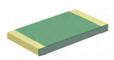
The Art of Resistors

0.031 W to 0.2 W
PVHT

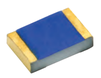


39 Ω to 2.5 MΩ
Operating temperature range:
-55 °C; +250 °C (storage up to 270 °C)
Temperature coefficient down to ± ppm/°C typical

0.04 W to 0.075 W
CZA, CZB

Impedance 50 Ω to 600 Ω
Attenuation 1 dB to 20 dB
Thick film fixed chip attenuator

0.0125 W to 0.1 W
CHP HT



0.1 Ω to 100 MΩ
5 % to 1 %
High-temperature 245 °C

0.015 W to 0.2 W
M83401

10 Ω to 1 MΩ
Down to 0.1 %, (ratio tol. 0.5 %)
Military networks (SIP, DIP, Flatpack)

Up to 0.5 W
TNPW Lead (Pb)-Bearing

10 Ω to 3.01 MΩ
Down to 10 ppm/K
Excellent overall stability

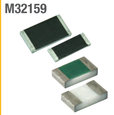
Up to 1 W
CRCW-IF e3, RCA-IF e3

1 Ω to 100 kΩ
High pulse performance (CRCW-IF and RCA-IF) and sulfur resistant (RCA-IF)
Case sizes 0402 to 2512

Up to 1 W
SMM

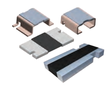
0.16 Ω to 10 MΩ; OMM for 0 Ω
Down to 0.1 %
High pulse load capability

0.035 W to 1 W
M55342, D55342, M32159



0 Ω (jumper) to 22 MΩ
10 % to 0.1 %
Military (M, P, R, S, U, V, T level)

1 W to 3 W
WSK, WSL3637, WSL2726, WSL4026



0.3 mΩ to 200 mΩ
5 % to 0.1 %
4-terminal, Kelvin connection

1 W to 3 W
CPF

0.1 Ω to 150 kΩ
5 % to 0.1 %
Industrial power metal film resistors

3 W
WSMS

50 µΩ to 100 µΩ
5 %
Meter shunt

0.5 W to 3.75 W
WSC, WSN, WSF, WSZ

0.1 Ω to 100 kΩ
10 % to 0.1 %
Wirewound / film SMD

Up to 22 W
RCP

10 Ω to 2 kΩ
High-power thick film chip, AlN substrate
Case sizes 0505 to 2512

20 W to 35 W
D2TO, DT025

0.01 Ω to 700 kΩ
10 % to 1 %
TO-263 (D²PAK) and TO-252 (DPAK)

36 W
WSBS, WSBM

50 µΩ to 1000 µΩ
5 % to 1 %
Battery shunt

20 W to 50 W
RTO 20, RTO 50

0.01 Ω to 550 kΩ
10 % to 1 %
TO-220 package

0.0189 W to 0.2 W
PHT

10 Ω to 7.5 MΩ
High-temperature 230 °C
Case sizes 0402 to 2010

0.03 W to 0.2 W
PRA

10 Ω to 2 MΩ
0.1 % abs. / 0.01 % ratio to 0.05 %
2 to 8 resistors

0.125 W to 0.2 W
CRCA, CRCC, CS206, TRC, MRCN

10 Ω to 1 MΩ
5 % to 1 %
R/C networks, chips and arrays

0.05 W to 0.25 W
PTF, PSF

15 Ω to 1 MΩ
1 % to 0.01 %
High-precision / high-stability

0.04 W to 1 W
RCWP, RC, RCHR

1 Ω to 3 GΩ
25 % to 1 %
Thick film chip resistors

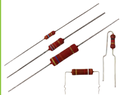
P_{70} 0.05 W to 1 W
RMKHT

10 Ω to 6 MΩ
Die resistor or die network
High-temperature 230 °C

0.063 W to 1 W
RCA e3

1 Ω to 10 MΩ, and 0
0.5 %, 1 %, and 5 %
AEC-Q200 (sulfur resistant)
Case sizes 0402 to 2512

0.063 W to 1 W
D AP, CRCW-AP



3.6 Ω to 1 MΩ, and 0
5 %, 1 %
For conductive gluing
Case sizes 0402 to 2512

P_{70} 1 W to 4 W
WK, WR
WK2 & WR4 are AEC-Q200 qualified

0.22 Ω to 1 MΩ
Down to 1 %
High power dissipation

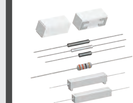
0.1 W to 5 W
WSL, WSL…18

2 mΩ to 500 mΩ
5 % to 0.1 %
Power Metal Strip®

1 W to 5 W
WSLT

0.3 mΩ to 500 mΩ
5 % to 0.1 %
Power Metal Strip® high temp.

2 W to 5 W
WSR



1 mΩ to 1 Ω
5 % to 0.5 %
Power Metal Strip® molded

20 W, 30 W, and 100 W
LTO

0.015 Ω to 1 MΩ
10 % to 1 %
TO-220, TO-247

1 W to 120 W
RWR, RER, RW, RE, RLV

0.01 Ω to 71.5 kΩ
1 % to 0.1 %
Military-qualified wirewound

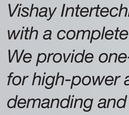
30 W to 125 W
SPR2213, SPR2214, MCRL, PC Quick Connect

0.2 Ω to 76 kΩ
10 % to 5 %
Wirewound, heat sink mount

5 W to 225 W
FST, FVT, AST, AVT, FSOT

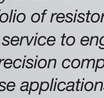
0.1 Ω to 651 kΩ
10 % to 1 %
Tubular wirewound

0.05 W to 0.25 W
MDP, TxxL, SOMC, SOGC



10 Ω to 2.2 MΩ
5 % to 1 %
Dual-in-line thick film networks

0.063 W to 0.25 W
RCG e3



1 Ω to 10 MΩ
Down to ± 0.5 %
Fully green
Case sizes 0402 to 1206

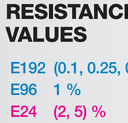
0.1 W to 0.25 W
TNPU e3

100 Ω to 511 kΩ
Down to ± 0.02 %
Low TCR down to ± 5 ppm/K

0.125 W to 0.25 W
RCV e3

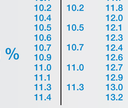
100 kΩ to 10 MΩ
Down to ± 1 %
High operating voltage (500 V)
Case sizes 0805 to 1206

0.07 W to 1 W
MBx (MBA, MBB, MBE), MRS



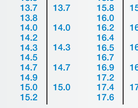
0.22 Ω to 22 MΩ
5 % to 0.1 %
AEC-Q200 options

0.25 W to 1 W
PLTT, HTRN



250 Ω to 3 MΩ
0.1 % to 0.02 %
High-temperature 215 °C

0.25 W to 1 W
VR (VR25, VR37, VR68)

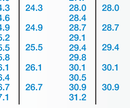


10 Ω to 68 MΩ
5 % to 1 %
High pulse load, U_{max} 10 kV

0.25 W to 1 W
CRHV, CDHV, CRMV, CDMV

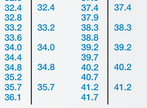
150 Ω to 50 GΩ
20 % to 1 %
Hi./med. voltage resistors / dividers

P_{40} 3 W to 5 W
ACxx-CS
(AC01-CS, AC03-CS, AC05-CS)



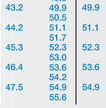
4.7 Ω to 100 Ω
5 %
Fusible wirewound

Up to 6 W
WSLF2512



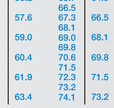
0.3 mΩ to 3mΩ
5% to 1%
Power Metal Strip® high-power

Up to 6 W
PCAN, PHP



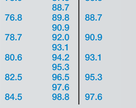
100 ppm/°C to 25 ppm/°C
5 % to 0.1 %
Precision high-power, thin film

7 W
WSHM



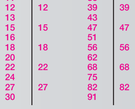
1 mΩ to 100 mΩ
5 % to 0.5 %
Power Metal Strip® high-power

7.5 W to 250 W
RH, NH



0.01 Ω to 273 kΩ
5 % to 0.05 %
Chassis mount

6 W to 500 W
ZBS, ZWS, ZWK



0.1 Ω to 620 kΩ
10 % to 2 %
Ferrules, lugs, corrugated ribbon

50 W to 500 W
VACR

2.7 Ω to 1.8 kΩ
10 %
High overload capacity

400 W to 750 W
RCEC

1 Ω to 1 MΩ
10 % to 5 %
Partial discharge free, thick film

Up to 0.25 W
UM (UMA, UMB)

22 Ω to 390 kΩ
Down to 0.02 %
Down to 5 ppm

Up to 0.33 W
TNPV e3

121 kΩ to 3.01 MΩ
Case sizes 1206, 1210
High operating voltage up to 1000 V

0.05 W to 0.4 W
MSP, CSC, TxxS

10 Ω to 2.2 MΩ
5 % to 1 %
Single-in-line thin film networks

0.1 W to 0.4 W
ACAS (ACAS 0612, ACAS 0606 AT, ACAS 0612 AT)

47 Ω to 221 kΩ
Down to ± 0.05 %
TCR down to ± 5 ppm/K

Up to 1 W
CRCW-P e3

1 Ω to 10 MΩ
down to 0.25 %
TCR down to 50 ppm/K
Semi-precision
Case sizes 0402 to 2512

Up to 1 W
MM HV (MMA HV, MMB HV)

340 kΩ to 10 MΩ
Case sizes 0204, 0207
High operating voltage > 500 V

Up to 1 W
MM (MMA, MMB, MMU)

0.1 Ω to 15 MΩ, and 0
Down to 0.1 %
High pulse load capability

Up to 1 W
CM (CMA, CMB)

2.2 Ω to 1.5 MΩ
5 %, 1 %
Up to 10 kV/3 kW pulse capability

0.4 W to 10 W
WSLP

0.3 mΩ to 500 mΩ
5 % to 0.1 %
Power Metal Strip® higher-power

P_{40} 1 W to 10 W
Z300-Cxx

0.1 Ω to 27 kΩ
10 %, 5 %
High surge (≤ 12 kV)

1 W to 10 W
LVR, SPU

1 mΩ to 800 mΩ
10 % to 0.1 %
Low value axial leaded, molded

1 W to 10 W
AC, AC-AT, PAC, Z300, Z300-C00
AC-AT is AEC-Q200 qualified

0.1 Ω to 27 kΩ
10 % to 1 %
Non-flammable coating

750 W
RCMC

0.27 Ω to 18 Ω
Thick film metal on ceramic
High pulse load capability

270 W to 900 W
C....T

0.33 Ω to 100 KΩ
Very high dissipation
Very high energy capability

7 W to 1000 W
GBS, GWS, GWK, RW

0.1 Ω to 330 kΩ
10 % to 2 %
Ferrules, lugs, corrugated ribbon

300 W to 1100 W
LPS

0.3 Ω to 1.3 kΩ
10 % to 1 %
Heatsink mounting

0.15 W to 0.4 W
PLT

250 Ω to 775 kΩ
0.1 % to 0.01 %
Low TCR down to 5 ppm/°C

0.25 W to 0.4 W
SFM, CTR, CL

1 Ω to 2 MΩ
0.1 % (ratio tol. 0.1 %)
25 ppm, wire bondable

Up to 0.4 W
MC (MCS, MCT, MCU, MCA)

1 Ω to 10 MΩ
Down to 10 ppm/K
Case sizes 0402 to 1206

P_{85} up to 0.4 W
MC AT (MCS AT, MCT AT, MCU AT, MCA AT)

1 Ω to 1 MΩ
Down to ± 0.1 %
AEC-Q200 qualified

1 W
WSLS

10 mΩ to 100 mΩ
5 % to 0.5 %
Power Metal Strip® high-stability

P_{85} up to 1 W
MCW AT (MCW 0406 AT, MCW 0612 AT)

1 Ω to 100 kΩ
Down to ± 0.1 %
Robust against thermal cycles

0.2 W to 1.5 W
CRCW-HP e3

1 Ω to 1 MΩ, and 0
Pulse proof high-power
Case sizes 0402 to 2512

0.25 W to 2.0 W
RCL, RCA-LS

Case sizes 0406 to 1225
1 Ω to 1 MΩ
Long side termination (RCL and RCA-LS) and sulfur resistant (RCA-LS)

0.06 W to 12 W
MR, MRA

0.01 Ω to 6 MΩ
10 % to 0.005 %
Non-magnetic / non-inductive

0.4 W to 13 W
CW, G, GN, RS, NS

0.1 Ω to 273 kΩ
10 % to 0.05 %
Leaded wirewound

1 W to 13 W
SR, SPU, SPR

0.5 mΩ to 50 mΩ
5 % to 0.01 %
Through-hole shunts

1 W to 13 W
CW...HE, CW...HS

0.1 Ω to 167 kΩ
High continuous energy ≤ 106.5 J
Surge immunity ≤ 12 kV
Wirewound high energy/surge

50 W to 1500 W
FSE, FVE, ASE, AVE

0.1 Ω to 151 Ω
10 % to 1 %
Tubular wirewound

0.14 MJ to 3.46 MJ
ULDCR

1 mΩ to several ohms
15 % to 5 %
High pulse energy (several kA)

400 W to 1600 W
EDGF, EDGU, EDGS, HEXF

0.053 Ω to 91.7 Ω
10 % to 5 %
Wirewound

5 W to 2000 W
RBEF, RBEA, RBSF, RBSA, RDEF, RDEA

0.01 Ω to 227 kΩ
10 % to 1 %
Tubular wirewound

0.125 W to 0.5 W
UX (UXB, UXE), MPR

10 Ω to 1 MΩ
0.25 % to 0.05 %
Exceptional TCR ± 2 ppm

0.2 W to 0.5 W
RCS

Case sizes 0402 to 1206
1 Ω to 10 MΩ
Anti surge high-power

0.33 W to 0.5 W
NFR25

0.22 Ω to 15 kΩ
5 %
Fusible, non-flammable

Up to 0.5 W
TNPW e3

4.7 Ω to 3.01 MΩ
Down to ± 0.1 %
Excellent overall stability

0.05 W to 2 W
CMF, RN, RL, CCF02, CCF50, CCF60

0.1 Ω to 50 MΩ
5 % to 0.1 %
Axial-leaded metal film resistors

0.05 W to 2 W
RNC, RNR, RNN, RLR

1 Ω to 10 MΩ
2 % to 0.1 %
Military (M, P, R, and S level)

0.063 W to 2 W
RCWE, RCWL

10 mΩ to 976 mΩ
5 % to 0.5 %
Low-value thick film
Case sizes 0402 to 2512

0.6 W to 3 W
PR (PR01, PR02, PR03)
PR01 & PR02 are AEC-Q200 qualified

0.22 Ω to 1 MΩ
5 % to 1 %
AEC-Q200 qualified

4 W to 17 W
G200

0.1 Ω to 120 kΩ
10 % to 2 %
Enhanced humidity protection

0.25 W to 20 W
RNX, ROX, FHV, TR, MVW, HVW, TD

100 Ω to 3 TΩ
20 % to 0.5 %
High-voltage through-hole resistors

2 W to 20 W
CPCx, CPW, CPWN

0.01 Ω to 150 kΩ
10 % to 0.5 %
Fireproof ceramic body

1 W to 25 W
CA, CP, CPR, CPSM

0.1 Ω to 50 kΩ
10 % to 5 %
Fiberglass core wirewound

Up to 2500 W
WCR

4.7 Ω to 56 kΩ
Non-inductive option
Water cooled

300 W to 20 000 W
CSQB, CSFR, CSPR

0.01 Ω to 227 kΩ
10 % to 1 %
Wirewound assembly

1000 W to 100 000 W
GRE1, GRE2, GRE4, GRES, NGR

0.01 Ω to 100 Ω
10 % to 5 %
Stainless steel grid resistors

Up to 4 500 000 W
Braking Resistor

Special design for harsh working conditions
Railway, mining

Vishay Intertechnology is the one manufacturer with a complete portfolio of resistor technologies. We provide one-stop service to engineers looking for high-power and precision components for demanding and diverse applications.

SERIES MAX. POWER RATINGS

- ≤ 0.5 W
- > 0.5 W up to 1 W
- > 1 W up to 10 W
- > than 10 W

STANDARD RESISTANCE VALUES

E192 (0.1, 0.25, 0.5) %
E96 1 %
E24 (2, 5) %
E12 10 %

E192	E96	E192	E96	E192	E96	E192	E96	E192	E96	E192	E96	E192	E96	E192	E96	E192	E96	E192	E96	E192	E96	E192	E96	E24	E12	E24	E12
10.0	10.0	11.5	11.5	13.3	13.3	15.4	15.4	17.8	17.8	20.5	20.5	23.7	23.7	27.4	27.4	31.6	31.6	36.5	36.5	42.2	42.2	48.7	48.7	56.2		64.9		75.0		86.6		10	10	33	33
10.1		11.7		13.5		15.6		18.0		20.8		24.0		27.7		32.0		37.0		42.7		49.3		56.9	56.2	65.7	64.9	75.9	75.0	87.6	86.6	11		36	
10.2	10.2	11.8	11.8	13.7	13.7	15.8	15.8	18.2	18.2	21.0	21.0	24.3	24.3	28.0	28.0	32.4	32.4	37.4	37.4	43.2	43.2	49.9	49.9	57.6		66.5		76.8		88.7		12	12	39	39
10.4		12.0		13.8		16.0		18.4		21.3		24.6		28.4		32.8		37.9		43.7		50.5		58.3	57.6	67.3	66.5	77.7	76.8	89.8	88.7	13		43	
10.5	10.5	12.1	12.1	14.0	14.0	16.2	16.2	18.7	18.7	21.5	21.5	24.9	24.9	28.7	28.7	33.2	33.2	38.3	38.3	44.2	44.2	51.1	51.1	59.0		68.1		78.7		90.9		15	15	47	47
10.6		12.3		14.2		16.4		18.9		21.8		25.2		29.1		33.6		38.8		44.8		51.7		59.7	59.0	69.0	68.1	79.6	78.7	92.0	90.9	16		51	
10.7	10.7	12.4	12.4	14.3	14.3	16.5	16.5	19.1	19.1	22.1	22.1	25.5	25.5	29.4	29.4	34.0	34.0	39.2	39.2	45.3	45.3	52.3	52.3	60.4		69.8		80.6		93.1		18	18	56	56
10.9		12.6		14.5		16.7		19.3		22.3		25.8		29.8		34.4		39.7		45.9		53.0		61.2	60.4	70.6	69.8	81.6	80.6	94.2	93.1	20		62	
11.0	11.0	12.7	12.7	14.7	14.7	16.9	16.9	19.6	19.6	22.6	22.6	26.1	26.1	30.1	30.1	34.8	34.8	40.2	40.2	46.4	46.4	53.6	53.6	61.9		71.5		82.5		95.3		22	22	68	68
11.1		12.9		14.9		17.2		19.8		22.9		26.4		30.5		35.2		40.7		47.0		54.2		62.6	61.9	72.3	71.5	83.5	82.5	96.5	95.3	24		75	
11.3	11.3	13.0	13.0	15.0	15.0	17.4	17.4	20.0	20.0	23.2	23.2	26.7	26.7	30.9	30.9	35.7	35.7	41.2	41.2	47.5	47.5	54.9	54.9	63.4		73.2		84.5		97.6		27	27	82	82
11.4		13.2		15.2		17.6		20.3		23.4		27.1		31.2		36.1		41.7		48.1		55.6		64.2	63.4	74.1	73.2	85.6	84.5	98.8	97.6	30		91	

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