Data Sheet

Customer:	
Product:	High Ohmic Chip Resistor - HMR Series
Size:	0805/1206
Issued Date:	15-Jun-22
Edition:	REV.A8

RoHS Compliant

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15-Jun-22	15-Jun-22	15-Jun-22		
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High Ohmic Chip Resistor



■Scope

－This specification applies to all sizes of rectangular-type fixed chip resistors with Ruthenium-base as material.

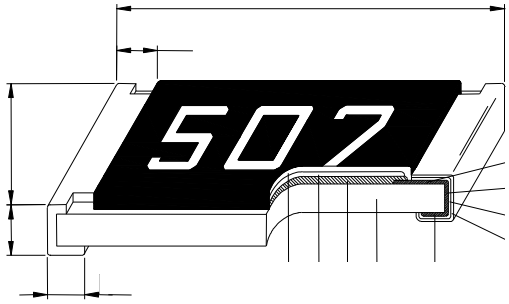
■Features

－Extended resistance range(110MΩ ~ 1GΩ)

－Surface mount package

－Highly reliable multilayer electrode construction

■Construction



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

■Applications

－Voltage dividers and hybrids

－X-Ray equipment

－Low signal detection or amplification circuits

－High input impedance quartz amplifiers

－Testing devices

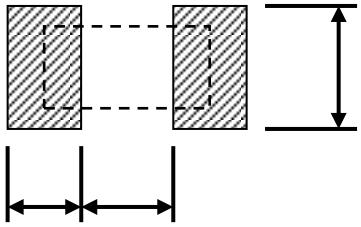
■Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)	Weight (g) (1000pcs)
HMR05	0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20	4.368
HMR06	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20	8.947

■Part Numbering

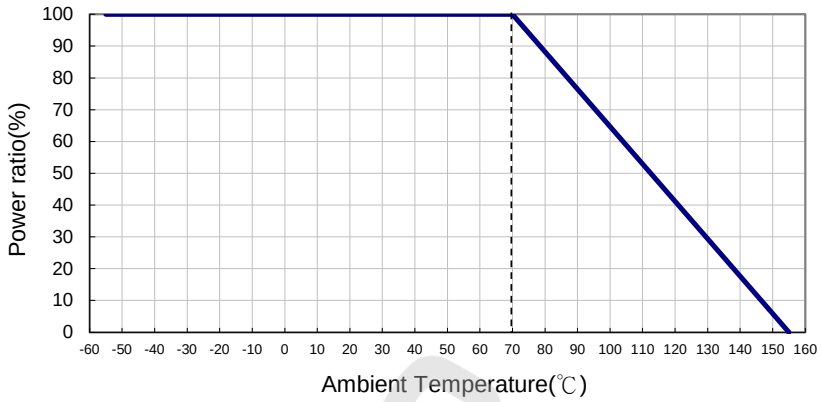
HMR	05	J	L	7	--200M
Product Type	Dimensions	Resistance Tolerance	Function Code	Packaging Code	Resistance
	05: 0805 06: 1206	J: ±5%	L: Standard	7: 7” Reel 5Kpcs A: 10” Reel 10Kpcs D: 13” Reel 20Kpcs	- - 200M: 200MΩ - - - -1G: 1GΩ “-“ to fill up 6 spaces

■Recommend Land Pattern

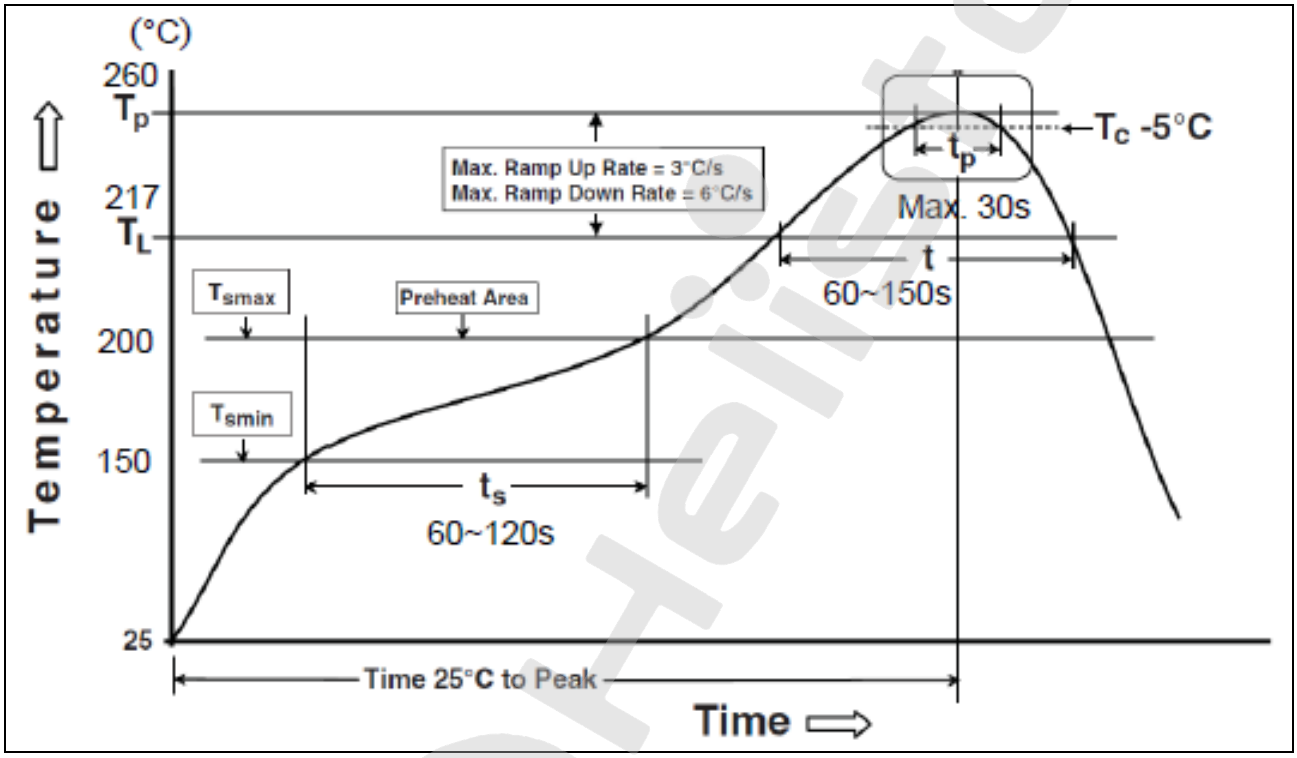


Type	A (mm)	B (mm)	C (mm)
HMR05	1.20	0.70	1.30
HMR06	2.00	0.90	1.60

■Derating Curve



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



Reflow Profiles	
Profile Feature	**Pb-Free Assembly**
Preheat Min. Temperature (Tsmin) Max Temperature (Tsmax) Preheating time (ts) from (Tsmin to Tsmax)	 150 °C 200 °C 60-120 seconds
Ramp-up rate (T_L to Tp)	3 °C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	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 T_L)	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.

■Standard Electrical Specifications

Item / Type	Power Rating at 70℃	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range ±5% (E24)	TCR (PPM/℃)
HMR05 (0805)	1/8W	-55 ~ +125°C	150V	300V	110MΩ ~ 500MΩ	±500
					510MΩ ~ 1GΩ	±1000
HMR06 (1206)	1/4W		200V	400V	110MΩ ~ 500MΩ	±500
					510MΩ ~ 1GΩ	±1000

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

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

■ Viking is capable of manufacturing the optional spec based on customer's requirement.

■Environmental Characteristics

Item	Requirement ±5%	Test Method
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

High Ohmic Chip Resistor

Item	Requirement ±5%	Test Method
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

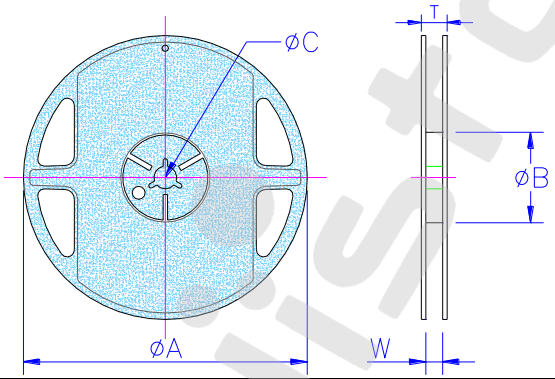
RCWV(Rated Continuous Working Voltage)=√(P*R) or Max. Operating Voltage whichever is lower.

■ **Storage Temperature: 15~28°C; Humidity < 80%RH**

■ **Shelf Life: 2 years from production date.**

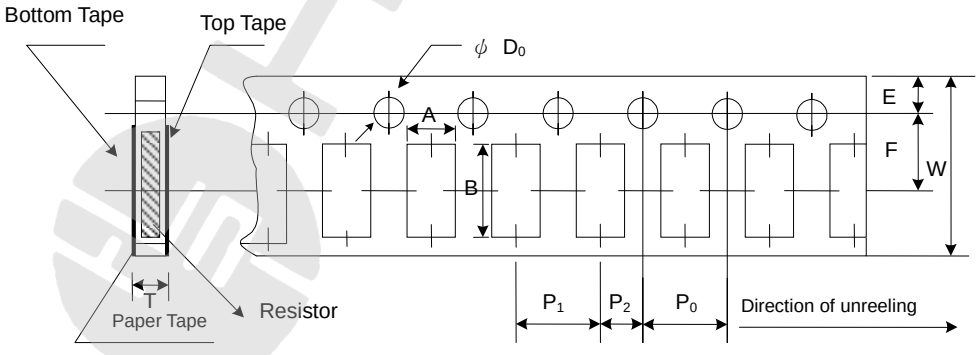
■Packaging

Reel Specifications & Packaging Quantity



Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
HMR05 HMR06	Paper	5K	8mm	7 inch	178.5±1.5	$60^{+1/-0}$	13.0±0.2	9.0±0.5	12.5±0.5
		10K	8mm	10 inch	254±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
		20K	8mm	13 inch	330±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5

Paper Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P_0 (mm)	P_1 (mm)	P_2 (mm)	ΦD_0 (mm)	T (mm)
HMR05	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
HMR06	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

■Marking

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

Example: 101=100Ω 102=1KΩ (1^{st} and 2^{nd} are E24 code and 3^{rd} 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

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A2	Jun 03, 2014	-	- Environmental Characteristics updated
Version A3	Jul 15, 2016	-	- Remove Material Description - Modify Storage Temperature
Version A4	May 20, 2019	-	- Modify TCR Test description
Version A5	Mar 10, 2021	-	- Modify Soldering Condition (IPC/JEDEC J-STD-020) - Modify Bending Test description
Version A6	Nov 15, 2021	-	- Increase the shelf life description
Version A7	Feb 15, 2022	-	- Derating Curve changes the temperature range
Version A8	Jun 15, 2022	-	- Modify Soldering Condition