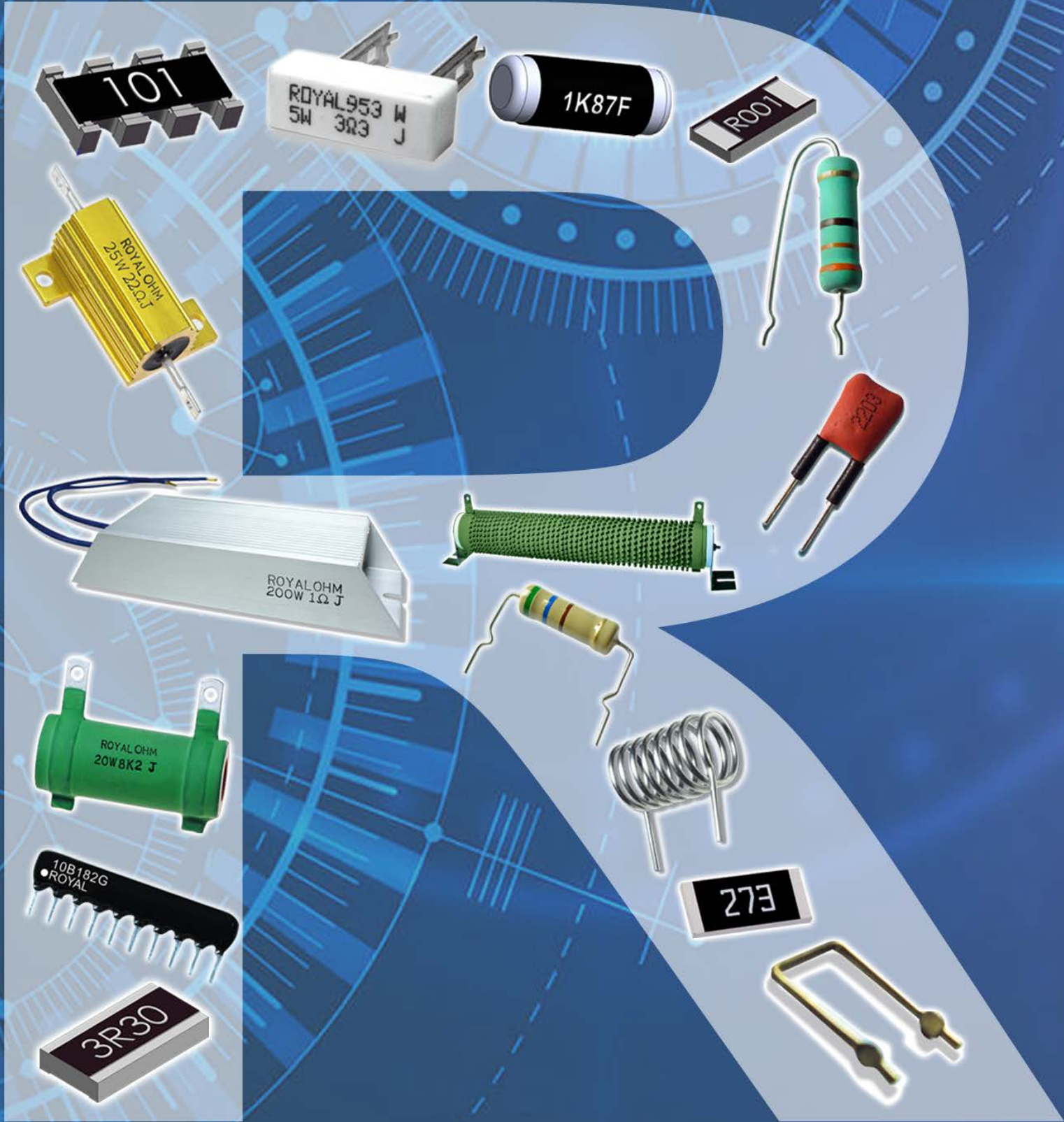




IATF 16949 : 2016



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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	±1%
~	~	±2%
1W	100MΩ	±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)

Wide Terminal

(AEC-Q200 Compliant)
WR08, WR12, WR20, WR18, WR25



WR

1/3W	0Ω/10mΩ	±1%
~	~	±5%
3W	1MΩ	

Depends on size and value range

Anti-Surge (AEC-Q200 Compliant)

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



AS

1/8W	1Ω	±5%
~	~	±10%
2W	10MΩ	±20%

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

High Precision Anti-Surge

(AEC-Q200 Compliant)
PS02, PS03, PS05, PS06, PS07,
PS10, PS12



PS

1/8W	0.1Ω	±1%
~	~	±5%
2W	10MΩ	

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

Anti-Electrostatic Discharge

(AEC-Q200 Compliant)
ES01, ES02, ES03, ES05,
ES06, ES07



ES

1/20W	1Ω	±1%
~	~	±5%
1/2W	10MΩ	

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

High Power (AEC-Q200 Compliant)

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



HP

1/10W	0Ω/0.01Ω	±1%
~	~	±5%
2W	10MΩ	

Depends on size and value range

Ultra High Power

(AEC-Q200 Compliant)
SP10, SP12, SP17, SP20, SP27
(Product design Patent no.: I566261)



SP

1W	1Ω	±1%
~	~	±5%
6W	10MΩ	

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

High Voltage (AEC-Q200 Compliant)

HV03, HV05, HV06, HV07, HV10, HV12
Anti sulfurized available - VS12



HV

1/10W	36KΩ	±1%
~	~	±5%
1W	10MΩ	

±100PPM/°C

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

(AEC-Q200 Compliant)
0201, 0402, 0603, 0805, 1206,
1210, 2010, 2512



NQ
NS

1/20W	0Ω/1Ω	±1%
~	~	±5%
1W	10MΩ	

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

Chip Array (Convex)

2D02, 2D03, 4D02, 4D03, 4DP3, 16P8



Array

1/16W	0Ω/1Ω	±1%
~	~	±5%
1/10W	1MΩ	

±200PPM/°C
(4D03, 4DP3, 16P8 refer to
catalog)

Chip Array Anti-Sulfurized

(AEC-Q200 Compliant)
2S02, 4S02, 4S03



Array

1/16W	0Ω/10Ω	±1%
~	~	±5%
	1MΩ	

±200PPM/°C
(4S03 refer to catalog)

Chip Array (Concave)

2C02, 4C02, 4C03, 2F01, 4F01



Array

1/20W	0Ω/1Ω	±1%
~	~	±5%
1/16W	1MΩ	

±200PPM/°C
(4C03 refer to catalog)

Automotive (CQ) / Automotive High Power (HQ) (AEC-Q200 Compliant)

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



HQ
CQ

1/20W	0Ω/1Ω	±1%
~	~	±5%
1W	10MΩ	

0201: 1Ω ~ 10Ω ±400PPM/°C
0402 ~ 2512:
1Ω~10Ω ±200PPM/°C
>10Ω ±100PPM/°C

Automotive Low Resistance

(AEC-Q200 Compliant)
CS02, CS03, CS05, CS06, CS07,
CS10, CS11, CS12



CS

1/8W	10mΩ	±1%
~	~	±5%
1W	1Ω	

Depends on size and value range



Product List

		Series	Power Rating	Value Range	Tol	T.C.R. PPM/°C & REMARKS
Metal Foil MS02, MS03, MS05, MS06, MS17		MS	1/4W ~ 1W	2.5mΩ ~ 50mΩ	±1%	Depends on size and value range
Metal Film Low Resistance TL01, TL02, TL03, TL05, TL06, TL07, TL10, TL12		TL	1/10W ~ 3W	10mΩ ~ 10Ω	±0.5% ±1% ±2% ±5%	±50PPM/°C ±100PPM/°C ±150PPM/°C ±200PPM/°C
Low T.C.R LT02, LT03, LT05, LT06		LT	1/16W ~ 1/4W	1Ω ~ 1MΩ	±0.25% ±0.5% ±1%	±50PPM/°C ±100PPM/°C
Metal Strip LR12 (AEC-Q200 Compliant)		LR	1W ~ 3W	1mΩ ~ 350mΩ	±1% ±5%	±50PPM/°C
Metal Alloy Low Resistance ML05, ML06, ML12, ML25, ML28, ML27		ML	1W ~ 5W	0.2mΩ ~ 500mΩ	±0.5% ±1% ±2% ±5%	±50PPM/°C ±75PPM/°C ±100PPM/°C
Complete Pb-Free PF0A, PF01, PF02, PF03, PF05, PF06, PF07, PF11, PF10, PF12		PF	1/32W ~ 1W	1Ω ~ 10MΩ	±1% ±5%	1Ω~10Ω: ±400PPM/°C >10Ω~100Ω: ±200PPM/°C >100Ω: ±100PPM/°C (PF0A, PF01 refer to catalog)
High Precision Thin Film TC02, TC03, TC05, TC06, TC07, TC10, TC12		TC	1/16W ~ 3/4W	2.49Ω ~ 1.5MΩ	±0.1% ±0.25% ±0.5% ±1%	±10PPM/°C ±15PPM/°C ±25PPM/°C ±50PPM/°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	1/8W ~ 1/3W	10Ω ~ 1MΩ	±2% ±5%	<50Ω: ±250PPM/°C 50Ω~1MΩ: ±200PPM/°C >1MΩ: ±250PPM/°C (RPL refer to catalog)
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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 0102, 0204, 0207, 0309		Mxx	1/8W ~ 2W	0.1Ω ~ 10MΩ	±0.10% ±0.25% ±0.5% ±1% ±2% ±5%	±15PPM/°C ±25PPM/°C ±50PPM/°C ±100PPM/°C
Moulded MELF (Metal Film) 0207		D27	1/2W	10Ω ~ 1MΩ	±0.10% ±0.25% ±0.5% ±1% ±2% ±5%	±15PPM/°C ±25PPM/°C ±50PPM/°C ±100PPM/°C ±200PPM/°C

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Product List

			Series	Power Rating	Value Range	Tol	T.C.R. PPM/°C & REMARKS
Fusible Wire Wound MELF (0309)	New		FW39	1W	0.47Ω ~ 820Ω	±2% ±5%	≤1Ω: ±400PPM/°C >1Ω: ±200PPM/°C
Jumper Wire			ZW	φ0.45mm ~ φ1.20mm	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%	±15PPM/°C ±25PPM/°C ±50PPM/°C ±100PPM/°C ±200PPM/°C
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
Metal Glaze Film	(UL Approved - No. E364163)	 	MGR	1/4W ~ 3W	1KΩ ~ 100MΩ	±1% ±5%	±200PPM/°C
Power Metal			PMR	1W ~ 3W	0.56Ω ~ 10MΩ	±1% ±2% ±5%	±200PPM/°C ±350PPM/°C ±400PPM/°C
Wire-Wound			KNP	1/2W ~ 10W	0.01Ω ~ 60KΩ	±1% ±2% ±5%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Fusible 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	10Ω ~ 15KΩ	±1% ±2% ±5%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Fusible Wire-Wound Fixed	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

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Product List

	Series	Power Rating	Value Range	Tol	T.C.R. PPM/°C & REMARKS
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: ±300PPM/°C
Radial Leaded 	PRM PRMA PRMB PRS	2W ~ 25W	0.1Ω ~ 200KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Radial Terminal 	PRZ PRV PRT PRU	5W ~ 50W	0.1Ω ~ 200KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±300PPM/°C
Vertical or Axial 	PRWI	4W ~ 17W	0.1Ω ~ 39KΩ	±5% ±10%	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C
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 	CSR	4.5A ~ 50A	3mΩ ~ 50mΩ	±2% ±5% ±10%	±400PPM/°C
Coil 	CSC	4A ~ 12A	3mΩ ~ 50mΩ	±5% ±10%	Depends on value range

INDUSTRIAL POWER RESISTORS





Power Dissipation Mount 	PDMS PDM	5W ~ 100W	0.01Ω ~ 35KΩ	±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: ±350PPM/°C

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Product List

		Series	Power Rating	Value Range	Tol	T.C.R. PPM/°C & REMARKS
Aluminum Case High Power Wire-Wound		HEWR HBWR	60W ~ 2000W	0.5Ω ~ 15KΩ	±5% ~ ±10%	±350PPM/°C
Thermal Fuse Wire-Wound (Blower Fan Resistor)		ASSY	12V	0.1Ω ~ 10Ω	±10%	±350PPM/°C
SURFACE MOUNT RESISTORS						
Surface Mount Wirewound Power Resistors New		PWR	1W	1Ω ~ 200Ω	±5%	1Ω≤R≤10Ω: ≤±50PPM/°C 10Ω<R≤200Ω: ≤±20PPM/°C
Metal Strip Plastic Surface Mount Resistors New		MP19	7W	3mΩ ~ 60mΩ	±1% ~ ±5%	±50PPM/°C

**Customized design capability

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