

RESISTORS

PRODUCT SELECTION GUIDE



TT Electronics plc is a global electronics company.

Within its resistors business unit are multiple manufacturing facilities and dedicated engineering teams providing custom solutions.

BI Technologies, IRC and Welwyn are market leading brands within this group, with an 80-year track record of resistive component innovation.

TT Electronics offers the full spectrum of resistor technologies and a broad standard product range, in addition to providing custom engineered solutions.

Medical Application

A manufacturer of portable automatic external defibrillators (AEDs) needed a compact high voltage resistor for use in the charge regulation circuit. Standard products from other sources were proving unreliable under conditions of sustained high humidity and high voltage loading. The precision and stability with time and temperature were critical as they directly impact the tight error budget for delivered energy dosage. TT Electronics engineers solved this problem with a planar resistor with optimised thick-film element design and a high integrity epoxy coating and supported the customer through their rigorous approval process.

Other innovations in this area include pulse withstanding chip resistors for monitor circuit protection and a 200J energy dump resistor based on reinforced wirewound technology to enable daily self-test diagnostic cycles.



Aerospace Application

A designer working on an anti-ice aircraft surface heating system had to meet stringent safety requirements in the event of failure of a heating circuit. The failure mode to be mitigated was an “always on” condition, and this called for a single shot disconnection switch. TT Electronics engineers were contacted to help identify a solution, but nothing was available off the shelf. A set of potential solutions was proposed and the preferred option was a combination of self-switching resistive heater and thermal fuse. This was developed from concept into a fully qualified component within the required timescale. The compact format of the design also contributed significantly to the customer’s mass reduction target.



Consumer Application

Safety is becoming increasingly important in consumer products and a key aspect is protection against fire by the use of fusing line input resistors. With one component it is possible to reduce inrush current, protect against power line surges and give flameproof circuit opening under fault conditions. One company working in this area had a further need for fusing to be inaudible and invisible to the consumer.

TT Electronics devised a solution using a wirewound resistor with impact absorbing coating which contains the fused element without fragmenting. Other innovations include the offer of UL1412 recognised fusing resistors.



Industrial Application

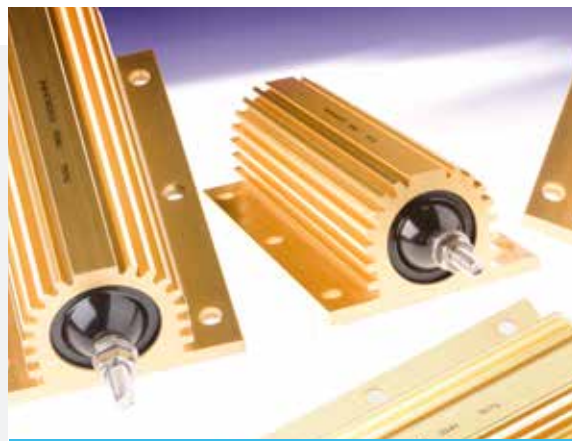
High-end industrial circuit breakers need to give reliable long-term performance under harsh conditions. In particular, transient surges caused by switching of inductive loads present a challenge. When a designer of industrial circuit breakers needed to modernise a design to SMT format, a through-hole wirewound protection resistor was proving hard to replace without filling a very large area with chip resistors. TT Electronics developed a solution whereby an axial part is leadformed and packed in blister tape. The resulting “ZI-form” component can be picked, placed and reflowed as an SMT part.



Using the Short Form

1. Choose the right technology - page 3
Find the best resistor technology for the set of features your design needs
2. Choose the right product series - pages 3 & 4
Use the SMT and Through Hole selector guides to identify a series which has the required ratings, precision and value range
3. Choose the right product type - pages 5 to 16
Refer to product tables to select the correct size and link to further data

Or, if you know the product series, use the Quick Find index.



Quick Find

Series	Page	Series	Page	Series	Page	Series	Page
1600/1900	9	HVD	7	PTS	15	WDBR-UL	11 (see WDBR)
3810	6	HVP	7	PWC	8	WH	11
4500	6	LCS	5	PWP	9	WHPC	11
4530	7	LHVC	7	RC	13	WHS	9
4800	12	LOB	5	RCP	13	WHS-UL	15
APC	12	LRCS/LVC	5	RHVD	8	WIN	13
ASC	16	LR(F)	5	SC3	10	WL4	16
BCN	16	LRF3W	5	SOT143	13	WMHP	11
BPC	9	LRMA	5	SP20F	14	WMO-S	11
BPR	10	LRZ	16	SPP	14	WPRT	12
CAR	12	MFC	6	SQM	10	WP-S	9
CR	15	MFP	10	SQP	10	WP-SZI	12
DIV23	12	MFR	15	T	8	WPYP	8
DSC	8	MF-S	10	TFHP	11	WRM	14
EBW	5	OAR	6	TJC	15	WRM-HP	14
EMC	14	OARS	6	ULR	6	WRM-HV	14
GCR	16	PCF	13	ULW	14	WSHR	11 (see WDBR)
GHVC	7	PCFH	13	VRW	8	WSM	12
HDSC	8 (see DSC)	PCFP	13	W20	11	WSMHP	12
HPDC	10	PCR	13	W30	9		
HPWC	8 (see PWC)	PFC	15	WA84F	14		
HR	7	PFC-D	13	WCM	9		
HTCR	10	PFC-HT	15	WCR	16		
HVC	7	PR	13	WDBR	11		

Current Sense

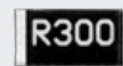
EBW Series						E-Beam Welded Shunt
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l,w,t
EBW5216	15	L050 – L100	1, 3, 5	-	150	52, 16, 3
EBW8518	36	L050 – L250	1, 2, 3, 5	-	100	85, 18, 3

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/Datasheets/EBW5216.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/EBW8518.pdf>



LCS Series						Low Value Current Sense Thin Film Chip Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l,w, h
0603	0.1	R02 – 1R	0.5, 1, 5	-	50, 100	1.6, 0.8, 0.55
0805	0.125	R02 – 1R	0.5, 1, 5	-	50, 100	2.0, 1.25, 0.65
1206	0.25	R05 – 1R	0.5, 1, 5	-	50, 100	3.05, 1.55, 0.65
2010	0.75	R05 – 1R	0.5, 1, 5	-	50, 100	4.9, 2.4, 0.65
2512	1.0	R05 – 1R	0.5, 1, 5	-	50, 100	6.3, 3.1, 0.65

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LCS.pdf>



LOB Series						Low Resistance Metal Element Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, Dia
LOB-3	3	0.005 - 0.12	1 - 5	-	-	14.2, 5.3
LOB-5	5	0.005 - 0.1	1 - 5	-	-	23.4, 8.4

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LOB.pdf>



LRCS/LVC Series						Small Size Low Value Chip Resistor
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, w, h
0402	0.063	R05 – 1R0	1, 5	-	200 – 400	1, 0.5, 0.32
0603	0.1	R02 – 1R0	1, 5	-	200 – 600	1.6, 0.8, 0.45
0805	0.125, 0.25	R02 – 1R0	1, 5	-	200 - 600	2, 1.25, 0.55

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRCS.pdf>



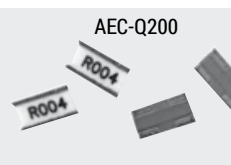
LR(F) Series						Low Value Flat Chip Resistor
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
1206	0.5	0R003 - 1R	1, 2, 5	-	±100	3.2, 1.63, .8
2010	1.0	0R003 - 1R	1, 2, 5	-	±100	5.23, 2.64, .8
2512	1.5/2.0	0R003 - 1R	1, 2, 5	-	±100	6.5, 3.25, .8

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LR.pdf>



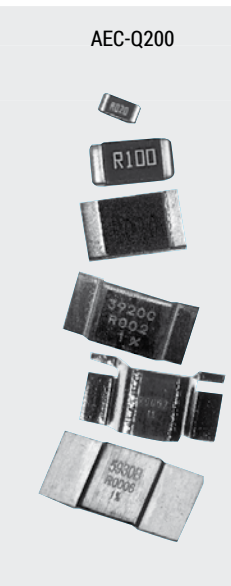
LRF3W Series						Low Range 3 Watt SMT Chip Resistor
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
LRF3W	3	0R003 - 1R	to ±1%	50	±100	3.25, 6.5, 0.9

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRF3W.pdf>



LRMA & LRMAPxxxx Series						Low Resistance Metal Alloy Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, w, h
M 0805	0.5	R001 – R025	1, 5	-	100	2, 1.25, 0.4
N 0612	1	R001 – R01	1, 5	-	100	1.7, 3.2, 0.6
N 0815	1	R001 – R03	1, 5	-	100	2.1, 3.75, 0.5
M 1206	1	R001 – R05	1, 5	-	50	3.2, 1.6, 0.5
T 2010	1.5	R002 – R05	1, 5	-	75, 100, 275	5, 2.5, 0.6
N 1225	3	R002 – R04	1, 5	-	100	3.2, 6.4, 0.9
M 2512	1 – 2	R0002 – R05	1, 5	-	75, 100, 275	6.4, 3.2, 0.9-2.6
T 2512	1 – 2	R001 – R1	1, 5	-	75, 100, 275	6.4, 3.2, 0.9-2.0
P 2512	3	R0005 – R5	1, 5	-	50	6.4, 3.2, 0.9-2.0
P 2726	5	R0002 – R5	1	-	25	6.9, 6.6, 2.4
P2817	5	R001 – R1	0.5, 1, 5	-	50, 75	7.1, 4.3, 0.8
P 3920	5	R0002 – R005	1	-	50 - 200	10, 5.2, 2
P4026	5	R0002 – R003	1	-	50, 75	12.9, 6.6, 3.0
P 5930	10	R0001 – R002	1	-	50 - 100	15, 7.8, 2

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRMA.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRMAP2726.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRMAP2817.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRMAP3920.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRMAP4026.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRMAP5930.pdf>



MFC Series Metal Foil on Ceramic Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l,w,h
0402	0.25	R01 - R05	0.5, 1, 2, 5	-	100	1.05, 0.55, 0.55
0603	0.5	R01 - R10	0.5, 1, 2, 5	-	100	1.7, 1, 0.77
0805	0.75	R01 - R10	0.5, 1, 2, 5	-	50	2.15, 1.4, 0.9
1206	1	R01 - R10	0.5, 1, 2, 5	-	50	3.2, 1.7, 0.9
2010	1.5	R01 - R10	0.5, 1, 2, 5	-	50	5, 2.5, 0.85
2512	2	R01 - R10	0.5, 1, 2, 5	-	50	6.4, 3.2, 0.85

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/MFC.pdf>

AEC-Q200



OAR Series Open Air Sense Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
OAR-1	1	R003 - R1	1, 5	-	to ±20	11.43, 1.65, 8.26
OAR-3	3	R0025 - R1	1, 5	-	to ±20	15.24, 1.65, 28.58
OAR-5	5	R003 - R05	1, 5	-	to ±20	20.32, 1.65, 28.58

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/OAR.pdf>



OARS / OARS-XP Series Surface Mount Sense Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
OARS1	2	OR003 to OR050	1	-	±20	11.18, 3.175, 3.05
OARSXP	5	OR001 to OR025	1, 5	-	±20	12, 6.4, 4.6

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/OARS.pdf>

AEC-Q200

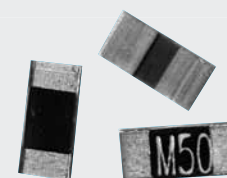


ULR Series Ultra Low Resistance Current Sense Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
ULR1S	1	R0002 - R01	1, 5	-	50	3.2, 1.6, 0.6
ULR1	1.0	R0005 - R01	1, 5	-	50, 75, 100, 150	6.4, 3.2, 1.4
ULR15S	1.5	R0002 - R01	1, 5	-	50	5.1, 2.5, 0.6
ULR2N	2.0	R001 - R003	1, 5	-	170, 300	2.54, 5.08, 0.6
ULR2	2.0	R0005 - R01	1, 5	-	50	6.4, 3.2, 1.4
ULR25	2.5	R0035 - R006	1, 5	-	50	6.4, 3.2, 1.4
ULR3	3.0	R00015 - R003	1, 5	-	50, 75, 100	6.4, 3.2, 1.4
ULR3N	3.0	R00015 - R003	1, 5	-	100, 250, 300, 350, 500	3, 6.35, 1
ULR5	5.0	R0005 - R003	1, 5	-	50, 150	6.4, 3.2, 1.4

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/ULR.pdf>

AEC-Q200



High Value / Voltage

3810 Series Ultra-High Value Precision Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
3810	-	100M - 1T	10, 20	500	-500 to -3500	25, 6
3811	-	100M - 1T	1, 2, 5, 10	1000	-500 to -3500	42.9, 6
3812	-	1T - 100T	2, 5, 10	1000	-500 to -3500	48, 6

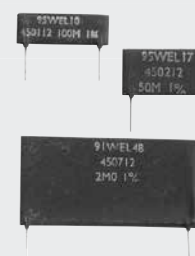
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/3810.pdf>



4500 Series High Voltage Planar Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
4501	1	20K - 500M	1, 2, 5	10000	100, 150	25.7, 2, 9
4502	1.7	36K - 750M	1, 2, 5	10000	100, 150	25.7, 2, 13
4503	2	36K - 750M	1, 2, 5	15000	100, 150	38.7, 2, 9
4504	3	62K - 1G	1, 2, 5	15000	100, 150	38.7, 2, 13
4505	2.8	51K - 1G	1, 2, 5	20000	100, 150	51.2, 2, 9
4506	3.6	82K - 1G	1, 2, 5	20000	100, 150	51.2, 2, 13
4507	4.5	180K - 1G	1, 2, 5	20000	100, 150	51.2, 2, 25.7

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/4500.pdf>



4530 Series

High Voltage Planar Dividers

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
4531	1.0	20K - 130M	1, 2, 5	6500	100	25.7, 2, 9
4532	1.7	36K - 250M	1, 2, 5	6500	100	25.7, 2, 13
4533	2.0	36K - 250M	1, 2, 5	10000	100	38.7, 2, 9
4534	3.0	62K - 450M	1, 2, 5	10000	100	38.7, 2, 13
4535	2.8	51K - 370M	1, 2, 5	15000	100	51.2, 2, 9
4536	3.6	82K - 660M	1, 2, 5	15000	100	51.2, 2, 13
4537	4.5	180K - 1G	1, 2, 5	15000	100	51.2, 2, 25.7

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/4530.pdf>

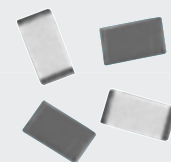


GHVC Series

Green High Voltage Chip Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, t
GHVC1206	0.3	25K - 100M	1, 2, 5, 10	1000	±100	3.2, 1.6, 0.6
GHVC2010	0.5	25K - 100M	1, 2, 5, 10	2000	±100	5.1, 2.5, 0.7
GHVC2512	1	25K - 100M	1, 2, 5, 10	3000	±100	6.5, 3.2, 0.7

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/GHVC.pdf>

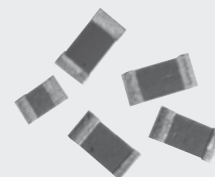


HR Series

High Value Surface Mount Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0503	-	10M - 20G	10	50	+250 to -2500	1.25, .63, .5
0603	-	10M - 20G	5	75	+250 to -2000	1.6, .8, .55
0805	-	100M - 50G	5	100	+250 to -2000	2, 1.25, .6
1005	-	100M - 50G	5	150	+250 to -1500	2.5, 1.25, .7
1206	-	100M - 50G	5	200	+250 to -1000	3.2, 1.6, .7
2512	-	27M - 10G	5	200	+250 to -1000	6.3, 3.2, .7

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/HR.pdf>



HVC Series

High Voltage Chip Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
1206	0.3	10K - 1G0	10, 5, 2, 1, 0.5	1000	50, 100	3.2±0.4, 1.6±0.2, 0.7
2010	0.5	10K - 1G0	10, 5, 2, 1, 0.5	2000	50, 100	5.1±0.3, 2.5±0.2, 0.8
2512	1	10K - 1G0	10, 5, 2, 1, 0.5	3000	50, 100	6.5±0.3, 3.2±0.2, 0.8

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/HVC.pdf>

Anti-Sulphur Option
AEC-Q200

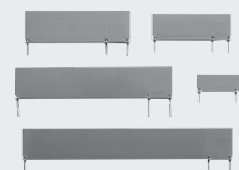


HVD Series

High Voltage Divider Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
HVD08	0.75	10K - 1G0	0.25, 0.5, 1	7,500	25, 50	25.4, 2.5, 9.4
HVD12	1.5	50K - 1G0	0.25, 0.5, 1	10,000	25, 50	38.1, 2.5, 13.6
HVD15	2.5	100K - 1G0	0.25, 0.5, 1	15,000	25, 50	50.8, 2.5, 16.1
HVD20	3.5	100K - 1G0	0.25, 0.5, 1	20,000	25, 50	76.2, 2.5, 16.1
HVD30	4.5	100K - 1G0	0.25, 0.5, 1	30,000	25, 50	101.6, 2.5, 16.1

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/HVD.pdf>



HVP Series

High Voltage Planar resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, w, h
HVP04	0.4	1K - 250M	0.25, 0.5, 1, 5	2000	25, 50, 100	10.2, 7.4, 2
HVP06	0.6	1K5 - 1G0	0.25, 0.5, 1, 5	5000	25, 50, 100	12.7, 7.4, 2
HVP08	0.8	2K - 1G0	0.25, 0.5, 1, 5	7500	25, 50, 100	19.1, 7.4, 2
HVP10	1	3K - 1G0	0.25, 0.5, 1, 5	10,000	25, 50, 100	25.4, 7.4, 2
HVP15	1.5	4K - 1G0	0.25, 0.5, 1, 5	15,000	25, 50, 100	38.1, 7.4, 2
HVP20	2	5K - 1G0	0.25, 0.5, 1, 5	20,000	25, 50, 100	50.8, 7.4, 2

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/HVP.pdf>



LHVC Series

Lower Range High Voltage Chip Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, w, h
0603	0.1	100K - 10M	1, 5	200	100	1.6, 0.8, 0.45
0805	0.125	100K - 10M	1, 5	400	100	2, 1.3, 0.55
1206	0.25	100K - 10M	1, 5	500	100	3.1, 1.6, 0.55
2010	0.5	50K - 10M	1, 5	1600	100	5, 2.5, 0.55
2512	1	50K - 10M	1, 5	2000	100	6.4, 3.2, 0.55

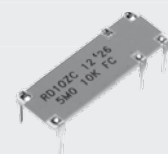
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LHVC.pdf>



RHVD Series Robust High Voltage Divider Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, h, w
RHVD08	0.5	10K - 1G0	0.25, 0.5, 1	7,500	25, 50	25.4, 9.2, 5
RHVD10	0.75	50K - 1G0	0.25, 0.5, 1	10,000	25, 50	38.1, 9.2, 5
RHVD10A	1	100K - 1G0	0.25, 0.5, 1	10,000	25, 50	38.1, 13.4, 5
RHVD15	1.5	100K - 1G0	0.25, 0.5, 1	15,000	25, 50	50.8, 9.2, 5
RHVD15A	2	100K - 1G0	0.25, 0.5, 1	15,000	25, 50	50.8, 15.9, 5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/RHVD.pdf>



T Series High Voltage Precision Thick Film Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
T43	1.5	10K - 10G	1, 2, 5	4000	25, 50, 100	25.4, 8.4
T44	3.5	10K - 50G	1, 2, 5	14000	25, 50, 100	50.8, 8.4
T48	10	33K - 50G	1, 2, 5	50000	25, 50, 100	150, 8.4

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/T40.pdf>



VRW Series High Voltage Thick Film Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) L, D
VRW25	0.25	100K to 30M	1, 2, 5	1600	200	6.2, 2.5
VRW37	0.5	100K to 10M	1, 2, 5	3500	200	9.0, 3.7
VRW68	1	100K - 68M	1, 2, 5	10000	200	15.5, 5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/VRW.pdf>



WPYP Series Capacitor Mount Balance/ Bleed Resistor

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) Pitch
WPYP8	10	1R0 - 82K	1, 2, 5	685	100	22
WPYP10	13	1R0 - 120K	1, 2, 5	940	100	31.8

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WPYP.pdf>



Surge / Pulse

DSC Series Double Sided Chip Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0603	0.125	0R5 - 1M0	0.5, 1, 5	75	100 - 200	1.5, 0.8, 0.6
0805	0.25	0R5 - 1M0	0.5, 1, 5	150	100 - 200	2.0, 1.25, 0.7
1206	0.33	0R5 - 4M7	0.5, 1, 5	200	100 - 200	3.2, 1.6, 0.7
2010	0.75	0R5 - 4M7	0.5, 1, 5	400	100 - 200	5.1, 2.5, 0.8
2512	1.5	0R5 - 4M7	0.5, 1, 5	500	100 - 200	6.5, 3.2, 0.8

Higher Pulse Double Sided (HDSC) version available

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/DSC.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/HDSC.pdf>

Anti-Sulphur Option



PWC Series Pulse Withstanding Chip Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0603	0.125	1R - 10M	0.5, 1, 5	75	100 - 200	1.5, 0.8, 0.6
0805	0.25	1R0 - 10M	0.5, 1, 5	150	100 - 200	2.0, 1.25, 0.7
1206	0.33	1R0 - 10M	0.5, 1, 5	200	100 - 200	3.2, 1.6, 0.7
2010	0.75	1R0 - 10M	0.5, 1, 5	400	100 - 200	5.1, 2.5, 0.8
2512	1.5	1R0 - 10M	0.5, 1, 5	500	100 - 200	6.5, 3.2, 0.8

Higher Pulse Withstanding (HPWC) version available

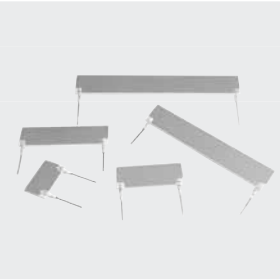
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PWC.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/HPWC.pdf>

Anti-Sulphur Option



PWP Series		Pulse Withstanding Planar Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
PWP04	0.4	100R – 200K	1, 5	-	±100	10.16, 2, 6.35
PWP06	0.6	100R – 200K	1, 5	-	±100	12.7, 2, 6.35
PWP08	0.8	100R – 200K	1, 5	-	±100	17.78, 2, 6.35
PWP10	1	100R – 200K	1, 5	-	±100	24.4, 2, 6.35
PWP15	1.5	100R – 200K	1, 5	-	±100	38.1, 2, 6.35
PWP20	2	100R – 200K	1, 5	-	±100	50.8, 2, 6.35

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PWP.pdf>



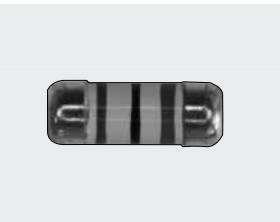
W30 Series		Flameproof Wirewound Resistor				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
W31	3	R01 – 10K	<R1: 5 ≥R1: 1, 2, 5	500	100 - 1000	13, 5.6

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/W30.pdf>



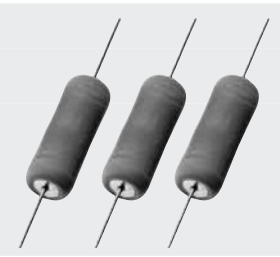
WCM Series		High Pulse Carbon Film MELF Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l dia
0204	0.25	7R5 – 10M	2, 5	200	-350 to -1500	3.7, 1.55
0207	0.5	7R5 – 10M	2, 5	300	-350 to -1500	6.1, 2.4
0207HP	1	7R5 – 10M	2, 5	350	-350 to -1500	6.1, 2.4

Datasheet - <https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WCM.pdf>



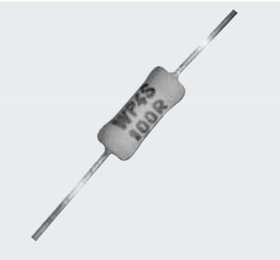
WHS Series		Wirewound High Surge Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim(mm) l,dia
WHS2	2	1R0 – 330R	1, 2, 5	-	±200	9, 3.6
WHS3	3	1R0 – 330R	1, 2, 5	-	±200	14.5, 5.2
WHS5	5	1R0 – 330R	1, 2, 5	-	±200	16.5, 7
WHS7	7	1R0 – 330R	1, 2, 5	-	±200	25, 8.8
WHS10	10	2R2 – 330R	1, 2, 5	-	±200	51, 10.5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WHS.pdf>



WP-S Series		Compact Flameproof Power Wirewound Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
WP1S	1	R068 to 430R	<20r: 5 ≥20R: 1,2,5	50	<1R: 350 ≥1R: 200	6.2, 2.8
WP2S	2	R05 to 900R	<20r: 5 ≥20R: 1,2,5	50	<1R: 350 ≥1R: 200	9.0, 3.6
WP25S	2.5	R05 to 900R	<20r: 5 ≥20R: 1,2,5	75	<1R: 350 ≥1R: 200	12.5, 4.5
WP3S	3	R01 to 2K2	<20r: 5 ≥20R: 1,2,5	100	<1R: 350 ≥1R: 200	14.5, 5.2
WP4S	4	R01 to 10K	<R10:5 ≥R10: 1,2,5	100	<1R: 350 ≥1R: 200	13, 5.6
WP5S	5	R015 to 6K8	<20r:5 ≥20R: 1,2,5	150	<1R: 350 ≥1R: 200	16.5, 7.0

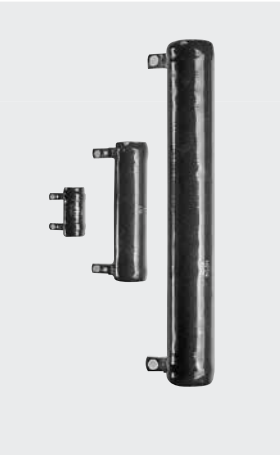
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WP-S.pdf>



High Power

1600/1900 Series		Tubular Vitreous Enamelled Wirewound Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
1601	11	1 - 15K	1, 2, 5, 10	250	75 - 200	33, 17.5
1905	16	1 - 30K	1, 2, 5, 10	450	75 - 200	56.1, 14.5
1600	16.5	1 - 56K	1, 2, 5, 10	600	75 - 200	61.5, 14.5
1602	17	1 - 43K	1, 2, 5, 10	500	75 - 200	51, 17.5
1906	22	1 - 50K	1, 2, 5, 10	700	75 - 200	64.3, 17.5
1603	25	1 - 83K	1, 2, 5, 10	850	75 - 200	74.5, 17.5
1604	35	1 - 100K	1, 2, 5, 10	1300	75 - 200	102, 17.5
1605	47	1 - 100K	1, 2, 5, 10	1100	75 - 150	89.5, 24
1908	54	1 - 100K	1, 2, 5, 10	1200	75 - 150	102, 24
1607	76	1 - 100K	1, 2, 5, 10	1300	75 - 150	102, 32
1606	91	1 - 160K	1, 2, 5, 10	2100	75 - 150	166, 24
1608	115	1 - 180K	1, 2, 5, 10	2100	75 - 150	152, 32
1609	165	1 - 250K	1, 2, 5, 10	3000	75 - 150	216, 32

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/1600-1900.pdf>



BPC Series		Planar Power Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, h, t
BPC3	3	0R1 - 200K	1, 2, 5, 10	500	100	10.2, 27.7, 2.5
BPC5	5	0R1 - 200K	1, 2, 5, 10	500	100	12.7, 27.7, 2.5
BPC7	7.5	0R1 - 200K	1, 2, 5, 10	500	100	19.1, 27.7, 2.5
BPC10	10	0R1 - 200K	1, 2, 5, 10	500	100	25.4, 27.7, 2.5

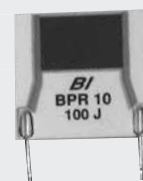
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/BPC.pdf>



BPR Series Vibration-proof Planar Power Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, h, t
BPR3	3	0R1 - 200K	1, 2, 5	500	100	12.7, 17, 6.1
BPR5	5	0R1 - 200K	1, 2, 5	500	100	12.7, 27.2, 6.1
BPR7	7	0R1 - 200K	1, 2, 5	500	100	25.4, 20.8, 6.1
BPR10	10	0R1 - 200K	1, 2, 5	500	100	25.4, 27.2, 6.1
BPR30	30	0R1 - 200K	1, 2, 5	500	100	53.3, 37.3, 6.1
BPR50	50	1R0 - 1K0	1, 2, 5	500	100	53.3, 52.8, 6.1

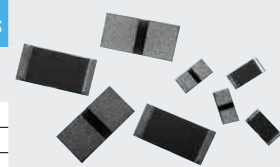
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/BPR.pdf>



HPDC Series High Power Density Chip (AlN) Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, t
1206	2.4	10 - 2K0	1, 5	200	150	3.1, 1.5, 0.64
2512	3.5	3R0 to 2K0	1, 5	200	150	6.4, 3.2, 0.64

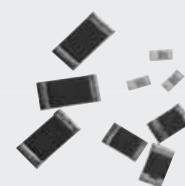
Datasheet - <https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/HPDC.pdf>



HTCR Series High Temperature Chip Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, h, t
0805	0.125	1R0 - 10M	1, 5	150	100 - 200	2, 1.3, 0.5
1206	0.25	1R0 - 10M	1, 5	200	100 - 200	3.2, 1.6, 0.5
2010	0.625	1R0 - 10M	1, 5	400	100 - 200	5, 2.5, 0.65
2512	1	1R0 - 10M	1, 5	500	100 - 200	6.3, 3.2, 0.65

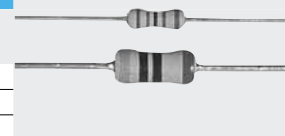
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/HTCR.pdf>



MFP Series Flameproof Power Metal Film Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
MFP1	1	0R1 - 1M	1, 2, 5	350	100, 200, 300	6.2, 2.5
MFP2	2	1R0 - 1M	1, 2, 5	350	100	10, 4

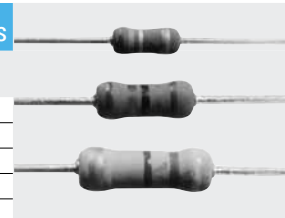
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/MFP.pdf>



MF-S Series Power Metal Film Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
MF1/2S	0.5	0R1 - 1M	1, 2, 5, 10	350	150 - 350	6.2, 2.5
MF1S	1.0	0R1 - 1M	1, 2, 5, 10	350	150 - 350	9, 3.6
MF2S	2.0	0R1 - 1M0	1, 2, 5, 10	350	150 - 350	12.5, 4.2
MF3S	3.0	0R1 - 1M0	1, 2, 5, 10	350	150 - 350	14.5, 5.3

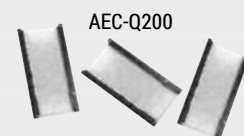
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/MF-S.pdf>



SC3 Series High Power Chip Resistor

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
SC3	3	1R0 - 10K	1, 2, 5	50	100	3.25, 6.5,

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/SC3.pdf>



SQM Series Ceramic Case Pluggable Resistor

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) h, w, d
SQM2	2	0R1 - 33K	5	150	350, 400	20, 11.5, 7.5
SQM3	3	0R1 - 56K	5	300	350, 400	25, 12.5, 8.5
SQM5	5	0R1 - 100K	5	350	350, 400	25, 12.5, 9
SQM7	7	0R1 - 200K	5	500	350, 400	38, 12.5, 9
SQM10	10	0R1 - 200K	5	750	350, 400	50, 12.5, 9
SQM10A	10	0R1 - 560R	5	750	350, 400	35, 16, 12

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/SQM.pdf>



SQP Series Ceramic Case Resistors - Wirewound / Metal Oxide

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
SQP2	2	0R1-120K	5	-	-	18, 7, 7
SQP3	3	0R1-150K	5	-	-	22, 8, 9
SQP5	5	0R1 - 150K	5	-	-	22, 10, 9
SQP7	7	0R1 - 200K	5	-	350	35, 10, 9
SQP10	10	0R1 - 200K	5	-	-	49, 10, 9
SQP15	15	1R0- 200K	5	-	-	49, 12.5, 11.5
SQP20	20	2R0-200K	5	-	-	60, 14.5, 13.5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/SQP.pdf>



TFHP Series		Thin Film High Power AlN Chip				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, t
1206	2	50 – 30K1	0.1, 0.25, 0.5, 1	100	25, 50	3.1, 1.6, 0.43
2512	6	50 – 30K1	0.1, 0.25, 0.5, 1	100	25, 50	6.3, 3.1, 0.43

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/TFHP.pdf>



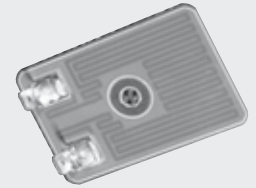
W20 Series		Vitreous Enamelled Wirewound Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
W21	3.0	0R1 - 10K	1, 2, 5	100	+75 to 200	12.7, 5.6
W22	7.0	0R1 - 22K	1, 2, 5	200	+75 to 200	22, 8
W23	10.5	0R15 - 60K	1, 2, 5	500	+75 to 200	38, 8
W24	14.0	0R2 - 100K	1, 2, 5	750	+75 to 200	53.5, 8

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/W20.pdf>



WDBR Series		Ultra Low Profile Dynamic Braking Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w
WDBR1/2	300	2R2 – 150R	10	-	+500 - +600	31.9, 28.1
WDBR1	700	3R3 – 270R	10	-	+500 - +600	49.3, 35.9
WDBR2	780	8R2 – 820R	10	-	+500 - +600	61, 40.6
WDBR3	900	8R2 – 1K0	10	-	+500 - +600	102, 70
WDBR5	1000	10R – 1K5	10	-	+500 - +600	122, 70
WDBR7	1490	2R2 – 1K0	10	-	+500 - +600	152, 102

UL Recognised (WDBR-UL) version also available and Steel Heater (WSHR) version also available
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WDBR.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WDBR-UL.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WSHR.pdf>



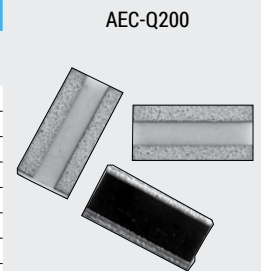
WH Series		Aluminium Housed Wirewound Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
WH5	10	0R01 - 10K	1, 2, 5, 10	150	50, 100	30, 17, 9
WH10	15	0R01 - 20K	1, 2, 5, 10	250	50, 100	36.5, 21, 11
WH25	25	0R01 - 44K	1, 2, 5, 10	500	50, 100	51, 28, 15
WH50	50	0R015 - 120K	1, 2, 5, 10	1250	50, 100	72.5, 30, 16
WH100	100	0R01 – 70K	1, 2, 5, 10	1900	25, 100	88, 47.5, 24.1
WH200	200	0R01 – 50K	1, 2, 5, 10	1900	25, 100	146, 72.5, 41.8
WH300	300	0R01 – 68K	1, 2, 5, 10	2500	25, 100	184, 72.5, 41.8

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WH.pdf>



WHPC Series		High Power Chip Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, w, h
0508X	1	1R – 1M	0.5, 1, 5	200	100, 150	1.3, 2, 0.55
1206	0.5	1R – 10M	1, 5	200	100 – 200	3.1, 1.6, 0.55
0612	0.5	1R – 1M	1, 5	200	100 – 400	1.6, 3.2, 0.55
0612X	1.5	1R – 1M	0.5, 1, 5	200	100, 150	1.6, 3, 0.55
2010	1	1R – 10M	1, 5	200	100 – 200	5, 2.5, 0.55
1020	1	1R – 1M	1, 5	200	100 – 400	2.5, 5, 0.55
1020X	2	1R – 1M	0.5, 1, 5	200	100, 150	2.5, 5, 0.6
1218	1	1R – 1M	1, 5	200	100 – 400	3.1, 4.6, 0.55
1225	1.5	1R – 1M	1, 5	200	100 – 400	3.1, 6.3, 0.55

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WHPC.pdf>



WMHP Series		Heatsink Mount High Power Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
WMHP20	20	R05 – 10K	1, 5	350	50	14.8, 10.1, 4.4
WMHP35	35	R05 – 10K	1, 5	350	50	14.8, 10.1, 4.4
WMHP50	50	R05 – 100K	1, 5	350	50	14.8, 10.1, 4.4
WMHP100	100	R05 – 100K	1, 5	700	50	20.7, 15.8, 5.0

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WMHP.pdf>



WMO-S Series		Flameproof Metal Oxide Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
WM01/2S	0.5	10R - 100K	5	250	350	7.5, 3
WM01S	1.0	10R - 120K	5	350	350	10, 4.5
WM02S	2.0	10R - 150K	5	350	350	12, 5
WM03S	3.0	10R - 150K	5	350	350	16, 5.5
WM05S	5.0	10R - 180K	5	500	350	26, 8.5
WM07S	7	20R - 150K	5	750	350	32, 8.5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WMO-S.pdf>

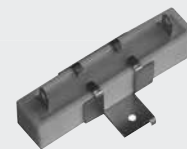


WPRT Series Wirewound Power Radial Terminal Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
WPRT10	10	1R0 – 820R	5	-	±350	48, 10, 9
WPRT15	15	1R0 – 1K0	5	-	±350	48, 12.5, 11.5
WPRT20	20	2R0 – 1K2	5	-	±350	63, 12.5, 13.5
WPRT30	30	3R0 – 1K5	5	-	±350	75, 19, 19
WPRT40	40	6R0 – 1K5	5	-	±350	90, 19, 19
WPRT50	50	6R0 – 1K5	5	-	±350	90, 19, 19

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WPRT.pdf>

AEC-Q200



WP-SZI Series Cement Coated Surface Mount Wirewound Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
WP2SZI	2	0.05 - 900R	<0R1:5,10	50	<1R: 350 1R: 200	14.8, 3.6, 6.5
WP3SZI	3	0.01 - 2K2	≥0R1:1,2,5,10	100	<1R: 350 1R: 200	21, 5.2, 8.2
WP5SZI	5	0.015 - 6K8	1, 2, 5, 10	150	<1R: 350 1R: 200	21, 7.0, 8.2

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/ZI-FORM.pdf>



WSM Series Moulded Surface Mount Wirewound Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
WSM2	2	0R01 - 1K	1, 2, 5, 10	100	20 - 100	12, 10.5, 5.5
WSM3	3	0R05 - 3K	1, 2, 5, 10	100	20 - 200	18, 16, 6.5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WSM.pdf>

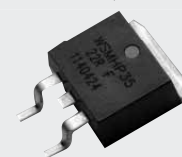


WSMHP Series Surface Mount TO-263 Power Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
WSMHP20	20	0R5 – 100K	1, 5	500	50	10.1, 10.1, 4.6
WSMHP25	25	0R5 – 100K	1, 5	500	50	10.1, 10.1, 4.6
WSMHP35	35	0R5 – 100K	1, 5	500	50	10.1, 10.1, 4.6

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WSMHP.pdf>

AEC-Q200



Precision

4800 Series Ultra Precision Bulk Metal Foil Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
4802/12/32	0.5	1R0 to 100K	0.005, 0.01	200	5	8.9, 10.2, 3.8, 7.5, 8, 2.5 9.7 5.4 9.7
4804	1	0R5 to 200k	0.02, 0.05	350	5	15.2, 13.2, 3.8
4805	1.5	33R0 to 300K	0.01, 0.25, 0.5, 1	500	5	22.6, 13.2, 3.8

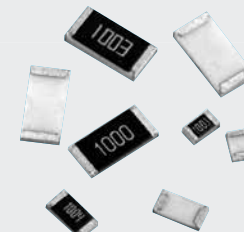
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/4800.pdf>



APC Series Anti-Sulphur Precision Chip Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0402	0.1	10R – 100K	0.05, 0.1, 0.25, 0.5, 1	25, 50	10, 15, 25, 50	1, 0.5, 0.35
0603	0.063 / 0.1	4R7 – 332K	0.05, 0.1, 0.25, 0.5, 1	50, 75	10, 15, 25, 50	1.55, 0.8, 0.45
0805	0.1 / 0.125	10R – 1M0	0.05, 0.1, 0.25, 0.5, 1	100, 150	10, 15, 25, 50	2, 1.25, 0.55
1206	0.125 / 0.25	10R – 1M0	0.05, 0.1, 0.25, 0.5, 1	150, 200	10, 15, 25, 50	3.05, 1.55, 0.55
1210	0.25 / 0.33	10R – 1M0	0.05, 0.1, 0.25, 0.5, 1	150, 200	10, 15, 25, 50	3.1, 2.6, 0.55
2010	0.25 / 0.5	10R – 1M5	0.05, 0.1, 0.25, 0.5, 1	150, 200	10, 15, 25, 50	4.9, 2.5, 0.55
2512	0.5 / 0.75	10R – 1M5	0.05, 0.1, 0.25, 0.5, 1	150, 200	10, 15, 25, 50	6.3, 3.2, 0.55

Datasheet - <https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/APC.pdf>

Anti-sulphur
AEC-Q200

CAR Series Ultra Precision Metal Film Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
CAR5	0.25	10R0 - 3M	0.01, 0.02,	250	5, 10,	7.2, 2.5
CAR6	0.33	10R0 - 5M	0.05, 0.1,	350	15, 25,	10, 3.7
CAR7	0.5	10R0 - 10M	1.0	500	50	15.5, 5.5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/CAR.pdf>



DIV23 Series Surface Mount Divider Network

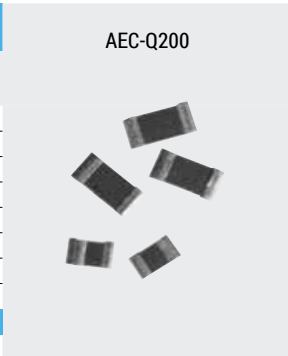
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
DIV23	0.25	10R - 200K	0.05	100	Track ±5	2.9, 1.3, 1

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/DIV23.pdf>



PCF Series Precision Surface Mount Resistor						
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0201	0.031	50R - 33K	0.5, 1	15	25, 50	0.6, 0.3, 0.26
0402	0.063	10R-205K	0.01 - 1	25	1 - 50	1, 0.5, 0.4
0603	0.063	2R - 1M	0.01 - 1	50	1 - 50	1.6, 0.8, 0.55
0805	0.1	1R - 2M	0.01 - 1	100	1 - 50	2, 1.3, 0.65
1206	0.125	1R - 2M5	0.01 - 1	150	1 - 50	3.2, 1.6, 0.65
1210	0.2	1R - 2M5	0.01 - 1	150	1 - 50	3.2, 2.6, 0.5
2010	0.25	1R - 3M	0.01 - 1	150	1 - 50	4.9, 2.4, 0.65
2512	0.5	1R - 3M	0.01 - 1	150	1 - 50	6.3, 3.1, 0.65

High Power (PCFH), and Passivated (PCFP) versions available
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PCF.pdf>



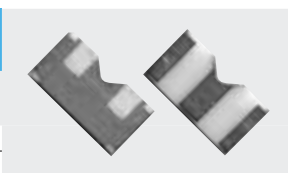
PCR Series Precision Thick Film Surface Mount Resistors						
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0805	0.1	10R - 1M	0.1 - 1	100	50	2, 1.25, .6
1005	0.125	10R - 1M	0.1 - 1	150	50	2.5, 1.25, .7
1206	0.25	10R - 1M	0.1 - 1	200	50	3.2, 1.6, .7

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PCR.pdf>



PFC-D Series Precision 1206 Resistive Dividers						
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, t
PFC-D	0.25	10R - 200K	0.05, 0.1, 0.5, 1	100	25, 50, 100	3.2, 1.6, 0.6

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PFC-D.pdf>



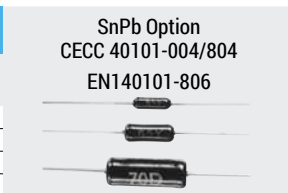
PR Series Precision Metal Film Resistors						
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
PR4	0.25	100R - 1M	0.1, 0.25,	250	15, 25, 50	6.2, 2.5
PR5	0.5	100R - 1M	0.5, 1	350	15, 25, 50	9, 3.6

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PR.pdf>



RC Series Precision Metal Film Resistors						
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
RC55	0.25	1R - 4M	0.05, 0.1, 0.25, 0.5	350	5, 10, 15, 25, 50, 100	7.2, 2.5
RC65	0.5	1R - 4M		350		10, 3.7
RC70	1.0	1R - 10M		500		15.5, 5.5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/RC.pdf>



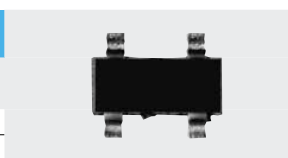
RCP Series Precision Metal Film Resistors						
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
RC55P	0.5	1R - 4M	0.05, 0.1, 0.25, 0.5	350	5, 10, 15, 25, 50, 100	7.2, 2.5
RC65P	1.0	1R - 4M		500		10, 3.7
RC70P	1.5	1R - 10M		500		15.5, 5.5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/RCP.pdf>



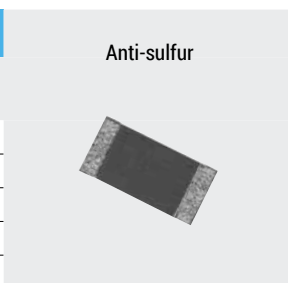
SOT143 Series Surface Mount 2- or 3-Resistor Network						
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
SOT	0.25	10R - 100K	0.05	100	Track ±5	2.9, 1.3, 1

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/SOT143.pdf>



WIN Series Water Insoluble Nitride Thin Film Precision Chip Resistors						
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
T0402	0.05	7R5 - 30K	0.1	75	25	1.02, 0.53, 0.3
T0603	0.1	4R7 - 100K	0.05	75	10	1.58, 0.8, 0.45
T0805	0.25	4R7 - 267K	0.05	100	10	2.02, 1.28, 0.45
T1206	0.33	4R7 - 1M0	0.05	200	10	3.15, 1.57, 0.5

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WIN.pdf>



WRM Series						Melf Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
0102	0.2	1R0 - 1M0	1, 0.1, 0.25, 0.5, 1, 2, 5	200	15, 25, 50, 100	2.3, 1.35
0204	0.25	R22 - 5M1		200	5, 15, 25, 50, 100	3.7, 1.55
0207	0.4	R22 - 4M7		250	25, 50, 100	6.1, 2.4

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WRM.pdf>



WRM-HP Series						High Power MELF Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
0204	0.4	0R1 - 1M0	0.1, 0.25, 0.5, 1, 5	200	15, 25, 50, 100	3.7, 1.55
0207	1	0R1 - 1M0	0.1, 0.25, 0.5, 1, 5	350	15, 25, 50, 100	6.1, 2.4

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WRM-HP.pdf>



WRM-HV Series						High Voltage MELF Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
0204	0.4	340K - 3M4	0.1, 0.25, 0.5, 1	500	25, 50	3.7, 1.55
0207	1	340K - 3M4	0.1, 0.25, 0.5, 1	1000	25, 50	6.1, 2.4

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WRM-HV.pdf>



Fusible

EMC Series						Pulse Withstanding Fusible Flameproof Metal Film Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
EMC2	2	4R7 - 68R	10, 20	-	100	10, 4

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/EMC.pdf>



SP20F Series						Failsafe Molded Wirewound Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
SP20F	1	0R1 - 1K0	5, 10	-	±150	9.91, 3.56

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/SP20-SP20F.pdf>



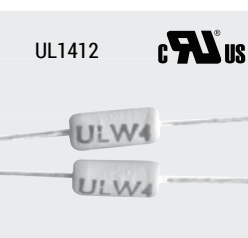
SPP Series						Fibre Core Conformal Coated Wirewound Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
SPP-1	1	0R1 - 1K2	5, 10	-	±300	10.2, 3.8
SPP-2	2	0R1 - 2K4	5, 10	-	±300	14.5, 4.3
SPP-3	3	0R1 - 2K4	5, 10	-	±300	14.5, 4.3

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/SPP.pdf>



ULW Series						UL1412 Wirewound Mains Input Resistor
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, dia
ULW2	2	1R - 100R	5	-	200	9, 3.6
ULW3	3	1R - 100R	5	-	200	14.5, 5.2
ULW4	4	1R - 100R	5	-	200	13, 5.6
ULW5	5	1R - 100R	5	-	200	16.5, 7.2

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/ULW.pdf>



WA84F Series						Fusible Wirewound Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
WA84F	1.6	0R2 - 30R	5	100	100 - 350	14.5, 5.2

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WA84F.pdf>



WHS-UL Series		Wirewound High Surge UL Recognised Fusible Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
WHS2UL	2	10R – 100R	1, 2, 5	-	200	9, 3, 8
WHS3UL	3	10R – 100R	1, 2, 5	-	200	14.5, 5.8
WHS5UL	5	10R – 100R	1, 2, 5	-	200	16.5, 7.2

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WHS-UL.pdf>

UL1412

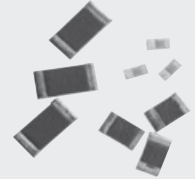


High Reliability

CR Series		Surface Mount Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0503	0.063	1R - 10M	0.1 - 5	50	100	1.25, .63, .5
0603	0.1	1R - 10M	0.1	75	100	1.6, .8, .55
0805	0.125	1R - 100M	0.1 - 5	150	100	2, 1.25, .6
1005	0.125	1R - 100M	0.1 - 5	150	100	2.5, 1.25, .7
1206	0.25	1R - 100M	0.1 - 5	200	100	3.2, 1.6, .7
2010	0.5	1 - 1M	0.1 - 5	400	100	5.1, 2.5, .7
2512	1.0	1 - 1M	0.1 - 5	500	100	6.5, 3.2, .7

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/CR.pdf>

SnPb Option
EN140401-802
CECC 40401-003/004/008



MFR Series		Metal Film Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, dia
MFR3	0.4	1R0 - 1M	1	200	50	3.5, 1.8
MFR4	0.5	1R0 - 1M	0.5, 1	350	50	6.2, 2.5
MFR5	0.75	1R0 - 1M	0.5,	350	100 - 150	9, 3.6

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/MFR.pdf>

SnPb Option
CECC 40101-019/803



PFC Series		TaFilm® Precision Chip Resistors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0402	0.05	50R – 30K	0.1 - 5	75	25 - 100	1, 0.5, 0.3
0603	0.1	5R – 100K	0.02 - 5	75	10 - 100	1.6, 0.8, 0.5
0805	0.25	5R – 267K	0.02 - 5	100	10 - 100	2.1, 1.3, 0.5
1206	0.33	5R – 1M	0.02 - 5	200	10 - 100	3.2, 1.6, 0.6

High Temperature (PFC-HT) and Special Options (PFC-S) version available
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PFC.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PFC-HT.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PFC-S.pdf>

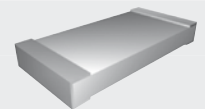
SnPb Option
Anti – Sulphur Option
MIL-PRF-55342



Temperature Sense & Thermal Management

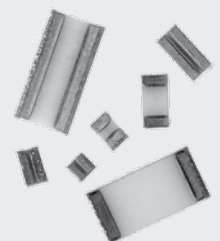
PTS Series		Platinum Film Temperature Sensors				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, t
0603	-	1K0	0.12, 0.24	-	+3850	1.6, 0.8, 0.5
0805	-	100R & 1K0	0.12, 0.24	-	+3850	2.1, 1.3, 0.5
1206	-	100R & 1K0	0.12, 0.24	-	+3850	3.2, 1.6, 0.6

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/PTS.pdf>



TJC Series		Aluminium Nitride Open Circuit Thermal Jumper Chip			
Type	Therm. Res. (°C/W)	Therm. Cond. (mW/°C)	Capacitance (pF)	Dim. (mm) l, w, t	
0603	13.8	72.5	0.16	1.5, 0.8, 0.8	
0505	7.4	135	0.27	1.21, 1.21, 0.8	
0805	11.8	84.7	0.16	2, 1.25, 0.8	
0508	4.6	217	0.4	1.25, 2, 0.8	
1206	14.7	68	0.11	3.2, 1.6, 0.8	
0612	3.7	270	0.43	1.6, 3.2, 0.8	
2010	15	66.7	0.07	5.1, 2.5, 0.8	
1020	3.6	278	0.31	2.5, 5.1, 0.8	
2512	14.9	67.1	0.05	6.5, 3.2, 0.8	
1225	3.6	278	0.46	3.2, 6.5, 0.8	

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/TJC.pdf>



Zero-Ohm Jumper

LRZ Series						High Current Jumper Chip
Type	Current (amps)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, t
0603	6	0.003 max	-	-	-	1.6, 0.8, 0.5
0805	15	0.003 max	-	-	-	2.0, 1.25, 0.61
1206	20	0.003 max	-	-	-	3.2, 1.25, 0.61
2010	30	0.003 max	-	-	-	5.23, 2.64, 0.74
2512	35	0.003 max	-	-	-	6.5, 3.25, 0.74

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/LRZ.pdf>

AEC-Q200



WL4 Series						Jumper Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
WL4	-	0.012 max	-	-	-	6.2, 2.3

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WL4.pdf>

The following series also have zero ohm versions: ASC, BCN, CR, GCR, OARS, WCR, WRM

General Purpose

ASC Series						Anti Sulphur Chip Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0402	0.063	1R0 - 10M	1	50	100 - 200	1, 0.5, 0.35
0603	0.1	1R0 - 10M	1	50	100 - 200	1.6, 0.8, 0.45
0805	0.125	1R0 - 10M	1	150	100 - 200	2, 1.25, 0.5
1206	0.25	1R0 - 10M	1	200	100 - 200	3.1, 1.55, 0.55
1210	0.33	1R0 - 10M	1	200	100 - 200	3.2, 2.6, 0.55
2010	0.625	1R0 - 10M	1	200	100 - 200	5, 2.5, 0.55
2512	1	1R0 - 10M	1	250	100 - 200	6.35, 3.2, 0.55

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/ASC.pdf>

Anti - Sulphur
AEC-Q200

BCN Series						Thick Film Chip Resistor Arrays
Type	Package Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	Array Description	Dim. (mm) l, w, h
BCN10	0.25	10R - 1M0	1, 5	25	4 Isolated	0804 2, 1, 0.36
BCN164A/AB	0.25	10R - 1M0	1, 2, 5	50	4 Isolated	1206 3.2, 1.6, 0.5-0.6
BCN168RB/SB	0.25	100R - 1M0	5	25	8 Bussed	1206 3.2, 1.6, 0.5

Exemption-free RoHS "Green" version (GBCN) available

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/BCN.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/GBCN.pdf>

Anti - Sulphur Option
AEC-Q200

GCR Series						Glueable Chip Resistors
Type	Current (amps)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0805	0.125	1R0 - 10M	1, 5	150	100 - 200	2, 1.3, 0.5
1206	0.25	1R0 - 10M	1, 5	200	100 - 200	3.2, 1.6, 0.5
2010	0.625	1R0 - 10M	1, 5	400	100 - 200	5, 2.5, 0.65
2512	1	1R0 - 10M	1, 5	500	100 - 200	6.3, 3.2, 0.65

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/GCR.pdf>



WCR Series						General Purpose Surface Mounted Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0201	0.05	10R - 1M	1	25	200	0.6, 0.3, 0.23
0402	0.1	1R - 1M	1	50	100	1, .5, .35
0603	0.063	1R - 10M	1	75	100	1.6, .8, .5
0805	0.125	1R - 10M	1	150	100	2, 1.25, .5
1206	0.25	1R - 10M	1	200	100	3.2, 1.6, .55
1210	0.25	1R - 10M	1	200	100	3.2, 2.6, 0.55
2010	0.5	1R - 10M	1	200	200	5, 2.5, .56
2512	1.0	1R - 10M	1	200	200	6.3, 3.2, .56

Exemption-free RoHS "Green" version (GWCR) available

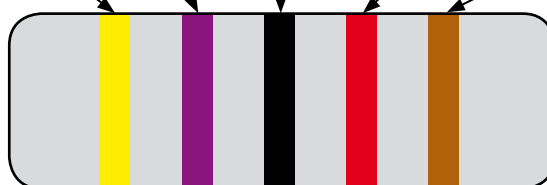
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/WCR.pdf>
<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheets/GWCR.pdf>



Colour Code for Band-marked Resistors

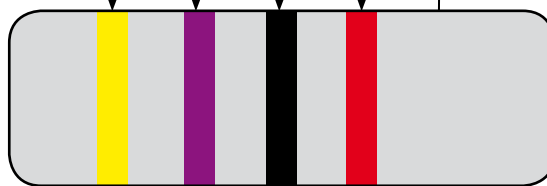
	Value 1	Value 2	Value 3	Multiplier	Tolerance	
Silver				x 0.01	10%	K
Gold				x 0.1	5%	J
Black	0	0	0	x 1		
Brown	1	1	1	x 10	1%	F
Red	2	2	2	x 100	2%	G
Orange	3	3	3	x 1K		
Yellow	4	4	4	x 10K		
Green	5	5	5	x 100K	0.5%	D
Blue	6	6	6	x 1M	0.25%	C
Violet	7	7	7	x 10M	0.1%	B
Grey	8	8	8	x 100M	0.05%	A
White	9	9	9	x 1G		
Blank					20%	M

Example 1
5-Band Marking
E24/E96 values



4 7 0 x100 1% = 47K 1%
E.g. MFR4 E96

Example 2
4-Band Marking
E24/E96 values
without tolerance



4 7 0 x100 = 47K
E.g. WRM0204 E96

Example 3
4-Band Marking
E24 values

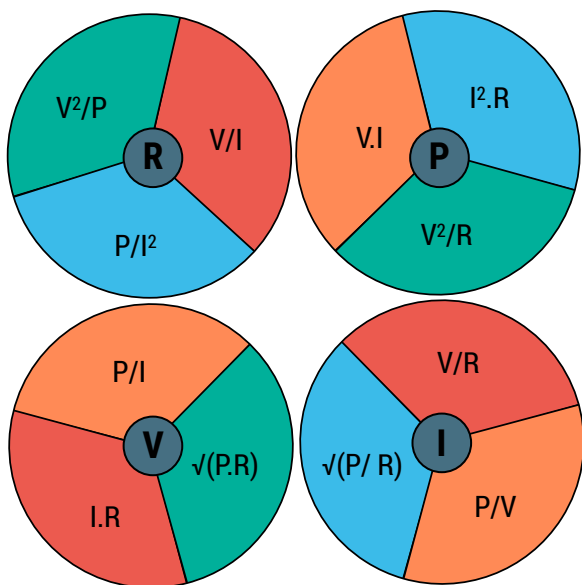


8 2 x1K 5% = 82K 5%
E.g. WM03S E24

Further Technical Information

Application Notes for current sense, circuit protection, pulse and overload ratings, energy metering, lighting, medical, automotive, high voltage design and more	http://www.ttelectronics.com/resistors
Parametric Search for selection of products by parameters, package, technology and application	http://www.ttelectronics.com/resistors/parts-search ,
Product Life Cycle for status, YTEOL, replacements and PCNs	https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/ApplicationNotes/TN007-Instant-Access-to-Life-Cycle-and-Obsolete-Product-Data-Online.pdf
Product Compliance for RoHS and REACH SVHC status, termination finish, CMRT, TSCA, SnPb availability and more	https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/ApplicationNotes/TN002-Instant-Access-to-RoHS-REACH-Conflict-Mineral-and-other-Compliance-Data-Online.pdf
Tin Whisker Report test report on tin whisker qualification of Pb-free finishes	https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/Compliance/Tin-Whisker-Test-Report.pdf

Common Formulae



R is resistance value (ohms) **P** is power dissipated (watts)
V is voltage dropped (volts) **I** is current flowing (amps)
 E.g. $R = V / I$

Preferred Values

	E192	E96	E24	E12	E6		
1	3.16	1	1	1	1	1	97
1.01	3.2	1.02	1.1	1.2	1.5	2	98
1.02	3.24	1.05	1.2	1.5	2.2	3	99
1.04	3.28	1.07	1.3	1.8	3.3	4	100
1.05	3.32	1.1	1.5	2.2	4.7	5	101
1.06	3.36	1.13	1.6	2.7	6.8	6	102
1.07	3.4	1.15	1.8	3.3	10 etc...	7	103
1.09	3.44	1.18	2	3.9		8	104
1.1	3.48	1.21	2.2	4.7		9	105
1.11	3.52	1.24	2.4	5.6		10	106
1.13	3.57	1.27	2.7	6.8		11	107
1.14	3.61	1.3	3	8.2		12	108
1.15	3.65	1.33	3.3	10 etc...		13	109
1.17	3.7	1.37	3.6			14	110
1.18	3.74	1.4	3.9			15	111
1.2	3.79	1.43	4.3			16	112
1.21	3.83	1.47	4.7			17	113
1.23	3.88	1.5	5.1			18	114
1.24	3.92	1.54	5.6			19	115
1.26	3.97	1.58	6.2			20	116
1.27	4.02	1.62	6.8			21	117
1.29	4.07	1.65	7.5			22	118
1.3	4.12	1.69	8.2			23	119
1.32	4.17	1.74	9.1			24	120
1.33	4.22	1.78	10 etc...			25	121
1.35	4.27	1.82				26	122
1.37	4.32	1.87				27	123
1.38	4.37	1.91				28	124
1.4	4.42	1.96				29	125
1.42	4.48	2				30	126
1.43	4.53	2.05				31	127
1.45	4.59	2.1				32	128
1.47	4.64	2.15				33	129
1.49	4.7	2.21				34	130
1.5	4.75	2.26				35	131
1.52	4.81	2.32				36	132
1.54	4.87	2.37				37	133
1.56	4.93	2.43				38	134
1.58	4.99	2.49				39	135
1.6	5.05	2.55				40	136
1.62	5.11	2.61				41	137
1.64	5.17	2.67				42	138
1.65	5.23	2.74				43	139
1.67	5.3	2.8				44	140
1.69	5.36	2.87				45	141
1.72	5.42	2.94				46	142
1.74	5.49	3.01				47	143
1.76	5.56	3.09				48	144
1.78	5.62	3.16				49	145
1.8	5.69	3.24				50	146
1.82	5.76	3.32				51	147
1.84	5.83	3.4				52	148
1.87	5.9	3.48				53	149
1.89	5.97	3.57				54	150
1.91	6.04	3.65				55	151
1.93	6.12	3.74				56	152
1.96	6.19	3.83				57	153
1.98	6.26	3.92				58	154
2	6.34	4.02				59	155
2.03	6.42	4.12				60	156
2.05	6.49	4.22				61	157
2.08	6.57	4.32				62	158
2.1	6.65	4.42				63	159
2.13	6.73	4.53				64	160
2.15	6.81	4.64				65	161
2.18	6.9	4.75				66	162
2.21	6.98	4.87				67	163
2.23	7.06	4.99				68	164
2.26	7.15	5.11				69	165
2.29	7.23	5.23				70	166
2.32	7.32	5.36				71	167
2.34	7.41	5.49				72	168
2.37	7.5	5.62				73	169
2.4	7.59	5.76				74	170
2.43	7.68	5.9				75	171
2.46	7.77	6.04				76	172
2.49	7.87	6.19				77	173
2.52	7.96	6.34				78	174
2.55	8.06	6.49				79	175
2.58	8.16	6.65				80	176
2.61	8.25	6.81				81	177
2.64	8.35	6.98				82	178
2.67	8.45	7.15				83	179
2.71	8.56	7.32				84	180
2.74	8.66	7.5				85	181
2.77	8.76	7.68				86	182
2.8	8.87	7.87				87	183
2.84	8.98	8.06				88	184
2.87	9.09	8.25				89	185
2.91	9.2	8.45				90	186
2.94	9.31	8.66				91	187
2.98	9.42	8.87				92	188
3.01	9.53	9.09				93	189
3.05	9.65	9.31				94	190
3.09	9.76	9.53				95	191
3.12	9.88	9.76				96	192
	10 etc...	10 etc...					

Terms and Definitions

Ambient Temperature	The temperature which would be adopted by the body of the resistor under application conditions except with negligible power dissipation in the resistor.
Critical Resistance	The resistance value at which application of the LEV causes dissipation of the full rated power.
Isolation Voltage (Voltage Proof)	The maximum continuous voltage which may be applied between the resistor and a conductor in contact with its insulated body.
LEV (Max Volts)	The maximum continuous voltage which may be applied across a resistor whose ohmic value is greater than the critical resistance.
Overload	Power dissipation which exceeds the power rating for durations exceeding 0.1s.
Power Rating	The maximum continuous power that may be dissipated by a resistor whose ohmic value is less than the critical resistance and at a defined maximum ambient temperature.
Pulse (Surge)	Power dissipation which exceeds the power rating for durations less than 0.1s.
Series	A set of components with the same basic design features and performance and usually a range of sizes and ratings.
TCR	Temperature Coefficient of Resistance; the maximum magnitude of reversible ohmic value change per degree centigrade due to deviation in body temperature from a reference normally of 20°C.
Tolerance	The maximum allowable magnitude of deviation from nominal ohmic value measured at delivery and at room temperature.
Type	An individual member of a series with specified size and rating.
VCR	Voltage Coefficient of Resistance; the maximum reversible reduction in ohmic value per volt due to an increase in applied voltage.



<https://www.ttelectronics.com/resistors>

General Note TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.