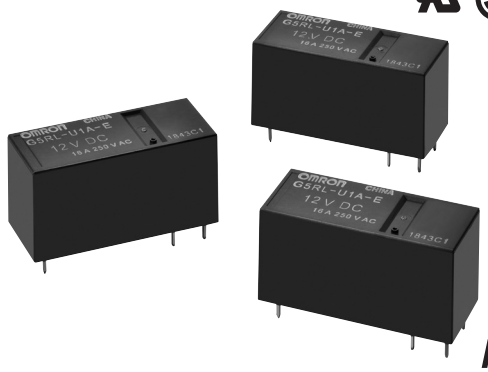
PCB Power Relay
G5RL -U/-K

16 A High Switching Current, General-purpose Latching Relay

- Available with Single coil or Dual coil latching versions.
- Creepage distance 8 mm between coil and contacts.
- 10 kV Impulse withstand voltage.
- Ambient Operating Temperature, 85°C
- TV-8 rating (1FormA models)
- Ideal for use in Electric Power Meters, UPS, Factory Automation equipment, Building Automation and Housing equipment.
- RoHS Compliant



NEW

Ordering Information

To Order: Select the part number and add the desired coil voltage and rating. (e.g., G5RL-U1A-E *DC5*)

Classification	Contact form	Terminal Style	Enclosure Rating	Single Coil Latching	Dual Coil Latching (double-winding)
High-capacity	1FormA (SPST-NO)	PCB Through-hole	Flux protection	**G5RL-U1A-E**	**G5RL-K1A-E**
	1FormC (SPDT)			**G5RL-U1-E**	**G5RL-K1-E**

G5RL-□ □ □-□ DC□
1 2 3 4 5

1. **Relay Function**
   U: Single coil latching
   K: Dual coil latching
2. **Number of poles**
   1: 1-Pole
3. **Contact Form**
   None: 1FormC (SPDT)
   A: 1FormA (SPST-NO)
4. **Classification**
   E: High-capacity
5. **Rated Coil Voltage**
   3, 5, 6, 12, 24 VDC (Single Coil Latching)
   5, 12, 24 VDC (Dual Coil Latching)

Specifications

■ Coil Ratings

Single Coil Latching

Rated voltage (V)	Rated coil current (mA)	Coil resistance (Ω)	Must set voltage	Must reset voltage	Maximum voltage	Power consumption (W)
			Percent of rated voltage			
DC 3	200	15	70% max.	70% max.	130% @ 23°C	Approx 0.6
DC 5	120	41.7				
DC 6	100	60				
DC 12	50	240				
DC 24	25	960				

Dual Coil Latching

Rated voltage (V)	Rated coil current (mA)		Coil resistance (Ω)		Must set voltage	Must reset voltage	Maximum voltage	Power consumption (mW)
	set coil	reset coil	set coil	reset coil	Percent of rated voltage			
DC 5	150		33.3		70% max.	70% max.	130% @ 23°C	Approx. 0.75
DC 12	62.5		192					
DC 24	35		686					Approx. 0.84

Note: Rated current and coil resistance are measured at 23°C with a tolerance of ±10%.

■ Contact Ratings

Item	1FormA (SPST-NO)	1FormC (SPDT)
Rated load (resistive)	16 A at 250 VAC 16 A at 24 VDC	16 A at 250 VAC (NO) 5 A at 250 VAC (NC) 16 A at 24 VDC (NO) 5 A at 24 VDC (NC)
Contact type	Single	
Contact material	Ag alloy (Cd free)	
Rated carry current	16 A	16 A (NO)/5 A (NC)
Max. switching voltage	250 VAC, 24 VDC	
Max. switching current	16 A	16 A (NO)/5 A (NC)

■ Characteristics

Contact resistance (See note 2.)		100 mΩ max.
Set time		15 ms max.
Reset time		15 ms max.
Minimum pulse width (See note 3.)		30 ms
Maximum pulse width (See note 3.)		1 minute
Insulation resistance (See note 4.)		1,000 MΩ min.
Dielectric strength		6,000 VAC, 50/60 Hz for 1 min between coil and contacts 1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity
Impulse withstand voltage		10 kV (1.2 × 50 μs) between coil and contacts
Vibration resistance	Destruction:	10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)
	Malfunction:	10 to 45 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude) at Set status 10 to 32 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude) at Reset status (Except 1Form A)
Shock resistance	Destruction:	1000 m/s^2 (approx. 100G)
	Malfunction:	150 m/s^2 (approx. 15G) at Set Status 50 m/s^2 (approx. 5G) at Reset Status (Except 1FormA)
Life expectancy (See Note 5)	Mechanical	5,000,000 operations min.
	Electrical	50,000 operations min.
Ambient operating temperature		–40°C to 85°C with no icing or condensation
Ambient operating humidity		5% to 85%
Weight		Approx. 10 g

Note: 1. The data shown above are initial values.

2. The contact resistance is measured with 1 A applied at 5 VDC using a fall-of-potential method.

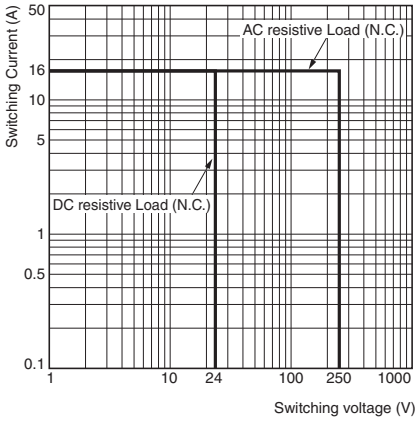
3. These are measured at a coil temperature of 23°C and rated coil voltage
Pulse duty factor should be 10% MAX.

4. The insulation resistance is measured between coil and contacts and between contacts of same polarity at 500 VDC.

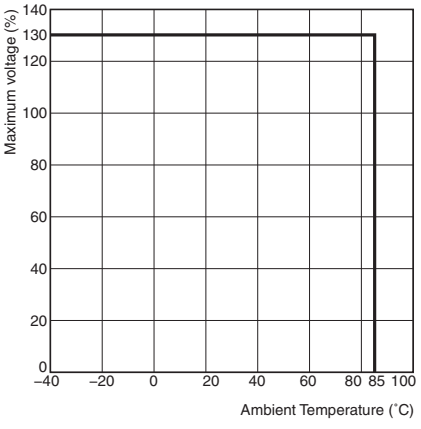
5. Operated with input pulse width "30 ms"

Engineering Data

Maximum Switching Capacity

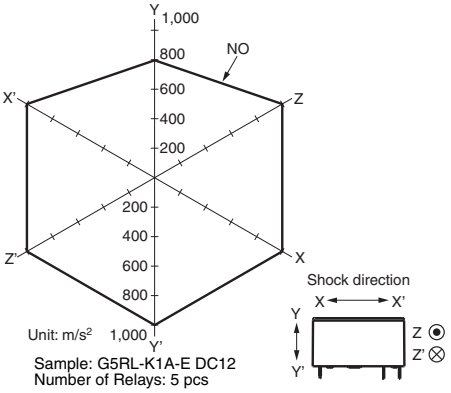


Ambient Temperature vs Maximum Coil Voltage



Note: Maximum voltage of Set pulse and Reset pulse at duty factor 10%

Shock Malfunction



Sample: G5RL-K1A-E DC12
Number of Relays: 5 pcs

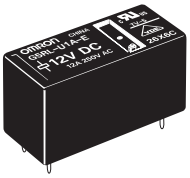
Test Conditions: Shock is applied in ±X, ±Y and ±Z directions three times each with Set and Reset Status to check the number of contact malfunctions.

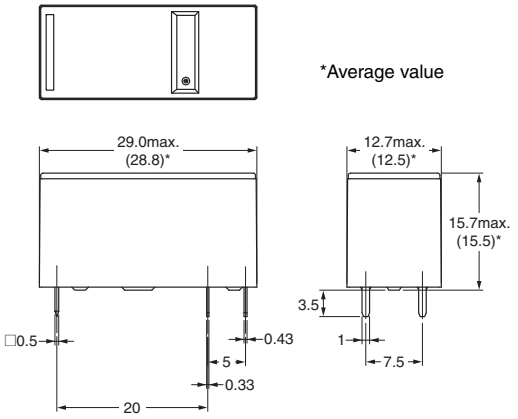
Standard Value: 50 m/s^2 with Set Status
100 m/s^2 with Reset Status

Dimensions

Note: All units are in millimeters unless otherwise indicated.

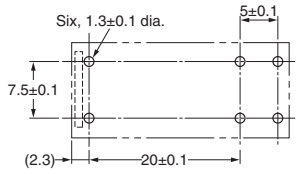
G5RL-U1A-E



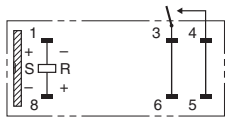


*Average value

PCB Mounting Holes
(Bottom view)



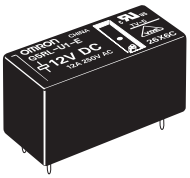
Terminal Arrangement/ Internal Connections
(Bottom view)

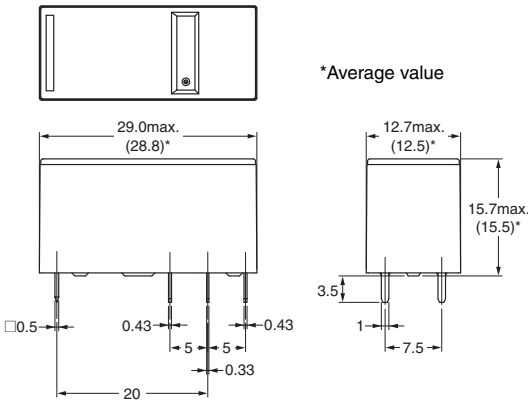


Note: Check carefully the coil polarity of the relay.

Note. Orientation marks are indicated as follows: ⬚ ▨

G5RL-U1-E





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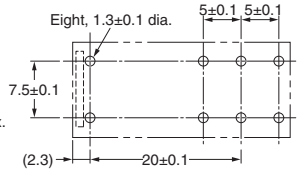
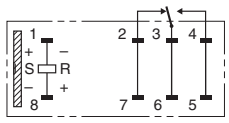


Terminal Arrangement/ Internal Connections
(Bottom view)



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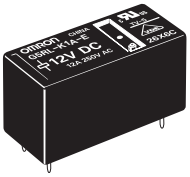
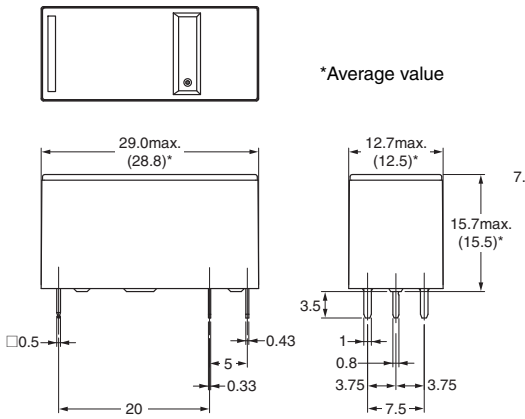
G5RL-K1A-E





*Average value

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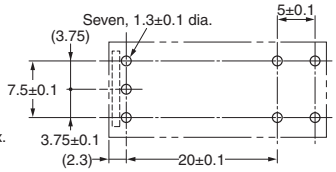
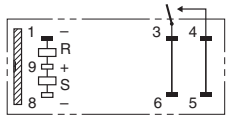
(Bottom view)



Terminal Arrangement/ Internal Connections
(Bottom view)



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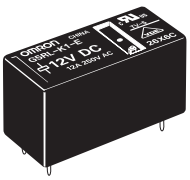
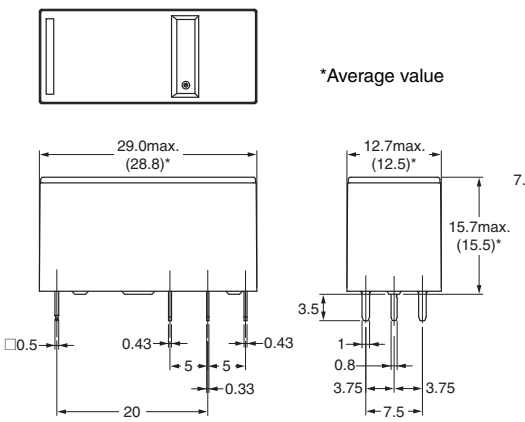
G5RL-K1-E





*Average value

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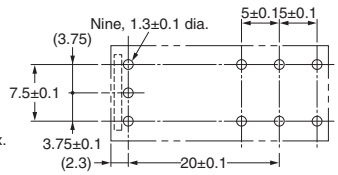

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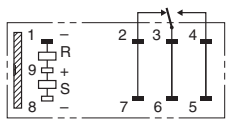


Note: Check carefully the coil polarity of the relay.

Note. Orientation marks are indicated as follows: ⬚ ▨

■ Approved Standard

UL Recognized (File No. E41643) / CSA Certified (File No. LR31928)

Model	Contact Form	Coil ratings	Contact ratings	Number of test operations
G5RL-U1A-E G5RL-K1A-E	SPST-NO (1a)	5 to 24 VDC	16 A, 277 VAC (Resistive) - NO	50,000
			TV-5 - NO	25,000
			TV-8 - NO	25,000
			8 A, 250 VAC (Ballast) - NO	6,000
			2,000 W, 250 VAC (Tungsten)	6,000
G5RL-U1-E G5RL-K1-E	SPDT (1c)		16 A, 277 VAC (Resistive) - NO	50,000
			8 A, 250 VAC (Ballast) - NO	6,000
			2,000 W, 250 VAC (Tungsten)	6,000
			5 A, 250 VAC (General) - NC	50,000

VDE Certified (EN61810-1) (License No. 40007172)

Model	Contact Form	Coil ratings	Contact ratings	Number of test operations
G5RL-U1A-E G5RL-K1A-E	SPST-NO (1a)	5, 12, 24 VDC	16 A, 250 VAC (cosϕ=1) - NO	30,000
			240 VAC, 100 A (0-P) Steady 10 A (rms) - NO	50,000
G5RL-U1-E G5RL-K1-E	SPDT (1c)		16 A, 250 VAC (cosϕ=1) - NO	30,000
			5 A, 250 VAC (cosϕ=1) - NC	30,000

Precautions

Be sure to read the precautions and information common to all Electromechanical Relays, contained in the Technical User's Guide, "Electromechanical Relays, Technical Information" for correct use.

■ Cautions

This product is not suitable for vehicles such as automobiles (including two-wheeled vehicles).

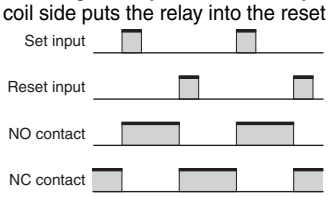
If the product is used in the following applications, consult Omron to check the necessary items according to the specification sheets. Also, make sure the product is used within the specified ratings and performance ranges with an ample margin and implement safety measures, such as designing a safety circuit, to minimize danger should the product fail.

- Outdoor use, uses involving potential chemical contamination or electrical interference.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, safety equipment and equipment that could present a risk to human life or body.
- Equipment requiring a high level of reliability, such as gas, water or electrical supply systems.

■ Correct Use

Basic Operation of Latching Relays

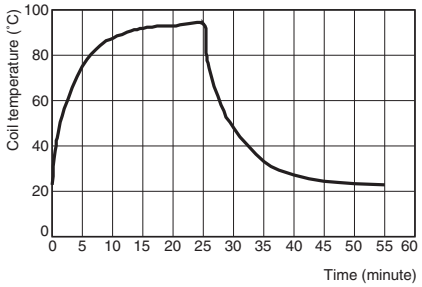
In these relays, the input pulse of the set coil causes the operating condition to be maintained magnetically or mechanically, whereas the input pulse to reset the coil side puts the relay into the reset condition.



Coil Temperature Rise of long time continuous current to the coil

When the coil is applied continuous current for a long time, the coil will become overheated. Please decide the coil input pulse width by "heat and cold of coil temperature".

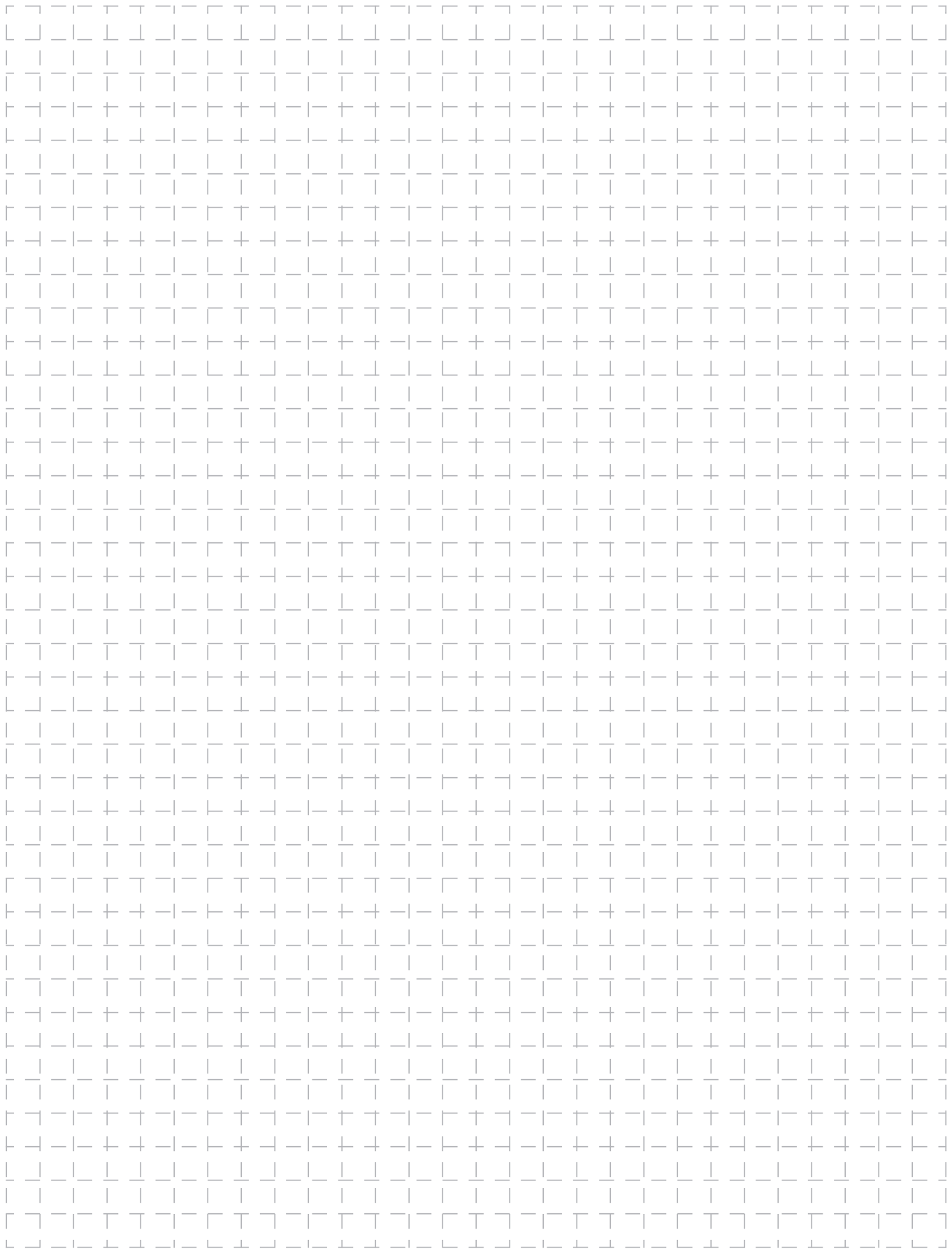
heat and cold of coil temperature



Wiring of High-Capacity Models (-E)

High-capacity models (-E) have a structure that connects two terminals from one contact. When designing the circuit, use both terminals. If you use only one terminal, the relay may be unable to satisfy specified performance.

MEMO



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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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