

## MAIN FEATURE

1. New 54A version with Class F insulation.
2. 40A switching use relay at ambient temperature of 80°C.
3. Compatible plug-in terminal available.
4. Metal or plastic bracket selection.
5. Standard type contact form SPDT and DPST available for customer's selection.
6. Operating ambient temperature range covers from -40°C to +125°C.
7. Comply with RoHS, REACH and ELV regulations.

## CONTACT RATING

Load Type	GRL (DM/DB)	GRL (D)	GRL-2P (DM)	GRL (DM1F)
Rated Load (Resistive)	N.O.: 40A 12VDC	N.O.: 40A 12VDC	40A(20A×2) 12VDC	54A 30VDC
	N.C.: 30A 12VDC	N.C.: 30A 12VDC		
Rated Carrying Current	40A	40A	40A(20A×2)	54A
Max. Allowable Voltage	30VDC	30VDC	30VDC	30VDC
Max. Allowable Current	40A	40A	40A(20A×2)	54A
Max. Allowable Power Force	480W	480W	240W	1620W
Contact Material	Ag Alloy	Ag Alloy	Ag Alloy	Ag Alloy
Contact Form	SPST	SPDT	DPST	SPST

## APPLICATION

Engine Cooling Fan Control, Air-Conditioning Control, Fuel Pump control, Lighting Control, Electric vehicle, PV energy generation system, IT power storage control.

## PERFORMANCE (AT INITIAL VALUE)

- Contact Resistance ..... 100 mΩ Max. @1A, 6VDC
- Operate Time ..... 10 mSec. Max.  
20 mSec. Max. (DM1F)
- Release Time ..... 10 mSec. Max.
- Dielectric Strength:
  - Between Coil & Contact ..... 1,000VAC at 50/60 Hz for one minute
  - 1,600VAC at 50/60 Hz for one minute (DM1F)
  - Between Contacts ..... 500VAC at 50/60 Hz for one minute
  - 2,000VAC at 50/60 Hz for one minute (DM1F)
- Insulation Resistance ..... 100 MegaΩ Min. at 500VDC
- Max. On/Off Switching:
  - Electrical ..... 6 Cycles per Minute
  - Mechanical ..... 300 Cycles per Minute
- Temperature Range ..... -40~+125°C  
-40~+85°C (DM1F)
- Humidity Range ..... 45~80% RH.

- Coil Temperature Rise ..... 60°C Max.
- Vibration:
  - Endurance ..... 10 to 55 Hz dual amplitude width 2 mm
  - Error Operation ..... 10 to 55 Hz dual amplitude width 2 mm
- Shock:
  - Endurance ..... 1,000 m/S<sup>2</sup>
  - Error Operation ..... 50 m/S<sup>2</sup>
- Life Expectancy:
  - Mechanical ..... 10<sup>7</sup> Operations at No Load condition
  - Electrical ..... 10<sup>5</sup> Operations at Rated Resistive Load
  - Electrical (DM1F) ..... 6\*10<sup>3</sup> Operations (UL)  
1\*10<sup>4</sup> Operations (TUV)
- Weight ..... About 36.5g  
About 35g (DM1F)

## ACCESSORIES & SOCKETS

- UC3003 ..... See Page 174
- CS3770 ..... See Page 174
- UC3001 ..... See Page 174

## SAFETY STANDARD & FILE NUMBER

- UL & C-UL ..... E141060 (only DM1F)
- TUV ..... R50406275 (only DM1F)

**COIL SPECIFICATION (AT 20°C)**

Coil Sensitivity	Nominal Voltage (VDC)	Nominal Current (mA)	Coil Resistance ( $\Omega \pm 10\%$ )	Power Consumption (W)	Pull-In Voltage (VDC)	Drop-Out Voltage (VDC)	Maximum Allowable Voltage (VDC)
GRL	12	150	80	Abt. 1.8	75% Maximum	5% Minimum	150% (for short time carrying current)
	24	75	320				
GRL DM1F	12	100	120	Abt. 1.2	80% Maximum	5% Minimum	150% (for short time carrying current)
	24	50	480				

**ORDERING INFORMATION**

**GRL - S - 1 12 D M H R1**

**Options:**

- Nil:** Standard
- R1:** Coil parallel with 1/2W Resistor  
680  $\Omega$  for Coil Voltage 12VDC  
2700  $\Omega$  for Coil Voltage 24VDC
- D1:** Coil parallel with diode & the Positive pole "+" on #85 Terminal
- D2:** Coil parallel with diode & the Negative pole "-" on #85 Terminal
- 1F:** 54A/30VDC with Class F insulation (Form A only)

**Bracket:**

- Nil:** No Bracket Standard
- H:** Dust Cover with Metal Bracket
- F:** Plastic Bracket Cover

**Contact Form:**

- Nil:** One Form C
- M:** One Form A
- B:** One Form B

**Coil Type:** **D:** Standard DC

**Coil Voltage:** **12:** 12V, **24:** 24V

**Number of Pole:** **1:** One Pole  
**2:** Two Poles (Form A only)

**Type of Sealing:** **S:** RT I Dust Protected  
**SS:** RT II Fluxed Proofed (only DM1F)  
**SH:** RT III Wash Tight (only DM1F)

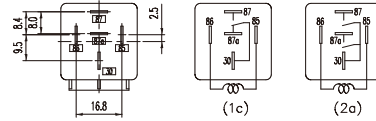
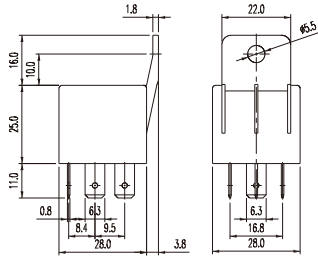
**Type:** **GRL**

**CLASSIFICATION**

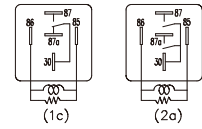
Model	GRL				
	1 Pole			2 Poles	1 Pole
Number of Pole	1 Pole			2 Poles	1 Pole
Contact Form	1C	1A	1B	2A	1A
No Bracket Standard	GRL-S-1□□D	GRL-S-1□□DM	GRL-S-1□□DB	GRL-S-2□□DM	GRL-S/SS/SH-1□□DM1F
Dust Cover Metal Bracket	GRL-S-1□□DH	GRL-S-1□□DMH	GRL-S-1□□DBH	GRL-S-2□□DMH	GRL-S/SS/SH-1□□DMH1F
Plastic Bracket Cover	GRL-S-1□□DF	GRL-S-1□□DMF	GRL-S-1□□DBF	GRL-S-2□□DMF	GRL-S/SS/SH-1□□DMF1F
Coil Additional Parts	Please add your choice Coil Parallel "R1", "D1", "D2" at the back of all above-mentioned part number.				N/A

**DIMENSION** ( $\leq 5\text{mm} \pm 0.2\text{mm}$ ,  $> 5\text{mm} \pm 0.3\text{mm}$ , the tolerance of PCB thru hole:  $+0.1\text{mm}$ )

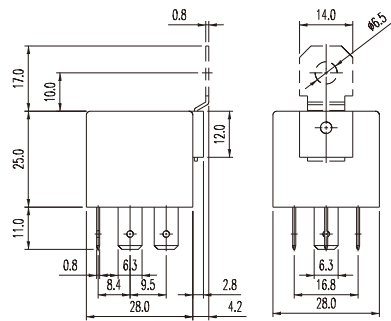
## GRL-S-F



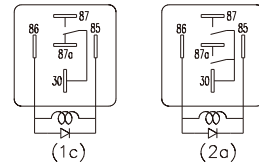
"R1" Type



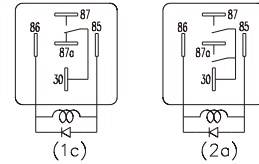
## GRL-S GRL-S-H



"D1" Type

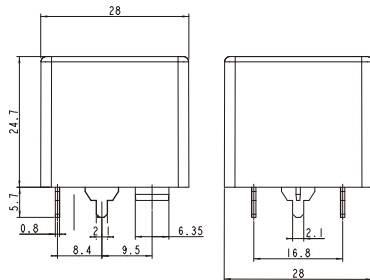


"D2" Type

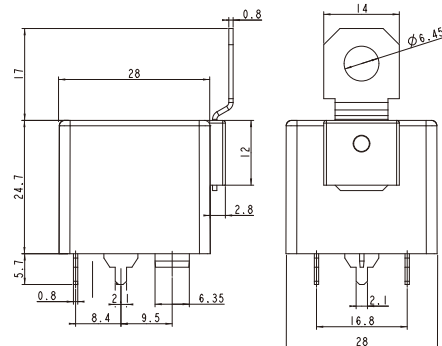


## GRL-DM1F

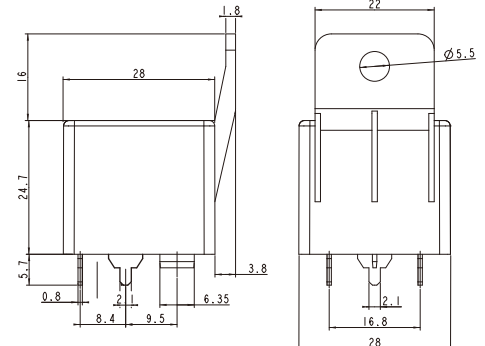
No Bracket Standard



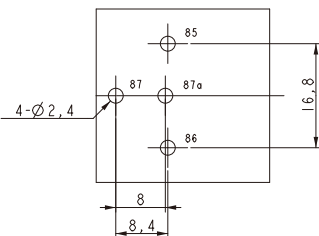
Dust Cover with Metal Bracket



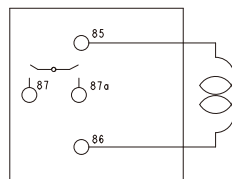
Plastic Bracket Cover



P.C.B Layout (Bottom View)



Wiring Diagram (Bottom View)



\*For RT III, there shall not be the slot hole of the plastic support on PCB layout.