

EDCON-COMPONENTS

DATA SHEET

MLCC Chip Capacitor Size 2225

Serie:

Mat. Code	Y5V
Voltage Code	250
Range Code	334

DRW:	Jason	CHKD	Wilson
APPD:	Schumi		

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Structure of Chip Capacitor

Nominal Capacitance Unit (pf)

Ordering Code	Actual Value
0P5	0,5pf
1R0	1,0pf
102	1000pf
224	220000pf

Note: The first two digits are

### Capacitance Tolerance

Ord. Code	B	C	D	F	G	
Tolerance	0,1pf	0,25pf	0,5pf		0,01	0,02

Note: These capacitance tolerance B,C,D are just applicable th capacitance that eqals to or less.

### Dielectric Style

Dielectric Code	CG	HG	LG	PH	RH
Dielectric	COG NPO	HG	LG	PH	RH

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### Terminal Material Styles

Ordering Code	Termination Material
S	(Silver Solderable Termination)
C	(Copper Solderable Termination)
N	(Nickel Barrier Termination)

### Temperature Coefficient / Characteristics

Dielectric	Temperature Coefficient	Temperature I
COG/NPO	. 0 +/- 30 ppm/°C	.+20°C > -55°l
HG	.-33 +/-30 ppm/°C	.+20°C > -55°l
LG	. -75 +/-30 ppm/°C	.+20°C > -55°l
CH	0 +/-60 ppm/°C	.+20°C > -55°l
PH	. -150 +/-60 ppm/°C	.+20°C > -55°l
RH	. -220 +/-60 ppm/°C	.+20°C > -55°l
SH	. -330 +/-60 ppm/°C	.+20°C > -55°l
TH	. -470 +/-60 ppm/°C	.+20°C > -55°l
UJ	. -750 +/-120 ppm/°C	.+20°C > -55°l
SL	. -1000 +140 ppm/°C	.+20°C > -55°l
X7R	. +/-15%	.+20°C > -55°l
X5R	. +/-15%	.+20°C > -55°l
Z5U	. -56% ~ +22%	.+20°C > -55°l
Y5V	. -80% ~ +30%	.+20°C > -55°l

Note: Nominal Temperature coefficient and allowed tolerance of class 1 are decided by the changing

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Note for CF

The following Q value is just confirmed by general customer. If there is a higher requirement for Q value

For the customer whose requirements for frequency is between 1MHz and 2,4GHz or higher frequency

Capacitance (pf)	Q value at 300MHz		Capacitance (pf)	Q value at 300MHz
	O805	O603		
4,7	400	320	20	90
5,2	36	288	22	86
5,6	340	272	24	80
6,2	320	256	27	70
6,8	280	224	30	60
7,5	260	208	33	56
8,2	230	184	36	52
9,1	210	168	39	48
10	200	160	43	44
11	180	144	47	40
12	160	128	51	36
13	150	120	56	34
14	140	112	62	32
15	130	104	68	30
16	120	96	75	28
18	100	80	82	26

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Reliability Test

Item	Technical specification	
Capacitance	Class I	Should be within the specific
DF, tan Dissipation Favctor	Class II	Should be within the specific
	Class I	DF ≤ 0,15%
	Class II	X7R

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Reliability Test

DF, tan Dissipation Favctor	Class II	Y5V / Z5U
(IR) Insulation Resistance	Class I	C ≤ 10nf, Ri ≥ 50000MΩ C > 10nf, Ri ≥ 500S
	Class II	X7R Y5V / Z5U

Item Technical Specification  
(DWV) Dielectric Withstanding Voltage No Breakdown or damage

Solderability At least 95% of the terminal electrode is covered by new

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#### Reliability Test

Resistance to Soldering Heat

Item	NPO to SL
C/C	$\leq 0,5\%$
DF	Same to initial Value
IR	Same to initial Value
Appearance:	No visible damage. At least 95% of the terminal

Resistance to Flexure of Substrate ( Bend Appearance: No visible damage.

C/C  $\leq \pm 10\%$

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Reliability Test

Item	Technical specification	
Termination Adhesion	No visible damage	
Temperature Cycle	Class I : $\leq \pm 1\%$ or 1pf whichever is larger.	Class

Moisture Resistance	C/C	Class I $\leq \pm 2\%$ or 1pf whichever is larger
		Class II B: $\leq \pm 10\%$
		Class II E,F: $\leq \pm 30\%$
	DF	Not more than twice of initial value
	IR	Class I: $R_i \geq 2500M\Omega$ $R_i/C_r \geq 25sec$ whichever
		Class II: $R_i \geq 1000M\Omega$ $R_i/C_r \geq 25sec$ whichever

Visual Apperance: No visible damage

Note: Pretratment (only for class 2 capacitor)

Pretratment (only for class 2 capacitor) is a method to treat the capacitor before measurement. First up-category temperasture or other specified higher temperature environment for 1 hour. Then recove pressure conditions for 24hours  $\pm 1hrs.$

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## Package Conditions

### Dimension of paper taping for size 0402

Code	W1	L1	D	C	B
0402	0,65 ±0,20	1,15 ±0,20	8,0 ±0,20	3,5 ±0,05	1,75 ±0,10
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## Package Conditions

### Dimension of paper taping for size 0805 ~ 1812

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Package Conditions

Dimension of Reel (mm)



	A	B	C	D	E
7' Reel	Ø178 ± 2,0		3 Ø13 ± 0,5	Ø21 ± 0,8	Ø50 or more
13' Reel	Ø330± 2,0		3 Ø13 ± 0,5	Ø21 ± 0,8	Ø50 or more

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#### Packing Quantity

Size	Packing Style Quantity		ET	BC
	PT			
0402	10000		-----	20000
0603	5000		-----	15000
0805	5000		2500	10000
1206	5000		2500	5000
1210	-----		2000	-----
1808	-----		2000	-----
1812	-----		2000	-----
2225	-----		-----	-----
3035	-----		-----	-----

Note: We can choose packing style and quantity can be according to the customer requirement

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Soldering Profile Curve

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Ordering Information

Serie	Range	Material
-------	-------	----------

I11010

-

334

Y5V

MLCC Chip Capacitor Size 2225

334= 330000pf

Y5V= Y5V Material

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CHKD

Wilson

APPD:

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I11010

Material:

Voltage:

Range:

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No	Name
1	Ceramic dielectric
2	Inner Electrode
3	Substrate Electrode
4	Nickel Layer
5	Tin Layer

significant; third digit denotes number of zeros after range; P= decimal point

J	K	M	S	Z
	0,05	0,1	0,2 .+50% / -20%	.+80% / -20%

SH	TH	UJ	SL	X	B	E
SH	TH	UJ	SL	X5R	X7R	Z5U

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Application

Hi-Q COG capacitance are i

Note for CQ

The following Q value is just

For the customer whose req

Point

- C > +20°C >+125°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+125°C
- C > +20°C >+85°C
- C > +20°C >+85°C
- C > +20°C >+85°C

Capacitance (pf)

- 4,7
- 5,2
- 5,6
- 6,2
- 6,8
- 7,5
- 8,2
- 9,1
- 10

g of the capacitance between 20°C and 85°C

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alue requirements, we can design and produce according to the special requirements.

ncy, we can design it according to theri requierements. The frequency of CQ is a little bit higher than ti

30MHz	Capacitance (pf)		Q value at 300MHz	
	O603		O805	O603
	72	91	24	20
	69	100	22	18
	64	110	20	16
	56	120	28	15
	48	130	16	13
	45			
	42			
	39			
	36			
	32			
	29			
	28			
	26			
	24			
	23			
	20			

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Test Methods and Remarks

± tolerance

Capacitance

≤1000pf

≥1000pf

± tolerance

C≤10μF

C>10μF

Z5U

Capacitance

≤1000pf

≥1000pf

>50V  
≤ 2,5%

25V  
≤ 3,5%

16V  
≤ 3,5%

10V  
≤ 5%

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≥25V  
≤ 7,0%  
( C < 1,0μF)  
≤ 9,0%  
( C ≥ 1,0μF)

16V  
≤12,5%

10V  
≤12,5%

C ≤ 25nf, Ri ≥ 10000MΩ  
C > 25nf, Ri ≥ 100S  
C ≤ 25nf, Ri ≥ 4000MΩ

C > 25nf, Ri ≥ 100S

solder. Visual Appearance: No visible damage:

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X7R  
. -5 ~ +10%

Y5V  
. -10 ~ +20%

Z5U

Preheating co  
Solder Tempe  
Clean the cap

nal electrode is covered by new solder.

Recovery time  
Recovery conc

Test Board: Al  
Wrap: 1mm  
Speed 0,5mm  
Unit: mm  
The measurer



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II: B=  $\leq \pm 10\%$  E,F:  $\leq \pm 20\%$

Test Methods and Remarks

Applied Force: 5N

Duration: 10sec +/- 1sec

Preheating conditions: up-category temper:

Recovery time: 24hrs +/-1hrs

Initial Measurement

Cycling Tiems 5times, 1cycle, 4steps

Step	Temperature (
1	Low-category
2	Normal Temp.
3	Up-category te
4	Normal Temp.

Recovery time after test 24hrs +/- 2hrs

Temperature: 40°C +/-2°C

Humidity: 90~95% RH

Voltage: Rated Voltage

Duration: 500hrs

Charge/Discharge Current: 50mA max.

Recovery Time; 24hrs (Class I) or 48hrs ((

er is smaller

ver is smaller

t place the capacitor in the  
ery the capacitor at standard

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Paper Size  
Size Code  
0603

0805

1206

P1	P2	P0	d	t
2	2	4	1,5	0,8
±0,05	±0,05	±0,05	±0,10	below

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Paper Size  
Size Code  
0805

1206

1210

1808

1812

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Taping Specifi

F                    G  
Ø10 ± 1,5 12 max.  
Ø10 ± 1,5 12 max.

Standard: 0,1N < peeling stg  
No paper dirty remains on tf

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BP  
5000  
5000  
5000  
5000  
2000  
2000  
2000  
500

-----

#### Soldering Informations

##### Storage Methods

The guaranteed period for st

Storage conditions:

Temperature: 5~40°C

Relative Humidity: 20~70%

Precautions for use

The Multilayer Ceramic Cap:

Following precautions for sal

##### Manual Soldering

Manual Soldering can pose :

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Voltage

Capacitance Tolerance

Termination Material

No Function

250

J

N

N

250= 25Volt

J= Tol. 5%

S= Silver Termination

N= No Function

G= Tol. 2%

C= Copper Termination

F= Tol. 1%

N= Nickel Termination

D= Tol. 0,5pf

C= Tol. 0,25pf

B= Tol. 0,1pf

Tol.Code B,C,D are only for  $\leq 10$ pf

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Y5V= Y5V Material

250= 25Volt

334= 330000pf

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Serie No.:  
Customer:

Drawing

Dimensions (mm)

Chip-Size Code  
2225

L	W	T
	5,7	6,3 ≤2,50

Note: We can design according to customer special requirements

Rated Voltage (V)

Code	Actual Value
6V3	6,3
500	50
201	200
102	1000

Note: The first two digits are

F

Y5V

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Part No.:  
Customer:

deally suited for RF and Microwave application requiring high Q, low ESR, and high resonant frequen

confirmed by general customer. If there is a higher requirement for Q value requirements, we can de

uirements for frequency is between 1MHz and 2,4GHz or higher frequency, we can design it accordir

Q value at 300MHz		Capacitance (pf)		Q value at 300MHz		Capacitance (	
O805	O603			O805	O603		
1000	800	11		450	360	24	
900	720	12		400	320	27	
850	680	13		375	300	30	
800	640	14		350	280	33	
700	560	15		325	260	36	
650	20	16		300	240	39	
575	460	18		250	200	43	
525	420	20		225	180	47	
500	400	22		215	172		

MLCC Chip C:



### High Voltage MLCC

Middle & High Voltage MLCC is a kind of special design MLCC that bases on the technology of gene

hat of CF. Please choose them according to your requirements.

### Application

Analog & Digital modems  
LAN & WAN Inteface  
Lighting Ballast Circuits  
Voltage Multipliers  
DC-DC-Converter  
Back-Lighting Inverters

### Measurement Method for High Voltage MLCC

Rated Voltage Range	Measuring Method
$500V \leq V_r \leq 1000V$	Force 150% Rated Voltage for 5seconds. Max. current sf
$1000V \leq V_r \leq 2000V$	Force 120% Rated Voltage for 5seconds. Max. current sf
$2000V \leq V_r \leq 5000V$	Force 120% Rated Voltage for 5seconds. Max. current sf

MLCC Chip C.

Measuring Frequency

Measuring Voltage

1MHz +/- 10%

1,0 Tol. 0,2Vrms

1KHz +/- 10%

Test Frequency 1KHZ +/-10%

Test Voltage 1,0 +/- 0,2Vrms

X7R, Y5V

Test Frequency 1KHZ +/-10%

Test Voltage 1,0 +/- 0,2Vrms

Z5U

Test Frequency 1KHZ +/-10%

Test Voltage 1,0 +/- 0,2Vrms

Measuring Frequency

Measuring Voltage

1MHz +/- 10%

1,0 Tol. 0,2Vrms

1KHz +/- 10%

6,3V

C= 10µF

≤ 5%

Test Frequency 1KHZ +/-10%

( C < 3,3µF)

≤ 10%

Test Voltage 1,0 +/- 0,2Vrms

( C ≥ 3,3µF)

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Part No.:  
Customer:

6,3V  
≤12,5%

C= 10µF X7R; Y5V  
Test Frequency 120Hz +/-20Hz  
Test Voltage 0,5 +/- 0,1Vrms  
Test Frequency 0,1KHz  
Test Voltage 0,5 +/- 0,05Vrms  
Measuring Voltage: Rated Voltage Duration: 60Sec. +/-

Test Method and Remarks  
Measuring Voltage:  
Class I: 300% Rated Voltage  
Class II: 250% Rated Voltage  
Duration : 5 +/-1sec  
Charge / Discharge Current : 50mA max.  
This method excludes high voltage MLCC  
Solder Temperature: 235°C +/- 5°C  
Duration : 2 +/-0,5sec

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Part No.:  
Customer:

Conditions: 100 to 200°C +/- 10°C 2mon.  
Temperature: 265°C +/- 5°C Duration 5sec. +/- 1sec.  
Capacitor with solvent and examine it with a 10x(min) microscope.

Time : 24hrs +/-2hrs  
Conditions: Room temperature

I2O3 or PCB

1/sec.

Measurement should be made with the board in bending position.

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Part No.:  
Customer:

ature 1hrs

(°C)  
temp. (NPO / X7R / Y5V / Z5U)  
. (+20)  
emp. (NPO / X7R / Y5V / Z5U)  
. (+20)

Class II)

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Part No.:  
Customer:

Dimension of paper taping for size 0603, 0805, 1206

A	B	C	D	E	F	
$\pm 0,20$	1,1 $\pm 0,20$	1,9 $\pm 0,20$	8 $\pm 0,05$	3,5 $\pm 0,10$	1,75 $\pm 0,10$	4
$\pm 0,20$	1,45 $\pm 0,20$	2,3 $\pm 0,20$	8 $\pm 0,05$	3,5 $\pm 0,10$	1,75 $\pm 0,10$	4
$\pm 0,20$	1,8 $\pm 0,20$	3,4 $\pm 0,20$	8 $\pm 0,05$	3,5 $\pm 0,10$	1,75 $\pm 0,10$	4

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Part No.:  
Customer:

A	B	C	D	E	F	
$\pm 0,20$	1,55 $\pm 0,20$	2,35 $\pm 0,20$	8 $\pm 0,05$	3,5 $\pm 0,10$	1,75 $\pm 0,10$	4
$\pm 0,20$	1,95 $\pm 0,20$	3,6 $\pm 0,20$	8 $\pm 0,05$	3,5 $\pm 0,10$	1,75 $\pm 0,10$	4

	2,7	3,42	8	3,5	1,75	4
±0,10	±0,10	±0,10	±0,05	±0,10	±0,10	
	2,2	4,95	12	5,5	1,75	4
±0,10	±0,10	±0,10	±0,05	±0,10	±0,10	
	3,66	4,95	12	5,5	1,75	8
±0,10	±0,10	±0,10	±0,05	±0,10	±0,10	

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ication

Strength < 0,7N  
The scotch when peeling, and sticks to top and bottom tape

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Part No.:  
Customer:

Shelf life is 6 months (Under delivery package conditions).

Capacitor (MLCC) may fail in a short circuit mode or in an open circuit mode when subjected to severe conditions.

Precautions and Application Notes shall be taken in your major consideration. If you have a question about the product, please contact your distributor.

There is a great risk of ceramic thermal cracks in capacitors. The hot soldering iron tip comes into direct contact with the ceramic surface.

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Part No.:  
Customer:

Too much solder  
Cracks tend occur due to large stress

Not enough solder  
Weak holding force may cause bad.  
connection between the capacitor and PCE

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No Function

ROHS

Packing



on

N	R	TR
N= No Function	R= Rohs Conform	TR= Tape / Reel
	N= NON Rohs Conform	BU= Bulk Ware

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apacitor Size 2225

I11010

WB

1

significant; third digit denotes number of zeros after range; P= decimal point

capacitor Size 2225

I11010

ncy

esign and produce according to the special requirements.

ng to their requirements. The frequency of CQ is a little bit higher than that of CF. Please choose the

pf)

Q value at 300MHz

O805	O603
200	160
175	140
150	120
140	112
130	104
120	96
110	88
100	80

capacitor Size 2225

I11010

eral MLCC. This kind of MLCC has stable high voltage reliability and suitable to SMT. Middle & high Vo

ould not exceed 50mA

ould not exceed 50mA

ould not exceed 10mA

apacitor Size 2225

I11010

apacitor Size 2225

I11010

apacitor Size 2225

I11010

apacitor Size 2225

I11010

Time (min)

30

2~3

30

2~3

apacitor Size 2225

I11010

G	H	J	T	
	2	4	1,5	1,1
±0,10	±0,10	±0,10	below	
	2	4	1,5	1,1
±0,10	±0,10	±0,10	below	
	2	4	1,5	1,1
±0,10	±0,10	±0,10	below	

apacitor Size 2225

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G	H	J	T	
	2	4	1,5	1,5
±0,10	±0,10	±0,10	below	
	2	4	1,5	1,5
±0,10	±0,10	±0,10	below	



$\pm 0,10$	2 $\pm 0,10$	4 $\pm 0,10$	1,55 $\pm 0,10$	1,55
$\pm 0,10$	2 $\pm 0,10$	4 $\pm 0,10$	1,5 $\pm 0,10$	1,8
$\pm 0,10$	2 $\pm 0,10$	4 $\pm 0,10$	1,55 $\pm 0,10$	1,85

apacitor Size 2225

I11010

apacitor Size 2225

I11010

nditions of electrical and / or mechanical stress beyond the specified rating and specified conditions i

precautions für handling, please consult our engineering department of our factory.

ct with the end terminations, and operator careless may cause the tip of the soldering iron to come ir

apacitor Size 2225

I11010

3

apacitor Size 2225

I11010

apacitor Size 2225

I11010



am according to your requirements.

High voltage MLCC is widely applicable for many direct high voltage circuits in which it can improve the performance.













n the specification, which will result in burn out, flaming or glowing in the worst case.

nto direct contact with the ceramic body of the capacitor. Therefore the soldering iron must be handled











ormance of the circuit.











| carefully, and pay much attention to the selection of the soldering iron tip and temperature contact of

























f the tip.