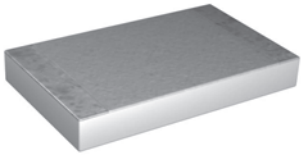
High Precision Flip Chip, Patents Pending (Industrialized Countries)



Product may not be to scale

VFC2512 is a Precision Surface Mount Flip Chip Resistor that utilizes Ultra Precision Bulk Metal® "Z" Foil (BMZF) for the resistive element. This product differs from other Vishay Bulk Metal® Foil surface mount devices in as much as it is installed with the foil side facing the PCB. The Foil element is isolated from the PCB by a protective overcoating. This overcoating plus the overall product design isolates the resistor from handling and installation stresses.

The flip chip configuration is providing space saving on the PCB and is more economical for high volume, analog applications where high precision is required.

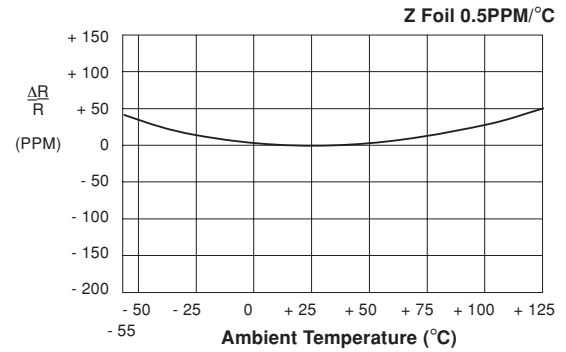
The BMZF technology provides inherently an extremely low and predictable Temperature Coefficient of Resistance (TCR), remarkable load life stability, low noise and availability of tight tolerance.

The TCR is a process capability not a selection process and for most of the range is independant of ohmic value and lot varied relations. The TCR curve on Fig.1 demonstrates the new revolutionary Z Foil with its TCR nominal of 0.5ppm/°C.

A voltage divider can be fashioned by using two arbitrarily selected VFC2512s with a resultant tracking specification of < 3ppm/°C. Extremely low tracking of < 1ppm/°C can be supplied upon request.

The availability of tight absolute tolerance provides a good cost solution for the variability of other components when compiling the total error budget. BMZF offers the best stability available; and is an order of magnitude better than thin film technology. The noise generated by the resistor is non measurable and its design and construction make it well suited for high frequency applications.

FIGURE 1 - NOMINAL TCR Z FOIL



The TCR for values < 100Ω are influenced by the termination composition and result in a deviation from this curve.

FEATURES

- High Precision: Tolerance to ± 0.01% (see table 1)
- Low Temperature Coefficient of Resistance. Nominal TCR: 0.5ppm/°C (- 55°C to + 125°C)
- Resistance Range: 10Ω to 100KΩ
- Load Life Stability: ± 0.01% maximum ΔR under full rated power at + 70°C for 2000 hours
- Shelf Life Stability: 50ppm/year (0.005%) maximum ΔR non-hermetically sealed
- Power Rating at + 70°C: 750mW
- Maximum Weight: 35 mg
- Voltage Coefficient: < 0.00001%/volt (< 0.1ppm/V)
- Current Noise: < 0.01μV (rms)/volt of applied voltage
- Non Inductive: < 0.08μH

TABLE 1 - TOLERANCE AND TCR VS RESISTANCE VALUE

VALUE Ω	STANDARD TOLERANCE (%)*	MAXIMUM TCR**
100Ω to 100KΩ	± 0.01	± 2.0ppm/°C
50Ω to < 100Ω	± 0.05	± 3.0ppm/°C
25Ω to < 50Ω	± 0.1	± 3.0ppm/°C
10Ω to < 25Ω	± 0.25	± 4.0ppm/°C

* Tighter tolerances are available. Please contact Vishay Application Engineering.

**Over MIL range: (- 55°C to +125°C, + 25°C reference)

TABLE 2 - TYPICAL PERFORMANCE SPECIFICATIONS

TEST	MIL-PRF-55342 CHARACTERISTIC E ΔR LIMITS*	VFC2512 MAXIMUM ΔR LIMITS**
Temperature Coefficient of Resistance	± 25ppm/°C	See Table 1
Thermal Shock	± 0.10%	± 0.02%
Low Temperature Operation	± 0.10%	± 0.02%
Short Time Overload	± 0.10%	± 0.02%
High Temperature Exposure	± 0.10%	± 0.03%
Resistance to Bonding	± 0.20%	± 0.02%
Moisture Resistance	± 0.20%	± 0.03%
Life 2000hrs at + 70°C	± 0.50%	± 0.01%

NOTES:
* As shown + 0.01Ω to allow for measurement error.
** As shown + 0.01Ω to allow for measurement error for values less than 100Ω.

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FIGURE 2 - POWER DERATING CURVE

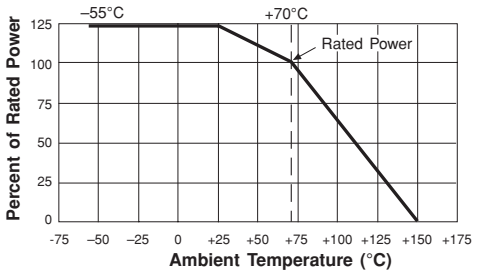


FIGURE 3 - CHIP CONFIGURATION

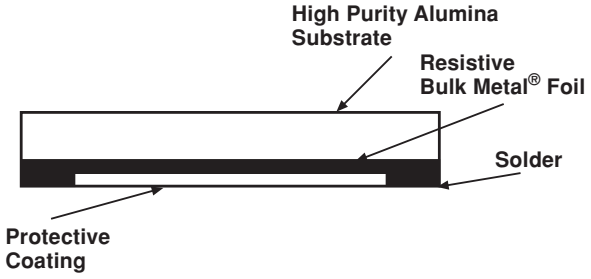
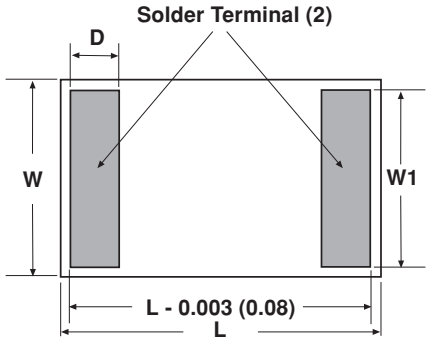
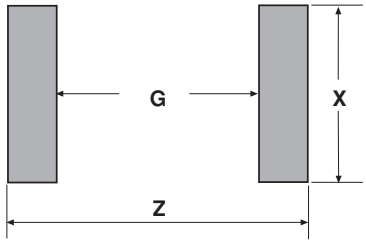


FIGURE 4 - DIMENSIONS AND LAND PATTERN in inches (millimeters)

Bottom View (Showing Terminals for Mounting):



Land Pattern



CHIP SIZE	L ± 0.005 (0.13)	W ± 0.005 (0.13)	THICKNESS MAXIMUM	D ± 0.003 (0.08)	W1 ± 0.003 (0.08)	Z ± 0.003 (0.08)	G ± 0.003 (0.08)	X ± 0.003 (0.08)
2512	0.250 (6.35)	0.125 (3.18)	0.025 (0.64)	0.024 (0.61)	0.123 (3.12)	0.250 (6.35)	0.196 (4.98)	0.126 (3.20)

TABLE 3 - ORDERING INFORMATION

MODEL	CHIP SIZE	RESISTANCE VALUE			TOLERANCE	TERMINATION	PACKAGING
		RESISTANCE RANGE	LETTER DESIGNATOR	MULTIPLIER FACTOR			
VFC	2512	10Ω to <1KΩ	**R**	x 1.0	**T** ± 0.01% **Q** ± 0.02% **A** ± 0.05% **B** ± 0.1% **C** ± 0.25% **D** ± 0.5% **F** ± 1.0%	**B** - solderable	**T** = Tape and Reel **W** = Waffle Pack
		Example: 249R00 = 249Ω					
		1K to 100K	**K**	x 10^3			
		Example: 10K000 = 10.0KΩ					

Patent Pending

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