

Automotive and Anti-Sulfuration Chip Resistor 0402



**RoHS
Compliant**

Description



The resistors are constructed in a high grade ceramic body (aluminium oxide). Internal metal electrodes are added at each end and connected by a resistive paste that is applied to the top surface of the substrate. The composition of the paste is adjusted to give the approximate resistance required and the value is trimmed to within tolerance by laser cutting of this resistive layer

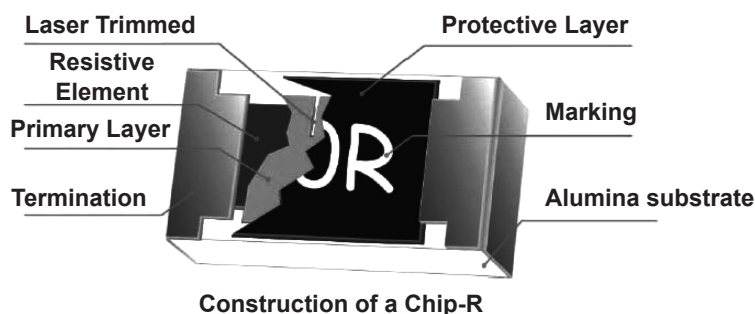
Features:

- High reliability and stability $\pm 1\%$
- Sulfuration resistant 1,000 ppm
- Automotive grade AEC Q-200 compliant
- 100% CCD inspection
- Lead-free

Applications:

- Automotive application
- Consumer electrical equipment
- EDP, computer application
- Telecom application

The resistive layer is covered with a protective coat. Finally, the two external end terminations are added. For ease of soldering the outer layer of these end terminations is a Tin (lead free) alloy



Quick Reference Data

Item	General Specification	
Series no.	MCSR04	
Size code	0402	
Resistance range	1 Ω to 10M Ω ($\pm 5\%$ tolerance), Jumper 1 Ω to 10M Ω ($\pm 1\%$ tolerance)	
Resistance tolerance	$\pm 1\%$ E96 / E24	$\pm 5\%$ E24
TCR (ppm/ $^{\circ}$ C) R > 1M Ω 10 Ω < R \leq 1M Ω R \leq 10 Ω	$\leq +200$ $\leq +100$ -200 to +400	
Maximum dissipation at T _{amb} = 70 $^{\circ}$ C	1/16W	
Maximum operation voltage (DC or RMS)	50V	
Maximum overload voltage (DC or RMS)	100V	
Climatic category (IEC 60068)	55/155/56	



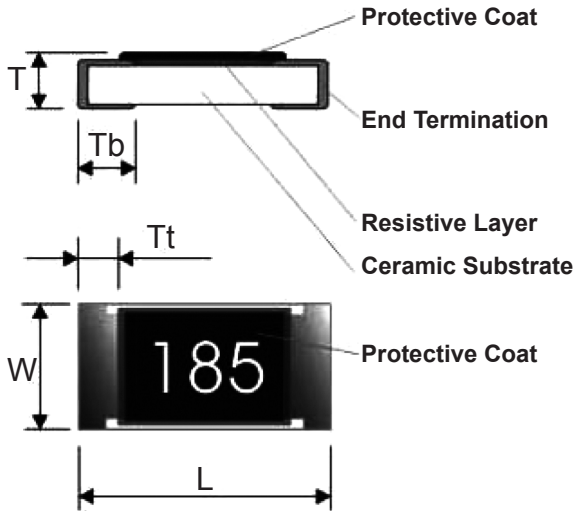
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Note:

1. This is the maximum voltage that may be continuously supplied to the resistor element, see “IEC publication 60115-8”
2. Maximum operation voltage : So called RCWV (rated continuous working voltage) is determined by

$$RCWV = \sqrt{\text{Rated Power} \times \text{Resistance Value or maximum RCWV listed above, whichever is lower}}$$
3. The resistance of jumper is defined $< 0.05\Omega$



Dimensions (mm)

MCSR04 (0402)	L	W	T	Tb	Tt
	1 ±0.05	0.5 ±0.05	0.35 ±0.05	0.25 ±0.1	0.2 ±0.1

Marking

Size \ No. of Digit of Code \ Tolerance	±5%	±1%
MCMR12 (1206)	No Marking	

Functional Description

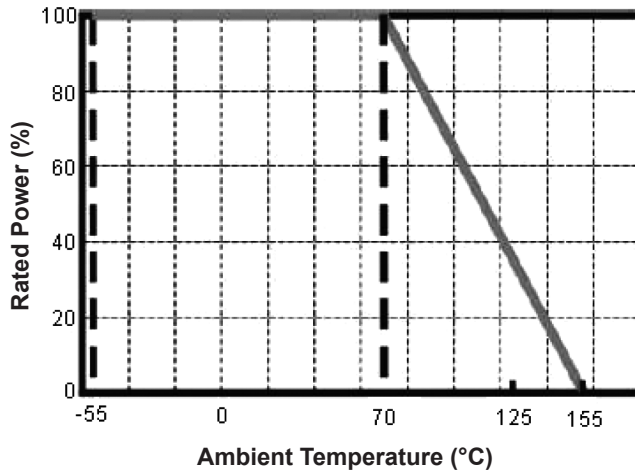
Product characterization

Standard values of nominal resistance are taken from the E24 series for resistors with a tolerance of ±5%, and E24+E96 series for resistors with a tolerance of ±1%. The values of the E24 / E96 series are in accordance with “IEC publication 60063”



Derating

The power that the resistor can dissipate depends on the operating temperature



Max. dissipation in percentage of rated power as a function of the ambient temperature

Mounting:

Due to their rectangular shapes and small tolerances, surface mountable resistors are suitable for handling by automatic placement systems

Chip placement can be on ceramic substrates and printed-circuit boards (PCBs)

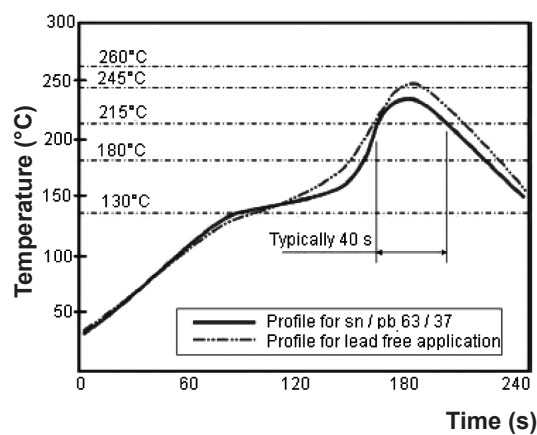
Electrical connection to the circuit is by individual soldering condition

The end terminations guarantee a reliable contact

Soldering Condition

The robust construction of chip resistors allows them to be completely immersed in a solder bath of 260°C for 10 seconds. Therefore, it is possible to mount surface mount resistors on one side of a PCB and other discrete components on the reverse (mixed PCBs)

Surface mount resistors are tested for solderability at 235°C during 2 seconds. The test condition for no leaching is 260°C for 30 seconds. Typical examples of soldering processes that provide reliable joints without any damage are given in below.



Infrared soldering profile for Chip Resistors

Test and Requirements

Essentially all tests are carried out according to the schedule of IEC publication 115-8, category LCT/UCT/56 (rated temperature range : Lower Category Temperature, Upper Category Temperature; damp heat, long term, 56 days). The testing also meets the requirements specified by EIA, EIAJ and JIS

The tests are carried out in accordance with IEC publication 68, "Recommended basic climatic and mechanical robustness testing procedure for electronic components" and under standard atmospheric conditions according to IEC 60068-1, sub-clause 5.3. Unless otherwise specified, the following value supplied :

Temperature : 15°C to 35°C

Relative humidity : 45% to 75%

Air pressure : 86kPa to 106kPa (860 mbar to 1,060 mbar)

All soldering tests are performed with mildly activated flux

Test	Procedure / Test Method	Requirement	
		Resistance $\pm 5\%$, $\pm 1\%$	0 Ω
Electrical Characteristics JISC5201-1: 1998 Clause 4.8	- DC resistance values measurement - Temperature Coefficient of Resistance (T.C.R) Natural resistance change per change in degree centigrade $\frac{R2 - R1}{R1 (t2 - t1)} \times 10^6 \text{ (ppm/}^\circ\text{C)}$ t ₁ : 20°C +5°C -1°C R1 : Resistance at reference temperature R2 : Resistance at test temperature	Within the specified tolerance Refer to "Quick Reference Data"	
Resistance to soldering heat (R.S.H) MIL-STD-202 method 210	Un-mounted chips completely immersed for 10 \pm 1 second in a SAC solder bath at 270°C \pm 5°C	$\Delta R/R$ Max. \pm (0.5%+0.05 Ω) No visible damage	< 50m Ω
Solderability J-STD-002	a) Bake the sample for 155°C dwell time 4 hours / solder dipping 235°C / 5 s b) Steam the sample dwell time 1 hour/ solder dipping 215°C/ 5 s c) Steam the sample dwell time 1 hour/ solder dipping 260°C / 7 s	95% coverage minimum, good tinning No visible damage	
Temperature cycling JESD22 method JA-104	1,000 cycles, -55°C to +155°C, dwell time 5 to 10mins	$\Delta R/R$ Max. \pm (0.5%+0.05 Ω) No visible damage	< 50m Ω
Moisture Resistance MIL-STD-202 method 106	65 \pm 2°C, 80 to 100% RH, 10 cycles, 24 hours / cycle	$\Delta R/R$ Max. \pm (0.5%+0.05 Ω) No visible damage	< 50m Ω
Bias Humidity MIL-STD-202 method 103	1,000 +48/-0 hours; 85°C, 85% RH, 10% of operation Power	$\Delta R/R$ Max. \pm (1%+0.05 Ω) No visible damage	< 50m Ω
Operational Life MIL-STD-202 method 108	1,000 +48/-0 hours; 35% of operation power, 125 \pm 2°C	$\Delta R/R$ Max. \pm (1%+0.05 Ω) No visible damage	< 50m Ω
High Temperature Exposure MIL-STD-202 method 108	1,000+48/-0 hours; without load in a temperature chamber controlled 155 \pm 3°C	$\Delta R/R$ Max. \pm (1%+0.05 Ω) No visible damage	< 50m Ω

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Test and Requirements

Test	Procedure / Test Method	Requirement	
		Resistance $\pm 5\%$, $\pm 1\%$	0 Ω
Mechanical Shock MIL-STD-202 method 213	1/2 sine pulse / 1,500 g peak / Velocity 15.4 ft/s	Within the specified tolerance No visible damage	< 50m Ω
Board Flex AEC-Q200-005	Resistors mounted on a 90 mm glass epoxy resin PCB(FR4), bending once 2 mm for 10 s	$\Delta R/R$ Max. $\pm (1\%+0.05 \Omega)$ No visible damage	< 50m Ω
Terminal strength AEC-Q200-006	Pressurizing force: 1 Kg, Test time: 60 \pm 1 s	No remarkable damage or removal of the terminations	
Vibration MIL-STD-202 method 204	Test 5 g's for 20 minimum, 12 cycles each of 3 orientations	$\Delta R/R$ Max. $\pm (1\%+0.05 \Omega)$ No visible damage	< 50m Ω
Thermal shock MIL-STD-202 method 107	Test -55 to 155 / dwell time 15 minimum / maximum transfer time 20 seconds 300 cycles	$\Delta R/R$ Max. $\pm (0.5\%+0.05 \Omega)$ No visible damage	< 50m Ω
ESD AEC-Q200-002	Test contact 1 KV (0.5 KV for 0402 only)	$\Delta R/R$ Max. $\pm (1\%+0.05 \Omega)$ No visible damage	< 50m Ω

Test Condition for Jumper (0 Ω)

Item	MCSR04 (0402)
Power rating at +70°C	1/16 W
Resistance	Max. 50m Ω
Rated current	1A
Peak current	2A
Operating temperature	-55°C to +155°C

MCSR04 (0402):

1. Reeled tape packaging : 8 mm width paper taping 10,000 pieces per reel
2. Bulk packaging : 10,000 pieces per poly-bag

Part Number Table

Description	Part Number	Description	Part Number
Resistor, 0402, 2R2, 1%, Anti Sulfur	MCSR04W2R20FTL	Resistor, 100R, 0402, 5%, Anti Sulfur	MCSR04X101 JTL
Resistor, 0402, 0R, Anti Sulfuration	MCSR04X000 PTL	Resistor, 1K, 0402, 5%, Anti Sulfur	MCSR04X102 JTL
Resistor, 10R, 0402, 5%, Anti Sulfur	MCSR04X100 JTL	Resistor, 10K, 0402, 5%, Anti Sulfur	MCSR04X103 JTL
Resistor, 0402, 100R, 1%, Anti Sulfur	MCSR04X1000FTL	Resistor, 100K, 0402, 5%, Anti Sulfur	MCSR04X104 JTL
Resistor, 0402, 1K, 1%, Anti Sulfur	MCSR04X1001FTL	Resistor, 1M, 0402, 5%, Anti Sulfur	MCSR04X105 JTL
Resistor, 0402, 10K, 1%, Anti Sulfur	MCSR04X1002FTL	Resistor, 0402, 1K07, 1%, Anti Sulfur	MCSR04X1071FTL
Resistor, 0402, 100K, 1%, Anti Sulfur	MCSR04X1003FTL	Resistor, 0402, 10R, 1%, Anti Sulfur	MCSR04X10R0FTL
Resistor, 0402, 1M, 1%, Anti Sulfur	MCSR04X1004FTL	Resistor, 0402, 110R, 1%, Anti Sulfur	MCSR04X1100FTL

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Description	Part Number	Description	Part Number
Resistor, 0402, 1K1, 1%, Anti Sulfur	MCSR04X1101FTL	Resistor, 0402, 1K8, 1%, Anti Sulfur	MCSR04X1801FTL
Resistor, 0402, 11K, 1%, Anti Sulfur	MCSR04X1102FTL	Resistor, 0402, 18K, 1%, Anti Sulfur	MCSR04X1802FTL
Resistor, 0402, 110K, 1%, Anti Sulfur	MCSR04X1103FTL	Resistor, 0402, 180K, 1%, Anti Sulfur	MCSR04X1803FTL
Resistor, 0402, 11R, 1%, Anti Sulfur	MCSR04X11R0FTL	Resistor, 0402, 187K, 1%, Anti Sulfur	MCSR04X1873FTL
Resistor, 0402, 120R, 1%, Anti Sulfur	MCSR04X1200FTL	Resistor, 0402, 18R, 1%, Anti Sulfur	MCSR04X18R0FTL
Resistor, 0402, 1K2, 1%, Anti Sulfur	MCSR04X1201FTL	Resistor, 0402, 1K96, 1%, Anti Sulfur	MCSR04X1961FTL
Resistor, 0402, 12K, 1%, Anti Sulfur	MCSR04X1202FTL	Resistor, 0402, 19K6, 1%, Anti Sulfur	MCSR04X1962FTL
Resistor, 0402, 120K, 1%, Anti Sulfur	MCSR04X1203FTL	Resistor, 0402, 200R, 1%, Anti Sulfur	MCSR04X2000FTL
Resistor, 0402, 1K21, 1%, Anti Sulfur	MCSR04X1211FTL	Resistor, 0402, 2K, 1%, Anti Sulfur	MCSR04X2001FTL
Resistor, 0402, 12R, 1%, Anti Sulfur	MCSR04X12R0FTL	Resistor, 0402, 20K, 1%, Anti Sulfur	MCSR04X2002FTL
Resistor, 0402, 130R, 1%, Anti Sulfur	MCSR04X1300FTL	Resistor, 0402, 200K, 1%, Anti Sulfur	MCSR04X2003FTL
Resistor, 0402, 1K3, 1%, Anti Sulfur	MCSR04X1301FTL	Resistor, 200R, 0402, 5%, Anti Sulfur	MCSR04X201 JTL
Resistor, 0402, 13K, 1%, Anti Sulfur	MCSR04X1302FTL	Resistor, 0402, 2K05, 1%, Anti Sulfur	MCSR04X2051FTL
Resistor, 0402, 130K, 1%, Anti Sulfur	MCSR04X1303FTL	Resistor, 0402, 20R, 1%, Anti Sulfur	MCSR04X20R0FTL
Resistor, 0402, 1K33, 1%, Anti Sulfur	MCSR04X1331FTL	Resistor, 0402, 2K15, 1%, Anti Sulfur	MCSR04X2151FTL
Resistor, 0402, 13K3, 1%, Anti Sulfur	MCSR04X1332FTL	Resistor, 0402, 220R, 1%, Anti Sulfur	MCSR04X2200FTL
Resistor, 0402, 1K37, 1%, Anti Sulfur	MCSR04X1371FTL	Resistor, 0402, 2K2, 1%, Anti Sulfur	MCSR04X2201FTL
Resistor, 0402, 13K7, 1%, Anti Sulfur	MCSR04X1372FTL	Resistor, 0402, 22K, 1%, Anti Sulfur	MCSR04X2202FTL
Resistor, 0402, 13R, 1%, Anti Sulfur	MCSR04X13R0FTL	Resistor, 0402, 220K, 1%, Anti Sulfur	MCSR04X2203FTL
Resistor, 0402, 1K4, 1%, Anti Sulfur	MCSR04X1401FTL	Resistor, 0402, 22R, 1%, Anti Sulfur	MCSR04X22R0FTL
Resistor, 0402, 14R, 1%, Anti Sulfur	MCSR04X14R0FTL	Resistor, 0402, 23K7, 1%, Anti Sulfur	MCSR04X2372FTL
Resistor, 0402, 150R, 1%, Anti Sulfur	MCSR04X1500FTL	Resistor, 0402, 240R, 1%, Anti Sulfur	MCSR04X2400FTL
Resistor, 0402, 1K5, 1%, Anti Sulfur	MCSR04X1501FTL	Resistor, 0402, 2K4, 1%, Anti Sulfur	MCSR04X2401FTL
Resistor, 0402, 15K, 1%, Anti Sulfur	MCSR04X1502FTL	Resistor, 0402, 24K, 1%, Anti Sulfur	MCSR04X2402FTL
Resistor, 0402, 150K, 1%, Anti Sulfur	MCSR04X1503FTL	Resistor, 0402, 240K, 1%, Anti Sulfur	MCSR04X2403FTL
Resistor, 0402, 1K54, 1%, Anti Sulfur	MCSR04X1541FTL	Resistor, 0402, 2K43, 1%, Anti Sulfur	MCSR04X2431FTL
Resistor, 0402, 15R, 1%, Anti Sulfur	MCSR04X15R0FTL	Resistor, 0402, 24R, 1%, Anti Sulfur	MCSR04X24R0FTL
Resistor, 0402, 160R, 1%, Anti Sulfur	MCSR04X1600FTL	Resistor, 0402, 2K61, 1%, Anti Sulfur	MCSR04X2611FTL
Resistor, 0402, 1K6, 1%, Anti Sulfur	MCSR04X1601FTL	Resistor, 0402, 270R, 1%, Anti Sulfur	MCSR04X2700FTL
Resistor, 0402, 16K, 1%, Anti Sulfur	MCSR04X1602FTL	Resistor, 0402, 2K7, 1%, Anti Sulfur	MCSR04X2701FTL
Resistor, 0402, 160K, 1%, Anti Sulfur	MCSR04X1603FTL	Resistor, 0402, 27K, 1%, Anti Sulfur	MCSR04X2702FTL
Resistor, 0402, 1K65, 1%, Anti Sulfur	MCSR04X1651FTL	Resistor, 0402, 270K, 1%, Anti Sulfur	MCSR04X2703FTL
Resistor, 0402, 1K69, 1%, Anti Sulfur	MCSR04X1691FTL	Resistor, 0402, 2K74, 1%, Anti Sulfur	MCSR04X2741FTL
Resistor, 0402, 16K9, 1%, Anti Sulfur	MCSR04X1692FTL	Resistor, 0402, 27R, 1%, Anti Sulfur	MCSR04X27R0FTL
Resistor, 0402, 16R, 1%, Anti Sulfur	MCSR04X16R0FTL	Resistor, 0402, 300R, 1%, Anti Sulfur	MCSR04X3000FTL
Resistor, 0402, 180R, 1%, Anti Sulfur	MCSR04X1800FTL	Resistor, 0402, 3K, 1%, Anti Sulfur	MCSR04X3001FTL

Automotive and Anti-Sulfuration Chip Resistor 0402



Description	Part Number	Description	Part Number
Resistor, 0402, 30K, 1%, Anti Sulfur	MCSR04X3002FTL	Resistor, 4K7, 0402, 5%, Anti Sulfur	MCSR04X472 JTL
Resistor, 0402, 300K, 1%, Anti Sulfur	MCSR04X3003FTL	Resistor, 0402, 47K5, 1%, Anti Sulfur	MCSR04X4752FTL
Resistor, 0402, 30K1, 1%, Anti Sulfur	MCSR04X3012FTL	Resistor, 0402, 47R, 1%, Anti Sulfur	MCSR04X47R0FTL
Resistor, 300K, 0402, 5%, Anti Sulfur	MCSR04X304 JTL	Resistor, 0402, 4K87, 1%, Anti Sulfur	MCSR04X4871FTL
Resistor, 0402, 30R, 1%, Anti Sulfur	MCSR04X30R0FTL	Resistor, 0402, 499R, 1%, Anti Sulfur	MCSR04X4990FTL
Resistor, 0402, 330R, 1%, Anti Sulfur	MCSR04X3300FTL	Resistor, 0402, 4K99, 1%, Anti Sulfur	MCSR04X4991FTL
Resistor, 0402, 3K3, 1%, Anti Sulfur	MCSR04X3301FTL	Resistor, 0402, 49K9, 1%, Anti Sulfur	MCSR04X4992FTL
Resistor, 0402, 33K, 1%, Anti Sulfur	MCSR04X3302FTL	Resistor, 0402, 49R9, 1%, Anti Sulfur	MCSR04X49R9FTL
Resistor, 0402, 330K, 1%, Anti Sulfur	MCSR04X3303FTL	Resistor, 0402, 510R, 1%, Anti Sulfur	MCSR04X5100FTL
Resistor, 0402, 3K32, 1%, Anti Sulfur	MCSR04X3321FTL	Resistor, 0402, 5K1, 1%, Anti Sulfur	MCSR04X5101FTL
Resistor, 0402, 33R, 1%, Anti Sulfur	MCSR04X33R0FTL	Resistor, 0402, 51K, 1%, Anti Sulfur	MCSR04X5102FTL
Resistor, 0402, 340R, 1%, Anti Sulfur	MCSR04X3400FTL	Resistor, 0402, 510K, 1%, Anti Sulfur	MCSR04X5103FTL
Resistor, 0402, 360R, 1%, Anti Sulfur	MCSR04X3600FTL	Resistor, 0402, 511R, 1%, Anti Sulfur	MCSR04X5110FTL
Resistor, 0402, 3K6, 1%, Anti Sulfur	MCSR04X3601FTL	Resistor, 0402, 5K11, 1%, Anti Sulfur	MCSR04X5111FTL
Resistor, 0402, 3K6, 1%, Anti Sulfur	MCSR04X3602FTL	Resistor, 0402, 51R, 1%, Anti Sulfur	MCSR04X51R0FTL
Resistor, 0402, 360K, 1%, Anti Sulfur	MCSR04X3603FTL	Resistor, 0402, 523R, 1%, Anti Sulfur	MCSR04X5230FTL
Resistor, 0402, 3K65, 1%, Anti Sulfur	MCSR04X3651FTL	Resistor, 0402, 5K23, 1%, Anti Sulfur	MCSR04X5231FTL
Resistor, 0402, 36R, 1%, Anti Sulfur	MCSR04X36R0FTL	Resistor, 0402, 5K36, 1%, Anti Sulfur	MCSR04X5361FTL
Resistor, 0402, 3K83, 1%, Anti Sulfur	MCSR04X3831FTL	Resistor, 0402, 560R, 1%, Anti Sulfur	MCSR04X5600FTL
Resistor, 0402, 390R, 1%, Anti Sulfur	MCSR04X3900FTL	Resistor, 0402, 5K6, 1%, Anti Sulfur	MCSR04X5601FTL
Resistor, 0402, 3K9, 1%, Anti Sulfur	MCSR04X3901FTL	Resistor, 0402, 56K, 1%, Anti Sulfur	MCSR04X5602FTL
Resistor, 0402, 39K, 1%, Anti Sulfur	MCSR04X3902FTL	Resistor, 0402, 560K, 1%, Anti Sulfur	MCSR04X5603FTL
Resistor, 0402, 390K, 1%, Anti Sulfur	MCSR04X3903FTL	Resistor, 0402, 5K62, 1%, Anti Sulfur	MCSR04X5621FTL
Resistor, 0402, 3K92, 1%, Anti Sulfur	MCSR04X3921FTL	Resistor, 0402, 56R, 1%, Anti Sulfur	MCSR04X56R0FTL
Resistor, 0402, 39R, 1%, Anti Sulfur	MCSR04X39R0FTL	Resistor, 0402, 5K9, 1%, Anti Sulfur	MCSR04X5901FTL
Resistor, 0402, 4K02, 1%, Anti Sulfur	MCSR04X4021FTL	Resistor, 5R1, 0402, 5%, Anti Sulfur	MCSR04X5R1 JTL
Resistor, 0402, 430R, 1%, Anti Sulfur	MCSR04X4300FTL	Resistor, 0402, 6K04, 1%, Anti Sulfur	MCSR04X6041FTL
Resistor, 0402, 4K3, 1%, Anti Sulfur	MCSR04X4301FTL	Resistor, 0402, 60K4, 1%, Anti Sulfur	MCSR04X6042FTL
Resistor, 0402, 43K, 1%, Anti Sulfur	MCSR04X4302FTL	Resistor, 0402, 620R, 1%, Anti Sulfur	MCSR04X6200FTL
Resistor, 0402, 430K, 1%, Anti Sulfur	MCSR04X4303FTL	Resistor, 0402, 6K2, 1%, Anti Sulfur	MCSR04X6201FTL
Resistor, 0402, 432K, 1%, Anti Sulfur	MCSR04X4323FTL	Resistor, 0402, 62K, 1%, Anti Sulfur	MCSR04X6202FTL
Resistor, 0402, 43R, 1%, Anti Sulfur	MCSR04X43R0FTL	Resistor, 0402, 620K, 1%, Anti Sulfur	MCSR04X6203FTL
Resistor, 0402, 470R, 1%, Anti Sulfur	MCSR04X4700FTL	Resistor, 0402, 62R, 1%, Anti Sulfur	MCSR04X62R0FTL
Resistor, 0402, 4K7, 1%, Anti Sulfur	MCSR04X4701FTL	Resistor, 0402, 6K49, 1%, Anti Sulfur	MCSR04X6491FTL
Resistor, 0402, 47K, 1%, Anti Sulfur	MCSR04X4702FTL	Resistor, 0402, 680R, 1%, Anti Sulfur	MCSR04X6800FTL
Resistor, 0402, 470K, 1%, Anti Sulfur	MCSR04X4703FTL	Resistor, 0402, 6K8, 1%, Anti Sulfur	MCSR04X6801FTL

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Description	Part Number
Resistor, 0402, 68K, 1%, Anti Sulfur	MCSR04X6802FTL
Resistor, 0402, 680K, 1%, Anti Sulfur	MCSR04X6803FTL
Resistor, 0402, 68K1, 1%, Anti Sulfur	MCSR04X6812FTL
Resistor, 0402, 68R, 1%, Anti Sulfur	MCSR04X68R0FTL
Resistor, 0402, 71K5, 1%, Anti Sulfur	MCSR04X7152FTL
Resistor, 0402, 750R, 1%, Anti Sulfur	MCSR04X7500FTL
Resistor, 0402, 7K5, 1%, Anti Sulfur	MCSR04X7501FTL
Resistor, 0402, 75K, 1%, Anti Sulfur	MCSR04X7502FTL
Resistor, 0402, 750K, 1%, Anti Sulfur	MCSR04X7503FTL
Resistor, 0402, 75R, 1%, Anti Sulfur	MCSR04X75R0FTL
Resistor, 0402, 7K87, 1%, Anti Sulfur	MCSR04X7871FTL
Resistor, 0402, 820R, 1%, Anti Sulfur	MCSR04X8200FTL
Resistor, 0402, 8K2, 1%, Anti Sulfur	MCSR04X8201FTL
Resistor, 0402, 82K, 1%, Anti Sulfur	MCSR04X8202FTL
Resistor, 0402, 820K, 1%, Anti Sulfur	MCSR04X8203FTL
Resistor, 0402, 82R, 1%, Anti Sulfur	MCSR04X82R0FTL
Resistor, 0402, 8K66, 1%, Anti Sulfur	MCSR04X8661FTL
Resistor, 0402, 909R, 1%, Anti Sulfur	MCSR04X9090FTL
Resistor, 0402, 910R, 1%, Anti Sulfur	MCSR04X9100FTL
Resistor, 0402, 9K1, 1%, Anti Sulfur	MCSR04X9101FTL
Resistor, 0402, 91K, 1%, Anti Sulfur	MCSR04X9102FTL
Resistor, 0402, 910K, 1%, Anti Sulfur	MCSR04X9103FTL
Resistor, 0402, 91R, 1%, Anti Sulfur	MCSR04X91R0FTL
Resistor, 0402, 93K1, 1%, Anti Sulfur	MCSR04X9312FTL

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