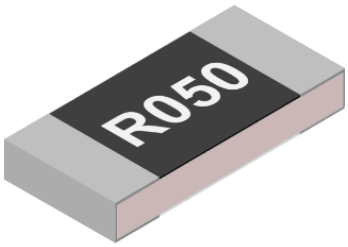
Low-Resistance Metal Film Chip Resistor

AMFR Series

PROSEMI offers AEC-Q200 qualified Current Sensing Resistor

Applications

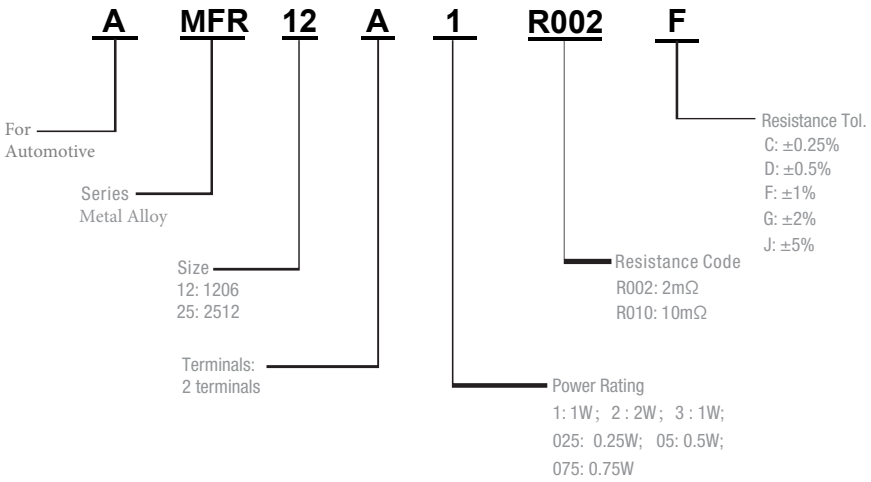
- Consumer electronics
- Computer & relative products
- Communication devices
- Measuring instrument
- Industrial / Power supply
- Battery management system



Features

- Low Resistance / TCR / Inductance(≦5NH)
- Excellent long-term stability
- High precision current sensing
- High power capability
- Halogen free and lead free
- RoHS compliant
- AEC-Q200 compliant

Part Numbering System

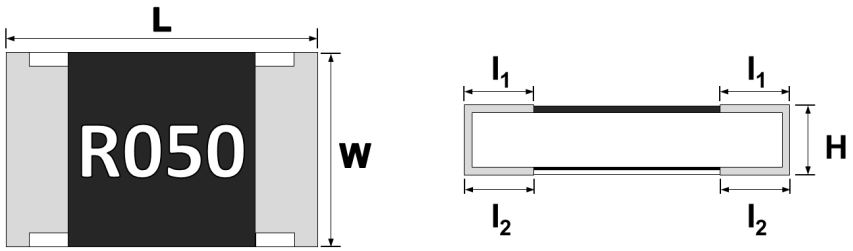


Low-Resistance Metal Film Chip Resistor AMFR Series

Type	Rating Power at 70℃	T.C.R. (ppm/℃)	Resistance Range(mΩ)		Meterial	Operating Temperature(℃)
			C: 0.25%	D: 0.5%, F: 1.0%, G: 2.0%, J: 5.0%		
AMFR12	0.25W,0.75W 0.5W, 1W	±150	-	39mΩ≦R<50mΩ	Metal Alloy	-55~+155°C
		±100	-	50mΩ≦R<100mΩ		
		±50	470mΩ≦ R≦10Ω	100mΩ≦R≦10Ω		
AMFR25	1W,2W 3W	±50	470mΩ≦ R≦10Ω	100mΩ≦R≦10Ω		

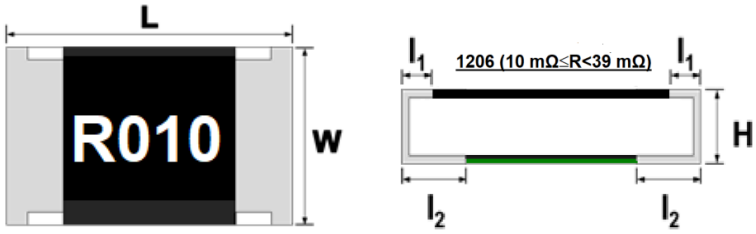
Type	Rating Power at 70℃	T.C.R. (ppm/℃)	Resistance Range(mΩ) F: 1.0%, G: 2.0%, J: 5.0%	Meterial	Operating Temperature(℃)
AMFR12	0.25W 0.5W	±200	10mΩ≦R< 39mΩ	Metal Alloy	-55~+155°C

Construction



Unit: mm

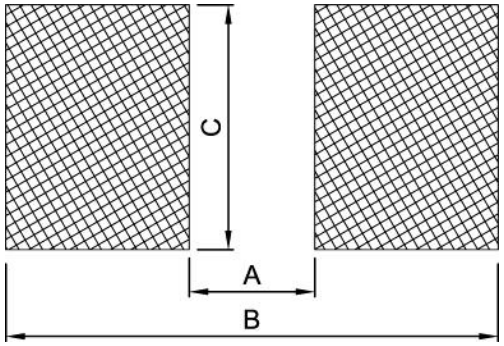
Type	L	W	H	I_1	I_2
AMFR12	3.1 ±0.1	1.6±0.1	0.55±0.1	0.4±0.2	0.45±0.2
AMFR25	6.3 ±0.2	3.2±0.2	0.55±0.1	0.65±0.25	0.65±0.25
AMFR25 3W			0.7±0.15		



Unit: mm

Type	L	W	H	I_1	I_2
AMFR12 (10mΩ≦R<39mΩ)	3.3 ±0.2	1.7±0.2	0.65±0.2	0.2±0.15	0.68±0.2

Recommended land pattern



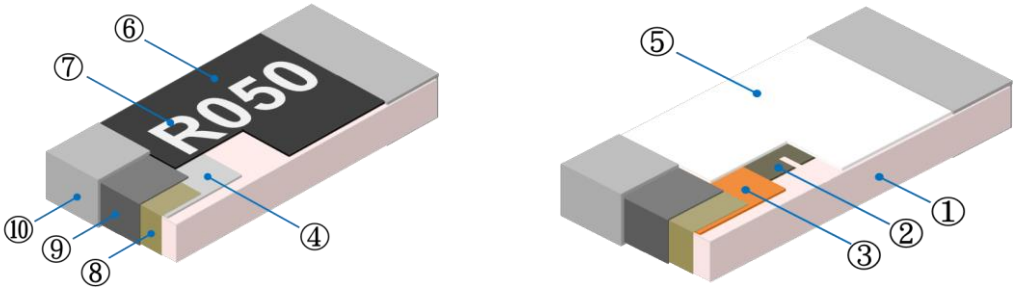
Unit: mm

Type	A	B	C
AMFR12	2.2	4.2	1.8
AMFR12 (10mΩ≦R<39mΩ)	1.2	4.8	1.84
AMFR25	4.9	8.1	3.4

Product Characteristics

Item	Test condition/ Methods	Limited
Temperature coefficient of resistance	TCR =(R-R_0)/R_0(T2-T1)X 10^6 R_0: resistance of room temperature R: resistance of 125℃ T1: Room temperature T2: Temperature at 125℃	Refer to Spec
Short time Overload	Standard power：6.25 times rated power whichever is less for 5 seconds. High power (2X/4X) and wide terminal type：5 times rated power whichever is less for 5 seconds.	±(1.0%+0.001Ω)
Resistance to Soldering Heat	260±5℃ for 10 seconds.	±(1.0%+0.001Ω) No Visual damage
Temperature Cycling	-55℃ to +155℃, 300 cycles	±(1.0%+0.001Ω) No Visual damage
High Temperature Exposure	At 155±5℃ for 1000 hours.	±(1.0%+0.001Ω)
Bias Humidity	1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24±4 hours after test conclusion.	±(0.5%+0.05Ω)
Leaching	260±5℃ for 30 seconds.	>95% Coverage No Visual damage
Insulation Resistance	Apply 100VDC for 1 minute.	≥10GΩ
Damp Heat with Load	40±2℃, 90~95% R.H. RCWV or Max. working current whichever is less for 1000 hrs with 1.5 hrs 〝ON〞 and 0.5 hr 〝OFF〞	±(1.0%+0.001Ω)
Solderability	245±5℃ for 3 seconds.	>95% Coverage No Visual damage
Load Life (Endurance)	70±2℃, Rated power, or Max. working current whichever is less for 1000 hrs with 1.5 hrs 〝ON〞 and 0.5 hr 〝OFF〞.	±(0.5%+0.05Ω)
Resistance to Solvent	The tested resistor be immersed into isopropyl alcohol of 20~25℃ for 60 secs. Then the resistor is left in the room for 48 hrs.	±(1.0%+0.001Ω) No Visual damage
Bending Strength	Bending once for 5 seconds D：1206 = 3mm 2512 = 2mm	±(1.0%+0.001Ω) No Visual damage

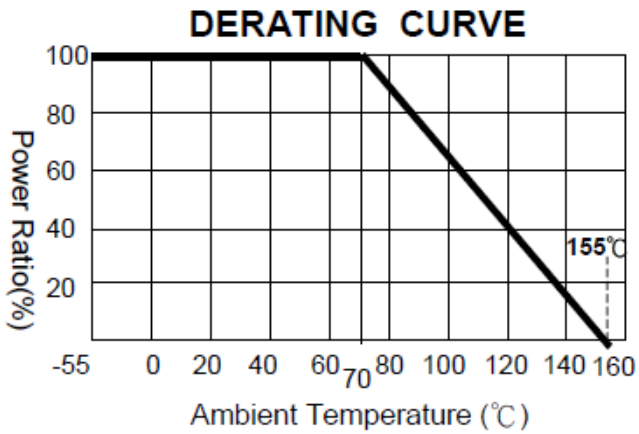
Construction



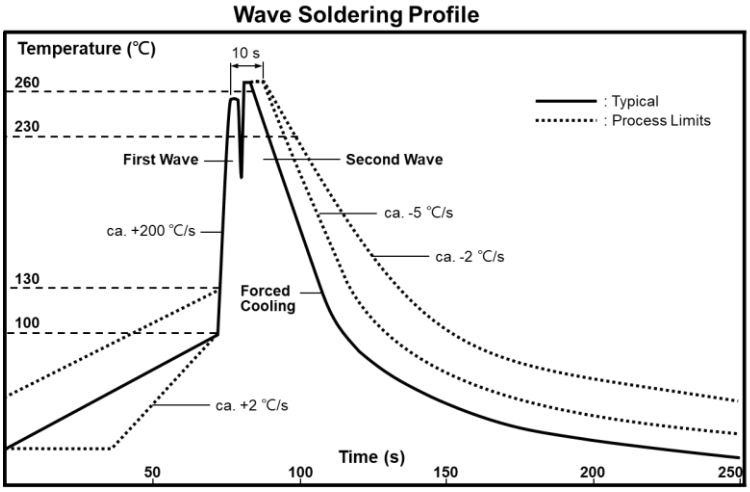
①	Alumina Substrate	⑥	Top Protective Overcoat
②	Resistive Layer	⑦	Marking
③	Bottom Inner Electrode (Cu)	⑧	Side Inner Electrode
④	Top Inner Electrode	⑨	Barrier Layer (Ni)
⑤	Bottom Protective Overcoat White(≧39mR) Green(<39mR)	⑩	Solder coating (Sn)

Power Derating Curve

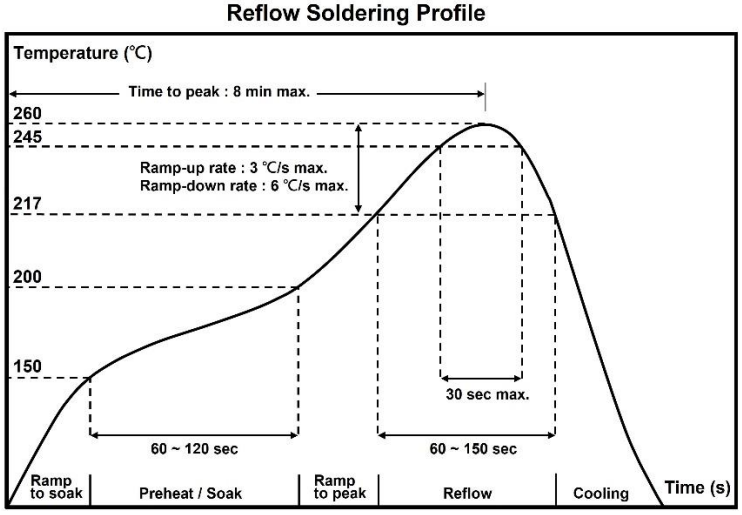
The Operating Temperature Range: -55°C ~+155°C.
Power rating or current rating is in the case based on continuous full-load at ambient temperature of 70°C. For operation at ambient temperature in excess of 70°C, the load should be derated in accordance with figure of derating Curve.



Wave solder Temperature condition



Solder reflow Temperature condition

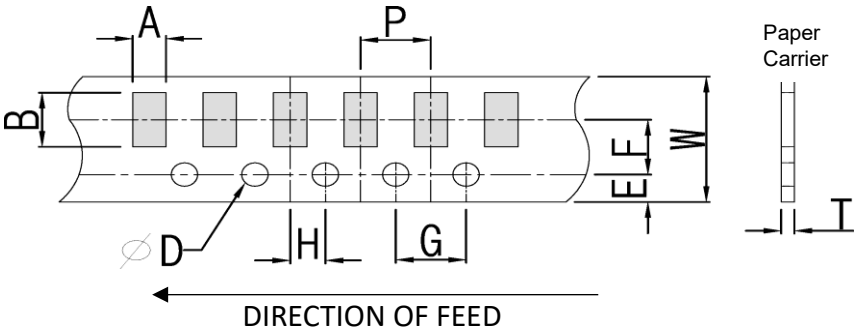


- **Rework temperature（hot air equipment）: 350℃, 3~5seconds**
- **Recommended reflow methods**

  IR, vapor phase oven, hot air oven

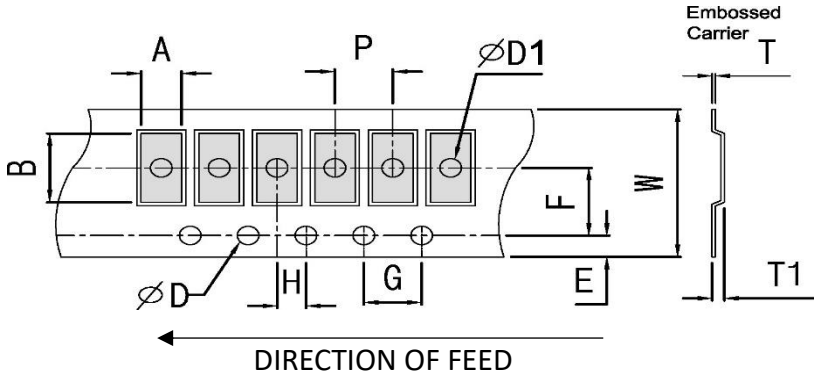
  If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Tapping & Package



Unit: mm

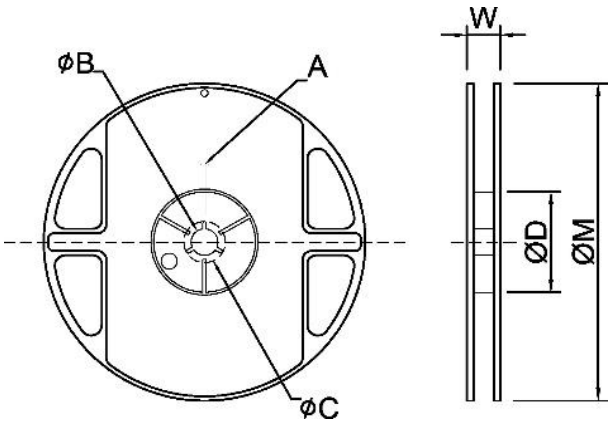
Type	A ±0.2	B ±0.2	W +0.2	E ±0.05	F ±0.05	G ±0.1	H ±0.05	T ±0.1	D	P ±0.1
1206	1.9	3.05	8.0	1.75	3.5	4.0	2.0	0.75	$1.50^{+0.1}_{-0}$	4.0



Unit: mm

Type	A ±0.2	B ±0.2	W +0.1	E ±0.1	F ±0.05	G ±0.1	H ±0.05	T ±0.1	D	D1 ±0.1	T1 ±0.15	P ±0.1
2512	3.4	6.7	12.0	1.75	5.5	4.0	2.0	0.23	$1.50^{+0.1}_{-0}$	1.5	0.85	4.0

Reel Specification



Unit: mm

Type	Quantity (pcs)	A	B	C	D	W	M
1206	5，000	2.0±0.5	13.5±1	21±1	60±1	11.5±2	178±2
2512	4，000					16.0±2	

- **Storage Data：**

  Storage time at the environment temp: 25±5℃& humidity: 60±20% is valid for one year from the date of delivery.