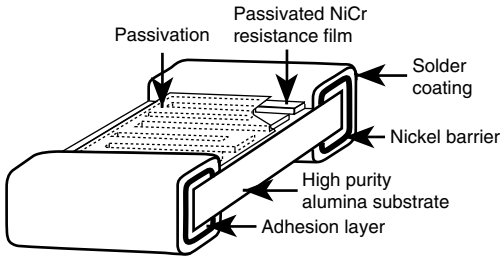
High Precision Wraparound Thin Film Chip Resistors

LINKS TO ADDITIONAL RESOURCES

3D Models

Utilizing proven expertise in thin film resistors, Vishay provides a chip manufactured according to CECC with the same reliability and stability found in QPL resistors. These chips are available in a wide range of sizes, values, and performance characteristics.

CONSTRUCTION



FEATURES

Pb-free Available

RoHS* Available

- Nickel barrier for high temperature operating conditions
- Tight TCR < 10 ppm/°C, and in lot tracking < 5 ppm/°C in (-55 °C, +155 °C temperature range)
- Very low noise < 35 dB and voltage coefficient 0.1 ppm/V
- Non-inductive
- Laser trimmed down to 0.1 %
- Wraparound resistance less than 0.01 Ω
- Antistatic waffle-pack or tape and reel packaging available
- High stability (0.05 % - 1000 h at Pn at +70 °C)
- Withstand moisture resistance test of AEC-Q200
- According to CECC 40401-010
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	RESISTANCE RANGE (1) (2) Ω	RATED POWER Pn W	LIMITING ELEMENT VOLTAGE (UL) V	TOLERANCE ± %	TEMPERATURE COEFFICIENT ± ppm/°C
RV	0505	100 to 260K	0.125	50	0.1, 0.5, 1, 2, 5	10, 25
RV	0603	100 to 260K	0.125	50	0.1, 0.5, 1, 2, 5	10, 25
RV	0805	100 to 300K	0.200	50	0.1, 0.5, 1, 2, 5	10, 25
RV	1206	100 to 1M	0.330	75	0.1, 0.5, 1, 2, 5	10, 25

Notes

(1) Extended resistance range on request

(2) For ohmic range versus tolerance and TCR, see detailed table

CLIMATIC SPECIFICATIONS

Operating temperature range	-55 °C to +155 °C
Storage temperature range	-55 °C to +155 °C

MECHANICAL SPECIFICATIONS

Resistive material	Nichrome
Substrate material	Alumina
Plating	Tin lead over nickel or tin silver over nickel or gold over nickel
Marking resistance to solvents	Per CECC specs

OHMIC RANGE VS. TOLERANCE AND TCR

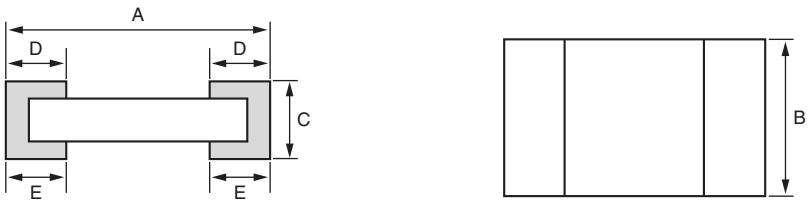
CASE SIZE	OHMIC RANGE Ω	TOLERANCE %	TCR ppm/°C
0505	100 < 500	0.5; 1; 2; 5	10, 25
0505	500 to 260K	0.1; 0.5; 1; 2; 5	10, 25
0603	100 < 500	0.5; 1; 2; 5	10, 25
0603	500 to 260K	0.1; 0.5; 1; 2; 5	10, 25
0805	100 < 500	0.5; 1; 2; 5	10, 25
0805	500 to 300K	0.1; 0.5; 1; 2; 5	10, 25
1206	100 < 500	0.5; 1; 2; 5	10, 25
1206	500 to 1M	0.1; 0.5; 1; 2; 5	10, 25

TECHNICAL SPECIFICATIONS		
TEST	**SPECIFICATIONS**	**CONDITIONS**
Absolute TCR	E: ± 25 ppm/°C / Y: ± 10 ppm/°C	-55 °C to +155 °C
Absolute tolerance	± 0.1 %, ± 0.5 %, ± 1 %, ± 2 %, ± 5 % ($R \geq 500\ \Omega$)	
	± 0.5 %, ± 1 %, ± 2 %, ± 5 % ($R \geq 100\ \Omega$)	
Voltage coefficient	0.1 ppm/V	
Noise	-35 dB typical	
Thermal EMF	< 0.1 µV/°C	
Load life stability	± (0.1 % Rn (1) ± 0.05 Ω)	1000 h Pn at +70 °C

Note

(1) Rn: nominal resistance

DIMENSIONS in millimeters (inches)



SERIES / CASE SIZES	A		B		D/E		C	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
RV 0505	1.198 (0.047)	1.502 (0.059)	1.143 (0.045)	1.397 (0.055)	0.250 (0.010)	0.510 (0.020)	0.373 (0.015)	0.627 (0.025)
RV 0603	1.368 (0.054)	1.672 (0.066)	0.623 (0.025)	0.877 (0.035)	0.250 (0.010)	0.510 (0.020)	0.373 (0.015)	0.627 (0.025)
RV 0805	1.758 (0.069)	2.062 (0.081)	1.143 (0.045)	1.397 (0.055)	0.250 (0.010)	0.510 (0.020)	0.373 (0.015)	0.627 (0.025)
RV 1206	2.908 (0.114)	3.212 (0.126)	1.473 (0.058)	1.727 (0.068)	0.250 (0.010)	0.510 (0.020)	0.373 (0.015)	0.627 (0.025)

POPULAR OPTION

AEC-Q200 moisture resistance

Option to order: 0058: specific production process to withstand 85 °C / 85 % RH at Pn/10

ENVIRONMENTAL TEST			
TEST	**CONDITIONS**	**VALUES AND DRIFTS ($\Delta R/R$ ± %)**	
		CECC REQUIREMENTS	**TYPICAL PERFORMANCE**
Overload	6.25 x rated power / 2 s (or 2 UL)	0.05 % Rn (2) + 0.05 Ω	0.01 % Rn (2)
Climatic sequences (1)	-55 °C / +155 °C 5 moisture cycles	0.1 % Rn (2) + 0.05 Ω	0.02 % Rn (2)
Thermal shock (1)	-55 °C / +155 °C 5 cycles 30 min	0.05 % Rn (2) + 0.05 Ω	0.02 % Rn (2)
Load life (1)	+70 °C/Pn 1000 h	0.1 % Rn (2) + 0.05 Ω	0.05 % Rn (2)
Resistance to solder heat	+260 °C/ 10 s	0.05 % Rn (2) + 0.05 Ω	0.02 % Rn (2)
Moisture resistance (1)	+40 °C / 93 % HR Pn/10	0.1 % Rn (2) + 0.05 Ω	0.01 % Rn (2)
	AEC-Q200 (3) 85 °C / 85 % RH / Pn/10 1000 h	0.5 % + 0.05 Ω	Max. < 0.3 % + 0.05 Ω
High temperature storage	1000 h at + 155 °C	0.1 % Rn (2) + 0.05 Ω	0.05 % Rn (2)
Bending (1)	10 bends / 2 mm / 5 s	0.05 % Rn (2) + 0.05 Ω	0.02 % Rn (2)

Notes

(1) Test requiring parts to be mounted on PCB will be performed with the requirement that termination alloy will be the same as solder paste alloy. Gold termination will be tested as B termination

(2) Rn: nominal resistance
Pn: nominal power

(3) Option to order: 0058

SPECIFIC CONDITIONS DUE TO TERMINATION TYPE

TEST	CONDITIONS		VALUES AND DRIFTS	
	B; G	N	VISHAY REQUIREMENTS	TYPICAL PERFORMANCE
Solderability	+235 °C/2 s Sn60Pb40 alloy	+245 °C/3 s Sn97Ag3 alloy	VISUAL INSPECTION	
High T° reflow profile	N/A	+255 °C/40 s (on parts)	0.02 % Rn [1] + 0.05 Ω	0.01 % Rn [1] + 0.05 Ω

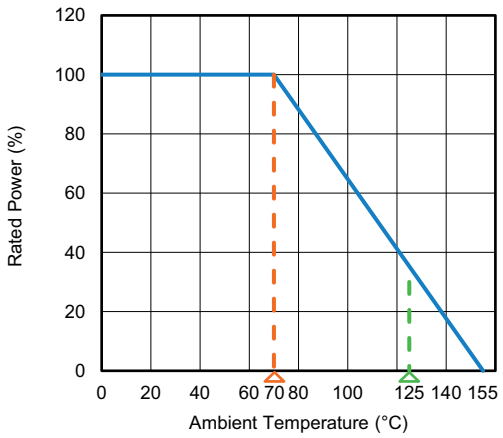
Note

[1] Rn: nominal resistance
Pn: nominal power

PACKAGING INFORMATION

SIZE	NUMBER OF PIECES PER PACKAGE			
	WAFFLE PACK (2" x 2")	TAPE AND REEL MIN.	TAPE AND REEL MAX.	TAPE WIDTH
0505	100	100	4000	8 mm (0.315")
0603			5000	
0805	100		4000	
1206	140			

DERATING CURVE



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: RV0505E1001DBT0099

R	V	0	5	0	5	E	1	0	0	1	D	B	T	0	0	9	9

GLOBAL MODEL	SIZE	TCR	VALUE	TOLERANCE	TERMINATION	PACKAGING	OPTION
	0505 **0603** **0805** **1206**	**E** = ± 25 ppm/°C **Y** = ± 10 ppm/°C	The first 3 digits (2 digits are enough for tolerance G and J) are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point **10R0** = 10 Ω **3901** = 3900 Ω **1004** = 1 MΩ	**B** = ± 0.1 % **D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 %	**B**: SnPb over nickel barrier **N**: SnAg over nickel barrier **G**: gold over nickel barrier	For more information see "Codification of packaging" table	Leave blank if no option

B: lead bearing version
N and **G**: lead (Pb)-free / RoHS version

Historical Part Number Example: RV 0505 25 ppm 1K 0.5 % B TR R1016

PART NUMBER DESCRIPTION (for information only)

RV	0505	25 ppm	1K	0.5 %	B	TR	R1016
MODEL	SIZE	TCR	OHMIC VALUE	TOLERANCE	TERMINATION	PACKAGING	OPTION

CODIFICATION OF PACKAGING	
CODE 18	**PACKAGING**
WAFFLE PACK	
W	100 min., 1 mult.
WA	100 min., 100 mult. (available only in size 1206)
PLASTIC TAPE (Standard for all sizes.)	
T	100 min., 1 mult.
TA	100 min., 100 mult.
TB	250 min., 250 mult.
TC	500 min., 500 mult.
TD	1000 min., 1000 mult.
TE	2500 min., 2500 mult.
TF	Full tape (quantity depending on size of chips)
PAPER TAPE (Available for 0603, 0805, and 1206. Please consult Vishay Sfernice for other sizes.)	
PT	100 min., 1 mult.
PA	100 min., 100 mult.
PB	250 min., 250 mult.
PC	500 min., 500 mult.
PD	1000 min., 1000 mult.
PE	2500 min., 2500 mult.
PF	Full tape (quantity depending on size of chips)

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