OMRON

High Power PCB Relay for Automotive and DC 12 V Applications

G8PM Relay

High Load Relay for Motor/Resistive/Lamp Control Applications

- Can replace Mini ISO Plug-in type relay
- Small size & High heat resistance enable for usage in engine room
- Can support 60 A Fuse
- PIP reflow compliant
- Temperature range -40°C to +125°C

■Model Number Legend

G8PM-□□□□□
1 2 3 4 5

1. Number of Contact Poles
1: 1-pole

2. Contact Form
A: SPST (1 Form A)

3. Contact structure
W: Double contact

4. Protective structure
7: Flux tight (Open vent hole) (RT II IEC61810)

5. Special function
R: Pin in paste compliant type

■Application Examples

- DC motor/resistive/lamp application control
- Automotive DC applications (Smart Junction Box, Main power, Radiator fan, EPS, DC/DC converter, Head lamp, etc.)

■Ordering Information

Classification	Contact form	Protective structure	Rated coil voltage (V)	Model	Minimum Packing unit (Tube packing)
High power	SPST 1 Form A double contact	Flux tight (open vent hole) (RT II IEC61810)	DC12	**G8PM-1AW7R DC12**	1200 pcs. / box (40 pcs. x 30 tubes)

Note. Above models are not certificated for the safety standards of UL or CSA, etc.

■Ratings

●Coil

Rated voltage (V)	Rated current (mA)	Coil resistance (Ω)	Must-operate voltage (V)	Must-release voltage (V)	Permissible voltage Range (V)	Rated Power consumption (mW)	Model
DC12	53.3	225	7.2 Max.	0.8 Min.	10 to 16	640	**G8PM-1AW7R DC12**

Note 1. The rated current and coil resistance are measured at a coil temperature of 20°C with a tolerance of ±10%.
Note 2. The operating characteristics are measured at a coil temperature of 20°C.

●Contacts

Item	Classification / Model	High power / G8PM-1AW7R DC12
Contact Type		Double
Contact material		Ag-alloy (Cd-free)
Rated continuous carry current	20°C	60 A
	125°C	40 A
Max. switching current		150 A Inrush 80 A break *1
Max. carrying current *2	135% fuse rating	81 A at DC14V for 1 h
	200% fuse rating	120 A at DC14V for 2 mins
Min. switching current		DC12V 0.1 A

*1. Break current is DC14V resistive load 100 cycles at room temperature.
*2. The data is measured at room temperature.

■Characteristics

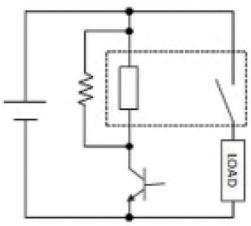
Item			G8PM-1AW
Contact resistance (See *1.)			Typ.2.5 mΩ Max. 50 mΩ
Operate time			10 ms max. (DC12V not including bounce time)
Release time			5 ms max. (DC12V not including bounce time)
Insulation resistance (See *2.)	Between coil and contacts		100 MΩ min.
	Between contacts of the same polarity		100 MΩ min.
Dielectric strength	Between coil and contacts		AC500V 1 min
	Between contacts of the same polarity		AC500V 1 min
Vibration resistance	Destruction		33 Hz, 45 m/s²
	Malfunction		10 to 500 Hz, 45 m/s² (detection time 10 μs min)
Shock resistance	Destruction		1,000 m/s² (pulse duration: 6 ms)
	Malfunction		100 m/s² (pulse duration: 11 ms detection time: 10 μs)
Mechanical endurance (See *3.)			1,000,000 ops. min.
Electrical endurance (See *4.)		Resistive Load	45 A, DC14V, 100,000 operations (1 s ON/1 s OFF)
		Lamp Load	100 A Inrush/ 20 A break, DC14V,100,000 operations (1 s ON/9 s OFF)
Ambient operating temperature			-40 to 125°C (without freezing or condensation)
Ambient operating humidity			35% to 85% RH
Weight			Approx. 7.6 g

Note. The above values are initial values at an ambient temperature of +20°C unless otherwise specified.
*1. The contact resistance was measured with 10 A at DC12V using the voltage drop method.
*2. The insulation resistance was measured with a DC500V megohmmeter.
*3. The mechanical endurance was measured at a switching frequency of 18,000 operations/hr.
*4. Please connect N.O. terminal to the +BATT side and connect surge suppression element in parallel between coil based on recommended circuit.

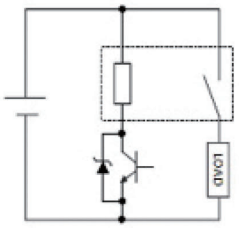
Recommended circuit: (a), (b), (c)
Not-recommended circuit: (d)

Note:
OMRON recommends coil driver circuit (b) and (c) for coil surge suppression. However the circuit (d) is not recommended because it may negatively affect the durability performance.

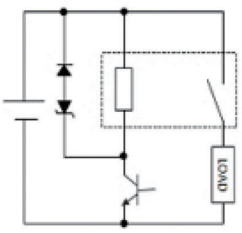
(a)



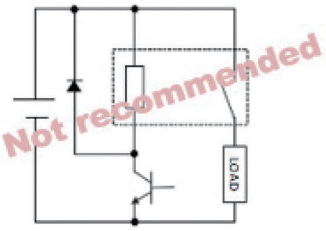
(b)



(c)



(d)

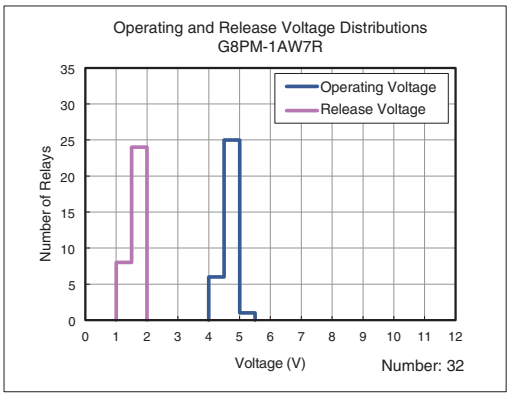


■Reference Technical Data

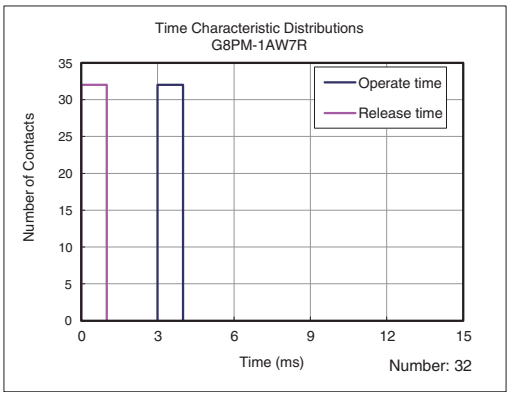
●Actual Electrical performance (reference)

Model	Application	Load voltage	Inrush	Steady state	Switching off	Inductance	Ambient temperature	Switching frequency		Required Cycles (min)
		(V)	(A)	(A)	(A)	(mH)	(°C)	On (s)	Off (s)	Total
G8PM-1AW7R DC12	Radiator Fan	13.5	80	30	30		-40 to 110	3.0	8.0	156,000
G8PM-1AW7R DC12	Lamp	14	100	20	20	-	-40 to 110	0.5	5.5	156,000
G8PM-1AW7R DC12	Resistive	14	50	10	10	-	25	2.0	5.0	1,000,000
G8PM-1AW7R DC12	Fuel pump	14.7	50	10	10	-	25	2.0	5.0	1,000,000
G8PM-1AW7R DC12	Starter Motor	14.5	150	50	50	0.16	-40 to 110	3.0	9.0	156,000

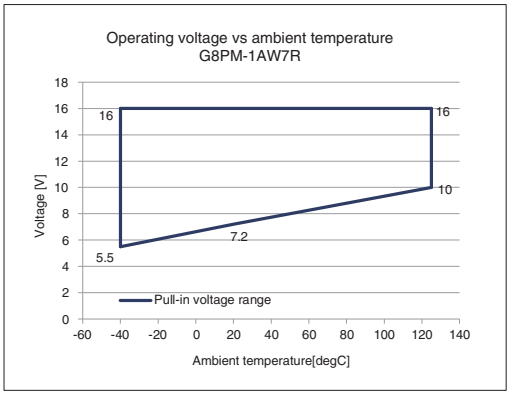
●Operating Voltage and Release Voltage Distributions (Number of Relays × Percentage of Rated Voltage)



●Time Characteristic Distributions (Number of Contacts × Time (ms))

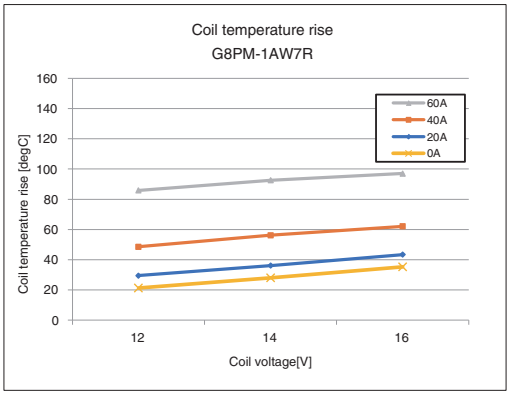


●Operating voltage vs ambient temperature (Cold start)

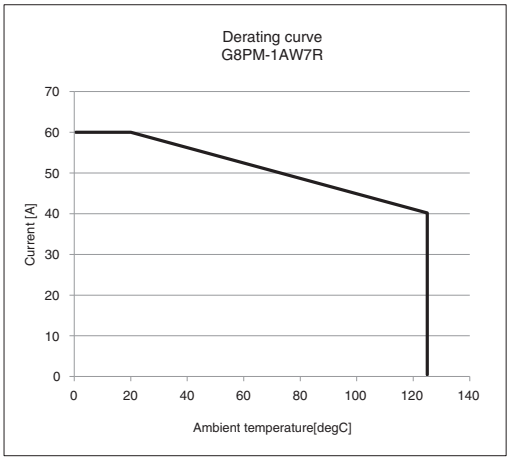


●Coil temperature rise [degC] at 20°C

(For using under a higher ambient temperature, please select the proper current carrying condition to avoid a possible excessive temperature rising.)



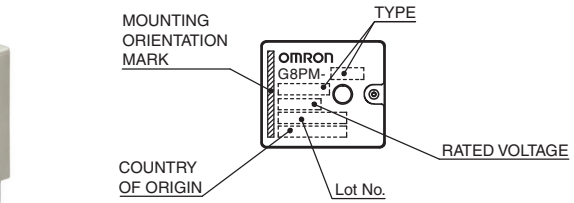
●Derating curve

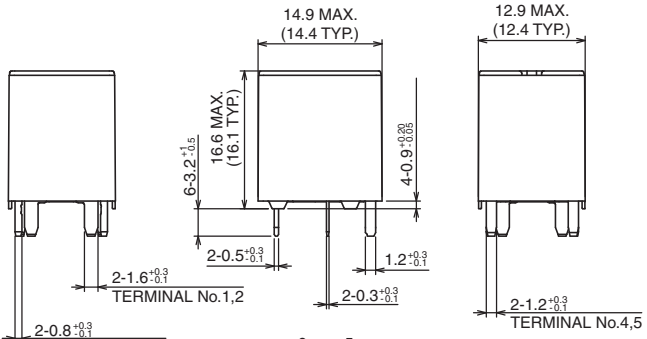


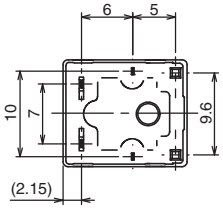
■Dimensions

CAD Data Please visit our website, which is noted on the last page. **(Unit: mm)**

G8PM



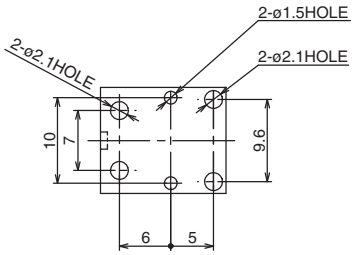




TOLERANCE UNLESS OTHERWISE SPECIFIED

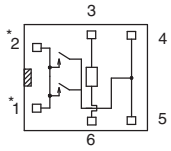
LESS THAN 1mm	: ±0.1mm
1 to 3mm	: ±0.2mm
3mm OR MORE	: ±0.3mm

PCB Mounting Holes
(Bottom View)



*Please study & choose other appropriate hole diameters if confirmed the diameter values recommended above don't work with the soldering process.

Terminal Arrangement/ Internal Connections
(Bottom View)



NOTE: *TERMINAL 1&2 CONNECT TO +BATT

CAD Data

■Precautions

●Please refer to “Safety Precautions for All Automotive Relays” for correct use.

Please check each region's Terms & Conditions by region website.

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