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## VSMA8420AY-M050JE, Shunt Sensor (Lead / Halogen Free)

The history of revision change for the specification

Date	Revision	Changes
A0	2021/9/13	New Approval
A1	2022/9/8	Add the thickness of plating

## VSMA8420AY-M050JE, Shunt Sensor (Lead / Halogen Free)

### 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 & AEC-Q200 qualified
- Automotive applications & 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	$\pm 100$ ppm/ $^\circ\text{C}$
Operation Temperature Range	-65 $^\circ\text{C}$ ~ +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 $^\circ\text{C}$ , the maximum load shall be derated in accordance with the following curve.

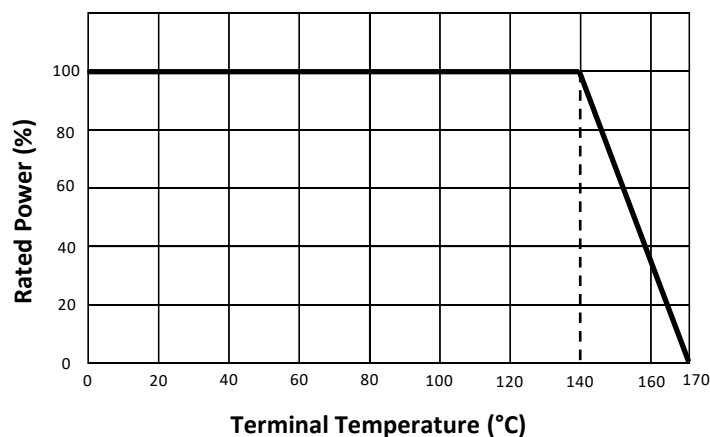
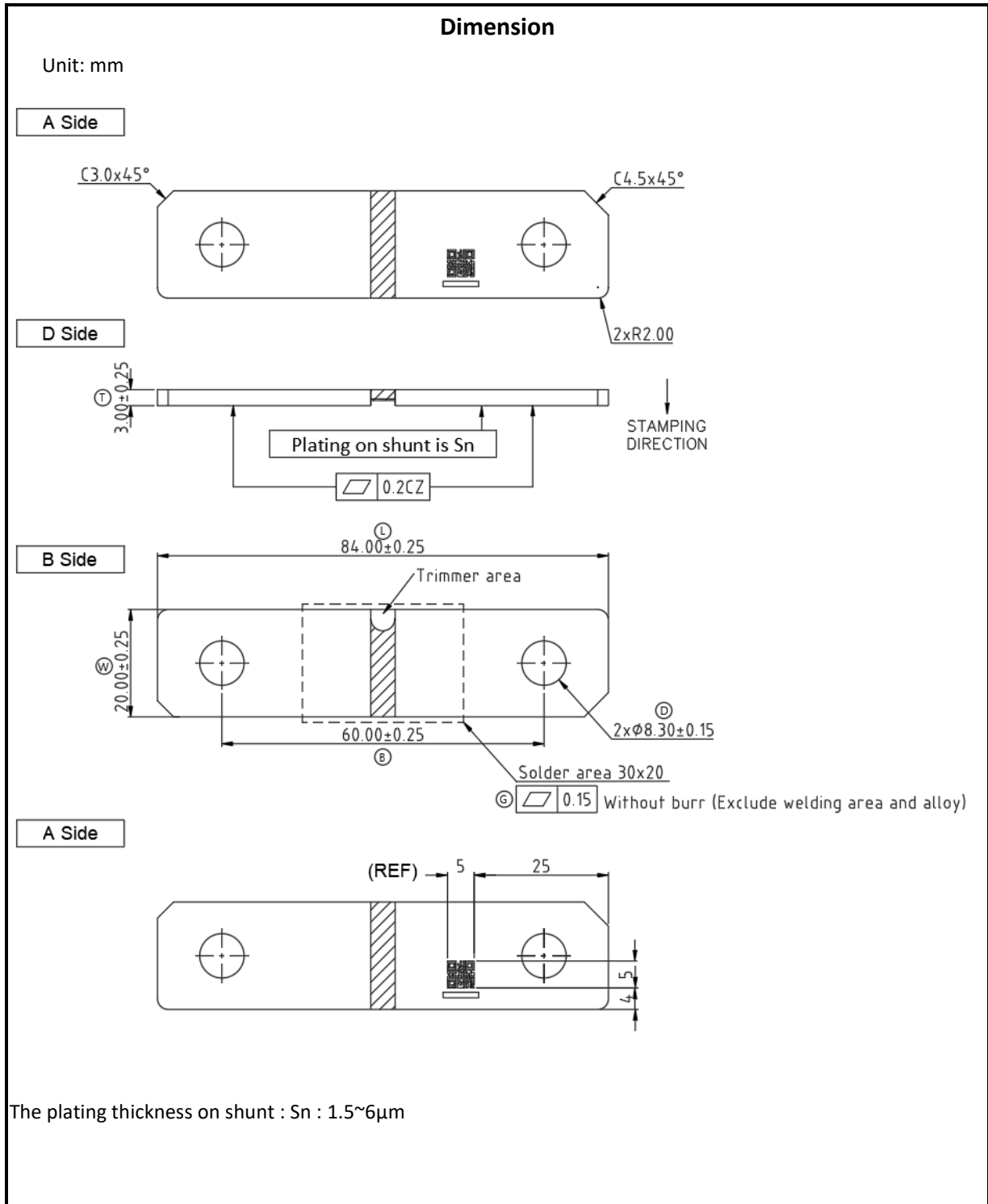
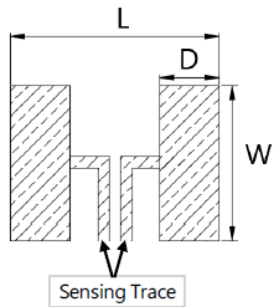


Figure 1. : Power derating curve at terminal temperature

Outline Drawing :



## Recommended Dimensions of the Land Pad



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

## Type Designation :

V S M A   8 4 2 0   A   Y   -   M 0 5 0   J   E  
 (1)   (2)   (3) (4) -   (5)   (6) (7)

### Note :

- (1) Series No.
- (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 ± 5°C for 15 ± 0.5 seconds.
Resistance to Solder Heat	$\Delta R: \pm 0.5\%$	MIL-STD-202 Method 210 260 ± 5°C for 10 ± 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, 12.3ft/sec.

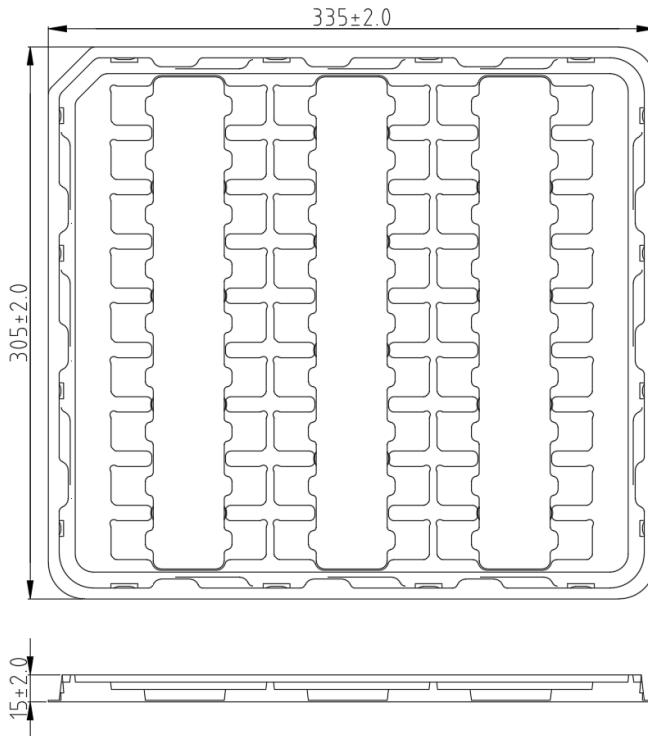
## Endurance

Item	Specification and Requirement	Test Method
Temperature Cycling	$\Delta R: \pm 0.5\%$	JESD22 Method JA-104 1000 cycles, (-55°C~150°C) 30 min 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 at least one year 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.