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SPECIFICATION FOR APPROVAL

DATE：

CUSTOMER：

PART NAME： Metal Strip Type Halogen Free Current Sensing Resistors

CUSTOMER'S DWG. NO.：

CUSTOMER'S PART NO.：

PDC PART NO.： **WME05 Series**

DESCRIPTION.： **0508 Metal Strip Current Sensing Resistors**

ACTION / RESULT	" V "	CUSTOMER'S SIGNATURE	NOTE
FULL APPROVED			
CONDITIONAL APPROVED			
REJECTED			

OUR ACTION	SIGNATURE
PREPARED By	Jenny Tseng
CHECKED By	Steven Wang
APPROVED By	Byron Tsai

CUSTOMER SIGNATURE FOR ACCEPTANCE

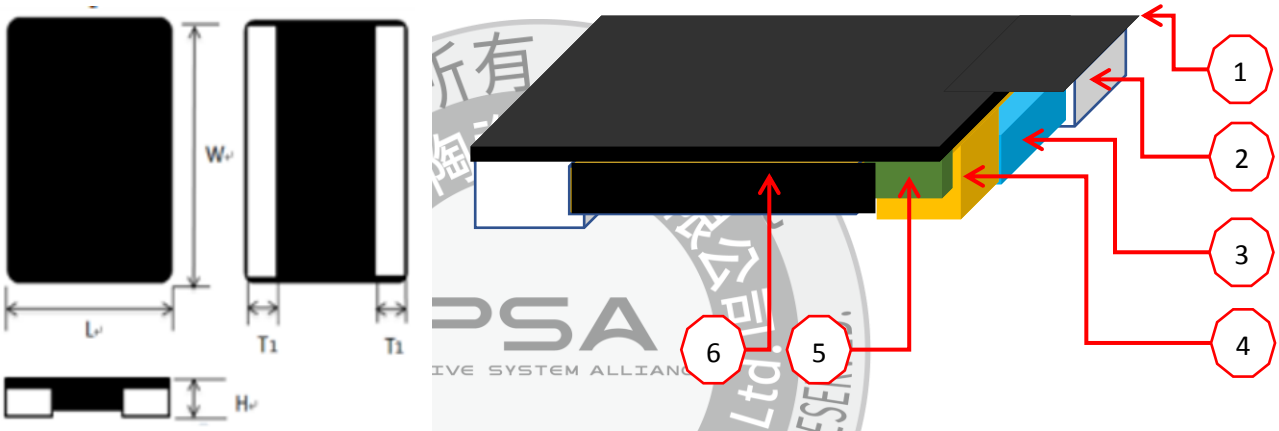
Contents.

WME05 (AEC-Q200)
Metal Strip High Power Lead Free Current Sensing Resistors Preliminary Spec.

1. Features
- High power rating and low TCR.
- Low resistance and high precision (1%).
- Excellent reliability and suitable cost.
- Suitable for lead free soldering.
- High precision trimming implement.
- RoHS compliant & Halogen Free.

2. Applications
- Switching model power supply.
- Battery pack.
- Notebook, Tablet PC
- Test Instrument.
- Power Amplifier.

3. Dimension and Construction



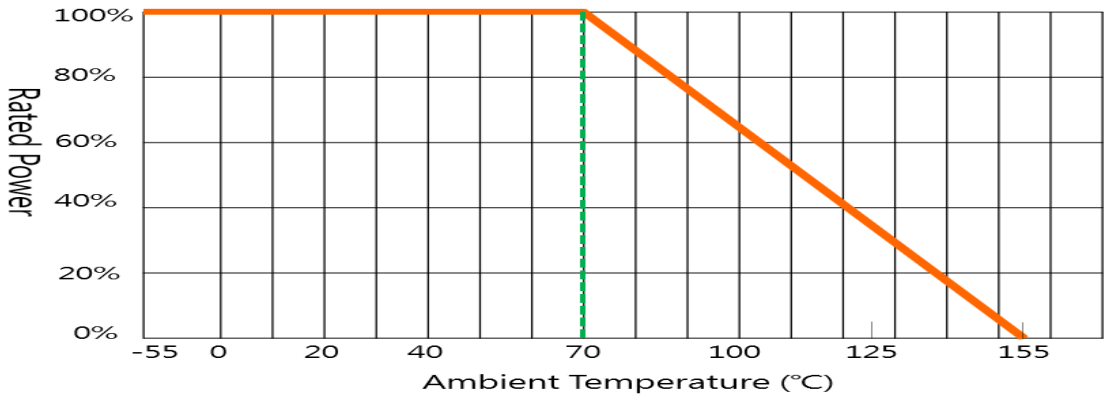
Item	1	2	3	4	5	6
Construction	Protective Coating	Outer Terminal	Middle Terminal	Inner Terminal	Resistive Element	Protective Coating
Material	Epoxy Resin Substrate	Matte Sn	Nickle	Copper	Manganin Alloy	Epoxy Resin

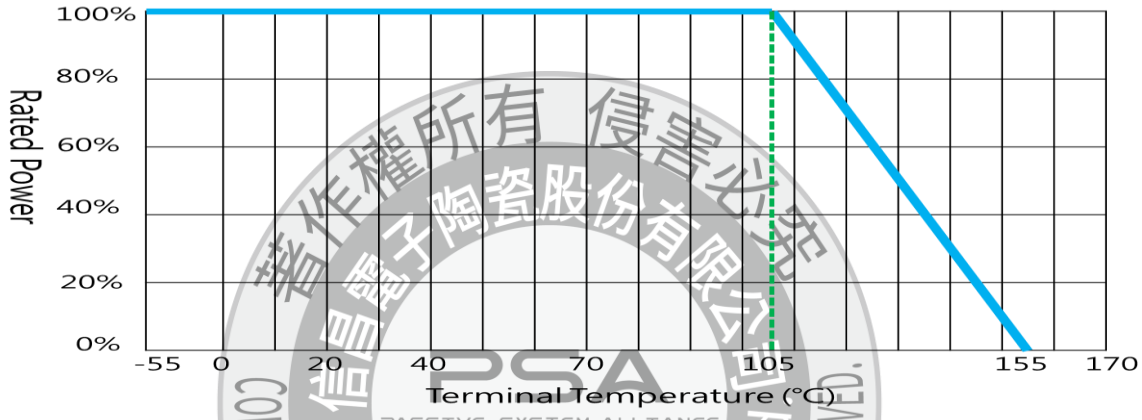
Unit：mm

Type	Type of Terminal	Power Rating (W)	Resistance Range (mΩ)	Dimensions(mm)			
				L	W	H	T1
0508	2	3/4	1	1.25±0.20	2.00±0.20	0.40±0.10	0.38±0.15
		1	1.5 ~ 5				0.32±0.15

4.Power Derating Curve

Operating Temperature Range: -55 to +155℃





5.Rating

Rating / Type	Type of Terminal	Tolerance (%)	Rating Power (W)	Rating Terminal Temperature	Max. Working Current*	Max. Overload Current*	Alloy Type	Temperature coefficient of Resistance (ppm/℃)**	Resistance (mΩ) ***
WME05 (0508)	**2**	**±1%(F) ±2%(G) ±5%(J)**	**3/4**	**105℃**	27.38A	44.76A	Low EMF	**±100**	**1~1.5**
					19.36A	38.72A		**±50**	**2~5**
			1		31.62A	63.24A	Low EMF	**±100**	**1~1.5**
					22.36A	44.72A		**±50**	**2~5**

Note:

(i) I = $\sqrt{P/R}$ or Max. Working Current.

(ii) I : Working Current(A)，P：Rated Power (W)，R：Resistance Value(Ω)

(iii) Please keep the terminal temperature do not exceed 105℃ when working.

(iv) * : Related number are depend on specific items only. ** : TCR Hot (+25~+155℃).

(v) *** : R-value might be variance depend on soldering conditions and please consider this influence before use milli-ohm resistors, and strongly suggest use the recommend solder pad to design your circuits.

6.Part Number

Type	Size	Terminal	Tolerance	Packing	Watt	Value	TCR	Special Code
WME	**05** :0508	**2** :2 terminals **4** :4 terminals	**F** :±1% **G** :±2% **J** :±5%	T:Paper Tape 5Kpcs	**G**: 3/4W **H**: 1W	**RXXX** 4 digit. **RXLX** 4 digit	**N**: 100 ppm **P**: 50 ppm	General: *Low EMF* **BH** AEC-Q200: *Low EMF* **BHM**

Example：

WME052FTGR005PBH

➔Metal strip, 0508 size, ±1%, paper tape, 3/4W, 5mΩ, low emf

WME052FTHR1L5NBH

➔Metal strip, 0508 size, ±1%, paper tape, 1W, 1.5mΩ, low emf

WME052FTHR001NBH

➔Metal strip, 0508 size, ±1%, paper tape, 1W, 1mΩ, low emf

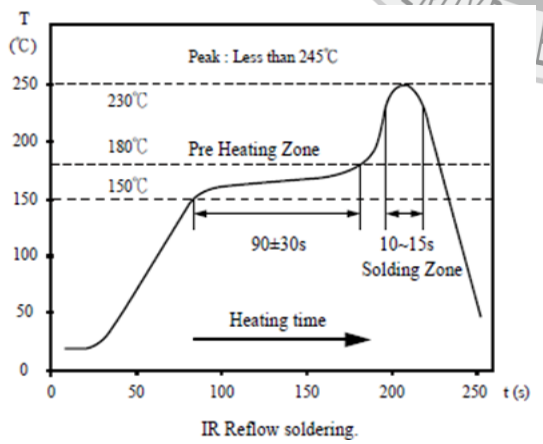
WME052FTHR001NBHM

➔Metal strip, 0508 size, ±1%, paper tape, 1W, 1mΩ, low emf, AEC-Q200

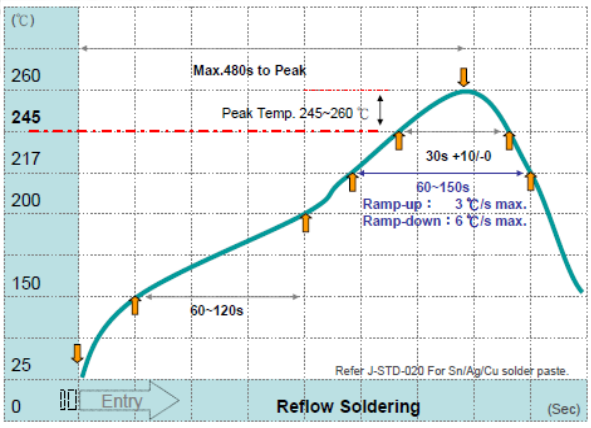
7.Marking / Soldering

WME052 : No Marking

Soldering Reference：Applicable for most industrial soldering request.
Compatible with reflow soldering. (Not compatible with wave soldering)

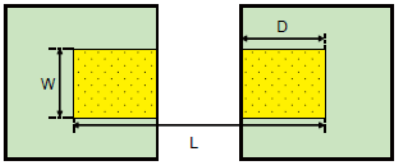


IR Reflow soldering.



Recommend Solder Pad Dimensions：(Unit:mm)

Type	Resistance (mΩ)	W	D	L
0508	**1**	2.30	0.90	2.20
	1.5~5	2.30	0.85	2.20



8. Reliability Performance (AEC-Q200)

* Normal test items for general product.

Test Item	Specification	Test Method (AEC-Q200. IEC 60115)
***DC Resistance**	J：±5%　G：±2% F：±1%	**AEC-Q200　TABLE 7.1** **IEC 60115-1 / JIS C 5201-1 , Clause 4.5** Measure the resistance Value.
High Temperature Exposure (Storage)	1~ 3 mΩ: ΔR≦ ±1% 4~5 mΩ: ΔR≦ ±2%	**AEC-Q200　TABLE 7.3** 1000 hrs. @ T=155℃. Unpowered. Measurement at 24 ±2 hours after test conclusion.
***Temperature Cycling**	ΔR≦ ±1% No mechanical damage.	**AEC-Q200　TABLE 7.4** 1000 Cycles (-55°C to +125°C). Measurement at 24±2 hours after test conclusion. **IEC 60115-1 Clause 4.19 for General Type** Repeat 5 cycles as follows -55℃(30min.)→25℃(2~3min.)→155℃(30min.)→25℃(2~3min.)
Moisture Resistance	△R≦ ±1%	**AEC-Q200　TABLE 7.6** Test 65℃/80~100%RH/10Cycles. Measurement at 24±2 hours after test conclusion. (t=24hrs/cycle).
Biased Humidity	Δ R≦ ±1%	**AEC-Q200　TABLE 7.7** 1000 hours 85℃/85%RH. 10% of operating power. Measurement at 24 ±2 hours after test conclusion.
Operational Life	Δ R≦ ±1%	**AEC-Q200　TABLE 7.8** Test 1000hr @ TA=125℃ at specified rated power. Measurement at 24±2 hours after test conclusion.
External Visual	No visual damage and refer PDC marking code.	**AEC-Q200　TABLE 7.9** Inspect device construction, marking and workmanship.
Physical Dimension	Within the spec.	**AEC-Q200　TABLE 7.10** Verify physical dimensions to the applicable device detail specification.

Mechanical Shock	Within product specification tolerance and no visible damage.	**AEC-Q200 TABLE 7.13** Test Peak value:100g's,Wave:Hail-sine, Duration:6ms,Velocity:12.3ft/sec.
Vibration	ΔR≦ ±1% No mechanical damage.	**AEC-Q200 TABLE 7.14** 5 g's for 20 min., 12 cycles each of 3 orientations. Test from 10-2000 Hz.
***Resistance to Solder Heat**	ΔR≦ ±1% No mechanical damage.	**AEC-Q200 TABLE 7.15** Solder dipping @ 260℃±5℃ for 10sec.±1sec.
Thermal Shock	ΔR≦ ±1% No mechanical damage.	**AEC-Q200 TABLE 7.16** -55 to 155℃/ dwell time 15min/ Max transfer time 20sec/ 300cycles.
ESD	ΔR≦ ±1% No mechanical damage.	**AEC-Q200-002** Test contact min. 1KV.
***Solder Ability**	Over 95% of termination must be covered with solder.	**AEC-Q200 TABLE 7.18** a)Baking 155℃ 4H, dipping 235℃ 5s b)Steam 8H, dipping 215℃ 5s c)Steam 8H, dipping 260℃ 7s **IEC 60115-1, Clause 4.17 for General Type** After immersing flux, dip in the 245±2℃ molten solder bath for 3±0.5 sec.
Flammability	Refer UL-94.	**AEC-Q200 TABLE 7.20** UL-94 V-0 or V-1 are acceptable
***Board Flex**	ΔR≦ ±1% No mechanical damage.	**AEC-Q200 TABLE 7.21** Bending 2mm for 60 seconds.
Anti-Sulfur	ΔR≦±1%	**EIA-977(Test B)** Sulfur 750 hours, 105±2°C

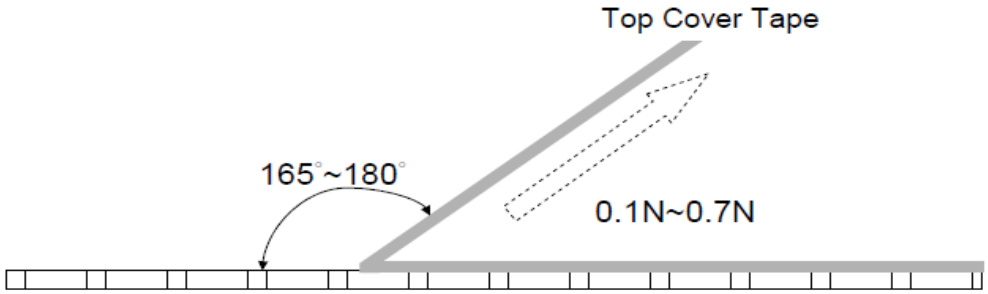
***Short Time Overload**	ΔR≦ ±1%	**IEC 60115-1, Clause 4.13** 5 × Rated power for 5 seconds
***Load Life Humidity**	Δ R≦ ±1%	**IEC 60115-1, Clause 4.24** 40±2℃ with relative humidity 90% ~ 95% D.C. rated voltage for 1.5 hours ON 30 minutes OFF. Cycle repeated 1000 hours.
***Temperature Coefficient of Resistance (TCR)**	Within the spec.	**IEC 60115-1, Clause 4.8** T_1 T_2 Test temperature： 25℃~ +155℃ TCR(ppm/℃) = $(R_2-R_1)/R_1 \times 1 / (T_2-T_1) \times 10^6$ (+25~ -55℃ please contact factory.)
***Load Life (Terminal Temperature Below 105℃)**	Δ R≦ ±1%	**IEC 60115-1, Clause 4.25** Rated current for 1.5 hours for followed by a pause 0.5 hour at terminal temperature 105℃ or ambient 70±2℃. Cycle repeated 1000 hours.
***Insulation Resistance**	Between termination and coating must over 100MΩ	**IEC 60115-1, Clause 4.6** Test voltage：100±15V

9. PACKAGING

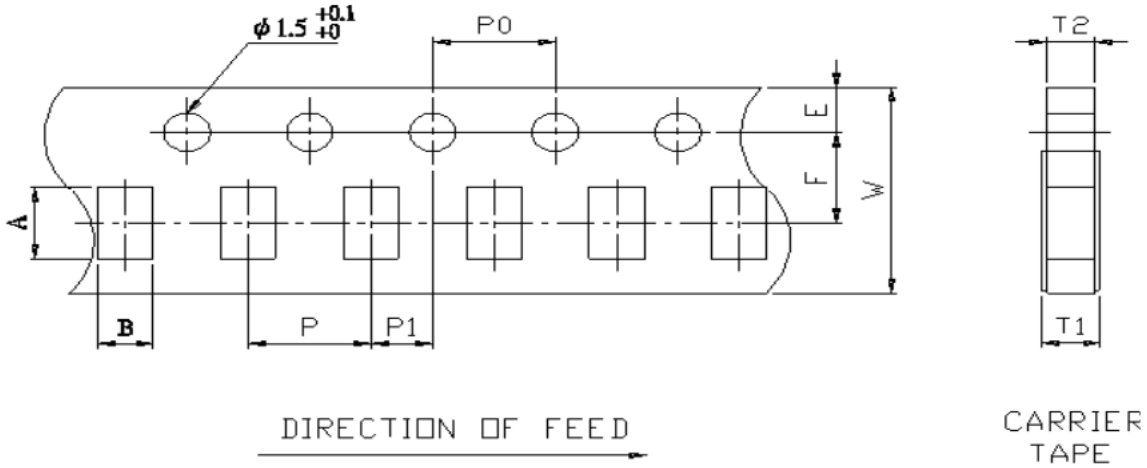
9.1 Peel Strength of Top Cover Tape

The peel speed shall be about 300 mm/min

The peel force of top cover tape shall between 0.1 to 0.7N



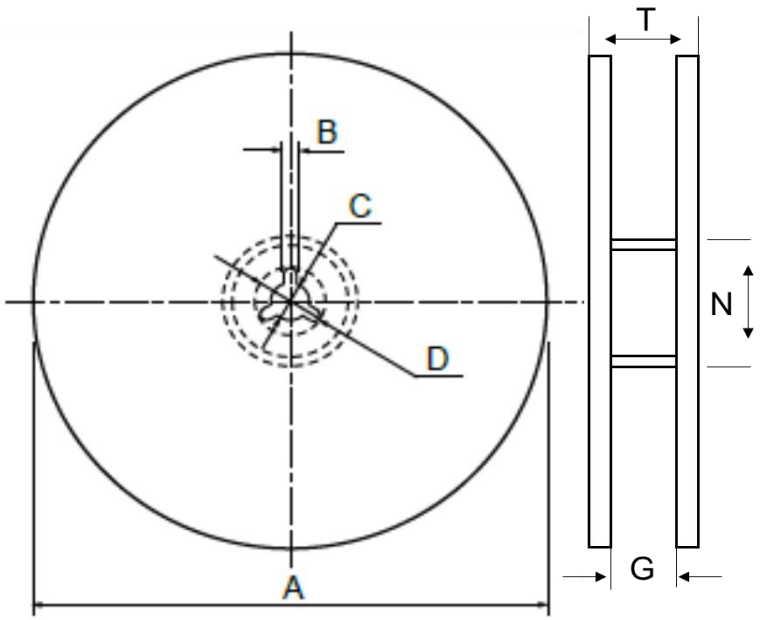
9.2 Tape Packaging Dimensions



Size	Resistance Range(mΩ)	A	B	W	F	E	T1	T2	P	P1	P0	10*P0
0508	1~5	2.40±0.20	1.65±0.20	8.0±0.30	3.50±0.05	1.75±0.10	0.60+0.2/-0	0.60±0.05	4.00±0.10	2.00±0.05	4.00±0.10	40.00±0.20

unit : mm

9.3 Reel Dimensions



Size	Packaging Q'ty	A	N	C	D	B	G	T
0508	5kpcs/Reel	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	10.0±1.5	14.9max.

10.Storage &. Handling

… Products are recommended to be used up within one year as ensured shelf life.
Check solder ability in case shelf life extension is needed.

… To store products with following condition:
Temperature:5 to 40℃ ; Humidity: 20 to 70% relative humidity.

Precaution for use :

The AEC-Q200 series resistors is mainly used on general automotive equipment without safety considerations. Please contact our company in advanced if you intend to use resistor for designing the equipment which may damage itself and the safety of third party. If necessary, please consider to add the protect circuit in devising process and obtaining fully safety evaluation. The contents of the acknowledgment is only used for our parent company, marketing subsidiaries and official marketing agents who purchase our products. Not applicable for the other nonofficial channels.

※ All products specification and data are subject to change without notice.