

Product Highlights

COMPONENT GUIDE

Technology leading components
for automotive and industrial systems



Introduction to electromechanical relays:

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 is able to meet both simple and complex demands from its vast range of sophisticated, economic switching technologies by offering the most appropriate relay to solve specific applications. 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 electromechanical and semiconductor types. Load switching capability ranges from low-level signals to high level values. Panasonic relays are available for all common mounting configurations with screw solder or surface mount terminals.

Contact materials and their attributes

Contact material	Ag (silver)	Highest electrical and thermal conductivity of all metals which contributes in low contact resistance
	AgSnO ₂ (silver-tin)	Exhibits superior welding resistance against capacitive loads which result in high inrush currents and low contact erosion for inductive loads
	AgW (silver-tungsten)	Also known as tungsten pre-contact. Realized in special type of DJ relay (on request) for handling inrush currents up to 600A on request.
	AgNi	Excellent arc resistance which leads to very low contact erosion while switching off inductive loads
	AgPd (silver palladium)	Advantageously for low level loads with inrush characteristic
Surface finish	Au clad (gold clad or gold plating)	<ul style="list-style-type: none"> great corrosion resistance especially in adverse atmospheres (pressure welded onto a base metal) uniform thickness and non-existent pinholes
	Au flash plating (0,1 to 0,5µm)	<ul style="list-style-type: none"> protection of the contact base metal during transport & storage will be destroyed after several switching cycles due to low thickness

The design of Panasonic relays is optimized, and contacts are the most important elements of relay construction. Contact performance is influenced by contact material, voltage and current values applied to the contacts, type of load, frequency of switching, ambient atmosphere, form of contact, contact switching speed, bounce...

DW-H series:

Strong performance at a great price



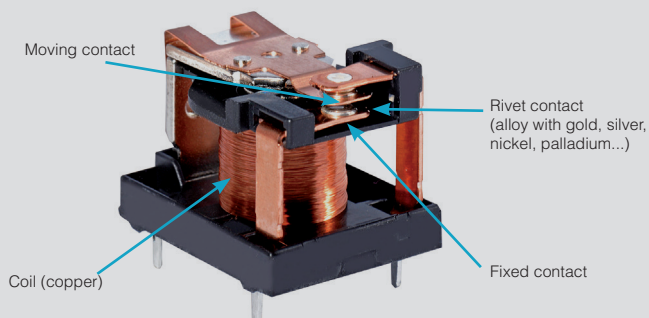
Size in mm: 24x10x15.8 (LxWxH)

Compact 16A high power relay with 1 Form A / 16A contact

- › Reflowable (LCP material) type available
- › EN 60335 (PBT material) type available
- › 16A switching current
- › Small dimensions
- › Low profile type available

Switching current	16A
Max. switching voltage	277V AC
Contact arrangement	1 Form A
Breakdown voltage between open contacts	1000Vrms
Breakdown voltage between contacts and coil	5000Vrms
Surge withstand voltage	12,000V (initial)
Coil voltage	(DC) 3, 5, 6, 9, 12, 24V
Coil power	200mW/400mW
Mounting method	Print
Ambient temperature	-40°C to +85°C (-40°F to +185°F)

Internal structure of a relay



Typical applications



White goods

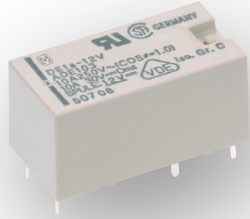


Smart metering



Home automation

DE series: Compact relays



Size in mm: 25 x 12.5 x 12.5 (LxWxH)

DJ series: High-current switching relays



Size in mm: 29 x 13 x 16 (LxWxH)

Miniature polarized 8A/10A power relay

- › Low coil power
- › High switching capacity: 16A = 25,000;
10A = 100,000 switching cycles
- › Creepage and clearance distance: min. 8mm
- › Mounting method: PCB
- › Conforms to European safety standards: EN60730 and EN60335

Switching current	Max: 8A (1a1b, 2a) ; 10/16A (1a)
Max. switching voltage	230V DC; 440V AC
Contact arrangement	1a, 1a1b, 2a
Breakdown voltage between open contacts	1000Vrms
Breakdown voltage between contact sets	4000Vrms (1a1b, 2a)
Breakdown voltage between contacts and coil	5000Vrms
Surge withstand voltage	12,000V
Coil voltage	(DC) 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V
Coil power	Single side stable: 200mW 1 coil latching: 100mW 2 coil latching: 200mW
Ambient temperature	-40°C to +70°C (-40°F to +158°F)

Compact polarized with high capacity power relay 16A up to 20A*

- › Latching type available
- › Low coil power
- › Optional available with manual test button
- › Creepage and clearance distance: min. 8mm
- › Mounting method: PCB

Switching current	Max: 16A, up to 20A
Max. switching voltage	125V DC; 400V AC
Contact arrangement	1a, 1b, 1c, 1a1b, 2a, 2b, 2c
Breakdown voltage between open contacts	1000Vrms
Breakdown voltage between contacts and coil	4000Vrms
Surge withstand voltage	10,000V
Coil voltage	(DC) 5, 6, 12, 24, 48V
Coil power	Single side stable: 250mW 1 coil latching: 150mW 2 coil latching: 250mW
Ambient temperature	-40°C to +70°C (-40°F to +158°F)

* 20A acceptable under certain conditions (please consult us)

Typical applications



Smart metering



Home automation

Typical applications



Electric power

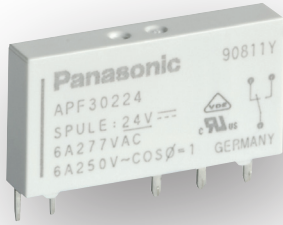


Lighting



Time switches

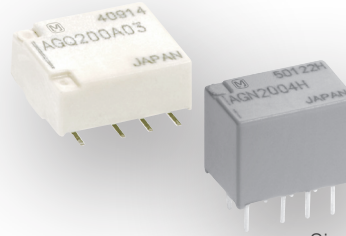
PF series: Slim 6A relay



Print socket available with LED indicator

Size in mm: 28 x 5 x 15 (LxWxH)

AGN/AGQ series



Size in mm: AGN: 10.6 x 5.7 x 9.0 / AGQ: 10.6 x 7.2 x 5.2 (LxWxH)

Very slim type relays with high power capacity

- › Optimized lifetime
- › Slim size with wide switching capacity
- › High surge voltage (6000V) and high breakdown voltage (4000V)
- › Insulation construction conforms to VDE0700
- › Contacts with silver nickel or silver nickel gold-clad (also available with AgSnO2 contact material)
- › Clearance/creepage distance min. 5.5mm/8mm

Switching current	6A (up to 8A*)
Max. switching voltage	300V DC; 400V AC
Contact arrangement	1a, 1c
Breakdown voltage between open contacts	1000Vrms
Breakdown voltage between contacts and coil	4000Vrms
Surge withstand voltage	6000V
Coil voltage	(DC) 4.5, 5, 6, 12, 18, 24, 48, 60V
Coil power	170mW (5 to 24V) 217mW (48V) 175mW (60V)
Mounting method	PCB
Ambient temperature	-40°C to +85°C (-40°F to +185°F)

* 8A 277V AC General use (UL, C-UL, File No. E120782)
8A 250V AC (VDE File No. 40027672)

Very slim or flat signal relay

- › Nominal operating power of 100mW available
- › Sealed according to RTIII (IP67)
- › Increased packaging density
- › Mounting method: PCB, SMT
- › Twin crossbar contacts ensure high contact reliability
- › Stationary contact: AgPd+Au clad movable contact: AgPd

Switching current	Max: 2A; min: 10µA
Max. switching voltage	110V DC; 125V AC
Contact arrangement	2c
Breakdown voltage between open contacts	750Vrms
Breakdown voltage between contact sets	1000Vrms
Breakdown voltage between contacts and coil	1500Vrms
Surge withstand voltage	1500V FCC; 2500V Bellcore (Telcordia)
Coil voltage	1.5, 3, 4.5, 6, 9, 12, 24V
Coil power	Single side stable standard: 140mW (1.5 to 12V DC); 230mW (24V DC) Single side stable sensitive: 100mW (1.5 to 12V DC); 120mW (24V DC) 1 coil latching: 100mW (1.5 to 12V DC); 120mW (24V DC)
Ambient temperature	(Single side stable, 1 coil latching type) -40°C to +85°C (-40°F to +185°F) (High sensitivity single side stable type) -40°C to +70°C (-40°F to +158°F)

Typical applications



Interface modules



Timers

Typical applications



High packing density suitable for battery power applications

HE-Y6: Smallest 90A in the market

Size in mm: 33 x 38 x 38.8 (LxWxH)

Advanced power range for relays

- › High capacity switching 90A 277VAC
- › Compact size W:38x L:33 x H:38,8mm
- › Energy efficiency by coil holding power of 310mW only
- › Contact gap of 3,0mm
- › Mounting method: PCB

Switching current	90A AC, 60A DC
Max. switching voltage	277V AC, 60V DC
Contact arrangement	1a
Breakdown voltage between open contacts	2000Vrms
Breakdown voltage between contacts and coil	5000Vrms
Surge withstand voltage	10,000V
Coil voltage	(DC) 6, 9, 12, 24V
Coil power	1,920 W (holding power: 310 mW)
Mounting method	PCB
Ambient temperature	-40°C to +85°C (-40°F to +185°F)

PAN- 5A: Relay at 5mm width

Size in mm: 20 x 5 x 12.5 (LxWxH)

Reinforced insulation for PLC and interface modules

- › Strong electrical endurance for various loads (resistive, inductive, capacitive)
- › Smallest size W: 5 x L: 20 x H: 12.5 mm (bent pin version 5mm height possible)
- › Reinforced insulation acc. to IEC 61010-1 by clearance of 5,29mm and creepage of 5,35mm
- › Sealed construction complies with standards for Hazardous locations (ATEX)

Switching current	5A (AC); 5A (DC)
Max. switching voltage	110VDC ; 250VAC
Contact arrangement	1a
Breakdown voltage between open contacts	1000Vrms (Form A contacts)
Breakdown voltage between contacts and coil	3000Vrms (Form A contact and coil)
Surge withstand voltage	6000V
Coil voltage	(DC) 3; 4,5; 5; 6; 9; 12; 18; 24V
Coil power	110mW
Ambient temperature	-40°C to +90°C (-40°F to +194°F)

Typical applications

Solar inverters



Charging station



Battery storage

Elevators and
escalators

UPS systems

Typical applications

PLC I/O modules



Interface modules

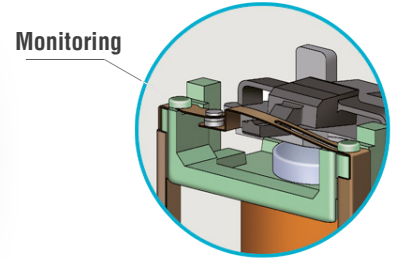
Lowest height
applications by bent
pin version

DJ-H: 50A relay dedicated for high inrush currents (EN 60669-1)



Size in mm: 39 x 15 x 33 (LxWxH)

HE-S: 2FormA 35A rating at smallest package size



Size in mm: 36 x 30 x 40 (LxWxH)

Latching relay including manual lever

- › High-capacity switching 50A 277V AC 10.000 switching cycles
- › Capable of handling inrush currents up to 600A for loads like 200µF 20A acc. to EN 60669-1
- › Compact size
- › Reinforced insulation: Clearance/ creepage distances btw. coil/contact > 10mm
- › Activation power 1W only (latching)

Switching current	50A
Max. switching voltage	480V AC
Contact arrangement	1a
Breakdown voltage between open contacts	1500Vrms
Breakdown voltage between contacts and coil	4000Vrms
Surge withstand voltage	12,000V
Coil voltage	5, 6, 9, 12, 24V (DC)
Coil power	1 coil latching: 1W 2 coil latching: 2W
Ambient temperature	-40°C to +85°C (-40°F to +185°F)

The first power relay which integrates safety by feedback contact mechanism

- › High-capacity and long life 35A 277V AC 50.000 switching cycles
- › Compact size
- › Integrated safety by mirror contact mechanisms acc. to EN60947-4-1
- › Energy efficiency by coil holding power of 170mW only
- › Contact gap: 3.2 mm (VDE0126 compliant)

Switching current	35A for each contact (AC), 30A DC
Max. switching voltage	300V DC contacts in series; 480V AC
Contact arrangement	2a, 2a1b
Breakdown voltage between open contacts	2000Vrms (Form A contacts)
Breakdown voltage between contacts and coil	5000Vrms (Form A contact and coil)
Surge withstand voltage	10,000V
Coil voltage	(DC) 5, 6, 9, 12, 24, 48V
Coil power	1880 mW (holding power: 170 mW)
Ambient temperature	-40°C to +85°C (-40°F to +185°F)

Typical applications



Lighting applications in the IOT

Typical applications



Solar inverters



Battery storage systems



Electric vehicle charging station

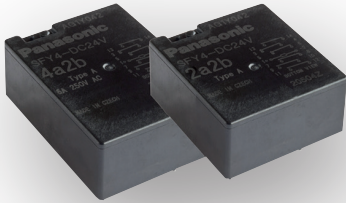


Elevators and escalators



UPS systems

SF-Y series: Compact, flat relays with forcibly guided contacts



Size in mm: 31 / 39 x 28.6 x 14.5 (LxWxH)

Approvals: EN61810-1, EN50205, EN50178

- › Reinforced insulation
- › Available as 4-pole and 6-pole types with various contact arrangements
- › Gold-clad contacts available upon request
- › Polarized rotating armature for low nominal operating power and high shock and vibration resistance

Switching current	Max.: 6A; min.: 1mA
Max. switching voltage	30V DC; 250V AC
Contact arrangement	2a2b, 3a1b, 4a2b, 5a1b
Breakdown voltage between open contacts	1500Vrms
Breakdown voltage between contact sets	4000Vrms
Breakdown voltage between contacts and coil	4000Vrms, 2500Vrms
Coil voltage	(DC) 5, 12, 18, 21, 24
Coil power	670mW
Mounting method	PCB
Ambient temperature	-40°C to +70°C (-40°F to +158°F), +85°C on request

EP series: High capacity DC cut-off relays



Size in mm (80A type): 79 x 75.5 x 40 (LxWxH)

High capacity of max. 1000V DC cut-off possible

- › High capacity to cut off DC voltage in a compact relay: max. cut-off current 2500A/300V DC (300A)
- › Nominal switching capacity (300A 400V DC)
- › Low operating noise
- › High contact reliability
- › DC type with sealed capsule and arc-space-free construction

Max. switching voltage	400V DC
Switching capability (1a)	Max: from 10A to 300A; min: 1A
Breakdown voltage between open contacts	2500Vrms
Breakdown voltage between contacts and coil	2500Vrms
Coil voltage	(DC) 12, 24, 48, 100V
Coil power	From 1.4W to 4.5W (10A...80A) 300A: 45W then 4W (after 100ms)
Mounting method	Screw terminal
Ambient temperature	-40°C to +80°C (-40°F to +176°F)

Typical applications



Elevators



Safety control modules



Machine safety



Railway and signal technology



Medical technology

Typical applications



Solar inverter



Battery charge and discharge control

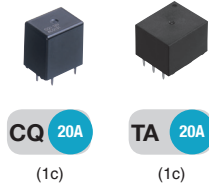


Electric vehicle charging station

Printed circuit board relays

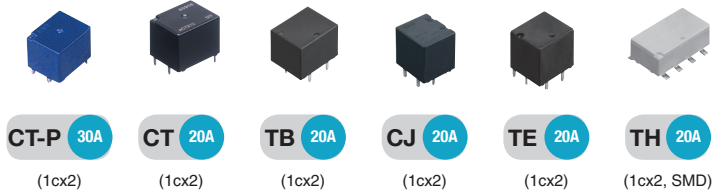
Silent type

for quiet operation



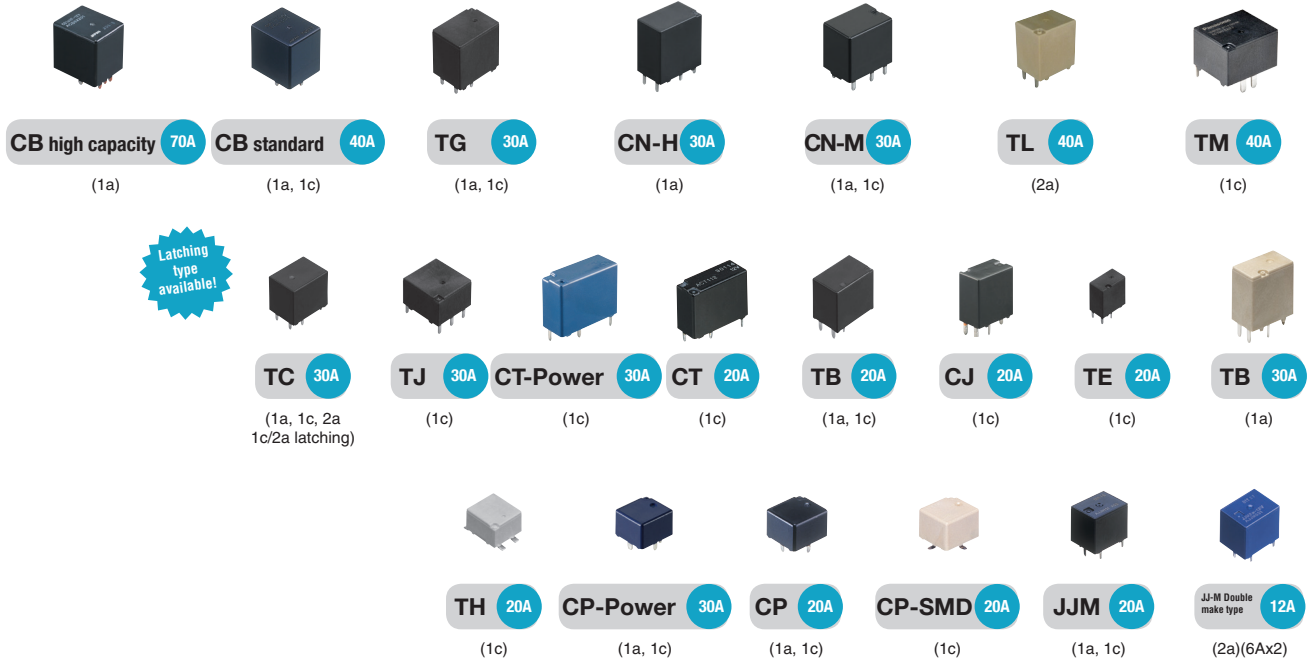
Twin type

for motor reversing application



Single type

for various applications



Panasonic has been contributing to the ever increasing need for innovation in transportation electronics for decades, with highly reliable, long lasting devices for safety, comfort, entertainment and powertrain applications.

Presenting a broad range of automotive PC board relays Panasonic can offer a suitable and cost efficient switching solution for almost any application.

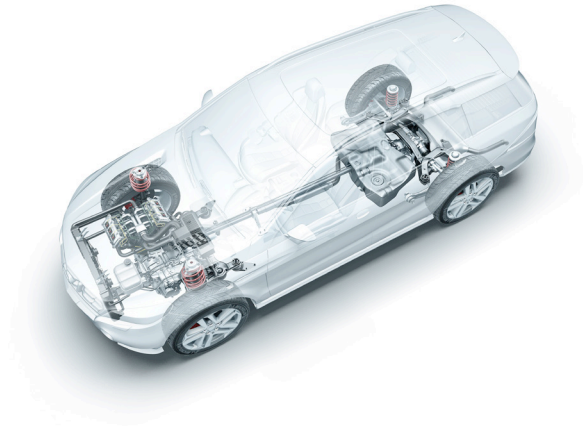
- › Nominal currents up to 70A
- › Twin relays as 10-pin type or as 8-pin type (integrated H-bridge) for motor reversing applications
- › Types with Pin-in-Paste (PIP) or SMD mounting are available
- › Flat or slim types for space saving applications
- › TC relay as latching type available
- › Special silent relays with extremely low sound pressure

EV series: Relays for hybrid and electric vehicles

Panasonic Electric Works' EV relay series can already be found in several million vehicles on the streets of Asia, America and Europe. These relays are optimized for each application, come in several shapes and sizes and cover all performance classes. Panasonic has developed new types with more than 6000A short circuit capability without electromagnetic repulsion. This adds more safety to the system in case extreme short circuit current has to be cut-off by the fuse.

High carrying and cut-off performance

- › Nominal currents up to 300A
- › New high short circuit types (without electromagnetic repulsion)
- › Plug-in types for faster assembly
- › Silent types for quiet operation
- › Several customizations possible (mounting position, coil connector, contact material...)



Pre-charge relay



DC-charger relay
(Normal or fast charge)



Maintenance switch (SDS)



Battery disconnect
relays

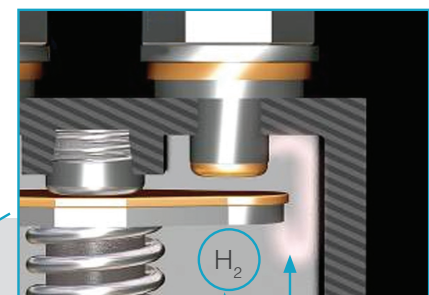


Relay for auxiliary applications
(Aircondition, heater,
DC/AC converter, etc.)

Mode of operation

When a high voltage circuit is opened, a strong arc will be formed between the contacts. This arc expands due to the presence of a magnetic field, which is used to weaken it even further, Panasonic uses inert gas (H_2) which rapidly extinguishes the arc. Typical voltage drop is approximately 400V DC.

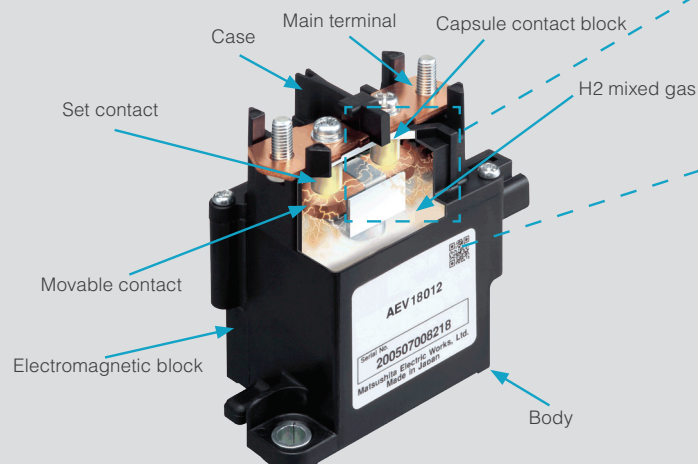
EV relay internal view



Inert gas extinguishes
the arc

Arc

The arc is pulled towards the
wall by permanent magnet



H_2 mixed gas

Introduction to PhotoMOS and Solid State Relays

What makes PhotoMOS relays so successful?

Modern semiconductor technology enables fast, quiet, bounce-free switching, even in miniature sizes. PhotoMOS relays nevertheless enjoy an almost unlimited lifetime if used according to the specifications. Moreover, they are extremely reliable, unaffected by vibrations, and their ON-resistance remains stable throughout their entire lifetime.

The most important advantages at a glance

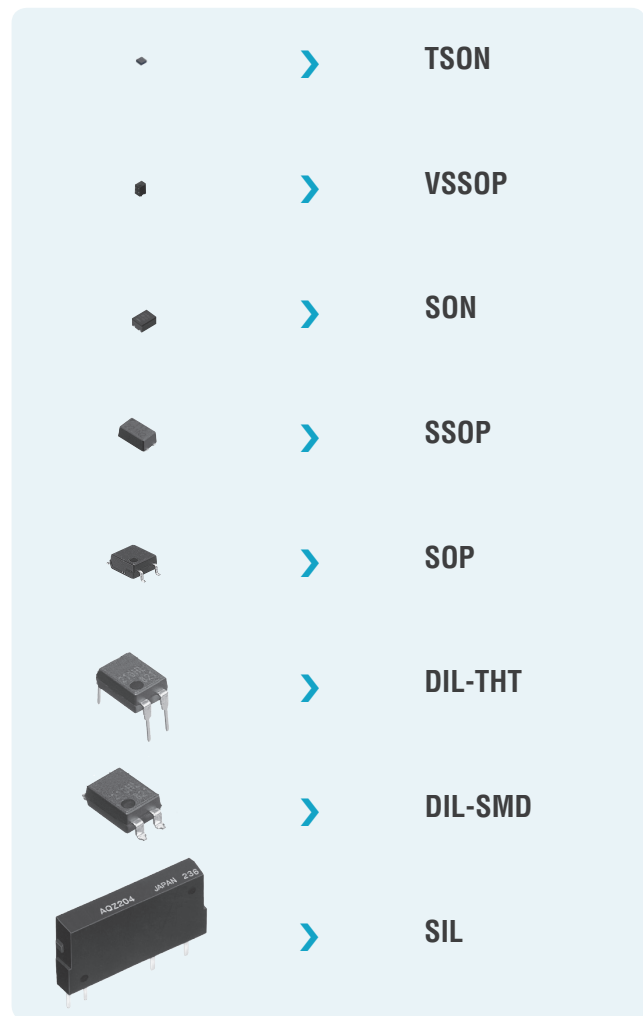
- › Galvanic I/O isolation
- › Linear output characteristics
- › No threshold voltage
- › Low operate current (sensitive type $\leq 0.31\text{mA}$)
- › Low output capacitance (RF type $\leq 1\text{pF}$)
- › Absolute minimum leakage current (pA)
- › Extremely long lifetime
- › Stable ON-resistance over the entire lifetime
- › Extremely compact design (VSSOP, SON, SSOP, SOP)
- › No contact bounce
- › Highly resistant to shock and vibration
- › Flexible mounting orientation

Smartphone App:

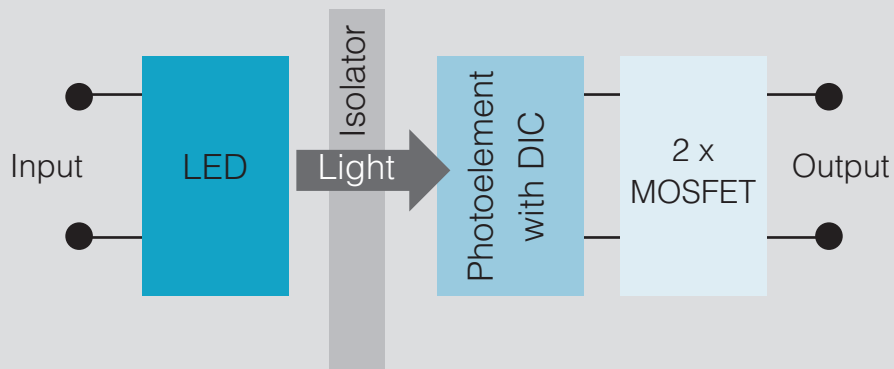
A clear and straight-forward navigation with three different search options helps you to find the best PhotoMOS for your application.



Various packages available



PhotoMOS technology



PhotoMOS[®] Relay

AQY2C1R6P / AQY2C1R2P / AQY2C2R2P series:
Capacitive coupled MOSFET Relay



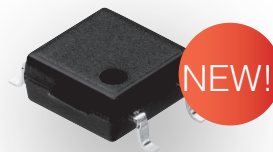
Size in mm: 1.8 x 1.95 x 0.8mm (LxWxH)

Ultraminiature PhotoMOS relay with low CxR MOSFETS on the output

- › Operating temperature max. +105°C
- › Low input current of max. 0,2 mA
- › Control by μ Controller directly due to voltage mode (3-5V)
- › On-/Off times in the range of μ S
- › Very compact TSON package

Item	Symbol	AQY2C1R6P	AQY2C1R2P	AQY2C2R2P
Output configuration		1 Form A		
Input voltage	V_{IN}	3-5V		
Load voltage	V_L	30V	40V	60V
Load current	I_L	0.75A	0.3A	0.3A
I/O isolation voltage	V_{iso}	200V AC		
Operating temperature	T_{opr}	-40°C ~ +105°C		
Storage temperature	T_{str}	-40°C ~ +125°C		
Operate voltage	V_{Fon}	Typ. 1.7V	Typ. 1.8V	Typ. 1.6V
Input current at $V_{IN}=3.3V$	I_{IN}	Max. 0.1mA		
Input current at $V_{IN}=5V$	I_{IN}	Max. 0.2mA		
On resistance at $V_{IN}=3.3V$	R_{on}	Typ. 0.22 Ω	Typ. 0.9 Ω	Typ. 1 Ω
Output capacitance	C_{out}	Typ. 40pF	Typ. 14.5pF	Typ. 27pF
Leakage current	I_{Leak}	Max. 10nA	Max. 10nA	Max. 10nA
Turn on time at $V_{IN}=3.3V$	T_{on}	Typ. 0.25ms	Typ. 0.15ms	Typ. 0.18ms
Turn off time at $V_{IN}=3.3V$	T_{off}	Typ. 0.06ms	Typ. 0.04ms	Typ. 0.06ms

APS1551S: High Speed Photo IC coupler

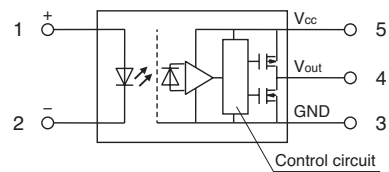


Size in mm: 4.4 x 4.3 x 2.1mm (LxWxH)

Up to 50 MBd switching speed

- › Operating temperature max. +105°C
- › Common mode transient rejection (CMTR) min. 15 kV/ μ s
- › Compact 5-pin SOP6 package
- › Isolation voltage: 3750Vrms
- › Totem pole output type

Package	5-pin SOP6 (6.8 x 4.3 x 2.1 mm)
Switching speed (standard)	Typ. 50 MBd
Common mode transient immunity (CMTI)	Min. 15 kV/μs
Operating temperature	-40 to 105°C
Power supply voltage	4.5 to 5.5 V
Input current	10 to 16 mA
Supply current (current consumption)	Max. 5 mA
Propagation delay time	Max. 30 ns
Pulse width distortion	Max. 10 ns
Isolation voltage	Min. 3750 Vrms



Typical applications



IC & Board Tester



Medicine market

Typical applications



PLC

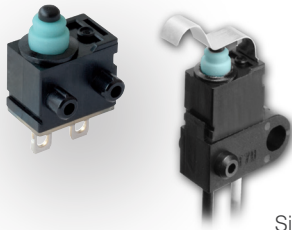


Measurement market



Control panels for Infrastructure

ASQ Mini: Turquoise stroke mini switches



Size in mm: 8.3 x 5.3 x 7.85 (LxWxH)

Smallest size in IP67

- › Miniaturization achieved with changing from 1 Form C to 1 Form A or 1 Form B contacts. (For the terminal type, volume has been cut 45% compared to our previous product.)
- › Lever installation possible while being miniature. Operation possible in various moving parts such as metal cams.
- › Contact pressure does not depend on the operation stroke
- › High contact reliability to support low level switching loads
- › Highly effective sealing for resistance against adverse environments (IP67)
- › Silent operation with sliding contact

Electrical switching life	5VDC 1mA (resistive load): min. 3 x 10 ⁵ 12VDC 50mA (resistive load): min. 2 x 10 ⁵ 16VDC 50mA (resistive load): min. 1.5 x 10 ⁵
Switching frequency	20 times/min
Pushbutton operation speed	30 to 500mm/s
Degree of protection	IP67

Actuator type:	Operating force, max.:
Pin plunger	1.2N
Simulated roller lever	1.5N

ASQM fork shape: For press fit



Size in mm: 8.3 x 5.3 x 7.85 (LxWxH)

Solderless connection

- › ASQM with fork shape
- › Press fit solution
- › Contributes to a time and cost-efficient production process

Electrical switching life	5VDC 1mA (resistive load): min. 3 x 10 ⁵ 12VDC 50mA (resistive load): min. 2 x 10 ⁵ 16VDC 50mA (resistive load): min. 1.5 x 10 ⁵
Switching frequency	20 times/min
Pushbutton operation speed	30 to 500mm/s
Degree of protection	IP67

Actuator type:	Operating force, max.:
Pin plunger	1.2N
Simulated roller lever	1.5N

Typical applications



Seat comfort



Air condition



Gear shifter



HUD



Blind control



Coffee machine



Access control
(Latches)

ASQ series: Sliding contact construction



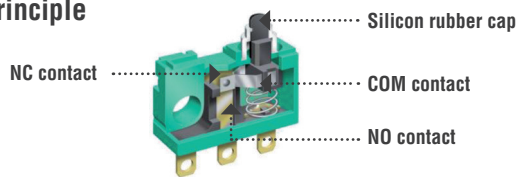
Size in mm: 13.3 x 5.4 x 10.1 (LxWxH)

Highly resistant to harsh environments, suitable for all markets

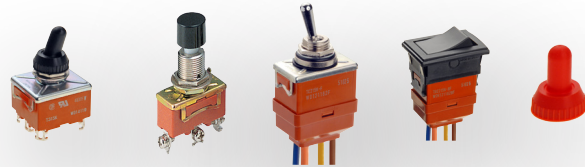
- › Tightness class conforming to IP67
- › High contact reliability thanks to double-sided sliding & gold-plated contact
- › Ultra long stroke of 2.5mm for NC contact
- › Stable contact pressure without bouncing
- › No operational click sound by sliding contact
- › Direct lateral actuation of the pin plunger

Electrical switching life	5VDC 1mA (resistive load): min. 5 x 10 ⁵ 16VDC 50mA (resistive load): min. 5 x 10 ⁵ 30VDC 100mA (resistive load): min. 2 x 10 ⁵
Switching frequency	20 times/min.
Pushbutton operation speed	30 to 500mm/s
Degree of protection	IP67

Working principle



T-Series: Including toggle-, rocker- and push button switches



With new UL61058

- › Sealed types available
- › Portfolio includes up to 4-pole type
- › Momentary and alternate function
- › Various terminal types make installation easy
- › Accessories for custom needs

Switching capacity:	Up to 15A/250VAC 15A/30VDC
Inrush current:	40A max.
Degree of protection:	up to IP67

Customized solutions

Please consult us for customized solutions:

Wire cutting, wire welding, hot melt potting, contact crimping, over molding, 100% end test, marking & packing.



Typical applications

- Automotive
(door locking units)
- Automotive
(steering column lock)
- Automotive
(comfort applications)
- E-bike
- Vacuum cleaner

Typical applications

- Radio control
- Forklift
- Good lifts
- Agriculture devices
- Industrial power
supply

EKMB



EKMC



Plug & Sense PIR

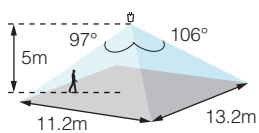
- › Amplifier and Comparator
- › Digital Output (LVTTTL & TTL)
- › Highest signal to noise ratio
- › Highest Responsivity

- › Highest D* & best NEP
- › Smallest focal distance

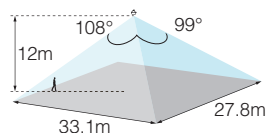
Output		Digital			
Detection type		Standard	Long distance	Wall installation	Standard and slight motion
Current consumption		1µA, 2µA, 6µA			
Detection distance		5m	12m	2.2m	
Field of view	Horizontal	94° (106°)	102° (108°)	40° (55,6)	34° & 82° (44° & 90°)
	Vertical	82° (97°)	92° (99°)	105° (112°)	34° & 82° (44° & 90°)
Switching zones		64	92	68	36 & 48
Lens color		white, black, pearl white			

Output		Digital			
Detection type		Standard	Long distance	Wall installation	Standard and slight motion
Current consumption		170µA			
Detection distance		5m	12m	2.2m	
Field of view	Horizontal	94° (106°)	102° (108°)	40° (55.6°)	34° & 82° (44° & 90°)
	Vertical				
Switching zones		64	92	68	36 & 48
Lens color		white, black, pearl white			

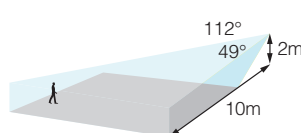
Standard



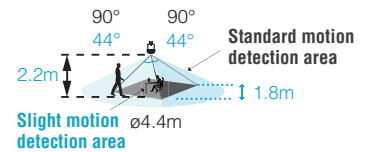
Long distance



Wall installation



Standard and slight motion



Typical applications

- Wireless sensors
- Wireless products
- Power management
- Smart home

Typical applications

- Safety and security
- Lighting management
- Heating, ventilation and air conditioning
- TV and display

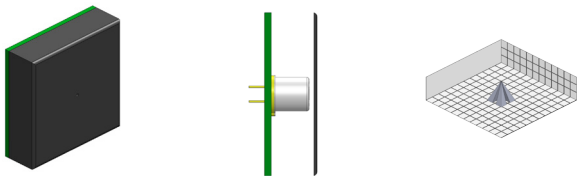
EKMB/EKMC



Output	Digital
Detection type	Lensless*
	<p>Lensless type available</p> <p>The EKMB/EKMC series also offers a lensless type for those customers who design their own lens.</p> <p>EKMB series 1µA type: EKMB1100100 2µA type: EKMB1200100 6µA type: EKMB1300100K</p> <p>EKMC series 170µA type: EKMC1600100</p> <p>Please contact us for detailed specification</p>

* For own lens design or pin-hole lens application

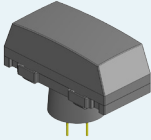
Pin-hole lens application example



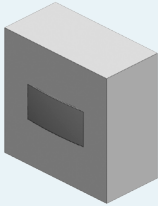
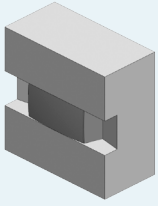
Coming soon!

NEW!

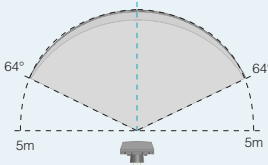
HMH type with unique detection performance!



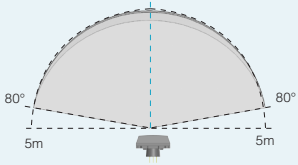
Application examples for integration

Detection area



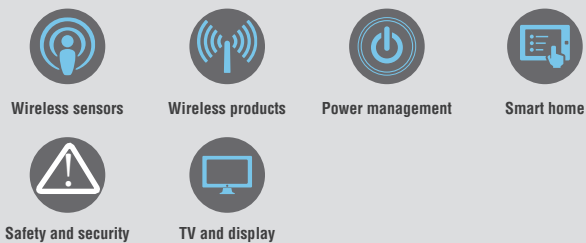
64° 64°
5m 5m



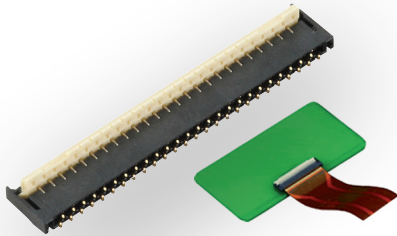
80° 80°
5m 5m

- › No blind zones
- › Improved radial motion detection

Typical applications




FPC connectors: Back lock type

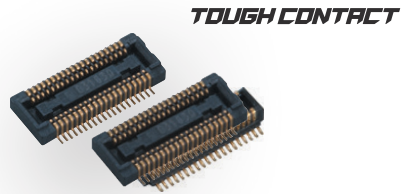


Designed for space saving applications

- › Mechanical design freedom is achieved with double top and bottom contacts
- › Wiring patterns can be placed underneath the connector
- › Easy-to-handle back lock design
- › Man-hours of assembly time can be reduced by delivering the connectors with their levers opened
- › Nickel barrier helps resist solder creepage
- › FPC holding contacts available

Usage	FPC
Pitch	0.2mm to 0.5mm
Mated height	0.6mm to 1.0mm
Lock structure	Back lock 
Applicable FPC thickness	0.2mm / 0.3mm
Specification	Top and bottom double contact (except Y3BL)
Terminal capability	0.2A to 0.5A terminal
Number of pin contacts	2 to 71
Ambient temperature	-55°C to +85°C
Insertion and removal life	20 times

Narrow pitch connectors:
For Board to FPC/Board to Board



Panasonic's proprietary pattern

- › High resistance to various environments
- › Simple lock structure provides tactile feedback to ensure excellent mating/unmating operation feel
- › Gull-wing-shaped terminals to facilitate visual inspections
- › Connectors for use in test adapters or inspection equipment available
- › Stacking connector series for high currents up to 10A

Usage	Board to FPC / Board to Board
Pitch	0.35mm to 0.5mm
Mated height	0.6 to 9mm
Specification	Ultra-slim body
Terminal capability	0.25A to 0.5A/terminal
Number of pin contacts	6 to 100
Ambient temperature	-55°C to +85°C
Insertion and removal life	Min. 30 times

Typical applications



Keyboard



Sensor module



Display connection

Typical applications



Camera module

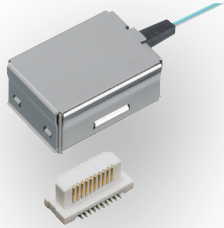


Battery module



Wireless products

Active Optical Connector: V-Series

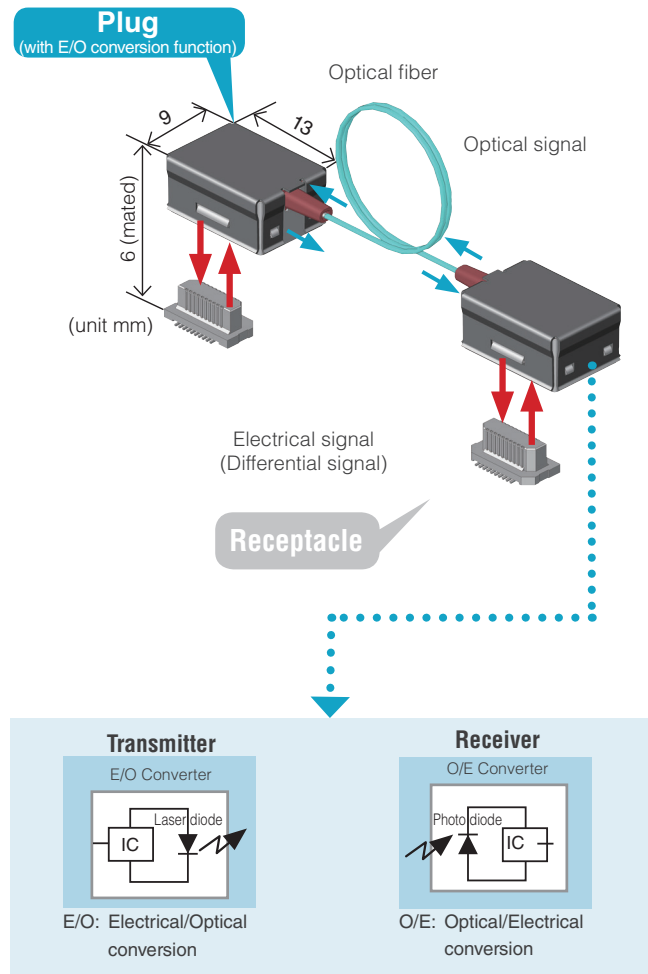


High-speed optical transmission by electrical connector

- › Structure of electric-optic conversion inside the plug
- › Bi-directional high speed and wideband data transmission
- › Excellent noise reduction and electrical isolation
- › Easy to handle by electrical connector
- › Suitable for small equipment by compact design

Channel	Bi-direction · 1ch
Fiber length	50mm, 300mm, 1m
Transmission rate	20Mbit/s to 6Gbps (max. 10Gbps)
Supply voltage	3.3VDC
Power consumption	Max. 230mW
Operating temperature	0 to 70°C

Connector with E/O Converter



Typical applications



Medical equipment



Measuring equipment



Imaging processing instruments

Typical applications



Radio control

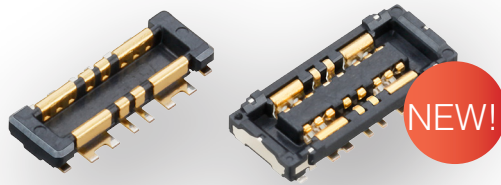


Good lifts



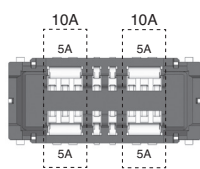
Agriculture devices

Stacking connector: BO2-series for high current

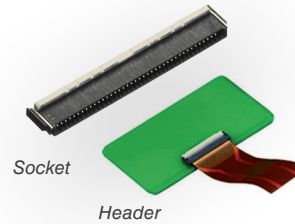


- › High current rating: 10.0 A (5.0 A/pin × 2 pin)
- › High reliability in low profile of 0.7mm
- › 4 signal terminals
- › High removal force

Usage	Board to FPC / Board to Board
Mated height	0.7mm
Number of pin contacts	4 pins power terminal 4 pins signal terminal
Rated voltage	30V AC/DC
Rated current	5.0A/pin (Power contact) 0.3A/pin (Signal contact)
Contact resistance	Power contact: max 16mΩ Signal contact: max. 90mΩ
Removal force	Min. 10N
Ambient temperature	-55°C to +85°C
Insertion and removal life	30 times



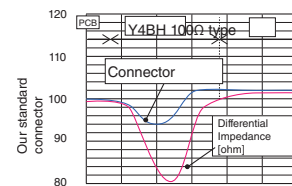
FPC connector: Y4BH-series:



Impedance matching type

- › Compact design with 0.4mm pitch and 1.0mm height
- › Suitable for high-speed transmission up to 10Gbps
- › Enable flexible circuit design
- › Back-lock design
- › Delivered with the levers opened

Usage	FPC
Mated height	1mm
Number of pin contacts	40, 50
Rated voltage	50V AC/DC
Rated current	0.3A/pin
Contact resistance	100mΩ
Impedance	85 / 90Ω ± 10Ω / 100Ω ± 15Ω
Applicable FPC thickness	0.3mm
Ambient temperature	-55°C to +85°C
Insertion and removal life	20 times



Typical applications



Battery module



Sensor module



Mobile equipment

Typical applications



Battery module



Mobile equipment and wearable devices



Wireless modules

Tough Contact technology

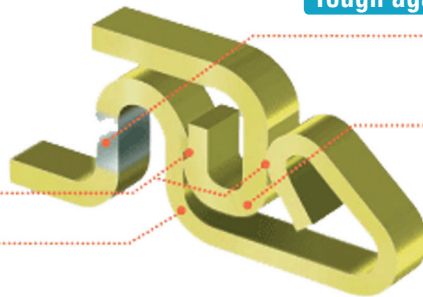
TOUGH CONTACT

Tough against dropping

Bellows contact construction improves the ability to withstand twisting and increased resistance to shock of dropping.

Tough against solder rise

Solder remains in the terminal area and a stable fillet of the soldering joints is possible. Prevents contact area from solder rise.

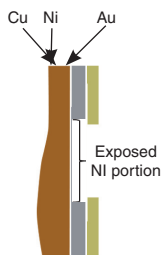


Tough against foreign particles and flux

Prevents foreign substances from contact area, doubles the contact points and increases contact pressure.

Tough against corrosive gases

Porosity treatment ensures high contact reliability by sealing pinholes in the gold plating.



An area where the nickel-plated layer is exposed has been secured in the middle of the socket contact. This area prevents solder rise, to which conventional ultra-low-profile connectors are prone.

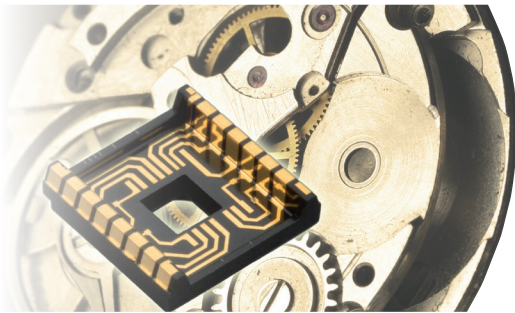
- › Influence of solder controlled in contact and contact spring parts.
- › Solder remains in the terminals and a stable fillet mold is possible.



The two-point contact structure provides high contact reliability even though the profile is ultra-low at 0.6mm. The structure blocks flux and foreign substances with an effect equivalent to that of our unique V-notch structure.

The simple lock structure gives tactile feedback that ensures a superior mating/unmating operation feel.

MIPTEC technology



3D fine pattern

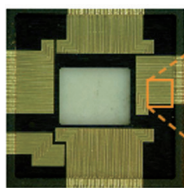
3D fine patterning is achieved by the high accuracy laser processing technology (circuit width/distance between circuit = 50µm/50µm, molded component pattern accuracy ± 30µm).

Direct bare chip mounting

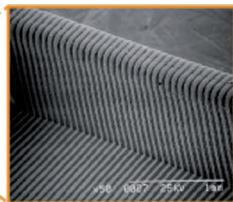
Direct mounting of chips is achieved with a resin material featuring a low linear expansion coefficient. Combined with a surface activation technology, this ensures smoothness of circuit surfaces.

Ceramic MID

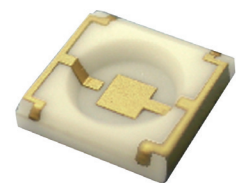
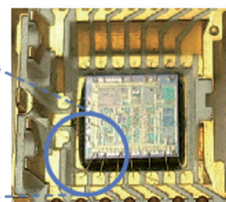
Capable of forming 3D fine patterns on surfaces made of ceramic as well as resin. High mounting reliability (low coefficient of linear expansion), high thermal resistance/high heat dissipation, good high-frequency characteristics.



3D fine pattern



Direct bare chip mounting



Ceramic MID

Global Network



North America

Europe

Asia Pacific

China

Japan

Panasonic Electric Works

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