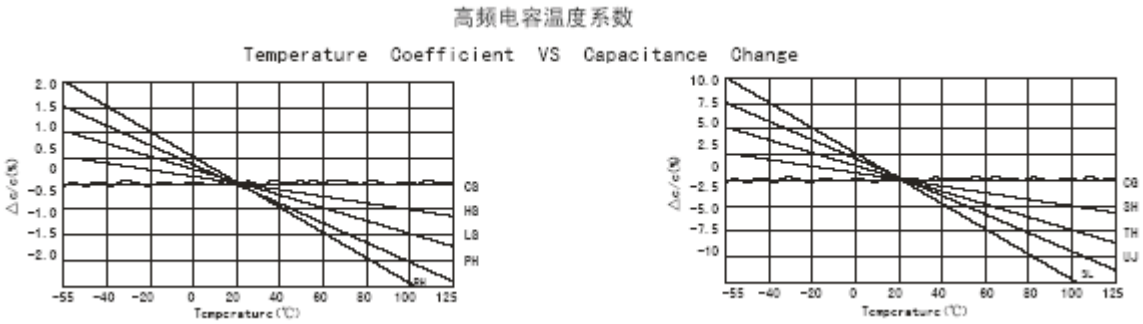
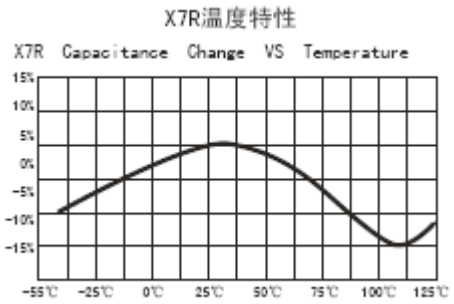
■ INTRODUCTION

- TYPES OF DIELECTRIC MATERIAL AND CAPACITOR

* HIGH FREQUENCY TYPE: The capacitor of this kind dielectric material is considered as Class I capacitor, including high frequency COG capacitor and temperature compensating capacitor such as HG, LG, PH, RH, SH, TH, UJ, SL. The electrical properties of COG capacitor are the most stable one and have little change with temperature, voltage and time. They are suited for applications where low-losses and high-stability are required, such as filters, oscillators, and timing circuits.



* X7R: X7R material is a kind of material which has high dielectric constant. The capacitor made of this kind material is considered as Class II capacitor whose capacitance is higher than that of Class I. These capacitors are classified as having a semi-satble temperature characteristic and used over a wide temperature range, such in these kinds of circuits, DC-blocking, decoupling, bypassing, frequency discriminating etc.

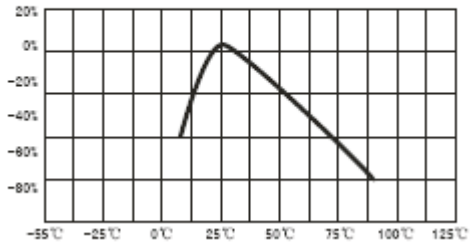


* Z5U: The capacitor made of this kind of material is considered as Class III capacitor, whose temperature characteristic is between that of X7R and Y5V. The capacitance of this kind of capacitor is unstable and sensible to temperature and voltage. Ideally suited for bypassing and decoupling application circuits operating with low DC bias in the environment approaches to room temperature.

* Z5U:

Z5U温度特性

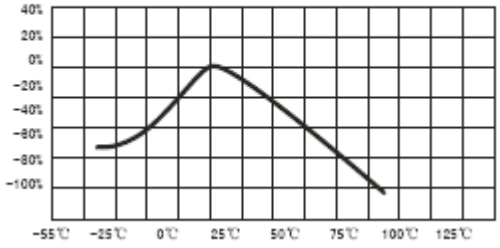
Z5U Capacitance Change VS Temperature



* Y5V: The capacitors made of this kind of material is the highest dielectric constant of all ceramic capccitors. They are used over a moderate temperature range in application where high capacitance is required because of its unstable temperature coefficient, but where moderate losses and capacitance changes can be tolerated. Its capacitance and dissipation factors are sensible to measuring conditions, such as temperature and voltage, etc.

Y5V温度特性

Y5V Capacitance Change VS Temperature



■ FEATURE AND APPLICATION

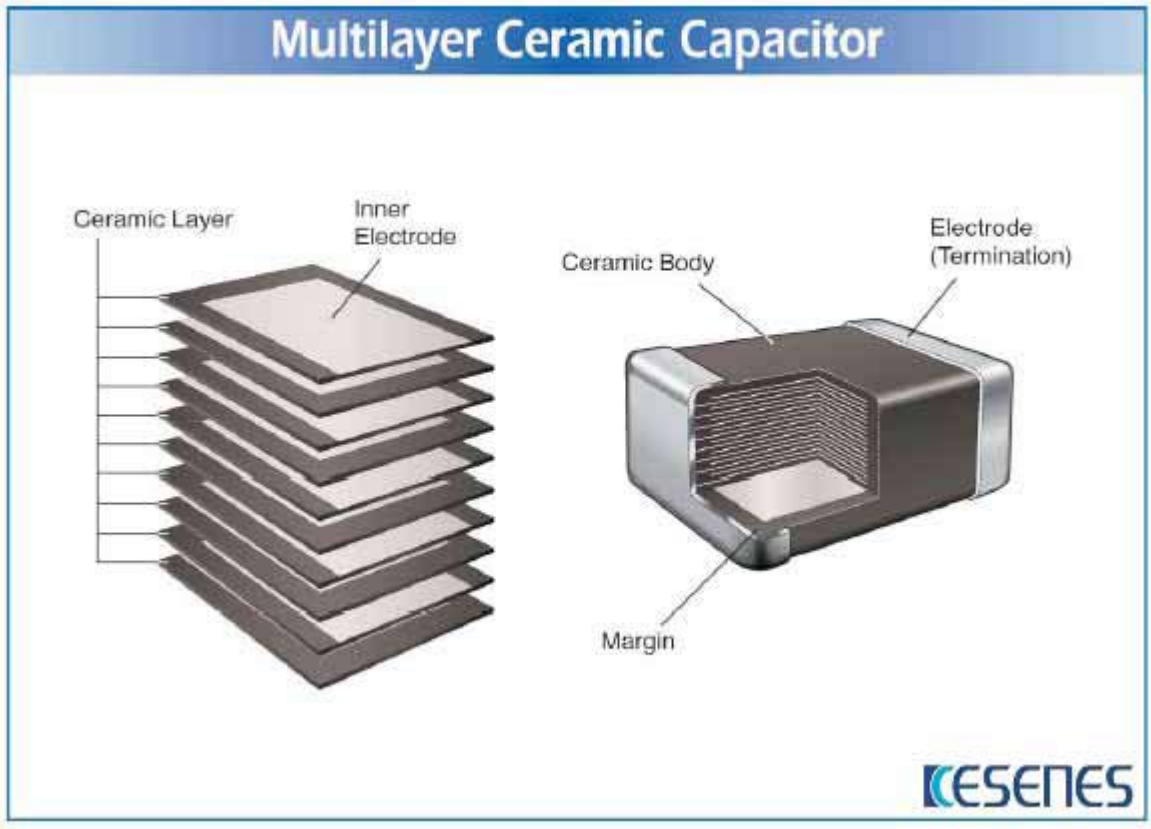
- Feature

- Miniature Size
- Wide Capacitance, Temperature Compensation and Voltage Range
- Highly Reliable Performance
- Industry Standard Size
- Tape & Reel for Surface Mount Assembly
- Low ESR at high frequencies
- High Q at high frequencies
- Stable temperature dependence of capacitance (COG)
- Ultra-small size
- Highly reliable performance
- High RF power handling capabilities
- Highly reliable performance in high-voltage
- Industry standard size
- Tape & reel for surface mount assembly

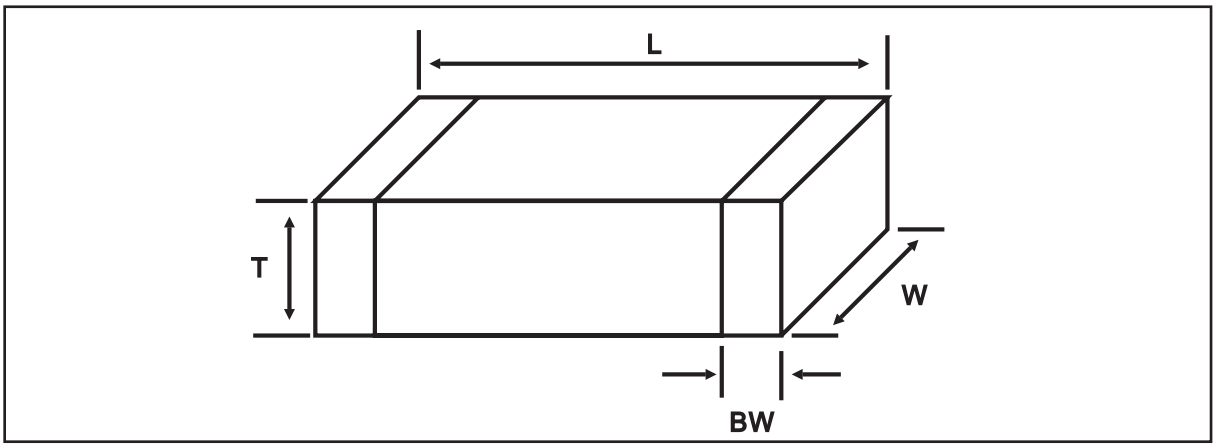
- Application

- General electronic equipment
- High frequency module and high power circuit
- Input signal filtering circuit of modem and LAN interface
- General high voltage circuits
- Inverter circuits with a liquid backlight

■ STRUCTURE


Multilayer Ceramic Capacitor
Ceramic Layer
Inner Electrode
Ceramic Body
Electrode (Termination)
Margin
KESENES

■ APPEARANCE AND DIMENSION



Size Code	DIMENSION (mm)			
	L	W	T	BW
0402	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05	0.25 ± 0.1
0603	1.6 ± 0.1	0.8 ± 0.1	0.8 ± 0.1	0.3 ± 0.1
0805	2.0 ± 0.2	1.25 ± 0.2	0.7 ± 0.2 1.0 ± 0.2 1.25 ± 0.2	0.5 ± 0.2
1206	3.2 ± 0.3	1.6 ± 0.2	0.7 ± 0.2 1.0 ± 0.2 1.25 ± 0.2	0.5 ± 0.25
1210	3.2 ± 0.3	2.5 ± 0.3	1.25 ± 0.3 1.5 ± 0.3	0.75 ± 0.25
1808	4.5 ± 0.4	2.0 ± 0.2	≤2.0	0.75 ± 0.25
1812	4.5 ± 0.4	3.2 ± 0.3	≤2.5	0.75 ± 0.25

■ PART NUMBERING

- Product symbol

CC41	0805	CG	1H	102	J	(N)	(A)
①	②	③	④	⑤	⑥	⑦	⑧

① Type
CC41 : High Frequency Capacitor, Class I
CT41G : Middle Frequency Capacitor, Class II
CT41 : Low Frequency Capacitor, Class III

② Size

③ Dielectric Style

Symbol	CG	2X1	2F4
EIA Code	COG	X7R	Y5V
Type	CC41	CT41G	CT41
Temperature Coefficient	0 ± 30 ppm/℃	± 15%	+ 22% ～ - 82%
Operation Temperature Range	- 55℃ ～ + 125℃	- 55℃ ～ + 125℃	- 30℃ ～ + 85℃

④ Rated Voltage

Symbol	0J	1A	1C	1E	1H	2A	2D	2H	1KV	2KV	3KV	4KV
Rated Voltage (V)	6.3	10	16	25	50	100	200	500	1000	2000	3000	4000

⑤ Nominal Capacitance
The first two digits are significant; third digit denotes number of zeros; R = decimal point.

(0R5 = 0.5pF , 1R0 = 1.0pF , 100 = 10pF , 101 = 100pF , 102 = 1000pF, 103 = 10000pF)

⑥ Capacitance Tolerance

Code	B	C	D	F	G	J	K	M	S	Z
Tolerance	± 0.1pF	± 0.25pF	± 0.5pF	± 1%	± 2%	± 5%	± 10%	± 20%	+ 50% - 20%	+ 80% - 20%

⑦ Termination
S = Silver
C = Copper
N = Silver/Copper Layer、Nickel Layer、Tin Layer

⑧ Packaging Type
T = Bulk
A = Tape Reel

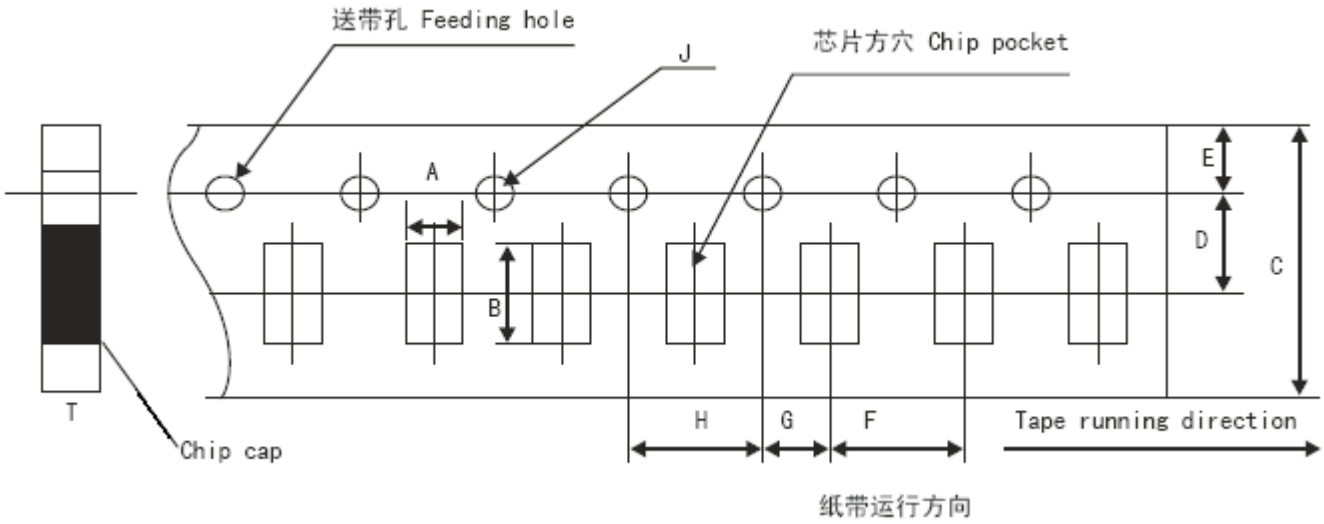
■ CAPACITANCE RANGE

Size Code	Rated Voltage	Capacitance (pF)		
		CG (COG)	2X1 (X7R)	2F4 (Y5V)
0402	6.3V	0.2～470	100～100,000	1,000～100,000
	10V	0.2～470	100～100,000	1,000～100,000
	16V	0.2～470	100～33,000	1,000～100,000
	25V	0.2～470	100～22,000	1,000～100,000
	50V	0.2～220	100～10,000	1,000～100,000
0603	6.3V	0.3～1,000	100～1,000,000	1,000～1,000,000
	10V	0.3～1,000	100～330,000	1,000～1,000,000
	16V	0.3～1,000	100～150,000	1,000～1,000,000
	25V	0.3～1,000	100～150,000	1,000～1,000,000
	50V	0.3～1,000	100～100,000	1,000～470,000
	100V	0.5～820	100～10,000	1,000～68,000
	200V	0.5～330	100～6,800	—
0805	6.3V	0.5～2,700	100～1,000,000	1,000～4,700,000
	10V	0.5～2,700	100～470,000	1,000～2,200,000
	16V	0.5～2,700	100～470,000	1,000～2,200,000
	25V	0.5～2,700	100～220,000	1,000～1,200,000
	50V	0.5～2,200	100～100,000	1,000～1,000,000
	100V	0.5～1,000	100～33,000	1,000～100,000
	200V	0.5～820	100～22,000	1,000～56,000
	500V	0.5～560	100～10,000	—
1206	6.3V	0.5～5,600	100～10,000,000	1,000～10,000,000
	10V	0.5～5,600	100～4,700,000	1,000～4,700,000
	16V	0.5～5,600	100～2,200,000	1,000～2,200,000
	25V	0.5～5,600	100～1,000,000	1,000～1,200,000
	50V	0.5～4,700	100～470,000	1,000～1,000,000
	100V	0.5～3,300	100～100,000	1,000～330,000
	200V	0.5～2,200	100～47,000	1,000～150,000
	500V	0.5～1,000	100～22,000	—
	1000V	0.5～680	100～5,600	—
	2000V	0.5～100	100～1,500	—

Size Code	Rated Voltage	Capacitance (pF)		
		CG (COG)	2X1 (X7R)	2F4 (Y5V)
1210	6.3V	10～10,000	470～10,000,000	4,700～10,000,000
	10V	10～10,000	470～4,700,000	4,700～4,700,000
	16V	10～10,000	470～2,200,000	4,700～4,700,000
	25V	10～10,000	470～1,000,000	4,700～1,500,000
	50V	10～7,500	470～1,000,000	4,700～1,500,000
	100V	5～4,700	100～220,000	1,000～820,000
	200V	5～3,300	100～100,000	1,000～390,000
	500V	5～2,000	100～33,000	—
	1000V	5～820	100～10,000	—
	2000V	5～470	100～6,800	—
1808	6.3V	10～10,000	470～10,000,000	4,700～10,000,000
	10V	10～10,000	470～4,700,000	4,700～4,700,000
	16V	10～10,000	470～2,200,000	4,700～4,700,000
	25V	10～10,000	470～1,000,000	4,700～2,200,000
	50V	10～6,800	470～1,000,000	4,700～2,200,000
	100V	5～4,700	100～220,000	1,000～820,000
	200V	5～2,700	100～100,000	1,000～390,000
	500V	5～1,800	100～39,000	—
	1000V	5～820	100～10,000	—
	2000V	5～220	100～6,800	—
	3000V	5～150	100～1,500	—
	4000V	5～100	100～1,000	—
1812	6.3V	10～15,000	470～22,000,000	10,000～10,000,000
	10V	10～15,000	470～10,000,000	10,000～10,000,000
	16V	10～15,000	470～4,700,000	10,000～10,000,000
	25V	10～15,000	470～3,300,000	10,000～3,300,000
	50V	10～10,000	470～2,200,000	10,000～2,200,000
	100V	5～10,000	100～330,000	10,000～1,000,000
	200V	5～5,600	100～150,000	10,000～470,000
	500V	5～3,900	100～100,000	—
	1000V	5～1,200	100～27,000	—
	2000V	5～390	100～10,000	—
	3000V	5～270	100～2,200	—
	4000V	5～220	100～1,500	—

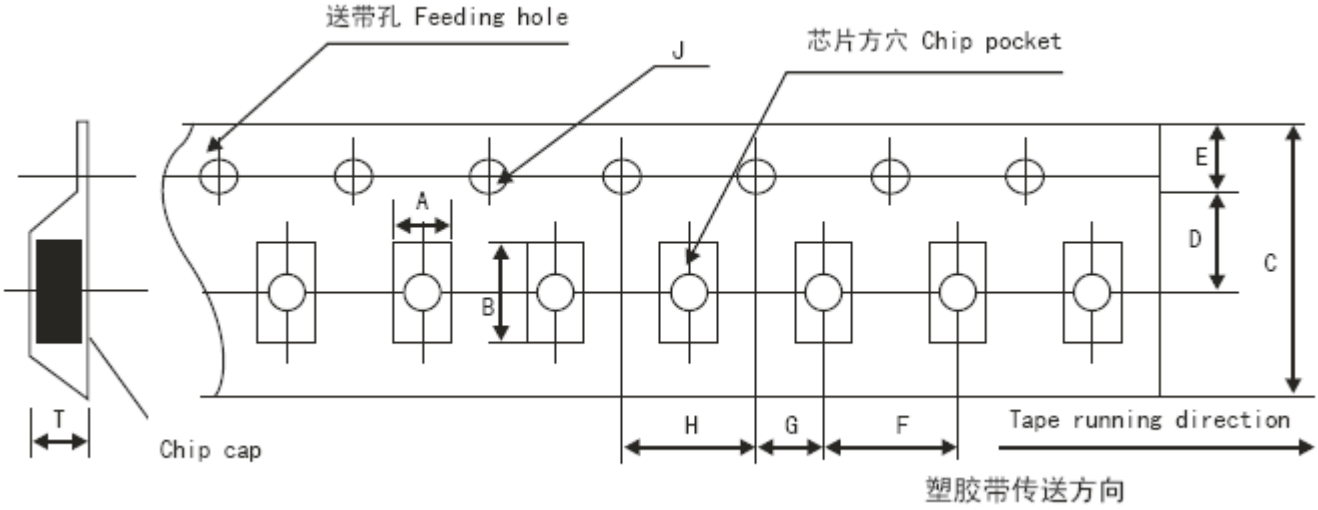
■ PACKAGING

- PAPER TAPING



Code	A	B	C	D	E	F	G	H	J	T
0402	0.65 ± 0.20	1.15 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	2.00 ± 0.05	2.00 ± 0.05	4.00 ± 0.10	1.55 ± 0.05	0.80 Below
0603	1.10 ± 0.20	1.90 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.55 ± 0.05	1.10 Below
0805	1.45 ± 0.20	2.30 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.55 ± 0.05	1.10 Below
1206	1.80 ± 0.20	3.40 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.55 ± 0.05	1.10 Below

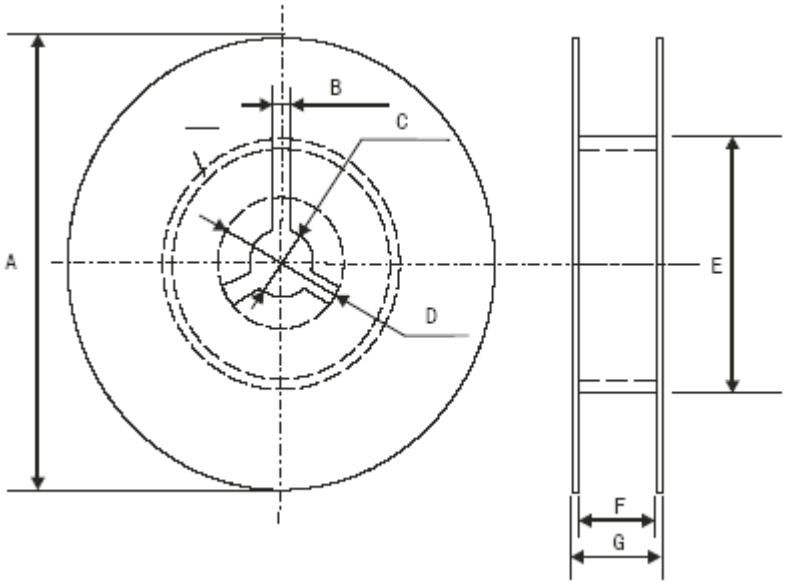
- EMBOSSED TAPING



Code	A	B	C	D	E	F	G	H	J	T
0805	1.55 ± 0.20	2.35 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.55 ± 0.05	1.50 Below
1206	1.95 ± 0.20	3.60 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.55 ± 0.05	1.50 Below
1210	2.70 ± 0.10	3.42 ± 0.10	8.00 ± 0.10	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.60 ± 0.05	1.55 ± 0.10
1808	2.20 ± 0.10	4.95 ± 0.10	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.55 ± 0.05	1.80 ± 0.10
1812	3.66 ± 0.10	4.95 ± 0.10	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.60 ± 0.05	1.85 ± 0.10

- REEL DIMENSION

Unit: mm



A	B	C	D	E	F	G
ö178.00 ± 2.00	3.00	ö13.00 ± 0.50	ö21.00 ± 0.80	ö50.00 or more ö50.00	10.00 ± 1.50	12 max

- PACKING QUANTITY

Size	Package Style & Quantity			Unit: pcs
	PT	ET	BC	BP
0402	10,000		20,000	5,000
0603	4,000		15,000	5,000
0805	4,000	2,000/3,000	10,000	5,000
1206	4,000	2,000/3,000	5,000	5,000
1210		2,000/3,000		2,000
1808		1,000		2,000
1812		1,000		2,000