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Internal

High Voltage Thick Film Chip Resistor

Features

- Highly reliable multilayer electrode construction
- Higher component and equipment reliability
- Excellent performance at high voltage
- Reduced size of final equipment

RS PRO High Voltage Thick Film Chip Resistor
RSPHVR Series



RS PRO is the own brand of RS. The RS PRO Seal of Approval is your assurance of professional quality, a guarantee that every part is rigorously tested, inspected, and audited against demanding standards. Making RS PRO the Smart Choice for our customers.

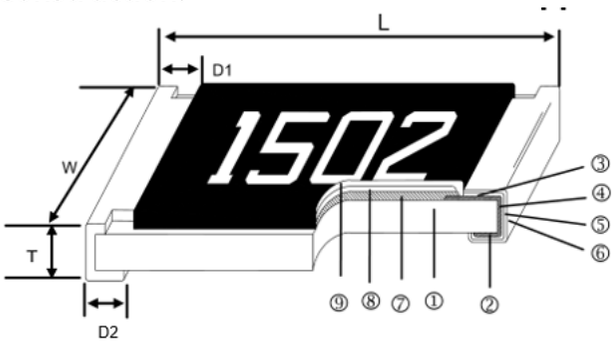
High Voltage Thick Film Chip Resistor

Product Description

Applications Include:

- Inverter - Outdoor Equipment
- Converter – High Pulse Equipment

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

Dimensions

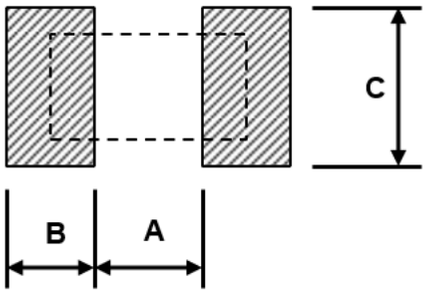
Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)	Weight (g) (1000pcs)
RSPHVR05	0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20	4.368
RSPHVR06	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20	8.947
RSPHVR0A	2010	5.00±0.10	2.50±0.15	0.55±0.10	0.60±0.25	0.50±0.20	24.241
RSPHVR12	2512	6.35±0.10	3.10±0.15	0.55±0.10	0.60±0.25	0.50±0.20	39.448

Part Number Make Up

Product Type	Dimensions	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance
RSPHVR	05: 0805 06: 1206 0A: 2010 12: 2512	F: ±1% J: ±5%	T: 7” Taping Reel	E: ±100 F: ±200 H: ±400	W: 1/8W V: 1/4W U: 1/2W T: 1W	1003: 100KΩ 1004: 1MΩ 1005: 10MΩ

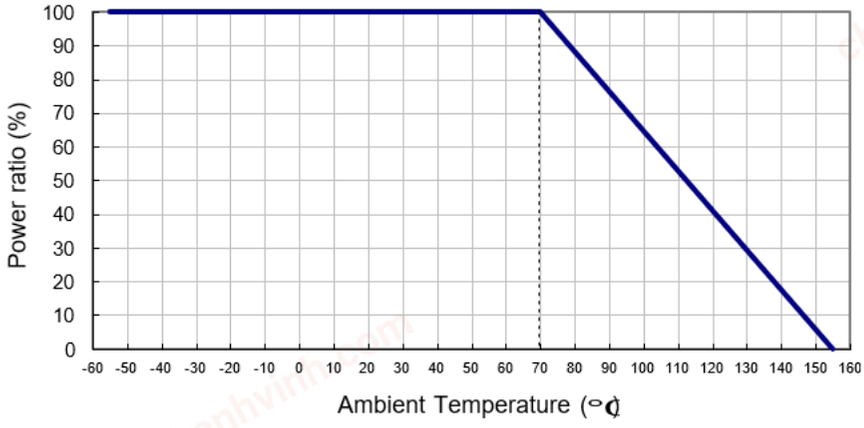
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Recommended Land Pattern

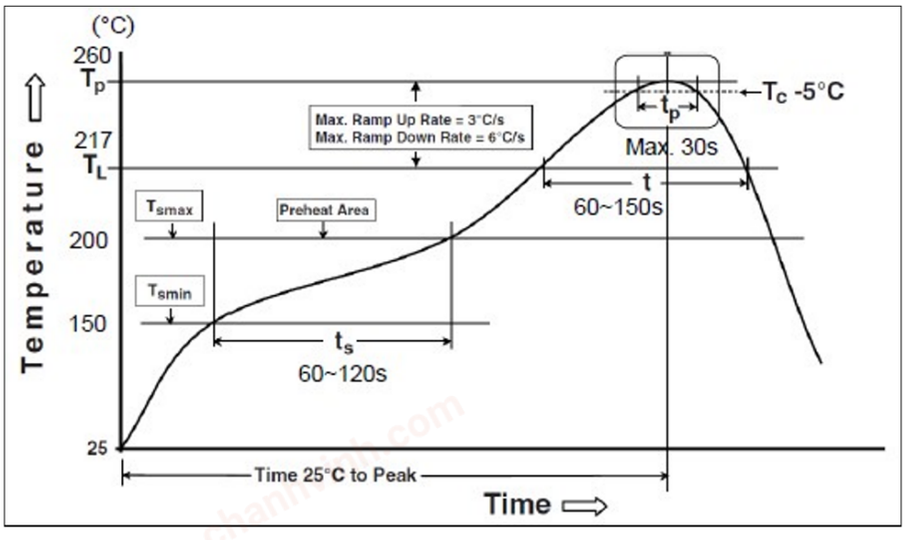


Type	A (mm)	B (mm)	C (mm)
RSPHVR05	1.20	0.70	1.30
RSPHVR06	2.00	0.90	1.60
RSPHVR0A	3.80	0.90	2.80
RSPHVR12	4.90	1.60	3.50

Derating Curve



Soldering Conditions



High Voltage Thick Film Chip Resistor

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.

Electrical Specifications

Type	Power Rating	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range		TCR (PPM/°C)
					±1%(E24 , E96)	±5%(E24)	
RSPHVR05 (0805)	1/8W	+55 ~ +155°C	400V	800V	100KΩ - 1MΩ		±100
					1.02MΩ – 10MΩ	1.1MΩ – 20MΩ	±200
					-	22MΩ – 100MΩ	±400
RSPHVR06 (1206)	1/4W		500V	1000V	100KΩ - 1MΩ		±100
					1.02MΩ – 10MΩ	1.1MΩ – 20MΩ	±200
					-	22MΩ – 100MΩ	±400
RSPHVR0A (2010)	1/2W		2000V	3000V	51KΩ - 1MΩ		±100
					1.02MΩ – 20MΩ	1.1MΩ – 20MΩ	±200
					-	22MΩ – 100MΩ	±400
RSPHVR12 (2512)	1W		3000V	4000V	30KΩ - 1MΩ		±100
					1.02MΩ – 20MΩ	1.1MΩ – 20MΩ	±200
					-	22MΩ – 100MΩ	±400

Operating Voltage=√(P*R) or Max. Operating Voltage listed above, whichever is lower.

Overload Voltage=2.5*√(P*R) or Max. Overload Voltage listed above, whichever is lower.

High Voltage Thick Film Chip Resistor

Environmental Characteristics

Item	Requirement		Test Method
	□1%	□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	□(1.0%+0.05Ω)	□(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	□(2.0%+0.10Ω)	□(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	□(2.0%+0.10Ω)	□(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	□(1.0%+0.05Ω)	□(1.5%+0.10Ω)	JIS-C-5201-1 4.23 IEC-60115-1 4.23.2 at +155□C for 1000 hrs
Bending Strength	□(1.0%+0.05Ω)	□(1.0%+0.05Ω)	JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 60 seconds 2010, 2512 sizes: 2mm Other 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	□(0.5%+0.05Ω)	□(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 HVR02: 150V for 1 minute HVR03: 300V for 1 minute HVR05/HVR06/HVR0A/HVR12: 500V 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	□(0.5%+0.05Ω)	□(1.0%+0.05Ω)	JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55□C to +155□C, 5 cycles

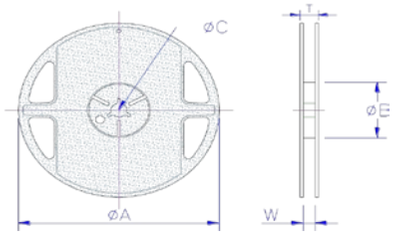
RCWV(Rated Continuous Working Voltage)=√(P*R) or Max. Operating Voltage whichever is lower.

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

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Packaging

Reel Specifications



Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
RSPHVR05 RSPHVR06	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
RSPHVR0A RSPHVR12	Embossed	4K	12mm	7 inch	178.5±1.5	60+1/-0	13.0±0.5	13.0±0.5	15.5±0.5
		8K	12mm	10 inch	250±1.0	62±0.5	13.0±0.5	12.5±0.5	16.5±0.5

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Similar Products

MPN	RS PRO Article		
	SSM	P Part	MPQ
RSPHVR05FTEW1003	2567723	2567723P	2567722
RSPHVR05FTEW1004	2567725	2567725P	2567724
RSPHVR05FTEW1503	2567727	2567727P	2567726
RSPHVR05FTEW2203	2567729	2567729P	2567728
RSPHVR05FTEW4993	2567731	2567731P	2567730
RSPHVR05FTEW6803	2567733	2567733P	2567732
RSPHVR05FTFW1504	2567735	2567735P	2567734
RSPHVR05FTFW2204	2567737	2567737P	2567736
RSPHVR05FTFW3604	2567739	2567739P	2567738
RSPHVR06FTEV1003	2567741	2567741P	2567740
RSPHVR06FTEV1004	2567743	2567743P	2567742
RSPHVR06FTEV1103	2567745	2567745P	2567744
RSPHVR06FTEV1503	2567747	2567747P	2567746
RSPHVR06FTEV1803	2567749	2567749P	2567748
RSPHVR06FTEV2203	2567751	2567751P	2567750
RSPHVR06FTEV2703	2567753	2567753P	2567752
RSPHVR06FTEV3903	2567755	2567755P	2567754
RSPHVR06FTEV4703	2567757	2567757P	2567756
RSPHVR06FTEV4993	2567759	2567759P	2567758
RSPHVR06FTEV5103	2567761	2567761P	2567760
RSPHVR06FTEV5113	2567763	2567763P	2567762
RSPHVR06FTEV6803	2567765	2567765P	2567764
RSPHVR06FTEV7503	2567767	2567767P	2567766
RSPHVR06FTEV9103	2567769	2567769P	2567768
RSPHVR06FTFV1005	2567771	2567771P	2567770
RSPHVR06FTFV1804	2567773	2567773P	2567772
RSPHVR06FTFV3004	2567775	2567775P	2567774
RSPHVR0AFTEU1004	2567777	2567777P	2567776
RSPHVR0AFTEU1103	2567779	2567779P	2567778
RSPHVR0AFTEU1503	2567781	2567781P	2567780
RSPHVR0AFTEU2200	2567783	2567783P	2567782
RSPHVR0AFTEU3300	2567785	2567785P	2567784
RSPHVR0AFTFU1005	2567787	2567787P	2567786
RSPHVR0AFTFU1504	2567789	2567789P	2567788
RSPHVR0AFTFU3304	2567791	2567791P	2567790
RSPHVR0AFTFU5104	2567793	2567793P	2567792
RSPHVR0AFTFU7504	2567795	2567795P	2567794
RSPHVR0AJTHU2205	2567797	2567797P	2567796
RSPHVR12FTET1003	2567799	2567799P	2567798
RSPHVR12FTET1004	2567801	2567801P	2567800
RSPHVR12FTET1803	2567803	2567803P	2567802

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RSPHVR12FTET2003	2567805	2567805P	2567804
RSPHVR12FTET2703	2567807	2567807P	2567806
RSPHVR12FTET3004	2567809	2567809P	2567808
RSPHVR12FTET3303	2567811	2567811P	2567810
RSPHVR12FTET3903	2567813	2567813P	2567812
RSPHVR12FTET4702	2567815	2567815P	2567814
RSPHVR12FTET4753	2567817	2567817P	2567816
RSPHVR12FTET4993	2567819	2567819P	2567818
RSPHVR12FTET6803	2567821	2567821P	2567820
RSPHVR12FTET7503	2567823	2567823P	2567822
RSPHVR12FTET8203	2567825	2567825P	2567824
RSPHVR12FTFT1005	2567827	2567827P	2567826
RSPHVR12FTFT1504	2567829	2567829P	2567828
RSPHVR12FTFT2004	2567831	2567831P	2567830
RSPHVR12FTFT2005	2567833	2567833P	2567832
RSPHVR12FTFT3304	2567835	2567835P	2567834
RSPHVR12FTFT3904	2567837	2567837P	2567836
RSPHVR12FTFT4304	2567839	2567839P	2567838
RSPHVR12FTFT6804	2567841	2567841P	2567840
RSPHVR12JTHT1006	2567843	2567843P	2567842