

Data Sheet

Customer: _____

Product: High Ohmic Chip Resistor - HMR Series _____

Size : 0805/1206 _____

Issued Date: 23-Aug.-2023 _____

Edition: Ver. 2 _____

Record of change

Date	Ver.	Description	Page
1-Apr.-2015	1		
23-Aug.-2023	2	Revised Part No. & electrical specification & Marking	1 ~ 5

HITANO ENTERPRISE CORP.

7F-7, No. 3, Wu Chuan 1st Road, New Taipei Industrial Park,

New Taipei City, TAIWAN, R.O.C.

Tel: +886 2 2299 1331 (Rep.)

Fax: +886 2 2298 2466, 2298 2969

Prepared by	Checked by	Approved by	Accepted by (customer)
23-Aug.-2023	23-Aug.-2023	23-Aug.-2023	
Hwa Wu	Andy Hsu	Arthur Su	

HIGH OHMIC CHIP RESISTORS

HMR SERIES

■ Features

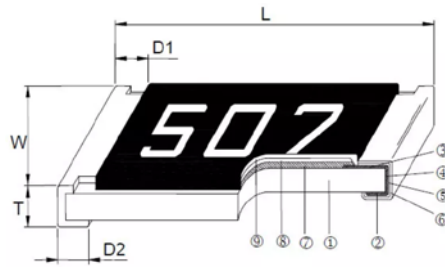
- Extended resistance range (110MΩ to 1GΩ)
- surface mount package
- Highly reliable multilayer electrode construction



■ Applications

- Low signal detection or amplification circuits
- X-ray equipment
- Voltage dividers and hybrids
- Testing devices
- High input impedance quartz amplifiers

■ Construction & Dimensions



① Alumina Substrate	④ Edge Electrode	⑦ Resistor Layer
② Bottom Electrode	⑤ Barrier Layer	⑧ Primary Overcoat
③ Top Electrode	⑥ External Electrode	⑨ Secondary Overcoat

Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)
0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20
1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20

■ Part Numbering



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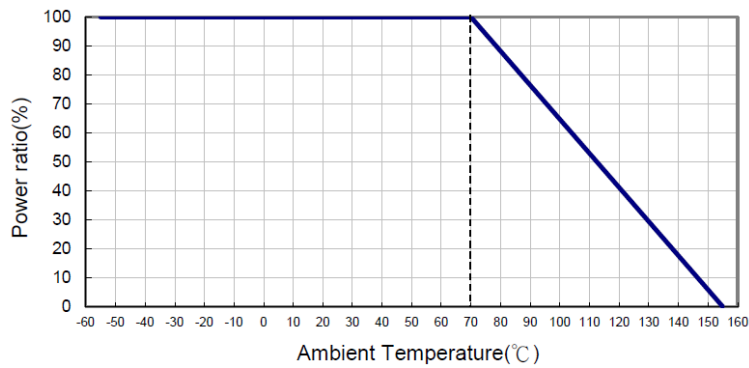
■ Standard Electrical Specification

Size	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Temperature Coefficient (TCR; ppm/°C)	Resistance Range
						±5%
0805	1/8W	-55 ~ +125°C	150V	300V	±500	110MΩ~500MΩ
					±1000	510MΩ~1GΩ
1206	1/4W		200V	400V	±500	110MΩ~500MΩ
					±1000	510MΩ~1GΩ

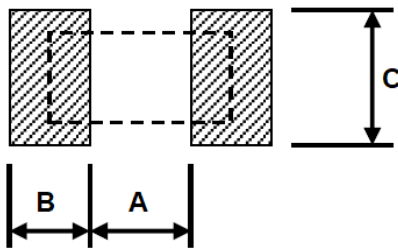
**Operating Voltage= $\sqrt{P \cdot R}$ or Max. operating voltage listed above, whichever is lower.

**Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max. overload voltage listed above, whichever is lower.

■ Derating Curve



■ Recommend Land Pattern



Size	A (mm)	B (mm)	C (mm)
0805	1.20	0.70	1.30
1206	2.00	0.90	1.60

■ Marking

5% for 0805/1206; 3 digits marking in E24

Example: 101=100Ω 102=1KΩ (1st and 2nd are E24 code and 3rd code is multiplier)

E24 code	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91

HIGH OHMIC CHIP RESISTOR

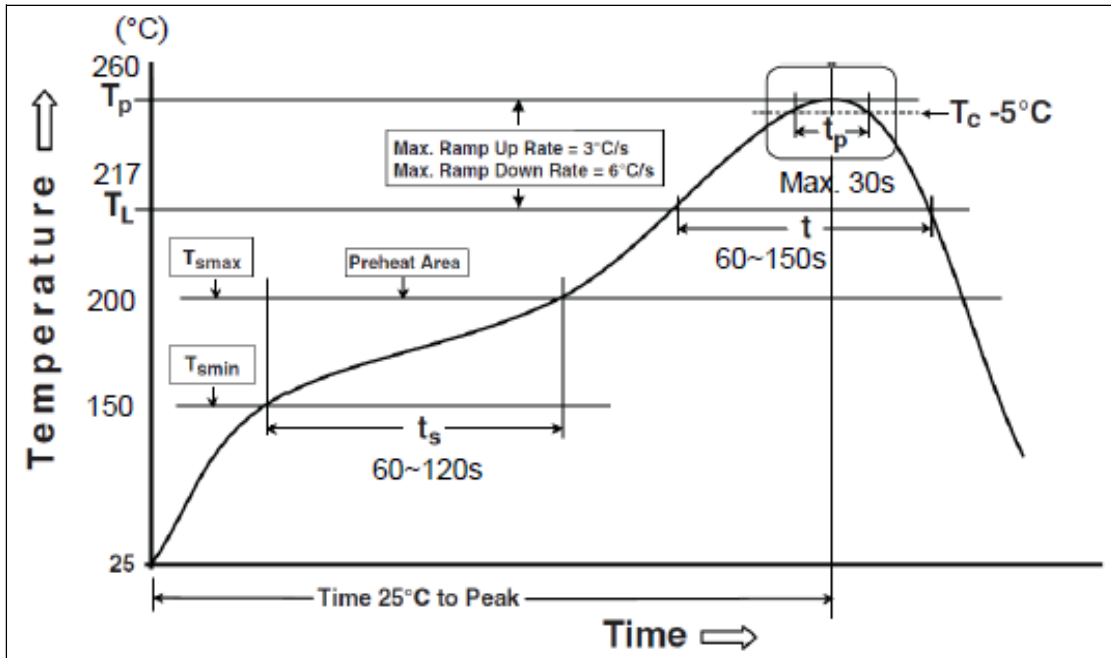
HMR SERIES

■ Environmental Characteristics

Item	Requirement	Test Method
	±5%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	JIS-C-5201-1 4.8 IEC-60115-1 4.8 At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature
Short Time Overload	±(2.0%+0.05Ω)	JIS-C-5201-1 4.13 IEC-60115-1 4.13 RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resistance	≥10G	JIS-C-5201-1 4.6 IEC-60115-1 4.6 Max. Overload Voltage for 1 minute
Endurance	±(3.0%+0.10Ω)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"
Damp Heat with Load	±(3.0%+0.10Ω)	JIS-C-5201-1 4.24 IEC-60115-1 4.24 40±2°C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"
Dry Heat	±(1.5%+0.10Ω)	JIS-C-5201-1 4.23 IEC-60115-1 4.23.2 at +125 °C for 1000 hrs
Bending Strength	±(1.0%+0.05Ω)	JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 60 seconds 0805, 1206 sizes: 3mm
Solderability	95% min. coverage	JIS-C-5201-1 4.17 IEC-60115-1 4.17 245±5°C for 3 seconds
Resistance to Soldering Heat	±(1.0%+0.05Ω)	JIS-C-5201-1 4.18 IEC-60115-1 4.18 260±5°C for 10 seconds
Voltage Proof	No breakdown or flashover	JIS-C-5201-1 4.7 IEC-60115-1 4.7 1.42 times Max. Operating Voltage for 1 minute
Leaching	Individual leaching area ≤5% Total leaching area ≤ 10%	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1 260±5°C for 30 seconds
Rapid Change of Temperature	±(1.0%+0.05Ω)	JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +125°C, 5 cycles

- RCWV(Rated Continuous Working Voltage)=√(P*R) or Max. Operating Voltage whichever is lower.

■ **Soldering Condition (Ref. IPC/JEDEC J-STD-020 & J-STD-002)**



Reflow Profiles	
Profile Feature	Pb-Free Assembly
Preheat Min. Temperature (Tsmmin) Max Temperature (Tsmmax) Preheating time (ts) from (Tsmmin to Tsmmax)	150 °C 200 °C 60-120 seconds
Ramp-up rate (TL to Tp)	3 °C/second max.
Liquidous temperature (TL) Time (tL) maintained above TL	217 °C 60-150 seconds
Min. Peak temperature (Tp min)	235°C
Max. Peak temperature (Tp max)	260°C
Time (tp) within 5 °C of the specified classification temperature (Tc)	30 seconds max.
Ramp-down rate (Tp to TL)	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.

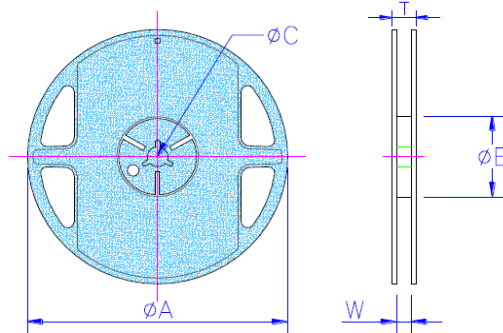
- **Storage Temperature: 15~28°C; Humidity <80%RH**
- **Shelf Life: 2 years from production date.**

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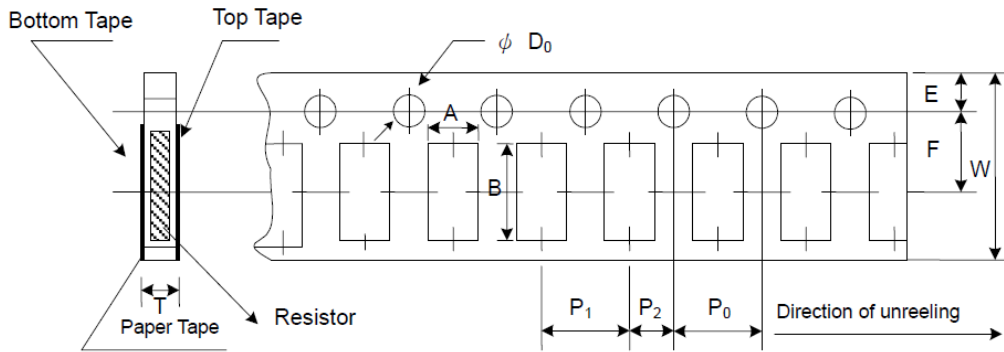
■ Packaging

Reel Specifications & Packaging Quantity



Size	Packaging Quantity		Tape Width	Reel Diameter	ϕA (mm)	ϕB (mm)	ϕC (mm)	W (mm)	T (mm)
0805 1206	Paper	5K	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5

Paper Tape Specifications



Size	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P ₀ (mm)	P ₁ (mm)	P ₂ (mm)	ϕD_0 (mm)	T (mm)
0805	1.60±0.10	2.40±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10
1206	1.90±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10