Innovative Service Around the Globe YAGEO

Consumer Electronics

Application Selection Guide

www.yageo.com

About Yageo

Founded in 1977, the Yageo Corporation has become a world-class provider of passive component services with capabilities on a global scale, including production and sales facilities in Asia, Europe and the Americas.

Yageo currently ranks as the world No.1 in chip-resistors, No. 3 in MLCCs and No. 4 in ferrite products, with a strong global presence: 23 sales offices in 15 countries, 9 production sites, 8 JIT logistic hubs, and 2 R&D centers worldwide. Ferroxcube and Vitrohm, who produce ferrites and leaded resistors, are also a part of the Yageo group.

We support our customers with extensive literature including datasheets, brochures and application notes, which are also available electronically on our website at: www.yageo.com

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Consumer Electronics

Introduction

The exciting world of consumer electronics constantly experiences rapid changes. The traditional stand-alone approach to entertainment, home appliances, and lighting devices has almost disappeared.

Like in other areas in the consumer segment, the Internet of Things is quickly securing its position through a strong integration of functions that are increasingly controlled remotely via mobile gear.

As device functionality increases, smaller electronics and wireless data transmissions replace conventional solutions. Yageo has a broad portfolio of passive components to cover all present and future requirements.

In game consoles, the extremely small 01005 Rchips and MLCCs and the 4-element arrays efficiently handle limited space on the PCB, even as the number of components increases.

New generations of flat panel displays require large electrolytic capacitors to be replaced by small MLCC high caps (up to 220uF). Thin film resistors also find their place in electronic circuits where accuracy and stability are a must. Yageo's varistors and ESD suppressors provide the solution to ESD risk.

Environmental conditions, such as humidity and repeated vibrations in washing machines and dishwashers, are met by our MLCCs with soft terminations, while current sensors guarantee efficient operation with minimal energy consumption and accurate power control. The special design of our TUV/UL certified SC Series safety caps prevents electrical shock from the mains in the unlikely event of a ceramic capacitor failure.

The tremendous advancements in LED lighting in public and private communities have changed the requirements for passive components. Conventional fluorescence and HID ballasts mainly use commodity Rchips and MLCCs with high capacitance and high voltage snubber NPO MLCCs.

However, in LED designs, dimmable features and remote control pose new challenges to passive components due to limited space and high temperatures. Sophisticated high caps in X7R and metal foil and plate current sensors as low as 0.5 milliohms efficiently transform the energy into a stable light and color output for LED lamps.

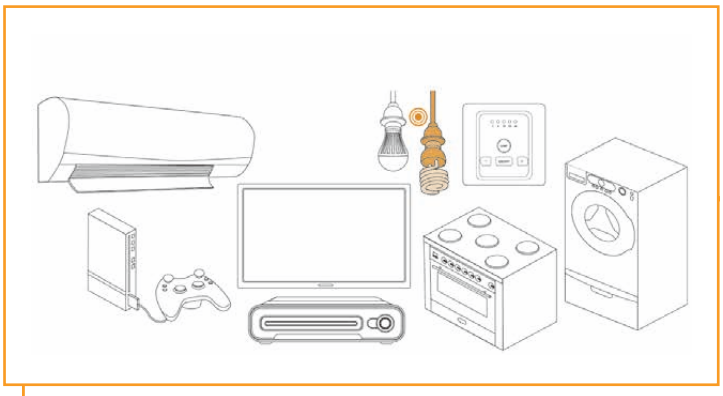
The common element in the aforementioned devices is the wireless transfer. For this reason, Yageo provides a broad portfolio of ceramic, PCB, and metal antennas in small sizes, high efficiency, and the possibility of customized design.

Leaded resistors are still an important passive product category in most, if not all, of the applications above.

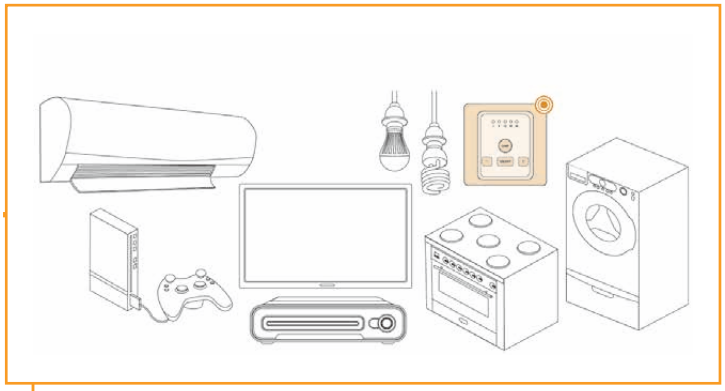
In home appliances, low ohmic (SLR Series) resistors support the efficient use of energy through accurate measurement of the current. Fusible wirewound (FKN Series), high voltage (HHV Series) and high power/flame proof (FMP Series) resistors play a vital role in modern LED design. Even in extremely slim flat panel TV sets, leaded resistors like those in fusible wirewound (FKN), high voltage (HHV) and low ohmic (SLR) series are used on the power supply board where performance, stability and long term reliability are key.

All Yageo passive components comply with RoHS and REACH regulations.

Lighting



LED Lighting



Lighting Control Systems

Consumer Electronics | Lighting

LED Lighting

• Chip Resistors

RE Series

Thick film precision grade chip resistor

Feature

- Tight tolerance
- Low TCR
- Highly reliable electrode construction
- Compatible with all soldering processes

• Chip Resistors

RT Series

Thin film high precision high stability chip resistor

Feature

- High precision & stability
- Low TCR
- Low electrical noise
- Advanced sputtering technology

• Chip Resistors

PE Series

Automotive grade metal current sensor, low TCR chip resistor

Feature

- Excellent current sensing performance
- High power rating for large current detection
- Accurate power control
- Reduce power consumption
- Low thermal EMF
- AEC-Q200 compliant
- Low TCR

• Chip Resistors

RC Series

Thick film general purpose chip resistor

Feature

- Highly reliable electrode construction
- Compatible for all soldering processes
- Highly stable in auto-placement surface mounting application
- Barrier layer end termination

• MLCC

CC-HC Series

High Capacitance

Feature

- High capacitance
- Very Low ESR and ESL
- Low self heating
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HCV Series

High CV

Feature

- High capacitance and high voltage
- Higher energy density
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HV Series

High Voltage

Feature

- Operates at high voltage
- Wide case size available
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-Class I and Class II (≧0201) Series

Gereral purpose

Feature

- Suitable for all general purpose
- Low ESR and self-heating
- Stable capacitance and low impedance over wide frequency range
- High reliability with no polarity
- RoHS-complaint & halogen-free

• Through Hole

FKN Series

Wirewound resistors, fusilbe, flameproof

Feature

- UL1412 certified
- Fusing time <60S for 25 or 36 times rated power
- Fusible function
- Excellent surge performance, customized surge requirements
- Flameproof silicone-coated
- Fully lead-free compliance with no RoHS exemptions(7C-1)

• Through Hole

FMP Series

Metal film resistors, high power & flameproof, ultra miniature

Feature

- Wide resistance range
- High reliability
- High quality
- Ultra-miniature
- Flameproof silicone-coated
- Fully lead-free compliance with no RoHS exemptions (7C-1)

• Through Hole

RSF Series

Metal oxide film resistors, flameproof

Feature

- High reliability
- High power, ultra-miniature
- Flameproof silicone coated
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

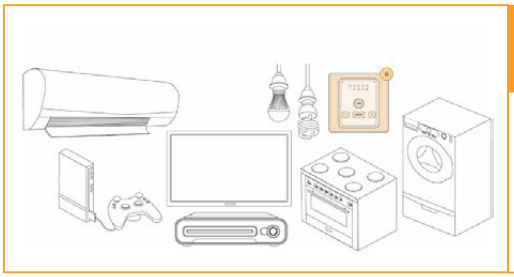
• Through Hole

MFR Series

Metal film resistors

Feature

- Wide resistance range
- High reliability
- High quality
- AEC-Q200 compliant
- Fully lead-free compliance with no RoHS exemptions (7C-1)



Lighting Control Systems

• Chip Resistors

RT Series

Thin film high precision high stability chip resistor

Feature

- High precision & stability
- Low TCR
- Low electrical noise
- Advanced sputtering technology

• Chip Resistors

PE Series

Automotive grade metal current sensor, low TCR chip resistor

Feature

- Excellent current sensing performance
- High power rating for large current detection
- Accurate power control
- Reduce power consumption
- Low thermal EMF
- AEC-Q200 compliant
- Low TCR

• Chip Resistors

SR Series

Surge Chip resistor

Feature

- Excellent pulse loading performance
- High stability & reliability
- Narrow tolerance to 0.5%
- Excellent ESD withstand performance
- AEC-Q200 compliant

• Chip Resistors

RV Series

High voltage chip resistor

Feature

- High working voltage
- Reliable electrode construction
- High stability & reliability
- Highly stable in auto-placement surface mounting

• MLCC

CC-HC Series

High Capacitance

Feature

- High capacitance
- Very Low ESR and ESL
- Low self heating
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HCV Series

High CV

Feature

- High capacitance and high voltage
- Higher energy density
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HV Series

High Voltage

Feature

- Operates at high voltage
- Wide case size available
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-Class I and Class II (≧0201) Series

Gereral purpose

Feature

- Suitable for all general purpose
- Low ESR and self-heating
- Stable capacitance and low impedance over wide frequency range
- High reliability with no polarity
- RoHS-complaint & halogen-free

• Wireless

WLAN/BT/ISM Antenna

Chip Antenna

Feature

- Compact size, small clearance
- SMD type antenna
- Operating temperature:- 40°C-105°C
- RoHS-compliant & halogen-free

• Wireless

WLAN/BT/ISM Antenna

PCB Antenna

Feature

- Easy installation
- Flexible cable length and connector type
- Operating temperature:-40°C-85°C
- RoHS-compliant & halogen-free

• Through Hole

HHV Series

Metal glazed film resistors, high-voltage & high ohmic

Feature

- UL1676 and VDE 0860 certified
- High working voltage up to 7KV
- Max. over load voltage up to 14KV
- Max. resistance up to 68Mohm
- Flameproof silicone-coated
- RoHS exemptions(7C-1)

• Through Hole

PNP Series

Wirewound resistors, high power, flameproof, ultra miniature

Feature

- High reliability
- High power, ultra-miniature
- Flameproof silicone coated
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

Entertainment

Game Consoles

Consumer Electronics | Entertainment

Game Consoles

• Chip Resistors

RT Series

Thin film high precision high stability chip resistor

Feature

- High precision & stability
- Low TCR
- Low electrical noise
- Advanced sputtering technology

• Chip Resistors

PT high power Series

Thick film low ohmic, low TCR, high power chip resistor

Feature

- Good current sensing performance
- High power rating for large current detection
- Accurate power control
- Highly reliable electrode construction
- AEC-Q200 compliant

• Chip Resistors

PE Series

Automotive grade metal current sensor, low TCR chip resistor

Feature

- Excellent current sensing performance
- High power rating for large current detection
- Accurate power control
- Reduce power consumption
- Low thermal EMF
- AEC-Q200 compliant
- Low TCR

• Chip Resistors

UE Series

ESD Suppressor

Feature

- Extremely low capacitance
- Very low leakage current
- ESD protection for high speed data lines to IEC61000-4-2

• MLCC

CC-HC Series

High Capacitance

Feature

- High capacitance
- Very Low ESR and ESL
- Low self heating
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HCV Series

High CV

Feature

- High capacitance and high voltage
- Higher energy density
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HV Series

High Voltage

Feature

- Operates at high voltage
- Wide case size available
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-Class I and Class II (≧0201) Series

Gereral purpose

Feature

- Suitable for all general purpose
- Low ESR and self-heating
- Stable capacitance and low impedance over wide frequency range
- High reliability with no polarity
- RoHS-complaint & halogen-free

• Wireless

WLAN/BT/ISM Antenna

Chip Antenna

Feature

- Compact size, small clearance
- SMD type antenna
- Operating temperature: -40°C-105°C
- RoHS-compliant & halogen-free

• Wireless

WLAN/BT/ISM Antenna

PCB Antenna

Feature

- Easy installation
- Flexible cable length and connector type
- Operating temperature: -40°C-85°C
- RoHS-compliant & halogen-free

• Through Hole

HHV Series

Metal glazed film resistors, high-voltage & high ohmic

Feature

- UL1676 and VDE 0860 certified
- High working voltage up to 7KV
- Max. over load voltage up to 14KV
- Max. resistance up to 68Mohm
- Flameproof silicone-coated
- RoHS exemptions(7C-1)

• Through Hole

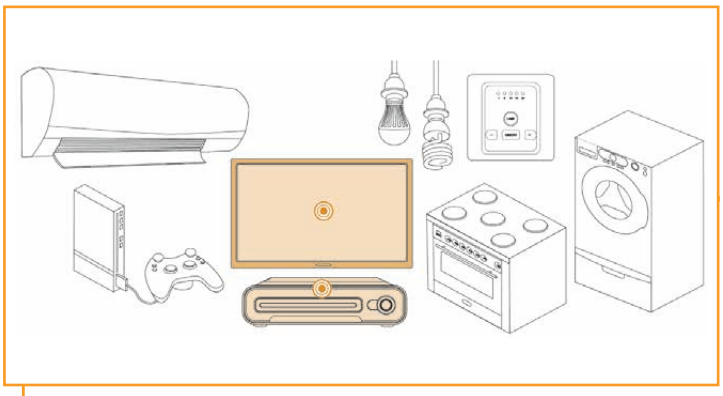
MF0 Series

Metal filmresistors, high power, professional

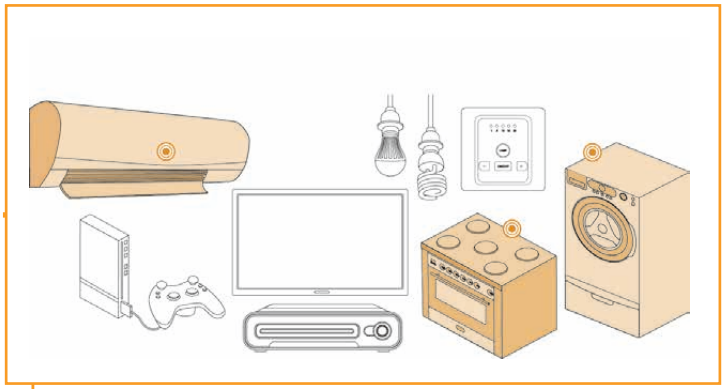
Feature

- High power & reduced size
- Wide resistance range
- High reliability
- High quality
- AEC-Q200 compliant
- Fully lead-free compliance with no RoHS exemptions (7C-1)

Home Appliances



TVs & Audios



White Goods

Consumer Electronics | Home Appliances

TVs & Audios

• Chip Resistors

RE Series

Thick film precision grade chip resistor

Feature

- Tight tolerance
- Low TCR
- Highly reliable electrode construction
- Compatible with all soldering processes

• Chip Resistors

RL high power Series

Thick film low ohmic, high power chip resistor

Feature

- Good current sensing performance
- High power rating for large current detection
- Accurate power control
- Highly reliable electrode construction
- AEC-Q200 compliant

• Chip Resistors

PT high power Series

Thick film low ohmic, low TCR, high power chip resistor

Feature

- Good current sensing performance
- High power rating for large current detection
- Accurate power control
- Highly reliable electrode construction
- AEC-Q200 compliant

• Chip Resistors

RC Series

Thick film general purpose chip resistor

Feature

- Highly reliable electrode construction
- Compatible for all soldering processes
- Highly stable in auto-placement surface mounting application
- Barrier layer end termination

• MLCC

CC-HC Series

High Capacitance

Feature

- High capacitance
- Very Low ESR and ESL
- Low self heating
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HCV Series

High CV

Feature

- High capacitance and high voltage
- Higher energy density
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HV Series

High Voltage

Feature

- Operates at high voltage
- Wide case size available
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-Class I and Class II (≧0201) Series

Gereral purpose

Feature

- Suitable for all general purpose
- Low ESR and self-heating
- Stable capacitance and low impedance over wide frequency range
- High reliability with no polarity
- RoHS-complaint & halogen-free

• Wireless

WLAN/BT/ISM Antenna

Chip Antenna

Feature

- Compact size, small clearance
- SMD type antenna
- Operating temperature: -40°C-105°C
- RoHS-compliant & halogen-free

• Wireless

WLAN/BT/ISM Antenna

PCB Antenna

Feature

- Easy installation
- Flexible cable length and connector type
- Operating temperature: -40°C-85°C
- RoHS-compliant & halogen-free

• Through Hole

HHV Series

Metal glazed film resistors, high-voltage & high ohmic

Feature

- UL1676 and VDE 0860 certified
- High working voltage up to 7KV
- Max. over load voltage up to 14KV
- Max. resistance up to 68Mohm
- Flameproof silicone-coated
- RoHS exemptions(7C-1)

• Through Hole

KNP Series

Wirewound resistors, flameproof

Feature

- High reliability
- Flameproof silicone coated
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

Consumer Electronics | Home Appliances

White Goods

• Chip Resistors

RT Series

Thin film high precision high stability chip resistor

Feature

- High precision & stability
- Low TCR
- Low electrical noise
- Advanced sputtering technology

• Chip Resistors

RE Series

Thick film precision grade chip resistor

Feature

- Tight tolerance
- Low TCR
- Highly reliable electrode construction
- Compatible with all soldering processes

• Chip Resistors

RV Series

High voltage chip resistor

Feature

- High working voltage
- Reliable electrode construction
- High stability & reliability
- Highly stable in auto-placement surface mounting

• Chip Resistors

SR Series

Surge Chip resistor

Feature

- Excellent pulse loading performance
- High stability & reliability
- Narrow tolerance to 0.5%
- Excellent ESD withstand performance
- AEC-Q200 compliant

• MLCC

CC-HC Series

High Capacitance

Feature

- High capacitance
- Very Low ESR and ESL
- Low self heating
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HCV Series

High CV

Feature

- High capacitance and high voltage
- Higher energy density
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-HV Series

High Voltage

Feature

- Operates at high voltage
- Wide case size available
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-Class I and Class II (≧0201) Series

Gereral purpose

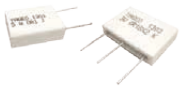
Feature

- Suitable for all general purpose
- Low ESR and self-heating
- Stable capacitance and low impedance over wide frequency range
- High reliability with no polarity
- RoHS-complaint & halogen-free

• Through Hole

SLR Series

Cement resistors, low ohmic, metal plate



Feature

- High power rating
- Low resistance (to 10mR)
- Double power available
- Flameproof cement case
- Excellent surge performance
- Vertical terminal
- Fully lead-free compliance with no RoHS exemptions (7C-1)

• Through Hole

FTR Series

Cement resistors, fusible thermal, vertical lead

Feature

- Fusible thermal resistors, for customized acting temperature
- Rated current: 2A-10A
- Flameproof cement case
- Excellent surge performance
- Vertical terminal
- Fully lead-free compliance with no RoHS exemptions (7C-1)

• Through Hole

HHV Series

Metal glazed film resistors, high-voltage & high ohmic

Feature

- UL1676 and VDE 0860 certified
- High working voltage up to 7KV
- Max. over load voltage up to 14KV
- Max. resistance up to 68Mohm
- Flameproof silicone-coated
- RoHS exemptions(7C-1)

• Through Hole

PNP Series

Wirewound resistors, high power, flameproof, ultra miniature

Feature

- High reliability
- High power, ultra-miniature
- Flameproof silicone coated
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

Chip Resistors

Ordering information - Global part number

Global part number - Single resistor [2]

Ordering example: RC0402JR-0710RL

R C 0 4 0 2 J R — 0 7 1 0 R L

Series name (code 1-2)
- RC = Thick film general
- RE = Thick film precision
- AC = Thick film automotive grade
- AA = Thick film anti-FOS automotive grade
- AF = Thick film anti-FOS
- SR = Thick film anti-surge
- RV = Thick film high voltage
- TR = Thick film trimmable
- AR = Thick film NiAu termination
- RT = Thin film high precision
- AT = Thin film high precision automotive grade
- RL/PT = Thick film low ohmic
- PA/PE/PS/PU = Metal current sensor
- UE = ESD suppressor[3]
- VRS = Multilayer chip varistor[3]

Size code (code 3-6)
(inch / metric)
- 0075 = 0.3x 0.15
- 0100 = 0.4 x 0.2
- 0201 = 0.6 x 0.3
- 0402 = 1.0 x 0.5
- 0603 = 1.6 x 0.8
- 0612 = 1.6 x 3.2
- 0805 = 2.0 x 1.25
- 0815 = 2.15 x 3.75
- 0830 = 2.0 x 7.5
- 1206 = 3.2 x 1.6
- 1210 = 3.2 x 2.6
- 1218 = 3.2 x 4.5
- 2010 = 5.0 x 2.5
- 2512 = 6.35 x 3.2

Tolerance (code 7)
- L = ±0.01%
- W = ±0.05%
- B = ±0.1%
- C = ±0.25%
- D = ±0.5%
- F = ±1%
- G = ±2%
- J = ±5% (for Thick Film Jumper ordering)
- K = ±10% (for TR = 0/-10%)
- M = ±20% (for TR = 0/-20%)
- N = ±30% (for TR = 0/-30%)
- "—" for RL/PT Jumper ordering

Default code[1] (code 17)

Resistance (code 12-16)
- 0R = Jumper
- 0U5 = 0.0005Ω
- 0R1 = 0.1Ω
- 1R = 1Ω
- 10R = 10Ω
- 100R = 100Ω
- 1K = 1 000Ω
- 1M = 1 000 000Ω
- 100M = 100 000 000Ω

Taping reel (code 10-11)
- 07 = 7 inch Dia. reel
- 13 = 13 inch Dia. reel
- 7N = 7 inch,ESD safe reel
- 7W = 7 in Dia. reel
  2 x standard quantity
- 7T = 3 x standard power
- 47 = 4 x standard power
- 57 = 5 x standard power

T. C. R. (code 9)
- A = ±5 ppm/°C
- B = ±10 ppm/°C
- C = ±15 ppm/°C
- D = ±25 ppm/°C
- E = ±50 ppm/°C
- M = ±75 ppm/°C
- F = ±100 ppm/°C
- L = ±150 ppm/°C
- G = ±200 ppm/°C
- I = ±300 ppm/°C
- J = ±350 ppm/°C
- K = ±400 ppm/°C
- Q = ± 700 ppm/°C
- "—" = Based on spec (for thick film)

Packing style (code 8)
- R = Paper tape reel
- K = Embossed plastic tape reel
- S = ESD safe reel

Note: 1. System default code for ordering only. Please refer to series datasheets for different default codes
2. Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products.
3. Please refer to UE/VRS series datacheets for coding details.

Chip Resistors

Ordering information - Global part number - Arrays

Global part number - Arrays

Ordering example: YC122-JR-07100KL

YC 12 2 — J R — 07 100K L

Series name (code 1-2)
- YC = Array & Network (convex / flat) thick film
- TC = Array (concave) thick film
- AF = Array (convex) thick film

Size code (inch) (code 3-4)
- 10 = 0201 x 2 (0202)
- 0201 x 4 (0204)
- 12 = 0402 x 2 (0404)
- 0402 x 4 (0408)
- 16 = 0603 x 2 (0606)
- 0603 x 4 (0612)
- 24 = 0602 x 8 (0616)
- 32 = 1206 x 4 (1224)
- 15 = 10Pin/8R (0612)
- 35 = 10Pin/8R (1225)
- AF is available with size 12&16

Number of resistors (code 5)
- 2 = 2 resistors
- 4 = 4 resistors
- 8 = 8 resistors

Schematic (code 6)
- H = Reverse & Half type
- M = Reverse type
- "—" = Based on spec.
- L = L-type (for YC358)
- T = T-type (for YC158/358)
- "H,M" for TC series

Tolerance (code 7)
- F = ±1%
- J = ±5% (for Jumper ordering)

Packing style (code 8)
- R = Paper tape reel
- K = Embossed plastic tape

T. C. R. (code 9)
- "—" = Based on spec.

Taping reel (code 10-11)
- 07 = 7 inch Dia. reel
- 13 = 13 inch Dia. reel

Resistance (code 12-16)
- 0R = Jumper
- 10R = 10Ω
- 100R = 100Ω
- 100K = 100KΩ

Default code (1) (code 17)

Note: 1. System default code for ordering only. Please refer to series datasheets for different default codes

MLCC
Ordering information - Global part number

Global part number
Ordering example: CC0201KRX7R8BB102

CC 0201 K R X7R 8 B B 102

Series name (code 1-2)
- CA = 4 x Capacitors array
- CC = Multilayer chip capacitors
- CL = Low inductance capacitors
- CQ = High frequency capacitors
- SC = Safety certification capacitors
- AC = Automotive grade capacitors
- CS = Soft termination capacitors

Size code (code 3-6)
- 0100
- 0201
- 0402
- 0603
- 0805
- 1206
- 1210
- 1808
- 1812
- 2220
- 0306
- 0508
- 0612

Capacitance tolerance (code 7)
- A = ±0.05 pF (CQ series only)
- B = ±0.1 pF
- C = ±0.25 pF
- D = ±0.5 pF
- F = ±1%
- G = ±2%
- J = ±5%
- K = ±10%
- M = ±20%
- Z = -20% to +80%

Packing style (code 8)
- R = Paper / PE tape reel Ø7 inch
- P = Paper / PE tape reel Ø13 inch
- K = Embossed plastic tape reel Ø7 inch
- F = Embossed plastic tape reel Ø13 inch
- C = Bulk case

TC material (code 9-11)
- NPO
- X5R
- X7R
- Y5V

Rated voltage (code 12)
- 5 = 6.3 V
- 6 = 10 V
- 7 = 16 V
- 8 = 25 V
- G = 35 V
- 9 = 50 V
- 0 = 100 V
- A = 200 V
- Y = 250 V
- B = 500 V
- Z = 630 V
- C = 1 kV
- D = 2 kV
- E = 3 kV
- T = X2 / Y3 for TUV / UL
- W = X1 / Y2 for TUV / UL
- U = X1 for UL (X7R, 1812)

Termination (code 13)
- B = Ni-Barrier

Process code (code 14)
- N = NP0
- B = Class 2 product

Capacitance value (code 15-17)
- 102 = 1 000 pF
- (2 significant digits+number of zeros; the 3rd digit signifies the multiplying factor, and letter R is decimal point)
- 0 = x 1
- 1 = x 10^1
- 2 = x 10^2
- 3 = x 10^3
- 4 = x 10^4
- 5 = x 10^5
- 6 = x 10^6
- 7 = x 10^7
- X X R = Special capacitance
- (X X: capacitance before decimal point)

Wireless

Ordering information - Global part number

Explanation of ordering code - New

Ordering example : ANT3216A063R2400A

ANT 3216 A 063 R 2400 A

Product Type (code 1)
- ANT: Antenna
- BPF: Band-Pass Filter
- LPF: Low-Pass Filter
- BLN: Balun
- BLF: Balun Filter
- DPX: Diplexer

(1) Size (mm) - SMD (LTCC) (code 2)
- 3216: 3.2 x 1.6 mm
- 2012: 2.0 x 1.2 mm
- 2520: 2.5 x 2.0 mm

(2) Connector - Cable length (mm) Stand-alone (code 2)

Ex: X100 – IPEX connector, 100 mm cable length
X: IPEX, M: MMCX, S: SMA, Z: Stripped
100: 100 mm cable length

Type (code 3)
- L, F, A: Chip antenna / Filter / Balun
- B: Bulk antenna
- P: PCB
- X: FPCB
- S: Metal
- E: External
- J: Integrated antenna

Factory Control Code / Cable Type (code 7)

Frequency Band (MHz)(code 6)
- 2400: 2.4 – 2.5 GHz;
- 2455: 2.4&5 GHz
- 1575: GPS; 1516: GPS+Glonass
- 0433: 433 MHz
- 0870: 868 MHz
- 0918: 900/1800 MHz
- WQUD: 850/900/1800/1900 MHz
- WPEN: 850/900/1800/1900/2100 MHz

Packing Style (code 5)
- R: Tape & Reel
- T: Tray
- B: Bulk

Serial No. (code 4)

Through Hole

Ordering information - Global part number

MFR	-12	F	T	F	52-	100R
Code 1 - 3 **Series Name** See Index	Code 4 - 6 **Power Rating** -05 = ød0.5mm -06 = ød0.6mm -07 = ød0.7mm -08 = ød0.8mm -10 = ød1.0mm -14 = ød1.4mm -12 = 1/6W -25 = 1/4W 25S = 1/4WS -50 = 1/2W 50S = 1/2WS 100 = 1W 1WS = 1WS 200 = 2W 2WS = 2WS 204 = 0.4W 207 = 0.6W 300 = 3W 3WS = 3WS 3WM = 3WM 400 = 4W 500 = 5W 5WS = 5WS 5SS = 5WSS 700 = 7W 7WS = 7WS 10A = 10W 20A = 20W 30A = 30W 40A = 40W 50A = 50W 10S = 10WS 15A = 15W 25A = 25W 10B = 100W 25B = 250W	Code 7 **Tolerance** P = ±0.02 % A = ±0.05 % B = ±0.1 % C = ±0.25% D = ±0.5 % F = ±1 % G = ±2 % J = ±5 % K = ±10 % - = Base on Spec.	Code 8 **Packing Style** T = Tape/Box R = Tape/Reel B = Bulk	Code 9 **Temperature Coefficient of Resistance** - = Base on Spec. A = ±5 ppm/°C B = ±10 ppm/°C C = ±15 ppm/°C S = ± 20ppm/°C D = ±25 ppm/°C E = ±50 ppm/°C F = ±100 ppm/°C G = ±200 ppm/°C H = ±250 ppm/°C I = ±300 ppm/°C J = ±350 ppm/°C	Code 10 - 12 **Forming Type** 26- = 26mm 52- = 52.4mm 73- = 73mm 81- = 81mm 91- = 91mm F = F Type FK = FK Type FKK = FKK Type FFK = F-form Kink M = M-Type Forming M-form MR W/flat MT = MT Type Forming MR = MR Type AV = AVIsert PN = PANAsert	Code 13 - 17 **Resistance Value** 0R1 = 0.1 100R = 100 10K = 10,000 10M = 10,000,000

EXCEPTION:

• Cement series:

<Code 8>: Special packing style code

B: Bulk with wirewound or metal oxide sub-assembly for resistance value

W: Bulk with ceramic based wirewound sub-assembly for resistance value

M: Bulk with metal oxide sub-assembly for resistance value

F: Bulk with Fiberglass based wirewound sub-assembly for resistance value

<Code 10-12>: Without forming code

Example: SQP500JB-10R

• JPW series:

<Code 13-17>: without resistance value code

Example: JPW-06-T-52-

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