KOA

Your Passive Solution

PASSIVE COMPONENTS

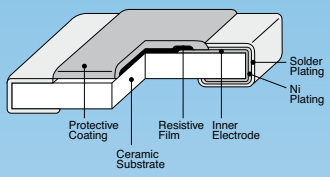
Selection Guide

Surface Mount Resistors & Arrays

Flat chip resistors and arrays include general purpose, high precision, laser trimmable, audio and surge, high voltage, high heat and zero ohm types for applications ranging from general purpose to ultra precision.

RoHS COMPLIANT

Thick Film



- Sizes available:
  01005 0603 1210
  0201 0805 2010
  0402 1206 2512
- RuO_2 Thick Film

General Purpose - RK73B
- Tolerance: ±2% and ±5%
- Resistance Range: 1Ω ~ 22MΩ

Precision - RK73H
- **NEW** 01005 chip size
- Tolerance: ±0.5% and ±1%
- Resistance Range: 1Ω ~ 10MΩ

High Precision - RK73G
- T.C.R.: ±50 ppm/K
- Resistance Range: 10Ω ~ 1MΩ
- Tolerance: ±0.5% and ±1%

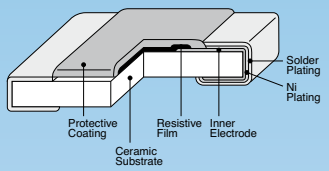
Audio Chip - RK73A
- High resolution sound
- Clarity in signal processing
- Resistance Range: 2.2Ω ~ 1MΩ
- Tolerance: ±2% and ±5%

Zero Ohm - RK73Z
- Maximum Resistance of 50mΩ
- Maximum Continuous Current @70°C: 0.5A ~ 2.0A

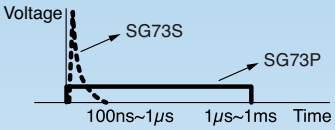
NEW Anti-Sulfur
- Excellent anti-sulfuration characteristics
- High heat and weather resistance
- Series available:
  RK73B RT CN_RT SG73 RT
  RK73H RT CN_KRT
  RK73Z RT CNZ_RT

Specialty

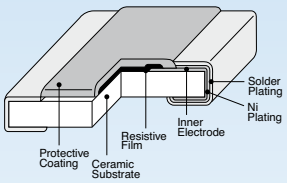
Surge Current - SG73
- 10x pulse power capability
- Resistance Range: 1Ω ~ 1MΩ
- Tolerance: ±10%, ±20%
- Sizes available: 0603, 0805,1206, 1210, 2010, 2512



NEW Pulse SG73P and Surge SG73S
- Resistance Range: 1Ω ~ 10MΩ
- Tolerance: ±0.5% ~ ±5%
- Sizes available: **0402**, 0603, 0805, 1206, 1210



Wide Terminal - WK73R
- Robust Thermal Cycle characteristic
- Resistance Range: 10Ω ~ 1MΩ
- Tolerance: ±1% and ±5%
- T.C.R.: ±100 and ± 200 ppm/K
- Sizes available:
  0612 1218 1020 2512
- RuO_2 Thick Film

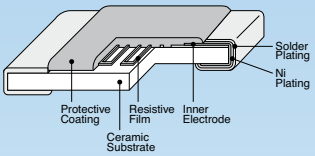


High Voltage - HV73
- 2.5x to 10x rated working voltage of standard thick film
- Chip Size 2512 with 3kV rated voltage
- Sizes available:
  0603, 0805, 1206, 2010, 2512
  350V, 400V, 500V, 2kV, 3kV
- Resistance Range: 10KΩ ~ 51MΩ
- Tolerance: ±0.5% ~ ±5%
- Sizes available: 0603, 0805, 1206, 2010, 2512

Thin Film

Ultra Precision - RN73
- Tolerance: ±0.05% ~ ±1%
- T.C.R. Max.: ±5, ±10, ±25, ±50 and ±100 ppm/K
- Resistance Range: 10Ω ~ 1MΩ
- Nickel chromium thin film resistor element

Ultra Precision - RN73H
- High Temperature range up to +155°C
- Higher rated ambient temperature: +85°C
- Improved moisture resistance with special coating
- Resistance Range: 10Ω ~ **1MΩ**
- Tolerance: ±0.05% ~ ±1%
- T.C.R. Max.: ±5, ±10, ±25, ±50 and ±100 ppm/K



- Sizes available:
  0402 0805 1210
  0603 1206

MELF

Carbon Film/Metal Film/Zero Ohm
- RD41 Carbon Film Series
- RN41 Metal Film Series
- CC Zero Ohm Series

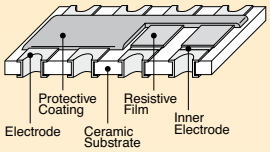
CERAMIC

Ceramic Composition - CPCN
- Reliable in pulse transient applications
- Power Rating: 0.5W, 1W, 1.5W and 2W
- Resistance Range: 1KΩ ~ 15KΩ
- Custom ohmic values on request
- Tolerance: ±20%

Resistor Arrays

Isolated Resistors

Convex, Square Corners - CN_K
- Resistance Range: 10Ω ~ 1MΩ
- Tolerance: ±1% ~ ±5%
- Sizes available: 0201, 0402, 0603 x2, x4, x8 elements



Concave, Square Corners - CN
- Resistance Range: 10Ω ~ 1MΩ
- Tolerance: ±1% ~ ±5%
- Sizes available: 0402, 0603, 0805, 1206 x2, x4, x8 elements

Convex, Scalloped Corners - CN_A
- Resistance Range: 1Ω ~ 1MΩ
- Tolerance: ±1% and ±5%
- Sizes available: 0603, 1206 x2, x4 elements

Zero Ohm Jumper - CNZ
Convex or Concave
- Current Rating @70°C (per element): 0.5A and 1.0A
- Sizes available: 0402, 0603, 0805, 1206 x2, x4, x8 elements

Bussed Resistors

Convex or Concave - CND
- Reverse common electrode and side electrode type circuits available
- Resistance Range: 22Ω ~ 100KΩ
- Tolerance: ±5%
- Sizes available: 1206, 1608 and 2512

Convex Staggered Terminations - CNB
- Resistance Range: 1KΩ ~ 470KΩ
- Tolerance: ±5%
- 4 or 8 elements included in one array in 2 sizes

BGA (ball grid array) - BR
- High level of integration
- Low inductance
- 18 integrated resistors
- Isolated or bussed

Current Sense Resistors

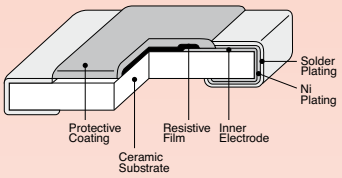
Four basic types of current sensing resistors are available in low-ohm, high precision, 4-terminal Kelvin, high power, low profile, high frequency, high heat, and power shunt chips for a wide range of detecting applications and power applications.

RoHS COMPLIANT

Thick Film

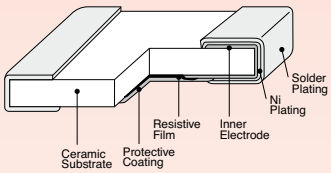
Low-ohm - SR73 Series

- Resistance Range: 24mΩ ~ 10Ω
- Tolerance: ±0.5% ~ ±5%
- Sizes available: 0402 ~ 2512
- T.C.R.: ±100 ~ ±1000 ppm/K



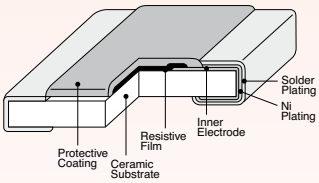
Ultra-low Ohm - UR73 Series

- Face-up and Face-down types available
- Resistance Range: 10mΩ ~ 100mΩ
- Tolerance: ±1%
- Improved T.C.R.: +100 ~ ±300 ppm/K
- Sizes available: 0402 ~ 2512



Wide terminal - WK73S

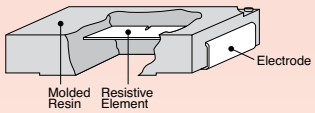
- Robust Thermal Cycle characteristic
- Power Rating: 0.75W ~ 1.5W
- Resistance Range: 10mΩ ~ 9.1Ω
- Tolerance: ±1% & ±5%
- T.C.R.: ±100, ±200, ±300 and ±800ppm/K
- Sizes available: 0612, 1020, 1218 & 1225



Molded

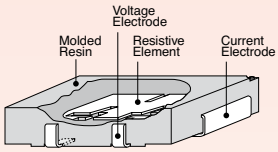
Compliant Lead - Frame SL(N)/TSL Series

- Molded with flame retardant resin (UL94 V-0)
- Non-wirewound, excellent for high frequency
- Enhanced thermal shock capability
- Operating Temperature: up to +180°C
- Power Rating: 1W, 2W and 3W
- Resistance Range: 3mΩ ~ 22MΩ
- Tolerance: ±0.5%, ±1%, ±2%, ±5%
- T.C.R.: ±75 ~ ±180 ppm/K



Four-terminal - CSR Series

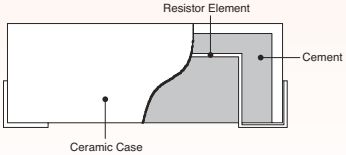
- Suitable for Kelvin applications
- Power Rating: 1W & 2W
- Resistance Range: 5mΩ ~ 50mΩ
- Tolerance: ±0.5% & ±1%
- T.C.R.: ±50 ppm/K



Ceramic

Ceramic Case - BLR Series

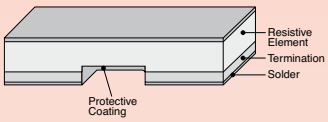
- Flame retardant ceramic case
- Resistance Range: 8mΩ ~ 50mΩ
- Tolerance: ±5%, ±10%
- Power Rating: 1W, 2W & 15W



Metal Plate

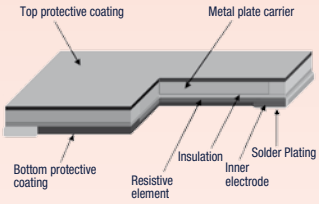
TLR Series

- Resistance Range: 1mΩ ~ 20mΩ
- Tolerance: ±1%
- Ultra Low T.C.R.: ±50, ±75 ppm/K
- 1206, 2010, 2512 chip size
- Ultra Low Height: 0.6mm



NEW TLR H Series

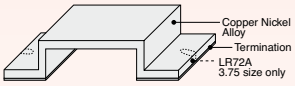
- Resistance Range 10mΩ - 250mΩ
- Tolerance: ±1%
- Ultra Low TCR: ±50, ±75 ppm/K
- Ultra Low Height: 0.25, 0.5 mm
- **0805**, 2010, 2512 chip size
- Power Rating 0.25W, 1W, 2W



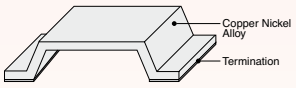
LR72 Series

- Power Rating: 1/4W, 1/2W & 1W
- Resistance Range: 2mΩ ~ 10mΩ
- Tolerance: ±5%
- T.C.R.: ±100, ±350 ppm/K
- Custom configurations available

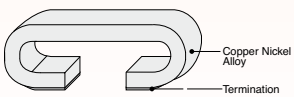
LR72A



LR72B



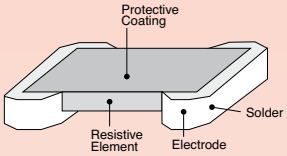
LR72C



Power Shunt

High power - PSB Series

- Power Rating: 6W
- Resistance Range: 0.75mΩ & 1mΩ
- Tolerance: ±1%
- T.C.R.: ±75 ppm/K

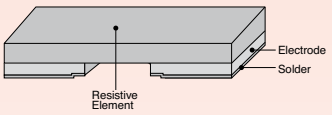


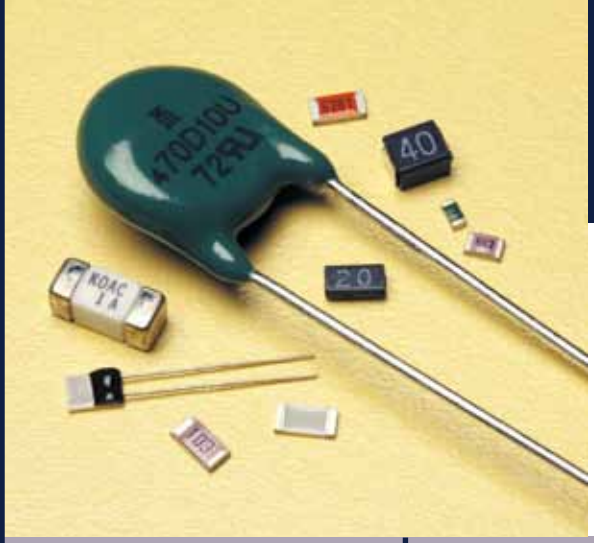
High power - PSI Series

- Power Rating: 3W, 5W
- Resistance Range: 1mΩ ~ 4mΩ
- Tolerance: ±1%
- T.C.R.: ±50 & ±75 ppm/°C

NEW High power - PSE Series

- Power Rating: 3W, 5W
- Resistance Range: 0.5mΩ ~ **2mΩ**
- Tolerance: ±5%
- T.C.R.: ±50 ppm/K





Circuit Protection

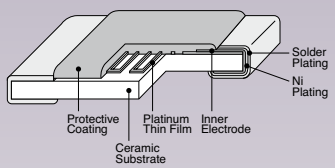
In addition to our flat chip resistors we offer a complete line of circuit protection products including thermistors, platinum sensors, chip and ceramic case fuses and metal oxide varistors.

RoHS COMPLIANT

Platinum Thermal Sensors

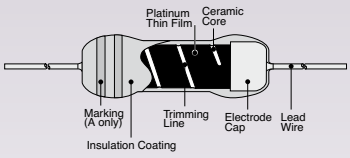
Chip Type Sensor - SDT73H / SDT73V

- T.C.R in accordance with DIN EN/IEC 60751
- V Series = AEC-Q200 tested
- Resistance Range: 100Ω & 500Ω
- Tolerance: ±0.2% & ±1%
- T.C.R.: ±3850ppm/K ±50ppm/K



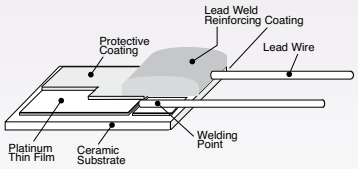
Axial Type - SDT101A/SDT101B

- -55 to +300°C Operating temperature
- +0.05% resistance change for 300 cycles
- Resistance Range: 10Ω, 100Ω, 500Ω
- Tolerance: ±0.5% & ±1%
- T.C.R.: ±3500 ppm/K ±1% or ±2%



Radial Type - SDT310

- T.C.R. in accordance with JIS/DIN Standards
- Resistance Range: 100Ω, 500Ω, 1KΩ
- Tolerance of Measuring Temp: Down to ±(0.15+0.002|t|)°C
- Temperature Range: -55°C ~ +650°C



Custom Configurations - ST Series/AFS Units

- Customer configurations based on use of SDT101 and SDT310 products

Applications for Temperature Compensation

- Automotives
- Sensor Drive Controls
- Telecommunications
- Measuring Equipments

Fuses

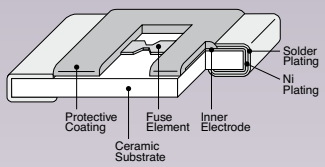
Fusing Flat Chip Resistors - RF73

- Resistance Range: 0.2Ω ~ 510Ω
- Tolerance: ±5%
- Sizes available: 0603 ~ 2512

Secondary Circuit Chip Fuses - TF

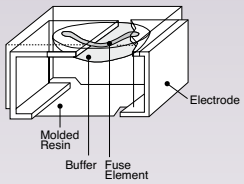
- Rated Current: from 0.2A ~ 5A
- Rated Voltage: 24V & 32V
- Sizes available: 0402 & 0603

NEW TF16VN: 0603 for Automotive



Micro-Fuse - CCP

- UL 248.14 approved, File #131375
- Fusing Current: from 1A ~ 10A
- Rated Voltage: 24V & 72V
- Sizes available: 1206 & 1210

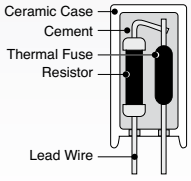


Chip Fuse - CCF/CCF-UM

- Square ceramic body
- Up to 125V AC and 160 DC
- UL248.14, c-UL(CSA)C22.2
- CCF-UM series IEC60127-4:2005 3rd Edition Part 4 Universal Modular Fuse Links Standard sheet 2
- Rated Current: 0.4A ~ 15A
- Size: 6.0 x 2.5 x 2.5 mm

Thermal Fuse & Power Resistor - WF

- Rated Current: 2A & 10A
- Rated Voltage: 250V
- Resistance Range: 1Ω ~ 10KΩ



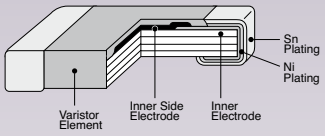
Varistors

Metal Oxide Chip - NV73

- Protects against static electricity, switching and incoming surges
- Varistor Voltage: 8Vc ~ 120Vc
- Sizes available: 0201 ~ 2220
- 3pF available
- Maximum Energy: 0.005J ~ 12.0J

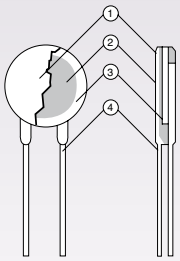
Metal Oxide Chip - NV73DL

- For Automotive
- Low leakage current
- Operating Temperature: up to +125°C
- Maximum Energy: 0.1J ~ 1.5J
- Varistors Voltage: 10 ~ 90 V_{1mA}
- Sizes available: 0603, 0805 & 1206



Metal Oxide Disc Type - NVD

- Higher surge current
- Absorbs positive and negative surges
- Varistor Voltage: 16V~1980V
- Disc diameters of 05, 07, 10, 14 & 20
- Maximum Energy: 0.3J ~ 360J

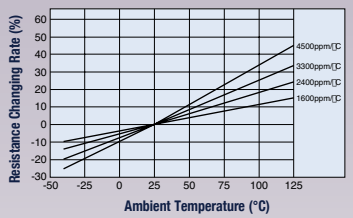


Thermal Sensors

Thin Film Linear Positive - LT73(V)/LP73

- LT73 available in 25 specifiable temperature characteristics
- LT73V: 0805 & 1206 for Automotive
- Resistance Range: 51Ω ~ 51KΩ
- Tolerance: ±1% ~ ±5%
- T.C.R.: ±150 ~ ±5000 ppm/°C
- Sizes available: 0603, 0805 & 1206

Positive Temperature Characteristics



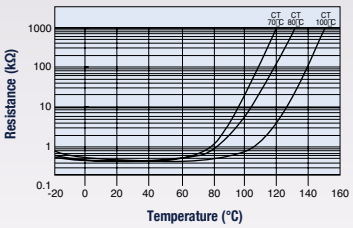
Thick Film Linear Positive - LA73

- Available in 13 specifiable temperature characteristics
- Resistance Range: 22Ω ~ 10KΩ
- Tolerance: ±5%
- Sizes available: 0603, 0805 & 1206

PTC Thermistor - PT72

- Three Curie Temperatures: 70°C, 80°C & 100°C
- Resistance Range: 50Ω, 120Ω, 470Ω & 1KΩ
- Sizes available: 0603 & 0805

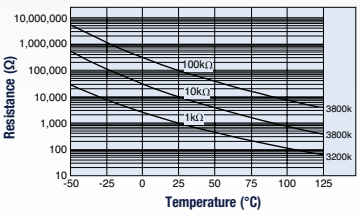
Temperature Characteristics



Negative Temperature - NT73

- Resistance Range: 1kΩ ~ 150 kΩ
- Tolerance: ±5% ~ ±15%
- B Constant Tolerance: ±3% ~ ±10%
- Sizes available: 0603, 0805, 1206

Negative Temperature Characteristics



Inductors

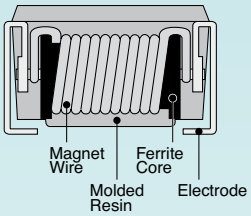
Magnetic solutions cover an application range from RF to power by using ferrite, ceramic, thin film, wirewound and choke coil technologies.

RoHS COMPLIANT

Wirewound

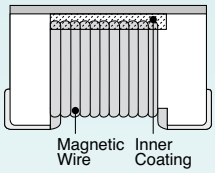
1210 Molded Ferrite Core - KL32/LFC32

- Wide range of applications
- Molded Resin
- Flat-top design
- High Q with wirewound structure
- Inductance Range: .005µH to 330µH
- Tolerance: ±5% ~ ±20%



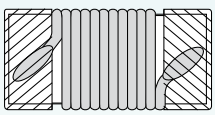
High Q Air Core - KQ/KQT

- High self resonant frequency
- Ideal for low loss, high output power consumption
- Q Factor Min.: 16 ~ 60
- Inductance Range: 1.0nH ~ 10µH
- Tolerance: ±0.1nH ~ ±20%
- Sizes available: 0402, 0603, 0805 & 1008



High Current Air Core - KQC

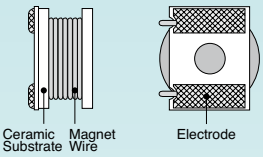
- Low DC resistance, high allowable DC current
- Nominal Inductance: 1.4nH ~ 27nH
- Tolerance: ±0.1nH ~ ±5%
- Sizes available: 0402, 0603



Choke Coils

Power - LPC

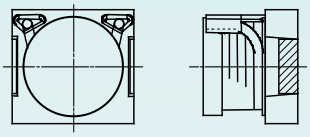
- Sizes with bottom terminations: 4045, 9040, 10065, 12065
- DC Current Max.: 0.12A ~ 10A
- Inductance Range: 0.68µH ~ 6.8mH
- Tolerance: ±10% ~ ±30%



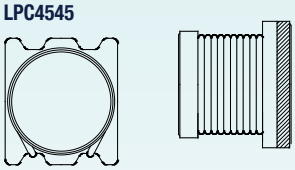
NEW LPC 4235, 4545

- Sizes with botton and side terminations
- Tested acc. to AEC-Q200 requirements
- DC Current Max: 0.1A ~ 3.66A
- Inductance Range: 0.82µH ~ 2200µH
- Tolerance: ± 10%, ±20%

LPC4235



LPC4545



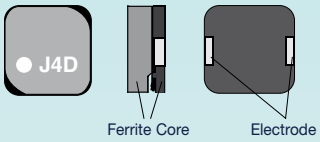
Power - SDR

- Sizes 0603, 0604, 0805, 1006, 0906
- DC Current Max.: 0.2A ~ 3A
- Inductance Range: 1.5µH ~1200µH
- Tolerance: ±10% ~ ±20%

Choke Coils

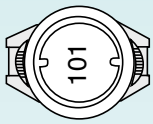
NEW Shielded - LKS

- Sizes 0745, 1045, 1260
- DC Current Max.: 0.4A ~ 6.6A
- Inductance Range: 3.3µH ~ 470µH
- Tolerance: ±20%, ±30%



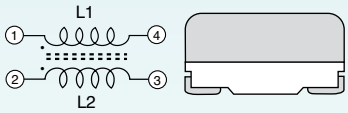
Shielded - SDS

- Sizes available: 0804 ~ 1208
- DC Current Max.: 0.07A ~ 7.5A
- Inductance Range: 2.2µH ~ 15000µH
- Tolerance: ±10% ~ ±20%



Common Mode - SLF

- Size available: 0905
- DC Current Max.: 600mA ~ 1600mA
- Inductance Range: 10µH ~ 2000µH
- Tolerance: ±50% & ±30%

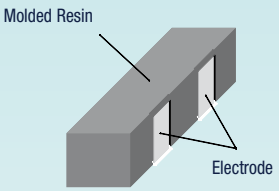


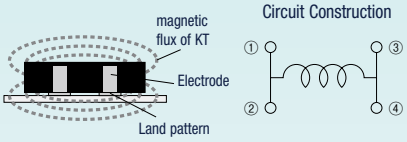
• Polarity

Transponder Coil

NEW Rx-Receiver – KT 11835

- Single-axis LF antenna (for receiving)
- High Q and High Sensitivity
- Strong to vibration, shock and substrate bending
- 4 element terminal structure
- DC current Max: 12mA ~ 15mA
- Inductance Range: 12mH and less
- Tolerance: ±2%, ±3%, ±5%

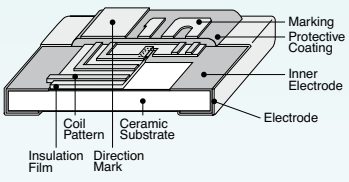




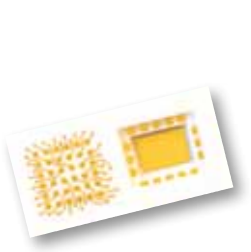
Thin Film

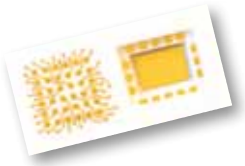
Thin Film Inductor - KL73

- High self resonant frequency
- DC Resistance Max: 0.10Ω ~ 5.00Ω
- Inductance Range: 0.56nH ~ 100nH
- Tolerance: ±0.1nH ~ ± 5%
- Sizes available: 0402 ~ 1206



LTCC Substrates





RoHS COMPLIANT

Integrated Components

Improve performance, save space and lower costs by combining components using our thin film, silicon based, multi-element technology.

RoHS COMPLIANT

Low Temperature Co-Fired Ceramic LTCC-KLC

Technology

Low Temperature Co-fired Ceramic is a multilayer ceramic technology that allows for moderate firing temperatures. The LTCC process is similar to the thick film hybrid process employed for multilayer ceramic capacitor and chip inductors. The moderate firing temperature level below 900 °C is achieved by mixing alumina and glass as main ingredients of the ceramic tape, the so-called green sheets. This permits the co-firing with highly conductive material (silver) for the electrodes. LTCC also support the creation of buried components and thus contribute to miniaturization.

Shrinkage Control

The LTCCs are fired under free shrinkage conditions: The material is allowed to shrink in all three dimensions.

The highly homogeneous structure of the green sheets and precise process control ensures high reproducibility of the dimensional accuracy. Relative accuracies of 0.05 % can be achieved. This high accuracy allows for the realization of dimensionally accurate cavities for the mounting of bare die semiconductor chips.

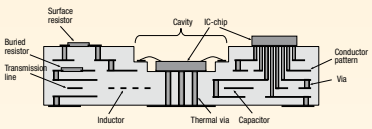
Features

- Excellent dimensional accuracy by KOA's original shrinkage control technology
- Multi layer technology up to 20 layers (more than 20 layers available on request)
- Surface Flatness down to ±5 µm on request
- High-density wiring by fine line patterning
- Miniaturization by buried R, L, C and strip-lines
- Back volumes and channels
- Excellent high frequency performance up to 60 GHz by the use of low loss ceramics and conductors
- Thermal expansion coefficient similar to Si and GaAs
- Precision cavities enable bare chip mounting with short bond wires
- Thermal vias under bare chips enhance heat transport
- Superior heat and humidity resistance

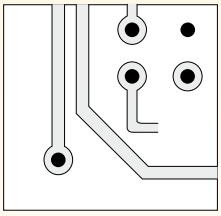
Low Temperature Co-Fired Ceramic LTCC-KLC

- Stack accuracy: 20µm max.
- Line width as low as 60µm
- Line-to-line spacing as low as 60µm
- Substrate flatness: 30 µm max.
- Via diameter: 100µm, 150µm, 200µm
- Through-via pad diameter: Via diameter +50µm min.
- Cavity width: 600µm min.
- Cavity depth: 100µm min.
- Cavity wall thickness: 500µm min
- Flexural/bending strength: 250MPa
- Coefficient of Thermal Expansion: 5.5ppm/K
- Thermal conductivity: 3W/m • K
- Minimum insulation resistance: $1x10^{13}\Omega$ • cm
- Dielectric constant at 1MHz: 7
- Dielectric loss at 1MHz: <0.003
- Density: 2.8g/cm^3
- Max. surface roughness (Ra): 0.4µm
- Min. withstanding voltage: 15kV/mm
- Fired layer thickness: 40µm ~ 125µm

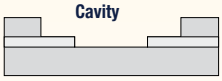
Cross-sectional structure



Inner layer



Cavity



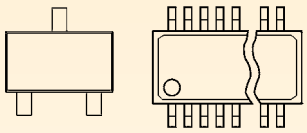
Applications:

- High density sensor interconnect
- MEMS Packages
- High frequency: Microwave, Milliwave
- Harsh environment: High Temperature, High humidity
- Mobile Communications
- Multi Chip Modules
- Interposer substrates

Resistor Networks

KOA's Integrated Passive Components - KPC

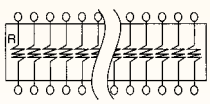
- Thin film (metal film) resistor array on Silicon wafer
- Excellent resistance matching, TCR tracking and stability
- Custom circuits are available with flexible layout (Different resistance combinations possible)
- Higher Integration saves board space and overall assembly costs
- Excellent reliability with standard molded IC package
- Suitable for reflow soldering
- Standard packagings:
  SOT-23
  QSOP 16, QSOP 20, QSOP 24
  SOIC-N08, SOIC-N14, SOIC-N16



- Typical applications
  - Highly accurate peripheral resistors for analog operational amplifiers
  - Automotives, Analog instrumentations, IC-testers
  - Computers, Data communications, Network systems
  - Operational amplifiers, Terminations, Pull-up/Pull-down
  - Meets or exceeds IEC 60115-1, JIS C 5201-1, JIS C 5101-1

Isolated Resistors – RIA

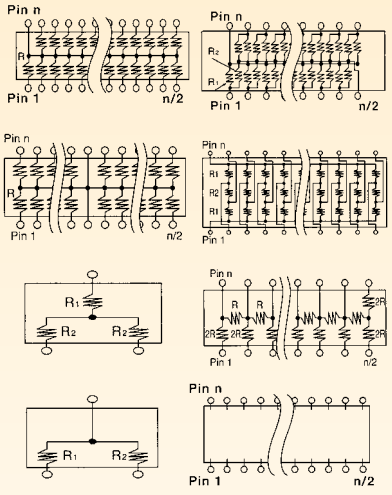
- Precision value matching
- Relative resistance tolerances: 0.05% ~ 2%
- T.C.R. tracking: 5ppm/K ~ 50 ppm/K



Resistor Networks

Bussed Resistors

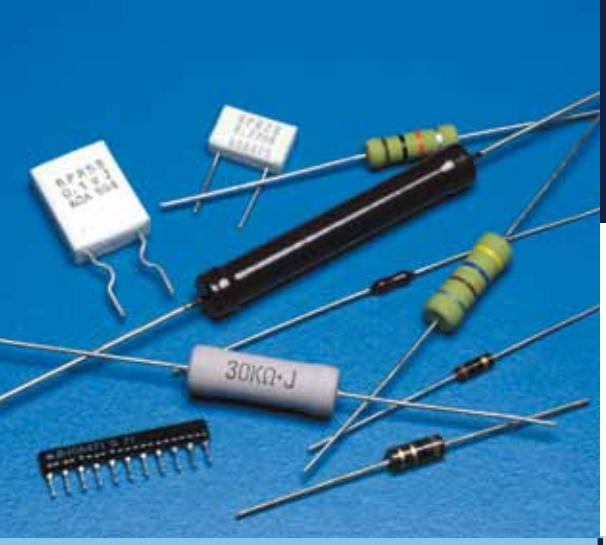
- Standard Combinations
  Bussed – RBA
  High speed bussed – RBB
  Dual terminator – RDA
  Differential terminator – RDB
  R2R network – RLA
  SOT-23 network – RTX, RTY
  Custom – RNX
- T.C.R.: ±10ppm/K ~ ±100ppm/K
- Resistance range: 10Ω ~ 510Ω



Custom Resistor Networks

Precision Pair Resistors – CCN

- Thin Film on ceramic
- Ratio matching
- Ratio Tolerance: ±0.05% & ±0.1%
- T.C.R. absolute: ±25ppm/K
- T.C.R. tracking: 5ppm/K



Leaded Resistors

The industry's broadest line of leaded resistors and networks include designs with various material composition and structure for use in general purpose, precision, anti-surge, high voltage, high resistance applications.

RoHS COMPLIANT

Carbon Film

General Purpose - Reduced Size and Flame Proof CF/CFS/CFP Series
- Power Rating: 0.25W ~ 0.5W
- Resistance Range: 2.2Ω ~ 5.1MΩ
- Tolerance: ±2% ~ ±5%

High Power Resistor - SPR and SPRX
- Power Rating: 0.25W ~ 5W
- Resistance Range: 0.1Ω ~ 110kΩ
- Tolerance: ±1% ~ ±5%

Metal Film

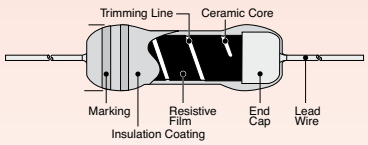
General Purpose - Reduced size MF/MFP/MFS/SN Series
- Power Rating: 0.25W ~ 2W
- Resistance Range: 1Ω ~ 5.11MΩ
- Tolerance: ±0.1% ~ ±5%

Precision - RNS/SF Series
- Power Rating: 0.125W ~ 1W
- Resistance Range: 0.2Ω ~ 6MΩ
- Tolerance: ±0.01% ~ ±5%

Metal Oxide

General purpose - MO/MOX Series
- Power Rating: 0.5W ~ 3W
- Resistance Range: 5.1Ω ~ 150KΩ
- Tolerance: ±2% ~ ±5%
- T.C.R.: ±200 ppm/K

Reduced Size - MOS/MOSX Series
- Power Rating: 0.5W ~ 5W
- Resistance Range: 0.1Ω ~ 100KΩ
- Tolerance: ±1% ~ ±5%
- T.C.R.: ±300 ppm/K



Power Type - BSR Series
- Rectangular Ceramic Case
- Power Rating: 2W ~ 20W
- Resistance Range: 430Ω ~ 75KΩ
- Tolerance: ±5%
- T.C.R.: ±300 ppm/K

Wirewound

Miniature type - CW/CWP/CWH Series
- Power Rating: 0.25W ~ 3W
- Resistance Range: 0.1Ω ~ 3kΩ
- Tolerance: ±0.25% ~ ±10%

Power - RW/RWH Series
- Power Rating: 0.5W ~14W
- Resistance Range: 0.1Ω ~ 62KΩ
- Tolerance: ±0.5% ~ ±5%

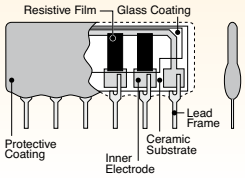
Power Rectangular Type - BGR, BWR Series
- BGR with glass core
- BWR with ceramic core
- Power Rating: 1W ~ 40W
- Resistance Range: 0.1Ω ~ 390Ω
- Tolerance: ±1% ~ ±10%

High Voltage/High Power - P Series
- Special shape parts
- Power rating: up to 250W
- Working Voltage: up to 300 kV

Leaded SIP Networks

Thick Film - RKC/RKH/RKL Series
- Number of Pins: 3 ~ 16
- Resistance Range: 10Ω ~ 2.2MΩ
- Tolerance: ±1% ~ ±5%
- Customs available

Precision Metal Film - MRP
- Resistance Range: 50Ω ~100KΩ
- Tolerance: ±0.1% ~ ±1%
- Tolerance Ratio: 0.025% ~ 0.5%

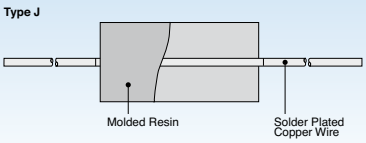


Zero Ohm/Jumper

Conformal coated - Z Series
- Max. Amperage: 1.5A, 2.5A
- Resistance: less than 20mΩ

Molded - J Series
- Max. Amperage: 8A, 10A
- Resistance: 10mΩ max.

Jumper Wire - JL Series
- Max. Current Rating: 8A, 10A
- Resistance: 20mΩ max.



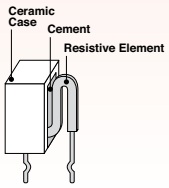
Specialty

Anti-Surge, Metal Glaze - RCR Series
- Max. Working Voltage: 500V ~ 5000V
- Power Rating: 0.25W ~ 3W
- Resistance Range: 3.3Ω ~ 100MΩ
- Tolerance: ±1% ~ ±5%

High Voltage, Metal Glaze - GS Series
- Max. Working Voltage: 0.5kV ~ 40kV
- Power Rating: 0.25W ~ 12W
- Resistance Range: 0.5MΩ ~ 10GΩ
- Tolerance: ±0.5% ~ ±10%

Ceramic Composition - PCF/HPC Series
- KOA original ceramic resistor
- Excellent characteristic against high voltage surge current
- Power Rating: 0.5W ~ 5W
- Resistance Range: 3.3Ω ~ 390KΩ
- Tolerance: ±10% ~ ±20%

Current Sensing Rectangular Type - BPR Series
- Power Rating: 2W ~ 7W
- Resistance Range: 0.01Ω ~ 1Ω
- Tolerance: ±5% & ±10%
- Twin Type with 3 leads available



Linear Thin Film PTC - LT/LP Series
- Resistance Range: 1Ω ~ 100kΩ
- Tolerance: ±1%, ±2%, ±5%
- T.C.R Tolerance: ±50ppm/K, ±5% ~ ±10%

Fusing Resistors - RF/BMF Series
- Power Rating: 0.17W ~ 5W
- Resistance Range: 0.1Ω ~ 15kΩ
- Tolerance: ±5%, ±10%
- RF25CC: Constant current fusing type
- RF26: Radial type
- BMF: Rectangular type

For an Innovative Partnership

KOA Europe…In Dägeling, Product and Application Engineers, together with an experienced Sales Force and a dedicated Customer Service Team, share one focus: our mutual growth and success.
Such aspirations necessitate all-round competence including continuous efforts in:

- A wide programme of passive components
- Product innovations
- Superior Customer Support
- Total Quality Management
- Custom-built logistic packages
- Competitive prices

Logistics is the key to efficiency and worldwide success.
KOA Europe runs a warehouse with approx. 2 billion pieces stock on hand to support customers within 24 hours with the most common parts. Our experts are pleased to share their experience with you:

- JIT shipments
- Customer specific labelling
- Full range of EDI possibilities
- Electronic incoming and dispatch control
- Consignment Stock

Continuous improvement is a "must" for today´s global business

- We achieved ISO 9001 certification the year following our foundation
- Moreover, KOA´s production plants are ISO/TS 16949 and ISO 14001 approved

Technical Support plays a critical role in helping customers to improve product quality.
KOA´s technical staff is highly trained in:

- Development of new products
- Design-In
- Application Engineering
- Product Performance Characteristics

Even with all this expertise, a company can only be as good as its Customer Service Team. At KOA you will find:

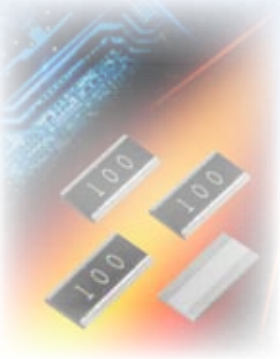
- Competent and reliable partners for your enquiries
- A multi-lingual team
- Automated order and sample processing
- Prompt, efficient responses

And yet continuous improvement is our goal. Constant staff training is one means by which we are aiming to achieve it, good communication with you is another.

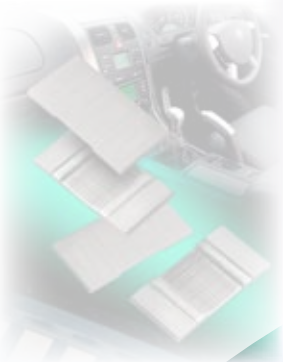
Let´s work together for…

Your Passive Solution

Your KOA Europe Team





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