumer appliances, automotive electrics and diverse OEM manufacturing industries.

In the field of safety of man and machine, the SF-series relays, with forcibly guided contacts, have set a new standard of security.

Panasonic has developed a wide range of SMD miniature relays for the new generation of surface mounting, automated assembly processes. In addition to electromechanical SMD types such as TQ, TX, GN, GQ and CP series, we have made significant developments in the rapidly expanding field of SSR and PhotoMOS relays.

If your application requires long lifetime, stable behavior, small size or high switching speed, semiconductor relays are definitely the best choice for you. Within our broad product range, you can find relays to switch low level loads or double-digit ampere values. Various package options are also available. In other words, our semiconductor relays complement our electromechanical relay selection to allow us to exactly meet your needs.

For us, supplying quality products is paramount. To guarantee superior quality, the company has implemented strict testing and inspection procedures to comply with or even exceed most international specifications. Of course, we have ISO9001 certification.

If you need more detailed information about Panasonic relays, please ask us to send you the complete relay catalog.

Soldering Guidelines for Lead-Free Solder

Our products support lead-free soldering processes. Please contact a Panasonic sales office to find out when each relay will support lead-free solder.

If you are using Sn-Pb eutectic solder, mounting conditions can remain as they are.

When using lead-free solder for our products, please adhere to the following soldering guidelines:

- DIP type

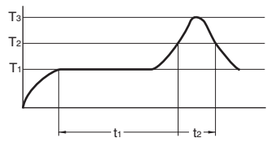
The conditions for mounting with lead-free solder are: preheating at 120°C within 120 seconds and soldering at 260 ±5°C within 6 seconds. (Soldering of PhotoMOS relays can be carried out at 260°C within 10 seconds.)

The reliability of the solder at the joining part can vary greatly depending on the actual mounting conditions. Influencing factors are: the type of lead-free solder, the landshape of the PCB, the mounting conditions.

- SMT type

We recommend the following temperature profile as a condition for automatic mounting when using lead-free solder.

- Recommended temperature profile condition during reflow soldering



T_1 = 150 to 180°C
T_2 = 230°C and higher
T_3 = Within 250°C

t_1 = 60 to 120 sec.
t_2 = Within 30 sec.

- Cautions when mounting

The relay temperature may rise depending on the mounting density and the heating method of the reflow oven. Accordingly, please set the temperature so that the soldered parts of the relay terminals do not exceed the mounting conditions given above. We recommend checking the temperature rise at each part to be soldered under the actual conditions.

Table of Contents

Product/Application Selector Chart

	Category	Signal Relays										Coaxial Switches	High Frequency Relays	
	Product Name	SX (ASX)	GN (AGN) GQ (AGQ)	TX TX-D TX-S	TQ	TQ (SMD)	TN	TK	HY	DS	DS2Y	RD (ARD)	RJ (ARJ)	RX (ARX)
Home Appliances	A/V								Muting					
	Amenities													
	Cooking													
	Other equipment													
	Home Automation													
Business	Office equipment								Pocket PC					
	Security				Emergency alarms									
	Automotive • Railway • Traffic						Vehicle information and communication system		Door mirrors					
	Vending machine • CD									Money exchange machine				
	Game equipment													
Communications Measurement	Telephones		Switch board/ transmitters	Switch board/ transmitters	Switch board/ Push-button telephone		FAX		Push-button telephone					
	Communication equipment				Communications equipment • LAN	LAN	LAN							
	Computers						Hard Disk Drive	Hard Disk Drive		Hard Disk Drive				
	Measuring instruments	Temperature measuring instrument					Board tester						High-frequency attenuator	
	Medical equipment				X-ray equipment					CT Scanner				
Machinery	Robots													
	NC machines													
	Conveyor machinery									Elevator				
	Injection molders									Emergency circuits				
	Agricultural/gardening equipment													
Equipment	Equipment				Warning units									
	Control panels													
	Engineering													
	Electric power		Automatic inspection equipment	Automatic inspection equipment										

	High Frequency Relays					Power Relays										
	RE (ARE)	RK	RA (ARA)	RP	RS	DE	PE (APE) PA PQ	MC	DSP	DY (ADY)	DK	DJ (ADJ)	DQ (ADQ)	S ST	SP	
Home Appliances	Tuner STB	Tuner STB														A/V
																Amenities
																Cooking
															Electric water heaters	Other equipment
												Network equipment	Network equipment	Remote controller	Remote controller	Home Automation
Business									Electronic blackboards							Office equipment
																Security
																Automotive • Railway • Traffic
										Automatic teller machine	Automatic teller machine					Vending machine • CD
																Game equipment
Communications Measurement				Car telephones						FAX	FAX					Telephones
																Communication equipment
	Multiplex equipment	Multiplex equipment					Interface									Computers
		High-frequency attenuator	High-frequency attenuator				For PLC output									Measuring instruments
														For power supply		Medical equipment
Machinery							Interface									Robots
							Interface									NC machines
							Interface									Conveyor machinery
							Interface		Emergency circuits							Injection molders
																Agricultural/gardening equipment
Equipment																Equipment
														NC boards/ Control panels	Instrument panels	Control panels
																Engineering
										Automatic inspection equipment	Automatic inspection equipment					Electric power

Product/Application Selector Chart

Category		Power Relays for general use						For industrial machines		J&L Series Power Relays			
	Product Name	HN (AHN)	HJ HK (AHK)	HC HL	HP	HG	HE	EP (AEP)	EJ (AEJ)	LF (ALF)	LE (ALE)	LZ (ALZ)	LJ (ALJ)
Home Appliances	A/V												
	Amenities			Air-conditioner			Air-conditioner			Air-conditioner			Air-conditioner
	Cooking										Microwave ovens	Microwave ovens	Microwave ovens
	Other equipment						Electric water heaters			Refrigera-tors	Refrigera-tors		Refrigera-tors
	Home Automation												
Business	Office equipment						Pocket PC			Pocket PC	Pocket PC	Office Automation equipment	
	Security												
	Automotive • Railway • Traffic												
	Vending machine • CD			Lamp units	Solenoid		Power supply units						
	Game equipment												
Communications Measurement	Telephones												
	Communication equipment												
	Computers			Sequence units		Power supply units							
	Measuring instruments												
	Medical equipment												
Machinery	Robots												
	NC machines			Sequence units				Spot welder	Spot welder				
	Conveyor machinery							Remote control conveyance vehicle	Remote control conveyance vehicle			UPS	
	Injection molders			Sequence units									
	Agricultural/gardening equipment		For heaters	For heaters			For heaters						
Equipment	Equipment							Uninterruptive power supplies/ invertor	Uninterruptive power supplies/ invertor				
	Control panels												
	Engineering												
	Electric power							Development device for poles	Development device for poles				

J & L Series Power Relays													Safety Relays			
LD (ALD)	LA (ALA)	LK-T LK-Q	LK LK-S LK-P	LS (ALS)	JQ	JS	JV-N	JW	JM	JT-V JT-N	JC	EB (AEB)	SF Slim type	SF	SF Double contact	
	Audio monitor	TV monitor/ Power supply units	TV monitor/ Power supply units													A/V
Air-conditioner		Air-conditioner	Air-conditioner					Air-conditioner	Air-conditioner							Amenities
Microwave ovens				Electric rice cookers	Electric water heaters	Electric rice cookers	Electric rice cookers	Microwave ovens		Ovens						Cooking
Refrigera-tors		Refrigera-tors	Refrigera-tors	Refrigera-tors		Refrigera-tors	Iron		Refrigera-tors							Other equipment
		Power supply units	Power supply units													Home Automation
		Laser Beam Printer/Cathode Ray Tube	Laser Beam Printer/Cathode Ray Tube		Pocket PC			Pocket PC								Office equipment
																Security
												42V car • Motor assist car				Automotive • Railway • Traffic
																Vending machine • CD
																Game equipment
		Power supply units	Power supply units		FAX											Telephones
																Communication equipment
		Power supply units	Power supply units					Power supply units								Computers
																Measuring instruments
																Medical equipment
													Safety devices	Safety devices	Safety devices	Robots
													Safety devices		Safety devices	NC machines
												UPS	Safety devices	Safety devices	Safety devices	Conveyor machinery
													Safety devices		Safety devices	Injection molders
																Agricultural/gardening equipment
																Equipment
																Control panels
																Engineering
																Electric power

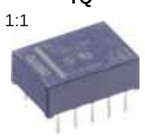
Product/Application Selector Chart

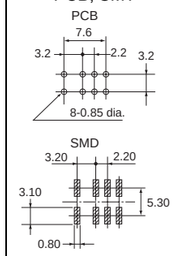
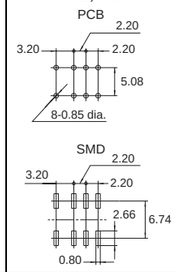
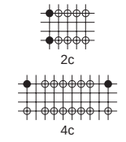
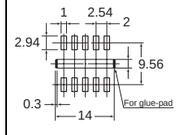
Category	Automotive										
Features	Twin			Single							
Product Name	CJ	CT	CT Power	JJ-M	JJ-M (double make contact)	CJ	CT	CT Power	CP	CP Power	CY JS-M
Safety											
Headlights (incl. HID)											■
Tail lights				■						■	■
Fog lights (front and rear)											■
Signal lights				■					■		
Windshield wipers			■	■				■	■	■	■
Power mirrors (also ones with heaters)	■	■	■	■		■	■	■		■	
Windshield washers				■		■	■	■	■	■	
Defogger										■	■
Horn	■	■		■		■	■		■	■	
Power Train Control											
Blower fan				■				■		■	
Radiator fan motor											
Engine starter motor											
EPS (electronic power steering)									■	■	
Magnetic clutch											
ABS/TRC				■					■	■	
Semi-active suspension				■		■	■	■	■	■	
Comfort											
Power sunroof	■	■	■	■		■	■	■		■	
Power seats	■	■	■	■		■	■	■	■	■	
Hatch	■	■	■	■		■	■	■		■	
Power window motor	■	■	■	■		■	■	■	■	■	
Keyless entry				■	■	■	■	■	■	■	
Door lock	■	■	■	■		■	■	■	■	■	
Sliding door	■	■	■	■		■	■	■			
Car security				■	■	■	■	■	■	■	
Seat heater											■
Car stereo				■		■	■	■	■		
Interior lighting				■		■	■	■	■	■	
Auto antennae	■	■	■	■		■	■	■	■	■	
Cruise control	■	■		■		■	■		■	■	
Special Vehicle											
Electric, hybrid and fuel cell verhicles											
Motorcycles											
Forklifts											

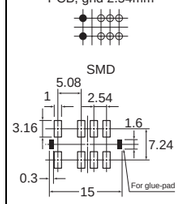
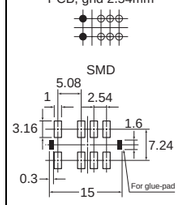
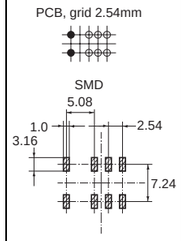
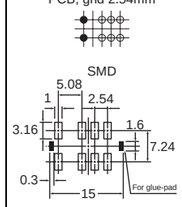
Automotive											
SMD	Quiet		Power versions				Others				
CP-SMD	CQ	CR	CV	CM	CB	CA	PhotoMOS AQY, AQV, AQW	GQ,GN	EB	EV	
			■	■	■	■					Headlights (incl. HID)
■			■	■	■	■					Tail lights
			■	■	■	■					Fog lights (front and rear)
											Signal lights
■	■	■									Windshield wipers
■	■	■						■			Power mirrors (also ones with heaters)
■											Windshield washers
■			■	■	■						Defogger
■	■	■									Horn
■			■	■	■						Blower fan
			■	■	■						Radiator fan motor
			■	■	■						Engine starter motor
■			■	■	■						EPS (electronic power steering)
			■	■	■						Magnetic clutch
■			■	■	■						ABS/TRC
■											Semi-active suspension
■	■	■									Power sunroof
■	■	■									Power seats
■											Hatch
■	■	■									Power window motor
■								■			Keyless entry
■	■	■						■			Door lock
■	■	■									Sliding door
■											Car security
■			■	■							Seat heater
■	■							■			Car stereo
■											Interior lighting
■	■	■						■			Auto antennae
■	■	■									Cruise control
							■		■	■	Electric, hybrid and fuel cell verhicles
						■					Motorcycles
			■	■	■					■	Forklifts

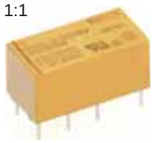
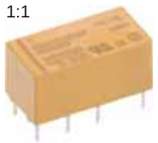
About the Selector Chart

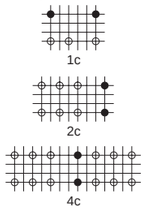
This selector chart is designed to help you quickly select a relay best suited for your needs. Please note: the values given for switching current and switching voltage do not necessarily indicate standard operating conditions. For the nominal switching capacity and other critical values, please refer to the respective data sheet. In case of doubt, please contact your Panasonic representative.

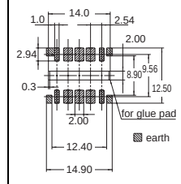
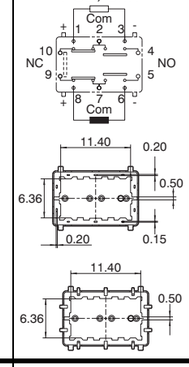
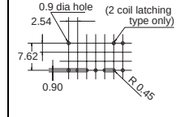
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
★**GN (SMD)** 1:1  10.6 x 5.7 x 9.0mm	• Compact slim body saves space • Outstanding surge resistance • The use of twin crossbar contacts ensures high contact reliability • RoHS compliant	**Max.:** 1A **Min.:** 10µA 	• 110V DC • 125V AC	2c	(DC) 1.5, 3, 4.5, 6, 9, 12, 24V
★**GQ (SMD)** 1:1  10.6 x 7.2 x 5.2/5.4mm	• Compact flat body saves space • Outstanding surge resistance • The use of twin crossbar contacts ensures high contact reliability • RoHS compliant	**Max.:** 1A **Min.:** 10µA 	• 110V DC • 125V AC	2c	(DC) 1.5, 3, 4.5, 6, 9, 12, 24V
★**TQ** 1:1  14 x 9 x 5mm	• 1,500V FCC 4-pole model available • RoHS compliant	**Max.:** 1A **Min.:** 10µA 	• 110V DC • 125V AC	2c, 4c	(DC) 3, 4.5, 5, 6, 9, 12, 24, 48V
★**TQ (SMD)** 1:1  14 x 9 x 5.6mm	• Ultra low profile 5.8mm • Surge withstand 2,500V • 3 types of surface-mount terminals available • RoHS compliant	**Max.:** 2A **Min.:** 10µA 	• 220V DC • 125V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V

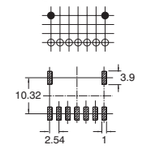
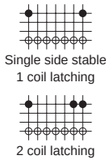
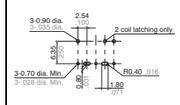
Coil power	Breakdown voltage: Between open contacts	Breakdown voltage: Between contact sets	Breakdown voltage: Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
Single side stable: 140mW (1.5 - 12V DC) 230mW (24V DC) **1 coil latching:** 100mW (1.5V - 12V DC) 120mW (24V DC)	750Vrms	1000Vrms	1500Vrms	1,500V FCC 2,500V Bellcore	PCB, SMT 	UL, CSA, BSI
Single side stable: 140mW (1.5 - 12V DC) 230mW (24V DC) **1 coil latching:** 100mW (1.5V - 12V DC) 120mW (24V DC)	750Vrms	1000Vrms	1500Vrms	1,500V FCC 2,500V Bellcore	PCB, SMT 	UL, CSA, BSI
Single side stable: 140mW (3 - 12V DC) 200mW (24V DC) 300mW (48V DC) **1 coil latching:** 100mW (3 - 12V DC) 150mW (24V DC) **2 coil latching:** 200mW (3 - 12V DC) 300mW (24V DC)	750Vrms	1000Vrms	1000Vrms	1,500V FCC	PCB Grid 2.54mm 	UL, CSA
Single side stable: 140mW (up to 12V DC) 200mW (24V DC) 300mW (48V DC) **1 coil latching:** 70mW (up to 12V DC) 100mW (24V DC) **2 coil latching:** 140mW (up to 12V DC) 200mW (24V DC)	1000Vrms	1500Vrms	1500Vrms	1,500V FCC 2,500V Bellcore	SMT 	UL, CSA

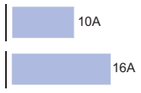
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
★**TX (SMD)** 1:1  15 x 7.4 x 8.2mm	• Surge withstand 2,500V • High contact capacity 2A 30V DC • Breakdown voltage between contacts and coil 2,000V • 3 types of surface-mount terminals available • RoHS compliant	**Max.:** 2A **Min.:** 10µA 	• 220V DC • 220V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V	**Single side stable:** 140mW (up to 24V DC) 270mW (48V DC) **1 coil latching:** 100mW **2 coil latching:** 200mW	1000Vrms	1000Vrms	2000Vrms	1,500V FCC 2,500V Bellcore	PCB, SMT PCB, grid 2.54mm 	UL, CSA, BSI
TX-S (SMD) 1:1  15 x 7.4 x 8.2/8.4mm	• Higher sensitivity • Nominal operating power, 50mW • 1,500V FCC • 3 types of surface-mount terminals available • RoHS compliant	**Max.:** 1A **Min.:** 10µA 	• 110V DC • 125V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V	**Single side stable:** 50mW (1.5 - 12V DC) 70mW (24V DC) **1 coil latching:** 35mW (1.5 - 12V DC) 50mW (24V DC) **2 coil latching:** 70mW (1.5 - 12V DC) 150mW (24V DC)	750Vrms	1000Vrms	1800Vrms	1,500V FCC 2,500V Bellcore	PCB, SMT PCB, grid 2.54mm 	UL, CSA, BSI
SX (SMD) 1:1  15 x 7.4 x 8.2/10mm	• High contact reliability over a long life has been made possible for low level loads • High sensitivity of 50mW • Low thermal electromotive force • RoHS compliant	**Max.:** 0.01A **Min.:** 10µA 	• 10V DC	2c	(DC) 1.5, 3, 4.5, 6, 9, 12, 24V	**Single side stable:** 50mW (1.5 - 12V DC) 70mW (24V DC) **1 coil latching:** 35mW (1.5 - 12V DC) 50mW (24V DC) **2 coil latching:** 70mW (1.5 - 12V DC) 150mW (24V DC)	750Vrms	1000Vrms	1000Vrms	-	PCB, SMT PCB, grid 2.54mm 	UL, CSA, BSI
TX-D (SMD) 1:1  15 x 7.4 x 8.2/8.4mm	• High-insulation relay that conforms to the insulation level provided for in the EN41003 • 3 types of surface-mount terminals available • RoHS compliant	**Max.:** 2A **Min.:** 10µA 	Break Before Make: • 220V DC • 250V AC Make Before Break: • 125V DC • 125V AC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V	**Single side stable:** 200mW (1.5 - 12V DC) 230mW (24V DC) **1 coil latching:** 150mW (1.5 - 12V DC) 170mW (24V DC)	1000Vrms	1000Vrms	2000Vrms	1,500V FCC 2,500V Bellcore	PCB, SMT PCB, grid 2.54mm 	UL, CSA, BSI
TN 1:1  14 x 5.6 x 9.8mm	• Slim size • 1,500V FCC • RoHS compliant	**Max.:** 1A **Min.:** 10µA 	• 110V DC • 125V AC	2c	(DC) 3, 4.5, 5, 6, 9, 12, 24, 48V	**Single side stable:** 140mW (up to 12V DC) 200mW (24V DC) 300mW (48V DC) **1 coil latching:** 100mW (3 - 12V DC) 150mW (24V DC) **2 coil latching:** 200mW (3 - 12V DC) 300mW (24V DC)	750Vrms	1000Vrms	1000Vrms	1,500V FCC	PCB Grid 2.54mm 	UL, CSA

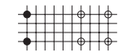
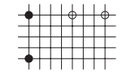
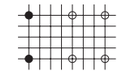
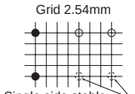
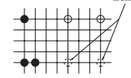
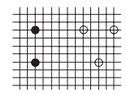
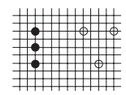
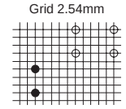
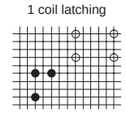
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
TK 1:1  10.6 x 9 x 4mm	• Low profile 4mm • High contact capacity 2A • Surge withstand voltage between contact and coil 2,500V • RoHS compliant	**Max.:** 2A **Min.:** 10µA 	• 220V DC • 220V AC	1c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V
DS 1:1  20 x 9.9 x 9.8mm	• 1500V FCC • High switching power • RoHS compliant	**Max.:** 2A **Min.:** 10µA 	• 220V DC • 250V AC	1c, 2c, 4c	(DC) 1.5, 3, 5, 6, 9, 12, 24, 48V
★**DS2Y** 1:1  20 x 9.9 x 9.3mm	• High sensitivity • 2 Form C contact • 1,500V FCC • Sealed construction • RoHS compliant	**Max.:** 2A **Min.:** 10µA 	• 220V DC • 250V AC	2c	(DC) 1.5, 3, 5, 6, 9, 12, 24, 48V
HY 1:1  12 x 7.4 x 10.1mm	• High sensitivity 150mW / 200mW • RoHS compliant	**Max.:** 1A **Min.:** 10µA 	• 60V DC	1c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Single side stable: 140mW (up to 12V DC) 270mW (24V DC) **1 coil latching:** 100mW (3 - 12V DC) 150mW (24V DC) **2 coil latching:** 200mW (1.5 - 9V DC) 250mW (12V DC) 400mW (24V DC)	750Vrms	1000Vrms	1500Vrms	1,500V FCC 2,500V Bellcore	PCB Grid 2.54mm 	UL, CSA
M type: **Single side stable:** 400mW **1 coil latching:** 180mW **2 coil latching:** 360mW **S type:** **Single side stable:** 200mW **1 coil latching:** 90mW **2 coil latching:** 180mW	1000Vrms (DS1-S: 500Vrms)	1000Vrms	1500Vrms (DS1-S: 1000Vrms)	1,500V FCC	PCB Grid 2.54mm 	UL, CSA
Single side stable: 200mW (up to 24V DC) 300mW (48V DC)	750Vrms	1000Vrms	1000Vrms	1,500V FCC	PCB Grid 2.54mm 	UL, CSA
Standard: 200mW **High sensitivity:** 150mW	500Vrms	-	1000Vrms	-	PCB Grid 2.54mm 	UL, CSA

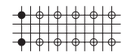
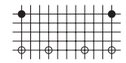
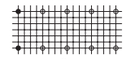
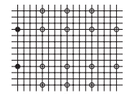
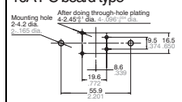
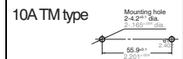
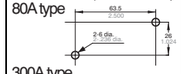
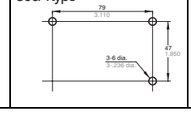
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
★**RD SPDT** 1:2  34 x 13.2 x 39mm	• Coaxial relay • Up to 26.5GHz (18GHz) • Impedance 50Ω • SPST high power version available • RoHS compliant HF Characteristics at 18GHz: • Isolation min. 60dB • Insertion loss max. 0.5dB • V.S.W.R. max. 1.5 • TTL Version available	**DC:** 100mA (indicator) **HF:** 120W (3GHz)	• 30V DC (indicator)	SPDT	(DC) 4.5, 5, 12, 24V	**Single side stable:** 840-970mW (4.5, 12, 24V) **2 coil latching:** 700-900mW (4.5, 12, 24V) **Latching with TTL driver (self cut-off function):** 5, 12, 24V	500Vrms	500Vrms	500Vrms	-	SMA	-
★**RD TRANSFER** 1:2  32 x 32 x 39mm	• Coaxial relay • Up to 26.5GHz (18GHz) • Impedance 50Ω • SPST high power version available • RoHS compliant HF Characteristics at 18GHz: • Isolation min. 60dB • Insertion loss max. 0.5dB • V.S.W.R. max. 1.5 • TTL Version available	**DC:** 100mA (indicator) **HF:** 120W (3GHz)	• 30V DC (indicator)	DPDT	(DC) 4.5, 5, 12, 24V	**Single side stable:** 1540-1670mW (4.5, 12, 24V) **2 coil latching:** 1200-1400mW (4.5, 12, 24V) **Latching with TTL driver (self cut-off function):** 5, 12, 24V	500Vrms	500Vrms	500Vrms	-	SMA	-
RA 1:1  14.7 x 9.7 x 5.9mm	• HF relay in SMT version • Up to 1GHz • Impedance 50Ω • RoHS compliant HF Characteristics at 1GHz: • Isolation min. 20dB • Insertion loss max. 0.3dB • V.S.W.R. max. 1.2	**DC:** 1A **HF:** 3W (1GHz, carrying point to carrying current)	• 30V DC	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V	**Single side stable:** 140mW (1.5 - 12V) 200mW (24V) 300mW (48V) **1 coil latching:** 70mW (1.5 - 12V) 100mW (24V) **2 coil latching:** 140mW (1.5 - 12V) 200mW (24V)	750Vrms	1000Vrms	1000Vrms	-	SMT Suggested mounting pads (Top view) 	-
★**RJ** 1:1  14 x 9 x 8.2mm	• Shielded HF relay • Up to 8GHz • Impedance 50Ω • RoHS compliant HF Characteristics at 5GHz: • Isolation min. 35dB • Insertion loss max. 0.5dB • V.S.W.R. max.1.25	**DC:** 0.3A **HF:** 1W (5GHz)	• 30V DC	2c	(DC) 3, 4.5, 12, 24V	**Single side stable:** 200mW **2 coil latching:** 150mW	500Vrms	500Vrms	500Vrms	-	PCB, SMT 	-
RX 1:1  20.5 x 12.4 x 9.4mm	• Shielded HF-Relay • Up to 3 GHz • Impedance 50Ω • RoHS compliant HF Characteristics at 2.5GHz • Isolation min. 60dB • Insertion loss max. 0.2dB • V.S.W.R. max. 1.2	**DC:** 0.5A **HF:** 10W (2.5GHz)	• 30V DC	1c	(DC) 3, 4.5, 6, 9, 12, 24V	**Single side stable:** 200mW **1 coil latching:** 200mW **2 coil latching:** 400mW	500Vrms	-	1000Vrms	-	PCB 	-

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
★**RE (SMD)** 1:1  20.2 x 11.2 x 8.9/9.6mm	• HF relay for broadcasting • Up to 2.6GHz • Impedance 50/75Ω • SMT and PCB version available • RoHS compliant HF Characteristics at 2.6GHz • Isolation min 30dB • Insertion loss max. 0.7dB • V.S.W.R. max. 1.7	**DC:** 0.5A **HF:** 1W (2.6GHz)	• 30V DC	1c	(DC) 3, 4.5, 6, 9, 12, 24V	**Single side stable:** 200mW	500Vrms	-	1000Vrms	-	PCB, SMT Grid 2.54mm 	-
RK 1:1  20.2 x 11.2 x 9.7mm	• HF relay for broadcasting • Up to 1.5GHz • Impedance 50/75Ω • Latching types available • RoHS compliant HF Characteristics: • Isolation min. 60dB (at 1.5GHz) • Insertion loss max. 0.3dB (at 900MHz) • V.S.W.R. max. 1.5 (at 900MHz)	**DC:** 0.5A **HF:** 10W	• 30V DC	1c	(DC) 3, 4.5, 5, 6, 9, 12, 24V	**Single side stable:** 200mW **1 coil latching:** 200mW **2 coil latching:** 400mW	500Vrms	-	1000Vrms	-	PCB Grid 2.54mm 	-
RP 1:1  10.6 x 9 x 4mm	• Low profile HF relay • Up to 1.8GHz • Impedance 50Ω • RoHS compliant HF Characteristics at 1.8GHz: • Isolation min. 10dB • Insertion loss max. 1dB • V.S.W.R. max. 1.3	**DC:** 0.1A **HF:** 1W (1.8GHz)	• 30V DC	1c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V	**Single side stable:** 140mW (1.5 - 12V) 270mW (24V)	750Vrms	-	1500Vrms	-	PCB Grid 2.54mm 	-
RS 1:1  14 x 8.6 x 7mm	• HF relay for broadcasting • Up to 3GHz • Impedance 75Ω • Silent type available • RoHS compliant HF Characteristics at 3GHz: • Isolation min. 30dB • Insertion loss max. 0.3dB • V.S.W.R. max. 1.4	**DC:** 0.5A **HF:** 10W (3GHz, contact carrying)	• 30V DC	1c	(DC) 3, 4.5, 9, 12, 24V	**Single side stable:** 200mW **1 coil latching:** 200mW **2 coil latching:** 400mW	500Vrms	-	1000Vrms	-	PCB 	-

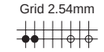
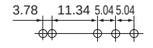
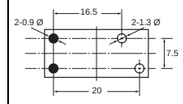
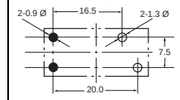
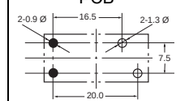
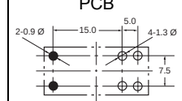
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
★**DE** 1:2  25 x 12.5 x 12.5mm	• Conforms to VDE0631 • Low operating power • Compact body saves space • Creepage & clearance distance >Min 8mm • RoHS compliant	**Max.:** 10/16A (1a)  8A (1a1b, 2a)  	• 230V DC • 440V AC	1a, 1a1b, 2a	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V
DSP 1:2  20.2 x 11 x 10.5mm	• High switching capacity • High sensitivity • High contact welding resistance • High breakdown voltage • RoHS compliant	**Max.:** 8A (1a)  5A (1a1b, 2a)  	• 220V DC • 400V AC	1a, 1a1b, 2a	(DC) 3, 5, 6, 9, 12, 24V
DK 1:2  20 x 15 x 10mm	• Large capacity in small size • High sensitivity • High breakdown voltage • RoHS compliant	**Max.:** 10A (1a)  8A (1a1b, 2a)  	• 125V DC • 400V AC	1a, 1a1b, 2a	(DC) 3, 5, 6, 9, 12, 24V
DY 1:2  20 x 15 x 9.7mm	• Latching types available • RoHS compliant • Socket available	**Max.:** 10A (1a)  8A (1a1b)  	• 125V DC • 380V AC	1a, 1a1b	(DC) 3, 5, 6, 12, 24V
★**DJ** 1:2  29 x 13 x 16/16.5mm	• Latching type • Compact with high capacity • Creepage & clearance distance > 8mm • Optional available with manual test button • RoHS compliant	**Max.:** 16A  	• 125V DC • 400V AC	1a, 1b, 1c, 1a1b, 2a, 2b, 2c	(DC) 5, 6, 12, 24, 48V
DQ 1:2  38 x 29 x 17.3mm	• Latching type • Compact with high capacity • High insulation • RoHS compliant	**Max.:** 30A  	• 250V DC • 250V AC	1a	(DC) 4.5, 6, 9, 12, 24V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Single side stable: 200mW **1 coil latching:** 100mW **2 coil latching:** 200mW	1000Vrms	4000Vrms (1a1b, 2a)	5000Vrms	12,000V	PCB Grid 2.54mm 	UL, CSA, VDE, TÜV
Single side stable: 300mW **1 coil latching:** 150mW **2 coil latching:** 300mW	1000Vrms	2000Vrms	3000Vrms	5,000V	PCB Grid 2.54mm  1a  1a1b, 2a	TÜV, UL, CSA, SEV
Single side stable: 200mW **2 coil latching:** 200mW	1000Vrms	4000Vrms	4000Vrms	10,000V	PCB Grid 2.54mm  1a  1a1b, 2a	VDE, TÜV, UL, CSA, SEV
Single side stable: 200mW **2 coil latching:** 200mW	1000Vrms	4000Vrms	4000Vrms	10,000V	PCB Grid 2.54mm  Single side stable 1a1b  2 coil latching	TÜV, UL, CSA
Single side stable: 250mW **1 coil latching:** 150mW **2 coil latching:** 250mW	1000Vrms	-	4000Vrms	10,000V	PCB Grid 2.54mm  Single side stable, 1 coil latching (1c)  2 coil latching (1c)	VDE, TÜV, UL, CSA, SEV
1 coil latching: 500mW **2 coil latching:** 1000mW	1500Vrms	-	4000Vrms	10,000V	PCB Grid 2.54mm  1 coil latching  2 coil latching	UL, CSA

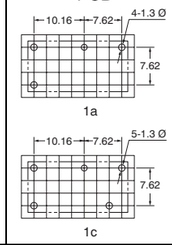
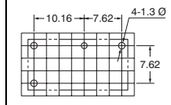
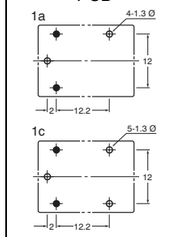
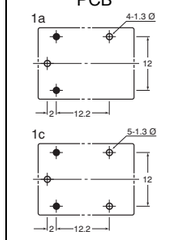
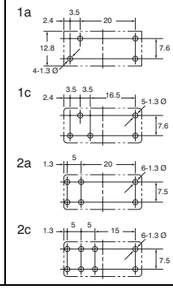
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
S 1:2  28 x 12 x 10.4mm	• High sensitivity • High vibration and shock resistance • Low thermal electromotive force (approx. 3μV) • RoHS compliant	**Max.:** 4A **Min.:** 100μA 	• 200V DC • 250V AC	2a2b, 3a1b, 4a	(DC) 3, 5, 6, 12, 24, 48V
ST 1:2  31 x 14 x 11.3mm	• High capacity in small size • High inrush capability • RoHS compliant	**Max.:** 8A **Min.:** 1mA 	• 250V DC • 400V AC	1a1b, 2a	(DC) 3, 5, 6, 9, 12, 24, 48V
SP 1:2  2c: 50 x 25.6 x 22mm 4c: 50 x 36.8 x 22mm	• High sensitivity • High vibration and shock resistance • Wide switching range • RoHS compliant	**Max.:** 15A 	• 110V DC • 250V AC	2c, 4c	(DC) 3, 5, 6, 12, 24, 48V
EP 1:8 mm  62.4 x 37.9 x 31.3 66.8 x 37.9 x 45 79.9 x 38 x 71 75.5 x 40 x 79 111 x 63 x 74.7	• Small size & light weight • No arc space required • Safety construction • Low operating noise • High contact reliability • RoHS compliant	**Max.:** 10A  60A  80A  300A 	• 400V DC	1a	(DC) 12, 24, 48, 100V

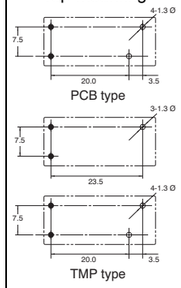
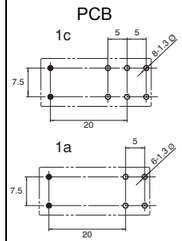
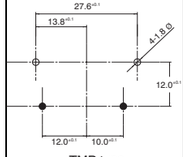
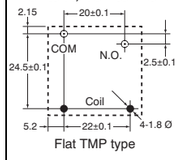
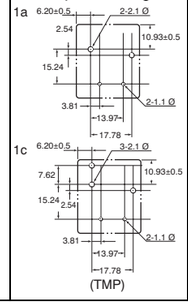
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
Single side stable: ~200mW (3V - 24V DC) 271mW (48V DC) **1 coil latching:** ~100mW (3V - 24V DC) 144mW (48V DC) **2 coil latching:** ~200mW	750Vrms	1000Vrms	1500Vrms	-	PCB Grid 2.54mm 	UL, CSA
Single side stable: 240mW **1 coil latching:** 130mW **2 coil latching:** 240mW	1200Vrms	2000Vrms	3750Vrms	6,000V	PCB Grid 2.54mm  (Single side stable)	UL, CSA, SEV, VDE, TV rating
Single side stable: 300mW **2 coil latching:** 300mW	1500Vrms	3000Vrms	3000Vrms	-	PCB, Plug-in Grid 2.54mm  2c  4c	UL, CSA, TÜV
Max.: 1.4W (10A) 5W (60A) 4.5W (80A) 4 - 40W (300A)	2500Vrms	-	2500Vrms	-	PCB 10A PC board type  10A TM type  60A type  80A type  300A type 	-

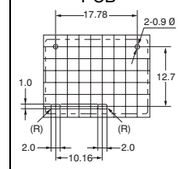
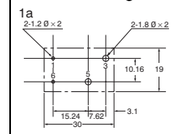
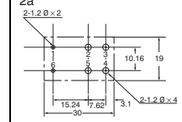
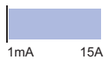
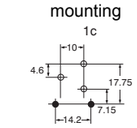
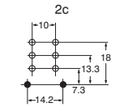
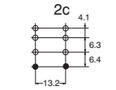
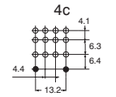
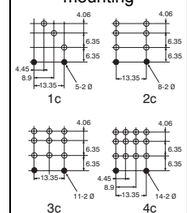
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
★**LD** 1:2  20.3 x 7 x 15mm	• Slim type: width 7mm • RoHS compliant	**Max.:** 3A 	• 30V DC • 277V AC	1a	(DC) 4.5, 5, 6, 9, 12, 18, 24V
PA 1:2  20 x 5 x 12.5mm	• Slim size permits higher density mounting • Wide switching capacity • High surge voltage 4,000V • High breakdown voltage 2,000V • RoHS compliant	**Max.:** 5A 	• 110V DC • 250V AC	1a	(DC) 5, 6, 9, 12, 18, 24V
★**PE** 1:2  28 x 5 x 15mm	• Slim size permits higher density mounting • Wide switching capacity • High surge voltage 6,000V • High breakdown voltage 4,000V • Creepage & clearance distance > 8mm	**Max.:** 6A 	• 300V DC • 400V AC	1a, 1b, 1c	(DC) 4.5, 5, 6, 12, 18, 24, 48, 60V
LK 1:2  24 x 11 x 25mm	• High inrush current capability • High insulation resistance between contact and coil • RoHS compliant	**Max.:** 5A 	• 30V DC • 277V AC	1a	(DC) 5, 9, 12, 24V
LK-P 1:2  24 x 11 x 25mm	• High switching capacity • High insulation • High inrush current capability • UL/CSA TV-5 rating • RoHS compliant	**Max.:** 10A 	• 30V DC • 277V AC	1a	(DC) 12, 24V
LK-S 1:2  24 x 11 x 25mm	• High sensitivity 250mV • High inrush current capability • High insulation resistance between contact and coil • RoHS compliant	**Max.:** 5A 	• 30V DC • 277V AC	1a	(DC) 5, 9, 12, 24V
LA 1:2  24 x 12 x 25mm	• Slim type: 2 Form A • High insulation resistance between contact and coil • RoHS compliant	**Standard:** **Max.:** 3A (3A rated)  **Power type:** **Max.:** 5A (5A, TV-4 rated) 	• 30V DC • 277V AC	2a	(DC) 12, 24V

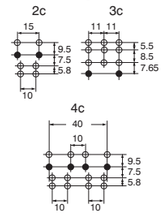
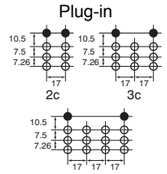
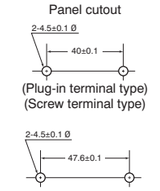
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
200mW	750Vrms	-	4000Vrms	10,000V	PCB	TÜV, UL, CSA, VDE
120mW (5 - 18V) 180mW (24V)	1000Vrms	-	2000Vrms	4,000V	PCB Grid 2.54mm 	TÜV, UL, CSA
170mW (5 - 24V) 217mW (48V) 175mW (60V)	1000Vrms	-	4000Vrms	6,000V	PCB 	UL, CSA, VDE
530mW	1000Vrms	-	4000Vrms	10,000V	PCB 	UL, CSA, TÜV, SEV, SEMKO, VDE, TV rating
530mW	1000Vrms	-	4000Vrms	10,000V	PCB 	UL, CSA, TÜV, SEV, SEMKO, VDE, TV rating
250mW	1000Vrms	-	4000Vrms	10,000V	PCB 	UL, CSA, TÜV, SEV, SEMKO, VDE, TV rating
530mW	1000Vrms	1000Vrms	4000Vrms	10,000V	PCB 	TÜV, UL, CSA, SEV, SEMKO

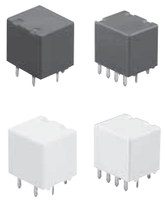
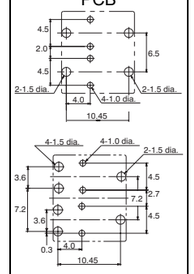
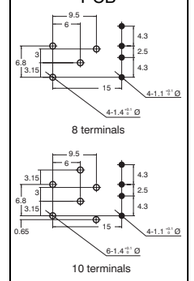
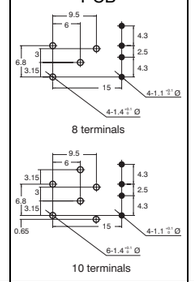
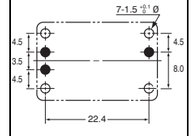
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
★**JQ** 1:2  20 x 10 x 15.6mm	• High electrical noise immunity • High switching capacity • High surge voltage 8,000V • RoHS compliant	**Standard:** **Max.:** 5A  **Power type:** **Max.:** 10A 	• 110V DC • 277V AC	1a, 1c	(DC) 3, 5, 6, 9, 12,18, 24, 48V
PQ 1:2  20 x 10 x 15.6mm	• High electrical noise immunity • High sensitivity 200mW • High surge voltage 8,000V • RoHS compliant	**Max.:** 5A 	• 110V DC • 250V AC	1a	(DC) 3, 5, 6, 9, 12, 18, 24V
★**JS** 1:2  22 x 16 x 16mm	• Ultra-miniature size with universal terminal footprint • High switching capacity 10A • RoHS compliant	**Max.:** 10A 	• 100V DC • 277V AC	1a, 1c	(DC) 5, 6, 9, 12, 18, 24, 48V
★**LS** 1:2  19.5 x 15.5 x 14.8mm	• 10A compact cube power relay • Universal footprint RoHS and EN 60335/4 compliant	**Max.:** 10A 	• 277V AC	1a, 1c	(DC) 5, 6, 9, 12, 18, 24, 48V
★**JW** 1:2  28.6 x 12.8 x 20mm	• High dielectric withstanding for transient protection • Class B coil insulation types available • RoHS compliant	**Standard:** **Max.:** 5A (2a, 2c)  **High capacity:** **Max.:** 10A (1a, 1c) 	• 100V DC • 440V AC	1a, 1c, 2a, 2c	(DC) 5, 6, 9, 12, 18, 24, 48V

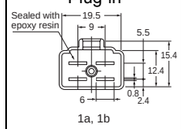
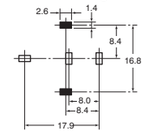
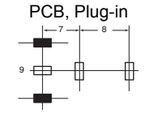
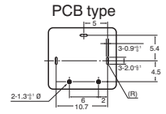
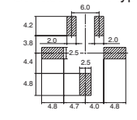
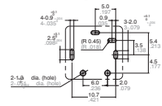
Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
200mW (1a) 400mW (1c)	1000Vrms (1a) 750Vrms (1c)	-	4000Vrms	8,000V	PCB 	UL, CSA, TÜV, VDE, SEMKO
200mW	1000Vrms	-	4000Vrms	8,000V	PCB 	UL, CSA, TÜV, SEV, SEMKO, VDE
360mW	750Vrms	-	1500Vrms	-	PCB 	TÜV, VDE, UL, CSA, complies with TV5
360mW	750Vrms	-	1500Vrms	-	PCB 	UL, C-UL, VDE
530mW	1000Vrms	3000Vrms (2a, 2c)	5000Vrms	10,000V	PCB 	TÜV, VDE, UL, CSA, SEV, complies with TV5, SEMKO

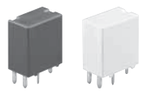
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
★LE 1:2  28.6 x 12.4 x 24.9mm	• Ideal for magnetron and heater loads • Excellent heat resistance • High sensitive version available • RoHS compliant	**Max.:** 16A 16A	• 277/400V AC	1a	(DC) 5, 6, 9, 12, 18, 24, 48V	**Standard:** 400mW **High sensitivity:** 200mW	1000Vrms	-	4000Vrms	10,000V	PCB, Top-mounting  PCB type TMP type	TÜV, UL, CSA, VDE
★LZ 1:2  28.8 x 12.5 x 15.7mm	• Low profile relay (15.7mm) • Low operating power (400mV) • High temperature resistant (105°C) • RoHS compliant	**Max.:** 16A 16A	• 250V DC • 440V AC	1a, 1c	(DC) 5, 9, 12, 18, 24, 48V	400mW	1000Vrms	-	5000Vrms	10,000V	PCB 	VDE, UL, CSA
★LF 1:2  30.1 x 15.7 x 23.3mm	• Ideal for compressor and inverter loads • High insulation resistance • RoHS compliant	**Max.:** 25A 25A	• 250V AC	1a	(DC) 5, 6, 9, 12, 18, 24V	900mW	1000Vrms	-	5000Vrms	10,000V	PCB, Top-mounting  TMP type	UL, CSA, TÜV, VDE, SEMKO
JM 1:2  Slim: 30.4 x 16 x 26.5mm Flat: 31 x 28.5 x 17.2mm	• Super welding resistance • High surge resistance • Compact high capacity relay for inductive load • RoHS compliant	**Max.:** 20A 20A	• 100V DC • 250V AC	1a	(DC) 5, 6, 9, 12, 24, 48V	900mW	1000Vrms	-	5000Vrms	10,000V	PCB, Top mount contact, coil to PCB  Flat TMP type	TÜV, UL, CSA, VDE
JT-V 1:2  PCB: 31.9 x 26.9 x 20.2mm TMP: 32.2 x 27.4 x 27.9mm	• Surge withstand voltage: Min. 6kV • High switching capacity • 2 contact arrangements • Class F type as standard • RoHS compliant	**Max.:** 30A 30A	• 30V DC • 277V AC	1a, 1c	(DC) 12, 18, 24, 48V	1000mW	-	1200Vrms	3500Vrms	6,000V	PCB Top-mounting  (TMP)	UL, C-UL

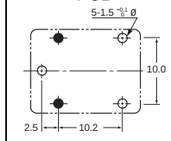
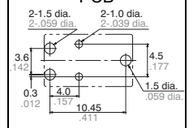
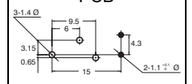
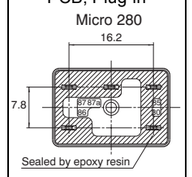
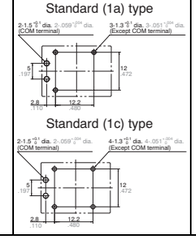
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
JV-N 1:2  22 x 16 x 10.9mm	• Compact, flat type with low 10.9mm profile • RoHS compliant	**Max.:** 16A 	• 110V DC • 277V AC	1a	(DC) 4.5, 6, 9, 12, 24, 48, 100V	(DC) 200mW (4.5V - 48V) (DC) 600mW (100V)	1000Vrms	-	2500Vrms	4,500V	PCB 	UL, CSA, TÜV
JC 1:2  30 x 19 x 30.4mm	• Class B coil type available • TV-rated type available • High dielectric withstanding 10,000V surge • Special type with blow-out magnet for high DC loads available • RoHS compliant	**Max.:** 15A 	• 250V AC **Blow-out magnet type:** • 250V DC	1a, 2a	(DC) 5, 6, 12, 24, 48V	900mW (1a) 1000mW (2a)	2000Vrms	2000Vrms (2a)	4000Vrms	10,000V	PCB, Plug-in, Top-mounting 1a  2a 	UL, VDE, SEV, SEMKO CSA, complies with TV5
HL 1:2  27.2 x 20.8 x 35.4mm	• Large capacity • Compact size • Footprint compatible with competitive types • RoHS compliant	**Max.:** 15A **Min.:** 1mA 	• 30V DC • 250V AC	1c, 2c	(DC) 6, 12, 24, 48, 110V (AC) 6, 12, 24, 48, 120, 240V	(DC) 900 - 1000mW (AC) 1.2 - 1.3VA	1000Vrms	1500Vrms	2000Vrms	-	PCB, Plug-in, Top-mounting 1c  2c 	UL, CSA, complies with TV5
HJ 1:2  28 x 21.5 x 35/38mm	• 2 contact arrangements same footprint as our popular HC relay • Coil breakdown detection-function (AC type with LED only) • Convenient Screw terminal sockets with finger protection also available • Test button type available • RoHS compliant	**Max.:** 7A 	• 30V DC • 250V AC	2c, 4c	(DC) 12, 24, 48, 110V (AC) 12, 24, 48, 100, 120, 200, 220/240V	(DC) 900 mW (AC) 1.2 - 1.5VA	1000Vrms	2000Vrms	2000Vrms	-	Plug-in 2c  4c 	VDE, UL, CSA, SEV, TV rating
HC 1:2  27.2 x 20.8 x 35.2mm	• Wide applications • Versatile range • Foot print compatible with competitive types • RoHS compliant	**Max.:** 10A **Min.:** 1mA 	• 30V DC • 250V AC	1c, 2c, 3c, 4c	(DC) 6, 12, 24, 48, 110V (AC) 6, 12, 24, 48,120, 240V	(DC) 900mW (AC) 1.2VA	700Vrms	700Vrms	2000Vrms	-	PCB, Plug-in, Top-mounting 	VDE, UL, CSA, SEV, TV rating

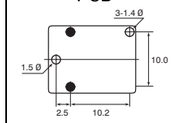
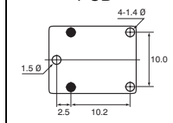
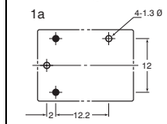
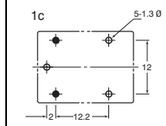
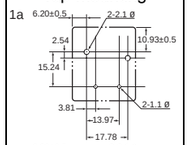
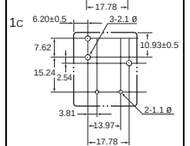
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
HN 1:2  29 x 13 x 28mm	• Slim and compact size • High reliability • RoHS compliant	**Max.:** 5A 	• 30V DC • 250V AC	1c, 2c	(DC) 5, 6, 12, 24, 48V (AC) 100, 120, 240V	(DC) 530mW (AC) 0.9VA	1000Vrms	3000Vrms	5000Vrms	-	Plug-in, Screw terminal -	UL, C-UL, (VDE)
HP 1:2  36 x 25 x 44.5mm	• High reliability • RoHS compliant	**Max.:** 10A 	• 125V DC • 250V AC	2c, 3c, 4c	(DC) 6, 12, 24, 48, 110V (AC) 6, 12, 24, 48, 115, 220, 240V	**2c:** (DC): ~1500mW (AC): ~2.0VA **3c:** (DC): ~1500mW (AC): ~3.1VA **4c:** (DC): ~1500mW (AC): ~4.8VA	2000Vrms	2000Vrms	2000Vrms	-	Plug-in 	VDE, UL, CSA, SEV
HG 1:3  2c: 44 x 36 x 56mm 3c: 36 x 36 x 56mm 4c: 68 x 36 x 56mm	• High capacity 20A • RoHS compliant	**Max.:** 20A 	• 125V DC • 250V AC	2c, 3c, 4c	(DC) 6, 12, 24, 48, 110V (AC) 6, 12, 24, 48, 115, 220, 240V	**2c:** (DC): ~1400mW (AC): ~3.6VA **3c:** (DC): ~1600mW (AC): ~5.2VA **4c:** (DC): ~2000mW (AC): ~7.6VA	2000Vrms	2000Vrms	2000Vrms	-	Plug-in 	UL, CSA
HE 1:3  50 x 33 x 35.8mm	• High dielectric withstanding 10,000V surge • High inrush resistance (TV-15: 1 form A) (TV-10: 2 form A) • RoHS compliant	**Max.:** 30A 	• 100V DC • 277V AC	1a, 2a	(DC) 6, 12, 24, 48, 110V (AC) 12, 24, 48,120, 240V	(DC) 1920mW (AC) 1.7 - 2.7VA	2000Vrms	4000Vrms	5000Vrms	10,000V	Top-mounting Panel cutout 	TÜV, UL, CSA, VDE, TV rating
MC 1:3  45.2 x 40 x 45.5mm	• Minicontactor for controlling motor, air-conditioning and heating loads • Energy saving • Also available in PCB version • 3mm contact opening	**Max.:** 16A 	• 440V DC • 400V AC	4a, 3a1b, 2a2b	(DC) 3, 5, 6, 12, 24, 48V (AC) 24, 42, 60,110, 125, 200, 220; 240, 380V	(DC) 500mW (AC) 1VA	2500Vrms	2500Vrms	2500Vrms	-	PCB, screw, plug-in, DIN rail -	UL, CSA

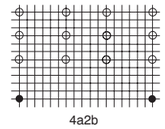
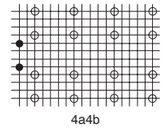
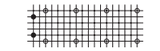
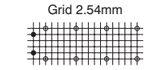
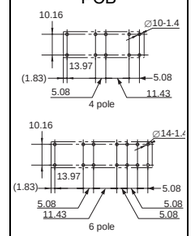
Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
Twin												
★**CJ** 1:2  8 Pin Print: 13.7 x 12.2 x 13.5mm PiP: 13.7 x 12.2 x 13.8mm 10 Pin Print: 14.4 x 12.2 x 13.5mm PiP: 14.4 x 12.2 x 13.8mm	• Super miniature size • High capacity in a compact body • Pin in Paste available • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1c, 1c x 2	(DC) 12V	**Standard:** 800mW **High sensitivity:** 640mW	500Vrms	-	500Vrms	-	PCB 	-
★**CT** 1:2  17.4 x 14 x 13.5mm	• Ultra small size • Twin (1 Form C x 2) • H-bridge type available • Pin in Paste available • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1c, 1c x 2	(DC) 12V	800mW	500Vrms	-	500Vrms	-	PCB 	-
★**CT POWER** 1:2  17.4 x 14 x 13.5mm	• Ultra small size • Twin (1 Form C x 2) • Footprint same as CT standard type • 30A switching capacity (motor load) • Silent operation • H-bridge type available • Pin in Paste available • RoHS compliant	**Max.:** 30A (N.O.) 30A 10A (N.C.) 10A	• 16V DC	1c, 1c x 2	(DC) 12V	1000mW	500Vrms	-	500Vrms	-	PCB 	-
CR 1:2  24.6 x 17 x 18.5mm	• Quiet • Twin (1 Form C x 2) • Simple footprint enable ease of PC board layout • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1c x 2	(DC) 12V	640mW	500Vrms	-	500Vrms	-	PCB 	-

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
Single												
CA 1:2  21.5 x 14.4 x 37mm	• Small size • Light weight • Completely water tight • Automotive direct plug-in • RoHS compliant	**Max.:** 20A (1a, 1.4W type) 20A 30A (1a, 1.8W type) 30A 20A (1b, 1c) 20A	• 15V DC (1c - 12V DC type) • 16V DC (1a, 1b - 12V DC type) • 30V DC (1c - 24V DC type)	1a, 1b, 1c	(DC) 12, 24V	1800mW 1400mW (type S)	500Vrms	-	500Vrms	-	Plug-in  1a, 1b	-
CB 1:2  26 x 22 x 25mm	• 40 A rating at 85°C (185°F) • ISO type terminals • High shock resistance for drop test requirements • Low temperature rise • RoHS compliant	**Max.:** 70A (N.O. H type) 70A 40A (1a, 1c N.O.) 40A 30A (1c N.C.) 30A	• 16V DC (12V DC type) • 32V DC (24V DC type)	1a, 1c	(DC) 12, 24V	1400mW (12V DC type) 1800mW (24V DC type) 1800mW (12V DC, H type)	500Vrms	-	500Vrms	-	PCB, Plug-in  (PCB standard type)	-
★**CM** 1:2  20 x 15 x 22mm	• Half the size, replaces Mini-ISO relay • Wide line-up • Micro-ISO terminal type • RoHS compliant	**Max.:** 35A (N.O.) 35A 20A (N.C.) 20A	• 16V DC (12V DC type) • 32V DC (24V DC type)	1a, 1c	(DC) 12, 24V	1500mW (12V DC type) 1800mW (24V DC type)	500Vrms	-	500Vrms	-	PCB, Plug-in 	-
★**CP** 1:2  14 x 13 x 9.5mm	• Low profile • High capacity • Simple footprint enables ease of PC board layout • 24V DC type available on request • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1a, 1c	(DC) 12V, 24V	640mW	500Vrms	-	500Vrms	-	PCB PCB type 	-
★**CP (SMD)** 1:2  14 x 13 x 9.5mm	• Low profile • High capacity • Simple footprint enables ease of PC board layout • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1c	(DC) 12V	640mW	500Vrms	-	500Vrms	-	SMT Surface mount type 	-
CP POWER 1:2  14 x 13 x 10.5mm	• Low profile • High capacity type: 45A maximum carrying current • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1a, 1c	(DC) 12V	450mW 640mW	500Vrms	-	500Vrms	-	PCB 	-

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
CQ 1:2  17 x 13 x 16.6mm	• Quiet • Less space required • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1c	(DC) 12V
★**CJ** 1:2  Print : 13.5 x 12.2 x 7.2mm PiP : 13.8 x 12.2 x 7.2mm	• Super miniature size • High capacity in a compact body • Pin in Paste available • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1c, 1c x 2	(DC) 12V
★**CT** 1:2  17.4 x 7.2 x 13.5mm	• Ultra small size • Twin (1 Form C x 2) • H-bridge type available • Pin in Paste available • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1c, 1c x 2	(DC) 12V
★**CT POWER** 1:2  17.4 x 7.2 x 13.5mm	• Ultra small size • Twin (1 Form C x 2) • Footprint same as CT standard type • 30A switching capacity (motor load) • Silent operation • H-bridge type available • Pin in Paste available • RoHS compliant	**Max.:** 30A (N.O.) 30A 10A (N.C.) 10A	• 16V DC	1c, 1c x 2	(DC) 12V
CV 1:2  22.5 x 15 x 15.7mm	• Low profile • Low temperature rise • Low sound pressure level • Wide line-up • Micro-ISO terminal type • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1a, 1c	(DC) 12V
CY 1:2  22 x 16 x 16.4mm	• 30A nominal switching capacity • H/L type (ideal for lamp loads) • RoHS compliant	**Max.:** 30A (N.O.) 30A 15A (N.C.) 15A	• 16V DC	1a, 1c, 1a (H/L type)	(DC) 12V

Coil power	Breakdown voltage			Surge withstand voltage	Mounting method (bottom view)	Approvals
	Between open contacts	Between contact sets	Contacts to coil			
640mW	500Vrms	-	500Vrms	-	PCB 	-
Standard: 800mW **High sensitivity:** 640mW	500Vrms	-	500Vrms	-	PCB 	-
800mW	500Vrms	-	500Vrms	-	PCB 	-
1000mW	500Vrms	-	500Vrms	-	PCB 	-
800mW	500Vrms	-	500Vrms	-	PCB, Plug-in Micro 280 	-
450mW 640mW	500Vrms	-	500Vrms	-	PCB Standard (1a) type 	-

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
★**JJM** 1:2  15.5 x 12 x 13.9mm	• Compact (half-size) • Perfect for automobile electrical systems • RoHS compliant	**Max.:** 20A (N.O.) 20A 10A (N.C.) 10A	• 16V DC	1a, 1c	(DC) 12V	640mW	500Vrms	-	500Vrms	-	PCB 	-
JJM-DM 1:2  15.5 x 12 x 13.9mm	• Small size • Standard terminal pitch employed • Double make contact arrangement • RoHS compliant	**Max.:** 2 x 6A 6A 6A	• 16V DC	Double make contact	(DC) 12V	1000mW	500Vrms	-	500Vrms	-	PCB 	-
JS-M 1:2  22 x 16 x 16.4mm	• Low pick-up voltage for high ambient use • RoHS compliant	**Standard:** **Max.:** 10A 10A **High capacity:** **Max.:** 15A 15A	• 16V DC	1a, 1c	(DC) 9, 12V	640mW	750Vrms	-	1500Vrms	-	PCB 1a  1c 	-
JT-N 1:2  PCB: 31.9 x 26.9 x 20.2mm TMP: 32.2 x 27.4 x 27.9mm	• High switching capacity • RoHS compliant	**Max.:** 30A (1a) 30A 20A (1c N.O.) 20A 10A (1c N.C.) 10A	• 30V DC • 277V AC	1a, 1c	(DC) 5, 6, 9, 12, 15, 18, 24V	800mW	1200Vrms	-	2500Vrms	-	PCB, Top-mounting 1a  1c  (TMP)	UL, CSA
Special Types												
EV 1:8 mm  66.8 x 49.7 x 37.9mm  82.8 x 40 x 79mm  111 x 63 x 75mm	• Small size & light weight • No arc space is required • Safety construction • Low operating noise • High contact reliability • RoHS compliant	**Max.:** 10A (1a) 10A 80A (1a) 80A 300A (1a) 300A	• 400V DC	1a	(DC) 12, 24V	**Stable:** • 4.5W (80A, 12/24V) • 4.0W (300A, 12/24V)	2500Vrms	-	2500Vrms	-	Screw terminal -	-

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage	Coil power	Breakdown voltage Between open contacts	Breakdown voltage Between contact sets	Breakdown voltage Contacts to coil	Surge withstand voltage	Mounting method (bottom view)	Approvals
SFN4D 1:3  53.3 x 33 x 14.5mm	• Polarised relay with forcibly guided contacts according to EN50205, Type B • Safety double contact • Extremely small total power loss • Relay height: 14.5mm • RoHS compliant	**Max.:** 8A **Min.:** 10mA  	• 500V DC • 500V AC	4a, 2b	(DC) 5, 9, 12, 16, 18, 21, 24, 36, 48, 60V	390mW (5 - 24V) 420mW (36 - 60V)	2500Vrms	4000Vrms	5000Vrms	-	PCB Grid 2.5mm  	UL, CSA, SEV, TÜV
SF4D 1:3  53.3 x 33 x 16.5mm	• Polarised relay with forcibly guided contacts according to EN50205, Type B • Safety double contact • RoHS compliant	**Max.:** 8A **Min.:** 10mA  	• 400V DC • 400V AC	4a, 4b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V	500mW	2500Vrms	2500Vrms	2500Vrms	-	PCB Grid 2.54mm  	UL, CSA, SEV, TÜV
SF2D 1:3  53.3 x 25 x 16.5mm	• Polarised relay with forcibly guided contacts according to EN50205, Type A • Safety double contact • RoHS compliant	**Max.:** 8A **Min.:** 10mA  	• 400V DC • 400V AC	2a, 2b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V	500mW	2500Vrms	2500Vrms	2500Vrms	-	PCB Grid 2.54mm  	UL, CSA, SEV, TÜV
SF3 1:3  53.3 x 25 x 16.5mm	• Polarised relay with forcibly guided contacts according to EN50205, Type A • RoHS compliant	**Max.:** 8A **Min.:** 10mA  	• 400V DC • 400V AC	3a, 1b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V	500mW	2500Vrms	2500Vrms	2500Vrms	-	PCB Grid 2.54mm  	UL, CSA, SEV, TÜV
SFS 1:3  40 x 13 x 24mm  50 x 13 x 24mm	• Polarised relay with forcibly guided contacts according to EN 50205, Type A • 4-pole and 6-pole type with various contact arrangements • Slim profile reduces mounting area • PC board sockets and DIN-rail terminal socket available • RoHS compliant	**Max.:** 6A **Min.:** 1mA  	• 30V DC • 250V AC	2a2b, 3a1b, 4a2b, 5a1b, 3a3b	(DC) 12, 16, 18, 21, 24, 48V	360mW (4 poles) 500mW (6 poles)	1500Vrms	2500Vrms/ 4000Vrms	4000Vrms	-	PCB  	UL, CSA, TÜV

Panasonic Electric Works offers a wide range of PhotoMOS relays for use in telecommunication, measurement, security devices and industrial control. Obviously, the PhotoMOS relay differs from the conventional electromechanical relay, but it also distinguishes itself from other switching solutions that utilize optocouplers or semiconductors.

The construction of the PhotoMOS relay is illustrated in Figure 1. The input pins are connected to a light emitting diode. This LED is located on the upper part of the relay and as soon as a current flows through it, it starts emitting infrared light. Below the LED, there is an array of solar cells intergrated into an optoelectronic device, thus switching the output transistors.

The light emitter and detector are moulded in translucent resin that allows light to pass through but provides a dielectric barrier between the input and output side. By integrating an internal circuit in the optoelectronic device, it serves as a control circuit for switching the power MOSFETs and therefore the load circuit in an ON of OFF-state.

A single power MOSFET is only capable of switching a DC voltage since its internal source-drain diode will become forward biased if the load polarity is reversed. Using a PhotoMOS relay for switching AC voltages therefore requires two source-coupled power MOSFETs in one PhotoMOS relay. By connecting the two output transistors of an AC relay in parallel, the allowable DC current can also be increased (A,B or C connection, see Figure 3 and 4).

Basically, the power MOSFET's output acts as a pure ohmic resistance thus distinguishing the PhotoMOS from an optocoupler or triac solution, since no saturation voltage or offset voltage is required. However the aforementioned source-drain diode of the MOSFET may influence the linearity of the output, and the output capacitance may limit the usability for higher frequencies. This strongly depends on the type of PhotoMOS relay used and on the application's requirements. Due to Panasonic Electric Works' broad product range, we are able to offer PhotoMOS relays for numerous applications, enabling you to utilize PhotoMOS' advantages:

- Low control current
- Control of small analog signals
- Low leakage current
- Fast switching speed
- Stable ON-resistance over lifetime
- Extremely long product life
- Small size
- Flexible mounting position
- High vibration and shock resistance
- No contact bouncing
- No switching noise

Due to the enormous variety of PhotoMOS relays, they are suitable for numerous applications. They can be used in telecommunications and for measurement equipment, for switching and controlling small motors or other power loads, and for controlling various signals out of microcontrollers.

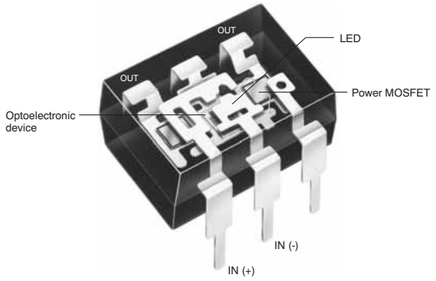


Figure 1: PhotoMOS internal construction

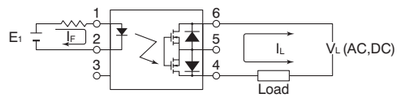


Figure 3: PhotoMOS in A connection

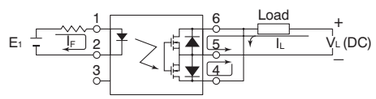


Figure 4: PhotoMOS in C connection

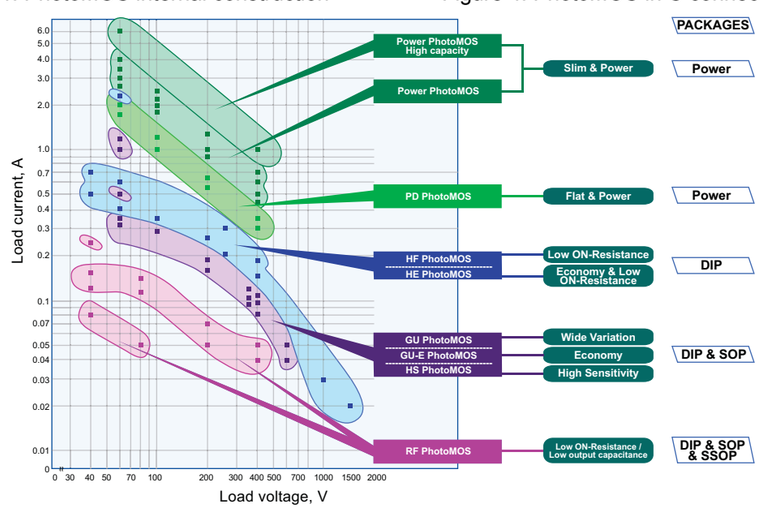
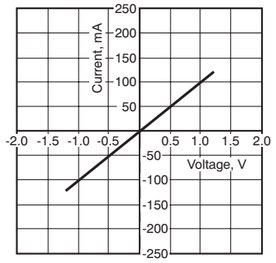


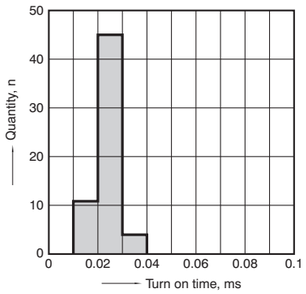
Figure 2: PhotoMOS load current vs. voltage - Selector Chart

Examples of PhotoMOS Advantages

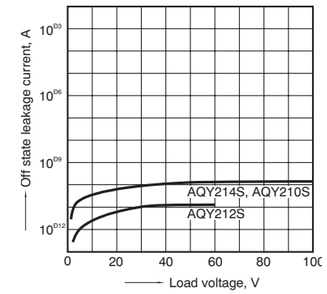
1. High output linearity without any saturation or offset voltage making PhotoMOS perfectly suitable for switching signals or loads (AQY225R2V).



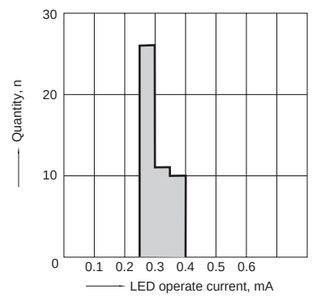
2. Fast switching times with stable behavior over lifetime and no contact bouncing due to semiconductor technology (AQY221N3V).



3. Perfectly suited for switching low level signals due to low off-state leakage current in the range of pA to nA (AQY21*S).



4. PhotoMOS relays require very low input control currents. Sensitive types are also available (AQV234). Take temperature and safety considerations into account.



Product Key

AQ V 2 5 2 G _ _ A X

Type
S : 4 channels SOP16
V : 1 channel DIP6, SOP6
W : 2 channels DIP8, SOP8
Y : 1 channel, DIP4, SOP4, SSOP
Z : 1 channel SIL

Contact Type
1 : 1 NO (DC)
2 : 1 NO (AC/DC)
2 NO (AC/DC)
4 : 1 NC (AC/DC)
2 NC (AC/DC)
6 : 1 NO, 1 NC (AC/DC)

NO = normally open contact
NC = normally closed contact

Usage
0 : HF type small volume resistance
1 : GU type general usage GE type economical
2 : RF type high frequency
3 : HS type highly sensitive
5 : HE type economical HF type small volume resistance
6 : Hybrid type
7 : Power DIP type

Load Voltage
0 : 350V
1 : 30V ~ 40V
2 : 60V
3 : 250V
4 : 400V
5 : 80V ~ 100V
6 : 600V
7 : 200V
8 : 1500V
9 : 1000V

Type
free : standard
E : economy
G : high capacity
N : Low CxR
R : Low CxR

I/O Electric Strength
free : 1500Vrms
H : 5000Vrms
Power PhotoMOS: 2500Vrms

Optional Function
free : standard type
L : current limiting
K : short circuit protected

Connection
free : Through hole terminal (DIL)
A : Surface mount terminal (SMD)
S : Small outline package (SOP)
V : Shrink small outline package (SSOP)

Packaging
free : tube packaging
X/W : packaging on continuous tapes
Z/Y : packaging on continuous tapes

Not all combinations are available

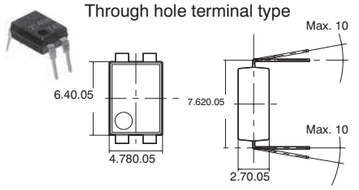
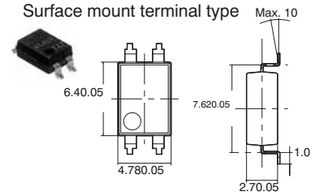
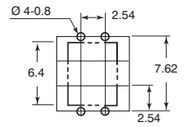
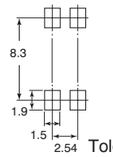
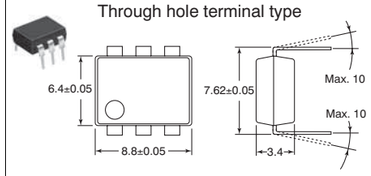
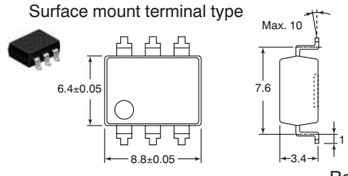
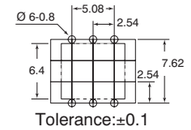
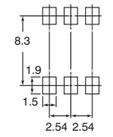
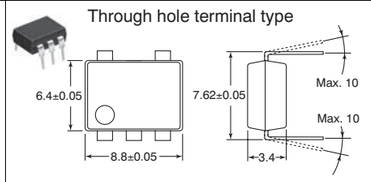
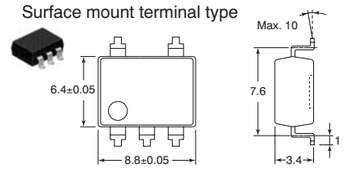
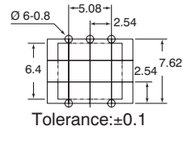
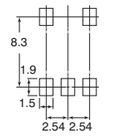
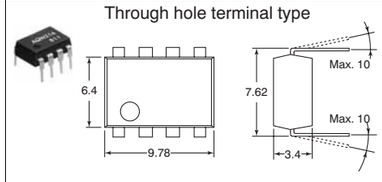
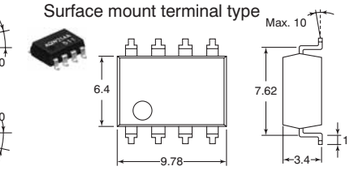
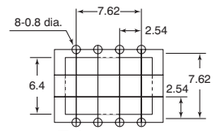
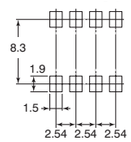
PhotoMOS Relays: ★ Popular Type Selection Table

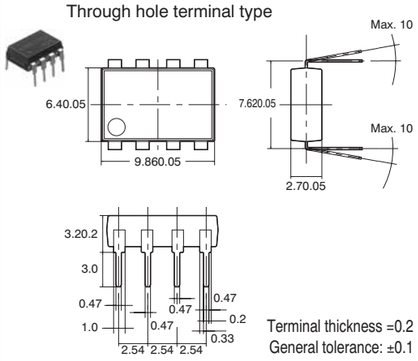
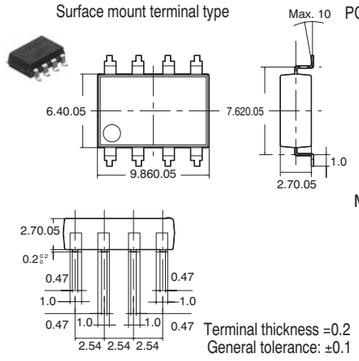
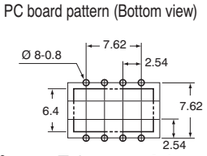
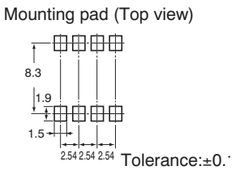
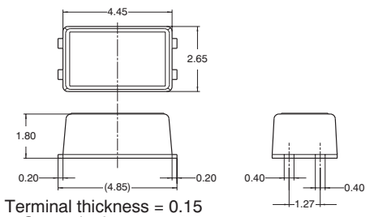
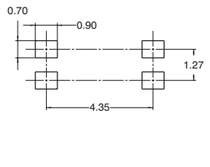
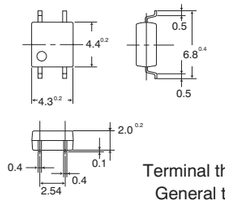
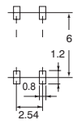
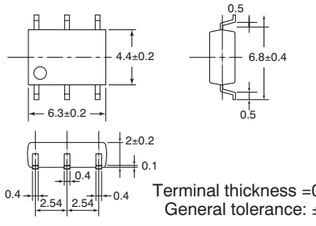
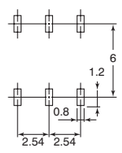
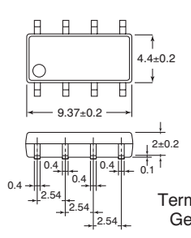
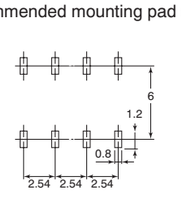
Product family	Type[1)]	Package	Contact arrangement[2)]	Peak load V	Continous load current	ON-resistance (typical)
GU-E PhotoMOS General use 	AQY211EH (A)	DIP4	1a	30V	1,0A	0,25Ω
	AQY212EH (A)	DIP4		60V	0,55A	0,85Ω
	AQY210EH (A)	DIP4		350V	0,13A	18Ω
	AQV210EH (A)	DIP6		350V	0,13A	23Ω
	AQY214EH (A)	DIP4		400V	0,12A	26Ω
	AQV214EH (A)	DIP6		400V	0,12A	30Ω
	AQY216EH (A)	DIP4		600V	0,05A	52Ω
	AQV410EH (A)	DIP6	1b	350V	0,13A	18Ω
	AQW610EH (A)	DIP8	1a1b	350V	0,12A	18Ω
	AQW614EH (A)	DIP8		400V	0,1A	26Ω
	AQW212EH (A)	DIP8	2a	60V	0,5A	0,83Ω
	AQW210EH (A)	DIP8		350V	0,12A	18Ω
	AQW214EH (A)	DIP8		400V	0,1A	26Ω
	AQW216EH (A)	DIP8		600V	0,04A	52Ω
	AQW414EH (A)	DIP8	2b	400V	0,1A	26Ω
GU PhotoMOS General use 	AQY212S	SOP4	1a	60V	0,5A	0,83Ω
	AQY212GS	SOP4		60V	1,0A	0,34Ω
	AQV212S	SOP6		60V	0,5A	0,83Ω
	AQY210S	SOP4		350V	0,12A	17Ω
	AQY214S	SOP4		400V	0,1A	25Ω
	AQY410S	SOP4	1b	350V	0,12A	18Ω
	AQW610S	SOP8	1a1b	350V	0,1A	18Ω
	AQW210S	SOP8	2a	350V	0,1A	16Ω
	AQW214S	SOP8		400V	0,08A	30Ω
Short-circuit protected PhotoMOS 	AQV112KL	DIL6	1a	60V	0,5A	0,55Ω
	AQY210KS	SOP4		350V	0,12A	23,5Ω
Power PhotoMOS (High capacity type) 	AQZ102	SIL	1a	60V	4,0A	0,05Ω
	AQZ202	SIL		60V	3,0A	0,11Ω
	AQZ205	SIL		100V	2,0A	0,23Ω
	AQZ204	SIL		400V	0,5A	2,1Ω
RF PhotoMOS Low CxR 	AQY221N3V	SSOP	1a	25V	0,15A	5,5Ω
	AQY221N2V	SSOP		40V	0,25A	9,5Ω
	AQY221N1S	SOP4		40V	0,12A	9,8Ω
	AQY221R2V	SSOP		40V	0,25A	0,75Ω
	AQY221N2S	SOP4		40V	0,12A	9,5Ω
	AQY221R2S	SOP4		40V	0,25A	0,8Ω

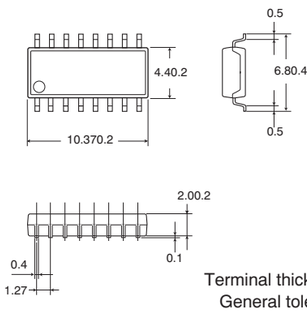
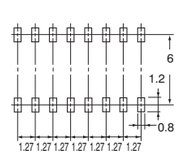
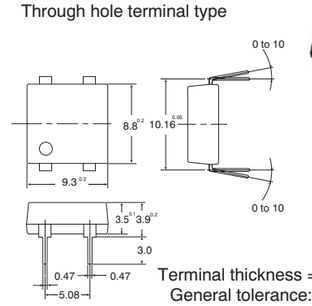
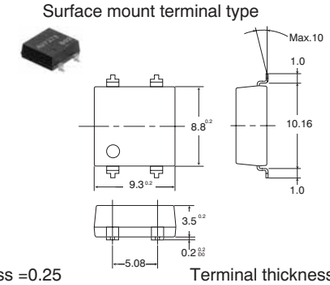
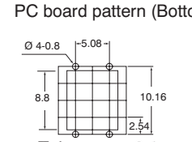
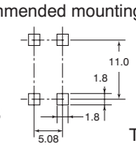
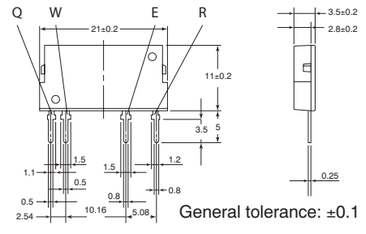
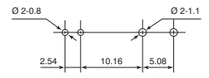
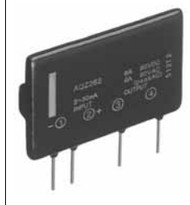
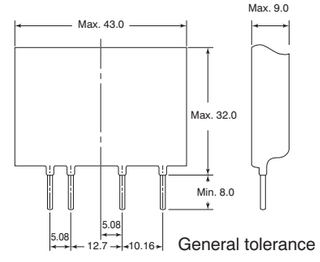
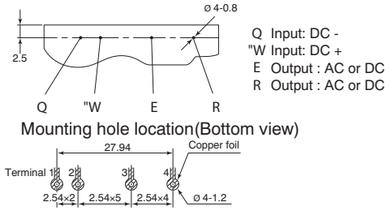
[1)]A = SMD type

[2)]The contact arrangements within each category are differentiated by colour.

PhotoMOS Relay Dimensions

Type	Dimensions
AQY21 AQY41 Series	Through hole terminal type  Surface mount terminal type  PC board pattern (Bottom view)  Mounting pad (Top view) 
AQV10 AQV11 AQV20 AQV21 AQV22 AQV23 AQV25 AQV41 AQV45 Series	Through hole terminal type  Surface mount terminal type  PC board pattern (Bottom view)  Recommended mounting pad (Top view) 
APV1122 Series	Through hole terminal type  Surface mount terminal type  PC board pattern (Bottom view)  Recommended mounting pad (Top view) 
AQW21 AQW22 AQW25 AQW41 AQW45 AQW61 AQW65 Series	Through hole terminal type  Surface mount terminal type  PC board pattern (Bottom view)  Recommended mounting pad (Top view) 

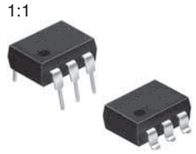
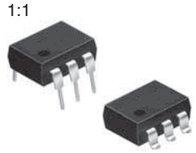
Type	Dimensions
AQW21❍EH AQW21❍HL AQW41❍EH AQW61❍EH Series	Through hole terminal type  Terminal thickness =0.2 General tolerance: ±0.1 Surface mount terminal type  Terminal thickness =0.2 General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance:±0.1 Mounting pad (Top view)  Tolerance:±0.
APV21 (SSOP) AQY22 (SSOP) Series	  Terminal thickness = 0.15 General tolerance: ±0.5 Recommended mounting pad (Top view)  Tolerance: ±0.1
APV21(SOP) APV11(SOP) AQY21(SOP) AQY22(SOP) AQY41(SOP) Series	  Terminal thickness =0.15 General tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance: ±0.1
AQV21(SOP) AQV22(SOP) AQV41(SOP) Series	  Terminal thickness =0.15 General tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance: ±0.1
AQW21(SOP) AQW61(SOP) Series	  Terminal thickness =0.15 General tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance: ±0.1

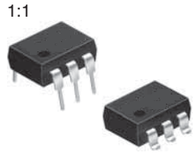
Type	Dimensions
AQS22(SOP) Series	  Terminal thickness = 0.15 General tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance:±0.1
AQY27 Series	 Through hole terminal type  Terminal thickness =0.25 General tolerance: ±0.1 Surface mount terminal type  Terminal thickness =0.25 General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance: ±0.1 Recommended mounting pad (Top view)  Tolerance: ±0.1
AQZ10 AQZ20 AQZ40 Series	  General tolerance: ±0.1 PC board pattern (Bottom view)  Tolerance: ±0.1 AC/DC type Q Input: DC - W Input: DC+ E Output: DC or AC R Output: DC or AC DC type Q Input: DC - W Input: DC+ E Output: DC - R Output: DC+
AQZ26 Series	  General tolerance 0.5  Q Input: DC - "W Input: DC + E Output : AC or DC R Output : AC or DC Mounting hole location(Bottom view) Pitch tolerance: 0.1

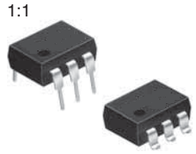
For standard housings and dimensions, see page 47.

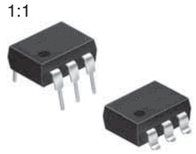
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
★**AQY212GS**	1:1  4.3 x 4.4 x 2.1mm	High capacity type	60V	• 1.0A / 3.0A 1A	0.34/0.7Ω	220pF	3.0mA	0.3mA	5.0ms	0.5ms	1,500V AC	UL, C-UL, TÜV, VDE
AQY212G2S		High capacity type	60V	• 1.25A / 3.0A 1.25A	0.2/0.5Ω	220pF	3.0mA	0.3mA	5.0ms	0.5ms	1,500V AC	-
★**AQY212S**			60V	• 0.5A / 1.0A 0.5A	0.83/2.5Ω	80pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, C-UL, BSI, CSA, TÜV
AQY210LS		Current limiting	350V	• 0.12A / - 0.18A (Output limit current [typ.]) 0.12A	20/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	1,500V AC	UL, C-UL, BSI, CSA, TÜV
★**AQY210S**			350V	• 0.12A / 0.3A 0.12A	17/25Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, BSI, CSA, TÜV
★**AQY210KS**		Short circuit protected	350V	• 0.12A / - 0.2A (Cut off current [typ.]) 0.12A	23.5/35Ω	42pF	3.0mA	0.3mA	2.0ms	1.0ms	1,500V AC	UL, C-UL, BSI, CSA, TÜV
★**AQY214S**			400V	• 0.1A / 0.24A 0.1A	25/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, BSI, CSA, TÜV

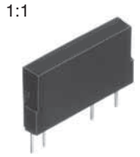
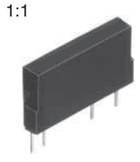
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
★**AQY211EH**	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm		30V	• 1.0A / 3.0A 	0.25/0.5Ω	240pF	3.0mA	0.4mA	5.0ms	1.0ms	5,000V AC	UL, C-UL, CSA, TÜV, BSI, VDE
★**AQY212EH**			60V	• 0.55A / 1.5A 	0.85/2.5Ω	80pF	3.0mA	0.4mA	4.0ms	1.0ms	5,000V AC	UL, C-UL, BSI, CSA, TÜV
★**AQY212GH**		High capacity type	60V	• 1.1A / 3.0A 	0.34/0.7Ω	220pF	3.0mA	0.3mA	5.0ms	0.5ms	5,000V AC	UL, C-UL, VDE
★**AQY214EH**			400V	• 0.12A / 0.3A 	26/35Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, C-UL, CSA, TÜV, BSI, VDE
★**AQY210EH**			350V	• 0.13A / 0.4A 	18/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, C-UL, CSA, TÜV, BSI, VDE
AQY210HL		Current limiting	350V	• 0.12A / - 0.18A (Output limit current [typ.]) 	20/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, BSI, C-UL, CSA, TÜV
★**AQY216EH**	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm		600V	• 0.05A / 0.15A 	52/120Ω	35pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, C-UL, CSA, TÜV, BSI, VDE

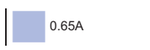
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
★**AQV212S**	1:1  6.3 x 4.4 x 2.1mm		60V	• 0.5A / 1.0A 0.5A	0.83/2.5Ω	150pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV215S			100V	• 0.3A / 0.9A 0.3A	2.3/4.0Ω	110pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV217S			200V	• 0.16A / 0.48A 0.16A	11/15Ω	70pF	3.0mA	0.4mA	1.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV210S			350V	• 0.12A / 0.3A 0.12A	23/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV214S			400V	• 0.1A / 0.3A 0.1A	30/50Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV216S			600V	• 0.04A / 0.12A 0.04A	70/120Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
★**AQV212**	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		60V	• 0.55A / 1.2A 0.55A	0.83/2.5Ω	80pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
★**AQV252G**		High capacity type	60V	• 2.5A / 6.0A 2.5A	0.08/0.12Ω	240pF	3.0mA	0.2mA	5.0ms	0.5ms	1,500V AC	UL, C-UL, CSA, TÜV, VDE
AQV255GS	1:1  6.3 x 4.4 x 2.0mm	High capacity type	80V	• 1.25A / 2.5A 1.25A	0.09/0.15Ω	300pF	3.0mA	0.2mA	5.0ms	0.5ms	1,500V AC	-
AQV215	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		100V	• 0.32A / 0.96A 0.32A	2.3/4.0Ω	110pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV217			200V	• 0.18A / 0.54A 0.18A	11/15Ω	70pF	3.0mA	0.4mA	1.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV210			350V	• 0.13A / 0.4A 0.13A	23/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
AQV210E	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		350V	• 0.13A / 0.4A 0.13A	23/35Ω	45pF	3.0mA	1.0mA	2.0ms	1.0ms	1,500V AC	UL, C-UL, CSA, TÜV
★**AQV210EH**			350V	• 0.13A / 0.4A 0.13A	23/35Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	1,500V AC	UL, C-UL, CSA, TÜV, BSI, VDE
AQV214			400V	• 0.12A / 0.3A 0.12A	30/50Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV214E			400V	• 0.12A / 0.3A 0.12A	30/50Ω	45pF	3.0mA	0.3mA	2.0ms	1.0ms	1,500V AC	UL, C-UL, CSA, TÜV
★**AQV214EH**			400V	• 0.12A / 0.3A 0.12A	30/50Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, C-UL, CSA, TÜV, BSI, VDE
AQV214H			400V	• 0.12A / 0.3A 0.12A	30/50Ω	45pF	3.0mA	0.4mA	0.8ms	0.2ms	5,000V AC	UL, C-UL, CSA, TÜV, BSI, VDE
AQV216			600V	• 0.05A / 0.15A 0.05A	70/120Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV101			40V DC	• 0.7A / 1.8A 0.7A	0.3/0.5Ω	600pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	UL, C-UL, TÜV
AQV201			40V	• 0.5A / 1.8A 0.5A	0.6/1Ω	350pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	UL, C-UL, TÜV
AQV251			40V	• 0.5A / 1.8A 0.5A	0.6/1.0Ω	350pF	3.0mA	0.4mA	3.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV102			60V DC	• 0.6A / 1.5A 0.6A	0.37/0.7Ω	600pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	UL, C-UL, TÜV
AQV202			60V	• 0.4A / 1.5A 0.4A	0.74/1.4Ω	350pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	UL, C-UL, TÜV

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
AQV252	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		50V	• 0.4A / 1.5A 0.4A	0.74/1.4Ω	350pF	3.0mA	0.4mA	1.4ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
★**AQV112KL**		Short circuit protected	60V DC	• 0.5A / - 0.5A	0.55/2Ω	300pF	10mA	0.3mA	2.0ms	1.0ms	1,500V AC	UL, C-UL, CSA, TÜV, VDE
AQV255			100V	• 0.35A / 1.0A 0.35A	1.8/2.5Ω	350pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV257			200V	• 0.25A / 0.75A 0.25A	2.6/4.0Ω	170pF	3.0mA	0.4mA	3.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV103			250V DC	• 0.3A / 0.6A 0.3A	2.7/4Ω	300pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	UL, C-UL, TÜV
AQV203			250V	• 0.2A / 0.6A 0.2A	5.5/8Ω	170pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	UL, C-UL, TÜV
AQV253			250V	• 0.2A / 0.6A 0.2A	5.5/8.0Ω	170pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
AQV253H	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		250V	• 0.2A / 0.6A 0.2A	5.5/8Ω	170pF	3.0mA	0.4mA	4.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV BSI, VDE
AQV104			400V DC	• 0.18A / 0.5A 0.18A	6.3/8Ω	300pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	UL, C-UL, TÜV
AQV204			400V	• 0.15A / 0.5A 0.15A	12.4/16Ω	170pF	5.0mA	0.8mA	1.0ms	1.0ms	1,500V AC	UL, C-UL, TÜV
AQV234		Sensitive type	400V	• 0.12A / 0.3A 0.12A	30/50Ω	45pF	0.31mA	0.1mA	2.0ms	1.0ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV254			400V	• 0.15A / 0.5A 0.15A	12.4/16Ω	170pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
★**AQV254H**			400V	• 0.15A / 0.5A 0.15A	12.4/16Ω	170pF	3.0mA	0.4mA	3.0ms	0.2ms	5,000V AC	UL, C-UL, CSA, TÜV BSI, VDE
AQV259			1,000V	• 0.03A / 0.09A 0.03A	80/200Ω	80pF	3.0mA	0.4mA	1.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV
AQV258			1,500V	• 0.02A / 0.06A 0.03A	345/500Ω	80pF	3.0mA	0.4mA	1.0ms	0.2ms	1,500V AC	UL, C-UL, CSA, TÜV

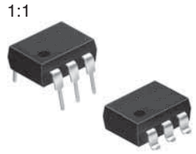
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
★**AQZ102**	1:1  21 x 3.5 x 12.5mm		60V DC	• 4.0A / 9.0A 4.0A	0.05/0.09Ω	1700pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA, TÜV
AQZ105			100V DC	• 2.6A / 6.0A 2.6A	0.081/0.17Ω	1700pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA, TÜV
AQZ107			200V DC	• 1.3A / 3.0A 1.3A	0.34/0.55Ω	900pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA, TÜV
AQZ104			400V DC	• 0.7A / 1.5A 0.7A	1.06/1.6Ω	900pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA, TÜV
★**AQZ202**			60V	• 3.0A / 9.0A 3.0A	0.11/0.18Ω	1400pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA, TÜV
AQZ262	1:1  43 x 9 x 32mm		60V	• 6.0A / 10.0A 6.0A	0.036/0.05Ω	1400pF	3.0mA	0.4mA	10.0ms	3.0ms	1,500V AC	UL, CSA
★**AQZ205**	1:1  21 x 3.5 x 12.5mm		100V	• 2.0A / 6.0A 2.0A	0.23/0.34Ω	1400pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA, TÜV
AQZ207			200V	• 1.0A / 3.0A 1.0A	07/11Ω	600pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA, TÜV
★**AQZ204**			400V	• 0.5A / 1.5A 0.5A	2.1/3.2Ω	600pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA, TÜV
AQZ264	1:1  43 x 9 x 32mm		400V	• 1.0A / 3.0A 1.0A	1.0/1.4Ω	600pF	3.0mA	0.4mA	10.0ms	3.0ms	1,500V AC	UL, CSA

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQY272	1:1  DIP : 9.3 x 8.8 x 3.9mm SMD: 9.3 x 8.8 x 3.7mm		60V	• 2.0A / 6.0A 
AQY275			100V	• 1.3A / 4.0A 
AQY277			200V	• 0.65A / 2.0A 
AQY274			400V	• 0.35A / 1.0A 

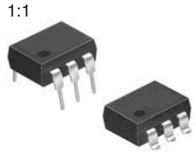
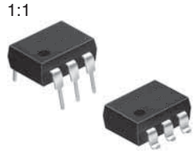
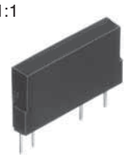
Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
0.11/0.18Ω	1400pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA
0.23/0.34Ω	1400pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA
0.7/1.1Ω	600pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA
2.1/3.2Ω	600pF	3.0mA	0.4mA	5.0ms	3.0ms	2,500V AC	UL, C-UL, CSA

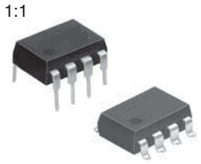
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	Operate voltage (max.)	Turn-off voltage (min.)	Turn-on time (max.)	Turn-off time (max.)		
AQZ102D	1:1  21 x 3.5 x 12.5mm	Input voltage sensitive	60V DC	• 3.6A / 9.0A 	0.033/0.09Ω	1700pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	UL, CSA, TÜV
AQZ202D		Input voltage sensitive	60V	• 2.7A / 9.0A 	0.066/0.18Ω	1400pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	UL, CSA, TÜV
AQZ105D		Input voltage sensitive	100V DC	• 2.3A / 6.0A 	0.090/ 0.17Ω	1700pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	UL, CSA, TÜV
AQZ205D		Input voltage sensitive	100V	• 1.8A / 6.0A 	0.18/0.34Ω	1400pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	UL, CSA, TÜV
AQZ107D		Input voltage sensitive	200V DC	• 1.1A / 3.0A 	0.33/0.55Ω	900pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	UL, CSA, TÜV
AQZ207D		Input voltage sensitive	200V	• 0.9A / 3.0A 	0.64/1.1Ω	600pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	UL, CSA, TÜV
AQZ104D		Input voltage sensitive	400V DC	• 0.6A / 1.5A 	1.23/1.6Ω	900pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	UL, CSA, TÜV
AQZ204D		Input voltage sensitive	400V	• 0.45A / 1.5A 	2.4/3.2Ω	600pF	4V	0.8V	10.0ms	3.0ms	2,500V AC	UL, CSA, TÜV

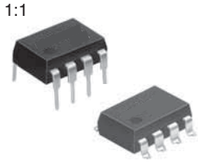
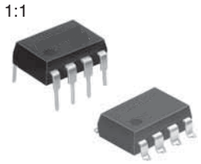
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
★**AQY221N3V**	1:1  2.65 x 4.45 x 1.8mm	Low CxR	25V	• 0.15A / 0.4A 0.15A	5.5/7.5Ω	1.pF	3.0mA	0.2mA	0.2ms	0.2ms	1,500V AC	-
★**AQY221N2V**		Low CxR	40V	• 0.12A / 0.3A 0.12A	9.5/12.5Ω	1.0pF	3.0mA	0.2mA	0.5ms	0.2ms	1,500V AC	-
★**AQY221R2V**		Low CxR	40V	• 0.25A / 0.75A 0.25A	0.75/1.25Ω	12.5pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	-
AQY225R2V		Low CxR	80V	• 0.12A / 0.3A 0.12A	10.5/15Ω	4.5pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	-
★**AQY221N1S**		Low CxR	40V	• 0.12A / 0.3A 0.12A	9.8/12.5Ω	2.0pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
★**AQY221N2S**		Low CxR	40V	• 0.12A / 0.3A 0.12A	9.5/12.5Ω	1.0pF	3.0mA	0.2mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
★**AQY221R2S**	1:1  4.3 x 4.4 x 2.1mm	Low CxR	40V	• 0.25A / 0.75A 0.25A	0.8/1.25Ω	13pF	3.0mA	0.1mA	0.5ms	0.2ms	500V AC	UL, CSA, TÜV
AQY222R1S		Low CxR	60V	• 0.5A / 1.0A 0.5A	0.8/1.2Ω	24.5pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	-
AQY225R1S		Low CxR	80V	• 0.35A / 0.7A 0.35A	0.8/1.2Ω	37.5pF	3.0mA	0.1mA	0.75ms	0.2ms	1,500V AC	-
AQY225R2S		Low CxR	80V	• 0.15A / 0.45A 0.15A	10.5/15Ω	4.5pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	-

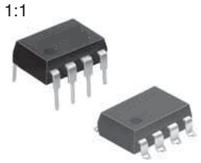
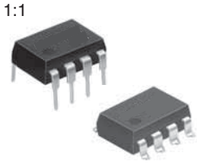
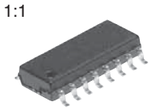
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
AQV227NS	1:1  6.3 x 4.4 x 2.1mm		200V	• 0.05A / 0.15A 0.05A	30/50Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQV224NS			400V	• 0.04A / 0.12A 0.04A	70/100Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQV221	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		40V	• 0.08A / 0.18A 0.8A	22/35Ω	5.6pF	3.0mA	0.4mA	0.3ms	0.1ms	1,500V AC	UL, CSA, TÜV
AQV221N			40V	• 0.15A / 0.45A 0.15A	9.8/15Ω	3.9pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQV225			80V	• 0.05A / 0.15A 0.05A	36/50Ω	4.8pF	3.0mA	0.4mA	0.3ms	0.1ms	1,500V AC	UL, CSA, TÜV
AQV225N			80V	• 0.15A / 0.15A 0.15A	7/10Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQV227N			200V	• 0.07A / 0.21A 0.07A	30/50Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQV224N			400V	• 0.05A / 0.15A 0.05A	70/100Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV

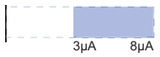
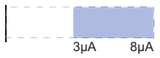
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
1 Form B Signal Relays												
AQY412S	1:1  4.3 x 4.4 x 2.1mm		60V	• 0.5A / 1.5A 0.5A	1/2.5Ω	450pF	3.0mA	0.4mA	3.0ms	1.0ms	1,500V AC	UL, CSA, VDE
★**AQY410S**			350V	• 0.12A / 0.3A 0.12A	18/25Ω	110pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	UL, CSA, TÜV, BSI
AQY414S			400V	• 0.1A / 0.24A 0.1A	26/35Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	UL, CSA, TÜV, BSI
AQY412EH	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm		60V	• 0.55A / 1.5A 0.55A	1/2.5Ω	480pF	3.0mA	0.4mA	10.0ms	1.0ms	5,000V AC	UL, CSA, VDE
★**AQY410EH**			350V	• 0.13A / 0.4A 0.13A	18/25Ω	110pF	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	UL, CSA, BSI
AQY414EH			400V	• 0.12A / 0.3A 0.12A	26/35Ω	100pF	3.0mA	0.4mA	3.0ms	1.0ms	5.000V AC	UL, CSA, BSI
AQV414S	1:1  6.3 x 4.4 x 2.1mm		400V	• 0.1A / 0.3A 0.1A	26/50Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	UL, CSA, TÜV

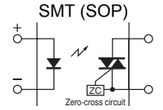
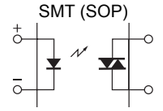
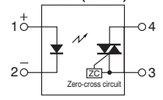
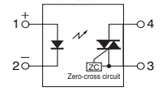
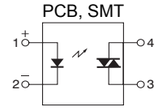
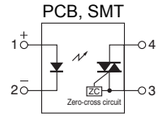
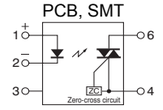
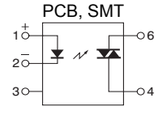
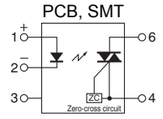
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
AQV410EH	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		350V	• 0.13A / 0.4A 0.13A	18/35Ω	110pF	3.0mA	0.4mA	3.0ms	1.5ms	5,000V AC	UL, CSA, TÜV, BSI, VDE
AQV412EH			60V	• 0.55A / 1.5A 0.55A	1/2.5Ω	480pF	3.0mA	0.4mA	10.0ms	1.5ms	5,000V AC	UL, CSA, TÜV, VDE
AQV414E			400V	• 0.12A / 0.3A 0.12A	26/50Ω	100pF	3.0mA	0.3mA	2.0ms	1.0ms	1.500V AC	UL, CSA, TÜV
AQV414EH			400V	• 0.12A / 0.3A 0.12A	26/50Ω	100pF	3.0mA	0.4mA	3.0ms	1.5ms	5,000V AC	UL, CSA, TÜV, BSI, VDE
AQV453			250V	• 0.2A / 0.6A 0.2A	5.5/8.0Ω	350pF	3.0mA	0.4mA	3.0ms	1.0ms	1,500V AC	UL, CSA
AQV414			400V	• 0.12A / 0.3A 0.12A	26/50Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	UL, CSA, TÜV
AQV454			400V	• 0.15A / 0.5A 0.15A	10.5/16Ω	170pF	3.0mA	0.4mA	2.0ms	1.0ms	1,500V AC	UL, CSA, TÜV
AQV454H	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm		400V	• 0.15A / 0.5A 0.15A	10.5/16Ω	170pF	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	UL, CSA, TÜV
1 Form B Power Relays												
AQZ404	1:1  21 x 3.5 x 12.5mm		400V	• 0.5A / 1.5A 0.5A	2.8/4.0Ω	2000pF	3.0mA	0.4mA	7.5ms	3.0ms	2,500V AC	UL, CSA

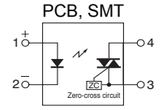
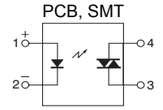
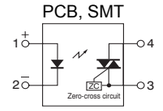
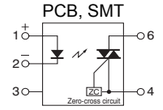
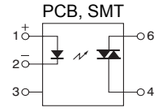
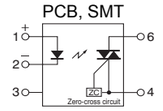
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
★**AQW210S**	1:1  9.37 x 4.4 x 2.1mm		350V	• 0.1A / 0.3A 0.1A	16/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
★**AQW214S**			400V	• 0.08A / 0.24A 0.8A	30/50Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
★**AQW212EH**	1:1  DIP : 9.86 x 6.4 x 3.2mm SMD: 9.86 x 6.4 x 2.9mm		60V	• 0.5A / 1.5A 0.5A	0.83/2.5Ω	80pF	3.0mA	0.4mA	4.0ms	1.0ms	5,000V AC	UL, CSA, TÜV
★**AQW210EH**			350V	• 0.12A / 0.36A 0.12A	18/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, CSA, TÜV
AQW210HL		Current limiting	350V	• 0.1A / - 0.18A (Output limit current [typ.]) 0.1A	20/25Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, CSA, TÜV
★**AQW214EH**			400V	• 0.1A / 0.3A 0.1A	26/35Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, CSA, TÜV
★**AQW216EH**			600V	• 0.04A / 0.12A 0.04A	52/120Ω	45pF	3.0mA	0.4mA	2.0ms	1.0ms	5,000V AC	UL, CSA, TÜV
AQW212	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		60V	• 0.6A / 1.0A 0.6A	0.83/2.5Ω	150pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQW215			100V	• 0.3A / 0.9A 0.3A	2.3/4.0Ω	110pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQW217			200V	• 0.16A / 0.48A 0.16A	11/15Ω	70pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQW210			350V	• 0.12A / 0.36A 0.12A	23/35Ω	45pF	3.0mA	0.4mA	0.5ms	0.05ms	1,500V AC	UL, CSA, TÜV
AQW214			400V	• 0.1A / 0.3A 0.1A	30/50Ω	45pF	3.0mA	0.4mA	0.5ms	0.05ms	1,500V AC	UL, CSA, TÜV
AQW254			400V	• 0.12A / 0.36A 0.12A	12.4/16Ω	170pF	3.0mA	0.4mA	2.0ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQW216			600V	• 0.04A / 0.12A 0.04A	70/120Ω	45pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV

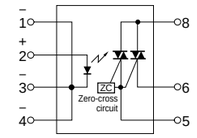
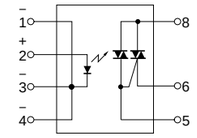
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
2 Form A Low CxR												
AQW227NS	1:1  9.37 x 4.4 x 2.1mm		200V	• 0.04A / 0.15A 0.04A	30/50Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, C-UL, TÜV
AQW223R2S			250V	• 0.14A / 0.42A 0.14A	10/15Ω	33pF	3.0mA	0.1mA	0.5ms	0.2ms	1,500V AC	C-UL
AQW227N	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		200V	• 0.05A / 0.15A 0.05A	30/50Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
AQW224N			400V	• 0.04A / 0.12A 0.04A	70/100Ω	10pF	3.0mA	0.4mA	0.5ms	0.2ms	1,500V AC	UL, CSA, TÜV
2 Form B												
★**AQW414EH**	1:1  DIP : 9.86 x 6.4 x 3.2mm SMD: 9.86 x 6.4 x 2.9mm		400V	• 0.1A / 0.3A 0.1A	26/35Ω	100pF	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	UL, CSA, TÜV, BSI
AQW414	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		400V	• 0.1A / 0.3A 0.1A	26/50Ω	100pF	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	UL, CSA, TÜV
AQW454			400V	• 0.12A / 0.36A 0.12A	11/16Ω	170pF	3.0mA	0.4mA	2.0ms	1.0ms	1,500V AC	UL, CSA, TÜV
1 Form A / 1 Form B												
AQW612S	1:1  9.4 x 4.4 x 2.1mm		60V	• 0.45A / 1.5A 0.45A	1/2.5Ω	80pF (N.O.) 450pF (N.C.)	3.0mA	0.4mA	3.0ms	1.0m	1,500V AC	UL, CSA, TÜV, VDE
★**AQW610S**	1:1  9.37 x 4.4 x 2.1mm		350V	• 0.1A / 0.3A 0.1A	18/25Ω	45pF (N.O), 100pF (N.C.)	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	UL, CSA, TÜV, BSI

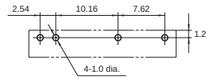
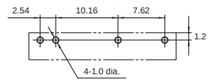
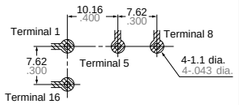
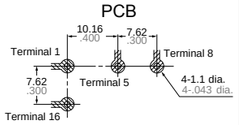
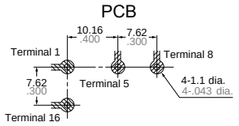
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	ON resistance (typical/max.)	Output capacitance (typical)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (max.)	Turn-off time (max.)		
AQW612EH	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		60V	• 0.5A / 1.5A 0.5A	1/2.5Ω	80pF (N.O.) 480pF (N.C.)	3.0mA	0.4mA	4.0ms (N.O.) 10.0ms (N.C.)	1.0ms	5,000V AC	UL, CSA, TÜV, VDE
★**AQW610EH**	1:1  DIP : 9.86 x 6.4 x 3.2mm SMD: 9.86 x 6.4 x 2.9mm		350V	• 0.12A / 0.36A 0.12A	18/25Ω	45pF (N.O.), 100pF (N.C.)	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	UL, CSA, TÜV, BSI
★**AQW614EH**			400V	• 0.1A / 0.3A 0.1A	26/35Ω	45pF (N.O.), 100pF (N.C.)	3.0mA	0.4mA	3.0ms	1.0ms	5,000V AC	UL, CSA, TÜV, BSI
AQW614	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		400V	• 0.1A / 0.3A 0.1A	27/50Ω	45pF (N.O.), 100pF (N.C.)	3.0mA	0.4mA	1.0ms	1.0ms	1,500V AC	UL, CSA, TÜV
AQW654			400V	• 0.12A / 0.36A 0.12A	• N.O.: 10/16Ω • N.C.: 11/16Ω	170pF	3.0mA	0.4mA	3.0ms	1.0ms	1,500V AC	UL, CSA, TÜV
Multichannel												
AQS221N2S	1:1  10.37 x 4.4 x 2.1mm	Low CxR	40V	• 0.06A / 0.12A 0.06A	9.5/12.5Ω	1pF	3.0mA	0.1mA	0.2ms	0.2ms	500V AC	-
AQS225R2S		Low CxR	80V	• 0.07A / 0.2A 0.07A	10.5/15.0Ω	4.5pF	3.0mA	0.3mA	0.3ms	0.2ms	1,500V AC	UL, CSA, TÜV

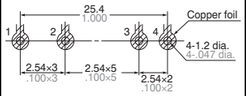
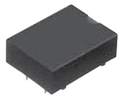
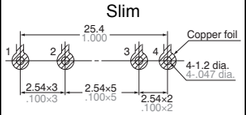
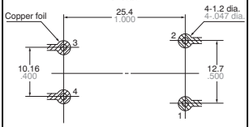
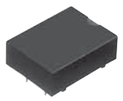
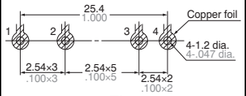
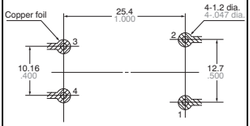
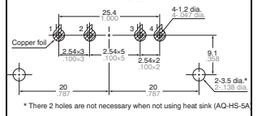
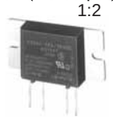
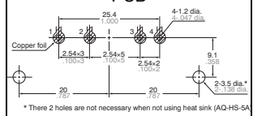
Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		Input		Switching speed (I LED = 5mA)		I/O isolation voltage	Approvals
			Drop-out voltage (typical/min.)	Short circuit current (typical/min.)	LED operate current (max.)	LED turn-off current (min.)	Turn-on time (typical)	Turn-off time (typical)		
★**APV2111V**	1:1  2.65 x 4.45 x 1.8mm	• Ultra small SSOP housing	8.2/5.0V	• 8 / 3μA 	3.0mA	0.2mA	0.8ms	0.1ms	1,500V AC	C-UL
APV1121S	1:1  4.3 x 4.4 x 2mm	• Ultra small SMD (SOP) housing	8.7/6.0V	• 14 / 5μA 	3.0mA	0.2mA	0.4ms	0.1ms	2,500V AC	C-UL
APV2121S		• Ultra small SMD (SOP) housing	8.2/5.0V	• 8 / 3μA 	3.0mA	0.2mA	0.8ms	0.1ms	2,500V AC	C-UL
APV1122	1:1  DIP : 8.8 x 6.4 x 3.4mm SMD: 8.8 x 6.4 x 3.4mm	• 5000V breakdown voltage	8.7/6.0V	• 14 / 5μA 	3.0mA	0.2mA	0.4ms	0.1ms	5,000V AC	C-UL

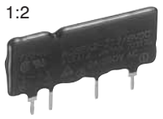
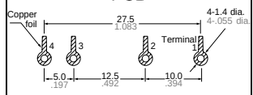
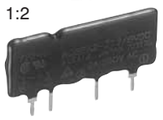
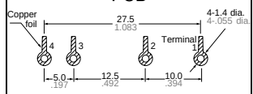
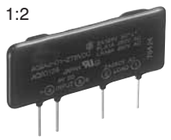
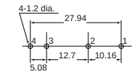
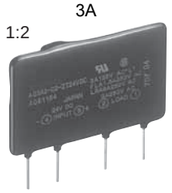
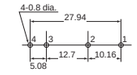
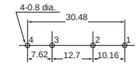
Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output				Input			Zero-cross voltage (max.)	I/O isolation voltage	Connection type Switching diagram	Approvals
			Repetitive peak OFF-state voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)/	Peak ON-state voltage (max.)	Peak OFF-state current (max.)	LED trigger current (max.)	LED drop-out voltage (max.)	Turn-on time (max.)				
APT1211S	1:1  4.3 x 4.4 x 2.1mm	• Zero-cross • SOP 4 pin	• 600V	• 0.05A / 0.6A 	2.5V	1µA	10mA	1.3V	0.1ms	50V	3,750V AC	SMT (SOP) 	UL, C-UL, VDE
APT1221S		• Non zero-cross • SOP 4 pin								-		SMT (SOP) 	
APT1231S		• Low zero-cross • SOP 4 pin			2.0V					15V		SMT (SOP) 	
APT1211	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm	• Zero-cross • DIP 4 pin	• 600V	• 0.1A / 1.2A 	2.5V	1µA	10mA	1.3V	0.1ms	50V	5,000V AC	PCB, SMT 	UL, C-UL, VDE
APT1221		• Non zero-cross • DIP 4 pin								-		PCB, SMT 	
APT1231		• Low zero-cross • DIP 4 pin			2.0V					15V		PCB, SMT 	
APT1212	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	• Zero-cross • DIP 6 pin	• 600V	• 0.1A / 1.2A 	2.5V	1µA	10mA	1.3V	0.1ms	50V	5,000V AC	PCB, SMT 	UL, C-UL, VDE
APT1222		• Non zero-cross • DIP 6 pin								-		PCB, SMT 	
APT1232		• Low zero-cross • DIP 6 pin			2.0V					15V		PCB, SMT 	

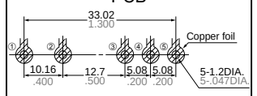
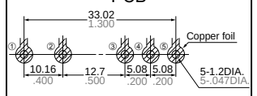
Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output				Input			Zero-cross voltage (max.)	I/O isolation voltage	Connection type Switching diagram	Approvals
			Repetitive peak OFF-state voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)/	Peak ON-state voltage (max.)	Peak OFF-state current (max.)	LED trigger current (max.)	LED drop-out voltage (max.)	Turn-on time (max.)				
APT1211W	1:1  DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm	• Zero-cross • DIP 4 pin wide terminal	• 600V	• 0.1A / 1.2A 	2.5V	1μA	10mA	1.3V	0.1ms	50V	5,000V AC	PCB, SMT 	UL, C-UL, VDE
APT1221W		• Non zero-cross • DIP 4 pin wide terminal								-		PCB, SMT 	
APT1231W		• Low zero-cross • DIP 4 pin wide terminal			2.0V					15V		PCB, SMT 	
APT1212W	1:1  DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm	• Zero-cross • DIP 6 pin wide terminal	• 600V	• 0.1A / 1.2A 	2.5V	1μA	10mA	1.3V	0.1ms	50V	5,000V AC	PCB, SMT 	UL, C-UL, VDE
APT1222W		• Non zero-cross • DIP 6 pin wide terminal								-		PCB, SMT 	
APT1231W		• Low zero-cross • DIP 6 pin wide terminal			2.0V					15V		PCB, SMT 	

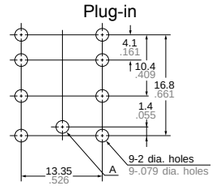
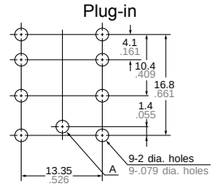
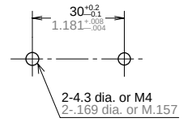
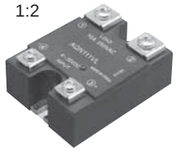
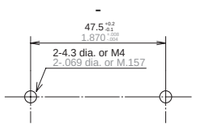
Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output				Input			Zero-cross voltage (max.)	I/O isolation voltage	Connection type Switching diagram	Approvals
			Repetitive peak OFF-state voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)/	Peak ON-state voltage (max.)	Peak OFF-state current (max.)	LED trigger current (max.)	LED drop-out voltage (max.)	Turn-on time (max.)				
AQH0213	1:1  DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm	• Photo-Triac • Zero-cross	• 600V	• 0.3A / 3A 	2.5V	100μA	10mA	1.3V	0.1ms	50V	5,000V	PCB, SMT With zero-cross switch:  Without zero-cross switch: 	UL, C-UL, VDE
AQH0223		• Photo-Triac • Non zero-cross								-			
AQH1213		• Photo-Triac • Zero-cross	• 600V	• 0.6A / 6A 	2.5V	100μA	10mA	1.3V	0.1ms	50V	5,000V		
AQH1223		• Photo-Triac • Non zero-cross								-			
AQH2213		• Photo-Triac • Zero-cross	• 600V	• 0.9A / 9A 	2.5V	100μA	10mA	1.3V	0.1ms	50V	5,000V		
AQH2223		• Photo-Triac • Non zero-cross								-			
AQH3213		• Photo-Triac • Zero-cross	• 600V	• 1.2A / 12A 	2.5V	100μA	10mA	1.3V	0.1ms	50V	5,000V		
AQH3223		• Photo-Triac • Non zero-cross								-			

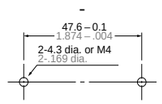
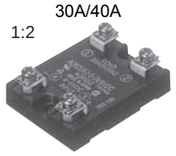
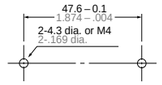
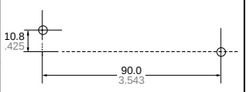
Type	Features	Output			Input					Breakdown voltage	Connection type Terminal layout	Approvals
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)	Input voltage	Input impedance	Drop-out voltage (min.)	Operate time	Release time			
AQG 1A 1:1  24.5 x 4.5 x 13.5mm	• Photo-Triac • Zero-cross • Integrated snubber circuit	• 75 - 264V AC	• 1A / 8A 	1.5mA	4 - 6V DC 9.6 - 14.4V DC 19.2 - 28.8V DC	0.3kΩ 0.8kΩ 1.6kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	3,000V AC	PCB 	UL, C-UL, VDE
	• Photo-Triac • Non zero-cross • Integrated snubber circuit	• 75 - 264V AC	• 1A / 8A 	1.5mA	4 - 6V DC 9.6 - 14.4V DC 19.2 - 28.8V DC	0.3kΩ 0.8kΩ 1.6kΩ	1V	1ms	½ cycle of voltage sine wave + 1ms	3,000V AC		
AQG 2A 1:1  24.5 x 4.5 x 20.5mm	• Photo-Triac • Zero-cross • Integrated snubber circuit	• 75 - 264V AC	• 2A / 30A 	1.5mA	4 - 6V DC 9.6 - 14.4V DC 19.2 - 28.8V DC	0.3kΩ 0.8kΩ 1.6kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	3,000V AC	PCB 	
	• Photo-Triac • Non zero-cross • Integrated snubber circuit	• 75 - 264V AC	• 2A / 30A 	1.5mA	4 - 6V DC 9.6 - 14.4V DC 19.2 - 28.8V DC	0.3kΩ 0.8kΩ 1.6kΩ	1V	1ms	½ cycle of voltage sine wave + 1ms	3,000V AC		
AQ-C AC input, DC input 1:2  20 x 10 x 12.8mm	• Photo-Transistor • AC input type	• 4 - 32V DC	• 25mA / - 	5µA	80 - 250V AC	-	10V AC	20ms	20ms	2,500V AC	PCB 	UL, CSA, TÜV
	• Photo-Transistor • DC input type	• 4 - 32V DC	• 25mA / - 	5µA	3 - 32V DC	-	1V DC	5ms	5ms	2,500V AC		
AQ-C 1A (AC output) 1:2  20 x 10 x 12.8mm	• Photo-Triac • Zero-cross	• 75 -125V AC • 75 - 250V AC	• 1A / 20A 	1.1mA	4 - 6V DC 9.6 - 14.4V DC 21.6 - 26.4V DC	0.3kΩ 0.8kΩ 1.8kΩ	0.5V 1.2V 2.4V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	2,500V AC	PCB 	UL, CSA, TÜV
	• Photo-Triac • Non zero-cross	• 75 -125V AC • 75 - 250V AC	• 1A / 20A 	1.1mA	4.- 6V DC 9.6 - 14.4V DC 21.6 - 26.4V DC	0.3kΩ 0.8kΩ 1.8kΩ	0.5V 1.2V 2.4V	1ms	½ cycle of voltage sine wave + 1ms	2,500V AC		
AQ-C 1A (DC output) 1:2  20 x 10 x 12.8mm	• Photo-Transistor	• 3 - 60V DC	• 1A / 1.5A (1s) 	0.1mA	4 - 6V DC 9.6 - 14.4V DC 21.6 - 26.4V DC	430Ω 1.2kΩ 2.8kΩ	4V 9.6V 21.6V	0.5ms	1ms	2,500V AC	PCB 	UL, CSA, TÜV

Type	Features	Output			Input					Breakdown voltage	Connection type Terminal layout	Approvals
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)	Input voltage	Input impedance	Drop-out voltage (min.)	Operate time	Release time			
AQ1 1A (DC output) 1:2  33 x 10 x 25.1mm	• Photo-Transistor	• 10 - 200V DC	• 1A / 5A (1s) 	1mA	3 - 28V DC	1.6kΩ	0.8V	0.5ms	2ms	3,000V AC	PCB Slim 	UL, CSA, TÜV
AQ1 2A (DC output) 1:2  33 x 10 x 25.1mm	• Photo-Transistor	• 3 - 60V DC	• 2A / 5A (1s) 	1mA	3 - 28V DC	1.6kΩ	0.8V	0.5ms	2ms	3,000V AC		
AQ1 2A (AC output) 1:2  33 x 10 x 25.1mm  33 x 25 x 12mm	• Photo-Transistor • Zero-cross	• 75 - 250V AC	• 2A / 80A 	5mA	3 - 28V DC	1.6kΩ	0.8V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	3,000V AC	PCB Slim  Flat 	UL, CSA, TÜV
AQ1 3A (AC output) 1:2  33 x 10 x 25.1mm  33 x 25 x 12mm	• Photo-Triac • Zero-cross • Non zero-cross available	• 75 - 250V AC	• 3A / 100A 	5mA	4 - 32V DC	- (Input current, max. 20mA)	1.0V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	• 4,000V AC (between input and output) • 2,500V AC (between input, output and case)	PCB Slim  Flat 	VDE
AQ1 5A (AC output) 1:2  54 x 26mm	• Photo-Transistor • Zero-cross	• 75 - 250V AC	• 5A (3A without heat sink) / 100A 	5mA	3 - 28V DC	1.6kΩ	0.8V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	• 3,000V AC (between input and output) • 1,500V AC (between input, output and case)	PCB 	UL, CSA, TÜV
AQ1 10A (AC output)) 1:2  54 x 26mm	• Photo-Triac • Zero-cross • Non zero-cross available	• 75 - 250V AC	• 10A (5A without heat sink) / 100A 	5mA	4 - 32V DC	- (Input current, max. 20mA)	1.0V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	• 4,000V AC (between input and output) • 2,500V AC (between input, output and case)	PCB 	VDE

Type	Features	Output			Input					Breakdown voltage	Connection type Terminal layout	Approvals
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)	Input voltage	Input impedance	Drop-out voltage (min.)	Operate time	Release time			
AQ-B 1A  43 x 9 x 20mm	• Photo-Triac • Zero-cross	• 75 - 125V AC • 75 - 250V AC	• 1A / 10A 	1.1mA	3 - 6V DC	0.18kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	1,500V AC/ 4,000V AC	PCB 	UL, CSA, TÜV
					7 - 14V DC	0.75kΩ						
					10 - 18V DC	1.2kΩ						
					18 - 30V DC	2.15kΩ						
	• Photo-Triac • Non zero-cross	• 75 - 125V AC • 75 - 250V AC	• 1A / 10A 	1.1mA	3 - 6V DC	0.18kΩ	1V	0.5ms	½ cycle of voltage sine wave + 1ms	1,500V AC/ 4,000V AC		
					7 - 14V DC	0.75kΩ						
					10 - 18V DC	1.2kΩ						
					18 - 30V DC	2.15kΩ						
AQ-B 2A  43 x 9 x 20mm	• Photo-Triac • Zero-cross	• 75 - 125V AC • 75 - 250V AC	• 2A / 20A 	1.1mA	3 - 6V DC	0.18kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	1,500V AC/ 4,000V AC	PCB 	UL, CSA, TÜV
					7 - 14V DC	0.75kΩ						
					10 - 18V DC	1.2kΩ						
					18 - 30V DC	2.15kΩ						
	• Photo-Triac • Non zero-cross	• 75 - 125V AC • 75 - 250V AC	• 2A / 20A	1.1mA	3 - 6V DC	0.18kΩ	1V	0.5ms	½ cycle of voltage sine wave + 1ms	1,500V AC/ 4,000V AC		
					7 - 14V DC	0.75kΩ						
					10 - 18V DC	1.2kΩ						
					18 - 30V DC	2.15kΩ						
AQ8 2A  45 x 9 x 24mm	• Photo-Triac • Zero-cross	• 75 - 125V AC • 75 - 250V AC	• 2A / 30A 	5mA	4 - 6V DC	0.18kΩ	0.5V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	3,000V AC	PCB Between input terminal 5.08mm  Between input terminal 7.65mm 	UL, CSA, TÜV, VDE
					9.6 - 14.4V DC	0.55kΩ	1.2V					
					21.6 - 26.4V DC	1.4kΩ	2.4V					
	• Photo-Triac • Non zero-cross	• 75 - 125V AC • 75 - 250V AC	• 2A / 30A 	5mA	4 - 6V DC	0.3kΩ	0.5V	1ms	½ cycle of voltage sine wave + 1ms	3,000V AC		
					9.6 - 14.4V DC	0.8kΩ	1.2V					
					21.6 - 26.4V DC	1.8kΩ	2.4V					
AQ8 3A  43 x 9 x 32mm	• Photo-Triac • Zero-cross	• 75 - 125V AC • 75 - 250V AC	• 3A / 80A 	5mA	4 - 6V DC	0.18kΩ	0.5V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	3,000V AC	PCB Between input terminal 5.08mm  Between input terminal 7.65mm 	UL, CSA, TÜV, VDE
					9.6 - 14.4V DC	0.55kΩ	1.2V					
					21.6 - 26.4V DC	1.4kΩ	2.4V					
	• Photo-Triac • Non zero-cross	• 75 - 125V AC • 75 - 250V AC	• 3A / 80A 	5mA	4 - 6V DC	0.3kΩ	0.5V	1ms	½ cycle of voltage sine wave + 1ms	3,000V AC		
					9.6 - 14.4V DC	0.8kΩ	1.2V					
					21.6 - 26.4V DC	1.8kΩ	2.4V					

Type	Features	Output			Input					Breakdown voltage	Connection type Terminal layout	Approvals
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)	Input voltage	Input impedance	Drop-out voltage (min.)	Operate time	Release time			
I/O RELAY AC input modules 1:2  43 x 10 x 20.5mm	• Photo-Transistor	• 4 - 15V DC • 10 - 32V DC	• 15mA / - 	100µA	80 - 140V AC	-	10V AC	20ms	20ms	4,000V AC		UL, CSA
					160 - 280V AC	-	20V AC					
I/O RELAY DC input modules 1:2  43 x 10 x 20.5mm	• Photo-Transistor	• 4 - 15V DC • 10 - 32V DC	• 15mA / - 	100µA	3 - 32V DC	-	0.8V	5ms	5ms	4,000V AC		
I/O RELAY AC output modules 1:2  43 x 10 x 20.5mm	• Photo-Transistor • Zero-cross	• 75 - 125V AC • 75 - 250V AC	• 2A / 30A 	5mA	3 - 15V DC	1.6kΩ	0.8V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	4,000V AC		UL, CSA
					4 - 15V DC	1.7kΩ						
					10 - 32V DC	5.6kΩ						
I/O RELAY DC output modules 1:2  43 x 10 x 20.5mm	• Photo-Transistor • Zero-cross	• 3 - 60V DC • 10 - 200V DC	• 2A / 5A (1s)  • 1A 	1mA	3 - 15V DC	1.6kΩ	0.8V	0.5ms	2ms	4,000V AC		
					4 - 15V DC	1.7kΩ						
					10 - 32V DC	5.6kΩ						

Type	Features	Output			Input					Breakdown voltage	Connection type Terminal layout	Approvals
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)	Input voltage	Input impedance	Drop-out voltage (min.)	Operate time	Release time			
Solid State Plug-in Terminals												
AQ-F 2A/3A (AC output) 1:2  27 x 21 x 35.2mm	• Photo-Triac • Zero-cross	• 75 - 250V AC	• 2A / 80A 2A	5mA	3 - 28V DC	1.6kΩ	0.8V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	2,000V AC	Plug-in 	UL, CSA
	• Photo-Triac • Zero-cross	• 75 - 250V AC	• 3A / 80A 3A	5mA	3 - 28V DC	1.6kΩ	0.8V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	2,000V AC		
AQ-F 2A/3A (DC output) 1:2  27 x 21 x 35.2mm	• Photo-Triac	• 3 - 60V DC	• 2A / 5A 2A	1mA	3 - 28V DC	1.6kΩ	0.8V	0.5ms	2ms	2,000V AC	Plug-in 	
	• Photo-Triac	• 3 - 60V DC	• 3A / 6A 3A	1mA	3 - 28V DC	1.6kΩ	0.8V	0.5ms	2ms	2,000V AC		
Solid State Hockey Puck Types												
AQ-J 1:2  38 x 28 x 17mm	• Photo-Triac • Zero-cross • **Ultra-compact size** • **Built-in varistor**	• 75 - 264V AC	• 10A / 100A 10A	5mA	4 - 6V DC	260Ω	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	• 3,000V AC (between input and output) • 2,500V AC (between input, output and case)	- 	C-UL, TÜV
			• 15A / 150A 15A		10 - 18V DC	800Ω						
			• 25A / 250A 25A		18 - 28V DC	1.6kΩ						
					4 - 6V DC	260Ω						
					10 - 18V DC	800Ω						
					18 - 28V DC	1.6kΩ						
AQ-N 1:2  59 x 44.8 x 12.5mm	• Photo-Triac • Zero-cross • Non zero-cross available	• 75 - 250V AC	• 10A / 100A 10A	10mA	4 - 32V DC	- (Input current, max. 20mA)	1V	• **Zero-cross:** ½ cycle of voltage sine wave + 1ms • **Non zero-cross:** 1ms	½ cycle of voltage sine wave + 1ms	• 4,000V AC (between input and output) • 2,500V AC (between input, output and case)	- 	C-UL, TÜV
			• 15A / 150A 15A									
			• 20A / 200A 20A									
			• 25A / 250A 25A									
			• 40A / 400A 40A									

Type	Features	Output			Input					Breakdown voltage	Connection type Terminal layout	Approvals
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)	Input voltage	Input impedance	Drop-out voltage (min.)	Operate time	Release time			
AQ-R 10A/15A/20A 1:2  59 x 44.8 x 12.5mm	• Photo-Triac • Zero-cross	• 75 - 125V AC • 75 - 250V AC	• 10A / 100A 	5mA	4 - 6V DC 10 - 18V DC 18 - 28V DC	0.26kΩ 0.86kΩ 1.36kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	• 1,500V AC (between input and output) • 4,000V AC type also available	- 	UL, CSA, TÜV
	• Photo-Triac • Zero-cross	• 75 - 125V AC • 75 - 250V AC	• 15A / 150A 	5mA	4 - 6V DC 10 - 18V DC 18 - 28V DC	0.26kΩ 0.86kΩ 1.36kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	• 1,500V AC (between input and output) • 4,000V AC type also available		
 59 x 44.8 x 12.5mm	• Photo-Triac • Zero-cross	• 75 - 125V AC • 75 - 250V AC	• 20A / 200A 	5mA	4 - 6V DC 10 - 18V DC 18 - 28V DC	0.26kΩ 0.86kΩ 1.36kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	• 1,500V AC (between input and output) • 4,000V AC type also available		
AQ-R 30A/40A 1:2  59 x 44.8 x 12.5mm	• Photo-Triac • Zero-cross	• 75 - 250V AC	• 30A / 300A 	5mA	4 - 6V DC 10 - 18V DC 18 - 28V DC	0.26kΩ 0.86kΩ 1.36kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	1,500V AC	- 	UL, C-UL
	• Photo-Triac • Zero-cross	• 75 - 250V AC	• 40A / 400A	5mA	4 - 6V DC 10 - 18V DC 18 - 28V DC	0.26kΩ 0.86kΩ 1.36kΩ	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	1,500V AC		
Solid State DIN Rail Types												
AQ-K 1:2  102 x 22.5 x 100mm	• Photo-Triac • Zero-cross	• 75 - 250V AC	• 15A / 150A 	9mA	4.5 - 30V DC	- (Input current, max. 10mA)	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	2,500V AC/ 4,000V AC	- 35mm DIN rail mounting hole or 2-4.6mm dia. hole or M4 hole 	UL, C-UL, TÜV
	• Photo-Triac • Zero-cross	• 75 - 250V AC	• 25A / 250A 	9mA	4.5 - 30V DC	- (Input current, max. 10mA)	1V	½ cycle of voltage sine wave + 1ms	½ cycle of voltage sine wave + 1ms	2,500V AC/ 4,000V AC		

Mechanical Relays

Semiconductor Relays

Global Network

North America | Europe | Asia Pacific | China | Japan

Panasonic Electric Works

Please contact our Global Sales Companies in:

Europe

▸ Headquarters	Panasonic Electric Works Europe AG	Rudolf-Diesel-Ring 2, 83607 Holzkirchen, Tel. (08024) 648-0, Fax (08024) 648-111, www.panasonic-electric-works.com
▸ Austria	Panasonic Electric Works Austria GmbH	Rep. of PEWDE, Josef Madersperger Str. 2, 2362 Biedermannsdorf, Tel. (02236) 26846, Fax (02236) 46133, www.panasonic-electric-works.at
	PEW Electronic Materials Europe GmbH	Ennshafenstraße 9, 4470 Enns, Tel. (07223) 883, Fax (07223) 88333, www.panasonic-electronic-materials.com
▸ Benelux	Panasonic Electric Works Sales Western Europe B.V.	De Rijn 4, (Postbus 211), 5684 PJ Best, (5680 AE Best), Netherlands, Tel. (0499) 372727, Fax (0499) 372185, www.panasonic-electric-works.nl
▸ Czech Republic	Panasonic Electric Works Czech s.r.o.	Průmyslová 1, 34815 Planá, Tel. 374 799 990, Fax 374 799 999, www.panasonic-electric-works.cz
▸ France	Panasonic Electric Works Sales Western Europe B.V.	Succursale Française, 10, rue des petits ruisseaux, 91370 Verrières le Buisson, Tél. 01 60135757, Fax 01 60135758, www.panasonic-electric-works.fr
▸ Germany	Panasonic Electric Works Deutschland GmbH	Rudolf-Diesel-Ring 2, 83607 Holzkirchen, Tel. (08024) 648-0, Fax (08024) 648-555, www.panasonic-electric-works.de
▸ Hungary	Panasonic Electric Works Europe AG	Magyarországi Közvetlen Kereskedelmi Képviselete, 1117 Budapest, Neumann János u. 1., Tel. 06 1 482 9258, Fax 06 1 482 9259, www.panasonic-electric-works.hu
▸ Ireland	Panasonic Electric Works UK Ltd.	Dublin, Tel. (01) 4600969, Fax (01) 4601131, www.panasonic-electric-works.co.uk
▸ Italy	Panasonic Electric Works Italia s.r.l.	Via del Commercio 3-5 (Z.I. Ferlina), 37012 Bussolengo (VR), Tel. (045) 6752711, Fax (045) 6700444, www.panasonic-electric-works.it
	Panasonic Electric Works Italia s.r.l.	Building Materials Division, Piazza della Repubblica 24, 20154 Milano (MI), Tel. (02) 29005391, Fax (02) 29003466
▸ Nordic Countries	Panasonic Electric Works Nordic AB	Sjöängsvägen 10, 19272 Sollentuna, Sweden, Tel. (08) 59476680, Fax (08) 59476690, www.panasonic-electric-works.se
	PEW Fire & Security Technology Europe AB	Citadellsvägen 23, 21118 Malmö, Tel. (040) 6977000, Fax (040) 6977099, www.panasonic-fire-security.com
▸ Poland	Panasonic Electric Works Polska sp. z o.o	Al. Krakowska 4/6, 02-284 Warszawa, Tel. 22 338-11-33, Fax 22 338-12-00, www.panasonic-electric-works.pl
▸ Portugal	Panasonic Electric Works España S.A.	Portuguese Branch Office, Avda Adelino Amaro da Costa 728 R/C J, 2750-277 Cascais, Tel. (21) 4812520, Fax (21) 4812529
▸ Spain	Panasonic Electric Works España S.A.	Barajas Park, San Severo 20, 28042 Madrid, Tel. (91) 3293875, Fax (91) 3292976, www.panasonic-electric-works.es
▸ Switzerland	Panasonic Electric Works Schweiz AG	Grundstrasse 8, 6343 Rotkreuz, Tel. (041) 7997050, Fax (041) 7997055, www.panasonic-electric-works.ch
▸ United Kingdom	Panasonic Electric Works UK Ltd.	Sunrise Parkway, Linford Wood, Milton Keynes, MK14 6 LF, Tel. (01908) 231555, Fax (01908) 231599, www.panasonic-electric-works.co.uk

North & South America

▸ USA	PEW Corporation of America	629 Central Avenue, New Providence, N.J. 07974, Tel. 1-908-464-3550, Fax 1-908-464-8513, www.pewa.panasonic.com

Asia Pacific / China / Japan

▸ China	Panasonic Electric Works (China) Co., Ltd.	Level 2, Tower W3, The Towers Oriental Plaza, No. 2, East Chang An Ave., Dong Cheng District, Beijing 100738, Tel. (010) 8518-5988, Fax (010) 8518-1297
▸ Hong Kong	Panasonic Electric Works (Hong Kong) Co., Ltd.	RM1205-9, 12/F, Tower 2, The Gateway, 25 Canton Road, Tsimshatsui, Kowloon, Hong Kong, Tel. (0852) 2956-3118, Fax (0852) 2956-0398
▸ Japan	Matsushita Electric Works, Ltd.	1048 Kadoma, Kadoma-shi, Osaka 571-8686, Japan, Tel. (06) 6908-1050, Fax (06) 6908-5781, www.mew.co.jp/e-acg/
▸ Singapore	Panasonic Electric Works Asia Pacific Pte. Ltd.	101 Thomson Road, #25-03/05, United Square, Singapore 307591, Tel. (06255) 5473, Fax (06253) 5689

Panasonic®

09/2007