



**passive
components**
SELECTION GUIDE

KOA[®]
KOA SPEER ELECTRONICS, INC.



OF RESISTORS SHIPPED EVERY MONTH

With 99%+ On-Time Delivery... You Can Count on KOA Speer

At KOA Speer, we ship Billions of resistors every month! And, despite that volume, our 99%+ on-time performance and service levels are off the charts. We offer a diverse and expanding family of surface mount and leaded resistors, all backed by our Quality 1st mandate to deliver unmatched service and product quality. Let KOA Speer help take your design from **Concept to Reality!**

Quality 1st



You expect product quality from any component that makes it into one of your designs. But in today's competitive global marketplace, there's more to the quality equation. At KOA Speer, our Quality 1st initiative reinforces our organization wide focus on serving you at the highest possible level.



Our commitment to quality in everything we do is paying off... as we consistently receive customer quality and service awards. We're the industry's most recognized and awarded supplier for achieving the highest product quality, on-time delivery and responsive customer service.

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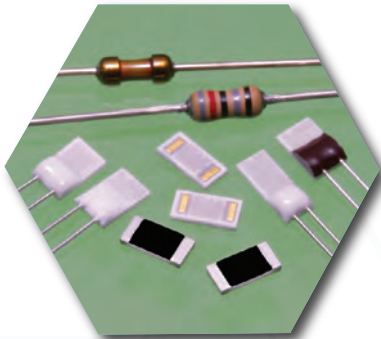
Leaded Resistors



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General Purpose • Precision
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Platinum Thin Film Thermal Sensors
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SURFACE MOUNT RESISTORS

General Purpose

RK73B - General Purpose Chip Resistor

- Tolerance: $\pm 2\%$, $\pm 5\%$
- Power rating: 0.03W (01005), 0.05W (0201), 0.1W (0402), 0.125W (0603), 0.25W (0805, 1206), 0.5W (1210), 0.75W (2010), 1W - 2W (2512)

RK73H - Precision Chip Resistor

- Tolerance: $\pm 0.5\%$, $\pm 1\%$
- Power rating: 0.03W (01005), 0.05W (0201), 0.1W (0402), 0.125W (0603), 0.25W (0805, 1206), 0.5W (1210), 0.75W (2010), 1W - 2W (2512)

RK73Z - Zero ohm Jumper Chip Resistor

- Zero ohm with max. resistance of 50m Ω

RK73-FT Lead-Free Chip Resistor

- RoHS exemption free

Precision Thick Film

RK73G High Precision

- TCR: $\pm 50\text{ppm}/^\circ\text{C}$
- Tolerance: $\pm 0.25\%$, $\pm 5\%$, $\pm 1\%$
- Power rating: .05W (0201), 0.1W (0402, 0603), 0.125W (0805), 0.25W (1206)

RS73 - Ultra Precision High Reliability

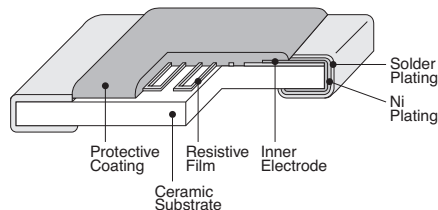
- Low TCR: $\pm 25\text{ppm}/^\circ\text{C}$, $\pm 50\text{ppm}/^\circ\text{C}$
- Tolerance: $\pm 0.1\% \sim \pm 1\%$
- Power rating: 0.125W (0402), 0.2W (0603), 0.25W (0805), 0.33W (1206)
- Excellent long-term stability with ΔR of $\pm 0.2\%$



Watch Video -
"Thin Film vs Thick Film
for High Reliability"

Precision Thick & Thin
Film Resistors
Selection Guide

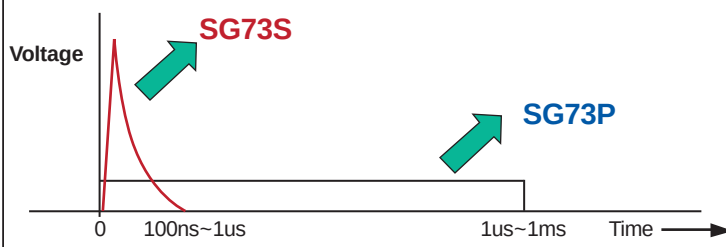
PRODUCT SERIES	0201	0402	0603	0805	1206	1210	2512
General Purpose	0.03W	0.05W	0.1W	0.125W	0.25W	0.5W	1W - 2W
Precision	0.03W	0.05W	0.1W	0.125W	0.25W	0.5W	1W - 2W
High Reliability	0.03W	0.05W	0.1W	0.125W	0.25W	0.5W	1W - 2W
Wide Terminal	0.03W	0.05W	0.1W	0.125W	0.25W	0.5W	1W - 2W



Excellent Surge & Pulse Withstanding Voltages

- ◆ **Surge overload**
High peak voltage, short duration
Ex.: CR discharge, ESD surge

- ◆ **Pulse overload**
Higher power than rated power, lower voltage than surge is applied for long time.
Ex.: Gate resistors of FET



Surge & Pulse Resistors
Sales Guide

Precision Thin Film

RN73H - for Automotive

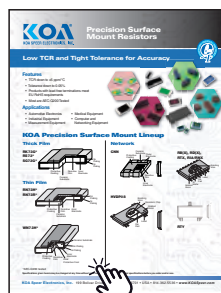
- High stability $\Delta R = 0.1\%$ after 3,000 hrs
- High precision tolerance: $\pm 0.05\% \sim \pm 1\%$
- High performance TCR: $\pm 5 \sim \pm 100\text{ppm}/^\circ\text{C}$

RN73R - High Reliability

- High precision tolerance: $\pm 0.05\% \sim \pm 1\%$
- High performance TCR: $\pm 5 \sim \pm 100\text{ppm}/^\circ\text{C}$



Watch Video -
"Improving Moisture Resistance
with RN73H Thin Film Resistors"



Precision Resistors
Sales Guide

WN73H Wide Terminal (Metal)

- High performance TCR: $\pm 10\text{ppm}/^\circ\text{C}$, $\pm 25\text{ppm}/^\circ\text{C}$, $\pm 50\text{ppm}/^\circ\text{C}$
- High precision tolerance: $\pm 0.1\% - \pm 0.5\%$
- Improved moisture resistance by special protective coating
- High precision resistor solution for tough environments, especially in high reliable automotive, medical, and industrial environments

Wide Terminal Thick Film

WG73 Surge Current Wide Terminal

- Superior to WK73 in pulse withstanding voltage
- Power rating: 1W (0612), 1.5W (1020), 2W (1225)
- Resistance range: 560m $\sim$ 1k Ω
- Tolerance: $\pm 10\%$, $\pm 20\%$



Watch Video -
"Advantages of Wide Terminal
Chip Resistors"



Wide Terminal
Sales Guide

WK73R Wide Terminal

- Offers excellent heat dissipation & achieves high rated power
- Power rating: 0.33W (0204), 0.66W (0306), 1W (0508), 1.5W (0612), 2W (1020), 3W (1225)



Wide Terminal
Type (WK73)
Heat Dissipation Image



Nominal Terminal
Type (RK73)
Heat Dissipation Image

SURFACE MOUNT RESISTORS (CONTINUED)

Surge Current Thick Film

SG73 High Pulse/Surge

- Superior to RK73 series in surge/pulse withstanding voltage
- Tolerance: $\pm 10\%$, $\pm 20\%$
- Power rating: 0.1W (0603), 0.125W (0805), 0.33W (1206), 0.5W (1210), 0.75W (2010), 1W (2512)

SG73G High Precision Pulse Power

- TCR: $\pm 50\text{ppm}/^\circ\text{C}$
- Tolerance: $\pm 0.25\%$, $\pm 0.5\%$
- Power rating: 0.33W (0603), 0.5W (0805, 1206)
- Ultra precision grade, high power

SG73P Pulse Resistant

- Superior to RK73 series in pulse withstanding voltage and high power
- Tolerance: $\pm 0.5\% \sim \pm 5\%$
- Power rating: 0.33W (0402), 0.5W (0603), 0.75W (0805), 1W (1206), 1.5W (1210)

SG73S Surge Resistant

- Superior to RK73 series in surge withstanding voltage and high power
- Tolerance: $\pm 0.5\% \sim \pm 5\%$
- Endures high ESD limiting voltage
- Power rating: 0.33W (0402), 0.5W (0603), 0.75W (0805), 1W (1206), 1.5W (1210)



Watch Video -
"Handling Pulse Power
with Surface Mount
Resistors"

High Voltage

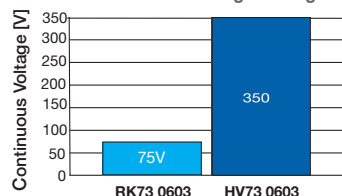
HV73 - High Voltage

- Superior to RK73 in maximum working voltage
- Absolute maximum working voltage as high as 800V (1206), 3000V D.C. (2512)
- Resistance range: 10k $\sim$ 100M Ω

HV73V - High Voltage for Automotive

- Superior to RK73 in maximum working voltage
- Maximum working voltage as high as 800V (1206)
- Resistance range: 10k $\sim$ 51M Ω

Use Fewer Resistors for High-Voltage



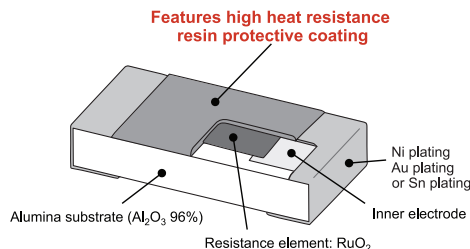
Watch Video -
"HV73 & HV73V High Voltage
Chip Resistors"

- Anti-Sulfuration Version - HV73RT - Only company to offer High Voltage resistor with sulfur proof terminations

High Temperature

HSG73P - High Temperature

- The maximum operating temperature of Sn plating products compatible with solder mounting is 175 $^\circ\text{C}$, and Au plating products compatible with conductive glue mounting is 200 $^\circ\text{C}$.



Automotive Resistors
Selection Guide

Mold Type

MWS-Power Type, Wirewound

- Power rating: 5W (package)
- Resistance range: 1 $\sim$ 470 Ω
- TCR: $\pm 200\text{ppm}/^\circ\text{C}$

SLR1 - High Temperature Resistance

- Resistance range: 301m $\sim$ 1M Ω
- Tolerance: $\pm 0.5\%$, $\pm 1\%$, $\pm 5\%$
- TCR: $\pm 100\text{ppm}/^\circ\text{C}$

Fusing

RF73 - Fusing Resistor

- Performs like RK73 under normal conditions
- Fuses when overloaded
- Fusing time: 60 seconds, maximum
- Fuses in less than 1 minute when subjected to specified overpower condition

MELF

CC, RD41 - Fixed Carbon Film MELF Resistor

- Metal plated terminals
- Power rating: 0.25W (RD41)
- Current rating: 2A- 5A (CC)

RN41 - Fixed Metal Film MELF Resistors

- Higher stability in short and long term tests
- TCR: ± 25 , $\pm 50\text{ppm}/^\circ\text{C}$
- Power rating: 0.4W (2ES), 1W (3AS)

Other Surface Mount Resistors

CPCN - Fixed Ceramic Resistor

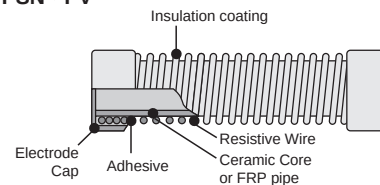
- Suitable for noise suppression of engine ignition systems
- Reliable in pulse/transient applications
- Power rating: 0.5W, 1.5W



P - High Voltage Power Resistor

- PSN is higher power (up to 250W) and for high voltage surge (up to 400kV)
- PSO is a completely moisture resistant version of PSN
- PN is non-inductive type and can be used for high frequency
- PWW is non-inductive wirewound resistor for high voltage with resistance wires wound on insulation pipes
- PAP is non-inductive wirewound resistor with inductance less than PWW, can be used for pulse wave measurement
- Wide power rating: 1.5 - 250W

PSN • PV



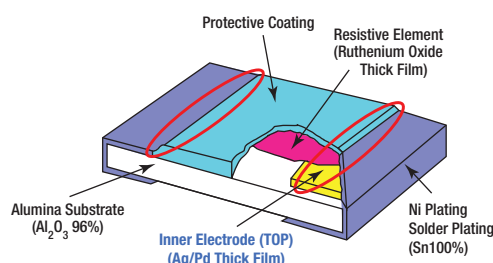
ANTI-SULFUR RESISTORS

Anti-Sulfuration Chip Resistors

Why Choose Anti-Sulfuration?

Sulfuration is a phenomenon that occurs in most thick film resistors with silver-based inner electrodes. When a resistor is used in a high-sulfur atmosphere, the sulfur molecules can migrate between the protective film and the outer electrode to the inner electrode, where they react to form silver sulfide. Silver sulfide is an insulator, and the resistance of the device increases toward an open circuit. KOA's product line includes resistors with sulfuration-resistant inner electrodes.

Structural Chart of Flat Chip Resistor (Standard)



All KOA Speer anti-sulfuration components (-RT) pass EIA-977 Anti-Sulfuration Testing

Chip Resistor Disconnected by Sulfuration

Needle Crystals of Silver Sulfide (Ag_2S)



General Purpose

RK73B-RT*

- General Purpose Flat Chip Resistor
- Tolerance: $\pm 2\%$, $\pm 5\%$
- Power rating: 0.03W (01005), 0.05W (0201), 0.1W (0402), 0.125W (0603), 0.25W (0805, 1206), 0.5W (1210), 0.75W (2010), 1W-2W (2512)

RK73H-RT*

- High Precision Flat Chip Resistor
- Tolerance: $\pm 0.5\%$, $\pm 1\%$
- Power rating: 0.03W (01005), 0.05W (0201), 0.1W (0402), 0.125W (0603), 0.25W (0805, 1206), 0.5W (1210), 0.75W (2010), 1W-2W (2512)

RK73Z-RT*

- Zero ohm with max. resistance of 50m Ω

* 0402 also available in KT style

High Precision

RK73G-RT

- Ultra Precision Flat Chip Resistor
- Tolerance: $\pm 0.25\%$, $\pm 0.5\%$, $\pm 1\%$
- TCR: $\pm 50\text{ppm}/^\circ\text{C}$
- Power rating: 0.1W (0402, 0603), 0.125W (0805), 0.25W (1206)

RS73-RT

- High reliability with ΔR of $\pm 0.2\%$
- Low TCR: $\pm 25\text{ppm}/^\circ\text{C}$, $\pm 50\text{ppm}/^\circ\text{C}$
- Power rating: 0.125W (0402), 0.2W (0603), 0.25W (0805), 0.33W (1206)



Watch Video - "Improving Sulfur Resistance in Thick Film Resistors"



Anti-Sulfur Sales Guide

Surge Current

SG73-RT

- Superior to RK73 series in surge withstanding voltage and pulse withstanding power
- Power rating: 0.1W (0603), 0.125W (0805), 0.33W (1206), 0.5W (1210), 0.75W (2010), 1W (2512)

SG73P-RT

- Pulse withstanding power
- Tolerance: $\pm 0.5\% \sim \pm 5\%$
- Power rating: 0.33W (0402), 0.5W (0603), 0.75W (0805), 1W (1206), 1.5W (1210)

SG73S-RT

- Surge Precision
- Tolerance: $\pm 0.5\% \sim 5\%$
- Power rating: 0.33W (0402), 0.5W (0603), 0.75W (0805), 1W (1206), 1.5W (1210)

Wide Terminal

WK73R-RT/WK73S-RT

- Power rating: 1W (0508 (WK73R-RT)), 1.25W (0508 (WK73S-RT)), 1.5W (0612), 2W (1020 (WK73R-RT)), 3W (1020 (WK73S-RT)), 1225 (WK73R-RT)), 4W (1225 (WK73S-RT))

High Voltage

HV73-RT

- Max working voltage as high as 3000V DC (2512)
- Power rating: 0.1W (0603), 0.25W (0805, 1206), 0.5W (2010), 1W (2512)

HV73V-RT

- High Voltage Flat Chip Resistor for Automotive
- Power rating: 0.1W (0603), 0.25W (0805), 0.33W (1206)

High Temperature

HSG73P-RT

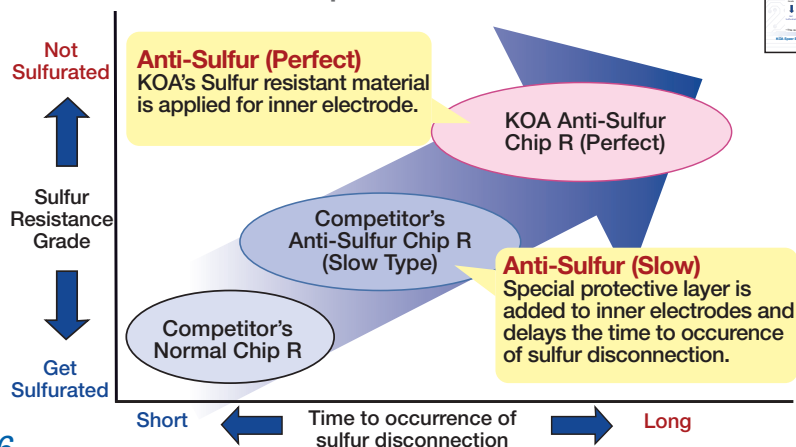
- Superior to RK73 series chip resistors pulse withstanding voltage and high power
- Power rating: 0.2W (0402), 0.33W (0603), 0.5W (0805), 0.75W (1206)

Current Sense

SR73-RT

- Low Resistance (0.1~10 Ω)
- Power rating: 0.166W (0402), 0.2W (0603), 0.5W (0805, 1206), 0.66W (1210)

Anti-Sulfur Performance Comparison



CURRENT SENSE / SHUNT RESISTORS

Metal Plate

TLR-Current Sensing, Low Resistance

- Power rating: 1W (0805), 2W (2010), 3W (1206), 5W (2512)
- Resistance range: 0.5m ~ 20mΩ
- TCR: ± 50 , ± 75 , ± 100 , ± 150 ppm/°C

TLRH-Current Sensing, Extended Resistance Range, Low Resistance

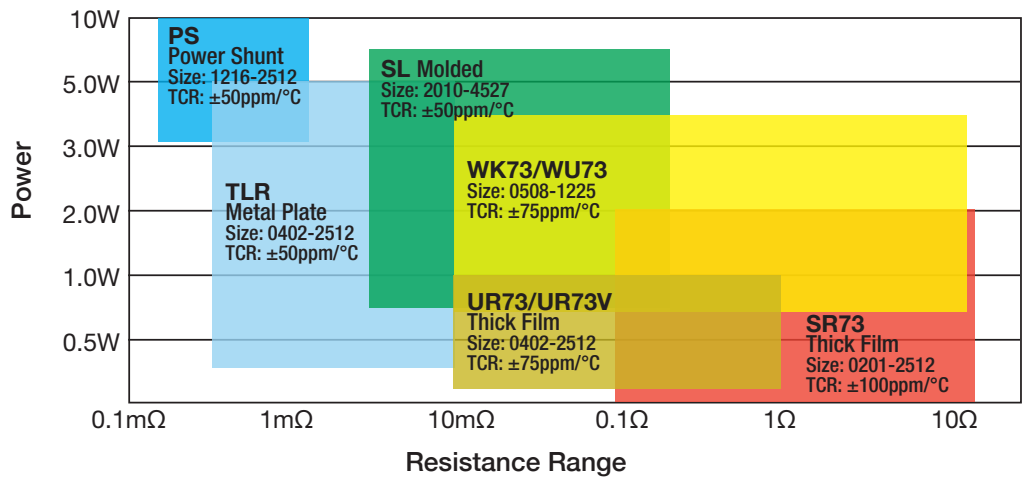
- Power rating: 0.5W (0805), 5W (2512)
- Resistance range: 6m ~ 270mΩ
- TCR: ± 50 , ± 75 ppm/°C

TLRZ-Current Sensing, Zero Ohm Jumper

- Current Ratings: 10A (0402), 26A (0603), 31.6A (0805), 50A (1206)
- Ultra low resistance not to exceed 0.5mΩ



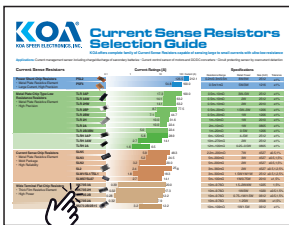
KOA Current Sense Resistor Lineup



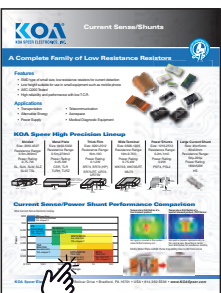
Watch Video -
"Handling Pulse Power with
Surface Mount Resistors"



Watch Video -
"Choosing Technologies for
Current Sense Resistors"

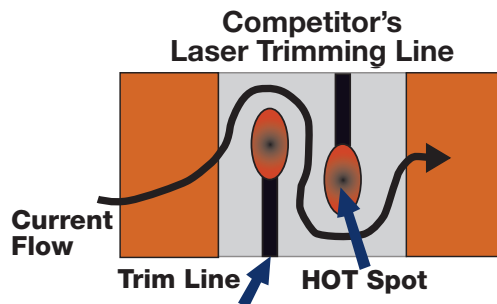


Current Sense
Selection Guide

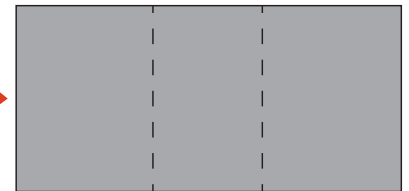


Current Sense
Sales Guide

KOA's Metal Plate LARGE Pulse Capability Due to NO Trim Lines



KOA's Special Trimming



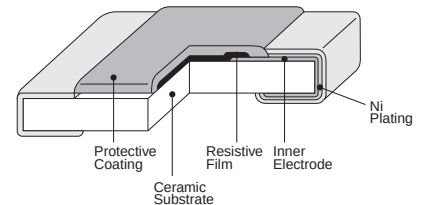
Thick Film

SR73-Low Resistance

- Resistance range: 24m ~ 10Ω
- TCR: Down to 100ppm/°C
- Tolerance: $\pm 0.5\%$ ~ $\pm 5\%$

UR73-Low Resistance, Low TCR

- Resistance range: 10m ~ 100mΩ
- TCR: Down to ± 100 ppm/°C
- Power rating: 0.125W (0402), 0.25W (0603), 0.33W (0805), 0.5W (1206), 1W (2512)



UR73V-High Heat, Low Resistance, Low TCR

- Operating temp range: -55°C ~ +155°C
- Resistance range: 10m ~ 1Ω
- TCR: ± 75 ppm/°C available
- Power rating: 0.5W (0805), 1W (1206)

CURRENT SENSE / SHUNT RESISTORS (CONTINUED)

Wide Terminal Thick Film**WK73S-Low Resistance, Wide Terminal**

- Power rating: 1.25W (0508), 1.5 W (0612), 3W (1020), 4W (1225)
- Resistance range: 10m ~ 9.76Ω
- Tolerance: $\pm 0.5\%$, $\pm 1\%$, $\pm 5\%$

WU73-Low Resistance, Wide Terminal

- Power rating: 1W - 1.5W (0612)
- Resistance range: 10m ~ 100mΩ
- Tolerance: $\pm 1\%$
- TCR: ± 75 , ± 100 ppm/°C

Power Shunts**PSF4-Large Current Sensing, Ultra Low Resistance, 4-Terminal, Low TCR**

- Resistance range: 0.5m, 1mΩ
- Power rating: 3W, 5W (1216)
- TCR: ± 50 ppm/°C

PSG4-Large Current Sensing, Ultra Low Resistance, 4-Terminal, High Power

- Resistance range: 0.5mΩ
- Power rating: 10W (2725)
- TCR: ± 50 ppm/°C

PSL2-Large Current Sensing, Ultra Low Resistance, 2-Terminal

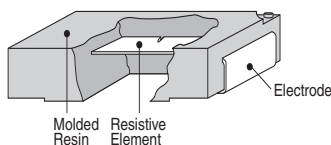
- Resistance range: 0.2m, 0.3m, 0.5mΩ
- Power rating: 8W, 9W (2512)
- TCR: Down to ± 115 ppm/°C
- Tolerance: $\pm 1\%$

Molded Metal Plate**CSR-Current Sensing 4-Terminal, Molded**

- Power rating: 1W (CSR1), 2W (CSR2)
- TCR: ± 50 ppm/°C
- Resistance values: 5m ~ 50mΩ
- Tolerance: $\pm 0.5\%$, $\pm 1\%$

SL-Current Sensing, Low Resistance

- Power rating: 0.75W (2010), 1W (2512), 2W (SL2 4527)
- Resistance range: 3m ~ 360mΩ
- Tolerance: $\pm 0.5\%$ ~ $\pm 5\%$
- TCR as low as: ± 50 ppm/°C

**SLN-SLW-Higher Power Current Sensing**

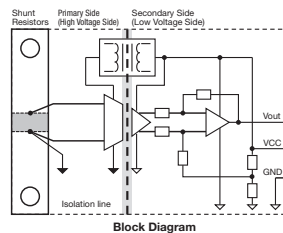
- Power rating: 1W (2010), 1.5W (2512), 7W (4527)
- TCR: As low as ± 50 ppm/°C
- Resistance range: 3m ~ 200m
- Tolerance: $\pm 0.5\%$, $\pm 1\%$, $\pm 5\%$

TSL-Low Profile Current Sensing

- Power rating: 1W (2512)
- Resistance range: 5m ~ 100mΩ
- Tolerance: $\pm 0.5\%$, $\pm 1\%$, $\pm 5\%$

Shunt Current Sensor**VSM0001- Shunt Current Sensor**

- Large current detection via shunt resistor
- High precision current sensing
- Low input loss
- Current rating: ± 200 A, ± 400 A

**Networks****CNN-Thin Film Chip Network**

- Excellent in relative TCR ($\pm 0.05\%$, $\pm 0.1\%$)
- Pair resistors for high precision OP-amplifiers

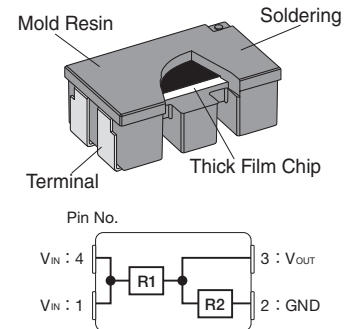
HVD-P08 - High Voltage Divider-Precision Type

- Max. working voltage 1000V
- Relative resistance tolerance: 0.1% ~ 0.5%
- Relative TCR tracking: 10ppm/°C, 25ppm/°C
- Absolute resistance tolerance: $\pm 0.1\%$ ~ $\pm 1\%$

MHVD-High Voltage Divider

Max. working voltage 1500V

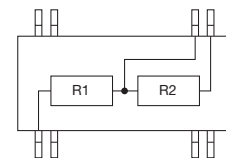
- Relative resistance tolerance: 0.25%, 0.5%
- Relative TCR tracking: 25ppm/°C, 50ppm/°C
- Absolute resistance tolerance: $\pm 0.25\%$, $\pm 0.5\%$

**RBA, RBB-Bussed Resistor Network**

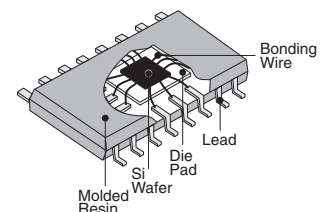
- Resistance range: 10 ~ 100kΩ

RDA, RDB-Terminator Network

- Resistance range: R1-150~10k
- R1:R2=1:1~1:4

**RIA-Isolated Resistor Network**

- Absolute tolerance: $\pm 0.1\%$ ~ $\pm 5\%$

**RLA-R/2R- Ladder Network**

- Resistance range: 1k~30k

RNX-High Precision Custom Resistor Network

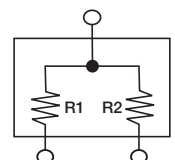
- Resistance range: 10 ~ 510kΩ

RTX-Thin Film Network

- Resistance range: 51 ~ 40kΩ

RTY-Precision Voltage Divider Thin Film

- Ratio matching
- TCR: ± 10 , ± 25 , ± 50 , ± 100 ppm/°C
- TCR tracking: 5 ~ 50ppm/°C



LEADED RESISTORS

General Purpose

CF-Carbon Film

- Flameproof coating available (CFP)
- Reduced body size offered (CFS, CFPS)
- Power rating: 0.25W (1/4), 0.5W (1/2)

Precision

MF-Precision Metal Film

- MFS two times the power rating of the standard body type
- Resistance range: 0.51 ~ 5.11M Ω
- Tolerance: $\pm 0.5\%$, $\pm 1\%$, $\pm 2\%$

RK-Metal Glaze Discharge Path Resistors

- Highly stable against environmental conditions and overload
- Power rating: 0.25W, 0.5W, 1W
- RK1/2G: Discharge path resistor
- UL1676 available

RNS-High Precision Metal Film

- Excellent long term stability
- Resistance range: 0.2 ~ 6.8M Ω
- Tolerance: $\pm 0.1\%$ ~ $\pm 1\%$

SN3A/3D- High Precision

- TCR: $\pm 50\%$, $\pm 100\%$, $\pm 200\text{ppm}/^\circ\text{C}$
- Wide resistance range: 10 ~ 1.5M Ω
- Power rating: 1W (SN3A), 2W (SN3D)

SNF- Flame Retardant, Fixed Resistor

- Wide resistance range: 0.47 ~ 100 Ω

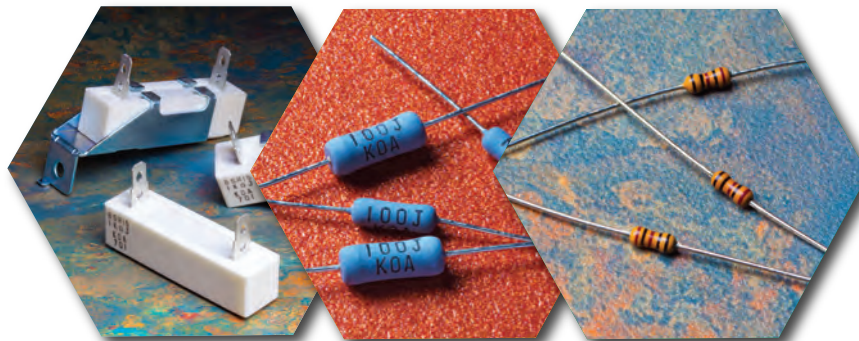
High Voltage

GS-High Voltage, High Resistance Thick Film

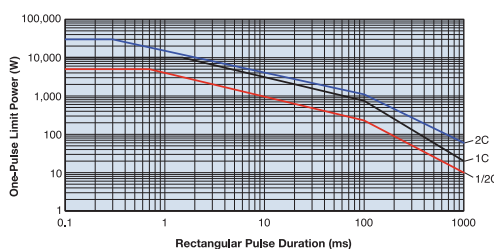
- Miniature construction can endure high continuous voltage (up to 40kV)
- High power rating up to 12W
- Excellent anti-surge characteristics
- Wide resistance range: 500k ~ 10G Ω

HPC-Ceramic Resistor for Anti-Pulse Surge

- KOA original bulk ceramic resistor
- Higher reliability against disconnection compared to wirewound resistors and film resistors
- Power rating: 0.5W ~ 5W



PCF Series One Pulse Limit Power Curve



PCF-Ceramic Resistor for Anti-Pulse Surge

- KOA original bulk ceramic resistor
- Coated with UL94 V-0 flameproof material
- Power rating: 0.5W ~ 2W

RCR-Anti-Surge Resistor

- Excellent anti-surge characteristics
- RCR50+ (1M Ω ~ 12M Ω), RCR50EN (1M ~ 12M Ω) and RCR60 are conductive-path and discharge path resistors recognized by UL1676 and c-UL (CSA-C22.2 No. 1-M94)
- RCR25EN, RCR50EN (100k ~ 33M Ω), RCR60 (100k ~ 56M Ω) are approved by EN6268-1 G.10 safety.

Power

BGR, BSR, BWR, -High Power Resistors

- Uses flame retardant insulated ceramic case
- Power rating: BGR - 5W ~ 40W, BSR - 2W ~ 20W, BWR - 1W ~ 20W
- Various styles available

BGRV, BWRV, BSRV-High Power Resistors for Automotive

- Uses flame retardant insulated ceramic case
- Excellent in anti-pulse and in rush current
- Power rating: BGRV - 5W ~ 40W, BSRV - 3W ~ 20W, BWRV - 3W ~ 60W

MOS/MOSX-Reduced Size Metal Oxide Power Type

- MOS/MOSX Small size power type resistor
- Power rating: 0.5W - 5W
- Resistance range: MOS- 10 ~ 100k Ω , MOSX - low resistance range: 0.1 ~ 9.1 Ω

SPR-Power Carbon Film

- High reliability performance
- Power rating: 0.25W - 5W



Surge & Pulse Sales Guide

LEADED RESISTORS (CONTINUED)

Wirewound

CW-Coat Insulated Wirewound Resistor

- CW1SS- UL1412 approval (file No. E320246)
- CW_X - power type & CW_S - small type available
- Power rating: 0.25W - 5W
- Tolerance: $\pm 2\%$, $\pm 5\%$, 10%

CWFS-Coat Insulated Wirewound Resistor with Fusing Function

- Fail-safe fusing at AC 250V
- Fusing power: 90W (CWFS23), 150W (CWFS35)
- Fusing time: 30 S. Max

CW_H-Miniature Wirewound Leaded Resistor

- Meets MIL-PRF-26 (U characteristics)
- High precision resistor with a TCR of less than $\pm 20 \text{ ppm}/^\circ\text{C}$
- Resistance range: $0.1 \sim 3 \text{ k}\Omega$
- Tolerance: $\pm 0.5\% \sim \pm 1\%$

CW_P-Precision Coat Insulated Wirewound Resistor

- Flameproof silicone coating equivalent (UL94 V-0)
- TCR: ± 50 , $\pm 90 \text{ ppm}/^\circ\text{C}$
- Tolerance: $\pm 0.25\%$, $\pm 0.5\%$, $\pm 1\%$

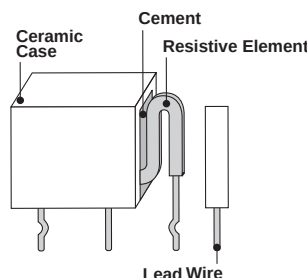
RW-Coat-Insulated Miniature Precision Power Wirewound Resistor

- Meets MIL-R-26E (U and V characteristics) and surface temperature (hot spot) 350°C max.
- Wide resistance range: $0.1 \sim 62 \text{ k}\Omega$
- RW_N are non-inductive wound and can be used in high frequency applications
- Tolerance: $+0.5\% \sim \pm 5\%$

Current Sense

BPR-Rectangular Metal Plate Resistor

- Power type current detecting resistor with flame retardant ceramic case
- Automatic insertion for a 5mm pitch between terminals is applicable (26 type, 58 type)
- Low resistance range: $0.01 \sim 1 \Omega$



LR-Custom Milliohm Resistor

- Pitches and heights are adjustable according to mounting conditions
- All custom made parts
- Max. current rating: $3 \text{ A} \sim 21 \text{ A}$

Fusing

RF-Coat Insulated Fusing Resistor

- Quick fusing protects circuit from excessive overload at an abnormal time
- Fusing time: 30s max, 60s max
- Flame-retardant coating equivalent to UL94 V-0
- Fusing power: $2.5 \text{ W} \sim 36 \text{ W}$

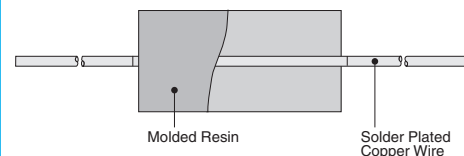
RF25CC-Coat-Insulated Fusing Resistor

- Constant current fuse type
- Fuse with 60 sec in case of over-current
- Flame retardant coating equivalent to UL94 V-0
- Fusing power: 1.25 W , 2.5 W

Jumper

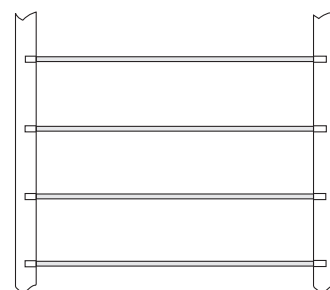
J-Molded Jumper

- Max. allowable current: 8A, 10A



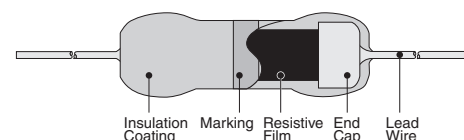
JL-Jumper Wire

- Suitable for automatic machine insertion
- Max. current rating: 8A (5), 10A (6), 12A (8),
- Gauge wire: 24 (JL5), 22 (JL6), 20 (JL8)



Z-Jumper (Coating Type)

- Max. Amperage: 15A
- Resistance: $20 \text{ m}\Omega$ or less



Automotive Application Resistors Selection Guide

The table includes columns for Resistor Type, Resistance Range, Power Rating, Temperature Coefficient (TCR), and other specifications. A hand icon points to the 'Automotive Application Resistors' section of the guide.

Automotive Resistors Selection Guide

THERMAL SENSORS/THERMISTORS

Platinum Thin Film Thermal Sensors (Through-Hole)

SDT101-Axial Platinum Thin Film Thermal Series

- Stable characteristics even in use for a long time with an excellent environment resistance
- Resistance: $10\Omega \sim 1k\Omega$

SDT310-Small Type Platinum Thin Film Thermal Sensor

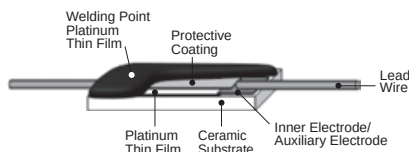
- TCR: $3850\text{ppm}/^\circ\text{C}$
- Thermal time constant is improved with the small package
- Operating temperature range: $-55^\circ\text{C} \sim 155^\circ\text{C}$, $-55^\circ\text{C} \sim 400^\circ\text{C}$, $-55^\circ\text{C} \sim +650^\circ\text{C}$

SDT310HCTP-Small Type Platinum Thin Film Thermal Sensor

- Small package of $1.2\text{mm} \times 3\text{mm}$ with 100Ω resistance
- Operating temperature range: $-55^\circ\text{C} \sim +300^\circ\text{C}$, $-55^\circ\text{C} \sim +400^\circ\text{C}$

SDT310VSP2-Small Type Platinum Thin Film Thermal Sensor, Fast Response

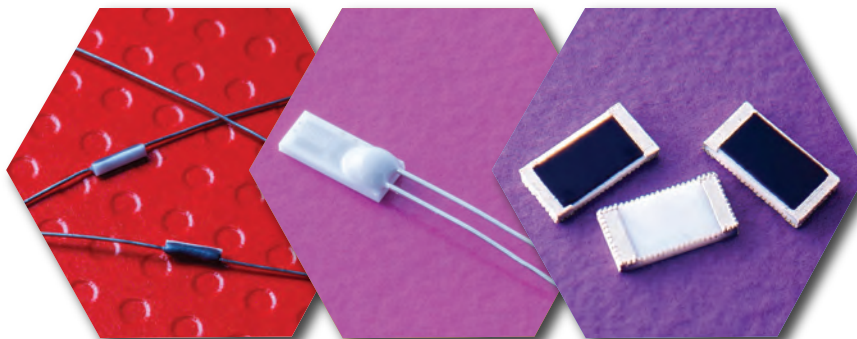
- Achieves a thermal time constant 2.8 seconds due to volume reduction
- Excellent heat-resistance
- Applies axial lead type suitable to use as a heater element



Platinum Thin Film Thermal Sensors (Custom)

ST-Custom Thermal Sensor

- All ST-series thermal sensors are custom designed in various shapes in accordance with your application
- Resistance values at 0°C : $100, 500, 1k\Omega$
- Utilize SDT310 or SDT101



Platinum Thin Film Thermal Sensors (Surface Mount)

SDT73H

- TCR: $3850\text{ppm}/^\circ\text{C}$
- Resistance values at 0°C : $100, 500\Omega$
- Thermal time constant: 6.5 seconds

SDT73S

- TCR: $3850\text{ppm}/^\circ\text{C}$
- Operating temperature range: $-55^\circ\text{C} \sim +250^\circ\text{C}$
- Thermal time constant: 6.5 seconds

SDT73V-Automotive

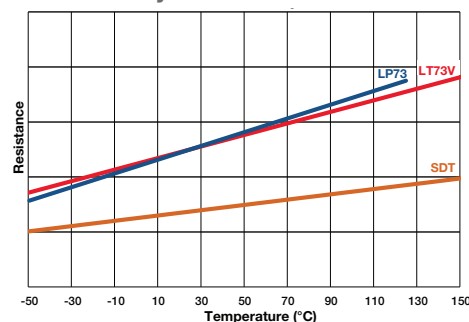
- TCR: $3850\text{ppm}/^\circ\text{C}$
- Operating temperature range: $-55^\circ\text{C} \sim +155^\circ\text{C}$
- Thermal dissipation constant: $2.4\text{mW}/^\circ\text{C}$
- Resistance values at 0°C : $100\Omega, 500\Omega$
- Thermal time constant: 6.5 seconds

NEW WTP-For Wire Bonding

- TCR: $3850\text{ppm}/^\circ\text{C}$ in accordance with JIS-IEC standards
- Electric structure suitable for Al wire bonding of thick lines
- Thermal time constant: 8.3 seconds

Thin Film Thermistors and PTC Thermistors

Thermistor Styles



LP73-Thin Film Thermal Sensors of SMD Type

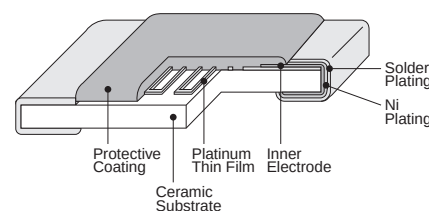
- Suitable for control of temperatures in various industrial equipment
- Sizes: 0603, 0805, 1206
- TCR tolerance: $\pm 5\%$
- Resistance: $100\Omega \sim 1k\Omega$

LT73-Linear Positive Tempco Thermistor

- TCR: $150 \sim 4500\text{ppm}/^\circ\text{C}$
- Thermal time constant: 1 second, 1.5 seconds
- Resistance: $51\Omega \sim 51k\Omega$

LT73V-Linear Positive Tempco Through-hole for Automotive

- TCR: $150 \sim 4500\text{ppm}/^\circ\text{C}$
- Sizes: 0805, 1206
- Resistance: $51\Omega \sim 22k\Omega$



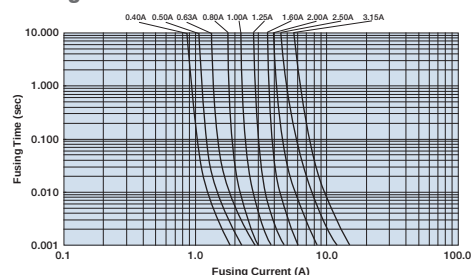
FUSES, VARISTORS, HYBRID IC & OTHER PRODUCTS

Fuses – Flat Chip

CCF1F-Anti Surge, Anti-Sulfuration Chip Fuse

- Meets IEC60127-4 specifications (7A or less)
- Stable fusing characteristics due to proprietary technology
- Current rating: 0.4 ~ 15A
- Standard size: 2410

Fusing Characteristics



CCF1N-Anti-Surge Chip Fuse

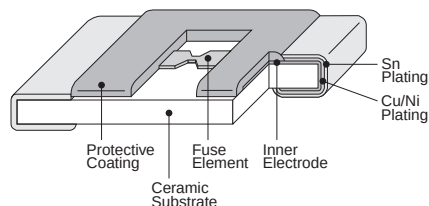
- Current rating: 400mA ~ 30A
- UL248, 14, c-UL(CAS)C22.2 approved
- Up to 125V AC and 160V DC
- Standard size: 2410

RF73-Fusing Flat Chip Resistor

- Resistance range: 0.2 ~ 510Ω
- Sizes available: 0603, 2512
- UL1412 Approved (0805 ~ 2512 sizes)

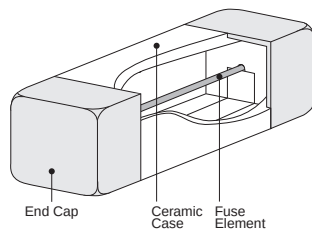
TF-Thin Film Chip Fuse

- Rated current from 0.20 ~ 5A
- Sizes available: 0402, 0603
- TF16AT is anti-pulse



TF16VN - Chip Current Fuse for Automotive

- Small and light for the secondary circuit
- Current rating: 0.40 - 3.15A
- Anti-pulse type in 0603 size



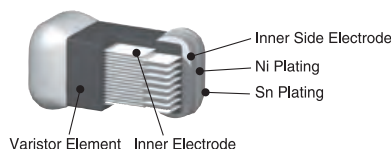
Varistors

NV73-Metal Oxide Varistor

- Protects against static electricity, switching and incoming surges
- Clamping voltage: 18V ~ 100V
- Max. peak current I_p (2 times): up to 70A

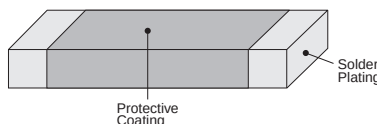
NV73DL-Metal Oxide Varistor for Automotive

- Ideal for countermeasures against ESD (conforming to IEC61000-4-2)
- Clamping voltage: 24V ~ 135V
- Max. energy type up to 1.5J



NV73S - Multilayer Type Metal Oxide Varistor

- Multilayer construction allows its small size to absorb a large surge
- Clamping voltage: 27V ~ 248V
- Max. peak current I_p (1 time): up to 6,000A



Hybrid IC

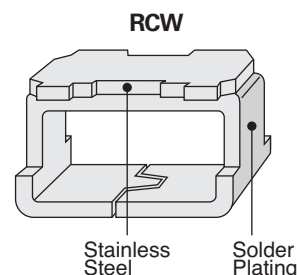
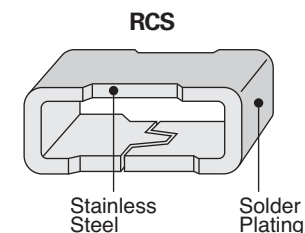
KA-Hybrid IC

- High density mounting by bonding (COB)
- Adjustment processes are decreased by function and ratio trimmings
- Conductor: Ag-Pd, Ag-Pt
- Printed resistor: 5Ω ~ 10MΩ $\pm 100 \times 10^{-6}/K$

Other Products

RC-Test Point Chip

- Surface-mountable chip type test terminal
- Standard resistance: 50mΩ or less
- Sizes available: 0603, 0805, 1206
- AEC-Q200 Qualified (RCU only)



Automotive Resistors Selection Guide

AUTOMOTIVE APPLICATION RESISTORS

Automotive Application Resistors



APPLICATION

	General Purpose	High Precision	High Precision & High Reliability	Wide Terminal	Surge & Pulse	High Heat & Pulse	High Voltage & Voltage Sensing	Precharge & Discharge	Current Sensing & Low Resistance	Circuit Protection/Fuse	Thermal Sensing	Jumpers
	RK73B/H ^{1,3} (incl. AT ver.) 	RK73G ¹ 	RN73H ² RN73R ² , RS73 ¹ 	WK73R ¹ WK73S ¹ WU73 	SG73(S/P/G) ¹ WG73 	HSG73P ² 	HV73V ¹ 	B_RV ² HPC ² , PCF ² 	TLR(H) ² , UR73V ² WK73S ¹ , WU73 	TF16VN 	SDT73V WTP 	RK73Z ^{1,3} TLRZ ²
ICE - Power Unit - Engine ECU												
ICE - Power Unit - Exhaust Gas Sensor ECU												
ICE - Power Unit - Engine Ignition System												
ICE - Fuel Injection System												
EV - Power Control Unit												
EV - On-Board Charger												
EV - Battery Management System												
EV - In-Wheel Motor												
EV - Motor Drive Inverter												
EV - EPS												
EV - Electronic Parking Brake ECU												
EV - Charging Station												
Drive/Brake - Transmission ECU												
Drive/Brake - Braking ECU (ABS/ASC/ESC)												
Autonomous Driving - ECU												
Autonomous Driving - Radar												
Autonomous Driving - Sensing Camera												
Autonomous Driving - LiDAR												
Autonomous Driving - Sonar ECU												
Autonomous Driving - Driver Monitoring Sys.												

¹ Available in Anti-Sulfur Version

ICE

EV

Drive/Brake

Autonomous Driving

² Non-Sulfur Sensitive

³ RoHS Exemption Free available



APPLICATION

	General Purpose	High Precision	High Precision & High Reliability	Wide Terminal	Surge & Pulse	High Heat & Pulse	High Voltage & Voltage Sensing	Precharge & Discharge	Current Sensing & Low Resistance	Circuit Protection/Fuse	Thermal Sensing	Jumpers
	RK73B/H ^{1,3} (incl. AT ver.) 	RK73G ¹ 	RN73H ² RN73R ² , RS73 ¹ 	WK73R ¹ WK73S ¹ WU73 	SG73(S/P/G) ¹ WG73 	HSG73P ² 	HV73V ¹ 	B_RV ² HPC ² , PCF ² 	TLR(H) ² , UR73V ² WK73S ¹ , WU73 	TF16VN 	SDT73V WTP 	RK73Z ^{1,3} TLRZ ²
Body/Security - Integrated ECU												
Body/Security - Gateway ECU												
Body/Security - Lamp Module												
Body/Security - Door Control Module												
Body/Security - Airbag ECU												
Body/Security - Air Conditioning Controller												
Body/Security - Digital Mirror												
Body/Security - Air Conditioning Compressor												
Infotainment - Cockpit												
Infotainment - HUD ECU												
Infotainment - ITS Connect												

¹ Available in Anti-Sulfur Version

Body/Security

Infotainment

² Non-Sulfur Sensitive

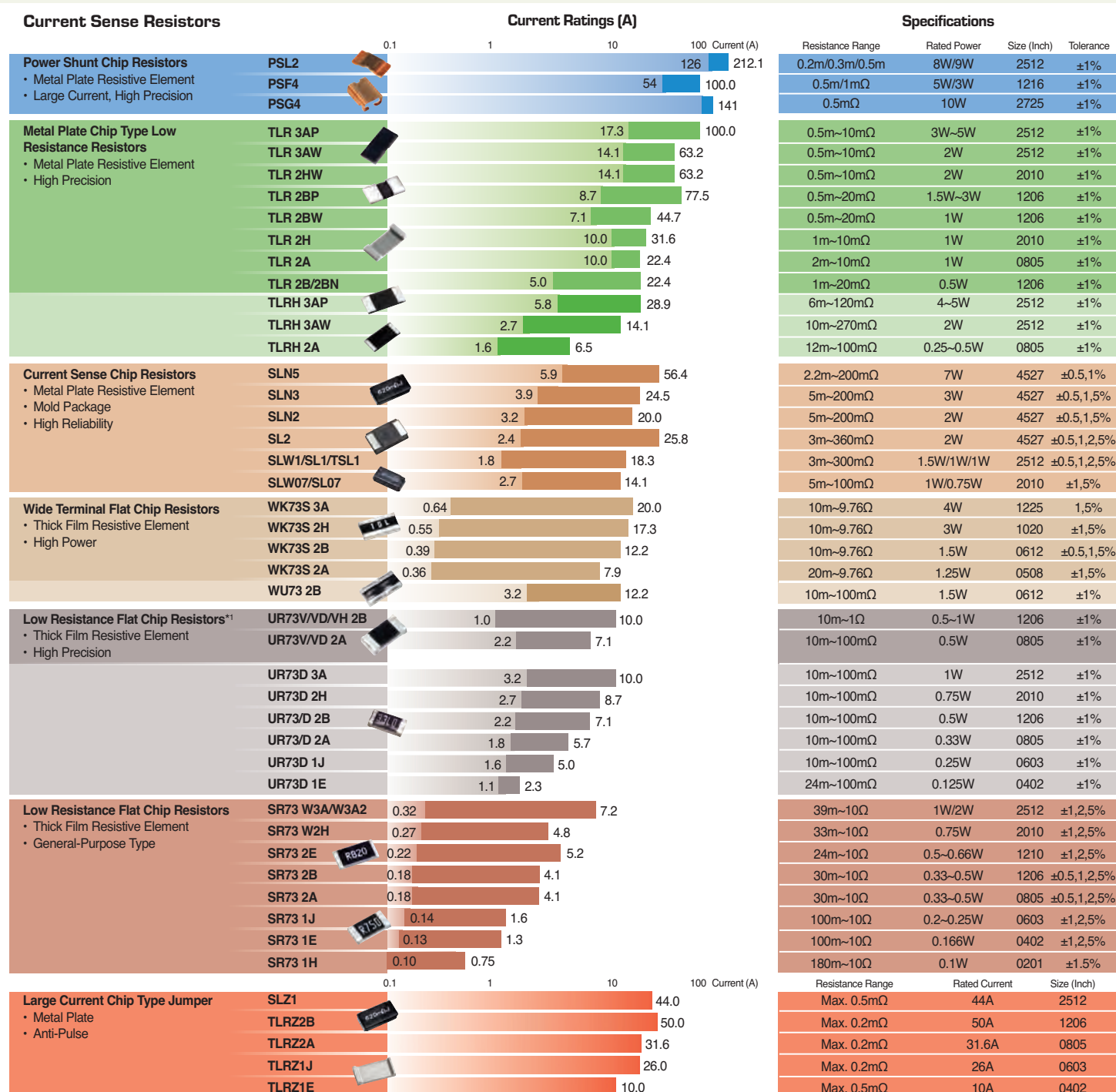
³ RoHS Exemption Free available

CURRENT SENSE RESISTORS SELECTION GUIDE

Current Sense Resistors Selection Guide

KOA offers complete family of Current Sense Resistors capable of sensing large to small currents with ultra-low resistance

Applications: Current management sensor including charge/discharge of secondary batteries • Current control sensor of motors and DC/DC converters • Circuit protecting sensor by overcurrent detection



* This selection guide plots the current value calculated from $\sqrt{\text{Power rating} \div \text{upper or lower limit of resistance}}$. Please build the design considering heat dissipation.

* This is the guideline to select products by current value. (Please confirm product specification for actual design and selecting products and use the products based on the precautions to use.)

* Please confirm our catalog or delivery specification for the details of each product.

*¹ UR73/UR73D is only applied for car accessories as automotive use. Please ask us for details.

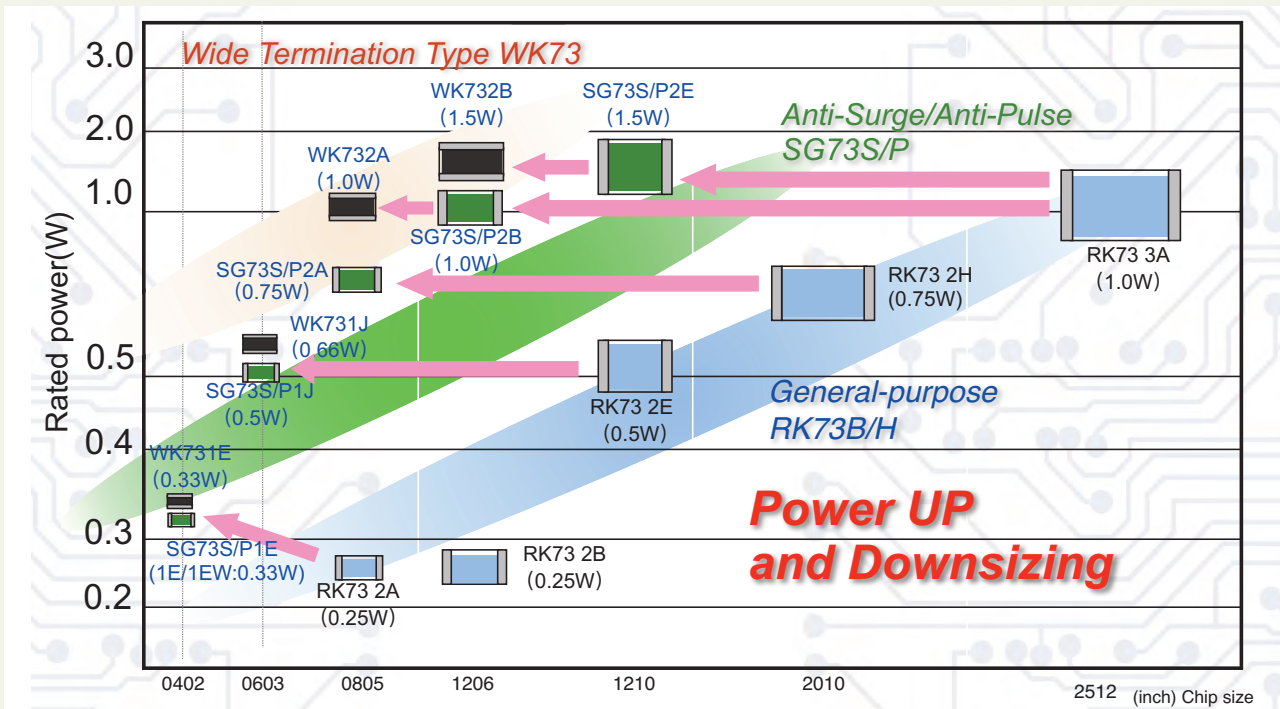
Main Applications

1. Current management sensor including charge/discharge of secondary batteries
2. Current control sensor of motors and DC/DC converters
3. Circuit protecting sensor by overcurrent detection

DOWNSIZING

Increasing Power Ratings

Downsizing Through Greater Stability & Temperature Management



Power Density/Downsizing Product Options

WATT	SIZE							
	2512	2010	1210	1206	0805	0603	0402	01005
0.03								RK73B/H1F ¹
0.05								RK73B/H1H ¹
0.1						RK73B/H1J ^{1,3}	RK73B/H1E ^{1,3}	SR731H
0.125						RK73B/H1J ¹	SG73P/S1E ¹	
0.166							SR731E ¹	
0.2						SG73P/S1J ¹		
0.25				RK73B/H2B ^{1,3}	RK73B/H2A ^{1,3}	SR731J	SG73P1EW	
0.33			RK732EB/H ³	SG73P/S2B ¹	SR732A ¹	WN73H1J ^{2,4}	SG73P1EW	SG73P/S1E ¹
0.5		RK73B/HW2H ³	RK73B/H2E ¹	SR732B ¹	SR732A ¹	SG73P/S1J ¹	WK73R1J	WK73R1E
0.66			SR732E ¹			WK73R1J		
0.75		RK73B/H2H ¹		WK73R/S2B ¹	SG73P/S2A ¹	WK73R2A ¹		
1.0	RK73B/H3A ¹	WK73R/S2H ¹		SG73P/S2B ¹	WK73R2A ¹			
1.25	RK73BW/HW3A ¹			UR73VH2B ²				
1.5	SR733A/W3A			WG732B				
2.0				WN73H2B ²				
3.0				WU732B				
4.0								

= Rated Terminal Temp. below 125°C

Rated Terminal Temp. is 125°C unless otherwise noted

¹ Available in Anti-Sulfur Version ² Non-Sulfur Sensitive

³ RoHS Exemption Free available (2512 is RK73B/HW3A series) ⁴ = 0.3 Watt

NOTE: WG73, WK73, WN73H, WU73 (Wide terminal film resistors are reverse geometry)

LAB KITS

Surface Mount Resistors

Anti-Sulfur Precision Flat Chip Resistors

RK73H1ERT-Kit1 (0402 chip size)

122 values, 100 pcs each

RK73H1JRT-Kit1 (0603 chip size)

122 values, 100 pcs each

Precision Flat Chip Resistors

RK73H1FTK001Kit (01005 chip size)

38 values, Lead-free, 25 pcs each (10R0 ~ 620K = $\pm 1\%$)

RK73H1HTK001Kit (0201 chip size)

217 values, Lead-free, 50 pcs each (0, 10R0 ~ 1M00 = $\pm 1\%$)

RK73H1ETK001 (0402 chip size)

122 values, Lead-free, 100 pcs each (0, 10R0 ~ 1M00 = $\pm 1\%$) E-24

RK73H1JTK001 (0603 chip size)

122 values, Lead-free, 100 pcs each (0, 10R0 ~ 1M00 = $\pm 1\%$) E-24

RK73H2ATK001 (0805 chip size)

122 values, Lead-free, 100 pcs each (0, 10R0 ~ 1M00 = $\pm 1\%$)

RK73H2BTK001 (1206 chip size)

122 values, Lead-free, 100 pcs each (0, 10R0 ~ 1M00 = $\pm 1\%$)

General Purpose Flat Chip Resistors

RK73B1FTK001Kit (01005 chip size)

51 values, Lead-free, 25 pcs each (0, 10 ~ 1M = $\pm 5\%$)

RK73B1HTK001Kit (0201 chip size)

139 values, Lead-free, 50 pcs each (0, 2R2 ~ 2M2 = $\pm 5\%$)

High Voltage Flat Chip Resistors

HV73TK001Kit (0603, 0805, 1206, 2010 chip sizes)

156 values, Lead-free, 25 pcs each (10k ~ 10M = $\pm 1\%$)

Surge Current Flat Chip Resistors

SG73TK001Kit (0603, 0805, 1206, 1210, 2010, 2512 chip sizes)

204 values, $\pm 10\%$, Lead-free, 25 pcs each

SG73STK001Kit (0603, 0805, 1206, 1210 chip sizes)

101 values, $\pm 1\%$, Lead-free, 25 pcs each

SG73PTK001Kit (0603, 0805, 1206, 1210 chip sizes)

97 values, $\pm 1\%$, Lead-free, 25 pcs each

Wide Terminal Flat Chip Resistors

WK731JT-Kit1 (0306 chip size) (WK73R Series)

73 values, Lead-free, 100 pcs each ($\pm 1\%$)

WK732AT-Kit1 (0508 chip size)

138 values, Lead-free, 100 pcs each ($\pm 1\%$)

WK73TK001Kit (0612, 1020, 1225 chip sizes)

64 values, Lead-free, 25 pcs each ($\pm 1\%$, $\pm 5\%$)

WK732BT-Kit1 (0612 chip size)

145 values, Lead-free, 100 pcs each ($\pm 5\%$)

WK732HT-Kit1 (1020 chip size)

145 values, Lead-free, 100 pcs each ($\pm 1\%$, $\pm 5\%$)

WK733AT-Kit1 (2512 chip size)

145 values, Lead-free, 200 pcs each $\pm 1\%$, $\pm 5\%$

WN73H1JT-Kit1 (0306 chip size)

32 values, Lead-free, 100 pcs each ($\pm 0.1\%$)

WN73H2BT-Kit1 (0612 chip size)

37 values, Lead-free, 100 pcs each ($\pm 0.1\%$)

WU73TK001Kit (0612 chip sizes)

27 values, Lead-free, 20 pcs each ($\pm 1\%$)



LAB KITS (CONTINUED)

Current Sense Resistors

Surface Mount Molded

SLW07TK001Kit (2010, 1W size)

27 values, 20 pcs each ($\pm 1\%$)

SLW1TK001Kit (2512, 1.5W size)

25 values, 20 pcs each ($\pm 0.5\%$)

SL1TK001Kit (2512, 1W size)

33 values, 20 pcs each ($\pm 1\%$)

SL2TK001Kit (4528, 2W size)

45 values, 20 pcs each ($\pm 1\%$)

SLN3TK001Kit (4528, 3W size)

32 values, 20 pcs each ($\pm 0.5\%$)

SLN5TK001Kit (4528, 5W size)

21 values, 10 pcs each ($\pm 0.5\%$)

TSL1TK001Kit (2512, 1W size)

33 values, Lead-free, 20 pcs each ($\pm 1\%$)

SLRTK001Kit (2513, 1W size)

40 values, 15 pcs each ($\pm 1\%$)

Metal Plate

TLR2ATK001Kit (0805 chip size)

6 values, 20 pcs each ($\pm 1\%$)

TLR2BWD-Kit (1206 chip size)

17 values, 15 pcs each ($\pm 1\%$)

TLR2HW-Kit (2010 chip size)

10 values, 15 pcs each ($\pm 1\%$)

TLR3APD-Kit (2512 chip size)

10 values, 20 pcs each ($\pm 1\%$)

TLRDK001Kit (1206, 2010, 2512 chip sizes)

36 values, Lead-free, complete range, 20 pcs each ($\pm 1\%$)

TLR2BP-Kit (1206 chip size)

17 values, 15 pcs each ($\pm 1\%$)

Chip Resistors

UR73TK001Kit (0402, 0603, 0805, 1206, 2010, 2512 chip sizes)

144 values, Lead-free, 20 pcs each ($\pm 1\%$)

UR73VTK001Kit (1206 chip sizes)

8 values, 20 pcs each ($\pm 1\%$)

Thick Film

SR731HTK001Kit (0201 chip size)

29 values, Lead-free, 50 pcs each (R47 ~ 10R0, $\pm 1\%$, $\pm 5\%$)

SR731ETK001Kit (0402 chip size)

25 values, Lead-free, 50 pcs each (R100 ~ 1R00, $\pm 1\%$)

SR731JK001Kit (0603 chip size)

49 values, Lead-free, 50 pcs each (R100 ~ 10R0, $\pm 1\%$)

SR732AK001Kit (0805 chip size)

49 values, Lead-free, 50 pcs each (R100 ~ 10R0, $\pm 1\%$)

SR732BK001Kit (1206 chip size)

49 values, Lead-free, 50 pcs each (R100 ~ 10R0, $\pm 1\%$)

SR732EK001Kit (1210 chip size)

49 values, Lead-free, 50 pcs each (R100 ~ 10R0, $\pm 1\%$)

SR732HK001Kit (2010 chip size)

49 values, Lead-free, 50 pcs each (R100 ~ 10R0, $\pm 1\%$)

SR733AK001Kit (2512 chip size)

49 values, Lead-free, 50 pcs each (R100 ~ 10R0, $\pm 1\%$)

NOTE: Reference product data pages for available values.

SHORT FORM SELECTION GUIDE

General Purpose & Precision Resistors		Specialty Resistors		Current Sense Resistors	
General Purpose - Chips		Wide Terminal - Chip		High Temperature - Chip	
RK73B/H/Z - 5% & 1% Tol. • 01005 - 2512 sizes • 1r - 22M • .03W - 2W		WG73 - Anti-Surge WK73R/S - Higher Power WN73H - Low Tol. & TCR WU73 - Low TCR • Higher power than standard termination • 0204 - 1225 • .33W - 3W • 10m - 1M <i>Applications:</i> 		HSG73P - High Temp • Can be used at temps. 155°C & higher	
Precision - Thick Film		Anti Surge/Pulse - Chip		Molded Packaging	
RK73G - 50 ppm TCR RS73 - Low Tol. & TCR • Down to 25 ppm TCR • Down to .1% Tol. • 0201 - 1206 sizes				Molded	
RN73R - High Reliability RN73H - Automotive WN73H - Wide Terminal • Tolerance down to .05% • TCR down to 5 ppm • 0402 - 1210 sizes • 10r - 1.5M • .063W - 1 W <i>Applications:</i> 		SG73 - Untrimmed SG73G - 50 ppm SG73P - Pulse SG73S - Surge • Superior surge & pulse withstanding voltage vs. standard resistor <i>Applications:</i> 		MWS - Wirewound SLR1 - High Temp • Operates to 180°C	
Precision - Thin Film		High Voltage - Chip		Melf	
CC - Cross Conductor RD41 - Carbon Film RN41 - Metal Film				Plate	
Other Surface Mount Res. CPCN - Noise Suppressor P- High Voltage		PSF/G/L - .2m-1m, 3W-10W TLR/H/Z - .25W-5W • Down to 50 micro ohm • Starting at 0201 size • .1W - 50W <i>Applications:</i> 		Anti-Sulfur - Chip	
Common Applications:  Automotive  Battery Management  Converters  Engine Control Units  Industrial  Medical  Power Supply  Surge  Test & Measurement		NEW VSM0001 - Large Current Detection Via Shunt Resistor <i>Applications:</i> 		Shunt Current Sensors	
		HSG73P - High Temp. HV73/V - High Voltage RK73B/H/Z - 5% & 1% Tol. RK73G - 50 ppm TCR RS73 - Low Tol. & TCR SG73/P/S - Pulse/Surge SR73 - Current Sense WK73R/S - High Power • Even more sulfur resistant than our standard product <i>Applications:</i> 			
		<i>Applications:</i> 			

SHORT FORM SELECTION GUIDE (CONTINUED)

Resistor Networks	Leaded Resistors		Sensors, Fuses & Varistors
Chip CNN - Thin Film Molded - High Voltage HVD - Thin Film Divider NEW MHVD - Thick Film Divider <i>Applications:</i>   Molded - Various RBA - Bussed - Resistor Network RBB - Bussed - High Speed RDA - Dual Terminator RDB - Differential Term. RLA - R/2R Ladder Network RIA - Isolated RNX - Custom RTX - SOT 23 RTY - Precision Voltage Divider <i>Common Applications:</i>  Automotive  Battery Management  Converters  Engine Control Units  Industrial  Medical  Power Supply  Surge  Test & Measurement	General Purpose CFS/CFPS - Carbon Film Reduced Size CFP - Carbon Film - Flameproof Precision MF - Metal Film - Standard RK - Metal Film - High Ohmic Value RNS - Metal Film - MIL - High Precision SN - Metal Film - High Precision SNF - Metal Film - Flameproof High Voltage GS - High Voltage HPC - Ceramic - Pulse/Surge PCF - Ceramic - Pulse/Surge RCR - Pulse/Surge Power BGR/V - Ceramic - Glass Core BSR/V - Ceramic - Metal Oxide BWR/V - Ceramic Wirewound MOS - Metal Oxide - Power SPR - Metal Film - Power <i>Applications:</i>   	Wirewound CW - Wirewound - Various RW - Wirewound - Precision Current Sense BPR - Ceramic - Current Sense LR - Current Sense - Wire Zero Ohm Jumpers J - Zero Ohm Jumper - Molded JL - Zero Ohm Jumper - Wire Only Z - Zero Ohm Jumper - w/ Body	Thermal Sensors LP73 - Thin Film (SMD) LT73/V - Linear Positive (SMD) SDT101 & 310 - Platinum (thru hole) SDT73 - Platinum (SMD) NEW WTP - For Wire Bonding <i>Applications:</i>   Fuses CCF - Ceramic RF73 - Fusing Chip TF/16VN - Thin Film Fuse Varistors NV73 - Metal Oxide Varistor NV73DL - MOV for Automotive NV73S - Multilayer MOV <i>Applications:</i>  Other Hybrid IC KA-Hybrid IC Test Point Chips RCx - 0603, 0805 & 1206 Lab Kits Various



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