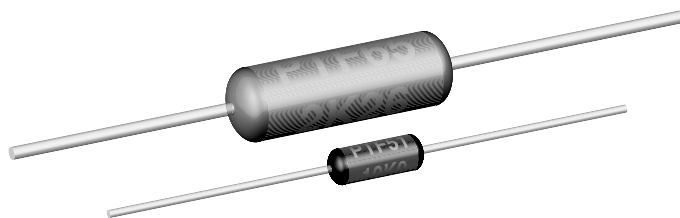


Metal Film Resistors, Precision, Ultra-high Stability



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
- Lead (Pb)-Free Version is RoHS Compliant



RoHS*
COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	HISTORICAL MODEL	POWER RATING $P_{85^{\circ}\text{C}}$ W	LIMITING ELEMENT VOLTAGE MAX. V_{LE}	TEMPERATURE COEFFICIENT ppm/°C	TOLERANCE %	RESISTANCE RANGE Ω
PTF51	PTF-51	0.05	200	5, 10, 15	0.02, 0.05, 0.1, 0.25, 0.5, 1	15R - 100K
PTF56	PTF-56	0.125	300	5, 10, 15	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	15R - 500K
PTF65	PTF-65	0.25	500	5, 10, 15	0.05, 0.1, 0.25, 0.5, 1	15R - 1M0

• Marking: Print-marked-model, Value, Tolerance, TC, Date code

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

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	PTF51	PTF56	PTF65
Rated Dissipation at 85°C	W	0.05	0.125	0.25
Limiting Element Voltage	V_{LE}	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/+ 150	- 55/+ 150	- 55/+ 150
Failure Rate	$10^{-9}/\text{h}$	< 1	< 1	< 1
Weight (max)	g	0.11	0.35	0.75

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 = Decimal K = Thousand M = Million G = Billion 15R000 = 15 Ω 500K00 = 500K Ω 1M0000 = 1.0M Ω		T = $\pm 0.01\%$ ** Q = $\pm 0.02\%$ ** A = $\pm 0.05\%$ B = $\pm 0.1\%$ C = $\pm 0.25\%$ D = $\pm 0.5\%$ F = $\pm 1\%$		Z = 5ppm Y = 10ppm X = 15ppm 0 = Special		EK = Lead Free, Bulk EA = Lead Free, T/R (Full) EB = Lead Free, T/R (1000pcs) BF = Tin/Lead, Bulk RE = Tin/Lead, T/R (Full) R6 = Tin/Lead, T/R (1000pcs)		Blank = Standard (Dash Number) (up to 3 digits) From 1-999 as applicable								

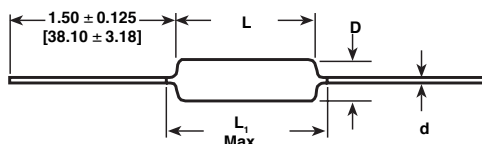
Historical Part Number example: PTF-5620K5BT-13R36 (will continue to be accepted)

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

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

** Historical tolerance codes were BB for 0.01% and BC for 0.02%..

DIMENSIONS

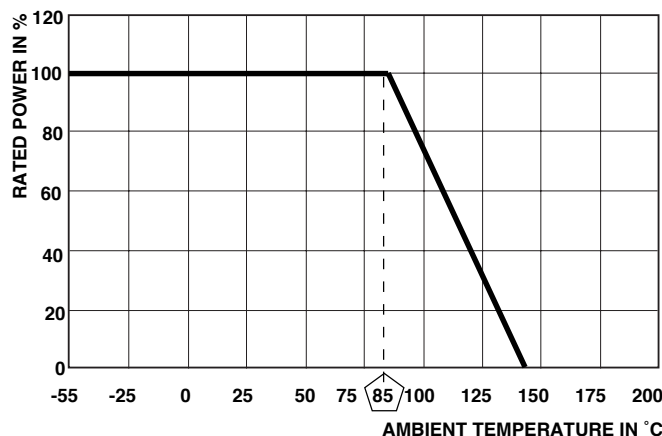


* 1.08 ± 0.125 [27.43 ± 3.18] IF TAPE AND REEL

GLOBAL	DIMENSIONS in inches [millimeters]			
MODEL	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
Endurance	MIL-PRF-55182 Para. 4.7.17 1000 hours rated power at + 85°C	≤ ± 0.04%
Thermal Shock	MIL-STD-202, Method 107 -55°C to + 85°C	≤ ± 0.02%
Short Time Overload	MIL-R-10509, Paragraph 4.6.6	≤ ± 0.01%
Low Temperature Operation	MIL-PRF-55182, Methods 4.7.9	≤ ± 0.02%
Moisture	MIL-STD-202 Method 106	≤ ± 0.08%
Resistance to Soldering Heat	MIL-STD-202, Methods 210	≤ ± 0.02%
Damp Heat IEC 60068-2.3	56 days at 40°C and 92% RH	≤ ± 0.08%
Dielectric Withstanding Voltage	MIL-STD-202, Methods 301 & 105	≤ ± 0.01%



DERATING

MATERIAL SPECIFICATIONS

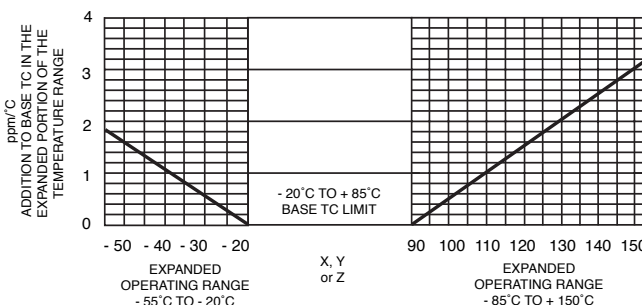
Element:	Precision deposited nickel chrome alloy with controlled annealing
Encapsulation:	Specially formulated epoxy compounds. Coated construction
Core:	Fire-cleaned high purity ceramic
Termination:	Standard lead material is solder-coated copper. Solderable and weldable per MIL-STD-1276, Type C.

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 = ± 15ppm/°C, Y = ± 10ppm/°C and Z = ± 5ppm/°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 ± 0.05ppm/°C) over the expanded temperature range of -55°C to ± 150°C. Therefore, when operating outside the range of -20°C to + 85°C, the designer can plan for a worst case addition of ± 0.05ppm/°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 ± 0.05ppm/°C times ± 40°C or ± 2ppm/°C. Therefore, a Z which is characterized by a base TC limit of ± 5ppm/°C over the temperature range of - 20°C to ± 85°C will exhibit a maximum temperature coefficient of ± 7ppm/°C over the expanded portion of the temperature range of - 55°C to + 125°C.



Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.