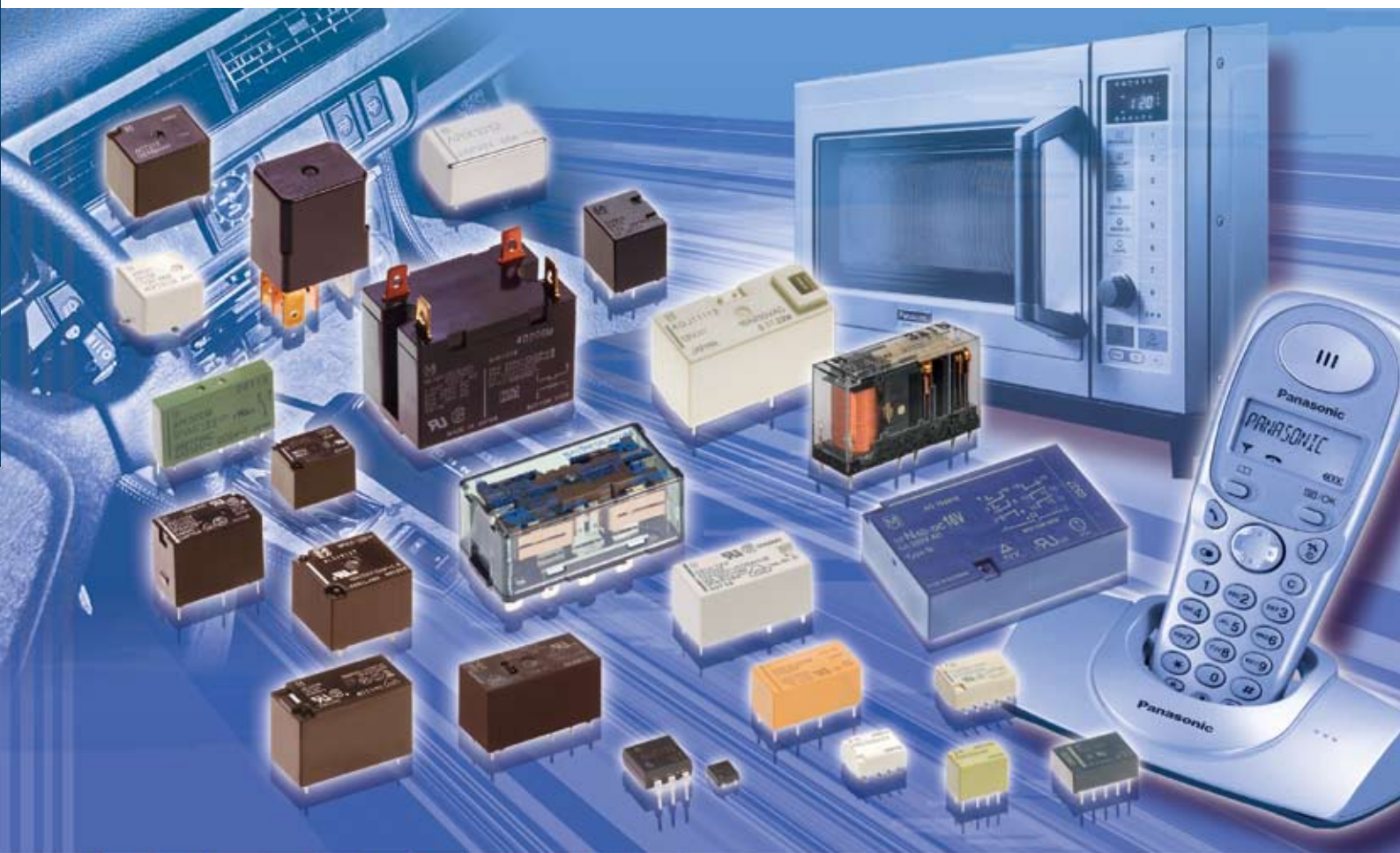


Panasonic
ideas for life



Short Form
Relays

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 minia-

ture relays for the new generation of surface mounting, automated assembly processes. In addition to electro-mechanical 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.)

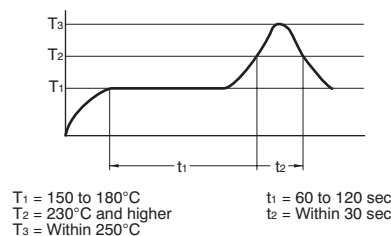
The reliability of the solder at the joining part can vary greatly depending on the actual mounting conditions. Influencing factors are: the type of lead-free solder, the landscape of the PCB, the mounting conditions.

- 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



- 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.

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	AV								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										

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	AV											
	Amenities			Air-conditioner		Air-conditioner			Air-conditioner			Air-conditioner
	Cooking									Microwave ovens	Microwave ovens	Microwave ovens
	Other equipment					Electric water heaters			Refrigerators	Refrigerators		Refrigerators
	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				

Product/Application Selector Chart









Category		Automotive											
Features	Product Name	Twin			Single								
		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 vehicles												
	Motorcycles												
	Forklifts												

Signal Relays





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



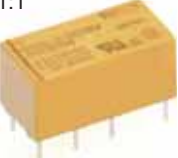

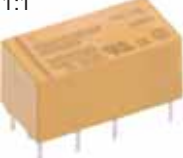



and other critical values, please refer to the respective data sheet. In case of doubt, please contact your Panasonic representative.

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
<p>★ GN (SMD)</p> <p>1:1</p>  <p>10.6 x 5.7 x 9.0mm</p>	<ul style="list-style-type: none"> • Compact slim body saves space • Outstanding surge resistance • The use of twin crossbar contacts ensures high contact reliability • RoHS compliant 	<p>Max.: 1A Min.: 10μA</p> 	<ul style="list-style-type: none"> • 110V DC • 125V AC 	2c	(DC) 1.5, 3, 4.5, 6, 9, 12, 24V
<p>★ GQ (SMD)</p> <p>1:1</p>  <p>10.6 x 7.2 x 5.2/5.4mm</p>	<ul style="list-style-type: none"> • Compact flat body saves space • Outstanding surge resistance • The use of twin crossbar contacts ensures high contact reliability • RoHS compliant 	<p>Max.: 1A Min.: 10μA</p> 	<ul style="list-style-type: none"> • 110V DC • 125V AC 	2c	(DC) 1.5, 3, 4.5, 6, 9, 12, 24V
<p>★ TQ</p> <p>1:1</p>  <p>14 x 9 x 5mm</p>	<ul style="list-style-type: none"> • 1,500V FCC • 4-pole model available • RoHS compliant 	<p>Max.: 1A Min.: 10μA</p> 	<ul style="list-style-type: none"> • 110V DC • 125V AC 	2c, 4c	(DC) 3, 4.5, 5, 6, 9, 12, 24, 48V
<p>★ TQ (SMD)</p> <p>1:1</p>  <p>14 x 9 x 5.6mm</p>	<ul style="list-style-type: none"> • Ultra low profile 5.8mm • Surge withstand 2,500V • 3 types of surface-mount terminals available • RoHS compliant 	<p>Max.: 2A Min.: 10μA</p> 	<ul style="list-style-type: none"> • 220V DC • 125V AC 	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V

Signal Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
<p>★ TX (SMD)</p> <p>1:1</p>  <p>15 x 7.4 x 8.2mm</p>	<ul style="list-style-type: none"> 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 	<p>Max.: 2A Min.: 10μA</p> 	<ul style="list-style-type: none"> 220V DC 220V AC 	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V
<p>TX-S (SMD)</p> <p>1:1</p>  <p>15 x 7.4 x 8.2/8.4mm</p>	<ul style="list-style-type: none"> Higher sensitivity Nominal operating power, 50mW 1,500V FCC 3 types of surface-mount terminals available RoHS compliant 	<p>Max.: 1A Min.: 10μA</p> 	<ul style="list-style-type: none"> 110V DC 125V AC 	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V
<p>SX (SMD)</p> <p>1:1</p>  <p>15 x 7.4 x 8.2/10mm</p>	<ul style="list-style-type: none"> 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 	<p>Max.: 0.01A Min.: 10μA</p> 	<ul style="list-style-type: none"> 10V DC 	2c	(DC) 1.5, 3, 4.5, 6, 9, 12, 24V
<p>TX-D (SMD)</p> <p>1:1</p>  <p>15 x 7.4 x 8.2/8.4mm</p>	<ul style="list-style-type: none"> High-insulation relay that conforms to the insulation level provided for in the EN41003 3 types of surface-mount terminals available RoHS compliant 	<p>Max.: 2A Min.: 10μA</p> 	<p>Break Before Make:</p> <ul style="list-style-type: none"> 220V DC 250V AC <p>Make Before Break:</p> <ul style="list-style-type: none"> 125V DC 125V AC 	2c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V
<p>TN</p> <p>1:1</p>  <p>14 x 5.6 x 9.8mm</p>	<ul style="list-style-type: none"> Slim size 1,500V FCC RoHS compliant 	<p>Max.: 1A Min.: 10μA</p> 	<ul style="list-style-type: none"> 110V DC 125V AC 	2c	(DC) 3, 4.5, 5, 6, 9, 12, 24, 48V

Signal Relays

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	<ul style="list-style-type: none"> • Low profile 4mm • High contact capacity 2A • Surge withstand voltage between contact and coil 2,500V • RoHS compliant 	Max.: 2A Min.: 10μA 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 1500V FCC • High switching power • RoHS compliant 	Max.: 2A Min.: 10μA 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • High sensitivity • 2 Form C contact • 1,500V FCC • Sealed construction • RoHS compliant 	Max.: 2A Min.: 10μA 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • High sensitivity 150mW / 200mW • RoHS compliant 	Max.: 1A Min.: 10μA 	<ul style="list-style-type: none"> • 60V DC 	1c	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24V


















High-Frequency Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
★ RD SPDT 1:2  34 x 13.2 x 39mm	<ul style="list-style-type: none"> • Coaxial relay • Up to 26.5GHz (18GHz) • Impedance 50Ω • SPST high power version available • RoHS compliant HF Characteristics at 18GHz: <ul style="list-style-type: none"> • 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
★ RD TRANSFER 1:2  32 x 32 x 39mm	<ul style="list-style-type: none"> • Coaxial relay • Up to 26.5GHz (18GHz) • Impedance 50Ω • SPST high power version available • RoHS compliant HF Characteristics at 18GHz: <ul style="list-style-type: none"> • 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
RA 1:1  14.7 x 9.7 x 5.9mm	<ul style="list-style-type: none"> • HF relay in SMT version • Up to 1GHz • Impedance 50Ω • RoHS compliant HF Characteristics at 1GHz: <ul style="list-style-type: none"> • 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
★ RJ 1:1  14 x 9 x 8.2mm	<ul style="list-style-type: none"> • Shielded HF relay • Up to 8GHz • Impedance 50Ω • RoHS compliant HF Characteristics at 5GHz: <ul style="list-style-type: none"> • 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
RX 1:1  20.5 x 12.4 x 9.4mm	<ul style="list-style-type: none"> • Shielded HF-Relay • Up to 3 GHz • Impedance 50Ω • RoHS compliant HF Characteristics at 2.5GHz: <ul style="list-style-type: none"> • 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








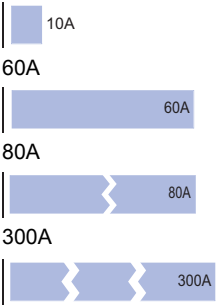
High-Frequency Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
★ RE (SMD) 1:1  20.2 x 11.2 x 8.9/9.6mm	<ul style="list-style-type: none"> • HF relay for broadcasting • Up to 2.6GHz • Impedance 50/75Ω • SMT and PCB version available • RoHS compliant HF Characteristics at 2.6GHz: <ul style="list-style-type: none"> • 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
RK 1:1  20.2 x 11.2 x 9.7mm	<ul style="list-style-type: none"> • HF relay for broadcasting • Up to 1.5GHz • Impedance 50/75Ω • Latching types available • RoHS compliant HF Characteristics: <ul style="list-style-type: none"> • 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
RP 1:1  10.6 x 9 x 4mm	<ul style="list-style-type: none"> • Low profile HF relay • Up to 1.8GHz • Impedance 50Ω • RoHS compliant HF Characteristics at 1.8GHz: <ul style="list-style-type: none"> • 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
RS 1:1  14 x 8.6 x 7mm	<ul style="list-style-type: none"> • HF relay for broadcasting • Up to 3GHz • Impedance 75Ω • Silent type available • RoHS compliant HF Characteristics at 3GHz: <ul style="list-style-type: none"> • 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















Polarized Power Relays

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	<ul style="list-style-type: none"> • Conforms to VDE0631 • Low operating power • Compact body saves space • Creepage & clearance distance >Min 8mm • RoHS compliant 	Max.: 10/16A (1a)  10A  16A 8A (1a1b, 2a)  8A	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • High switching capacity • High sensitivity • High contact welding resistance • High breakdown voltage • RoHS compliant 	Max.: 8A (1a)  8A 5A (1a1b, 2a)  5A	<ul style="list-style-type: none"> • 220V DC • 400V AC 	1a, 1a1b, 2a	(DC) 3, 5, 6, 9, 12, 24V
DK 1:2  20 x 15 x 10mm	<ul style="list-style-type: none"> • Large capacity in small size • High sensitivity • High breakdown voltage • RoHS compliant 	Max.: 10A (1a)  10A 8A (1a1b, 2a)  8A	<ul style="list-style-type: none"> • 125V DC • 400V AC 	1a, 1a1b, 2a	(DC) 3, 5, 6, 9, 12, 24V
DY 1:2  20 x 15 x 9.7mm	<ul style="list-style-type: none"> • Latching types available • RoHS compliant • Socket available 	Max.: 10A (1a)  10A 8A (1a1b)  8A	<ul style="list-style-type: none"> • 125V DC • 380V AC 	1a, 1a1b	(DC) 3, 5, 6, 12, 24V
★ DJ 1:2  29 x 13 x 16/16.5mm	<ul style="list-style-type: none"> • Latching type • Compact with high capacity • Creepage & clearance distance > 8mm • Optional available with manual test button • RoHS compliant 	Max.: 16A  16A	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Latching type • Compact with high capacity • High insulation • RoHS compliant 	Max.: 30A  30A	<ul style="list-style-type: none"> • 250V DC • 250V AC 	1a	(DC) 4.5, 6, 9, 12, 24V

Polarized Power Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
<p>S</p> <p>1:2</p>  <p>28 x 12 x 10.4mm</p>	<ul style="list-style-type: none"> • High sensitivity • High vibration and shock resistance • Low thermal electromotive force (approx. 3μV) • RoHS compliant 	<p>Max.: 4A Min.: 100μA</p> 	<ul style="list-style-type: none"> • 200V DC • 250V AC 	2a2b, 3a1b, 4a	(DC) 3, 5, 6, 12, 24, 48V
<p>ST</p> <p>1:2</p>  <p>31 x 14 x 11.3mm</p>	<ul style="list-style-type: none"> • High capacity in small size • High inrush capability • RoHS compliant 	<p>Max.: 8A Min.: 1mA</p> 	<ul style="list-style-type: none"> • 250V DC • 400V AC 	1a1b, 2a	(DC) 3, 5, 6, 9, 12, 24, 48V
<p>SP</p> <p>1:2</p>  <p>2c: 50 x 25.6 x 22mm 4c: 50 x 36.8 x 22mm</p>	<ul style="list-style-type: none"> • High sensitivity • High vibration and shock resistance • Wide switching range • RoHS compliant 	<p>Max.: 15A</p> 	<ul style="list-style-type: none"> • 110V DC • 250V AC 	2c, 4c	(DC) 3, 5, 6, 12, 24, 48V
<p>EP</p> <p>1:8</p>  <p>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</p>	<ul style="list-style-type: none"> • Small size & light weight • No arc space required • Safety construction • Low operating noise • High contact reliability • RoHS compliant 	<p>Max.: 10A 60A 80A 300A</p> 	<ul style="list-style-type: none"> • 400V DC 	1a	(DC) 12, 24, 48, 100V











Non-Polarized Power Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
<p>★ LD</p> <p>1:2</p>  <p>20.3 x 7 x 15mm</p>	<ul style="list-style-type: none"> • Slim type: width 7mm • RoHS compliant 	<p>Max.: 3A</p> 	<ul style="list-style-type: none"> • 30V DC • 277V AC 	1a	(DC) 4.5, 5, 6, 9, 12, 18, 24V
<p>PA</p> <p>1:2</p>  <p>20 x 5 x 12.5mm</p>	<ul style="list-style-type: none"> • Slim size permits higher density mounting • Wide switching capacity • High surge voltage 4,000V • High breakdown voltage 2,000V • RoHS compliant 	<p>Max.: 5A</p> 	<ul style="list-style-type: none"> • 110V DC • 250V AC 	1a	(DC) 5, 6, 9, 12, 18, 24V
<p>★ PE</p> <p>1:2</p>  <p>28 x 5 x 15mm</p>	<ul style="list-style-type: none"> • Slim size permits higher density mounting • Wide switching capacity • High surge voltage 6,000V • High breakdown voltage 4,000V • Creepage & clearance distance > 8mm 	<p>Max.: 6A</p> 	<ul style="list-style-type: none"> • 300V DC • 400V AC 	1a, 1b, 1c	(DC) 4.5, 5, 6, 12, 18, 24, 48, 60V
<p>LK</p> <p>1:2</p>  <p>24 x 11 x 25mm</p>	<ul style="list-style-type: none"> • High inrush current capability • High insulation resistance between contact and coil • RoHS compliant 	<p>Max.: 5A</p> 	<ul style="list-style-type: none"> • 30V DC • 277V AC 	1a	(DC) 5, 9, 12, 24V
<p>LK-P</p> <p>1:2</p>  <p>24 x 11 x 25mm</p>	<ul style="list-style-type: none"> • High switching capacity • High insulation • High inrush current capability • UL/CSA TV-5 rating • RoHS compliant 	<p>Max.: 10A</p> 	<ul style="list-style-type: none"> • 30V DC • 277V AC 	1a	(DC) 12, 24V
<p>LK-S</p> <p>1:2</p>  <p>24 x 11 x 25mm</p>	<ul style="list-style-type: none"> • High sensitivity 250mV • High inrush current capability • High insulation resistance between contact and coil • RoHS compliant 	<p>Max.: 5A</p> 	<ul style="list-style-type: none"> • 30V DC • 277V AC 	1a	(DC) 5, 9, 12, 24V
<p>LA</p> <p>1:2</p>  <p>24 x 12 x 25mm</p>	<ul style="list-style-type: none"> • Slim type: 2 Form A • High insulation resistance between contact and coil • RoHS compliant 	<p>Standard: Max.: 3A (3A rated)</p>  <p>Power type: Max.: 5A (5A, TV-4 rated)</p> 	<ul style="list-style-type: none"> • 30V DC • 277V AC 	2a	(DC) 12, 24V






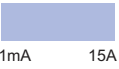




Non-Polarized Power Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
<p>★ JQ</p> <p>1:2</p>  <p>20 x 10 x 15.6mm</p>	<ul style="list-style-type: none"> • High electrical noise immunity • High switching capacity • High surge voltage 8,000V • RoHS compliant 	<p>Standard: Max.: 5A</p>  <p>Power type: Max.: 10A</p> 	<ul style="list-style-type: none"> • 110V DC • 277V AC 	1a, 1c	(DC) 3, 5, 6, 9, 12, 18, 24, 48V
<p>PQ</p> <p>1:2</p>  <p>20 x 10 x 15.6mm</p>	<ul style="list-style-type: none"> • High electrical noise immunity • High sensitivity 200mW • High surge voltage 8,000V • RoHS compliant 	<p>Max.: 5A</p> 	<ul style="list-style-type: none"> • 110V DC • 250V AC 	1a	(DC) 3, 5, 6, 9, 12, 18, 24V
<p>★ JS</p> <p>1:2</p>  <p>22 x 16 x 16mm</p>	<ul style="list-style-type: none"> • Ultra-miniature size with universal terminal footprint • High switching capacity 10A • RoHS compliant 	<p>Max.: 10A</p> 	<ul style="list-style-type: none"> • 100V DC • 277V AC 	1a, 1c	(DC) 5, 6, 9, 12, 18, 24, 48V
<p>★ LS</p> <p>1:2</p>  <p>19.5 x 15.5 x 14.8mm</p>	<ul style="list-style-type: none"> • 10A compact cube power relay • Universal footprint • RoHS and EN 60335/4 compliant 	<p>Max.: 10A</p> 	<ul style="list-style-type: none"> • 277V AC 	1a, 1c	(DC) 5, 6, 9, 12, 18, 24, 48V
<p>★ JW</p> <p>1:2</p>  <p>28.6 x 12.8 x 20mm</p>	<ul style="list-style-type: none"> • High dielectric withstanding for transient protection • Class B coil insulation types available • RoHS compliant 	<p>Standard: Max.: 5A (2a, 2c)</p>  <p>High capacity: Max.: 10A (1a, 1c)</p> 	<ul style="list-style-type: none"> • 100V DC • 440V AC 	1a, 1c, 2a, 2c	(DC) 5, 6, 9, 12, 18, 24, 48V

Non-Polarized Power Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
★ LE 1:2  28.6 x 12.4 x 24.9mm	<ul style="list-style-type: none"> • Ideal for magnetron and heater loads • Excellent heat resistance • High sensitive version available • RoHS compliant 	Max.: 16A  16A	<ul style="list-style-type: none"> • 277/400V AC 	1a	(DC) 5, 6, 9, 12, 18, 24, 48V
★ LZ 1:2  28.8 x 12.5 x 15.7mm	<ul style="list-style-type: none"> • Low profile relay (15.7mm) • Low operating power (400mV) • High temperature resistant (105°C) • RoHS compliant 	Max.: 16A  16A	<ul style="list-style-type: none"> • 250V DC • 440V AC 	1a, 1c	(DC) 5, 9, 12, 18, 24, 48V
★ LF 1:2  30.1 x 15.7 x 23.3mm	<ul style="list-style-type: none"> • Ideal for compressor and inverter loads • High insulation resistance • RoHS compliant 	Max.: 25A  25A	<ul style="list-style-type: none"> • 250V AC 	1a	(DC) 5, 6, 9, 12, 18, 24V
JM 1:2  Slim: 30.4 x 16 x 26.5mm Flat: 31 x 28.5 x 17.2mm	<ul style="list-style-type: none"> • Super welding resistance • High surge resistance • Compact high capacity relay for inductive load • RoHS compliant 	Max.: 20A  20A	<ul style="list-style-type: none"> • 100V DC • 250V AC 	1a	(DC) 5, 6, 9, 12, 24, 48V
JT-V 1:2  PCB: 31.9 x 26.9 x 20.2mm TMP: 32.2 x 27.4 x 27.9mm	<ul style="list-style-type: none"> • Surge withstand voltage: Min. 6kV • High switching capacity • 2 contact arrangements • Class F type as standard • RoHS compliant 	Max.: 30A  30A	<ul style="list-style-type: none"> • 30V DC • 277V AC 	1a, 1c	(DC) 12, 18, 24, 48V

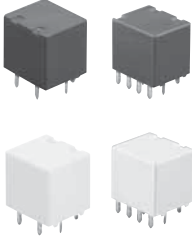
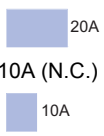


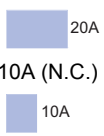


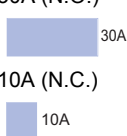


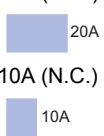

Non-Polarized Power Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
JV-N 1:2  22 x 16 x 10.9mm	<ul style="list-style-type: none"> • Compact, flat type with low 10.9mm profile • RoHS compliant 	Max.: 16A  16A	<ul style="list-style-type: none"> • 110V DC • 277V AC 	1a	(DC) 4.5, 6, 9, 12, 24, 48, 100V
JC 1:2  30 x 19 x 30.4mm	<ul style="list-style-type: none"> • 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  15A	<ul style="list-style-type: none"> • 250V AC Blow-out magnet type: <ul style="list-style-type: none"> • 250V DC 	1a, 2a	(DC) 5, 6, 12, 24, 48V
HL 1:2  27.2 x 20.8 x 35.4mm	<ul style="list-style-type: none"> • Large capacity • Compact size • Footprint compatible with competitive types • RoHS compliant 	Max.: 15A Min.: 1mA  1mA 15A	<ul style="list-style-type: none"> • 30V DC • 250V AC 	1c, 2c	(DC) 6, 12, 24, 48, 110V (AC) 6, 12, 24, 48, 120, 240V
HJ 1:2  28 x 21.5 x 35/38mm	<ul style="list-style-type: none"> • 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  7A	<ul style="list-style-type: none"> • 30V DC • 250V AC 	2c, 4c	(DC) 12, 24, 48, 110V (AC) 12, 24, 48, 100, 120, 200, 220/240V
HC 1:2  27.2 x 20.8 x 35.2mm	<ul style="list-style-type: none"> • Wide applications • Versatile range • Foot print compatible with competitive types • RoHS compliant 	Max.: 10A Min.: 1mA  1mA 10A	<ul style="list-style-type: none"> • 30V DC • 250V AC 	1c, 2c, 3c, 4c	(DC) 6, 12, 24, 48, 110V (AC) 6, 12, 24, 48, 120, 240V


Non-Polarized Power Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
HN 1:2  29 x 13 x 28mm	<ul style="list-style-type: none"> • Slim and compact size • High reliability • RoHS compliant 	Max.: 5A  5A	<ul style="list-style-type: none"> • 30V DC • 250V AC 	1c, 2c	(DC) 5, 6, 12, 24, 48V (AC) 100, 120, 240V
HP 1:2  36 x 25 x 44.5mm	<ul style="list-style-type: none"> • High reliability • RoHS compliant 	Max.: 10A  10A	<ul style="list-style-type: none"> • 125V DC • 250V AC 	2c, 3c, 4c	(DC) 6, 12, 24, 48, 110V (AC) 6, 12, 24, 48, 115, 220, 240V
HG 1:3  2c: 44 x 36 x 56mm 3c: 36 x 36 x 56mm 4c: 68 x 36 x 56mm	<ul style="list-style-type: none"> • High capacity 20A • RoHS compliant 	Max.: 20A  20A	<ul style="list-style-type: none"> • 125V DC • 250V AC 	2c, 3c, 4c	(DC) 6, 12, 24, 48, 110V (AC) 6, 12, 24, 48, 115, 220, 240V
HE 1:3  50 x 33 x 35.8mm	<ul style="list-style-type: none"> • High dielectric withstanding 10,000V surge • High inrush resistance (TV-15: 1 form A) (TV-10: 2 form A) • RoHS compliant 	Max.: 30A  30A	<ul style="list-style-type: none"> • 100V DC • 277V AC 	1a, 2a	(DC) 6, 12, 24, 48, 110V (AC) 12, 24, 48, 120, 240V
MC 1:3  45.2 x 40 x 45.5mm	<ul style="list-style-type: none"> • Minicontactor for controlling motor, air-conditioning and heating loads • Energy saving • Also available in PCB version • 3mm contact opening 	Max.: 16A  16A	<ul style="list-style-type: none"> • 440V DC • 400V AC 	4a, 3a1b, 2a2b	(DC) 3, 5, 6, 12, 24, 48V (AC) 24, 42, 60, 110, 125, 200, 220, 240, 380V




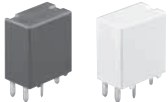














Automotive Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
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	<ul style="list-style-type: none"> • Super miniature size • High capacity in a compact body • Pin in Paste available • RoHS compliant 	Max.: 20A (N.O.)  10A (N.C.) 	<ul style="list-style-type: none"> • 16V DC 	1c, 1c x 2	(DC) 12V
★ CT 1:2  17.4 x 14 x 13.5mm	<ul style="list-style-type: none"> • Ultra small size • Twin (1 Form C x 2) • H-bridge type available • Pin in Paste available • RoHS compliant 	Max.: 20A (N.O.)  10A (N.C.) 	<ul style="list-style-type: none"> • 16V DC 	1c, 1c x 2	(DC) 12V
★ CT POWER 1:2  17.4 x 14 x 13.5mm	<ul style="list-style-type: none"> • 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.)  10A (N.C.) 	<ul style="list-style-type: none"> • 16V DC 	1c, 1c x 2	(DC) 12V
CR 1:2  24.6 x 17 x 18.5mm	<ul style="list-style-type: none"> • Quiet • Twin (1 Form C x 2) • Simple footprint enable ease of PC board layout • RoHS compliant 	Max.: 20A (N.O.)  10A (N.C.) 	<ul style="list-style-type: none"> • 16V DC 	1c x 2	(DC) 12V

Automotive Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
Single					
CA 1:2  21.5 x 14.4 x 37mm	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
CB 1:2  26 x 22 x 25mm	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 16V DC (12V DC type) • 32V DC (24V DC type) 	1a, 1c	(DC) 12, 24V
★ CM 1:2  20 x 15 x 22mm	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 16V DC (12V DC type) • 32V DC (24V DC type) 	1a, 1c	(DC) 12, 24V
★ CP 1:2  14 x 13 x 9.5mm	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 16V DC 	1a, 1c	(DC) 12V, 24V
★ CP (SMD) 1:2  14 x 13 x 9.5mm	<ul style="list-style-type: none"> • Low profile • High capacity • Simple footprint enables ease of PC board layout • RoHS compliant 	Max.: 20A (N.O.)  20A 10A (N.C.)  10A	<ul style="list-style-type: none"> • 16V DC 	1c	(DC) 12V
CP POWER 1:2  14 x 13 x 10.5mm	<ul style="list-style-type: none"> • Low profile • High capacity type: 45A maximum carrying current • RoHS compliant 	Max.: 20A (N.O.)  20A 10A (N.C.)  10A	<ul style="list-style-type: none"> • 16V DC 	1a, 1c	(DC) 12V



Automotive Relays

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	<ul style="list-style-type: none"> • Quiet • Less space required • RoHS compliant 	Max.: 20A (N.O.)  10A (N.C.) 	• 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	<ul style="list-style-type: none"> • Super miniature size • High capacity in a compact body • Pin in Paste available • RoHS compliant 	Max.: 20A (N.O.)  10A (N.C.) 	• 16V DC	1c, 1c x 2	(DC) 12V
★ CT 1:2  17.4 x 7.2 x 13.5mm	<ul style="list-style-type: none"> • Ultra small size • Twin (1 Form C x 2) • H-bridge type available • Pin in Paste available • RoHS compliant 	Max.: 20A (N.O.)  10A (N.C.) 	• 16V DC	1c, 1c x 2	(DC) 12V
★ CT POWER 1:2  17.4 x 7.2 x 13.5mm	<ul style="list-style-type: none"> • 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.)  10A (N.C.) 	• 16V DC	1c, 1c x 2	(DC) 12V
CV 1:2  22.5 x 15 x 15.7mm	<ul style="list-style-type: none"> • Low profile • Low temperature rise • Low sound pressure level • Wide line-up • Micro-ISO terminal type • RoHS compliant 	Max.: 20A (N.O.)  10A (N.C.) 	• 16V DC	1a, 1c	(DC) 12V
CY 1:2  22 x 16 x 16.4mm	<ul style="list-style-type: none"> • 30A nominal switching capacity • H/L type (ideal for lamp loads) • RoHS compliant 	Max.: 30A (N.O.)  15A (N.C.) 	• 16V DC	1a, 1c, 1a (H/L type)	(DC) 12V

Automotive Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current (Min.: see data sheet)	Max. switching voltage	Contact arrangement	Coil voltage
<p>★ JJM</p> <p>1:2</p>  <p>15.5 x 12 x 13.9mm</p>	<ul style="list-style-type: none"> • Compact (half-size) • Perfect for automobile electrical systems • RoHS compliant 	<p>Max.: 20A (N.O.) 20A 10A (N.C.) 10A</p>	• 16V DC	1a, 1c	(DC) 12V
<p>JJM-DM</p> <p>1:2</p>  <p>15.5 x 12 x 13.9mm</p>	<ul style="list-style-type: none"> • Small size • Standard terminal pitch employed • Double make contact arrangement • RoHS compliant 	<p>Max.: 2 x 6A 6A 6A</p>	• 16V DC	Double make contact	(DC) 12V
<p>JS-M</p> <p>1:2</p>  <p>22 x 16 x 16.4mm</p>	<ul style="list-style-type: none"> • Low pick-up voltage for high ambient use • RoHS compliant 	<p>Standard: Max.: 10A 10A</p> <p>High capacity: Max.: 15A 15A</p>	• 16V DC	1a, 1c	(DC) 9, 12V
<p>JT-N</p> <p>1:2</p>  <p>PCB: 31.9 x 26.9 x 20.2mm TMP: 32.2 x 27.4 x 27.9mm</p>	<ul style="list-style-type: none"> • High switching capacity • RoHS compliant 	<p>Max.: 30A (1a) 30A 20A (1c N.O.) 20A 10A (1c N.C.) 10A</p>	<ul style="list-style-type: none"> • 30V DC • 277V AC 	1a, 1c	(DC) 5, 6, 9, 12, 15, 18, 24V
Special Types					
<p>EV</p> <p>1:8</p>  <p>66.8 x 49.7 x 37.9mm</p>  <p>82.8 x 40 x 79mm</p>  <p>111 x 63 x 75mm</p>	<ul style="list-style-type: none"> • Small size & light weight • No arc space is required • Safety construction • Low operating noise • High contact reliability • RoHS compliant 	<p>Max.: 10A (1a) 10A 80A (1a) 80A 300A (1a) 300A</p>	• 400V DC	1a	(DC) 12, 24V

Safety Relays

Type ★ = Popular Type (Picture scale: DIN A4)	Features	Switching current	Max. switching voltage	Contact arrangement	Coil voltage
SFN4D 1:3  53.3 x 33 x 14.5mm	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 500V DC • 500V AC 	4a, 2b	(DC) 5, 9, 12, 16, 18, 21, 24, 36, 48, 60V
SF4D 1:3  53.3 x 33 x 16.5mm	<ul style="list-style-type: none"> • Polarised relay with forcibly guided contacts according to EN50205, Type B • Safety double contact • RoHS compliant 	Max.: 8A Min.: 10mA 	<ul style="list-style-type: none"> • 400V DC • 400V AC 	4a, 4b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V
SF2D 1:3  53.3 x 25 x 16.5mm	<ul style="list-style-type: none"> • Polarised relay with forcibly guided contacts according to EN50205, Type A • Safety double contact • RoHS compliant 	Max.: 8A Min.: 10mA 	<ul style="list-style-type: none"> • 400V DC • 400V AC 	2a, 2b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V
SF3 1:3  53.3 x 25 x 16.5mm	<ul style="list-style-type: none"> • Polarised relay with forcibly guided contacts according to EN50205, Type A • RoHS compliant 	Max.: 8A Min.: 10mA 	<ul style="list-style-type: none"> • 400V DC • 400V AC 	3a, 1b	(DC) 5, 9, 12, 18, 21, 24, 36, 48, 60V
SFS 1:3  40 x 13 x 24mm  50 x 13 x 24mm	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 30V DC • 250V AC 	2a2b, 3a1b, 4a2b, 5a1b, 3a3b	(DC) 12, 16, 18, 21, 24, 48V

PhotoMOS Relays

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 or 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.

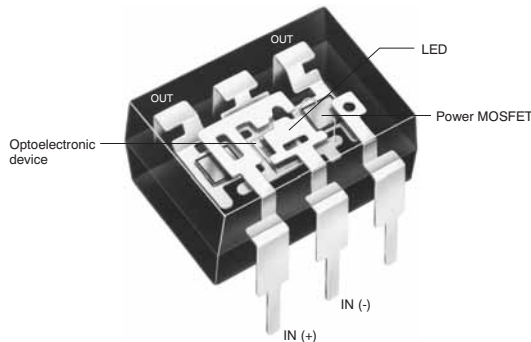


Figure 1: PhotoMOS internal construction

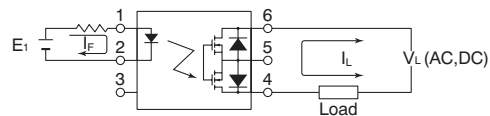


Figure 3: PhotoMOS in A connection

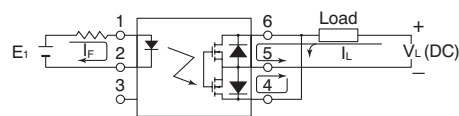


Figure 4: PhotoMOS in C connection

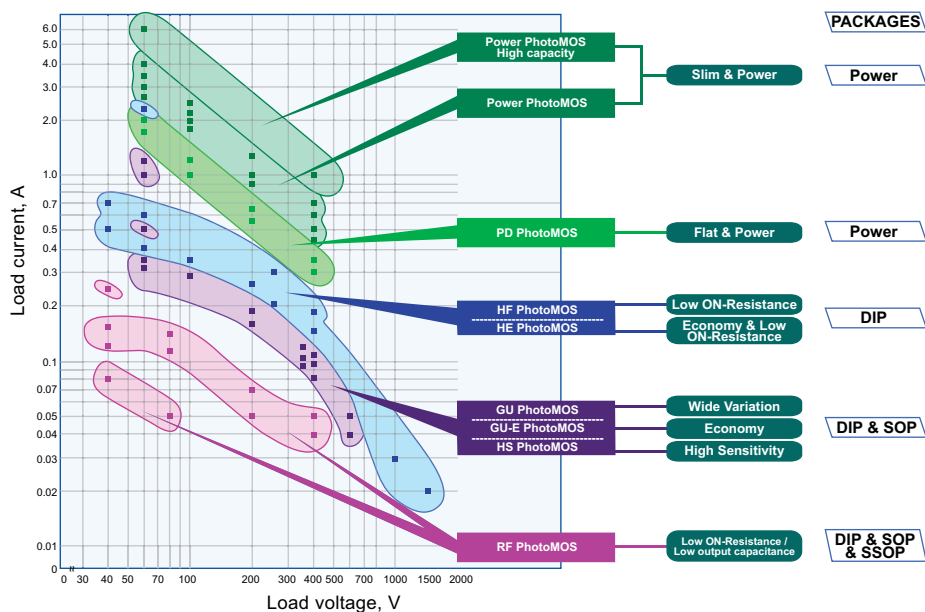







Figure 2: PhotoMOS load current vs. voltage - Selector Chart

PhotoMOS Relays: ★ Popular Type Selection Table

Product family	Type ¹⁾	Package	Contact arrangement ²⁾	Peak load V	Continuous 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 Relays









Type	Dimensions		
AQW21○EH AQW21○HL AQW41○EH AQW61○EH Series	Through hole terminal type	Surface mount terminal type	PC board pattern (Bottom view)
APV21 (SSOP) AQY22 (SSOP) Series	Recommended mounting pad (Top view)		
APV21(SOP) APV11(SOP) AQY21(SOP) AQY22(SOP) AQY41(SOP) Series	Recommended mounting pad (Top view)		
AQV21(SOP) AQV22(SOP) AQV41(SOP) Series	Recommended mounting pad (Top view)		
AQW21(SOP) AQW61(SOP) Series	Recommended mounting pad (Top view)		

PhotoMOS 1 Form A Signal Relays



















For standard housings and dimensions, see page 47.

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
★ AQY212GS	 <p>1:1 4.3 x 4.4 x 2.1mm</p>	High capacity type	60V	<ul style="list-style-type: none"> • 1.0A / 3.0A 
AQY212G2S		High capacity type	60V	<ul style="list-style-type: none"> • 1.25A / 3.0A 
★ AQY212S			60V	<ul style="list-style-type: none"> • 0.5A / 1.0A 
AQY210LS		Current limiting	350V	<ul style="list-style-type: none"> • 0.12A / - 0.18A (Output limit current [typ.]) 
★ AQY210S			350V	<ul style="list-style-type: none"> • 0.12A / 0.3A 
★ AQY210KS		Short circuit protected	350V	<ul style="list-style-type: none"> • 0.12A / - 0.2A (Cut off current [typ.]) 
★ AQY214S			400V	<ul style="list-style-type: none"> • 0.1A / 0.24A 

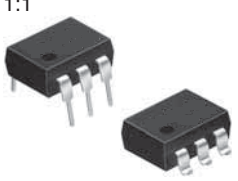












PhotoMOS 1 Form A Signal Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	
★ AQY211EH	 <p>1:1</p> <p>DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm</p>		30V	• 1.0A / 3.0A  1A	
★ AQY212EH			60V	• 0.55A / 1.5A  0.55A	
★ AQY212GH		High capacity type	60V	• 1.1A / 3.0A  1.1A	
★ AQY214EH				400V	• 0.12A / 0.3A  0.12A
★ AQY210EH				350V	• 0.13A / 0.4A  0.13A
AQY210HL		Current limiting	350V	• 0.12A / - 0.18A (Output limit current [typ.])  0.12A	
★ AQY216EH		 <p>1:1</p> <p>DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm</p>		600V	• 0.05A / 0.15A  0.05A

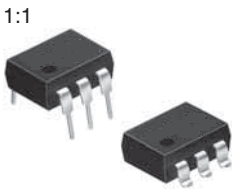







PhotoMOS 1 Form A Signal Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	
★ A QV212S	<p>1:1</p>  <p>6.3 x 4.4 x 2.1mm</p>		60V	• 0.5A / 1.0A 	
A QV215S			100V	• 0.3A / 0.9A 	
A QV217S				200V	• 0.16A / 0.48A 
A QV210S				350V	• 0.12A / 0.3A 
A QV214S				400V	• 0.1A / 0.3A 
A QV216S				600V	• 0.04A / 0.12A 
★ A QV212	<p>1:1</p>   <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>		60V	• 0.55A / 1.2A 	
★ A QV252G		High capacity type	60V	• 2.5A / 6.0A 	
A QV255GS	<p>1:1</p>  <p>6.3 x 4.4 x 2.0mm</p>	High capacity type	80V	• 1.25A / 2.5A 	
A QV215	<p>1:1</p>   <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>		100V	• 0.32A / 0.96A 	
A QV217			200V	• 0.18A / 0.54A 	
A QV210			350V	• 0.13A / 0.4A 	

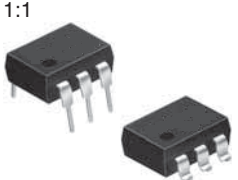







PhotoMOS 1 Form A Signal Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	
AQV210E	 <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>		350V	• 0.13A / 0.4A 	
★AQV210EH			350V	• 0.13A / 0.4A 	
AQV214				400V	• 0.12A / 0.3A 
AQV214E				400V	• 0.12A / 0.3A 
★AQV214EH				400V	• 0.12A / 0.3A 
AQV214H				400V	• 0.12A / 0.3A 
AQV216				600V	• 0.05A / 0.15A 
AQV101				40V DC	• 0.7A / 1.8A 
AQV201				40V	• 0.5A / 1.8A 
AQV251				40V	• 0.5A / 1.8A 
AQV102				60V DC	• 0.6A / 1.5A 
AQV202				60V	• 0.4A / 1.5A 

PhotoMOS 1 Form A Signal Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQV252	 <p>1:1</p> <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>		50V	• 0.4A / 1.5A 
★ AQV112KL		Short circuit protected	60V DC	• 0.5A / - 
AQV255			100V	• 0.35A / 1.0A 
AQV257			200V	• 0.25A / 0.75A 
AQV103			250V DC	• 0.3A / 0.6A 
AQV203			250V	• 0.2A / 0.6A 
AQV253			250V	• 0.2A / 0.6A 






PhotoMOS 1 Form A Signal Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	
AQV253H	 <p>1:1</p> <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>		250V	• 0.2A / 0.6A 	
AQV104			400V DC	• 0.18A / 0.5A 	
AQV204			400V	• 0.15A / 0.5A 	
AQV234		Sensitive type	400V	• 0.12A / 0.3A 	
AQV254			400V	• 0.15A / 0.5A 	
★ AQV254H			400V	• 0.15A / 0.5A 	
AQV259				1,000V	• 0.03A / 0.09A 
AQV258				1,500V	• 0.02A / 0.06A 

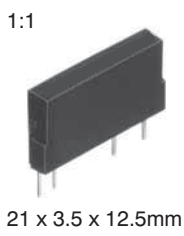








PhotoMOS 1 Form A Power Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
★ AQZ102	<p>1:1</p>  <p>21 x 3.5 x 12.5mm</p>		60V DC	<ul style="list-style-type: none"> • 4.0A / 9.0A 
AQZ105			100V DC	<ul style="list-style-type: none"> • 2.6A / 6.0A 
AQZ107			200V DC	<ul style="list-style-type: none"> • 1.3A / 3.0A 
AQZ104			400V DC	<ul style="list-style-type: none"> • 0.7A / 1.5A 
★ AQZ202				60V
AQZ262	<p>1:1</p>  <p>43 x 9 x 32mm</p>		60V	<ul style="list-style-type: none"> • 6.0A / 10.0A 
★ AQZ205	<p>1:1</p>  <p>21 x 3.5 x 12.5mm</p>		100V	<ul style="list-style-type: none"> • 2.0A / 6.0A 
AQZ207			200V	<ul style="list-style-type: none"> • 1.0A / 3.0A 
★ AQZ204			400V	<ul style="list-style-type: none"> • 0.5A / 1.5A 
AQZ264		<p>1:1</p>  <p>43 x 9 x 32mm</p>		400V













PhotoMOS 1 Form A Power Relays

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	<p>1:1</p>  <p>DIP : 9.3 x 8.8 x 3.9mm SMD: 9.3 x 8.8 x 3.7mm</p>		60V	<ul style="list-style-type: none"> • 2.0A / 6.0A 
AQY275			100V	<ul style="list-style-type: none"> • 1.3A / 4.0A 
AQY277			200V	<ul style="list-style-type: none"> • 0.65A / 2.0A 
AQY274			400V	<ul style="list-style-type: none"> • 0.35A / 1.0A 











PhotoMOS 1 Form A Power Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQZ102D	 <p>1:1</p> <p>21 x 3.5 x 12.5mm</p>	Input voltage sensitive	60V DC	• 3.6A / 9.0A  3.6A
AQZ202D		Input voltage sensitive	60V	• 2.7A / 9.0A  2.7A
AQZ105D		Input voltage sensitive	100V DC	• 2.3A / 6.0A  2.3A
AQZ205D		Input voltage sensitive	100V	• 1.8A / 6.0A  1.8A
AQZ107D		Input voltage sensitive	200V DC	• 1.1A / 3.0A  1.1A
AQZ207D		Input voltage sensitive	200V	• 0.9A / 3.0A  0.9A
AQZ104D		Input voltage sensitive	400V DC	• 0.6A / 1.5A  0.6A
AQZ204D		Input voltage sensitive	400V	• 0.45A / 1.5A  0.45A











PhotoMOS 1 Form A Power Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
★ AQY221N3V	 <p>1:1 2.65 x 4.45 x 1.8mm</p>	Low CxR	25V	• 0.15A / 0.4A 
★ AQY221N2V		Low CxR	40V	• 0.12A / 0.3A 
★ AQY221R2V		Low CxR	40V	• 0.25A / 0.75A 
AQY225R2V		Low CxR	80V	• 0.12A / 0.3A 
★ AQY221N1S	 <p>1:1 4.3 x 4.4 x 2.1mm</p>	Low CxR	40V	• 0.12A / 0.3A 
★ AQY221N2S		Low CxR	40V	• 0.12A / 0.3A 
★ AQY221R2S		Low CxR	40V	• 0.25A / 0.75A 
AQY222R1S		Low CxR	60V	• 0.5A / 1.0A 
AQY225R1S		Low CxR	80V	• 0.35A / 0.7A 
AQY225R2S		Low CxR	80V	• 0.15A / 0.45A 

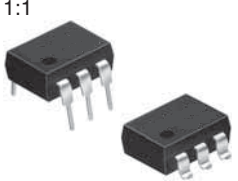











PhotoMOS 1 Form A Power Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
AQV227NS	1:1  6.3 x 4.4 x 2.1mm		200V	• 0.05A / 0.15A 
AQV224NS			400V	• 0.04A / 0.12A 
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 
AQV221N			40V	• 0.15A / 0.45A 
AQV225			80V	• 0.05A / 0.15A 
AQV225N			80V	• 0.15A / 0.15A 
AQV227N			200V	• 0.07A / 0.21A 
AQV224N			400V	• 0.05A / 0.15A 

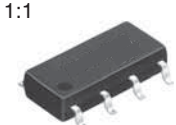


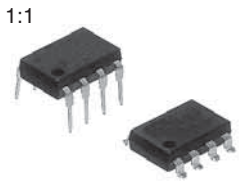





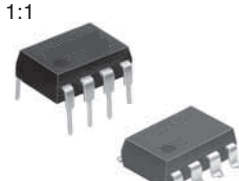






PhotoMOS 1 Form A Power Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
1 Form B Signal Relays				
AQY412S	1:1  4.3 x 4.4 x 2.1mm		60V	• 0.5A / 1.5A 
★ AQY410S			350V	• 0.12A / 0.3A 
AQY414S			400V	• 0.1A / 0.24A 
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 
★ AQY410EH			350V	• 0.13A / 0.4A 
AQY414EH			400V	• 0.12A / 0.3A 
AQV414S	1:1  6.3 x 4.4 x 2.1mm		400V	• 0.1A / 0.3A 













PhotoMOS 1 Form A Power Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output		
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)	
AQV410EH	 <p>1:1</p> <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>		350V	• 0.13A / 0.4A 	
AQV412EH			60V	• 0.55A / 1.5A 	
AQV414E			400V	• 0.12A / 0.3A 	
AQV414EH			400V	• 0.12A / 0.3A 	
AQV453			250V	• 0.2A / 0.6A 	
AQV414			400V	• 0.12A / 0.3A 	
AQV454			400V	• 0.15A / 0.5A 	
AQV454H		 <p>1:1</p> <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>		400V	• 0.15A / 0.5A 
1 Form B Power Relays					
AQZ404	 <p>1:1</p> <p>21 x 3.5 x 12.5mm</p>		400V	• 0.5A / 1.5A 	

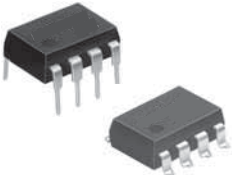

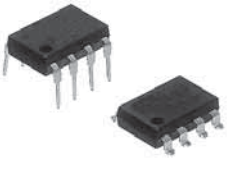


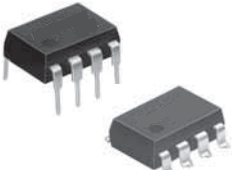


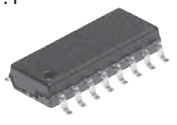


PhotoMOS 2 Form A Signal Relays

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
★ AQW210S	 1:1 9.37 x 4.4 x 2.1mm		350V	• 0.1A / 0.3A 
★ AQW214S			400V	• 0.08A / 0.24A 
★ 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 
★ AQW210EH			350V	• 0.12A / 0.36A 
AQW210HL		Current limiting	350V	• 0.1A / - 0.18A (Output limit current [typ.]) 
★ AQW214EH			400V	• 0.1A / 0.3A 
★ AQW216EH			600V	• 0.04A / 0.12A 
AQW212				60V
AQW215	 1:1		100V	• 0.3A / 0.9A 
AQW217			200V	• 0.16A / 0.48A 
AQW210			350V	• 0.12A / 0.36A 
AQW214			400V	• 0.1A / 0.3A 
AQW254			400V	• 0.12A / 0.36A 
AQW216			600V	• 0.04A / 0.12A 

PhotoMOS Other Types

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
2 Form A Low CxR				
AQW227NS	1:1  9.37 x 4.4 x 2.1mm		200V	• 0.04A / 0.15A 
AQW223R2S			250V	• 0.14A / 0.42A 
AQW227N	1:1 		200V	• 0.05A / 0.15A 
AQW224N	 DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		400V	• 0.04A / 0.12A 
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 
AQW414	1:1 		400V	• 0.1A / 0.3A 
AQW454	 DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		400V	• 0.12A / 0.36A 
1 Form A / 1 Form B				
AQW612S	1:1  9.4 x 4.4 x 2.1mm		60V	• 0.45A / 1.5A 
★ AQW610S	1:1  9.37 x 4.4 x 2.1mm		350V	• 0.1A / 0.3A 

PhotoMOS Other Types

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Peak load V DC/AC	Continuous load current/ Peak load current (100ms)
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 
★ AQW610EH	1:1 		350V	• 0.12A / 0.36A 
★ AQW614EH	DIP : 9.86 x 6.4 x 3.2mm SMD: 9.86 x 6.4 x 2.9mm		400V	• 0.1A / 0.3A 
AQW614	1:1 		400V	• 0.1A / 0.3A 
AQW654	DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm		400V	• 0.12A / 0.36A 
Multichannel				
AQS221N2S	1:1 	Low CxR	40V	• 0.06A / 0.12A 
AQS225R2S	10.37 x 4.4 x 2.1mm	Low CxR	80V	• 0.07A / 0.2A 

Photovoltaic MOSFET drivers


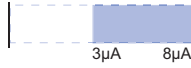


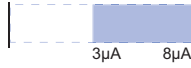
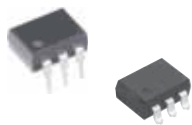

Type ★ = Popular Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output	
			Drop-out voltage (typical/min.)	Short circuit current (typical/min.)
★ APV2111V	1:1  2.65 x 4.45 x 1.8mm	<ul style="list-style-type: none"> Ultra small SSOP housing 	8.2/5.0V	<ul style="list-style-type: none"> 8 / 3μA 
APV1121S	1:1  4.3 x 4.4 x 2mm	<ul style="list-style-type: none"> Ultra small SMD (SOP) housing 	8.7/6.0V	<ul style="list-style-type: none"> 14 / 5μA 
APV2121S		<ul style="list-style-type: none"> Ultra small SMD (SOP) housing 	8.2/5.0V	<ul style="list-style-type: none"> 8 / 3μA 
APV1122	1:1  DIP : 8.8 x 6.4 x 3.4mm SMD: 8.8 x 6.4 x 3.4mm	<ul style="list-style-type: none"> 5000V breakdown voltage 	8.7/6.0V	<ul style="list-style-type: none"> 14 / 5μA 

Photo-Triac Couplers











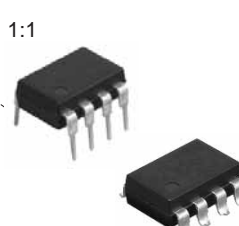




Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output			
			Repetitive peak OFF-state voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)/	Peak ON-state voltage (max.)	Peak OFF-state current (max.)
APT1211S	<p>1:1</p>  <p>4.3 x 4.4 x 2.1mm</p>	<ul style="list-style-type: none"> • Zero-cross • SOP 4 pin 	• 600V	<ul style="list-style-type: none"> • 0.05A / 0.6A 	2.5V	1μA
APT1221S		<ul style="list-style-type: none"> • Non zero-cross • SOP 4 pin 				
APT1231S		<ul style="list-style-type: none"> • Low zero-cross • SOP 4 pin 			2.0V	
APT1211	<p>1:1</p>  <p>DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm</p>	<ul style="list-style-type: none"> • Zero-cross • DIP 4 pin 	• 600V	<ul style="list-style-type: none"> • 0.1A / 1.2A 	2.5V	1μA
APT1221		<ul style="list-style-type: none"> • Non zero-cross • DIP 4 pin 				
APT1231		<ul style="list-style-type: none"> • Low zero-cross • DIP 4 pin 			2.0V	
APT1212	<p>1:1</p>  <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>	<ul style="list-style-type: none"> • Zero-cross • DIP 6 pin 	• 600V	<ul style="list-style-type: none"> • 0.1A / 1.2A 	2.5V	1μA
APT1222		<ul style="list-style-type: none"> • Non zero-cross • DIP 6 pin 				
APT1232		<ul style="list-style-type: none"> • Low zero-cross • DIP 6 pin 			2.0V	

Photo-Triac Couplers

Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output			
			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.)
APT1211W	 <p>1:1</p> <p>DIP : 4.78 x 6.4 x 3.2mm SMD: 4.78 x 6.4 x 2.9mm</p>	<ul style="list-style-type: none"> • Zero-cross • DIP 4 pin wide terminal 	<ul style="list-style-type: none"> • 600V 	<ul style="list-style-type: none"> • 0.1A / 1.2A 	2.5V	1μA
APT1221W		<ul style="list-style-type: none"> • Non zero-cross • DIP 4 pin wide terminal 				
APT1231W		<ul style="list-style-type: none"> • Low zero-cross • DIP 4 pin wide terminal 			2.0V	
APT1212W	 <p>1:1</p> <p>DIP : 8.8 x 6.4 x 3.9mm SMD: 8.8 x 6.4 x 3.6mm</p>	<ul style="list-style-type: none"> • Zero-cross • DIP 6 pin wide terminal 	<ul style="list-style-type: none"> • 600V 	<ul style="list-style-type: none"> • 0.1A / 1.2A 	2.5V	1μA
APT1222W		<ul style="list-style-type: none"> • Non zero-cross • DIP 6 pin wide terminal 				
APT1231W		<ul style="list-style-type: none"> • Low zero-cross • DIP 6 pin wide terminal 			2.0V	






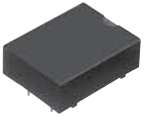








AQH Relays

Type	Photo with Dimensions (Picture scale: DIN A4)	Features	Output			
			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.)
AQH0213	 <p>DIP : 9.78 x 6.4 x 3.9mm SMD: 9.78 x 6.4 x 3.6mm</p>	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	• 600V	<ul style="list-style-type: none"> • 0.3A / 3A 	2.5V	100μA
AQH0223		<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 				
AQH1213		<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	• 600V	<ul style="list-style-type: none"> • 0.6A / 6A 	2.5V	100μA
AQH1223		<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 				
AQH2213		<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	• 600V	<ul style="list-style-type: none"> • 0.9A / 9A 	2.5V	100μA
AQH2223		<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 				
AQH3213		<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	• 600V	<ul style="list-style-type: none"> • 1.2A / 12A 	2.5V	100μA
AQH3223		<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 				

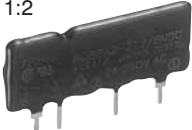


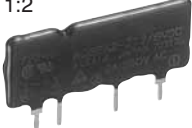








Solid State SIL and DIL Types

Type	Features	Output		
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)
AQG 1A 1:1  24.5 x 4.5 x 13.5mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross • Integrated snubber circuit 	• 75 - 264V AC	• 1A / 8A 	1.5mA
	<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross • Integrated snubber circuit 	• 75 - 264V AC	• 1A / 8A 	1.5mA
AQG 2A 1:1  24.5 x 4.5 x 20.5mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross • Integrated snubber circuit 	• 75 - 264V AC	• 2A / 30A 	1.5mA
	<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross • Integrated snubber circuit 	• 75 - 264V AC	• 2A / 30A 	1.5mA
AQ-C AC input, DC input 1:2  20 x 10 x 12.8mm	<ul style="list-style-type: none"> • Photo-Transistor • AC input type 	• 4 - 32V DC	• 25mA / - 	5µA
	<ul style="list-style-type: none"> • Photo-Transistor • DC input type 	• 4 - 32V DC	• 25mA / - 	5µA
AQ-C 1A (AC output) 1:2  20 x 10 x 12.8mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	• 75 - 125V AC • 75 - 250V AC	• 1A / 20A 	1.1mA
	<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 	• 75 - 125V AC • 75 - 250V AC	• 1A / 20A 	1.1mA
AQ-C 1A (DC output) 1:2  20 x 10 x 12.8mm	<ul style="list-style-type: none"> • Photo-Transistor 	• 3 - 60V DC	• 1A / 1.5A (1s) 	0.1mA










Solid State SIL and DIL Types

Type	Features	Output		
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)
AQ1 1A (DC output) 1:2  33 x 10 x 25.1mm	<ul style="list-style-type: none"> • Photo-Transistor 	<ul style="list-style-type: none"> • 10 - 200V DC 	<ul style="list-style-type: none"> • 1A / 5A (1s) 	1mA
AQ1 2A (DC output) 1:2  33 x 10 x 25.1mm	<ul style="list-style-type: none"> • Photo-Transistor 	<ul style="list-style-type: none"> • 3 - 60V DC 	<ul style="list-style-type: none"> • 2A / 5A (1s) 	1mA
AQ1 2A (AC output) 1:2  33 x 10 x 25.1mm  33 x 25 x 12mm	<ul style="list-style-type: none"> • Photo-Transistor • Zero-cross 	<ul style="list-style-type: none"> • 75 - 250V AC 	<ul style="list-style-type: none"> • 2A / 80A 	5mA
AQ1 3A (AC output) 1:2  33 x 10 x 25.1mm  33 x 25 x 12mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross • Non zero-cross available 	<ul style="list-style-type: none"> • 75 - 250V AC 	<ul style="list-style-type: none"> • 3A / 100A 	5mA
AQ1 5A (AC output) 1:2  54 x 26mm	<ul style="list-style-type: none"> • Photo-Transistor • Zero-cross 	<ul style="list-style-type: none"> • 75 - 250V AC 	<ul style="list-style-type: none"> • 5A (3A without heat sink) / 100A 	5mA
AQ1 10A (AC output) 1:2  54 x 26mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross • Non zero-cross available 	<ul style="list-style-type: none"> • 75 - 250V AC 	<ul style="list-style-type: none"> • 10A (5A without heat sink) / 100A 	5mA











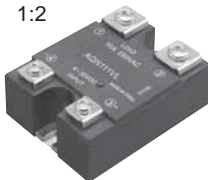





Solid State SIL and DIL Types

Type	Features	Output		
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)
AQ-B 1A 1:2  43 x 9 x 20mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 1A / 10A 	1.1mA
	<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 1A / 10A 	1.1mA
AQ-B 2A 1:2  43 x 9 x 20mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 2A / 20A 	1.1mA
	<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 2A / 20A 	1.1mA
AQ8 2A 1:2  45 x 9 x 24mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 2A / 30A 	5mA
	<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 2A / 30A 	5mA
AQ8 3A 1:2  43 x 9 x 32mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 3A / 80A 	5mA
	<ul style="list-style-type: none"> • Photo-Triac • Non zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 3A / 80A 	5mA


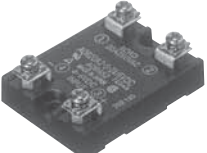






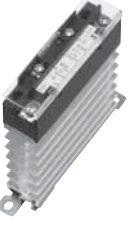


Solid State SIL and DIL Types

Type	Features	Output		
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)
I/O RELAY AC input modules 1:2  43 x 10 x 20.5mm	<ul style="list-style-type: none"> • Photo-Transistor 	<ul style="list-style-type: none"> • 4 - 15V DC • 10 - 32V DC 	<ul style="list-style-type: none"> • 15mA / - 	100µA
I/O RELAY DC input modules 1:2  43 x 10 x 20.5mm	<ul style="list-style-type: none"> • Photo-Transistor 	<ul style="list-style-type: none"> • 4 - 15V DC • 10 - 32V DC 	<ul style="list-style-type: none"> • 15mA / - 	100µA
I/O RELAY AC output modules 1:2  43 x 10 x 20.5mm	<ul style="list-style-type: none"> • Photo-Transistor • Zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 2A / 30A 	5mA
I/O RELAY DC output modules 1:2  43 x 10 x 20.5mm	<ul style="list-style-type: none"> • Photo-Transistor • Zero-cross 	<ul style="list-style-type: none"> • 3 - 60V DC • 10 - 200V DC 	<ul style="list-style-type: none"> • 2A / 5A (1s)  <ul style="list-style-type: none"> • 1A 	1mA

Solid State Other Types

Type	Features	Output		
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)
Solid State Plug-in Terminals				
AQ-F 2A/3A (AC output) 1:2  27 x 21 x 35.2mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	• 75 - 250V AC	• 2A / 80A  2A	5mA
	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	• 75 - 250V AC	• 3A / 80A  3A	5mA
AQ-F 2A/3A (DC output) 1:2  27 x 21 x 35.2mm	<ul style="list-style-type: none"> • Photo-Triac 	• 3 - 60V DC	• 2A / 5A  2A	1mA
	<ul style="list-style-type: none"> • Photo-Triac 	• 3 - 60V DC	• 3A / 6A  3A	1mA
Solid State Hockey Puck Types				
AQ-J 1:2  38 x 28 x 17mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross • Ultra-compact size • Built-in varistor 	• 75 - 264V AC	• 10A / 100A  10A	5mA
			• 15A / 150A  15A	
			• 25A / 250A  25A	
AQ-N 1:2  59 x 44.8 x 12.5mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross • Non zero-cross available 	• 75 - 250V AC	• 10A / 100A  10A	10mA
			• 15A / 150A  15A	
			• 20A / 200A  20A	
			• 25A / 250A  25A	
			• 40A / 400A  40A	

Solid State Other Types

Type	Features	Output		
		Load voltage	Max. load current/ Non-repetitive surge current (1 cycle, 60Hz)	OFF-state leakage current (max.)
AQ-R 10A/15A/20A 1:2  59 x 44.8 x 12.5mm  59 x 44.8 x 12.5mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 10A / 100A 	5mA
	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 15A / 150A 	5mA
	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 125V AC • 75 - 250V AC 	<ul style="list-style-type: none"> • 20A / 200A 	5mA
AQ-R 30A/40A 1:2  59 x 44.8 x 12.5mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 250V AC 	<ul style="list-style-type: none"> • 30A / 300A 	5mA
	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 250V AC 	<ul style="list-style-type: none"> • 40A / 400A 	5mA
Solid State DIN Rail Types				
AQ-K 1:2  102 x 22.5 x 100mm	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 250V AC 	<ul style="list-style-type: none"> • 15A / 150A 	9mA
	<ul style="list-style-type: none"> • Photo-Triac • Zero-cross 	<ul style="list-style-type: none"> • 75 - 250V AC 	<ul style="list-style-type: none"> • 25A / 250A 	9mA

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