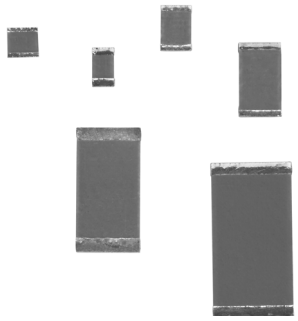
High Stability Resistor Chips (< 0.25 % at Pn at 70 °C during 1000 h) Thick Film Technology



FEATURES

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

Pb-free Available

RoHS* COMPLIANT

VISHAY SFERNICE thick film resistor chips are specially designed to meet very stringent specifications in terms of reliability, stability < 0.25 % at Pn at + 70 °C during 1000 h, homogeneity, reproductibility and quality.

They conform to specifications NFC 83-240 and MIL-R-55342 D.

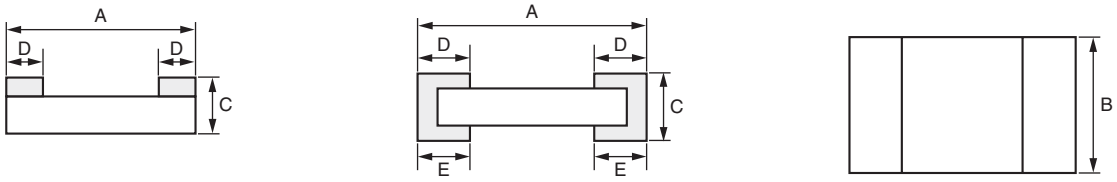
Evaluated to ESCC 4001/026.

Sputtered Thin Film terminations, with nickel barrier, are very convenient for high 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	DIMENSIONS				POWER RATING Pn mW	LIMITING ELEMENT VOLTAGE V	MAXIMUM (1) RESISTANCE MΩ	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. + 0.127 [+ 0.005] MIN. TOL. - 0.127 [- 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 [0.05]	0.5 [0.02]	0.38 [0.015]	125	50	10	3
0603	1.52 [0.08]	0.85 [0.033]	0.5 [0.02]	0.38 [0.015]	125	50	25	2
0705 0805	1.91 [0.075]	1.27 [0.05]	0.5 [0.02]	0.38 [0.015]	200	75	25	4
1005	2.54 [0.100]	1.27 [0.05]	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

Notes:

(1) Shall be read in conjunction with other tables

(2) With special assembly care

* Pb containing terminations are not RoHS compliant, exemptions may apply

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Thick Film Technology

ELECTRICAL SPECIFICATIONS

Resistance range: 0.1R to 100M
Resistance tolerance: 0.5 % to 10 %
Power dissipation: Pn: 50 mW to 2 W
Temperature coefficient: K: 100 ppm/°C
L: 200 ppm/°C
M: 300 ppm/°C

MECHANICAL SPECIFICATIONS

Substrate: Alumina
Technology: Thick film (Ruthenium oxyde)
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)

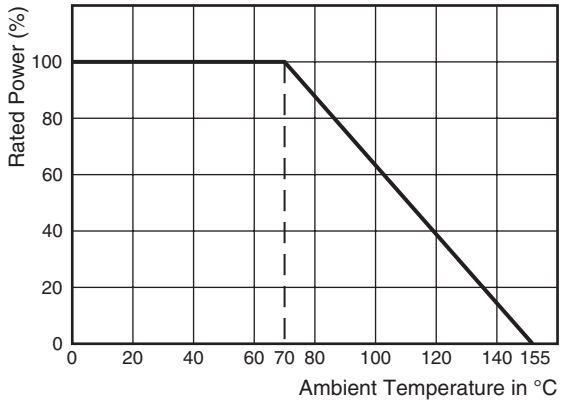
TIGHTEST TOLERANCE	OHMIC VALUES	BEST TCR ppm/°C
0.5 % (D)	10 Ω < *R* < 5M	100 (K)
1 % (F)	5 Ω < *R* < 10M	100 (K)
2 % (G)	1 Ω < *R* < *R* max.	200 (L)
5 % (J)	0.1 Ω < *R* < *R* max.	200 (L)
10 % (K)	0.1 Ω < *R* < *R* max.	300 (M)

Note:
(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..)

POWER DERATING CURVE



PACKAGING

Waffle-pack or tape and reel when specified

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

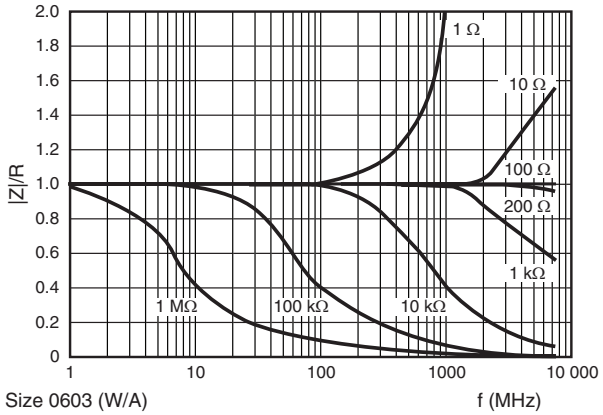
Note:
(2) 12 mm on request

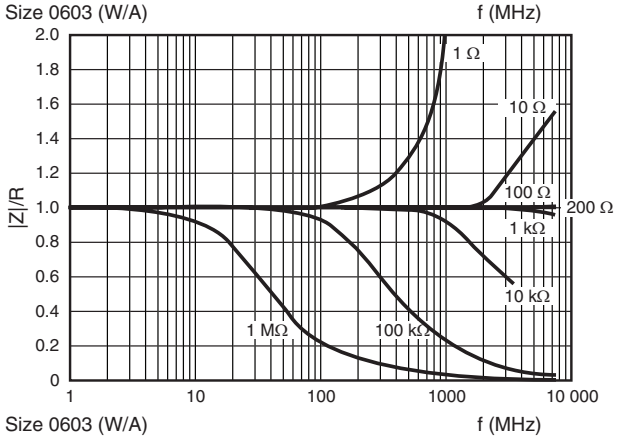
MARKING

(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 = 10 Ω
3901 = 3900 Ω
1004 = 1 MΩ

TYPICAL HF PERFORMANCE OF HCHP





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PERFORMANCE

TESTS	CONDITIONS	REQUIREMENTS	TYPICAL VALUES AND DRIFTS		
Termination adhesion	5N for 10 s	± (0.25 % + 0.05 Ω)	< ± 0.1 %		
Resistance to solder heat	immersion 10 s in Sn/Pb 60/40 at + 260 °C	± (0.25 % + 0.05 Ω)	< ± 0.1 %		
Rapid temperature change	5 cycles - 55 °C + 155 °C	± (0.25 % + 0.05 Ω)	< ± 0.1 %		
Climatic sequence	Phase A dry heat Phase B damp heat Phase C cold - 55 °C Phase D damp gheat 5 cycles	± (1 % + 0.05 Ω)	< ± 0.2 %		
Humidity (steady state)	56 days	± (1 % + 0.05 Ω)	< ± 0.2 %		
Short time overload	6.25 Pn for 2 s	± (0.25 % + 0.05 Ω)	< ± 0.1 %		
Load life	1000 h at rated power 90'/30' at + 70 °C	1000 h ± (1 % + 0.05 Ω)	1000 h < 0.25 %	2000 h < 0.5 %	10 000 h < 1 %

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CHP0805K1001FBT55 (preferred part number format)

C	H	P		0	8	0	5	K	1	0	0	1	F	B	T	5	5

GLOBAL MODEL	SIZE	TCR	VALUE	TOLERANCE	TERMINATION	TAPE	OPTION
CHP **HCHP** (3 or 4 digits)	**0502** **0505** **0603** **0805** **0705** **1005** **1206** **1505** **2010** **1020** **1010** **2208** **2512**	**K** = 100 ppm **L** = 200 ppm **M** = 300 ppm	The first 3 digits 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	**D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 %	**B:** SnPb over nickel barrier **N:** SnAg over nickel barrier **F:** SnAg over nickel barrier (one face) **G:** Gold over nickel barrier **W:** Gold over nickel barrier (one face)		Leave blank if no option

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

Historical Part Number example: CHP 0805 100 ppm 1K 1 % B TR R0055 (will continue to be accepted)

CHP	0805	100 ppm	1K	1 %	B	TR	R0055	e2
HISTORICAL MODEL	SIZE	TCR	VALUE	TOLERANCE	TERMINATION	TAPE	OPTION	RoHS
CHP **HCHP** (3 or 4 digits)	**0502** **0505** **0603** **0805** **0705** **1005** **1206** **1505** **2010** **1020** **1010** **2208** **2512**	in clear	in clear	in clear	**B:** SnPb over nickel barrier **N:** SnAg over nickel barrier **F:** SnAg over nickel barrier (one face) **G:** Gold over nickel barrier **W:** Gold over nickel barrier (one face) **B:** Lead bearing version **N and G:** Lead (Pb)-free/RoHS version		Leave blank if no option	e2: tin/silver e4: gold blank: SnPb

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