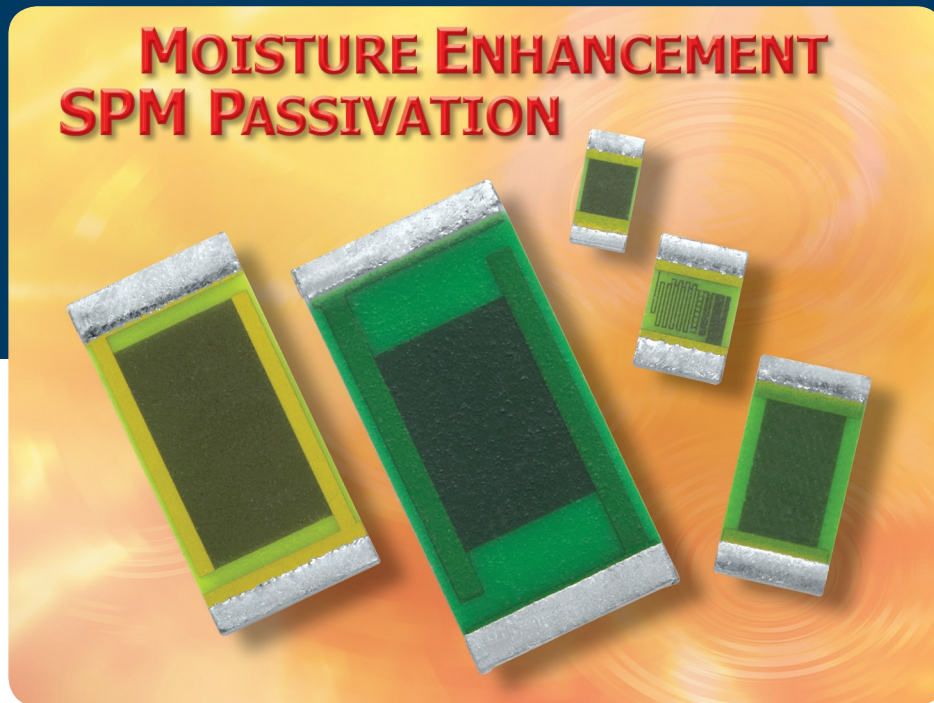




THIN FILM RESISTORS

P-NS

MOISTURE ENHANCEMENT SPM PASSIVATION



Thin Film Precision Surface-Mount Wraparound Chip Resistors

Special Passivation Method (SPM) Moisture Resistance

KEY BENEFITS

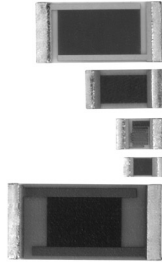
- Wide selection of case sizes
- Tolerances to $\pm 0.02\%$
- TCR of ± 25 ppm/ $^{\circ}\text{C}$ (standard) to ± 10 ppm/ $^{\circ}\text{C}$
- Non-standard values available
- Solderable or wire-and-epoxy-bondable

APPLICATIONS

- Precision reference
- Low-noise instrumentation
- ATE industrial precision voltage dividers

Datasheet is available on our web site at www.vishay.com
for P-NS - <http://www.vishay.com/doc?60023>

Commercial Thin Film Chip Resistors



FEATURES

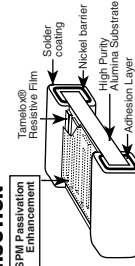
- Lead (Pb)-free available
- Moisture resistant (SPM) special passivation method
- Non-standard values available
- Pre-finned terminations over nickel barrier (Gold available)
- Very low noise and voltage coefficient (< -30 dB, 0.1 ppm/V)
- Non-inductive
- Laser-trimmed tolerances to 0.02 %
- In-lot tracking less than 5 ppm/°C



Actual Size
0505

For applications requiring low noise, stability, low temperature coefficient of resistance, and low voltage coefficient, all VISHAY's proven precision thin film wraparound resistors will meet your exact requirements. Manufactured with the same material and processes as QPL and manufactured in a QPL facility.

CONSTRUCTION



TYPICAL PERFORMANCE

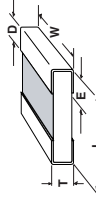
TCR	ABS
TOL	25
	0.1

TEST	SPECIFICATIONS	CONDITIONS
MATERIAL	TAMELOX	
Absolute TCR	± 25 ppm/°C (Available to ± 10 ppm/°C)	- 55 °C to + 125 °C
Absolute Tolerance	± 0.1 % (Available to ± 0.02 %)	+ 25 °C
Power Rating	see table	
Voltage Coefficient	0.1 ppm/Volt typical	
Working Voltage	see table	
Operating Temperature Range	- 55 °C to + 125 °C	
Storage Temperature Range	- 55 °C to + 150 °C	
Noise	< - 35 dB typical	

CASE SIZE	POWER RATING - (mW)		MAX WORKING VOLTAGE		RESISTANCE RANGE - (Ω)	
	≥ 0.1 %	< 0.1 %	≥ 0.1 %	< 0.1 %	≥ 0.1 %	< 0.1 %
0402	50	50	75	75	25-75K	250 Ω - 70K
0502	100	100	75	75	20-130K	250 Ω - 130K
0505	150	150	75	75	20-301K	250 Ω - 301K
0603	150	150	75	75	10-175K	250 Ω - 175K
0805, 0705	200	200	100	100	10-475K	250 Ω - 475K
1005	250	250	100	100	10-649K	250 Ω - 649K
1010	500	500	150	150	50-1M	250 Ω - 1M
1206	400	400	200	200	10-1M	250 Ω - 1M
1505	400	400	150	150	10-1M	250 Ω - 1M
2208	800	750	150	150	10-1.75M	250 Ω - 1M
2010	800	750	200	150	10-2M	250 Ω - 1M
2512	1000	750	200	200	10-3M	250 Ω - 1M

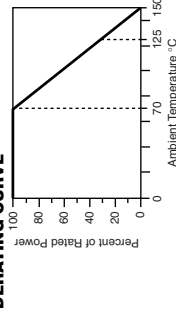
* Pb-containing terminations are not RoHS compliant, exemptions may apply

DIMENSIONS in inches



CASE SIZE	TERM	L	W	T	D	E
0402	B	0.042 ± 0.008	0.022 ± 0.005	0.012 to 0.033	0.010 to 0.005	0.010 ± 0.005
0502	B	0.055 ± 0.006	0.025 ± 0.005	0.012 to 0.033	0.010 to 0.005	0.015 ± 0.005
0505	B	0.055 ± 0.006	0.050 ± 0.005	0.012 to 0.033	0.010 to 0.005	0.015 ± 0.005
0603	B	0.064 ± 0.006	0.032 ± 0.005	0.020 Max.	0.012 to 0.005	0.015 ± 0.005
0805*, 0705*	B	0.080 ± 0.006	0.050 ± 0.005	0.015 to 0.033	0.016 to 0.008	0.015 ± 0.005
1005	B	0.105 ± 0.007	0.050 ± 0.005	0.015 to 0.033	0.015 to 0.005	0.015 ± 0.005
1010	B	0.105 ± 0.007	0.100 ± 0.005	0.015 to 0.033	0.015 to 0.005	0.015 ± 0.005
1206	B	0.126 ± 0.008	0.063 ± 0.005	0.015 to 0.033	0.020 + 0.005, - 0.010	0.020 + 0.005, 0.010
1505	B	0.155 ± 0.007	0.050 ± 0.005	0.015 to 0.033	0.015 to 0.005	0.015 ± 0.005
2010	B	0.209 ± 0.009	0.098 ± 0.005	0.015 to 0.033	0.020 to 0.005	0.020 ± 0.005
2208	B	0.230 ± 0.007	0.075 ± 0.005	0.015 to 0.033	0.020 to 0.005	0.020 ± 0.005
2512	B	0.259 ± 0.009	0.124 ± 0.005	0.015 to 0.033	0.020 to 0.005	0.020 ± 0.005

DERATING CURVE



ENVIRONMENTAL TESTS	10 kΩ, ΔR ± (%)	100 kΩ, ΔR ± (%)
Environmental Test	0.02	0.02
Thermal Shock	0.01	0.01
Short Time Overload	0.01	0.01
Low Temperature Operation	0.04	0.03
Resistance to Solder Heat	0.02	0.01
Moisture Resistance	0.03	0.05
High Temperature Exposure	0.05	0.05
Lead life (10 000 hrs, + 70 °C)	± 25 ppm/°C	± 25 ppm/°C
TCR		

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: P-1206E1002B8T5 (preferred part number format)

P	-	1	2	0	6	E	1	0	0	2	B	B	T	S
GLOBAL MODEL	SIZE	TCR	CHARACTERISTIC	RESISTANCE	TOLERANCE	TERMINATION	PACKAGING							
P-	0402	Y ± 10 ppm/°C	D ± 15 ppm/°C	The first 3 digits are significant figures and the last digit specifies the number of zeros to follow.	Q = ± 0.02 % A = ± 0.05 % D = ± 0.5 % F = ± 1 % G = ± 2 % J = ± 5 %	B = Solderable G = Epoxy/Solderable S = Lead (Pb)-free (e1)	TAPE AND REEL T0 = 100 Min 100 Mult T1 = 300 Min 300 Mult T3 = 300 Min 300 Mult T5 = 500 Min 500 Mult TF = Full Reel/2500 TS = 100 Min 1 Mult UF = TUBED							

Historical Part Number example: P0805H680TBBT (will continue to be accepted)

P	0805	H	6801	B	B	T
STYLE	CASE SIZE	CHARACTERISTIC	OHMIC VALUE	TOLERANCE	TERMINATION	PACKAGING

Revision 10-May-06

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For technical questions, contact thin-film@vishay.com