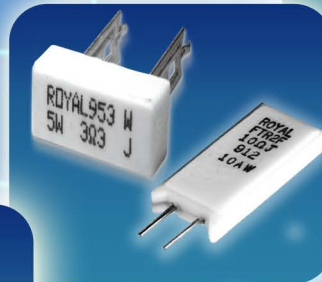
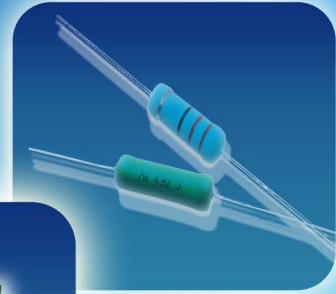


IATF16949:2016



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since
1978
Resistors Specialist



Product List

Series	Power Rating	Value Range	Tol	T.C.R. PPM/°C & REMARKS
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CHIP RESISTORS

General Purpose

01005, 0201, 0402, 0603,
0805, 1206, 1210, 1812,
2010, 2512

High ohmic value Available in sizes
0603,0805,1206,1210



RMC

1/32W 0Ω/0.01Ω
~
1W 100MΩ

±1%
±2%
±5%

0.01Ω~0.015Ω: ±1500PPM/°C
0.0154Ω~0.03Ω: ±1000PPM/°C
0.033Ω~0.976Ω: ±800PPM/°C
1Ω~10Ω: ±200PPM/°C
>10Ω~10M: ±100PPM/°C
>10M~100M: ±200PPM/°C
(01005, 0201, 0402 & 0603 refer to
catalog)

Complete Pb-Free



PF0A, PF01, PF02, PF03, PF05, PF06,
PF07, PF11, PF10, PF12



PF

1/32W 0Ω/1Ω
~
1W 10MΩ

±1%
±5%

1Ω~10Ω: ±400PPM/°C
>10Ω~100Ω: ±200PPM/°C
>100Ω: ±100PPM/°C
(PF0A, PF01 refer to catalog)

Wide Terminal

WR08, WR12, WR20, WR18, WR25



WR

1/3W 0Ω/10mΩ
~
3W 1MΩ

±1%
±5%

Low TCR till ±100PPM/°C.
Depends on size, power &
value. Refer to catalog

Anti-Surge

AS02, AS03, AS05, AS06, AS07,
AS10, AS12



AS

1/8W 1Ω
~
2W 10MΩ

±5%
±10%
±20%

1Ω~10Ω: ±400PPM/°C
>10Ω~10MΩ: ±100PPM/°C

High Precision Anti-Surge

PS02, PS03, PS05, PS06, PS07,
PS10, PS12



PS

1/8W 0.1Ω
~
2W 10MΩ

±1%
±5%

PS02:1Ω~10Ω: ±400PPM/°C
>11Ω~100Ω: ±200PPM/°C
>100Ω: ±100PPM/°C
Other sizes: ±100PPM/°C

High Power Precision Anti-Surge

HS03, HS05, HS06, HS07



HS

1/3W 1Ω
~
1W 10MΩ

±1%
±5%

1Ω~10Ω: ±200PPM/°C
>10Ω~10MΩ: ±100PPM/°C

Anti-Electrostatic Discharge

ES01, ES02, ES03, ES05,
ES06, ES07



ES

1/20W 1Ω
~
1/2W 10MΩ

±1%
±5%

1Ω~10Ω: ±200PPM/°C
>10Ω~10MΩ: ±100PPM/°C
(ES01 refer to catalog)

High Power

HP02, HP03, HP05, HP06,
HP07, HP10, HP11, HP12



HP

1/10W 0Ω/0.01Ω
~
2W 10MΩ

±1%
±5%

Low TCR till ±100PPM/°C.
Depends on size, power &
value. Refer to catalog

Ultra High Power

SP10, SP12, SP17, SP20, SP27
(Product design Patent no.: I566261)



SP

2W 1Ω
~
6W 10MΩ

±1%
±5%

1Ω~10Ω: ±200PPM/°C
>10Ω~10MΩ: ±100PPM/°C

High-Voltage

HV03, HV05, HV06, HV07,
HV10, HV12



HV

1/10W 47Ω
~
1W 10MΩ

±1%
±5%

±100PPM/°C

High-Voltage Anti-Sulfurized

VS05, VS10, VS12



VS

1/8W 39KΩ
~
1W 10MΩ

±1%
±5%

±100PPM/°C

Anti-Sulfurized Automotive (NQ) High Quality Anti-Sulfurized (NS)

0201, 0402, 0603, 0805, 1206,
1210, 2010, 2512



NQ

NS

1/20W 0Ω/1Ω
~
1W 10MΩ

±1%
±5%

1Ω~10Ω: ±200PPM/°C
>10Ω: ±100PPM/°C
(NQ01, NS01 refer to catalog)

Low T.C.R

LT02, LT03, LT05, LT06



LT

1/16W 1Ω
~
1/4W 1MΩ

±0.25%
±0.5%
±1%

1Ω~10Ω: ±100PPM/°C
>10Ω~1M: ±50PPM/°C
LT02: ±50PPM/°C



Product List

Series	Power Rating	Value Range	Tol	T.C.R. PPM/°C & REMARKS
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Automotive Standard Power 0201, 0402, 0603, 0805, 1206, 1210, 2010, 2512  	CQ	1/20W ~ 1W	0Ω/1Ω ~ 10MΩ	±0.5% ±1% ±2% ±5%	CQ01:1Ω~10Ω:~100~+350PPM/°C >10Ω ±200PPM/°C CQ02~CQ12: 1Ω~10Ω ±200PPM/°C >10Ω ±100PPM/°C
Automotive High Power 0402, 0603, 0805, 1206, 1210, 2010, 2512  	HQ	1/10W ~ 2W	0Ω/1Ω ~ 10MΩ	±1% ~ ±5%	1Ω~10Ω: ±200PPM/°C >10Ω: ±100PPM/°C
Automotive Low Resistance CS02, CS03, CS05, CS06, CS07, CS10, CS11, CS12  	CS	1/8W ~ 1W	10mΩ ~ 1Ω	±1% ~ ±5%	Low TCR till ±100PPM/°C. Depends on size, power & value. Refer to catalog
Metal Strip LR06, LR12  	LR	1W ~ 3W	0.5mΩ ~ 350mΩ	±1%	<1mΩ: ±100PPM/°C ≥1mΩ: ±50PPM/°C
Metal Alloy Low Resistance ML05, ML06, ML12, ML25, ML28, ML27  	ML	1/2W ~ 5W	0.2mΩ ~ 500mΩ	±0.5% ±1% ±2% ±5%	Low TCR till ±50PPM/°C. Depends on size, power & value. Refer to catalog
Metal Foil MS01, MS02, MS03, MS05, MS06 MS10, MS12, MS17 	MS	1/5W ~ 3W	2.5mΩ ~ 200mΩ	±1%	Low TCR till ±50PPM/°C. Depends on size, power & value. Refer to catalog
Metal Foil Wide Terminal MW08, MW12, MW15, MW25 	MW	1W ~ 3W	1mΩ ~ 100mΩ	±0.5% ±1% ±2%	Low TCR till ±50PPM/°C. Depends on size, power & value. Refer to catalog
Wide Terminal Low-Resistance TW08, TW12, TW20, TW25  	TW	1W ~ 3W	10mΩ ~ 2Ω	±0.5% ±1% ±2% ±5%	±100PPM/°C.
Metal Film Low Resistance TL01, TL02, TL03, TL05, TL06, TL07, TL10, TL12  	TL	1/10W ~ 3W	39mΩ ~ 10Ω	±0.5% ±1% ±2% ±5%	39mΩ~50mΩ: ±150PPM/°C >50mΩ~100mΩ: ±100PPM/°C >100mΩ~10Ω: ±50PPM/°C
Alloy Shunt Resistors RA12, RA20, RA30  	RA	3W ~ 15W	0.2mΩ ~ 5mΩ	±0.5% ±1% ±2% ±5%	Low TCR till ±50PPM/°C. Depends on size, power & value. Refer to catalog
Alloy Shunt Resistors RA26, RA27  	RA	3W ~ 12W	0.2mΩ ~ 5mΩ	±0.5% ±1% ±2% ±5%	0.2mΩ~1mΩ: ±75PPM/°C 2mΩ~5mΩ: ±50PPM/°C
High Precision Thin Film TC02, TC03, TC05, TC06, TC07, TC10, TC12 	TC	1/16W ~ 3/4W	2.49Ω ~ 3MΩ	±0.1% ±0.25% ±0.5% ±1%	Low TCR till ±5PPM/°C. Depends on size, power & value. Refer to catalog
Chip Array (Convex) 2D02, 2D03, 4D02, 4D03, 4DP3, 16P8  	Array	1/16W ~ 1/10W	0Ω/1Ω ~ 1MΩ	±1% ~ ±5%	±200PPM/°C 4D03,4DP3,16P8: <10Ω: ±400PPM/°C >10Ω: ±200PPM/°C
Chip Array (Concave) 2C02, 4C02, 4C03  	Array	1/16W ~ 1/10W	0Ω/1Ω ~ 1MΩ	±1% ~ ±5%	±200PPM/°C 4C03: <10Ω: ±400PPM/°C >10Ω: ±200PPM/°C

This document is a general reference only, please refer to datasheet for details.

Any resistor items not listed in this document, please send inquiry to your Contact Sales.



Product List

Series

Power Rating

Value Range

Tol

T.C.R.
PPM/°C & REMARKS

Chip Array (Flat Terminal)
2F01, 4F01



Array

1/20W

0Ω/10Ω
~
1MΩ

±1%
±5%

±200PPM/°C

Chip Array Anti-Sulfurized
2S02, 4S02, 4S03



Array

1/16W

0Ω/1Ω
~
1MΩ

±1%
±5%

±200PPM/°C
4S03: <10Ω: ±400PPM/°C
>10Ω: ±200PPM/°C

Chip Resistors Network
8R06, 8S06, 10P8, 10S8, 10T8, 10E9



Resistor Network

1/32W
1/16W

0Ω/10Ω
~
1MΩ

±1%
±5%

±200PPM/°C

CHIP / THROUGH HOLE RESISTORS KIT

Album Type

*Std SMD
*CQ, HP, SP12
*CFR, MFR, MOR



Album

1/16W
~
3W

E-6
E-12
E-24
E-96

±1%
±2%
±5%

E Series and value range will depend on the resistor type

Plastic Bag Type
CFR, MFR, MOR



Plastic Bag

1/16W
~
1W

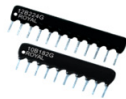
E-6
E-12
E-24

±1%
±2%
±5%

Customize KIT is available upon request

NETWORK RESISTORS - SIL

Resistor Network
4-14 PINS



RNL
RPL
RNM
RPH

1/8W
~
1/2W

10Ω
~
1MΩ

±2%
±5%

Low TCR till ±100PPM/°C.
Depends on type & value.
Refer to catalog

MELF RESISTORS & JUMPER

Carbon Film - MELF
0204, 0207, 0309



MCxx

1/4W
~
2W

1Ω
~
5.1MΩ

±2%
±5%

1Ω~100KΩ: ±350PPM/°C
101KΩ~500KΩ: ±700PPM/°C
501KΩ~1MΩ: ±1000PPM/°C
1MΩ~5.1MΩ: ±1500PPM/°C

Metal Film - MELF
0204, 0207, 0309, 0411
Automotive grade Available!



Mxx
Pxx
Axx

1/6W
~
3W

0.22Ω
~
10MΩ

±0.5%
±1%
±2%
±5%

Low TCR till ±25PPM/°C.
Depends on size, power & value. Refer to catalog

Fusible Wire Wound with Surge MELF (0309)



FA39

1W

1Ω
~
470Ω

±5%

±200PPM/°C

Jumper Wire



ZW

φ0.45mm
~
φ2.00mm

0Ω

N/A

N/A

Zero Ohm



ZOC
ZOT

1/8W
~
1/4W

0Ω

N/A

ZOC (Ceramic Rod)
ZOT (Steel Rod)
ZOC 1/4W is EOL

THROUGH HOLE RESISTORS

Carbon Film



CFR

1/8W
~
3W

1Ω
~
10MΩ

±2%
±5%
±10%

≤10Ω: ±300PPM/°C
11Ω~99KΩ: ±450PPM/°C
100KΩ~1MΩ: 0~-700PPM/°C
1.1MΩ~10MΩ: 0~-1500PPM/°C

Precision Metal Film



MFR

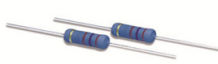
1/8W
~
3W

1Ω
~
10MΩ

±0.1%
±0.25%
±0.5%
±1%
±2%
±5%

Low TCR till ±15PPM/°C.
Depends on size, power & value. Refer to catalog

Metal Oxide



MOR

1/4W
~
9W

0.1Ω
~
680KΩ

±2%
±5%
±10%

±350PPM/°C

Fusible 
(UL Approved - No. E306074)



FRN

1/4W
~
3W

0.22Ω
~
10KΩ

±2%
±5%
±10%

±350PPM/°C



Product List

T.C.R.
PPM/°C & REMARKS

	Series	Power Rating	Value Range	Tol	T.C.R. PPM/°C & REMARKS
Metal Glaze Film (UL Approved - No. E364163) 	MGR	1/4W ~ 3W	1KΩ ~ 500MΩ	±1% ±5%	±200PPM/°C
Power Metal 	PMR	1W ~ 3W	0.56Ω ~ 10MΩ	±1% ±2% ±5%	Low TCR till ±200PPM/°C. Depends on size, power & value. Refer to catalog
Wire-Wound 	KNP	1/2W ~ 10W	0.01Ω ~ 60KΩ	±1% ±2% ±5%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Wire-Wound (UL Approved - No. E306074) 	KNPU	1W ~ 7W	0.47Ω ~ 240Ω	±5%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Anti-Surge Wire-Wound High Power-small body size Available! 	KNPA	1/2W ~ 10W	1Ω ~ 15KΩ	±1%** ±2% ±5%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Fusible Wire-Wound Anti surge Available - FWRA (UL Approved - No. E306074) 	FWR FWRA	1W ~ 3W	0.47Ω ~ 470Ω	±5%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Terminal Wire-Wound 	KNH KNHA KNS	2W ~ 100W	0.4Ω ~ 50KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Thermal Fusing Wire-Wound 	TFR	1W	2.2Ω ~ 4.7Ω	±5% ±10%	±400PPM/°C
Metal Glazed Film Fixed Resistors Patent No.: 1581275 	RC06 RC06-1	0.25W	1Ω ~ 10MΩ	±1% ±5%	1Ω ~ 10Ω: ±400PPM/°C 11Ω ~ 100Ω: ±200PPM/°C >100Ω: ±100PPM/°C
Terminal Type Metal Oxide 	TMOR TMOV	3W ~ 7W	10Ω ~ 43KΩ	±5%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C
Forming Type Panasert, Avisert, Formed 	CFR MFR MOR FRN KNP	1/8W ~ 5W	10Ω ~ 1MΩ	±5% ±10%	Depends on resistor type, size and value. Refer to catalog







CEMENT TYPE RESISTORS

Axial Leaded 	PRW PRWA PRWC PRWC-1	1W ~ 25W	0.1Ω ~ 200KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C
Radial Leaded 	PRM PRMA PRMB PRS	2W ~ 25W	0.1Ω ~ 200KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C
Radial Terminal 	PRZ PRV PRT PRU	5W ~ 50W	0.1Ω ~ 200KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C
Vertical or Axial 	PRWI	4W ~ 17W	0.1Ω ~ 39KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C

** KNPA series AEC Q200 compliant does not include 1% & extra small sizes.



Product List

		Series	Power Rating	Value Range	Tol	T.C.R. PPM/°C & REMARKS
Thermal Fusible		FTR	1.4W ~ 5.2W	0.22Ω ~ 1.8KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C
Power Flat Alloy		PFA	2W ~ 10W	0.01Ω ~ 3.3Ω	±5% ±10%	≥0.1Ω: ±350PPM/°C (<0.1Ω pls contact us)
SHUNT & COIL RESISTORS						
Shunt CSRA, CSRB, CSRC, CSRD, CSRE, CSRJ		CSR	4.5A ~ 50A	3mΩ ~ 50mΩ	±2% ~ ±5% ±10%	±100PPM/°C
Coil		CSC	4A ~ 12A	3mΩ ~ 50mΩ	±5% ±10%	Depends on value range
INDUSTRIAL POWER RESISTORS						
Power Dissipation Mount		PDM0 PDM1 PDM2 PDMH PDMM PDMS	5W ~ 500W	0.5Ω ~ 20KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C
Power (Ribbon) Wire-Wound		QH QL QR QRZG	20W ~ 2500W	0.2Ω ~ 200KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Aluminum Case High Power Wire-Wound		HEWR HBWR	60W ~ 2000W	0.5Ω ~ 15KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C
Thermal Fuse Wire-Wound (Blower Fan Resistor)		ASSY	12V	0.1Ω ~ 10Ω	±10%	±350PPM/°C

****Customized design capability**

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