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DIRECT

Electronics Tech.

(ASM) Flat Power Wirewound Mica Resistors

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▶ Product Introduction

High Performance Therm And Electrical Insulation of Direct Flat Mica Resistors Improve Power Capacity.

Direct has introduced a new line of high-power, high-current mica flat resistors (ASM) in standard planar bank sizes. Offering designers a lower cost option to the standard space-saving design, Direct (ASM) compact mica resistors feature flat wirewound technology for improvements in low electric current loss, excellent thermal stability, and power capacity, while maintaining the same package size.



The (ASM) resistor is compact in structure, and the resistance wire is wound on the mica substrate, and both sides are insulated with mica sheets. To ensure symmetrical expansion of the resistor and maximum stability to high load pulses, the device is packaged in a thin metal alloy case made of aluminum and zinc. For the resistance winding, we use a high quality strip wires composed of CuNi, NiCr, or CrAl alloy. This ensures that even the resistor element reaches its maximum pulse load.

Due to its low profile, the (ASM) mica power resistor can be easily mounted on the back side of a Voltage to Frequency Converter (VFC). In particular, the (ASM) is fitting extremely well into the given space as an internal braking resistor and a series resistor for current limiting when charging the intermediate circuit capacitor of the frequency converter. Further application as load banks, dynamic braking, and motor control, or protective resistor. The nominal load can be improved by forced air cooling or by mounting the resistors on a heat sink.

The (ASM) flat mica resistor features with power handling capability of 100W to 400W and wide resistance range 1Ω to $10K\Omega$ with Temperature Coefficients $TCR \pm 260\text{ppm}/^\circ\text{C}$. The devices offer operating temperature form -55°C to $+275^\circ\text{C}$ with precision tolerance of $\pm 5\%$ and $\pm 10\%$ and conform to the RoHS directives and Lead-free.

To assist with your specifying power load and braking applications, please contact Direct Electronics. For each load case, a thermal simulation can be calculated to determine the suitability of a given application. Customed design are also available on request. Or link to Direct official website "[High Power Resistors](#)" to get more information.

Applications:

- Applied for functional power supply, Electric power distribution, load test, Variable frequency power source etc.
- Applied for driving and braking part of the industrial control system.

Features:

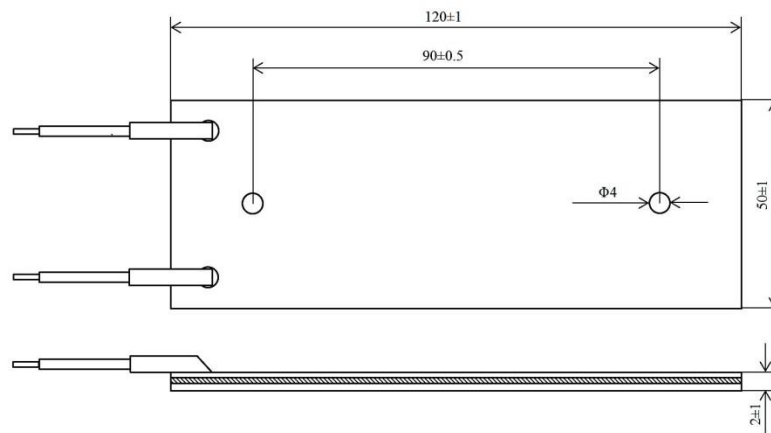
- Excellent high temperature load performance, low electric current loss, excellent mechanical strength.
- Perfect insulation, high dielectric strength, low moisture absorption, excellent Thermal stability.
- Product is flat, thin and with small size and, Cost-Effective.
- Heat sink must be installed as required when it's used.



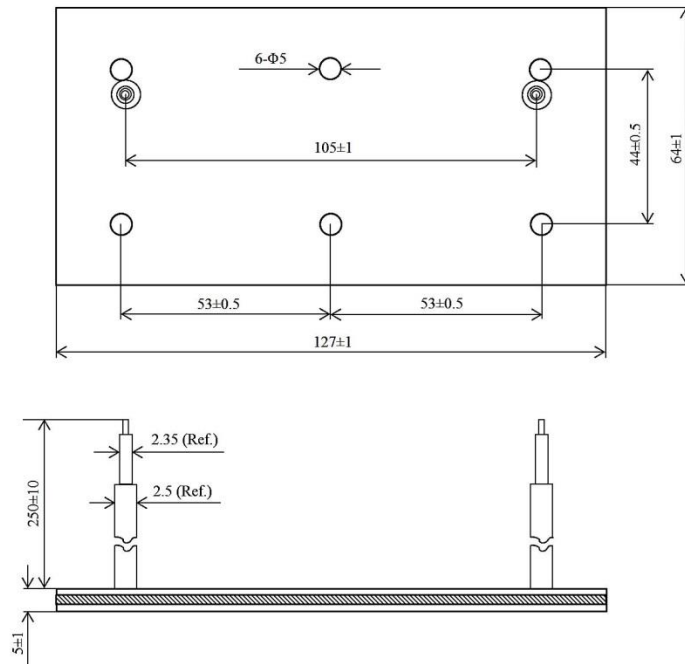
Construction & Dimensions

Construction & Dimensions (Unit: mm)

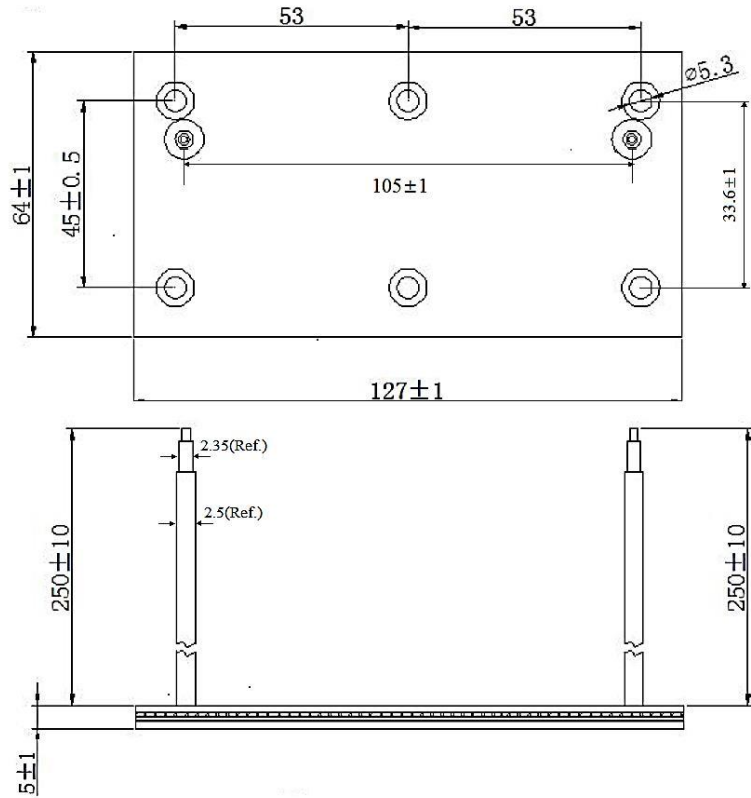
Type	Power Rating (W)	Resistance Range (Ω)	Tolerance (%)	TCR(ppm/ $^{\circ}$ C)	Operating Voltage Max	Overload Voltage Max	Insulation voltage	Operating Temperature
ASM-5002	100W	1~10K	J($\pm 5\%$), K($\pm 10\%$)	± 260	\sqrt{PR}	$\sqrt{5PR}$	1500VAC	$-55 \sim +275^{\circ}\text{C}$
ASM-6405	200W	1~10K	J($\pm 5\%$), K($\pm 10\%$)					
ASM-6405	300W	1~10K	J($\pm 5\%$), K($\pm 10\%$)					
ASM-6105	400W	1~10K	J($\pm 5\%$), K($\pm 10\%$)					



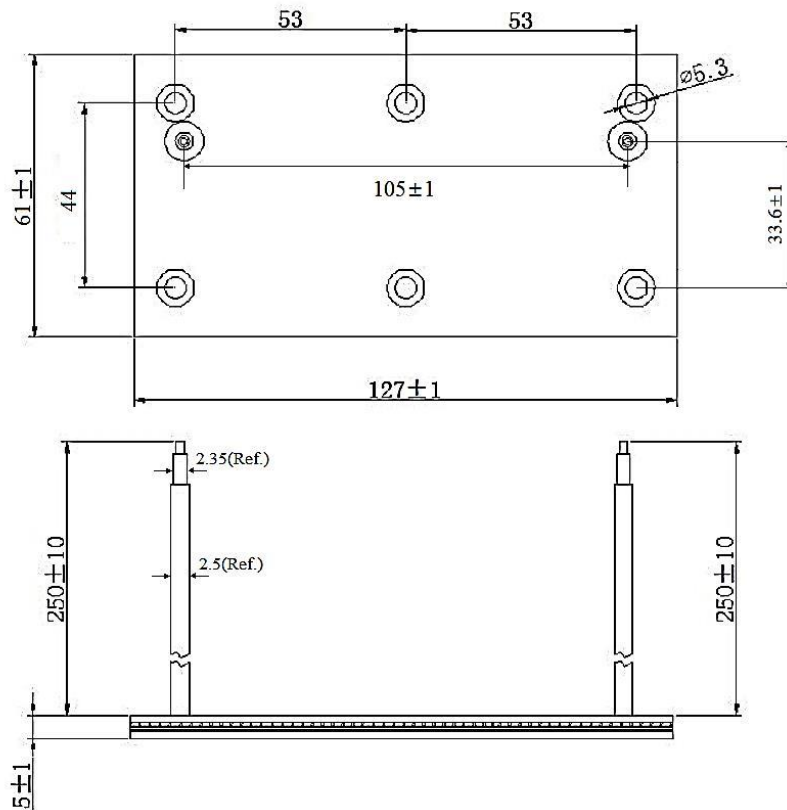
ASM-5002-100W Mica Plate Braking Resistor Dimensions



ASM-6405-200W Mica Power Resistor Dimensions



ASM-6405-300W Mica wirewound Resistor Dimensions



ASM-6105-400W Power Mica Resistor Dimensions



► Electrical Characteristics

Electrical Characteristics

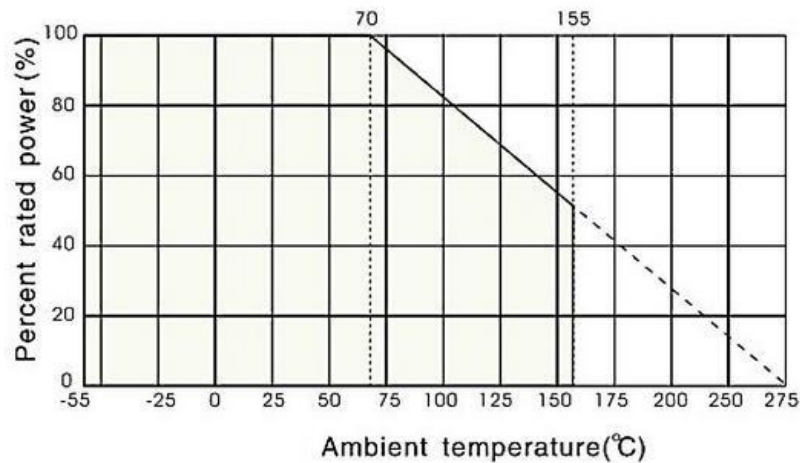
No.	Test Item	Test Method	Characteristics
1	Operating Voltage Max	-	\sqrt{PR}
2	Overload Voltage Max	-	$\sqrt{5PR}$
3	Insulation voltage	-	1500VAC
4	TCR	After measuring the resistance of the test resistor at room temperature, place it in a thermostatic chamber at -55°C and 125°C successively, and then measure the resistance after 30 to 50 minutes respectively.	$\pm 260\text{ppm}/^{\circ}\text{C}$
5	Terminal strength	The resistor body should be firmly mounted, apply a predetermined direct pull force of 8 kg in the direction of the lead wire, and hold one end at a time for $10\pm 1\text{s}$. After the test, the resistor shall have no visible damage, and the change in resistance shall not be greater than $\pm (1.0\%R+0.05\Omega)$.	$\Delta R \leq \pm (1.0\%R+0.05\Omega)$
6	High temperature resistance	Place the resistor in a thermostat; raise it to $275\pm 5^{\circ}\text{C}$, hold for 2 hours, then cool to room temperature. The appearance of the resistor should be free of mechanical damage.	$\Delta R \leq \pm (1.0\%R+0.05\Omega)$
7	Withstand voltage	The resistor is normally mounted on a metal plate. The metal plate should be larger than the resistor body. 1500 AC was applied for 1 minute and voltage was applied between the terminals connected together and the metal mounting plate. The resistor should be free from damage, arcing, flashing, and insulation breakdown.	$\Delta R \leq \pm (1.0\%R+0.05\Omega)$
8	Insulation resistance	DC 500V, Insulation resistance between terminal and case $\geq 100\text{M}\Omega$.	Dry Condition : $R \geq 100\text{M}\Omega$; After humidity test : $R \geq 100\text{M}\Omega$
9	Thermal shock	The resistor is fixedly mounted on a stipulated aluminum chassis. The resistors should be properly ventilated. Apply the rated voltage of the power supply until it reaches thermal stability. Then cut off the voltage. Within 8 to 12 seconds, place the resistor in a thermostatic chamber at $-55\pm 5^{\circ}\text{C}$ for 15 to 30 minutes. After 2 hours of removal, measure the resistance again. The change in resistance before and after the test shall not be greater than: $\pm (1.0\% R + 0.05 \Omega)$. The resistor should be free of mechanical damage.	$\Delta R \leq \pm (1.0\%R+0.05\Omega)$
10	Short-time overload	The resistor is fixedly mounted on a stipulated aluminum chassis. The resistors should be properly ventilated. Apply 5 times the power rating of the power supply for 5 seconds. After the resistor is stabilized at room temperature, the resistance is measured. The change in resistance before and after the test shall not be greater than: $\pm (1.0\% R + 0.05 \Omega)$. The resistor shall be free of arcing, charring and charring.	$\Delta R \leq \pm (1.0\%R+0.05\Omega)$
11	Moisture resistance	MIL-STD-202 The terminal shall be free of cracks, cracks, loosening or corrosion. Insulation resistance should not be less than $100\text{M}\Omega$.	$\Delta R \leq \pm (1.0\%R+0.05\Omega)$
12	Long-time life	The resistor is fixedly mounted on a stipulated aluminum chassis. The resistors should be properly ventilated. The rated voltage of the applied power supply is 1000h, 1.5h pass and 0.5h cut. and the resistor shall be free of mechanical damage. Insulation resistance should not be less than $100\text{M}\Omega$.	$\Delta R \leq \pm (1.0\%R+0.05\Omega)$



No.	Test Item	Test Method	Characteristics
13	Impact Test	The test resistor shall be subjected to the 213 method of MIL-STD-202. The sign of the test condition is I, acceleration: 100 g, pulse duration: 6 ms, sawtooth wave. After the test, the resistor shall have no visible damage, The resistor shall be able to meet the specified dielectric pressure requirements.	$\Delta R \leq \pm(1.0\%R+0.05\Omega)$
14	High frequency vibration	MIL-STD-202, Method 204. The vibration frequency of the vibration table gradually increases from 10HZ to 2000HZ, and then gradually decreases from 2000HZ to 10HZ. The frequency change is completed in 20 minutes, and the amplitude should be 1.5mm. According to the above method, the X, Y, and Z axes were scanned 12 times in each of the three directions. The total duration was about 12 hours. The resistor shall be free of mechanical damage and shall be able to meet the specified dielectric pressure requirements.	$\Delta R \leq \pm(1.0\%R+0.05\Omega)$

► **Derating Curve**

Derating Curve



Order Codes**Mica Power Resistor Order Codes (ASM)**

ASM-6405	400W	20R		J
Type	Rated Power (W)	Resistance (Ω)		Resistance Tolerance (%)
ASM-5002	100W	20R	20 Ω	J \pm 5%
ASM-6405	200W	1K	1K Ω	K \pm 10%
ASM6405	300W	10K	10K Ω	
ASM-6105	400W			



► General Information

Benefits & Features

Providing design engineers with an economical resistor with high quality performance, Direct Electronics offers industry grade power wire wound devices.

Direct provide terminal blocks, thermal switches, fusing, fans, junction boxes, screened or solid bottom plates, conduit knockouts, and customer specified requirements. For large applications a welded frame construction is utilized to provide a robust design for power resistor mounting in both indoor and outdoor environments.

Products range from large capacity metal clad, nonflammable fixed and adjustable, wave ribbon wire-wound, slide, starter, box type, to nonflammable flat type. Direct extends a complete line for both military and commercial applications.

Utilization Notes

1. Smoke emitted from non-flammable resistors on initial use in powered circuits is a normal phenomenon and the component can be safely utilized.
2. All resistors manufactured by Direct Electronics Industry Corporation comply with the U.S. UL-94 non- flammability test, Class V-0, a continuous combustion period of zero seconds.
3. Never use organic solvents to clean non-flammable resistors.
4. Non-flammable resistors cannot be utilized in oil.
5. Non-flammable resistors cannot be used in high frequency machinery because of the inductance produced by the windings. A suitable type of resistor must be selected. Contact us for details.
6. In applications where resistors are subject to intermittent current surges and spikes, be sure in advance that the components selected are capable of withstanding brief durations of increased load.
7. Do not exceed the recommended usable load. Resistors must use within the rated voltage range to prevent the shortening of service life and/or failure of the wound resistance elements.
8. Minimum load. Resistors must be utilized at 1/10 or more of the rated voltage to prevent poor conductance due to oxidation build-up.
9. Although the hardness exceeds that of a 3H pencil lead, do not nick the resistor coating with screw drivers or other pointed objects.
10. Avoid touching non-flammable resistors in operation; the surface temperature ranges from approximately 350°C ~ 400°C when utilized at the full rated value. Maintaining a surface temperature of 200°C or less will extend resistor service life.
11. Keep temperature from rising by choosing a resistor with a higher rated capacity; do not use a component having the exact load value required. For considerations of safety in extended period applications, the resistor rating should be more than four times higher than the actual wattage involved, but never use a resistor at less than 25% of its rated power.
12. Application and Placement: Wire-wound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments. Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

