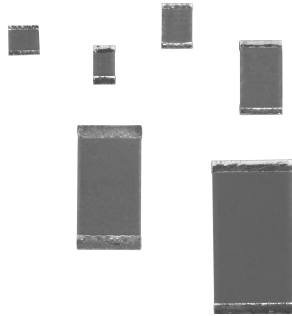


High Stability Resistor Chips Thick Film Technology



FEATURES

- Robust terminations
- Large ohmic value range 0.1Ω to 100M
- Tight tolerance to 0.5%
- CHP: standard passivated version for industrial, professional and military applications
- HCHP: for high frequency applications
- CECC and ESA/SCC approvals in progress

VISHAY SFERNICE thick film resistor chips are specially designed to meet very stringent specifications in terms of reliability, stability, homogeneity, reproducibility and quality.

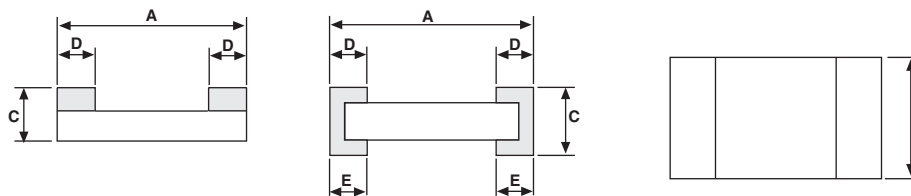
They conform to specifications NFC 83-240 and MIL-R-55342 D. EN 140 401 802 certification is in progress.

Sputtered Thin Film terminations, with nickel barrier, are very convenient for high temperature operating conditions. They can withstand thousands of very severe thermal shocks.

B (W/A), N (W/A) and F (one face) types are for solder reflow assembly.

G (W/A) and W (one face) types are for wire bonding, gluing and even high temperature solder reflow.

DIMENSIONS in millimeters (inches)



CASE SIZE	DIMENSION				POWER RATING mW Pn	LIMITING ELEMENT VOLTAGE V	MAXIMUM ⁽¹⁾ RESISTANCE MOHM	UNIT WEIGHT IN mG
	A	B	C	D/E				
	MAX. TOL. + 0.152 (0.006) MIN. TOL. - 0.152 (- 0.006)	MAX. TOL. + 0.127 (0.005) MIN. TOL. - 0.127 (- 0.005)	MAX. TOL. + 0.127 (0.005) MIN. TOL. - 0.127 (- 0.005)	MAX. TOL. + 0.13 (0.005) MIN. TOL. - 0.13 (- 0.005)				
0502	1.27 (0.05)	0.6 (0.023)	0.5 (0.02)	0.38 (0.015)	50	50	25	1
0505	1.27 (0.05)	1.27 (0.050)	0.5 (0.02)	0.38 (0.015)	125	50	10	3
0603	1.52 (0.080)	0.85 (0.033)	0.5 (0.02)	0.38 (0.015)	125	50	25	2
0705 0805	1.91 (0.075)	1.27 (0.050)	0.5 (0.02)	0.38 (0.015)	200	75	25	4
1005	2.54 (0.100)	1.27 (0.050)	0.5 (0.02)	0.38 (0.015)	250	100	50	5
1206	3.05 (0.120)	1.60 (0.063)	0.5 (0.02)	0.38 (0.015)	250	150	50	8
1505	3.81 (0.150)	1.32 (0.054)	0.5 (0.02)	0.38 (0.015)	500	150	75	8
2010	5.08 (0.200)	2.54 (0.100)	0.5 (0.02)	0.38 (0.015)	1000 ⁽²⁾	200	100	26
1020	2.54 (0.100)	5.08 (0.200)	0.5 (0.02)	0.38 (0.015)	1000 ⁽²⁾	100	10	25
2208	5.58 (0.22)	1.91 (0.075)	0.5 (0.02)	0.38 (0.015)	750	200	100	21
2512	6.35 (0.250)	3.06 (0.120)	0.5 (0.02)	0.38 (0.015)	2000 ⁽²⁾	250	100	42
1010	2.54 (0.100)	2.54 (0.100)	0.5 (0.02)	0.38 (0.015)	500	100	25	12

⁽¹⁾ Shall be read in conjunction with others tables

⁽²⁾ With special assembly care



ELECTRICAL SPECIFICATIONS

Resistance Range: 0.1R to 100M
 Resistance Tolerance: 0.5% to 10%
 Power Dissipation: Pn: 50mW to 2W
 Temperature Coefficient: K: 100ppm/°C
 L: 200ppm/°C
 M: 300ppm/°C

MECHANICAL SPECIFICATIONS

Substrate: Alumina
 Technology: Thick Film (Ruthenium oxide)
 Protection: Epoxy Coating
 Terminations:
B (W/A) : SnPb over nickel barrier for solder reflow
N (W/A) : SnAg over nickel barrier for solder reflow
F (Flip Chip) : SnAg over nickel barrier for solder reflow
W (one face) and G (W/A) type: gold over nickel barrier for other applications

CLIMATIC SPECIFICATIONS

Operating Temp. Range: -55°C to +155°C

BEST TOL. AND TCR VERSUS OHMIC VALUE (1)

TIGHTEST TOLERANCE	OHMIC VALUES	BEST TCR ppm/°C
0.5% (D)	10Ω < R < 5M	100 (K)
1% (F)	5Ω < R < 10M	100 (K)
2% (G)	1Ω < R < R max	200 (L)
5% (J)	0.1Ω < R < R max	200 (L)
10% (K)	0.1Ω < R < R max	300 (M)

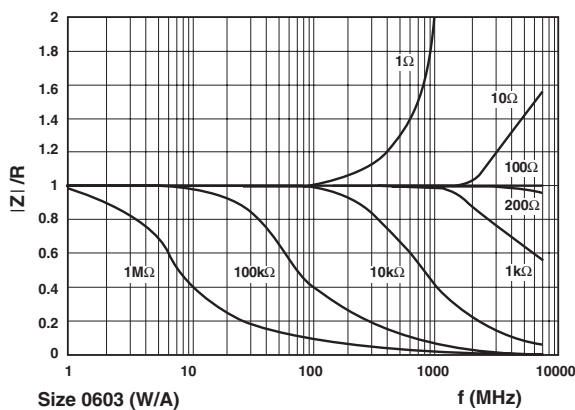
(1) Improved performance on request.

CHIPS FOR HIGH FREQUENCY APPLICATIONS

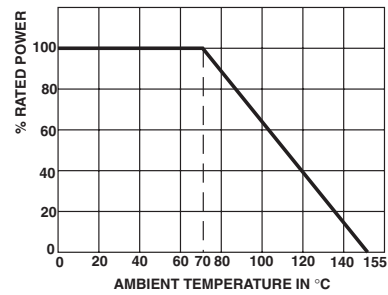
The HF performance of Flip Chip and W/A types can be improved on request.

Please ask for HCHP or CHP with a dedicated release number (R..)

TYPICAL HF PERFORMANCE OF HCHP



POWER DERATING CURVE



PACKAGING

Waffle-pack or tape and reel when specified.

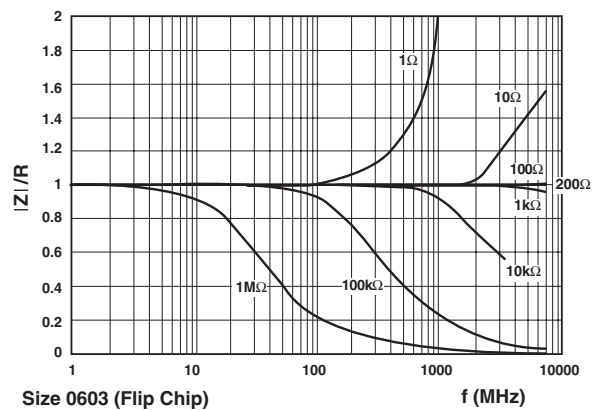
SIZE	NUMBER OF PIECES PER PACKAGE		TAPE WIDTH	
	WAFFLE PACK 2" X 2"	TAPE AND REEL		
		MIN.	MAX.	
0502	100	250	4000	8mm
0505				
0603				
0805				
1005	140	250	1000	8mm*
1206				
1505	60	250	4000	8mm*
2010				
1010	100	250	1000	8mm*
2208				
1020				
2512	45	250	1000	8mm*

*12mm on request

MARKING

(On request with premium, for size higher than 1206.) (4 digit code,) the first three digits are significant figures and the last digit specifies the number of zero's to follow. R designates decimal point.

10R0 = 10Ω
 3901 = 3900Ω
 1004 = 1MΩ





PERFORMANCE					
TESTS	CONDITIONS	REQUIREMENTS	TYPICAL VALUES AND DRIFTS		
Termination Adhesion	5N for 10 seconds	$\pm (0.25\% + 0.05\Omega)$	< $\pm 0.1\%$		
Resistance to Solder Heat	immersion 10 seconds in Sn/Pb 60/40 at + 260°C	$\pm (0.25\% + 0.05\Omega)$	< $\pm 0.1\%$		
Rapid Temperature Change	5 cycles - 55°C + 155°C	$\pm (0.25\% + 0.05\Omega)$	< $\pm 0.1\%$		
Climatic Sequence	Phase A dry heat Phase B damp heat Phase C cold - 55°C Phase D damp gheat 5 cycles	$\pm (1\% + 0.05\Omega)$	< $\pm 0.2\%$		
Humidity (Steady State)	56 days	$\pm (1\% + 0.05\Omega)$	< $\pm 0.2\%$		
Short Time Overload	6.25 Pn for 2 seconds	$\pm (0.25\% + 0.05\Omega)$	< $\pm 0.1\%$		
Load Life	1000h at rated power 90'/30' at + 70°C	1000 h $\pm (1\% + 0.05\Omega)$	1000 h < 0.25%	2000 h < 0.5%	10 000 h < 1%

ORDERING INFORMATION						
CHP	1206	100ppm	10K Ω	1%	B	TR
SERIES	SIZE	TEMPERATURE COEFFICIENT	OHMIC VALUE	TOLERANCE	TERMINATIONS	
CHP: standard passivated chips	0502	100ppm (K)	(whatever)	0.5%	B	(For T and R only)
HCHP: high frequency applications	0505	200ppm (L)		1%	G	
CHPCC: short circuits (2)	0603	300ppm (M)		2%	F	
	0805			5%	W	
	0705			10%	N	
	1005					
	1206					
	1505					
	2010					
	1020					
	1010					
	2208					
	2512					

(2) Referenced as P....X0R00XB (or G)



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