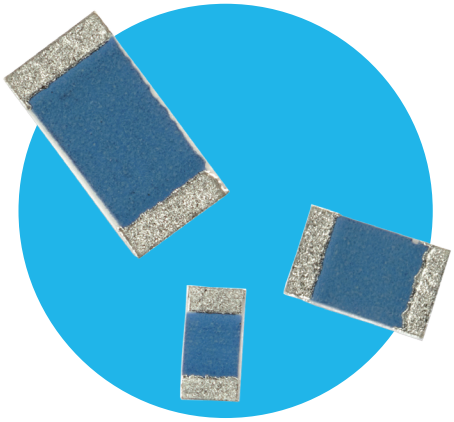
Resistors

Water Insoluble Nitride Thin Film Precision Chip Resistors

WIN Series



- TaN thin film technology
- Inherent moisture protection superior to that of passivated nichrome chip resistors
- High stability in humid and polluted environments
- Typical 85°C, 85%RH biased humidity 2000 hour stability <0.1%
- Typical moisture resistance stability ±100ppm
- Precision ±0.05% tolerance and ±10ppm/°C
- Anti-sulfur terminations
- 100% screened by automated optical inspection

RoHS All Pb-free parts comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

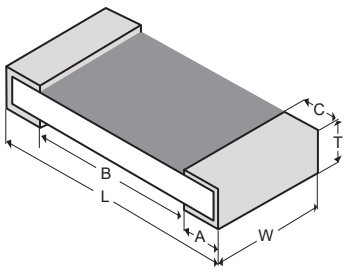
Electrical Data

		T0402	T0603	T0805	T1206
Power rating @ 70°C	watts	0.05	0.1	0.25	0.33
Resistance range	ohms	7R5 to 30K	5R to 100K	5R to 267K	5R to 1M0
Limiting element voltage (maximum voltage)	Vdc or rms	75	75	100	200
Resistance tolerance	%	±0.1 ±0.5 ±1	±0.05 ±0.1 ±0.5 ±1		
TCR	ppm/°C	±50 ±25	±10 ±15 ±25 ±50		
Standard values		E24, E96, E192			
Ambient temperature range	°C	-65 to +150			

Physical Data

Dimensions in mm & (inch) and weight in mg

	L	W	T	C	B min	A	Wt. nom
T0402	1.02±0.05 (0.04±0.002)	0.53±0.05 (0.021±0.002)	0.3±0.08 (0.012±0.003)	0.2±0.05 (0.008±0.002)	0.44 (0.017)	0.25±0.05 (0.01±0.002)	0.9
T0603	1.58 ± 0.15 (0.062 ± 0.006)	0.80 ± 0.10 (0.031 ± 0.004)	0.45 ± 0.10 (0.018 ± 0.004)	0.27 ± 0.20 (0.011 ± 0.008)	0.82 (0.032)	0.34 ± 0.20 (0.013 ± 0.008)	2.0
T0805	2.02 ± 0.15 (0.080 ± 0.006)	1.28 ± 0.15 (0.050 ± 0.006)	0.45 ± 0.10 (0.018 ± 0.004)	0.31 ± 0.20 (0.012 ± 0.008)	1.1 (0.043)	0.40 ± 0.20 (0.016 ± 0.008)	4.3
T1206	3.15 ± 0.15 (0.124 ± 0.006)	1.57 ± 0.15 (0.062 ± 0.006)	0.50 ± 0.15 (0.020 ± 0.006)	0.45 ± 0.25 (0.018 ± 0.010)	2.03 (0.08)	0.52 ± 0.25 (0.020 ± 0.010)	9.6



Construction

Conductors, thin film resistive element and epoxy outer protection are applied to an alumina substrate. The chips are supplied with wrap-around terminations suitable for soldering. The terminations have an electroplated nickel barrier and either 100% matt tin or 60/40 SnPb finish.

Marking & Solvent Resistance

WIN resistors have no marking on the component body. The body protection is resistant to all normal cleaning solvents suitable for printed circuits

Screening

WIN resistors can be screened to any tests identified in MIL-PRF-55342 and AEC-Q200 to provide components suitable as a COTS equivalent to MIL products or screened product subject to harsh operating environments.

General Note

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BI Technologies IRC Welwyn

www.ttelectronics.com/resistors

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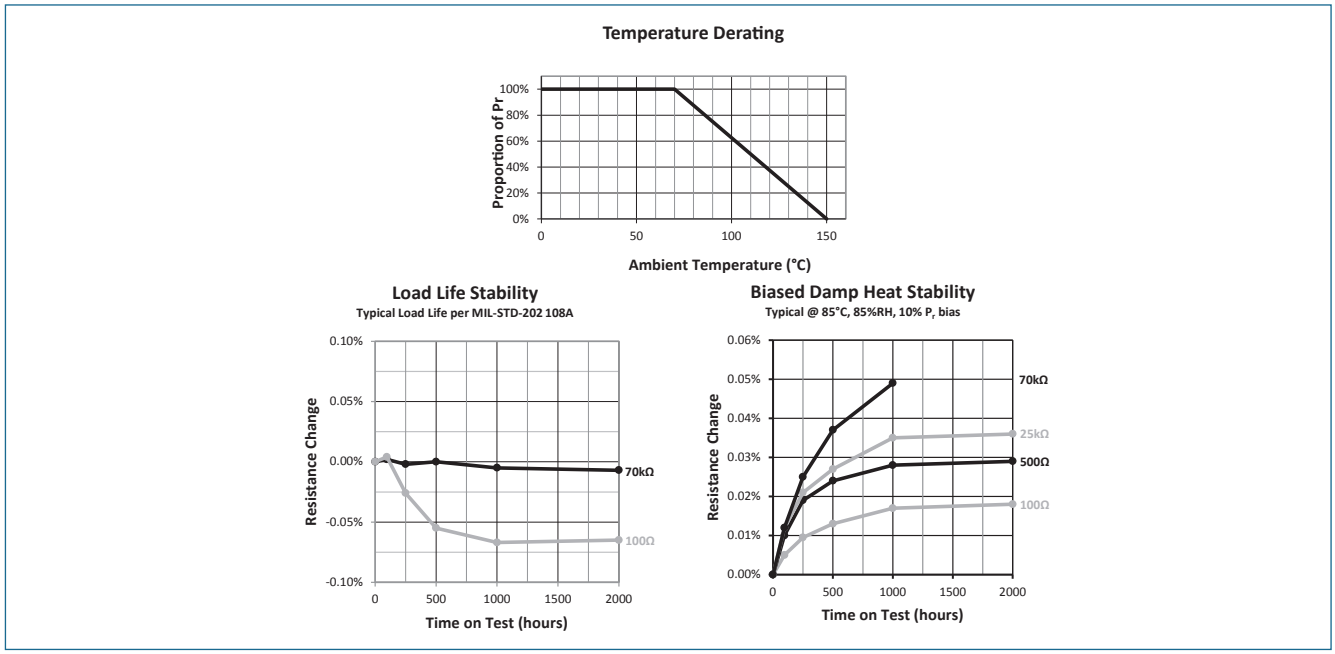
Manufacturing Capabilities Data

TCR ppm/°C	Tolerance %						
	T0402	T0603		T0805		T1206	
	0.1-1	0.05	0.1-1	0.05	0.1-1	0.05	0.1-1
10		5kΩ-10kΩ		5kΩ-40kΩ		5kΩ-80kΩ	
15		100Ω-50kΩ		100Ω-100kΩ		100Ω-400kΩ	
25	10Ω-30kΩ	50Ω-50kΩ	10Ω-100kΩ	50Ω-100kΩ	10Ω-267kΩ	50Ω-400kΩ	10Ω-1MΩ
50	7.5Ω-30kΩ		5Ω-100kΩ		5Ω-267kΩ		5Ω-1MΩ

Performance Data

Test	Method	ΔR	
		MIL-PRF-55342 Limits (max)	WIN actual performance (typ)
Thermal Shock	MIL-PRF-55342 4.8.3 (MIL-STD-202 107G cond. F: 5 cycles in air, +150 / -65°C)	± 0.1%	± 0.01%
Thermal Shock - Extended	MIL-STD-202 107G cond. F-3: 100 cycles in air, +150 / -65°C	± 0.1%	± 0.02%
Low Temp. Operation	MIL-PRF-55342 4.8.5 (-65°C)	± 0.1%	± 0.02%
Short Time Overload	MIL-PRF-55342 4.8.6 (lesser of 6.25 x Pr or 2 x LEV for 5 seconds)	± 0.1%	± 0.02%
High Temp. Exposure	MIL-PRF-55342 4.8.7 (+150°C for 100 hours)	± 0.1%	± 0.02%
High Temp. Exposure Extended	+150°C for 1000 hours	N/A	±0.1%
Resistance to Solder Heat	MIL-PRF-55342 4.8.8	± 0.2%	± 0.02%
Moisture Resistance	MIL-PRF-55342 4.8.9 (MIL-STD-202 106G: 10 cycles, 65±2°C, 95±5% RH)	± 0.2%	± 0.01%
Load Life	MIL-PRF-55342 4.8.11 (MIL-STD-202 108A: Pr at 70°C for 2000 hours)	± 0.5%	± 0.08%
Biased Damp Heat	85°C, 85%RH, 10% Pr bias, for 2000 hours	N/A	± 0.08%
Flower of Sulfur	ASTM B-809 (modified) 105°C Dry, 1000 Hours	Pass	



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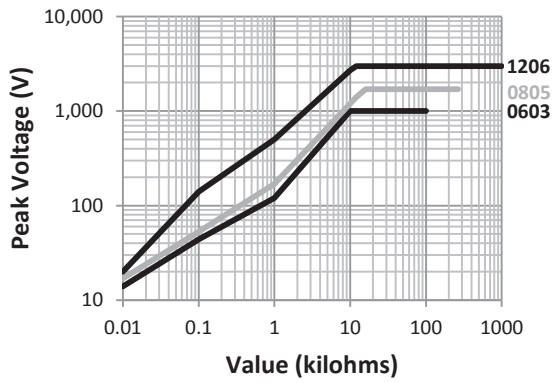
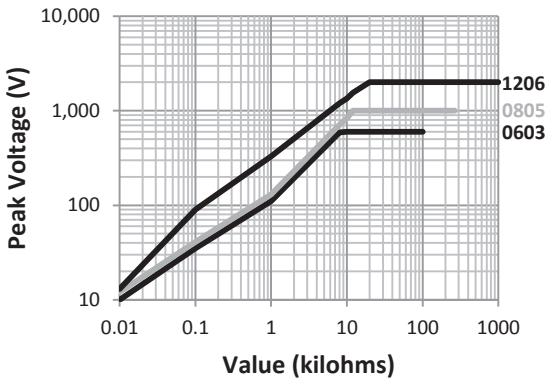
1.2/50µs Pulse Performance

IEC60 115-1, 5 pulses, |ΔR|<0.1%



10/700µs Pulse Performance

IEC60 115-1, 10 pulses, |ΔR|<0.1%



Pulse performance for 0402 to be advised.

Ordering Procedure

This product has two valid part numbers:

European (Welwyn) Part Number: WINT1206LF031001B3 (1206, ±25ppm/°C, 1 kilohm ±0.1%, Pb-free)

W	I	N	T	1	2	0	6	L	F	0	3	1	0	0	1	B	3
1				2				3		4			5			6	7

1 Series	2 Type	3 Termination	4 TCR	5 Value	6 Tolerance	7 Packing		
WIN	T0402	PB = SnPb	12 = ±10ppm/°C	3 digits + multiplier R = ohms for values <100 ohms	A = ±0.05%	Tape & reel		
	T0603	LF = Pb free	11 = ±15ppm/°C		B = ±0.1%	3	3000/reel	Standard
	T0805		03 = ±25ppm/°C		D = ±0.5%	Blank	1000/reel	
	T1206		02 = ±50ppm/°C		F = 1%			

USA (IRC) Part Number: WIN -T1206LF-03-1001-B3 (1206, ±25ppm/°C, 1 kilohm ±0.1%, Pb-free)

W	I	N	-	T	1	2	0	6	L	F	-	0	3	-	1	0	0	1	-	B	3
1				2					3			4			5					6	7

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	T0603	LF = Pb free	11 = ±15ppm/°C		B = ±0.1%	3	3000/reel	Standard
	T0805		03 = ±25ppm/°C		D = ±0.5%	Blank	1000/reel	
	T1206		02 = ±50ppm/°C		F = 1%			

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