

VSMA8420AY-M050JE

Features / Applications

- High power rating is up to 36W
- Low inductance (< 5 nH)
- Low thermal EMF (< 3 $\mu\text{V}/^\circ\text{C}$)
- Welding construction; excellent long-term stability
- RoHS compliant and AEC-Q200 qualified
- Automotive applications and current sensing for BMS
- Sn plating assists with PCB mounting and corrosion protection



Electrical Specifications

Characteristics	Feature
Power Rating*	36 W
Resistance Value	50 $\mu\Omega$
Temperature Coefficient of Resistance	$\pm 100 \text{ ppm}/^\circ\text{C}$
Operation Temperature Range	$-65^\circ\text{C} \sim +170^\circ\text{C}$
Resistance Tolerance	$\pm 5\% (J)$
Maximum Working Voltage (V)	$(P \cdot R)^{1/2}$

*Note :

For sensors operated at terminal temperature in excess of 140°C , the maximum load shall be derated in accordance with the following curve.

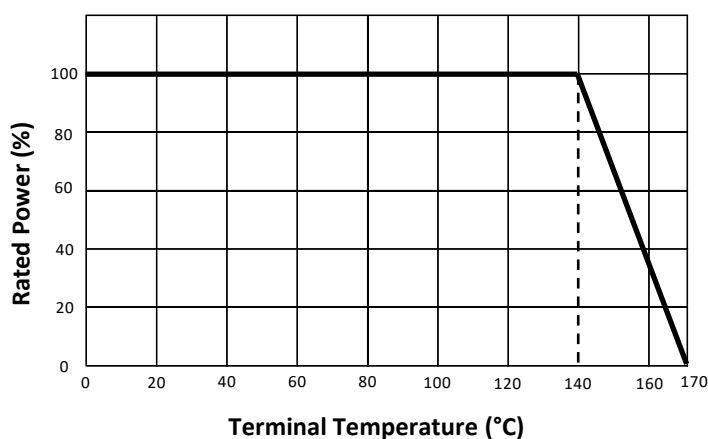
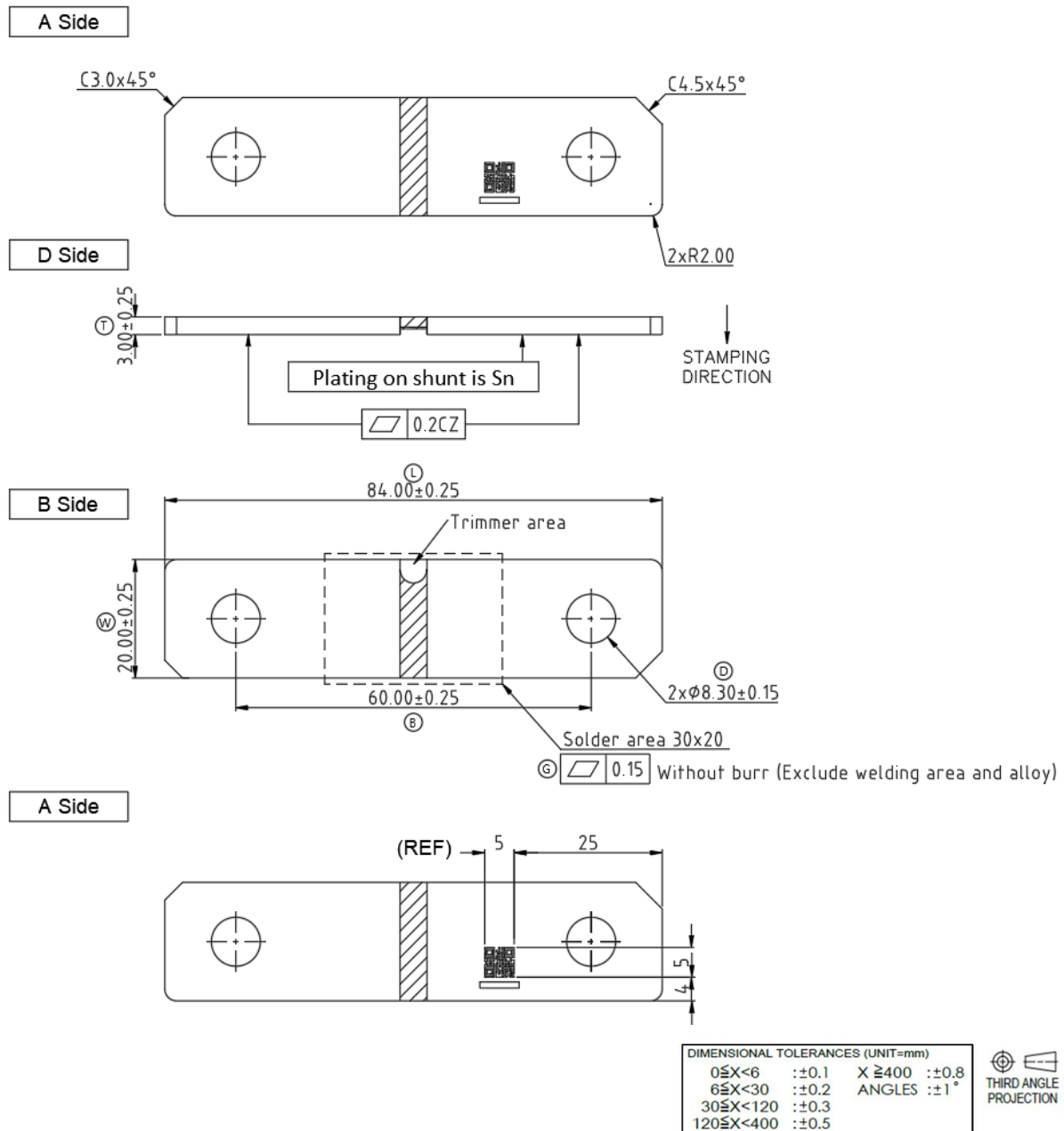


Figure 1. Power derating curve at terminal temperature

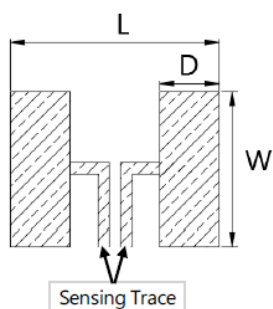
Outline Drawing

Dimension



The plating thickness on shunt : Sn: 1.5 ~ 6 μm

Recommended Dimensions of the Land Pad



Resistance Range	Dimensions (mm)		
	L	D	W
50 $\mu\Omega$	11.95	4	21

Type Designation

VSMA 8420 A Y - M050 J E
 (1) (2) (3) (4) - (5) (6) (7)

Note:

- (1) Series number
- (2) Size
- (3) Terminal type: A = internal code
- (4) Power Rating: Y = 36W
- (5) Resistance value: M050 = 50 $\mu\Omega$
- (6) Tolerance: J = $\pm 5\%$
- (7) Internal code

Characteristics

Electrical

Item	Specification and Requirement	Test Method
Temperature Coefficient (TCR)	As follow specification	JIS-C-5201 +25°C / +125°C
Short Time Overload	$\Delta R: \pm 0.5 \%$ Without damage by flashover, spark, arcing, burning or breakdown	JIS-C-5201-1 4.13 5 x rated power for 5 seconds
ESD	$\Delta R: \pm 1 \%$	AEC-Q200-002 Human body, 8KV.

Mechanical

Item	Specification and Requirement	Test Method
Solderability	The surface of terminal immersed shall be minimum of 95 % covered with a new coating of solder	J-STD-002 245 \pm 5°C for 20 \pm 0.5 seconds
Resistance to Solder Heat	$\Delta R: \pm 0.5 \%$	MIL-STD-202 Method 210 260 \pm 5°C for 10 \pm 1 seconds
Vibration	$\Delta R: \pm 0.5 \%$ Without distinct damage in appearance	MIL-STD-202 Method 204 5G's for 20 minutes, 12 cycles each of 3 orientations. Test from 10-2000Hz.
Mechanical Shock	$\Delta R: \pm 0.5\%$ Without distinct damage in appearance	MIL-STD-202 Method 213 100G's peak value, 6ms, Half-sine waveform, 12.3 ft/sec.

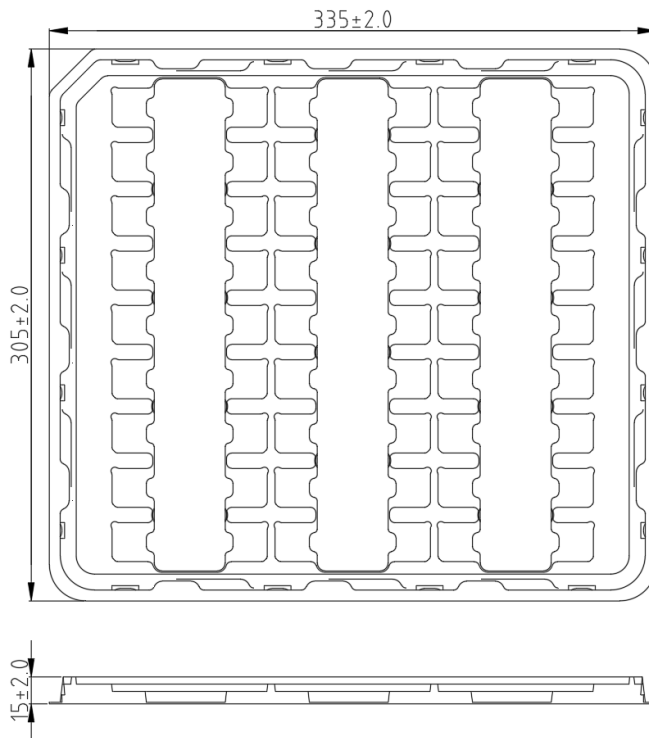
Endurance

Item	Specification and Requirement	Test Method
Temperature Cycling	$\Delta R: \pm 0.5 \%$	JESD22 Method JA-104 1000 cycles, (-55°C ~ 155°C) 30 minutes maximum dwell time at each temperature
Biased Humidity	$\Delta R: \pm 0.5 \%$	MIL-STD-202 Method 103 1000 hours, 85°C / 85% R.H, applied for 10 % rated power
Operational Life	$\Delta R: \pm 1.0 \%$	MIL-STD-202 Method 108 100 % rate power for 1,000 hours at terminal temperature 140°C
High Temperature Store	$\Delta R: \pm 1.0 \%$	MIL-STD-202 Method 108 170°C for 1,000 hours

Note : Measurement at 24 ± 4 hours after test conclusion for all reliability tests-parts.

Packaging

Tray packaging dimensions :



Label Marking :

The following items shall be marked on tray

- (1) Description
- (2) Quantity
- (3) Part No.
- (4) Tapping No.

Quantity:

27 Pcs / Tray

135 Pcs / Carton

Care Note

Care note for storage

- (1) Shunt sensor shall be stored in a environment where temperature and humidity must be controlled (temperature 5 to 35°C, humidity < 60% RH). However, the humidity should be maintained as low as possible.
- (2) Shunt sensor shall not be stored under direct sunlight.
- (3) Shunt sensor shall be stored in condition without moisture, dust, any material defect solderability, or hazardous gas (i.e. hydrogen chloride, sulfurous acid gas, and hydrogen sulfide)
- (4) The sensor can be stored for two years under the condition mentioned above.

Care note for operating and handling

- (1) Protect the edge and coating of the sensors from mechanical stress.
- (2) Avoid bending of printing circuit board (PCB) when cutting and fixing it on support body to reduce mechanical stress on sensors.
- (3) Sensor should be used within the condition of specification.

Note: When a voltage higher than specified value is loaded to the sensor, this may damage the sensor material due to temperature rise.
- (4) The loaded voltage should consult terminal temperature of the sensor according to the derating curve.
- (5) When applying a high current exceeding suggested specification (pulse current, shock current) to the sensor, it is necessary to re-evaluate the operating condition before using it in the system.