Innovative Service Around the Globe YAGEO

Electronic Components for Mobile & Tablet Applications

www.yageo.com

YAGEO Phicomp

About Yageo

Table of Contents

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: 21 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

Introduction

Anytime, Anywhere, Any Content, Any Device

Tablet PCs and smart phones have significantly refined personalized communication experiences. In addition to storing important data and documents, they can instantly access information, audio, video, and voice through continuous connectivity, no matter whether you are at your workspace, on the road, or at home. Now, wearable devices have entered the consumer electronics family and are becoming one of the next big things in technology. Major application segments for these technologies are consumer, healthcare and enterprise markets. According to IHS/IMS Research, new product areas where wearable technology will have a strong impact include smart watches, smart glasses, sleep sensors, industrial and military heads-up displays, and hand-worn terminals.

Yageo has developed ultra-compact components to meet the requirements of miniaturization and mobility. The low-loss, battery-friendly electronic components, thermal counter measure components, and wireless antennas provide connectivity with low power consumption.

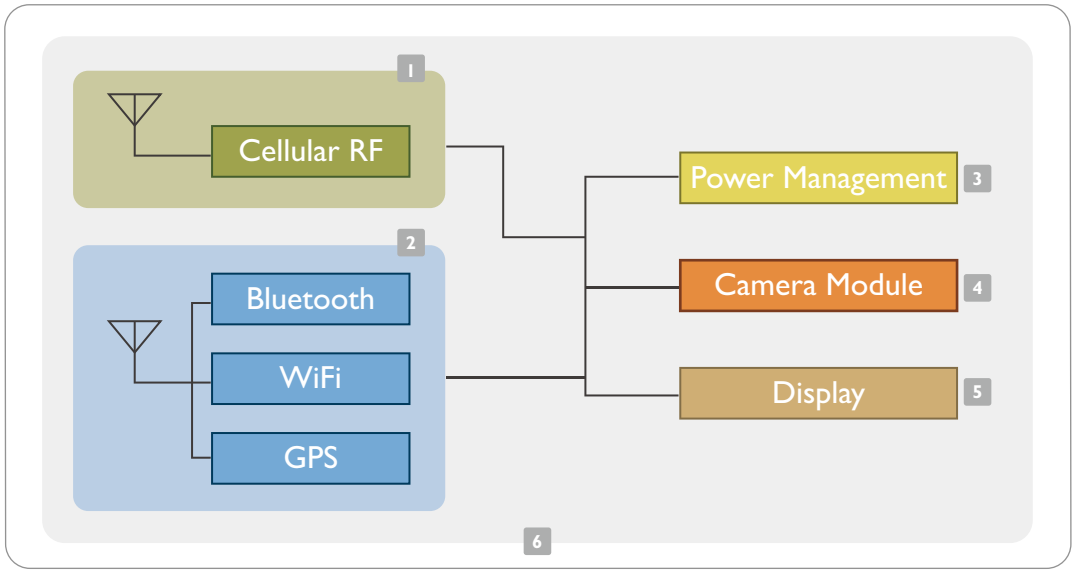
Requirements for Personal Mobile and Smart Devices

- Smoothing of Input-output Current of Various Power Supply Circuits, and Backup Use Over the Load Change of CPU Circumstances
- Reduction of the Number of Parts, or Reduction of Substrate Area
- ESD protection
- Connectivity and Expansion
- Long Hours of Mobility
- Over Voltage Protection

Passive Components for Smartphones

As trends in diverse functionality of high performance digital devices such as smartphones and tablet PCs continue to develop, demand increases for more functions to be packed into their compact and thin housing. In these devices, high value capacitors used for power circuit decoupling are required to assure the reliable operation of high performance ICs.

What's more, MLCCs generally feature a lower ESR, and superior frequency characteristics when compared with tantalum electrolytic capacitors and aluminum electrolytic capacitors. Because of this, MLCCs are indispensable in the role of effectively eliminating noise as a decoupling capacitor for power circuits.

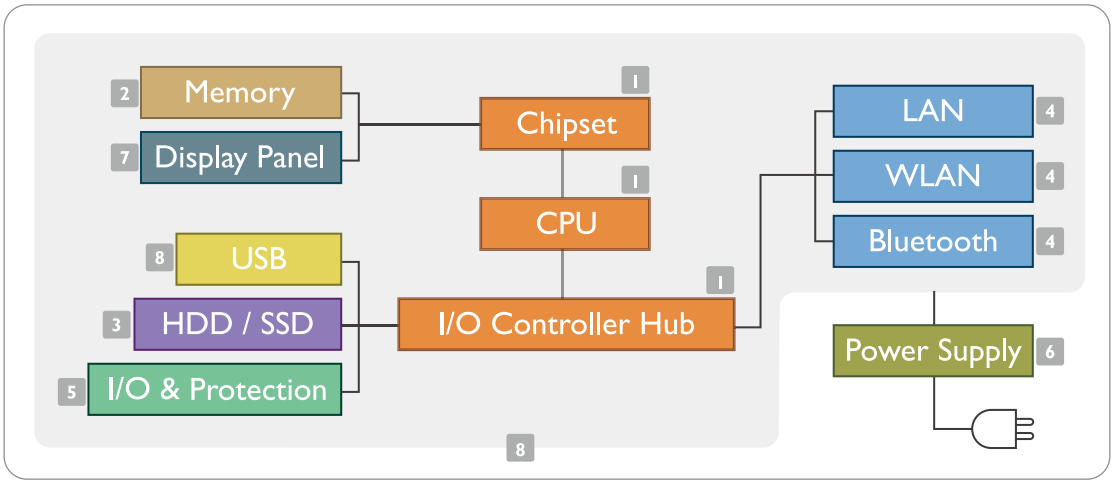


1 Cellular RF		4 Camera Module	
Chip Antenna		MLCC	
MLCC		MLV	
2 Connectivity		**5 Display**	
Balun		Chip Resistor	
Band Pass Filter		MLCC	
3 Power Management		**6 Main Board**	
Chip Resistor		Chip Resistor	
MLCC		MLCC	
Power Inductor		EMI Filter	

Passive Components for Notebook/Tablet PCs

We can separate Notebook/Tablet PC design into two parts – power management and the hardware device. Power management includes CPU power, battery charger, VGA power source, and adaptor. It requires overload protection, high surge capability, high power, a low profile, and current sensing.

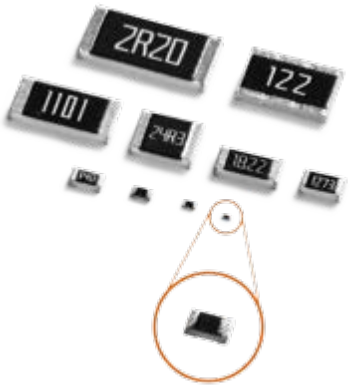
Hardware devices include USB ports, remote controls, touchpads, SD cards and wireless transmission systems. Their priorities include a small footprint, an EMI filter with ESD protection, high efficiency (low power loss), high reliability, and a narrow TCR.



1 CPU / Chipset	
MLCC	
2 Memory	
Chip Resistor	
MLCC	
3 HDD / SSD	
Polymer E-Cap	
4 Interface / Wireless	
Balun	
Chip Antenna	
Filter	
5 I/O & Protection	
Chip Resistor Array	
6 Power Supply	
Chip Resistor	
MLCC	
7 Display Panel	
MLCC	
8 Main Board	
Chip Inductor	
Chip Bead	
Chip Resistor	

Recommended Products

Ultra Compact Chip Resistors – RC0100



Yageo's ultra-compact 01005-sized resistors contribute to greater miniaturization, it reduces mounting area and volume by 56% and 75%, respectively, compared with the 0201-sized RC series. The miniature size effectively improves the utilization of production materials, while reducing the impact of waste on the environment.

Features & Benefits

- Size: 01005 inch (0402 mm)
- Resistance range: 1 Ω to 1 MΩ
- Rated power: 1/32 W
- Rated voltage: 15V
- Tolerance: ± 1%, ± 5%
- TCR: 1Ω ≤ R < 10Ω: -200~600 ppm/°C
  10Ω ≤ R ≤ 1MΩ: ±250 ppm/°C
- Operating temperature: -55°C to +125°C

Chip Resistor Array – YC Series

Features & Benefits

- Integrated discrete chip resistors from 2 to 4 pcs
- Low assembly costs
- Reduced size of final equipment
- Higher component and equipment reliability

Low-Ohmic Current Sensing Chip Resistors - PE/PR/PA Series

Features & Benefits

- Low TCR and high precision
- Ultra low ohmic down to 0.001Ω
- High power rating
- PE Size: 0402, 0603, 0805, 1206, 2010, 2512, 4527
  Wide terminal: 0306, 0508, 0612, 0815, 0830, 1225
- PR Size: 1206, 2010
- PA Size: 2512
- Low thermal EMF

MLCC Array - CA Series

Features & Benefits

- Board space saving
- Increased throughput, by time saved in mounting
- 0508 (4x0402) / 0612 (4x0603) capacitors per array

Ultra Compact MLCCs - CC0100

Yageo's ultra-small MLCC achieved high reliability during high-speed mounting, by satisfying severe dimensional tolerances. It also contributes to the reduction of the mounting area and is ideal for compact mobile devices and high frequency circuits.

Features & Benefits

- Size: 01005 inch (0402 mm)
- Materials: NP0 and X5R
- Capacitance range from 10pF ~ 10nF
- Tape & reel for surface mount assembly
- Rated working voltage from 6.3V – 16V

High Capacitance MLCCs (≥ 1μF)

Features & Benefits

- Materials: X5R, X7R and Y5V
- Sizes: 0201 – 1812
- Highly reliable tolerance and high speed automatic chip placement on PCB
- Capacitance range from 1μF – 100μF
- Highly resistant termination metal
- Tape & reel for surface mount assembly
- Rated working voltage from 6.3V – 50V

Mid Voltage MLCCs

Features & Benefits

- Materials: NP0 and X7R
- Sizes: 0402 – 1812
- Voltage from 100V - 630V

Low Inductance MLCC - CL Series

Features & Benefits

- Materials: X7R
- Sizes: 0306, 0508, 0612
- Low ESL for high frequency applications

Recommended Products

Multi Layer Varistor (MLV)

Features & Benefits

- Excellent clamping voltage & energy dissipation capability
- Quick response time (< 1 n sec.)
- Adjustable capacitance values
- High transient current capability
- Symmetrical voltage-current characteristics
- ESD protection

Chip Antenna

Features & Benefits

- Embedded antenna with moderate gain and efficiency performance
- Ultra compact available in different sizes for various applications
- Surface mount, to meet the compact and low-profile requirements
- Omni directional radiation, suitable for short-range wireless applications
- Integrated GPS patch antenna with LNA

RF Components

Features & Benefits

- Low temperature co-fired ceramic (LTCC) technology - high frequency material/ process/ design component and customized substrate
- 3D design with integrated passives - embedded HF capacitor, inductor and transmission line to reduce component count and required PCB space
- High Q and low loss - high performance conductor and dielectric materials

Polymer Electrolytic Capacitor – CG/CP Series

Features & Benefits

- Low impedance and low E.S.R. at high frequency
- High ripple current capability
- Excellent temperature characteristics from -55°C to +105°C
- Reflow soldering method available (260°C, 10 sec)
- Excellent endurance characteristics

Note: * For Electrolytic Capacitors and Chip Antennas, please refer to www.yageo.com for detailed information.

Product Information - Chip Resistors

Electrical characteristics

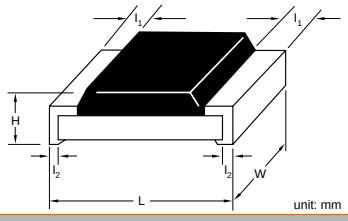
Type	Series	Size	Power rating	Voltage range	Operating temp. range	Resistance range	Tol.	T.C.R.
RC0100xR-07xxxxL	RC	01005	1/32W	15V	-55°C to 125°C	1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±1% ±5%	1Ω ≤ R < 10Ω -200~600 ppm/°C 10Ω ≤ R ≤ 1MΩ ±250 ppm/°C
PE0402xRx47xxxxxx	PE	0402	1/4W	(PxR)^1/2	-55°C to 155°C	10mΩ ≤ R ≤ 50mΩ	±1% ±5%	±100 ppm/°C
PE0603xRx57xxxxxx		0603	1/2W		-55°C to 170°C	5mΩ ≤ R ≤ 100mΩ		±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
PE0805xRx47xxxxxx		0805	1/2W			4mΩ ≤ R ≤ 100mΩ		
PE1206xxx47xxxxxx		1206	1W			4mΩ ≤ R ≤ 100mΩ		
PE2010xKx7Wxxxxxx		2010	1W			5mΩ ≤ R ≤ 100mΩ		
PE2512xKx7Wxxxxxx		2512	2W			6mΩ ≤ R ≤ 100mΩ		
PE4527xKx7Wxxxxxx		4527	3W			5mΩ ≤ R < 910mΩ		
PA2512xKF7TxxxxL	PA	2512	3W	(PxR)^1/2	–55°C to 155°C	1mΩ ≤ R ≤ 5mΩ	±1% ±5%	±100 ppm/°C
PR1206xKx47xxxxxx	PR	1206	1W	(PxR)^1/2	-55°C to 170°C	1mΩ ≤ R ≤ 4mΩ	±1% ±5%	±50 ppm/°C
PR2010xKx7Wxxxxxx		2010	1W			1mΩ ≤ R < 4mΩ		
YC102-xR-07xxxxL	YC	2*0201	1/32W	15V	-55°C to 125°C	10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±1% ±5%	±200 ppm/°C
YC104-xR-07xxxxL		4*0201	1/32W	12.5V	-55°C to 125°C			
YC122-xR-07xxxxL		2*0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		1Ω ≤ R < 10Ω ±250 ppm/°C 10Ω ≤R≤ 1MΩ ±200 ppm/°C
YC124-xR-07xxxxL		4*0402	1/16W	25V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		
YC162-xR-07xxxxL		2*0603	1/16W	50V		10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		±200 ppm/°C
YC164-xR-07xxxxL		4*0603	1/16W	50V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		

Wide terminal

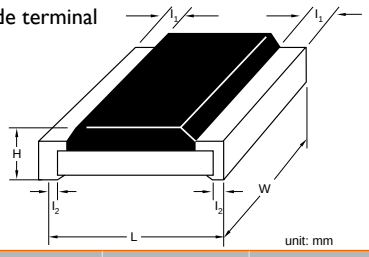
Type	Series	Size	Power rating	Voltage range	Operating temp. range	Resistance range	Tol.	T.C.R.
PE0306xRM07xxxxZ	PE	0306	1W	(PxR)^1/2	-55°C to 170°C	5mΩ≤ R ≤ 100mΩ	±1% ±5%	±75 ppm/°C ±100 ppm/°C
PE0508xRM07xxxxZ		0508	1.2W			3mΩ≤ R ≤ 100mΩ		
PE0612xKM7WxxxxZ		0612	2W			1mΩ≤ R ≤ 300mΩ		
PE0815xKM7WxxxxZ		0815	1W			1mΩ≤ R ≤ 100mΩ		
PE0830xKx7Wxxxxxx		0830	3W			1mΩ ≤ R ≤ 100mΩ		
PE1225xKM7WxxxxZ		1225	3W			1mΩ≤ R ≤ 100mΩ		

Product Information - Chip Resistors

Dimensions



Wide terminal

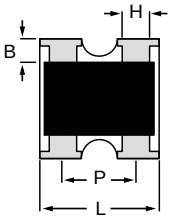


Type	Resistance range	L	W	H	I_1	I_2
RC0100	10Ω ≤ R ≤ 1MΩ	0.40 ± 0.02	0.20 ± 0.02	0.13 ± 0.02	0.10 ± 0.03	0.10 ± 0.03
PE0402	10mΩ ≤ R ≤ 50mΩ	1.00 ± 0.30	0.50 ± 0.20	0.45 ± 0.20	---	0.25 ± 0.10
PE0603	5mΩ ≤ R ≤ 100m	1.60 ± 0.25	0.80 ± 0.25	0.60 ± 0.25	---	0.30 ± 0.25
PE0805	4mΩ	2.00 ± 0.25	1.25 ± 0.25	0.60 ± 0.25	---	0.70 ± 0.25
	5mΩ	2.00 ± 0.25	1.25 ± 0.25	0.60 ± 0.25	---	0.63 ± 0.25
	6mΩ ≤ R ≤ 7mΩ	2.00 ± 0.25	1.25 ± 0.25	0.60 ± 0.25	---	0.55 ± 0.25
	8mΩ ≤ R ≤ 100mΩ	2.00 ± 0.25	1.25 ± 0.25	0.60 ± 0.25	---	0.40 ± 0.25
PE1206	4mΩ	3.20 ± 0.25	1.60 ± 0.25	0.60 ± 0.25	---	1.20 ± 0.25
	5mΩ ≤ R ≤ 8mΩ	3.20 ± 0.25	1.60 ± 0.25	0.60 ± 0.25	---	1.15 ± 0.25
	9mΩ ≤ R ≤ 100mΩ	3.20 ± 0.25	1.60 ± 0.25	0.60 ± 0.25	---	0.58 ± 0.25
PE2010	5mΩ ≤ R ≤ 9mΩ	5.00 ± 0.25	2.50 ± 0.25	0.60 ± 0.25	---	1.50 ± 0.25
	10mΩ ≤ R ≤ 100mΩ	5.00 ± 0.25	2.50 ± 0.25	0.60 ± 0.25	---	0.60 ± 0.25
PE2512	6mΩ ≤ R ≤ 8mΩ	6.30 ± 0.25	3.10 ± 0.25	0.60 ± 0.25	---	1.90 ± 0.25
	9mΩ ≤ R ≤ 99mΩ	6.30 ± 0.25	3.10 ± 0.25	0.60 ± 0.25	---	0.95 ± 0.25
	100mΩ	6.45 ± 0.25	3.25 ± 0.25	0.70 ± 0.25	---	0.60 ± 0.25
PE4527	5mΩ	11.50 ± 0.25	7.00 ± 0.25	0.60 ± 0.25	---	2.90 ± 0.25
	6mΩ ≤ R <1Ω	11.50 ± 0.25	7.00 ± 0.25	0.60 ± 0.25	---	2.60 ± 0.25
PA2512	1mΩ ≤ R ≤ 5mΩ	6.50 ± 0.20	3.20 ± 0.20	0.65 ± 0.15	0.90 ± 0.20	0.90 ± 0.20
PR1206	1mΩ ≤ R ≤ 4mΩ	3.20 ± 0.25	1.60 ± 0.25	0.64 ± 0.25	0.50 ± 0.25	0.50 ± 0.25
PR2010	1mΩ ≤ R ≤ 3mΩ	5.10 ± 0.25	2.54 ± 0.25	0.80 ± 0.25	1.30 ± 0.25	1.30 ± 0.25
	4mΩ	5.10 ± 0.25	2.54 ± 0.25	0.64 ± 0.25	0.80 ± 0.25	0.80 ± 0.25

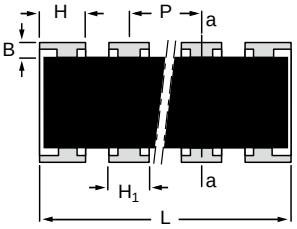
Wide terminal

Type	Resistance range	L	W	H	I_1	I_2
PE0306	5mΩ ≤ R ≤ 100mΩ	0.90±0.20	1.70±0.20	0.65±0.20	---	0.25±0.15
PE0508	3mΩ ≤ R ≤ 100mΩ	1.35±0.20	2.10±0.20	0.65±0.20	---	0.43±0.15
PE0612	1mΩ	1.60 ±0.20	3.20 ±0.20	0.60 ±0.15	---	0.55 ±0.20
	2mΩ ≤ R ≤ 4mΩ	1.60 ±0.20	3.20 ±0.20	0.60 ±0.15	---	0.40 ±0.20
	5mΩ ≤ R ≤ 300mΩ	1.60 ±0.20	3.20 ±0.20	0.60 ±0.15	---	0.30 ±0.20
PE0815	1mΩ	2.50 ±0.20	3.70 ±0.20	0.60 ±0.15	---	0.95 ±0.20
	2mΩ	2.50 ±0.20	3.70 ±0.20	0.60 ±0.15	---	0.75 ±0.20
	3mΩ ≤ R ≤ 100mΩ	2.50 ±0.20	3.70 ±0.20	0.60 ±0.15	---	0.60 ±0.20
PE0830	6 / 8 / 10mΩ	2.00 ±0.20	7.50 ±0.30	0.60 ±0.15	---	0.60 ±0.15
	1mΩ ≤ R ≤ 100mΩ (except 6/8/10mΩ)	2.50 ±0.20	7.50 ±0.30	0.60 ±0.15	---	0.58 ±0.15
PE1225	1mΩ	3.10±0.20	6.30±0.20	0.60±0.15	---	1.15±0.20
	2mΩ ≤ R ≤ 100mΩ	3.10±0.20	6.30±0.20	0.60±0.15	---	0.50±0.20

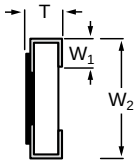
YC 102/122/162



YC 104/124/164



Side view for all types



unit: mm

Type	H / H_1	B	P	L	T	W_1	W_2
YC102	H:0.35 ±0.10	0.20 ±0.10	0.50 ±0.05	0.80 ±0.10	0.35 ±0.10	0.15 ±0.10	0.60 ±0.10
YC104	H:0.20 ±0.10	0.15 ±0.05	0.40 (Typical)	1.40 ±0.10	0.35 ±0.10	0.15 ±0.10	0.60 ±0.10
YC122	H: 0.21 +0.10/-0.05	0.20 ±0.10	0.67 ±0.05	1.00 ±0.10	0.30 ±0.10	0.25 ±0.10	1.00 ±0.10
YC124	H:0.45 ±0.05 H_1:0.30 ±0.05	0.20 ±0.15	0.50 ±0.05	2.00 ±0.10	0.45 ±0.10	0.30 ±0.15	1.00 ±0.10
YC162	H:0.30 ±0.10	0.30 ±0.10	0.80 ±0.05	1.60 ±0.10	0.40 ±0.10	0.30 ±0.10	1.60 ±0.10
YC164	H:0.65 ±0.05 H_1:0.50 ±0.15	0.30 ±0.15	0.80 ±0.05	3.20 ±0.15	0.60 ±0.10	0.30 ±0.15	1.60 ±0.15

Note: Please contact sales offices, distributors and representatives in your region before ordering

Product Information - Chip Resistors

Ordering Code Definition - Single Resistor

RC 0100 F K - 07 0R1 L

Series name (code 1-2)
RC= Thick film general purpose
PA / PE / PR= Current sensor - low T. C. R.

Size code (inch)

0100	0815
0306	0830
0402	1206
0508	1225
0603	2010
0612	2512
0805	4527

Tolerance (code 7)
F = ±1%
G = ±2%
J = ±5%

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

Default Code (code 17)
L / Z = Default code

Resistance (code 12-16)

0R = Jumper	0U5= 0.0005Ω
0R1 = 0.1Ω	10R = 10Ω
0R01 = 0.01Ω	1K = 1,000Ω
0R001= 0.001Ω	1M = 1,000,000Ω

Taping Reel (code 10-11)
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel
7W = 7 inch Dia. reel 2 x standard power type
7T = 7 inch Dia. reel 3 x standard power type
47 = 7 inch Dia. reel 4 x standard power type
57 = 7 inch Dia. reel 5 x standard power type

T.C.R (code 9)
E = ±50 ppm/°C
M = ±75 ppm/°C
F = ±100 ppm/°C
"–" Based on spec. (– for RC only)

Ordering Code Definition - Arrays

YC 164 - J R - 07 10R L

Series name (code 1-2)
YC= 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)

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

Schematic (code 6)
"_" = Based on spec.

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

Default code (code 17)

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

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

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

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

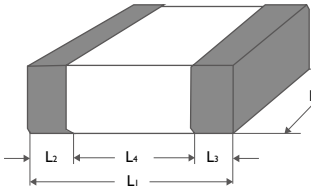
Product Information - MLCCs

Electrical characteristics

Type	TC	Operating Temp range	Capacitace range	Voltage range	Tolerance
CC0100	NPO	-55°C to 125°C	10pF ~ 100pF	10V ~ 16V	±0.25pF, ±0.5pF, ±5%
	X5R	-55°C to 85°C	100pF ~ 10nF	4V ~ 6.3V	±10%, ±20%
CC0201	X5R	-55°C to 85°C	1uF	6.3V	±20%
CC0402	NPO	-55°C to 125°C	10pF ~ 100pF	100V	±0.25pF, ±0.5pF, ±2%, ±5%, ±10%
	X5R	-55°C to 85°C	1uF ~10uF	6.3V ~ 50V	±10%, ±20%
	Y5V	-55°C to 85°C	1uF	6.3V ~ 10V	+80% ~ -20%
CC0603	NPO	-55°C to 125°C	10pF ~ 4.7nF	100V ~ 250V	±0.25pF, ±0.5pF, ±2%, ±5%, ±10%
	X5R	-55°C to 85°C	100pF ~ 22uF	6.3V ~ 50V	±10%, ±20%
	X7R	-55°C to 125°C	1uF ~ 4.7uF	6.3V ~ 50V	±10%
	Y5V	-55°C to 85°C	1uF ~ 4.7uF	6.3V ~ 50V	+80% ~ -20%
CC0805	NPO	-55°C to 125°C	10pF ~ 4.7nF	100V ~ 630V	±0.25pF, ±0.5pF, ±2%, ±5%, ±10%
	X5R	-55°C to 85°C	1uF ~ 47uF	6.3V ~ 50V	±10%, ±20%
	X7R	-55°C to 125°C	220pF ~ 10uF	6.3V ~ 630V	±10%
	Y5V	-55°C to 85°C	1uF ~ 22uF	6.3V ~ 50V	+80% ~ -20%
CC1206	NPO	-55°C to 125°C	10pF ~ 10nF	100V ~ 630V	±0.25pF, ±0.5pF, ±2%, ±5%, ±10%
	X5R	-55°C to 85°C	1uF ~ 100uF	6.3V ~ 50V	±10%, ±20%
	Y5V	-55°C to 85°C	1uF ~ 22uF	10V ~ 50V	+80% ~ -20%
	X7R	-55°C to 125°C	220pF ~ 22uF	6.3V ~ 630V	±10%
CC1210	NPO	-55°C to 125°C	47pF ~ 10nF	100V ~ 630V	±0.25pF, ±0.5pF, ±2%, ±5%, ±10%
	X5R	-55°C to 85°C	1uF ~ 100uF	6.3V ~ 50V	±10%, ±20%
	Y5V	-55°C to 85°C	10uF ~ 47uF	6.3V ~ 25V	+80% ~ -20%
	X7R	-55°C to 125°C	2.2nF ~ 47uF	6.3V ~ 630V	±10%
CC1812	NPO	-55°C to 125°C	10pF ~ 5.6nF	100V ~ 630V	±0.25pF, ±0.5pF, ±2%, ±5%, ±10%
	X7R	-55°C to 125°C	1000pF ~ 1uF	50V ~ 630V	±10%
CA0508	NP0	-55°C to 125°C	10pF ~ 220pF	50V	±5%, ±10%
	X7R	-55°C to 125°C	1nF ~ 100nF	16V~50V	±10%
CA0612	NP0	-55°C to 125°C	10pF ~ 470pF	50V	±5%, ±10%
	X7R	-55°C to 125°C	180pF ~ 100nF	16V~50V	±10%
	Y5V	-55°C to 85°C	10nF ~ 100nF	25V	+80% ~ -20%
CL0306	X7R	-55°C to 125°C	100nF ~ 220nF	10V	±10%
CL0508	X7R	-55°C to 125°C	10nF ~ 220nF	16V~25V	±10%
CL0612	X7R	-55°C to 125°C	10nF ~ 100nF	50V	±10%

Dimensions

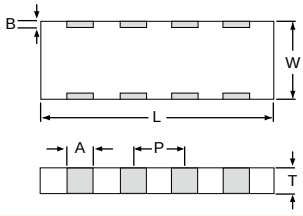
unit: mm



Inch-based	Metric	L_1 (mm)	W (mm)	L_2 / L_3 (mm)		L_4 (mm)
				min.	max.	min.
0100	0402M	0.4 ±0.02	0.2 ±0.02	0.07	0.14	0.13
0201	0603M	0.6 ±0.03	0.3 ±0.03	0.1	0.2	0.2
0402	1005M	1.0 ±0.05	0.5 ±0.05	0.15	0.3	0.4
0603	1608M	1.6 ±0.10	0.8 ±0.10	0.2	0.6	0.4
0805	2012M	2.0 ±0.10	1.25 ±0.10	0.25	0.75	0.55
		2.0 ±0.20	1.25 ±0.20	0.25	0.75	
1206	3216M	3.2 ±0.15	1.6 ±0.15	0.25	0.75	1.4
		3.2 ±0.30	1.6 ±0.20	0.25	0.75	
1210	3225M	3.2 ±0.20	2.5 ±0.20	0.25	0.75	1.4
		3.2 ±0.40	2.5 ±0.30	0.25	0.75	
1812	4532M	4.5 ±0.20	3.2 ±0.20	0.25	0.75	2.2

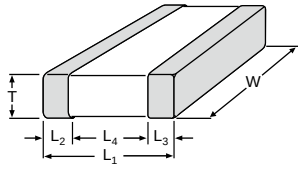
Product Information - MLCCs

4C arrays



Inch-based	Metric	L	W	T_{min}	T_{max}	A	B	P
0508	1220M	2.0 ±0.15	1.25 ±0.15	0.50	0.70	0.28 ±0.10	0.2 ±0.10	0.5 ±0.10
0612	1632M	3.2 ±0.15	1.60 ±0.15	0.70 (1) 0.50 (2)	0.90 (1) 0.70 (2)	0.4 ±0.10	0.3 ±0.20	0.8 ±0.10

Discrete capacitors - Low inductance types only



Inch-based	Metric	L_1	W	T	L_2 / L_3 min	L_2 / L_3 max	L_4 min
0306	0816M	0.8 ±0.15	1.6 ±0.20	0.50 ±0.10	0.10	0.30	0.20
0508	1220M	1.25 ±0.20	2.0 ±0.20	0.85 ±0.10	0.13	0.46	0.38
0612	1632M	1.6 ±0.20	3.2 ±0.20	0.85 ±0.10	0.13	0.46	0.50

Ordering Code Definition

CC 0201 K R X7R 8 B B 102

Series name (code 1-2)
CC = Multilayer chip capacitors
CA = Capacitor array
CL = Low inductance capacitors

Size code (code 3-6)
(inch)

0100	0201	0306	0402	0508
0603	0805	1206	1210	1812

Tolerance (code 7)

B = ±0.1 pF	G = ±2%
C = ±0.25 pF	J = ±5%
D = ±0.5 pF	K = ±10%
F = ±1%	M = ±20%

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)

NP0	X7R
X5R	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	4 = x 10^4
1 = x 10^1	5 = x 10^5
2 = x 10^2	6 = x 10^6
3 = x 10^3	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	A = 200 V	S = 2.5 kV
6 = 10 V	B = 500 V	Y = 250 V
7 = 16 V	C = 1 kV	Z = 630 V
8 = 25 V	D = 2 kV	
9 = 50 V	E = 3 kV	
0 = 100 V	G = 35 V	

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Our sales/services offices are strategically located to serve our customers worldwide and our international distributor network improves our product availability, delivery lead time and our service anywhere in the world.

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In addition, our field application engineers constantly strive wherever possible, to work closely with customers to aid them with design-in and provide them with the support they need to remain competitive in their markets.

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