Innovative Service Around the Globe YAGEO

Industrial

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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Industrial

Introduction

The core of industrial electronics can be segmented into power electronics, factory automation, mechatronics and robotics, intelligent systems, measurement and testing and a new technological gamut of quickly growing Internet-based applications. Some of the key drivers today include high compactness, greater integration and flexibility, improved safety, long term reliability, improved energy efficiency, wide connectivity, self diagnostic facilities, and a long operating life.

While passive components like resistors, capacitors and wireless components play a vital role in the electric circuitry of industrial applications, they must meet the following requirements:

- Technically advanced
- Wide range of products
- Robust and highly reliable
- Long term performance characteristics and stability
- Long term availability

Yageo's well known standard series of products, R Chip and MLCC series fulfill every aspect of these requirements. Additionally, Yageo offers a range of specialized passive components.

The rugged AF Series with its specific design and construction is capable of operating in corrosive, sulfur containing atmospheres.

Current sensing in power supply components is the second arena of specialized components. These products require low TCR and resistive values down to 0.5milliohm. Current sensing plays an ever increasing role in industrial applications available through the R Chip metal foil and metal plate PE and PA series solutions. For the highest accuracy measurements, Yageo offers the 4-Terminal Kelvin series.

In applications where vibration and mechanical or thermal stress is a challenge, preventing damage to components is the main purpose delivered by the MLCC CS series with soft terminations.

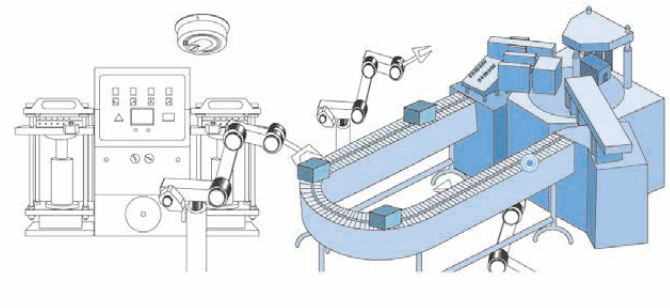
Of most importance is the protection against electrical shock. Safety to the human factor requires fail-safe solutions. Yageo delivers the SC series of MLCCs. UL and TUV certified, the SC series offers X1/Y2 and X2/Y3 combinations with the option to replace existing leaded devices with a full SMD solution.

The quickly expanding Machine-to-Machine Industrial applications need versatile components for Wireless Communication in a broad frequency range. The comprehensive Yageo portfolio in Ceramic, PCB and Metal antennas combined with our customer service in lay-out design and performance measurement decreases the development time for these rapidly evolving markets.

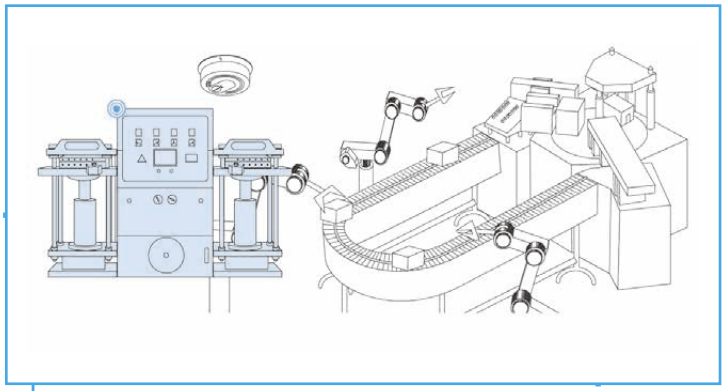
A considerable part of passives in industrial electronic assemblies are still the versatile, reliable and stable leaded resistors. High voltage compatibility is delivered by the HHV Series and where power dissipation is a challenge, the wirewound KNP/PNP series offer their capabilities. AHB/ATH/ATC series are essential aluminum housed resistors that are suggested for DC motor/servo controls and dynamic braking applications.

Yageo's industrial product lines fully meet RoHS and REACH industry compliancy. Strict production and quality standards serve to create the building blocks for a long product lifetime before obsolescence. Yageo's complete lineup of products for Industrial applications fulfills all power requirements with greater efficiency, lowered cost, and smaller footprints.

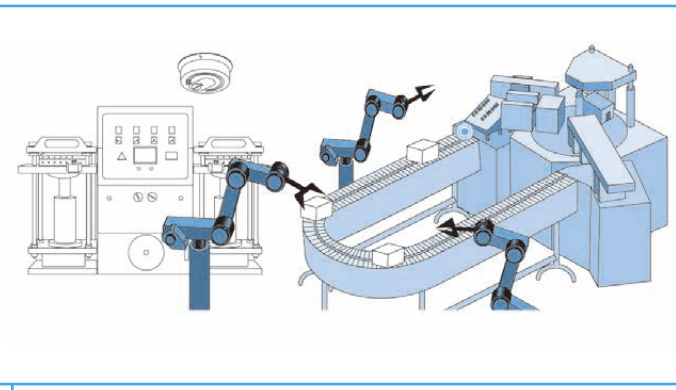
Automation



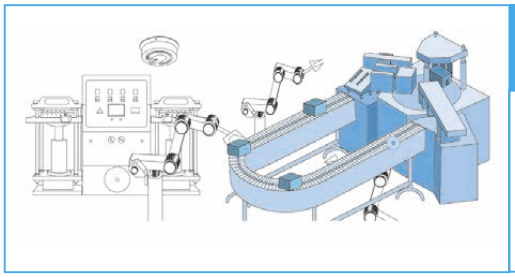
Servo & Motor Control



PLC & Contollers



Testing & Measuring Equipment



Industrial | Automation

Servo & Motor Control

• 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

PA 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

YC Series

Thick film array/network chip resistor

Feature

- Integrated descrete chip resistors from 2 to 8pcs
- Greater efficiency in pick & place application
- Low assembly cost
- Reduce PCB space
- Higher component and equipment reliability

• Chip Resistors

AF Series

Sulfur resistance chip resistor

Feature

- Superior resistance against sulfur-containing environments
- Highly reliable electrode construction
- FOS test method: ASTM B809-95 105°C, 750 hours

• 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-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

• MLCC

IC Series

Industrial grade

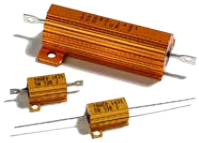
Feature

- Good for Harsh Outdoor environment application
- High Thermal Stability
- High Reliability

• Through Hole

AHA/AHP Series

Wirewound resistors, high power, aluminum housed, heatsink type



Feature

- High power rating (up to 50W)
- Wirewound (max. resistance up to 33Kohm)
- Heatsink mounted
- Reduced size
- Corrision-resistant aluminum case for severe environments
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

• Through Hole

AHB Series

Wirewound resistors, high power, aluminum housed, heatsink type

Feature

- High power rating (up to 500W)
- Wirewound (max. resistance up to 82Kohm)
- Heatsink mounted
- Reduced size
- Corrision-resistant aluminum case for severe environments
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

• Through Hole

ATH Series

Wirewound resistors, high power, aluminum housed, trapezium type

Feature

- High power rating (up to 1800W)
- Wirewound (max. resistance up to 35Kohm)
- Corrision-resistant aluminum case for severe environments
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

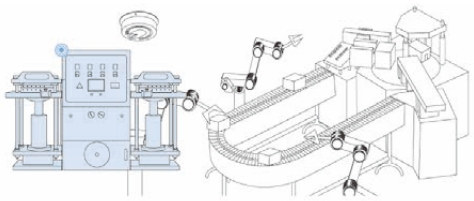
• Through Hole

ATC Series

Wirewound resistors, high power, aluminum housed, compact size

Feature

- High power rating (up to 200W)
- Wirewound (max. resistance up to 1Kohm)
- Compact size
- Corrision-resistant aluminum case for severe environments
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)



Industrial | Automation

PLC & Contollers

• 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

PA 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

YC Series

Thick film array/network chip resistor

Feature

- Integrated descrete chip resistors from 2 to 8pcs
- Greater efficiency in pick & place application
- Low assembly cost
- Reduce PCB space
- Higher component and equipment reliability

• Chip Resistors

AF Series

Sulfur resistance chip resistor

Feature

- Superior resistance against sulfur-containing environments
- Highly reliable electrode construction
- FOS test method: ASTM B809-95 105°C, 750 hours

• 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-Class II (≧0201) Series

General purpose class II

Feature

- Class II temperature characteristics
- Suitable for all general purpose
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-Class I (≧0201) Series

General purpose class I

Feature

- Class I temperature characteristics
- High stability and no capacitance aging
- Operates in temperature up to 125°C
- High reliability with no polarity
- RoHS-compliant & halogen-free

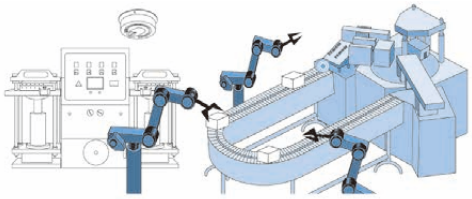
• Wireless

X2Y

X2Y

Feature

- Excellent performance in EMI suppression or decoupling
- Ultra-low equivalent series inductance (ESL)
- Provides differential & common mode filtering with a single device
- RoHS-compliant & halogen-free
- AEC-Q200-complaint



Industrial | Automation

Testing & Measuring Equipment

• 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

PA 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

YC Series

Thick film array/network chip resistor

Feature

- Integrated descrete chip resistors from 2 to 8pcs
- Greater efficiency in pick & place application
- Low assembly cost
- Reduce PCB space
- Higher component and equipment reliability

• Chip Resistors

AF Series

Sulfur resistance chip resistor

Feature

- Superior resistance against sulfur-containing environments
- Highly reliable electrode construction
- FOS test method: ASTM B809-95 105°C, 750 hours

• 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

IC Series

Industrial grade

Feature

- Good for Harsh Outdoor environment application
- High Thermal Stability
- High Reliability

• Wireless

X2Y

X2Y

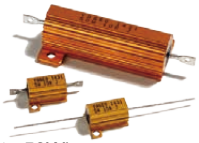
Feature

- Excellent performance in EMI suppression or decoupling
- Ultra-low equivalent series inductance (ESL)
- Provides differential & common mode filtering with a single device
- RoHS-compliant & halogen-free
- AEC-Q200-complaint

• Through Hole

AHA/AHP Series

Wirewound resistors, high power, aluminum housed, heatsink type



Feature

- High power rating (up to 50W)
- Wirewound (max. resistance up to 33Kohm)
- Heatsink mounted
- Reduced size
- Corrision-resistant aluminum case for severe environments
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

• Through Hole

AHB Series

Wirewound resistors, high power, aluminum housed, heatsink type

Feature

- High power rating (up to 500W)
- Wirewound (max. resistance up to 82Kohm)
- Heatsink mounted
- Reduced size
- Corrision-resistant aluminum case for severe environments
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

• Through Hole

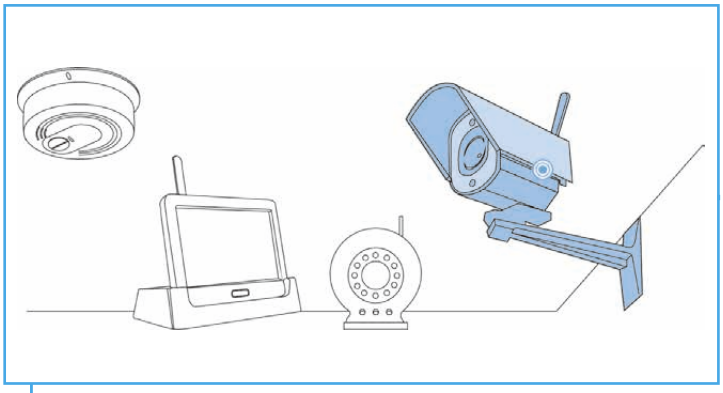
ATH Series

Wirewound resistors, high power, aluminum housed, trapezium type

Feature

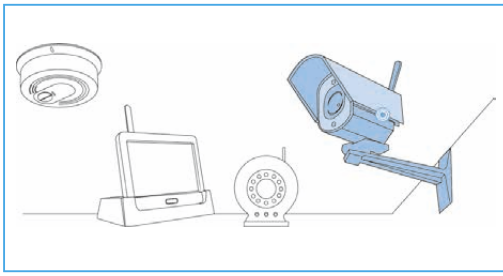
- High power rating (up to 1800W)
- Wirewound (max. resistance up to 35Kohm)
- Corrision-resistant aluminum case for severe environments
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

Safety Devices



Surveillance

Sensors & Detectors



Surveillance

• 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

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

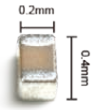
Feature

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

• MLCC

CC (01005) Series

Miniaturization(01005)



Feature

- Extremely small and space saving
- Accurate dimension control
- Effective pick & place implementation
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-Class II (≧0201) Series

General purpose class II

Feature

- Class II temperature characteristics
- Suitable for all general purpose
- High reliability with no polarity
- RoHS-compliant & halogen-free

• MLCC

CC-Class I (≧0201) Series

General purpose class I

Feature

- Class I temperature characteristics
- High stability and no capacitance aging
- Operates in temperature up to 125°C
- High reliability with no polarity
- RoHS-compliant & halogen-free

• Wireless

Sub-GHz/ Short-range Antenna

Chip Antenna

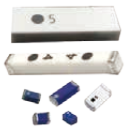
Feature

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

• Wireless

WLAN/BT/ISM Antenna

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

AHA/AHP Series

Wirewound resistors, high power, aluminum housed, heatsink type

Feature

- High power rating (up to 50W)
- Wirewound (max. resistance up to 33Kohm)
- Heatsink mounted
- Reduced size
- Corrision-resistant aluminum case for severe environments
- Excellent surge performance
- Fully lead-free compliance with no RoHS exemptions (7C-1)

Sensors & Detectors

• 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

PA 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

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-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

• MLCC

IC Series

Industrial grade

Feature

- Good for Harsh Outdoor environment application
- High Thermal Stability
- High Reliability

• MLCC

CC-HV Series

High Voltage

Feature

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

• Wireless

Sub-GHz/ Short-range 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

Chip Antenna

Feature

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

• Through Hole

HHV Series

Metal glazed film resistor, 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

RC 0402 J R — 07 10R 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

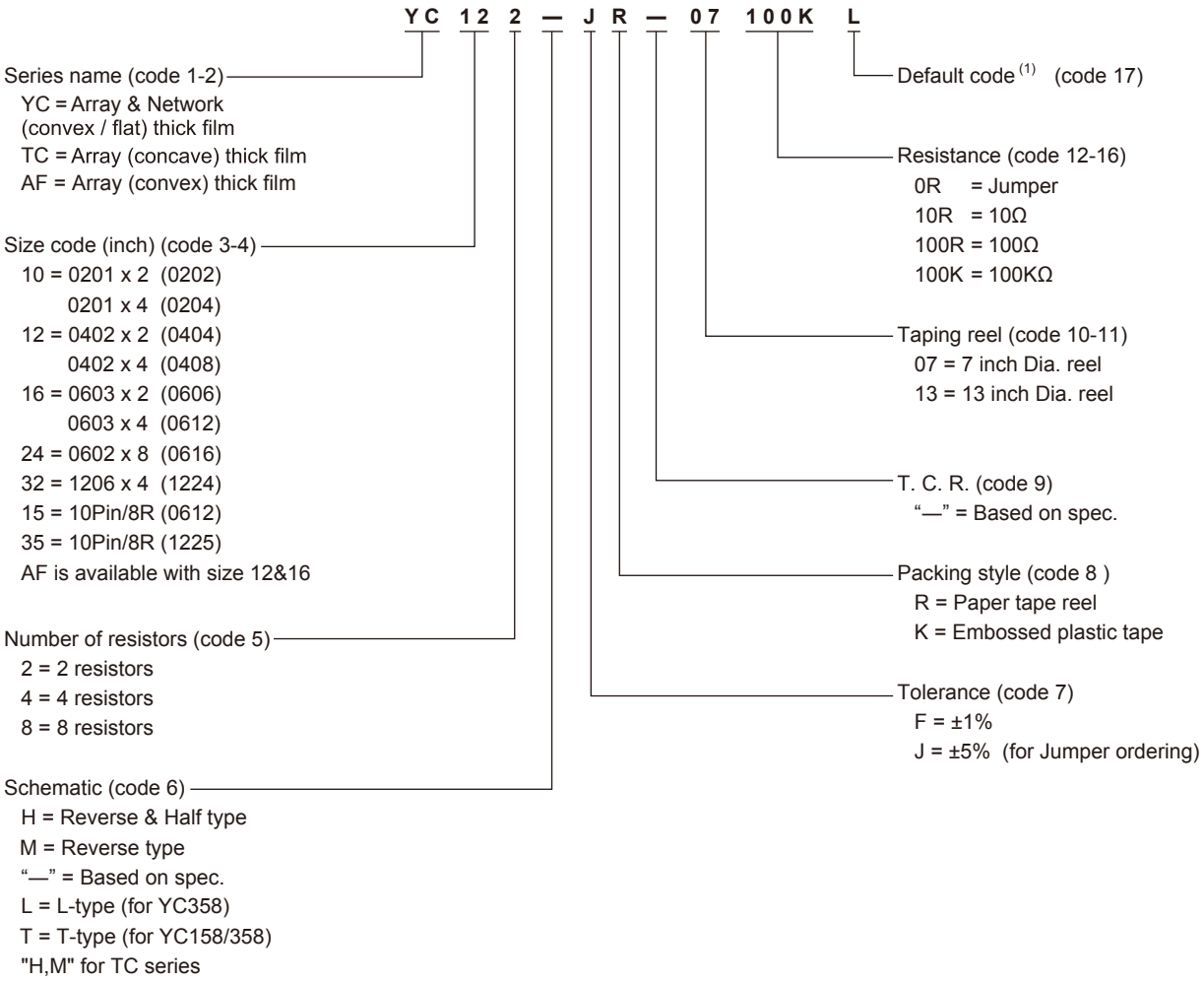
Note: 1. System default code for ordering only. Please refer to series datasheets for different default codes
2. Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products.
3. Please refer to UE/VRS series datacheets for coding details.

Chip Resistors

Ordering information - Global part number - Arrays

Global part number - Arrays

Ordering example: YC122-JR-07100KL



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

C C 0 2 0 1 K R X 7 R 8 B B 1 0 2

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

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)

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

Termination (code 13)
- B = Ni-Barrier

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)

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-formMBV/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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