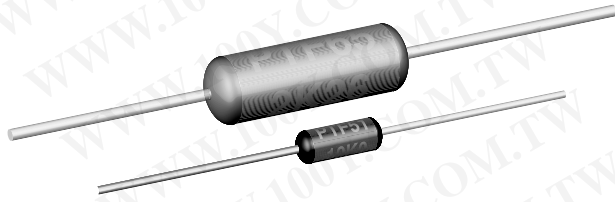


Metal Film Resistors, High Precision, High Stability



FEATURES

- Extremely low temperature coefficient of resistance
- Very low noise and voltage coefficient
- Very good high frequency characteristics
- Can replace wirewound bobbins
- Proprietary epoxy coating provides superior moisture protection
- For surface mount product, see Vishay Dale's PSF datasheet
- Compliant to RoHS directive 2002/95/EC



RoHS*
COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	HISTORICAL MODEL	POWER RATING $P_{85^{\circ}\text{C}}$ W	LIMITING ELEMENT VOLTAGE MAX. (1) V	TEMPERATURE COEFFICIENT \pm ppm/°C	TOLERANCE \pm %	RESISTANCE RANGE Ω
PTF51	PTF-51	0.05	200	5, 10, 15	0.02, 0.05, 0.1, 0.25, 0.5, 1	15 to 100K
PTF56	PTF-56	0.125	300	5, 10, 15	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	15 to 500K
PTF65	PTF-65	0.25	500	5, 10, 15	0.05, 0.1, 0.25, 0.5, 1	15 to 1M

Notes

- Marking: Print-marked-model, value, tolerance, TC, date code
- DSCC has created a drawing to support the need for a precision axial-leaded product. Vishay Dale is listed as a resource on this drawing as follows:

DSCC DRAWING NUMBER	VISHAY DALE MODEL	POWER RATING $P_{85^{\circ}\text{C}}$ W	RESISTANCE RANGE Ω	TOLERANCE \pm %	TEMPERATURE COEFFICIENT \pm ppm/°C	MAXIMUM WORKING VOLTAGE (1) V
89088	PTF56..31, PTF56..32 (2)	0.100	15 to 100K	0.01, 0.05, 0.1, 0.5, 1	5, 10	200
90038	PTF65..16, PTF65..14 (2)	0.250	15 to 100K	0.05, 0.1, 0.5, 1	5, 10	200

This drawing can be viewed at: www.dscclia.mil/Programs/MilSpec/ListDwgs.asp?DocType=DSCCdwg

- (1) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less.
 (2) Hot solder dipped leads

TEMPERATURE COEFFICIENT CODES

GLOBAL TC CODE	HISTORICAL TC CODE	TEMPERATURE COEFFICIENT
Z	T-16	5 ppm/°C
Y	T-13	10 ppm/°C
X	T-10	15 ppm/°C

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: PTF5620K500BYRE (preferred part numbering format)

P T F 5 6 2 0 K 5 0 0 B Y R E

GLOBAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	TEMP. COEFFICIENT	PACKAGING	SPECIAL
PTF51 PTF56 PTF65	R = Ω K = k Ω M = M Ω 15R000 = 15 Ω 500K00 = 500 k Ω 1M0000 = 1.0 M Ω	T = \pm 0.01 % (1) Q = \pm 0.02 % (1) A = \pm 0.05 % B = \pm 0.1 % C = \pm 0.25 % D = \pm 0.5 % F = \pm 1 %	Z = 5 ppm Y = 10 ppm X = 15 ppm 0 = Special	EK = Lead (Pb)-free, bulk EA = Lead (Pb)-free, T/R (full) EB = Lead (Pb)-free, T/R (1000 pieces) BF = Tin/lead, bulk RE = Tin/lead, T/R (full) R6 = Tin/lead, T/R (1000 pieces)	Blank = Standard (Dash number) (Up to 3 digits) From 1 to 999 as applicable

Historical Part Number example: PTF-5620K5BT-13R36 (will continue to be accepted)

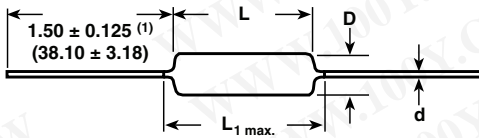
PTF-56	20K5	B	T-13	R36
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	TEMP. COEFFICIENT	PACKAGING

Note

- (1) Historical tolerance codes were BB for 0.01 % and BC for 0.02 %

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

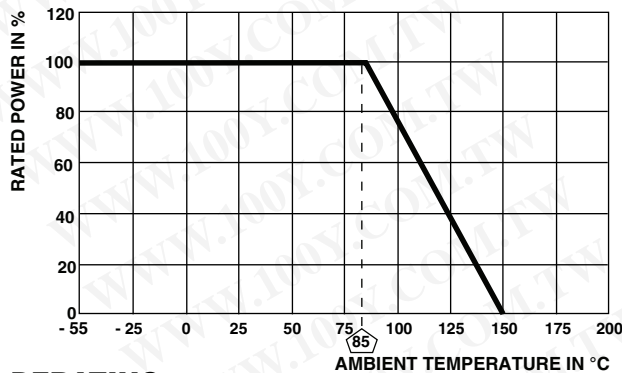
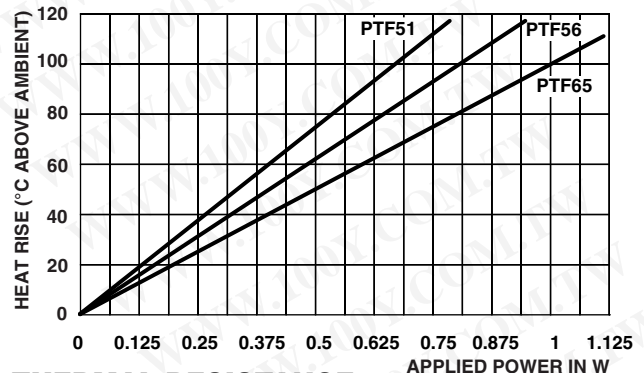
TECHNICAL SPECIFICATIONS				
PARAMETER	UNIT	PTF51	PTF56	PTF65
Rated Dissipation at 85 °C	W	0.05	0.125	0.25
Limiting Element Voltage	V_{\equiv}	200	300	500
Insulation Voltage (1 Min)	V_{eff}	> 500	> 500	> 500
Thermal Resistance	K/W	< 1300	< 520	260
Terminal Strength, Axial	N	> 150	> 50	> 50
Insulation Resistance	Ω	$\geq 10^{11}$	$\geq 10^{11}$	$\geq 10^{11}$
Category Temperature Range	°C	- 55 to + 150	- 55 to + 150	- 55 to + 150
Failure Rate	$10^{-9}/\text{h}$	< 1	< 1	< 1
Weight (Max.)	g	0.11	0.35	0.75

DIMENSIONS

Note

 (1) 1.08 ± 0.125 (27.43 ± 3.18) if tape and reel

GLOBAL MODEL	DIMENSIONS in inches (millimeters)			
	L	D	L ₁ max.	d
PTF51	0.150 ± 0.020 (3.81 ± 0.51)	0.070 ± 0.010 (1.78 ± 0.25)	0.200 (5.08)	0.016 (0.41)
PTF56	0.250 ± 0.031 (6.35 ± 0.79)	0.091 ± 0.009 (2.31 ± 0.23)	0.300 (7.62)	0.025 (0.64)
PTF65	0.375 ± 0.062 (9.53 ± 1.57)	0.145 ± 0.016 (3.68 ± 0.41)	0.475 (12.07)	0.025 (0.64)

PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST RESULTS (TYPICAL TEST LOTS)
Life	MIL-PRF-55182 Paragraph 4.8.18 1000 h rated power at + 85 °C	$\leq \pm 0.04$ %
Thermal Shock	MIL-STD-202, Method 107 - 55 °C to + 85 °C	$\leq \pm 0.02$ %
Short Time Overload	MIL-R-10509, Paragraph 4.7.6	$\leq \pm 0.01$ %
Low Temperature Operation	MIL-PRF-55182, Methods 4.8.10	$\leq \pm 0.02$ %
Moisture	MIL-PRF-55182, Paragraph 4.8.15	$\leq \pm 0.08$ %
Resistance to Soldering Heat	MIL-STD-202, Methods 210	$\leq \pm 0.02$ %
Damp Heat IEC 60068-2-3	56 days at 40 °C and 92 % RH	$\leq \pm 0.08$ %
Dielectric Withstanding Voltage	MIL-STD-202, Methods 301 and 105	$\leq \pm 0.01$ %


DERATING

THERMAL RESISTANCE

MATERIAL SPECIFICATIONS

Element	Precision deposited nickel chrome alloy with controlled annealing
Encapsulation	Specially formulated epoxy compounds. Coated construction
Core	Fire-cleanded high purity ceramic
Termination	Standard lead material is solder-coated copper. Solderable and weldable per MIL-STD-1276, Type C.

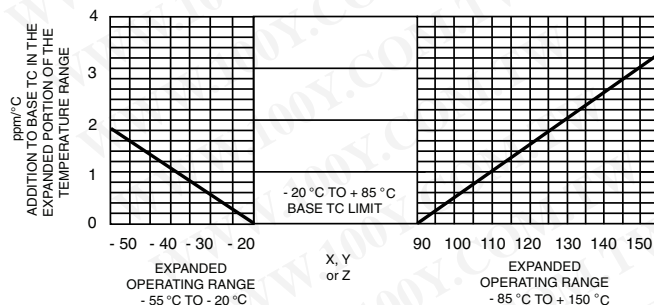
TEMPERATURE COEFFICIENT OF RESISTANCE

Temperature coefficient (TC) of resistance is normally stated as the maximum amount of resistance change from the original + 25 °C value as the ambient temperature increases or decreases. This is most commonly expressed in parts per million per degree centigrade (ppm/°C).

The resistance curve over the operating temperature range is usually a non-linear curve within predictable maximum limits. PTF resistors have a very uniform resistance temperature characteristic when measured over the operating range of - 20 °C to + 85 °C. The standard temperature coefficients available are

X = ± 15 ppm/°C, Y = ± 10 ppm/°C and Z = ± 5 ppm/°C.

Some applications of the PTF require operation beyond the specifications of - 20 °C to + 85 °C. The change in temperature coefficient of resistance is very small (less than ± 0.05 ppm/°C) over the expanded temperature range of - 55 °C to ± 150 °C. Therefore, when operating outside the range - 20 °C to + 85 °C, the designer can plan for a worst case addition of ± 0.05 ppm/°C for each degree centigrade beyond either - 20 °C or + 85 °C as indicated in the graph. This applies to all three temperature coefficient codes.



Example: Assume the operating characteristics demand a temperature range from - 55 °C to + 125 °C. This requires a ± 35 °C Δ below - 20 °C and a ± 40 °C Δ above + 85 °C. The extreme Δ being ± 40 °C means that the worst case addition to the specified TC limit of ± 0.05 ppm/°C times ± 40 °C or ± 2 ppm/°C. Therefore, a Z which is characterized by a base TC limit of ± 5 ppm/°C over the temperature range of - 20 °C to ± 85 °C will exhibit a maximum temperature coefficient of ± 7 ppm/°C over the expanded portion of the temperature range of - 55 °C to + 125 °C.

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)