

Product Data Short Form

Resistors



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 a 70-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

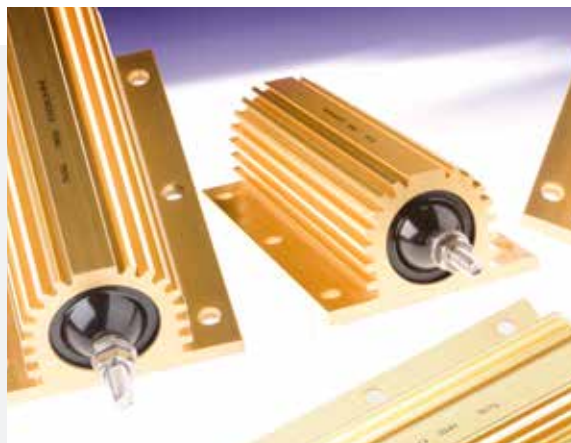
High-end industrial circuit breakers need to give reliable long-term performance under harsh conditions. In particular, transient surges caused by switching of inductive loads present a challenge. When a designer of industrial circuit breakers needed to modernise a design to SMT format, a through-hole 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

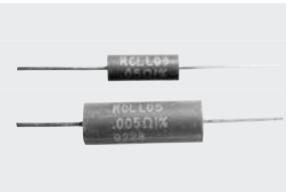
Series	Page	Series	Page	Series	Page	Series	Page
1600/1900	9	HVP	7	PHVP	8	WBC	13
3810	6	LHVC	7	PLO	5	WCR	16
4500	6	LOB	5	PR	13	WDBR	11
4530	6	LRCS/LVC	5	PTCR	15	WH	11
4800	12	LR(F)	5	PTS	15	WHPC	11
ASC	16	LRF3W	5	PWC	9	WHS	9
BCN	16	LRMA	5	PWP	9	WHVL	8
BPC	10	LRZ	15	PWRL	6	WIN	14
BPR	10	MAR	13	RC	13	WL4	15
CAR	12	MFP	10	RCP	13	WMHP	11
CC	8	MFR	15	RHVD	7	WMO-S	12
CHP	8	MFR4P	16	SC3	10	WPRT	12
CR	14	MF-S	10	SOT143	13	WP-S	9
CRT	16	MH	7	SP20F	14	WP-SZI	12
DIV23	12	OAR	5	SPP	14	WPYP	8
DSC	9	OARS	5	SQM	10	WRM	14
EMC	14	PCF	13	SQP	11	WSM	12
GC	6	PCFH	13	T	7	WSMHP	12
GCR	16	PCFP	13	ULR	6		
GPCF	16	PCR	13	ULW	14		
HR	6	PFC	15	VRW	8		
HTCR	10	PFC-D	13	W20	11		
HVC	7	PFC-HT	15	W30	9		
HVD	7	PHVD	8	WA84F	14		

Current Sense

LOB Series Low Resistance Metal Element Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, Dia
LOB-1	1	0.005 - 0.1	1 - 5	-	-	9.9, 3.6
LOB-3	3	0.005 - 0.1	1 - 5	-	-	14.2, 5.3
LOB-5	5	0.005 - 0.1	1 - 5	-	-	23.4, 8.4

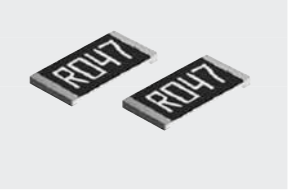
Datasheet - <http://www.ttelectronicresistors.com/datasheets/LOB.PDF>



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

Datasheet - <http://www.ttelectronicresistors.com/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

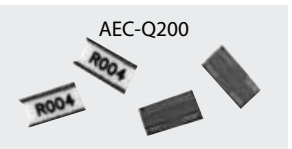
Datasheet - <http://www.ttelectronicresistors.com/datasheets/LR.pdf>



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

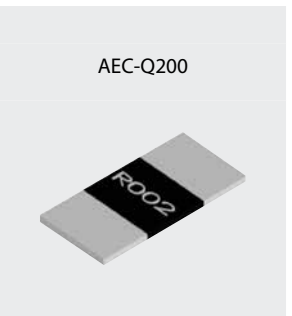
Datasheet - <http://www.ttelectronicresistors.com/datasheets/LRF3W.PDF>



LRMA 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	R005 - R025	1, 5	-	100	2, 1.25, 0.4
N 0815	1	R003 - R03	1, 5	-	100	2.1, 3.75, 0.5
M 1206	1	R001 - R03	1, 5	-	50	3.2, 1.6, 0.5
T 2010	1.5	R005 - R1	1, 5	-	75, 100, 275	5, 2.5, 0.6
M 2512	1 - 2	R0005 - R06	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 - R3	1, 5	-	50	6.4, 3.2, 0.9-2.0

Datasheet - <http://www.ttelectronicresistors.com/datasheets/LRMA.PDF>



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	R002 - 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

Datasheet - <http://www.ttelectronicresistors.com/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	0R003 to 0R050	1	-	±20	11.18, 3.175, 3.05
OARSXP	5	0R001 to 0R025	1, 5	-	±20	12, 6.4, 4.6

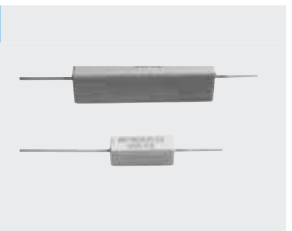
Datasheet - <http://www.ttelectronicresistors.com/datasheets/OARS.PDF>



PLO Series Low Resistance Power Wirewound Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
PLO-3	3	R005 - R18	1, 2, 3, 5, 10	-	30 - 500	22.4, 7.87, 7.87
PLO-5	5	R005 - R18	1, 2, 3, 5, 10	-	30 - 500	22.4, 9.65, 8.89
PLO-7	7	R01 - R18	1, 2, 3, 5, 10	-	30 - 500	35.3, 9.65, 8.89
PLO-10	10	R01 - R18	1, 2, 3, 5, 10	-	30 - 500	47.8, 9.65, 8.89

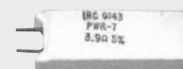
Datasheet - <http://www.ttelectronicresistors.com/datasheets/PLO.PDF>



PWRL Series Low Resistance Stand-up Power Wirewound Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w,
PWRL	3, 5, 7, 10	0R01 - 0R18	1, 2, 3, 5, 10	-	50 - 500	25.4, 12 (3W)

Datasheet - <http://www.ttelectronicsresistors.com/datasheets/PWRL.PDF>

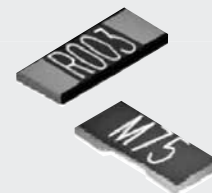


ULR Series Metal Strip Current Sense Resistors Surface Mount

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
ULR1S	1	R0005 - R01	1, 5	-	50	3.2, 1.6, 0.6
ULR1	1.0	R0005 - R022	1, 5	-	50, 75, 100, 150	6.4, 3.2, 1.4
ULR1SS	1.5	R0005 - R01	1, 5	-	50	5.1, 2.5, 0.6
ULR2	2.0	R0005 - R01	1, 5	-	50	6.4, 3.2, 1.4
ULR25	2.5	R004 - R006	1, 5	-	50	6.4, 3.2, 1.4
ULR3	3.0	R0005 - R003	1, 5	-	50, 75, 100	6.4, 3.2, 1.4

Datasheet - <http://www.ttelectronicsresistors.com/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

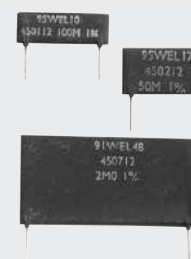
Datasheet - <http://www.ttelectronicsresistors.com/datasheets/3810.PDF>



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 - 1.5G	1, 2, 5	20000	100, 150	51.2, 2, 25.7

Datasheet - <http://www.ttelectronicsresistors.com/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 - 1.4G	1, 2, 5	15000	100	51.2, 2, 25.7

Datasheet - <http://www.ttelectronicsresistors.com/datasheets/4530.PDF>



GC Series High Value Thick Film Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
GC55	0.25	47K - 1G	1, 2, 5	1700	100	6.2, 2.5
GC65	0.5	47K - 1G	1, 2, 5	3500	100	9, 3.6
GC70	1.0	47K - 1G	1, 2, 5	10000	100	14.5, 5.3

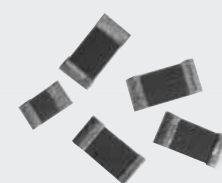
Datasheet - <http://www.ttelectronicsresistors.com/datasheets/GC.PDF>



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	0 to -2500	1.25, .63, .5
0805	-	100M - 50G	10	100	0 to -2000	2, 1.25, .6
1005	-	100M - 50G	10	150	0 to -1500	2.5, 1.25, .7
1206	-	100M - 50G	10	200	0 to -1000	3.2, 1.6, .7

Datasheet - <http://www.ttelectronicsresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/HVC.PDF>

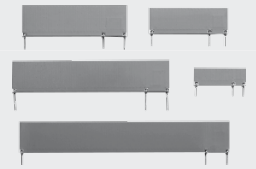
Anti-Sulphur Option



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 - 2G0	0.25, 0.5, 1	10,000	25, 50	38.1, 2.5, 13.6
HVD15	2.5	100K - 2G0	0.25, 0.5, 1	15,000	25, 50	50.8, 2.5, 16.1
HVD20	3.5	100K - 5G0	0.25, 0.5, 1	20,000	25, 50	76.2, 2.5, 16.1
HVD30	4.5	100K - 5G0	0.25, 0.5, 1	30,000	25, 50	101.6, 2.5, 16.1

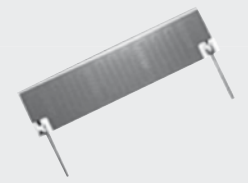
Datasheet - <http://www.ttelectronicresistors.com/datasheets/HVD.pdf>



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, 6.4, 2
HVP06	0.6	1K5 - 1G0	0.25, 0.5, 1, 5	5000	25, 50, 100	12.7, 6.4, 2
HVP08	0.8	2K - 1G0	0.25, 0.5, 1, 5	7500	25, 50, 100	19.1, 6.4, 2
HVP10	1	3K - 2G0	0.25, 0.5, 1, 5	10,000	25, 50, 100	25.4, 6.4, 2
HVP15	1.5	4K - 5G0	0.25, 0.5, 1, 5	15,000	25, 50, 100	38.1, 6.4, 2
HVP20	2	5K - 10G	0.25, 0.5, 1, 5	20,000	25, 50, 100	50.8, 6.4, 2

Datasheet - <http://www.ttelectronicresistors.com/datasheets/HVP.pdf>



LHVC Series Lower Range High Voltage Chip

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	200	1.6, 0.8, 0.45
0805	0.125	100K - 10M	1, 5	400	200	2, 1.3, 0.55
1206	0.25	100K - 10M	1, 5	500	200	3.1, 1.6, 0.55
2010	0.5	50K - 10M	1, 5	1600	200	5, 2.5, 0.55
2512	1	50K - 10M	1, 5	2000	200	6.4, 3.2, 0.55

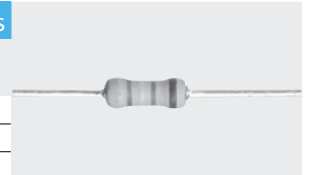
Datasheet - <http://www.ttelectronicresistors.com/datasheets/LHVC.pdf>



MH Series High Voltage Metal Film Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
MH25	0.25	100K - 10M	1, 2, 5	1600	100	6.2, 2.3
MH37	0.5	100K - 1M	1, 2, 5	3500	100	9, 3.7

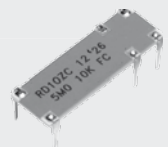
Datasheet - <http://www.ttelectronicresistors.com/datasheets/MH.PDF>



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

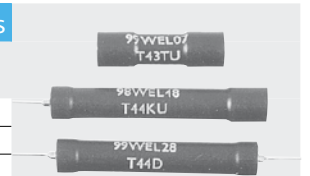
Datasheet - <http://www.ttelectronicresistors.com/datasheets/RHVD.pdf>



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

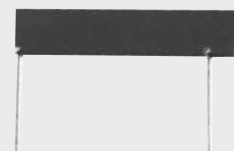
Datasheet - <http://www.ttelectronicresistors.com/datasheets/T40.pdf>



PHVD Series Precision High Voltage Divider

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, h, w
PHVD10	0.75	1K – 7G	0.1, 0.25, 0.5, 1	10,000	25, 50	25.4, 7.6, 2.5
PHVD15	1.5	1K – 10G		15,000		38.1, 12.7, 2.5
PHVD20	2.5	1K – 20G		20,000		50.8, 15.2, 2.5
PHVD30	3.5	1K – 30G		30,000		76.2, 15.2, 2.5
PHVD40	4.5	1K – 40G		40,000		101.6, 15.2, 2.5

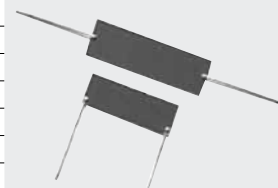
Datasheet - <http://www.ttelectronicresistors.com/datasheets/PHVD.PDF>



PHVP Series Precision High Voltage Planar Resistor

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, h, w
PHVP5	1	1K – 3G	0.1, 0.25, 0.5, 1	5000	15, 25, 50	12.7, 5.1, 2
PHVP7	0.8	1K – 1G		7000		20.3, 3.8, 2
PHVP7B	1	1K – 2G5		7000		20.3, 5.1, 2.5
PHVP10	1	1K – 1G5		10,000		25.4, 3.8, 2
PHVP10B	1.3	1K – 3G5		10,000		25.4, 5.1, 2.5
PHVP10C	2	1K – 7G		10,000		25.4, 7.6, 2.5
PHVP15	1.5	1K – 4G		15,000		38.1, 3.8, 2
PHVP15B	2	1K – 5G		15,000		38.1, 5.1, 2.5
PHVP15C	3	1K – 10G		15,000		38.1, 12.7, 2.5
PHVP20	2	1K – 7G		20,000		50.8, 5.1, 2
PHVP20B	3	1K – 10G	20,000	50.8, 6.4, 2.5		
PHVP20C	4.5	1K – 20G	20,000	50.8, 15.2, 2.5		
PHVP30	6.5	1K – 30G	30,000	76.2, 15.2, 3		
PHVP40	9	1K – 40G	40,000	101.6, 15.2, 3		

Datasheet - <http://www.ttelectronicresistors.com/datasheets/PHVP.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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/VRW.PDF>



WHVL Series Precision Low Inductance High Voltage Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, dia
WHVL2	2.9	1K – 100G	0.1, 0.25, 0.5, 1	11,000	15, 25, 50	27, 8
WHVL3	3.8	1K – 100G		14,000		37, 8
WHVL5	5.6	1K – 100G		22,000		52, 8
WHVL7	7.5	1K – 100G		33,000		77, 8
WHVL10	10	1K – 100G		45,000		102, 8.3
WHVL12	12	1K – 100G		54,000		122, 8.5
WHVL15	15	1K – 100G		67,000		152, 8.5

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WHVL.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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WPYP.pdf>

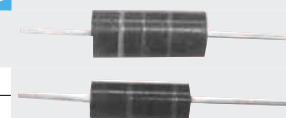


Surge / Pulse

CC Series Carbon Composition Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, dia
CC1	1	100R – 50K	10, 20	-	1000	15, 6
CC2	2	100R – 10K	10, 20	-	1000	18, 8

Datasheet - <http://www.ttelectronicresistors.com/datasheets/CC.pdf>



CHP Series Metal Glaze™ Surface Mount Power Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
CHP1/8	0.25	0R1 - 1M	1, 2, 5	200	50, 100	3.25, 1.45
CHP1/2	0.5	0R1 - 350K	1, 2, 5	300	50, 100	5.08, 2.01
CHP1	1	0R1 - 2M2	1, 2, 5	350	50, 100	6.38, 2.10
CHP2	1.33	0R1 - 2M2	1, 2, 5	500	50, 100	9.32, 2.67

Datasheet - <http://www.ttelectronicresistors.com/datasheets/CHP.PDF>



DSC Series						Double Sided Chip
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0805	0.25	1R0 - 1M0	0.5, 1, 2, 5	150	100 - 200	2.0, 1.25, 0.7
1206	0.33	1R0 - 4M7	0.5, 1, 2, 5	200	100 - 200	3.2, 1.6, 0.7
2010	0.75	1R0 - 4M7	0.5, 1, 2, 5	400	100 - 200	5.1, 2.5, 0.8
2512	1.5	1R0 - 4M7	0.5, 1, 2, 5	500	100 - 200	6.5, 3.2, 0.8

Datasheet - <http://www.ttelectronicresistors.com/datasheets/DSC.PDF>

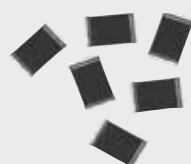
Anti-Sulphur Option



PWC Series						Pulse Withstanding Chip Resistors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0805	0.25	1R0 - 10M	0.5, 1, 2, 5	150	100 - 200	2.0, 1.25, 0.7
1206	0.33	1R0 - 10M	0.5, 1, 2, 5	200	100 - 200	3.2, 1.6, 0.7
2010	0.75	1R0 - 10M	0.5, 1, 2, 5	400	100 - 200	5.1, 2.5, 0.8
2512	1.5	1R0 - 10M	0.5, 1, 2, 5	500	100 - 200	6.5, 3.2, 0.8

Datasheet - <http://www.ttelectronicresistors.com/datasheets/PWC.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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/PWP.PDF>



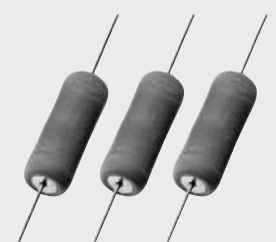
W30 Series						Flameproof Wirewound Resistor
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
W31	3	R01 - 10K	<R1: 5 ≥R1: 1, 2, 5	500	100 - 1000	13, 5.6

Datasheet - <http://www.ttelectronicresistors.com/datasheets/W30.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

Datasheet - <http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/1600-1900.PDF>

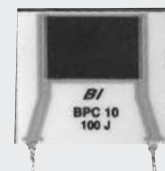


BPC Series

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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/BPC.PDF>

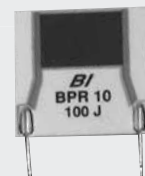


BPR Series

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
BPR20	20	0R1 - 200K	1, 2, 5	500	100	50.8, 27.2, 6.1
BPR30	30	0R1 - 200K	1, 2, 5	500	100	53.3, 37.3, 6.1
BPR40	40	0R1 - 200K	1, 2, 5	500	100	53.3, 50.0, 6.1
BPR50	50	0R1 - 200K	1, 2, 5	500	100	53.3, 57.7, 6.1

Datasheet - <http://www.ttelectronicresistors.com/datasheets/BPR.PDF>

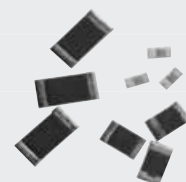


HTCR Series

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

Datasheet - <http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/MFP.PDF>

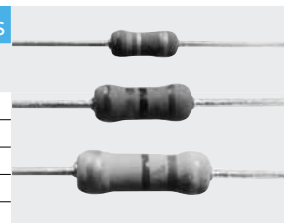


MF-S Series

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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/MF-S.PDF>

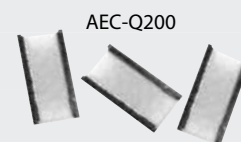


SC3 Series

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,

Datasheet - <http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/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	-	350	18, 7, 7
SQP3	3	0R1-150K	5	-		22, 8, 9
SQP5	5	0R1 - 150K	5	-		22, 10, 9
SQP7	7	0R1 - 200K	5	-		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

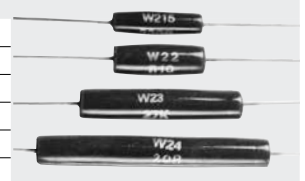
Datasheet - <http://www.ttelectronicresistors.com/datasheets/SQP.PDF>



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
W215	5.0	0R1 - 15K	1, 2, 5	160	+75 to 200	22, 7
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

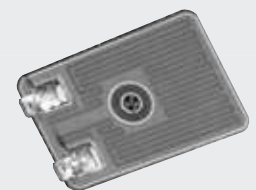
Datasheet - <http://www.ttelectronicresistors.com/datasheets/W20.PDF>

SnPb Option
CECC 40201-002



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	22R - 100R	10	-	+500 - +600	31.9, 28.1
WDBR1	700	12R - 150R	10	-	+500 - +600	49.3, 35.9
WDBR2	780	12R - 150R	10	-	+500 - +600	61, 40.6
WDBR3	900	12R - 150R	10	-	+500 - +600	102, 70
WDBR5	1000	12R - 150R	10	-	+500 - +600	122, 70
WDBR7	1490	47R - 150R	10	-	+500 - +600	152, 102

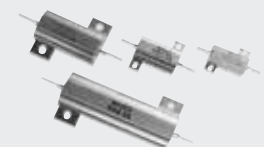
Datasheet - <http://www.ttelectronicresistors.com/datasheets/WDBR.PDF>



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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WH.PDF>

SnPb Option
CECC 40203-006



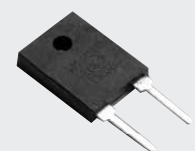
WHPC Series		High Power Chip				
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim. (mm) l, w, h
1206	0.5	1R - 10M	1, 5	200	100 - 200	3.1, 1.6, 0.55
0612	0.5	1R - 1M	1, 5	200	100 - 400	1.6, 3.2, 0.55
2010	1	1R - 10M	1, 5	200	100 - 200	5, 2.5, 0.55
1020	1	1R - 1M	1, 5	200	100 - 400	2.5, 5, 0.55
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

Datasheet - <http://www.ttelectronicresistors.com/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 - 10K	1, 5	350	50	14.8, 10.1, 4.4
WMHP100	100	R05 - 10K	1, 5	700	50	20.7, 15.8, 5.0

Datasheet - <http://www.ttelectronicresistors.com/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
WMO1/2S	0.5	10R - 100K	5	250	350	7.5, 3
WMO1S	1.0	10R - 120K	5	350	350	10, 4.5
WMO2S	2.0	10R - 150K	5	350	350	12, 5
WMO3S	3.0	10R - 150K	5	350	350	16, 5.5
WMO5S	5.0	10R - 180K	5	500	350	26, 8.5
WMO7S	7	20R - 150K	5	750	350	32, 8.5

Datasheet - <http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WP-S.PDF> <http://www.ttelectronicresistors.com/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
WSM1	1	0R01 - 1K	1, 2, 5, 10	100	20 - 100	7.9, 7, 3.94
WSM2	2	0R01 - 2K	1, 2, 5, 10	100	20 - 100	12, 10.5, 5.5
WSM3	3	0R01 - 3K	1, 2, 5, 10	100	20 - 200	18, 16, 6.5

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WSM.PDF>

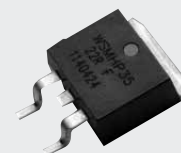


WSMHP Series Surface Mount TO-263 Power Resistors

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

Datasheet - <http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/4800.PDF>



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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/CAR.PDF>



DIV23 Series Surface Mount Divider Network

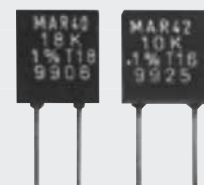
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
DIV23	0.25	10R - 200K	0.05	100	Track ±5	2.9, 1.3, 1

Datasheet - <http://www.ttelectronicresistors.com/datasheets/DIV23.pdf>



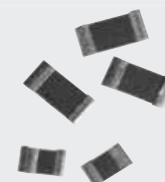
MAR 40/42 Series			Ultra Precision Metal Film Resistors			
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
MAR 40	0.3	20R0 - 400K	0.005, 0.01	250	2, 5	7.75, 3.3, 8.64
MAR 42			0.01, 0.25, 0.5,			8.25, 3.3, 8.64

Datasheet - <http://www.ttelectronicresistors.com/datasheets/MAR.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 - 0.5	25	5 - 50	1, 0.5, 0.4
0603	0.063	2R - 1M	0.01 - 0.5	50	5 - 50	1.6, 0.8, 0.55
0805	0.1	1R - 2M	0.01 - 0.5	100	5 - 50	2, 1.3, 0.65
1206	0.125	1R - 2M5	0.01 - 0.5	150	5 - 50	3.2, 1.6, 0.65
1210	0.2	1R - 2M5	0.01 - 0.5	150	5 - 50	3.2, 2.6, 0.5
2010	0.25	1R - 3M	0.01 - 0.5	150	5 - 50	4.9, 2.4, 0.65
2512	0.5	1R - 3M	0.01 - 0.5	150	5 - 50	6.3, 3.1, 0.65

AEC-Q200

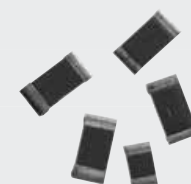


High Power (PCFH), Extended High Power (PCFX) and Passivated (PCFP) versions available

Datasheet - <http://www.ttelectronicresistors.com/datasheets/PCF.pdf>

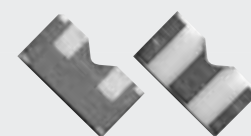
PCR Series			Precision Thick Film Surface Mount Resistors			
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0805	0.1	10R - 1M	0.1 - 1	100	50	2, 1.25, .6
1005	0.125	10R - 1M	0.1 - 1	150	50	2.5, 1.25, .7
1206	0.25	10R - 1M	0.1 - 1	200	50	3.2, 1.6, .7

Datasheet - <http://www.ttelectronicresistors.com/datasheets/PCR.PDF>



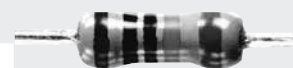
PFC-D Series			Precision 1206 Resistive Dividers			
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, t
PFC-D	0.25	10R - 200K	0.05, 0.1, 0.5, 1	100	25, 50, 100	3.2, 1.6, 0.6

Datasheet - <http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/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,	7.2, 2.5
RC65	0.5	1R - 4M		350	25, 50, 100	10, 3.7
RC70	1.0	1R - 10M		500		15.5, 5.5

Datasheet - <http://www.ttelectronicresistors.com/datasheets/RC.PDF>

SnPb Option
CECC 40101-004/804

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,	7.2, 2.5
RC65P	1.0	1R - 4M		500	25, 50, 100	10, 3.7
RC70P	1.5	1R - 10M		500		15.5, 5.5

Datasheet - <http://www.ttelectronicresistors.com/datasheets/RCP.PDF>



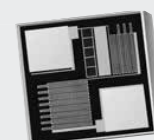
SOT143 Series			4 Pin SMT Package			
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
SOT	0.25	10R - 100K	0.05	100	Track ±5	2.9, 1.3, 1

Datasheet - <http://www.ttelectronicresistors.com/datasheets/SOT143.pdf>



WBC Series			TaNSil® Wire Bondable Silicon Chip Resistors			
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0202	0.25	10R - 400K	to 0.05	100	±25	0.51, 0.51
0303	0.25	21R - 800K	to 0.05	100	Track 2	0.76, 0.76

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WBC.PDF>

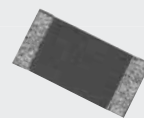


WIN Series Water Insoluble Nitride Thin Film Precision Chip Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
T0603	0.1	10R – 100K	0.1	75	25	1.58, 0.8, 0.45
T0805	0.25	10R – 267K	0.1	100	25	2.02, 1.28, 0.45
T1206	0.33	10R – 1M0	0.1	200	25	3.15, 1.57, 0.5

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WIN.pdf>

Anti-sulfur



WRM Series Mini Melf Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
0102	0.125	4R7 – 110K	1	150	50	2.2, 1.35
0204	0.25	R22 - 5M1	0.1, 0.25,	200	5, 15, 25, 50, 100	3.7, 1.55
0207	0.4	R16 - 10M	0.5, 1, 2, 5	250	25, 50, 100	6.1, 2.4

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WRM.PDF>

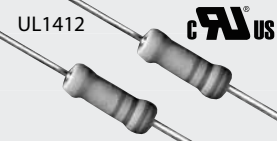


Fusible

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

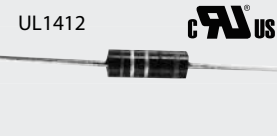
Datasheet - <http://www.ttelectronicresistors.com/datasheets/EMC.PDF>



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

<http://www.ttelectronicresistors.com/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

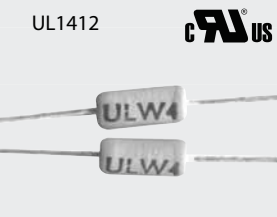
<http://www.ttelectronicresistors.com/datasheets/spp.pdf>



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	4R7 - 100R	5	-	200	9, 3.6
ULW3	3	4R7 - 100R	5	-	200	14.5, 5.2
ULW4	4	4R7 - 100R	5	-	200	13, 5.6
ULW5	5	4R7 - 100R	5	-	200	16.5, 7.2

<http://www.ttelectronicresistors.com/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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WA84F.PDF>



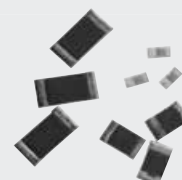
High Reliability

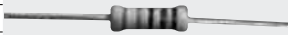
CR Series Surface Mount Resistors

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
0805	0.125	1R - 100M	0.1 - 5	100	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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/CR.PDF>

SnPb Option
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, dia	
MFR3	0.4	1R0 - 1M	1	200	50	3.5, 1.8	 <p>SnPb Option CECC 40101-019/803</p>
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	


Datasheet - <http://www.ttelectronicresistors.com/datasheets/MFR.PDF>

PFC Series							TaNFilm® 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	 <p>SnPb Option Anti - Sulphur Option MIL-PRF-55342</p>
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	
1505	0.35	5R - 1M	0.02 - 5	100	25 - 100	3.9, 1.3, 0.6	
2010	0.8	5R - 1M	0.02 - 5	175	25 - 100	5.2, 2.6, 0.6	
2512	1	5R - 1M	0.02 - 5	200	25 - 100	6.5, 3.1, 0.6	

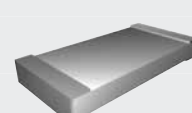
High Temperature (PFC-HT) version available

Datasheet - <http://www.ttelectronicresistors.com/datasheets/PFC.pdf>
 Datasheet - <http://www.ttelectronicresistors.com/datasheets/PFC-HT.pdf>

Temperature Sense


PTCR Series							PTC Thermistor Chip
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim (mm) l, w, h	
0805	0.1	10R - 400R	2, 5, 10	100	2200 - 3500	2, 1.25, 0.6	
1206	0.2	10R - 800R	2, 5, 10	200	2200 - 3500	3.2, 1.6, 0.7	

Datasheet - <http://www.ttelectronicresistors.com/datasheets/PTCR.PDF>

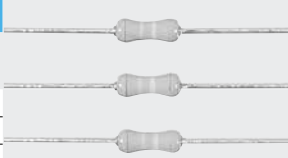
PTS Series							Platinum Film Temperature Sensors
Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, t	
0603	-	1K0	0.12, 0.24	-	+3850	1.6, 0.8, 0.5	
0805	-	100R & 1K0	0.12, 0.24	-	+3850	2.1, 1.3, 0.5	
1206	-	100R & 1K0	0.12, 0.24	-	+3850	3.2, 1.6, 0.6	

Datasheet - <http://www.ttelectronicresistors.com/datasheets/PTS.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	
0805	15	0.003 max	-	-	-	2.0, 1.25, 0.61	 <p>AEC-Q200</p>
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	

Datasheet - <http://www.ttelectronicresistors.com/datasheets/LRZ.pdf>

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	
WLT						Wire link taped, 0.6 / 0.7 / 0.8mm dia x 52mm	

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WL4.PDF>

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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/ASC.PDF>

Anti - Sulphur



BCN Series Thick Film Chip Resistor Arrays

Type	Package Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	Array Description			Dim. (mm) l, w, h
					# Res.	Circuit	Size	
BCN10	0.25	10R - 1M0	5	25	4	Isolated	0804	2, 1, 0.36
BCN164A/AB(I)	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
BCN21	0.5	68R - 220K	5	25	8	Bussed	1608	4, 2.1, 0.55
BCN4D(BI)	0.5	10R - 1M0	1, 5	75	4	Isolated	2112	5.34, 3.1, 0.55
BCN318RB(I)/SB(I)	0.5	22R - 1M0	1, 2, 5	50	8	Bussed	2512	6.4, 3.1, 0.55-0.6

Datasheet - <http://www.ttelectronicresistors.com/datasheets/bcn.pdf>

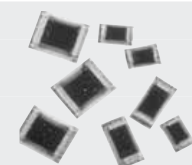
Anti - Sulphur Option
AEC-Q200 (BCN164AB)



CRT Series Trimmable 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	±20	100	250	2, 1.25, .5
1206	0.125	10R - 1M	±20	200	250	3.2, 1.6, .55

Datasheet - <http://www.ttelectronicresistors.com/datasheets/CRT.PDF>



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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/GCR.PDF>



GPCF Series General Purpose Precision Surface Mount Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, w, h
0402	0.063	10R - 100K	0.1, 1	50	25, 50	1.0, 0.5, 0.45
0603	0.1	10R - 100K	0.1, 1	75	25, 50	1.6, 0.8, 0.55
0805	0.125	10R - 100K	0.1, 1	150	25, 50	2.1, 1.25, 0.65
1206	0.25	10R - 100K	0.1, 1	150	25, 50	3.1, 1.55, 0.7

Datasheet - <http://www.ttelectronicresistors.com/datasheets/GPCF.pdf>



MFR4P Series Metal Film Resistors

Type	Power (watts)	Res. Range (ohms)	Tolerance %	Max Volts	TCR (ppm/°C)	Dim.(mm) l, dia
MFR4P	0.6	R22 - 1M	1, 2, 5,	250	50	6.2, 2.5

Datasheet - <http://www.ttelectronicresistors.com/datasheets/MFR4P.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	250	0.6, 0.3, 0.23
0402	0.1	1R - 1M	1	50	100	1, .5, .35
0603	0.063	1R - 10M	1	50	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

Datasheet - <http://www.ttelectronicresistors.com/datasheets/WCR.PDF>

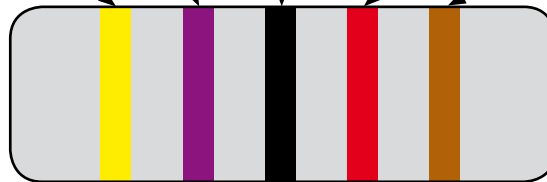
AEC-Q200 option



Colour Code for Band-marked Resistors

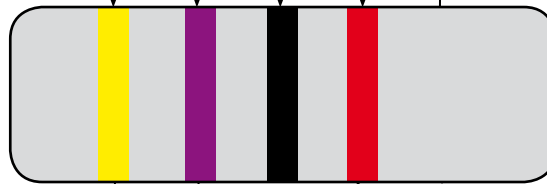
		Value 1	Value 2	Value 3	Multiplier	Tolerance	
Silver					x 0.01	10%	K
Gold					x 0.1	5%	J
Black		0	0	0	x 1		
Brown		1	1	1	x 10	1%	F
Red		2	2	2	x 100	2%	G
Orange		3	3	3	x 1K		
Yellow		4	4	4	x 10K		
Green		5	5	5	x 100K	0.5%	D
Blue		6	6	6	x 1M	0.25%	C
Violet		7	7	7	x 10M	0.1%	B
Grey		8	8	8	x 100M	0.05%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

Example 1
5-Band Marking
E24/E96 values



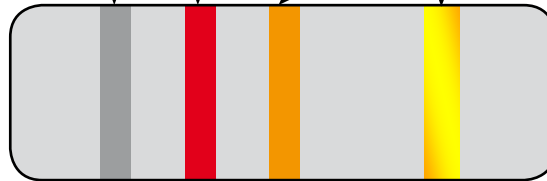
4 7 0 x100 1% = 47K 1%
E.g. MFR4 E96

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

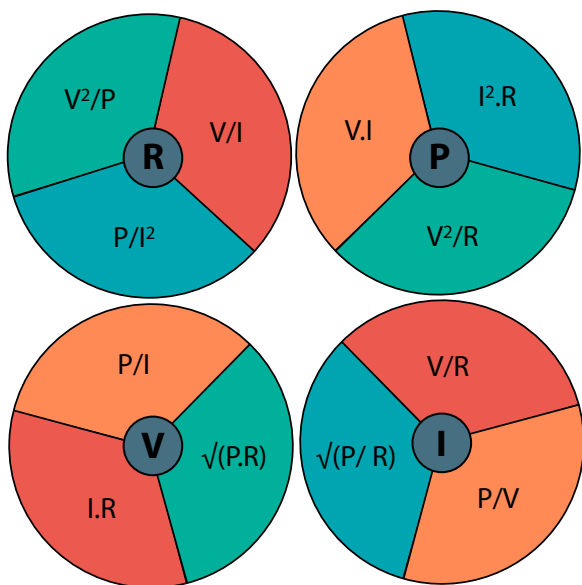


8 2 x1K 5% = 82K 5%
E.g. WMO3S E24

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.ttelectronicresistors.com/literature.asp
Parametric Search for selection of products by parameters, package, technology and application	http://www.ttelectronicresistors.com/search/
Calculation Tools for pulse loading, temperature derating, critical resistance, capacitor bleed and more	http://www.ttelectronicresistors.com/products/resistors/calculation-tools.asp
Product Compliance for RoHS and REACH SVHC status, termination finish, obsolescence data, SnPb availability and more	See compliance and lifecycle tabs of relevant product information page.
Tin Whisker Report test report on tin whisker qualification of Pb-free finishes	http://www.ttelectronicresistors.com/pdf/Tin % 20Whisker % 20Test % 20Report.pdf

Common Formulae



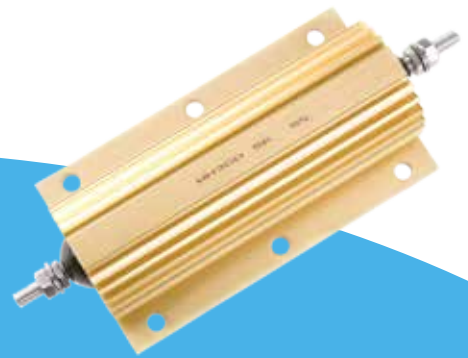
R is resistance value (ohms) P is power dissipated (watts)
 V is voltage dropped (volts) I is current flowing (amps)
 E.g. $R = V / I$

Preferred Values

	E192	E96	E24	E12	E6	
1	3.16	1	1	1	1	97
1.01	3.2	1.02	1.1	1.2	1.5	98
1.02	3.24	1.05	1.2	1.5	2.2	99
1.04	3.28	1.07	1.3	1.8	3.3	100
1.05	3.32	1.1	1.5	2.2	4.7	101
1.06	3.36	1.13	1.6	2.7	6.8	102
1.07	3.4	1.15	1.8	3.3	10 etc...	103
1.09	3.44	1.18	2	3.9		104
1.1	3.48	1.21	2.2	4.7		105
1.11	3.52	1.24	2.4	5.6		106
1.13	3.57	1.27	2.7	6.8		107
1.14	3.61	1.3	3	8.2		108
1.15	3.65	1.33	3.3	10 etc...		109
1.17	3.7	1.37	3.6			110
1.18	3.74	1.4	3.9			111
1.2	3.79	1.43	4.3			112
1.21	3.83	1.47	4.7			113
1.23	3.88	1.5	5.1			114
1.24	3.92	1.54	5.6			115
1.26	3.97	1.58	6.2			116
1.27	4.02	1.62	6.8			117
1.29	4.07	1.65	7.5			118
1.3	4.12	1.69	8.2			119
1.32	4.17	1.74	9.1			120
1.33	4.22	1.78	10 etc...			121
1.35	4.27	1.82				122
1.37	4.32	1.87				123
1.38	4.37	1.91				124
1.4	4.42	1.96				125
1.42	4.48	2				126
1.43	4.53	2.05				127
1.45	4.59	2.1				128
1.47	4.64	2.15				129
1.49	4.7	2.21				130
1.5	4.75	2.26				131
1.52	4.81	2.32				132
1.54	4.87	2.37				133
1.56	4.93	2.43				134
1.58	4.99	2.49				135
1.6	5.05	2.55				136
1.62	5.11	2.61				137
1.64	5.17	2.67				138
1.65	5.23	2.74				139
1.67	5.3	2.8				140
1.69	5.36	2.87				141
1.72	5.42	2.94				142
1.74	5.49	3.01				143
1.76	5.56	3.09				144
1.78	5.62	3.16				145
1.8	5.69	3.24				146
1.82	5.76	3.32				147
1.84	5.83	3.4				148
1.87	5.9	3.48				149
1.89	5.97	3.57				150
1.91	6.04	3.65				151
1.93	6.12	3.74				152
1.96	6.19	3.83				153
1.98	6.26	3.92				154
2	6.34	4.02				155
2.03	6.42	4.12				156
2.05	6.49	4.22				157
2.08	6.57	4.32				158
2.1	6.65	4.42				159
2.13	6.73	4.53				160
2.15	6.81	4.64				161
2.18	6.9	4.75				162
2.21	6.98	4.87				163
2.23	7.06	4.99				164
2.26	7.15	5.11				165
2.29	7.23	5.23				166
2.32	7.32	5.36				167
2.34	7.41	5.49				168
2.37	7.5	5.62				169
2.4	7.59	5.76				170
2.43	7.68	5.9				171
2.46	7.77	6.04				172
2.49	7.87	6.19				173
2.52	7.96	6.34				174
2.55	8.06	6.49				175
2.58	8.16	6.65				176
2.61	8.25	6.81				177
2.64	8.35	6.98				178
2.67	8.45	7.15				179
2.71	8.56	7.32				180
2.74	8.66	7.5				181
2.77	8.76	7.68				182
2.8	8.87	7.87				183
2.84	8.98	8.06				184
2.87	9.09	8.25				185
2.91	9.2	8.45				186
2.94	9.31	8.66				187
2.98	9.42	8.87				188
3.01	9.53	9.09				189
3.05	9.65	9.31				190
3.09	9.76	9.53				191
3.12	9.88	9.76				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.



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Sales Enquiries: <http://www.ttelectronicresistors.com/sales.php>

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