

# Passive Components & Power Solution

## Ceramic products

### For ESD countermeasure

#### Multilayer chip varistor

Alternate of the Zener diode is easy.  
Advantage for size and weight.

•85 °C/85% RH/2000h

0402/ 0603 size  
EZJ series



### For load damp surge suppression (JASO D 001-94/ ISO7637-2/ISO16750-2)

#### ZNR surge adsorber

Protection of ECU for DC12V automotive.

•-40~125 °C

•-40~125 °C/1000c

ERZHF series



### For Temp. detection

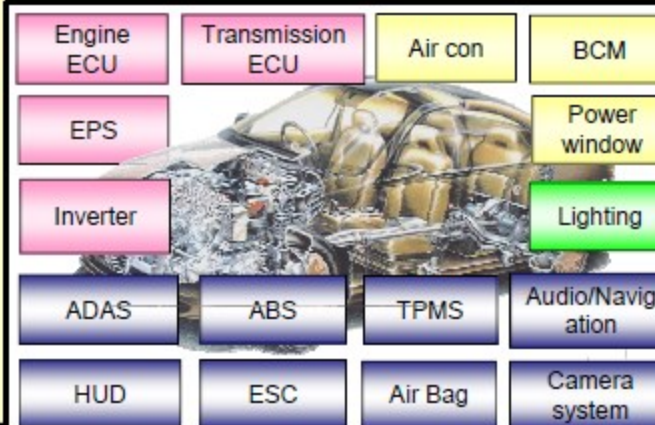
#### Multilayer thermistor

Highly reliability

•-40~125 °C

•85 °C/85% RH/2000h

0402/ 0603 size  
ERTJ series



## AEC-Q200

### Power line

For reliability under high temperature environment and down-sizing

#### 1. Power Choke Coil for Automotive

• -40~150 °C

• Large currents

5mm Sq.-10mm Sq.

1.5uH~100uH ETQ series



#### 2. Alum. Ecap SMD type

Low ESR/Long life

-55~105 °C/2000~5000h- FK

-40~125 °C/2000~3000- TK/TP



#### 3. Alum. Ecap Dip type

Low ESR/High temp. (125 °C)

FP/TK/TP series



#### 4. Hybrid Alum. Ecap

Ultra Low ESR /High ripple.

-55~125 °C/4000h- ZC series

-55~105 °C/10000h- ZA series



#### 5. POS CAP (Poly-Tan solid cap)

High reliability/AECQ200/TS16949

•-55~125 °C

•Small size (B,A,S)



#### 6. OS-CON (Poly-Al solid cap)

High reliability/AECQ200/TS16949

•SVP/SVQP/SVPD

•-55~125 °C



## For HEV/PHEV/EV

### EDLC for Emergency Backup

• Backup for E-Latch , E-Call  
(EU Regulation)



### DC-Link for Inverter

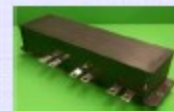
Film cap

•High reliability

•85% share in world wide.

(Toyota/Honda/Nissan)

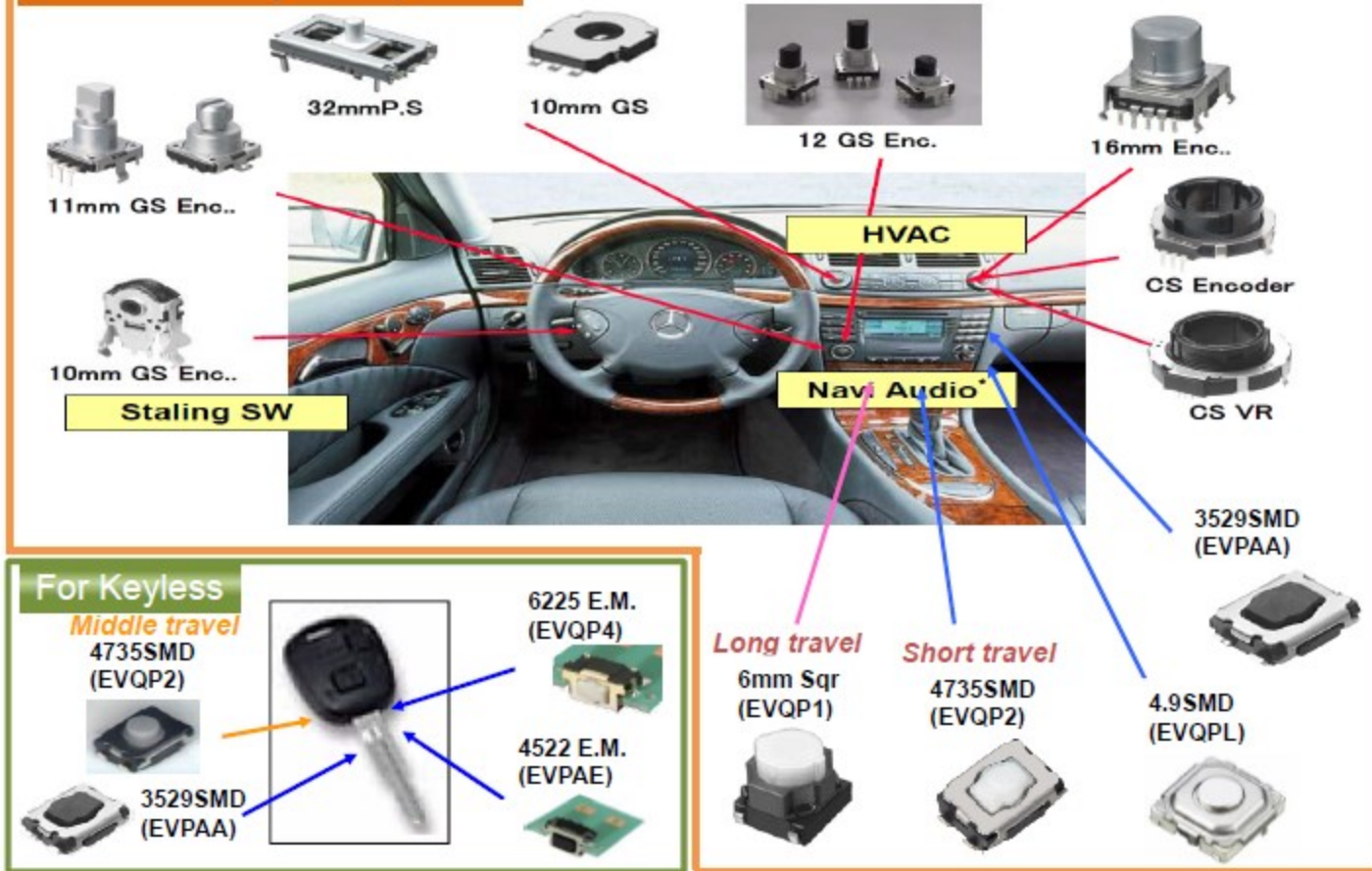
450V- 581uF/1000uF



**Panas**

# Switches Solution

For Audio/Navigation system.



# Relay Solution for EV / HEV

## 1 Main relay

Main relay breaks the circuit of high-voltage in an accident, while stopping (ignition off), and something wrong with the circuit



## 4 Main switch

Capsule type

Non capsule type



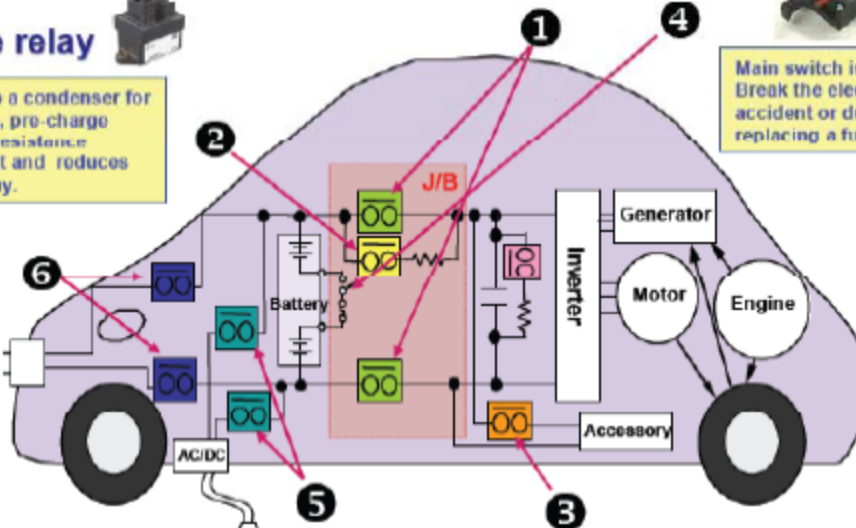
Main switch is a manual circuit breaker. Break the electric circuit by hand in an accident or during the operation, such as replacing a fuse

## 2 Pre-charge relay



Inrush current flows to a condenser for charging up; therefore, pre-charge relay with pre-charge resistance receives inrush current and reduces the load on a main relay.

Quick charge stand



## 5 Household electric charger (BEV, PHEV)

Normal charge (5A~10A)

## 6 Quick electric charger (BEV)

Quick charge (120A~150A)



Electric charger relay is used for safety to isolate external voltage, such as a quick electric charger, from a car when detect a charger failure and start/stop charging.

## 3 High-voltage Acc.



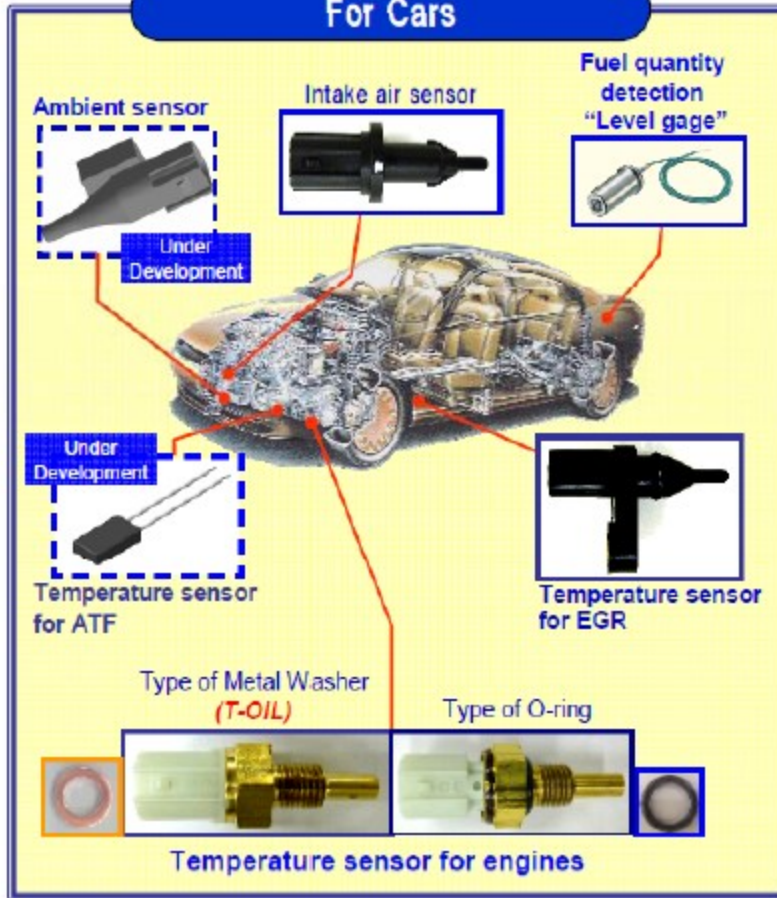
- PTC heater (10A~15A)
- Air conditioner (15A~20A) etc.

High-voltage Acc. has a similar function with 12V acc. except high-voltage acc. can interrupt high-voltage.

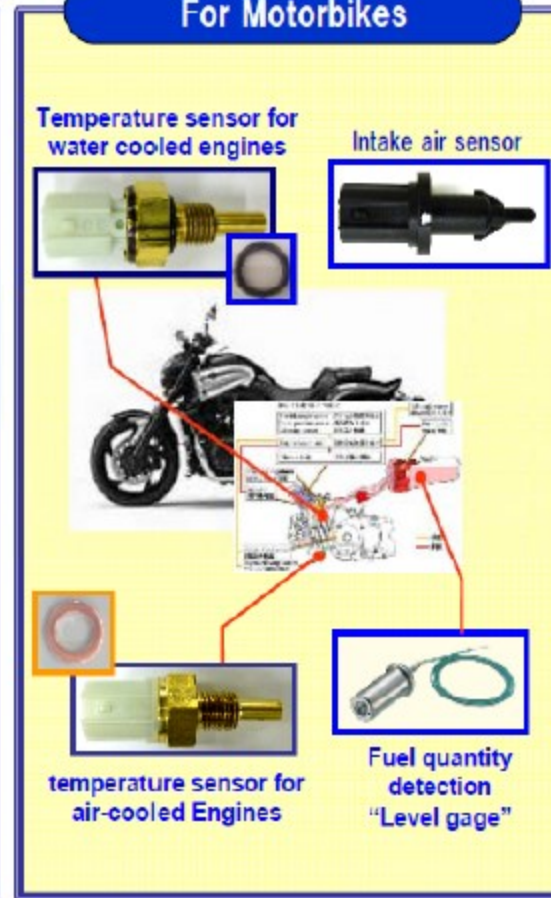


# Fuel Gage & Water/Oil/Air Temperature Sensor









## For Cars





## For Motorbikes







# PCB Relays - THD (Single type)





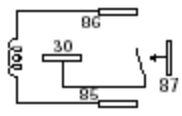

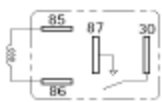


TYPE	CN-H <b>New</b> 	CN-M <b>New</b> 	CY 	JJM JJM2w 	CP CP-P 	CT1 CTP1 	CJ1 	CQ <b>Quiet</b> 
CONTACT ARRANGMENT	1a	1a,1c	1a,1c	1a,1c	1a,1c	1c	1c	1c
LOAD	30A 14VDC	30A 14VDC	30A 14VDC	20A 14VDC	20A 14VDC	20A 14VDC	20A 14VDC	20A 14VDC
COIL CONSUMPTION	450mW 650mW	640mW	450mW 640mW	640mW	450mW 640mW	800mW 1000mW	640mW 800mW	640mW
DIMENTION (L x W x H)mm	17 x 10.6 x 18.3	15.5 x 11 x 14.4	22 x 16 x 16	15.5 x 12 x 13.9	14 x 13 x 9.5	17.4 x 7.2 x 13.5	12.2 x 7.2 x 13.5	17 x 13 x 16.6
WEIGHT (Typ.)	9g	5.5g	12g	5g	4g	4g	3.5g	6.5g
NOISE (Typ.)	65dB	60dB	65dB	65dB	60dB	55dB	60dB	45dB
FEATURE	- High current	- High current - Low space	-Low cost -High current	- Low cost - Double make	- Flat	- Slim	- Compact	-Quiet

TYPE	CN-M  <span style="color: red; font-weight: bold; border: 1px solid red; border-radius: 50%; padding: 2px;">New</span>	CP CP-P 
CONTACT ARRANGMENT	1a,1c	1a,1c
LOAD	30A 14VDC	20A 14VDC
COIL CONSUMPTION	640mW	450mW 640mW
DIMENTION (L x W x H)mm	15.5 x 11 x 15.1	14 x 13 x 10.5
WEIGHT (Typ.)	5.5g	4g
NOISE (Typ.)	60dB	60dB
FEATURE	- High current - Low space	- Flat

## PCB Relays - THD (Twin type)

3

TYPE	CT-P2 / CT-P5 	CT2 / CT5 	CJ2 / CJ5 	CR  <i>Quiet</i>
CONTACT ARRANGMENT	1c x 2	1c x 2	1c x 2	1c x 2
LOAD	30A 14VDC	20A 14VDC	20A 14VDC	20A 14VDC
COIL CONSUMPTION	1000mW	800mW	640mW/ 800mW	640mW
DIMENTION (L x W x H)mm	17.4 x 14 x 13.5	17.4 x 14 x 13.5	13.7 x 12.2 x 13.5	24.6 x 12 x 18.5
WEIGHT (Typ.)	8g	8g	6.5g	12.5g
NOISE (Typ.)	55dB	55dB	65dB	45dB
FEATURE	-For high current -H-bridge -10 terminal	-H-bridge -10 terminal	-Compact size -H-bridge	-Quite type

TYPE	CB relay – MINI ISO		CM relay – MICRO ISO	CV relay ;Flat ISO MICRO/ 280 MICRO	
		 250 terminal	 375 terminal		
CONTACT ARRANGEMENT	1a , 1c		1a , 1c	1a , 1c	
MAX.SWITCHING LOAD	N/O: 40A 14V DC N/C: 30A 14V DC		N/O: 35A 14V DC N/C: 20A 14V DC	N/O: 20A 14V DC N/C: 10A 14V DC	
MAX.CARRY CURRENT	35A		20A	20A	
COIL CONSUMPTION	1.4 W		1.5 W	0.8 W	
DIMENSIONS (L x W x H) mm	26 x 22 x 25 33 g		20 x 15 x 22 20 g	22.5 x 15 x 15.7 15 g	
NOISE	Typ. 70dB		Typ. 70dB	Typ. 60dB	
NOTE	PCB type and 24V type available.			PCB type available.	
FEATURE	 250 terminal • For high current	 375 terminal	 MICRO ISO • Compact size	 MICRO ISO	 MICRO 280 • Flat type