

NON-LINEAR RESISTORS

Resistive Products

NTC Thermistors Sensors

	Product Family	Size and Encapsulant	Lead Wire or Termination Characteristics	Res. Range R_{25} (Ω)	Tol. (% or K)	$B_{25/85}$ (K)	$B_{25/85}$ Tol. (%)	Temp. Range ($^{\circ}$ C)	AEC-Q200 Compliant	HALOGEN FREE	RoHS	REACH
SMD	 NTCS	0805 (2012 metric)	Ni barrier + tinned on T&R glass protected	2.2 k to 680 k	± 1 to ± 5	3430 to 4125	1 to 3	-40 to +150	x	x	x	x
		0603 (1608 metric)		2 k to 100 k		3420 to 4100			x	x	x	x
		0402 (1005 metric)		4.7 k to 100 k		3490 to 4075			x	x	x	x
	NTCS...SMT	0402, 0603, 0805		100 k to 210 k	± 1	3590	1			x	x	
	 NTHS	1206 (3216 metric)	Ni barrier + tinned on T&R glass protected	6 k to 330 k	± 3 to ± 10 (± 1 to ± 10 Curve1)	3486 to 4262	3	-40 to +125		x	x	
		0805 (2012 metric)		4.7 k to 350 k						x	x	
		0603 (1608 metric)		6.8 k to 350 k						x	x	
		0402 (1005 metric)		10 k to 350 k						x	x	
Leaded (Through Hole)	 NTCC200/300	2 mm x 2 mm x 0.7 mm	Ag/Au metallized bondable die	4.7 k to 20 k	± 1 to ± 5	3435 to 3865	1	-55 to +175	x	x	x	
	 NTCSMELF	SOD80 glass	Tinned dummet on T&R	10 k to 100 k	± 5	3977	1.3	-40 to +150		x	x	
	 NTCLE100	3.8 mm epoxy (5 mm)	Tinned Cu 0.6 mm ...B0: Bulk 1E pitch ...T1: T&R 1E pitch ...T2: T&R 2E pitch	3.3 to 2 k	± 2 to ± 5	2880 to 3560	0.5 to 3	-40 to +125			x	x
				2.2 k to 10 k		3977	0.75				x	x
				10 k to 470 k		3740 to 4570	1.5				x	x
	 NTCLE203	3.4 mm epoxy	Tinned Ni 0.4 mm	2 k to 470 k	± 1 to ± 5	3528 to 4570	0.5 to 2	-40 to +125			x	x
	 NTCLE203..SB0	4 mm epoxy	Tinned Ni 0.5 mm (T&R available)	2060 to 2800	± 0.5 K	3528 to 4090	0.5 to 0.75	-55 to +150	x		x	
				3k to 10k		3984	0.5					
				30 k		3935	0.75					
	 NTCLE213	2.5 mm epoxy	Tinned Ni 0.4 mm (T&R long leads available)	2.1 k	± 1 to ± 5	3511	0.5	-55 to +150	x		x	x
				10 k		3435 to 3984	0.5 to 0.75					
				12 k to 100 k		3740 to 4190	0.75 to 1.5					
	 NTCLE301 	2.40 mm epoxy	PEEK AWG30 SP Ni	2.1 k to 10 k	± 1 to ± 5	3435 to 3984	0.5 to 1.0	-55 to 150	x		x	
	 NTCLE305	1.60 mm epoxy	ETFE AWG32 SP Ni	2060 to 10 k	± 0.5 K	3511 to 3984	0.5 to 1	-40 to 125	x		x	
	 NTCLG100E2	SOD27 glass	Tinned CCSW 0.56 mm bulk / T&R	10 k to 220 k	± 5	3797 to 3977	1.3 to 3	-40 to +200		x	x	
	 NTCLE400	6 mm epoxy	UL-2468 PVC AWG24	2.2 k to 100 k	± 3	3977 to 4190	0.75 to 1.5	-40 to +85			x	
	 NTCLE413	3 mm epoxy	UL-2651 PVC AWG30	4.7 k to 100 k	± 1 to ± 5	3435 to 4190	0.5 to 1.5	-40 to +105			x	
	 NTCLE428		PVC AWG30									
Sensor Assemblies	 NTCLP4 11/12/13	Pipe 6 mm	UL-2651 PVC AWG26/24/22	4.7 k to 100 k	± 1 to ± 5	3435 to 4190	0.5 to 1.5	-40 to +105			x	
	 NTCLP450	Pipe 3.2 mm	UL-2651 PVC lead wire AWG30	100 k	± 3	4190	1.5					
	 NTCALUG01	Stud screw M3	PTFE AWG24 TP Cu	4.7 k to 100 k	± 1 to ± 5	3435 to 4190	0.5 to 1.5	-40 to +150	x		x	x
	 NTCALUG02		PEEK AWG30 SP Ni		± 1 to ± 3			-55 to +125				
	 NTCALUG03/39	Stud screw M2/M3	ETFE AWG32 SP Ni		± 2 to ± 5			-40 to +125				
	 NTCALUG01T 	Stud screw M3	ETFE AWG26 SP Cu	10 k	± 2	3984	0.5	-40 to +150	x		x	x
	 NTCASCW	Anodized Alu screw M4	Tinned Cu 0.6 mm Tinned Ni 0.5 mm	1 k to 470 k	± 1 to ± 5	3528 to 4570	0.5 to 2.5	-40 to +100			x	x
	 NTCACAP	ABS cap diameter 7 mm to 9 mm	Tinned, AWG22 to AWG30, single or double insulated	2.7 k to 10 k	$\pm 1, \pm 2$	3984	0.5	-55 to +60			x	x
	 NTCAIMME3	SS pipe 2.5 mm to 3.9 mm (brass collar)	UL-2651 PVC AWG30	10 k	± 3	3984	1.0	-25 to +105			x	

A **WORLD OF**
SOLUTIONS

NON-LINEAR RESISTORS

Resistive Products

PTC Thermistors Sensors

	Product Family	Size and Encapsulant	Lead Wire or Termination Characteristics	Res. Range R at T _{ref} (Ω)	T _n (°C)	Tol. (% or K)	TCR (ppm/°C)	Temp. Range (°C)	AEC-Q200 Compliant	HALOGEN FREE	RoHS	REACH
SMD	 PTS, Platinum Thin Film	0603 (1608 metric)	Ni barrier + tinned in box / T&R protective coating	100	0	± 0.3 K, ± 0.6 K	3850	-55 to +155		x	x	
		0805 (2012 metric)		100, 500								
		1206 (3216 metric)		100, 500, 1 k								
	 PTS AT	0603 (1608 metric)	Ni barrier + tinned on T&R protective coating	100R	0	± 0.3 K, ± 0.6 K	3850	-55 to +175	x	x	x	
		0805 (2012 metric)		100, 500								
		1206 (3216 metric)		100, 500, 1 k								
	 TFPT, Nickel Thin Film	0603 (1608 metric)	Ni barrier + tinned in T&R	100 to 1 k	25	± 0.5 to ± 5	4110	-55 to +150	x	x	x	x
		0805 (2012 metric)		100 to 5 k								
		1206 (3216 metric)		100 to 10 k								
Leaded (Through Hole)	 PTCSL03, Ceramic	3.5 mm silicone coating	Tinned CCSW 0.5 mm 1E/2E pitch bulk / T&R	550 to 1330	80 to 150	± 5 K	> 100 000	-40 to T _n +15	x		x	x
	 TFPTL, Nickel Thin Film	TFPTL10 3.6 mm epoxy	Tinned CCSW 0.5 mm 1E/2E pitch	100 to 1 k	25	± 1, ± 5	4110	-55 to +150			x	x
		TFPTL15 4.0 mm epoxy		100 to 5 k								

PTC Power Thermistors

	Product Family	Size and Encapsulant	Lead Wire or Termination Characteristics	Res. Range R ₂₅ (Ω)	Tol. (%)	Max. Voltage (V _{RMS}) (V _{DC})	I _{hold} - I _{max.} (A _{RMS}) E _m (J)	Temp. Range (°C)	AEC-Q200 Compliant	HALOGEN FREE	RoHS	REACH
SMD	 PTCTZ, PTCCZ, SMD Lead-frame	D6.4, D7.2, D7.8 mm 10 mm pitch silicone	Tin-plated P-bronze leadframe, T&R	2 to 500	± 10 to ± 20	16 to 600	I _n 0.05 - 0.5 I _m 0.7 - 10	-40 to +85	x		x	
Leaded (Through Hole)	 PTCCL...D/E Overload 30 / 60 V	D5 to D21 mm Silicone coated	Tinned CCSW 0.6 mm / 0.5 mm Bulk 2E pitch / T&R	0.3 to 50	± 20	30, 60	I _n 0.09 - 2.0 I _m 0.8 - 23	-40 to +85			x	x
	 PTCCL...F Overload 145 V			1.3 to 50		145	I _n 0.05 - 1.0 I _m 0.2 - 13	0 to +70				
	 PTCCL...H Overload 265 V			2.1 to 5 k		265	I _n 0.01 - 0.8 I _m 0.08 - 5.5					
	 PTCCL...S/T/V Overload ≥ 600 V	PTCCL...H..SBE Series	Tinned CCSW/Cu 0.6 mm / 0.5 mm Bulk 2E pitch / T&R	400 to 5 k	± 20 to ± 25	600 to 1000	I _n 0.01 - 0.03 I _m 0.1 - 0.5	-10 to +55			x	x
	 PTCEL, Inrush-Current Limiting	PTCEL13 Series, D13 mm, silicone coated	Tinned CCSW 0.6 mm Bulk 2E pitch / T&R	60 to 500	± 30	350 to 560 500 to 800	I _n 0.042 - 0.12 E _m 150	-40 to +105			x	
		PTCEL17 Series, D17 mm, silicone coated	Tinned CCSW 0.8 mm Bulk 2E pitch / T&R	60 to 120		440 to 460 625 to 650	I _n 0.1 - 0.14 E _m 240					

Varistors

	Product Family	Reference Size and Encapsulant	Lead Wire or Termination Characteristics	Voltage Range (V _{RMS})	V _{bd} (V _{DC} at 1 mA) ±10%	Max. I _{surge} (A _{peak}) 8/20 μs	Max. Energy (J) 10/1000 μs	Temp. Range (°C)	AEC-Q200 Compliant	HALOGEN FREE	RoHS	REACH
Leaded	 VDRS05/07/10/14/20 Standard Surge	5 mm, 7 mm, 10 mm, 14 mm, 20 mm epoxy coated	Tinned CCSW 0.6 mm, 0.8 mm tinned Cu 1.0 mm straight, kinked, flanged leads, bulk / T&R	14 to 680	22 to 1100	100 to 6500	0.5 to 496	-40 to +85		x	x	x
	 VDRH05/07/10/14/20 High Surge	5 mm, 7 mm, 10 mm, 14 mm, 20 mm epoxy coated	Tinned CCSW 0.6 mm, 0.8 mm tinned Cu 1.0 mm straight, kinked leads, bulk / T&R	11 to 680	18 to 1100	250 to 10 000	0.7 to 620	-40 to +125		x	x	x
SMD	 MLV Series	0402, 0603, 0805	Ni barrier + tinned in T&R	4 to 25	8 to 46	20 to 40	0.05 to 0.1	-40 to +125	x	x		
		1206 1210, 1812, 2220		4 to 95	8 to 150	100 to 1200	0.5 to 12	-40 to +85				