HITANO
ENTERPRISE CORP. ®

Data Sheet

Customer:

Product: Multilayer Chip Ceramic Capacitor - C Series

Size : 0201/0402/0603/0805/1206/1210/1808/1812/1825/2211/2220/2225

Issued Date: 20-Sep.-2023

Edition: Ver. 11

Record of change

Date	Ver.	Description	Page
30-Oct.-2014	1		
05-Oct-2015	2	Revised storage condition	21
20-Feb.-2016	3	Revised capacitance range and thickness Delete size 2211	4 ~ 13
23-Apr.-2016	4	Add PCB land pattern recommendation	27
16-SEP.-2020	5	0805N103J500 T:0.85mm/1.25mm	5
16-Jul.-2021	6	1210B105K500 T:1.65mm/1.25mm	9
27-Oct-2021	7	Add 1206 154/224 200/250 V	10
10-Dec-2021	8	Add 1210 106K 100V X7R, Y5V EOL	10, 13
10-May-2022	9	Revised C >10UF Freq.	15
08-Nov-2022	10	EOL 1825 1.8NF ±5% 3000V NPO	8
20-Sep.-2023	11	Revise capacitance range & thickness code & add 0201 & specification	2~37

HITANO ENTERPRISE CORP.
7F-7, No. 3, Wu Chuan 1st Road, New Taipei Industrial Park,
New Taipei City, TAIWAN, R.O.C.
Tel: +886 2 2299 1331 (Rep.)
Fax: +886 2 2298 2466, 2298 2969

Prepared by	Checked by	Approved by	Accepted by (customer)
20-Sep.-2023	20-Sep.-2023	20-Sep.-2023	
Hwa Wu	Andy Hsu	Arthur Su	

HITANO
ENTERPRISE CORP. ®

Table of Contents

HITANO
ENTERPRISE CORP. ®

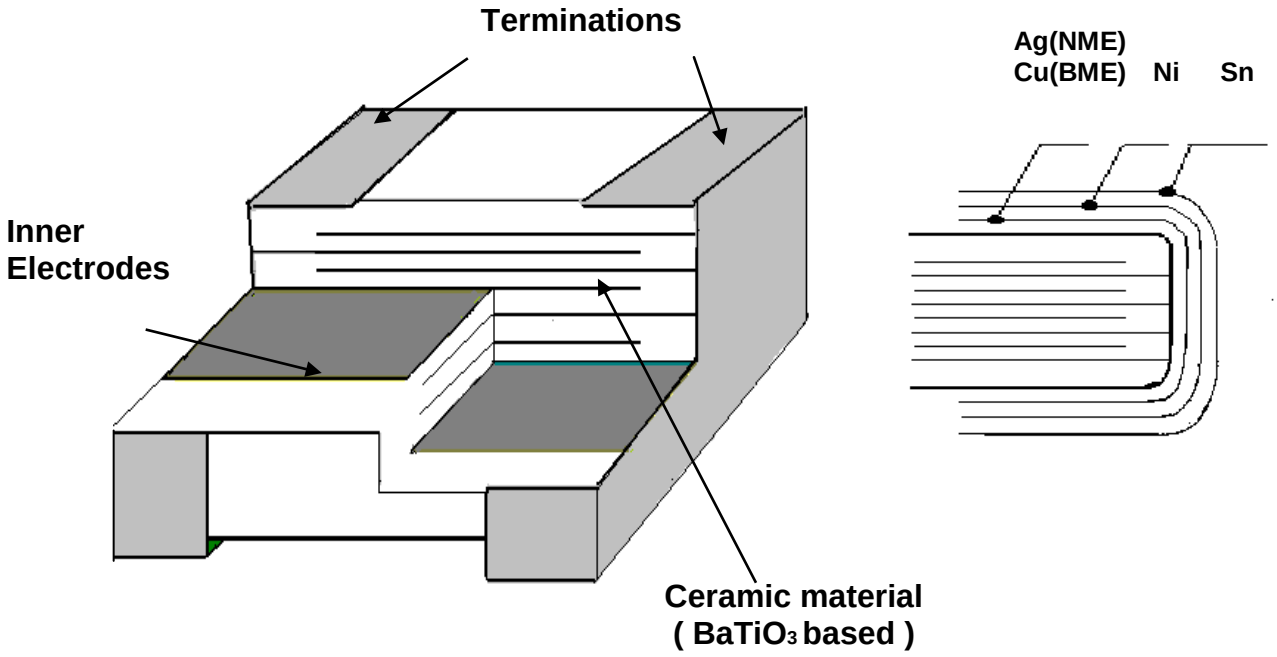
Features

a. A wide selection of sizes is available (0201 to 2225).
b. High capacitance in given case size.
c. Capacitor with lead-free termination (pure Tin).
d. RoHS & HALOGEN compliant.

Applications

a. For general digital circuit.
b. For power supply bypass capacitors.
c. For consumer electronics.
d. For telecommunication.
e. DC to DC converter.

Construction of MLCC



HITANO
ENTERPRISE CORP. ®

Part Numbering

0805 N 102 J 500 N T L

SIZE CODE

0402 = .04 X .02" 0603 = .06 X .03"

0805 = .08 X .05" 1206 = .12 X .06"

1210 = .12 X .10" 1808 = .18 X .08

1812 = .18 X .12" 2220 = .22 X .20

DIELECTRIC

N (COG) B (X7R)

Y (Y5V) X (X5R)

CAPACITANCE

Value in Pico farads: Two significant figures

Followed by no. of zero. 0R5=0.5pF 2R0=2pF 101=100pF.

CAPACITANCE TOLERANCE

A = ±0.05pF B = ±0.10pF (EIA Code)

C = ±0.25pF D = ±0.50pF

F = ±1.0% G = ±2.0%

H = ±3.0% J = ±5.0%

K = ±10% M = ±20%

Z = -20% ~+80% Tolerances may be restricted by dielectric type.

VOLTAGE

VDC：Two significant figures followed by number of zeros

063 = 6.3 VDC 100 = 10 VDC 160 = 16 VDC 250 = 25 VDC

500 = 50 VDC 101 = 100 VDC 251 = 250 VDC 501 = 500VDC

102 = 1 KVDC 202 = 2 KVDC 302 = 3 KVDC

TERMINATION

N = Nickel barrier with 100% Tin

EXTENDED CODE

- = Omit if per spec.

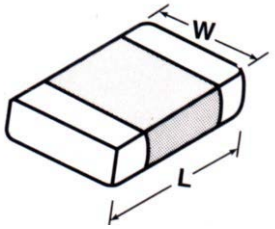
L = Add thickness code if not standard

PACKING CODE

B = Bulk in Tray

05 = 500/Reel 1= 1K/Reel 2= 2K/Reel 3= 3K/Reel (for plastic tape only)

T= 4K/Reel U= 10K/ Reel V= 15K/ Reel W = 50K/Reel



Dimension : (UNIT mm)

	0201	0402	0603	0805	1206	1210	1808	1812	1825	2220	2225
L	0.60±0.03	1.00±0.10	1.60±0.15	2.00±0.20	3.20±0.20	3.20±0.30	4.50±0.40	4.50±0.40	4.50±0.40	5.70±0.40	5.70±0.40
W	0.30±0.03	0.50±0.10	0.80±0.15	1.25±0.20	1.60±0.20	2.50±0.30	2.00±0.25	3.20±0.30	6.30±0.40	5.00±0.40	6.30±0.40

HITANO
ENTERPRISE CORP. ®

Capacitance range NPO 10V ~ 50V (Low Voltage)

Cap(pF)	EIA Size	0201				0402				0603				0805				1206			
	Code	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V
0.1	0R1	L	L	L	L	N	N	N	N												
0.2	0R2	L	L	L	L	N	N	N	N												
0.3	0R3	L	L	L	L	N	N	N	N	S	S	S	S								
0.4	0R4	L	L	L	L	N	N	N	N	S	S	S	S								
0.5	0R5	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A				
0.6	0R6	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A				
0.7	0R7	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A				
0.8	0R8	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A				
0.9	0R9	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A				
1.0	1R0	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A				X
1.0	1R0	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A				X
1.2	1R2	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
1.5	1R5	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
1.8	1R8	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
2.2	2R2	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
2.7	2R7	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
3.3	3R3	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
3.9	3R9	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
4.7	4R7	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
5.6	5R6	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
6.8	6R8	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
8.2	8R2	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
10	100	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
12	120	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
15	150	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
18	180	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
22	220	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
27	270	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
33	330	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
39	390	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
47	470	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
56	560	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
68	680	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
82	820	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
100	101	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
120	121	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
150	151	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
180	181	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
220	221	L	L	L	L	N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
270	271			L		N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
330	331					N	N	N	N	S	S	S	S	A	A	A	A	X	X	X	X
390	391			L		N	N	N	N	S	S	S	S	X	X	X	X	X	X	X	X
470	471			L		N	N	N	N	S	S	S	S	X	X	X	X	X	X	X	X
560	561					N	N	N	N	S	S	S	S	X	X	X	X	X	X	X	X
680	681					N	N	N	N	S	S	S	S	X	X	X	X	X	X	X	X
820	821					N	N	N	N	S	S	S	S	X	X	X	X	X	X	X	X
1000	102					N	N	N	N	S	S	S	S	X	X	X	X	X	X	X	X
1200	122									B	B	B	B	X	X	X	X	X	X	X	X
1500	152									B	B	B	B	X	X	X	X	X	X	X	X
1800	182									B	B	B	B	X	X	X	X	X	X	X	X
2200	222									B	B	B	B	X	X	X	X	X	X	X	X
2700	272									B	B	B	B	C	C	C	C	X	X	X	X
3300	332									B	B	B	B	C	C	C	C	X	X	X	X
3900	392									B	B	B	B	C	C	C	C	X	X	X	X
4700	472									B	B	B	B	C	C	C	C	X	X	X	X
5600	562									B	B	B	B	C	C	C	C	X	X	X	X
6800	682									B	B	B	B	C	C	C	C	C	C	C	C
8200	822									B	B	B	B	C	C	C	C	C	C	C	C
10000	103									B	B	B	B	C	C	C	C	C	C	C	C
12000	123													T/C	T/C	T/C	C	P	P	P	P
15000	153													C	C	C	C	P	P	P	P
18000	183													C	C	C	C	P	P	P	P
22000	223													C	C	C	C	P	P	P	P
27000	273																	P	P	P	P
33000	333																	P	P	P	P
39000	393																	P	P	P	P
47000	473																	P	P	P	P
56000	563																	P	P	P	P
68000	683																	P	P	P	P
82000	823																	P	P	P	P
100000	104																	E/P	E/P	E/P	E/P

HITANO
ENTERPRISE CORP. ®

Capacitance range NPO 10V ~ 50V (Low Voltage)

Cap(pF)	EIA Size	1210				1808		1812				1825		2220		2225	
	Code	10V	16V	25V	50V	25V	50V	10V	16V	25V	50V	25V	50V	25V	50V	25V	50V
2.2	2R2					C	C										
2.7	2R7					C	C										
3.3	3R3					C	C										
3.9	3R9					C	C										
4.7	4R7					C	C										
5.6	5R6					C	C										
6.8	6R8					C	C										
8.2	8R2					C	C										
10	100	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
12	120	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
15	150	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
18	180	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
22	220	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
27	270	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
33	330	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
39	390	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
47	470	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
56	560	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
68	680	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
82	820	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
100	101	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
120	121	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
150	151	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
180	181	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
220	221	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
270	271	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
330	331	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
390	391	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
470	471	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
560	561	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
680	681	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
820	821	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
1000	102	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
1200	122	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
1500	152	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
1800	182	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
2200	222	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
2700	272	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
3300	332	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
3900	392	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
4700	472	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
5600	562	M	M	M	M	C	C	C	C	C	C	F	F	F	F	F	F
6800	682	M	M	M/C	M/C	C	C	C	C	C	C	F	F	F	F	F	F
8200	822	M	M	M/C	M/C	C	C	C	C	C	C	F	F	F	F	F	F
10000	103	M	M	M/C	M/C	C	C	C	C	C	C	F	F	F	F	F	F
12000	123	C	C	C/E	C/E	E	E	C	C	C	C	F	F	F	F	F	F
15000	153	C	C	C/E	C/E	E	E	C	C	C	C	F	F	F	F	F	F
18000	183	F	F	F	F	F	F	C	C	C	C	F	F	F	F	F	F
22000	223	F	F	F	F	F	F	C	C	C	C	F	F	F	F	F	F
27000	273	F	F	F/G	F/G			C	C	E	E	F	F	F	F	F	F
33000	333	F	F	F/G	F/G			C	C	E	E	F	F	F	F	F	F
39000	393	F	F	F/G	F/G			G	G	G	G	F	F	F	F	F	F
47000	473	F	F	F/G	F/G			G	G	G	G	F	F	F	F	F	F
56000	563							G	G	G	G	F	F	F	F	F	F
68000	683							G	G	G	G	F	F	F	F	F	F
82000	823							G	G	G	G	F	F	F	F	F	F
100000	104							G	G	G	G	G	G	G	G	F	F

HITANO
ENTERPRISE CORP. ®

Size and capacitance range NPO 100V ~ 630V (Medium Voltage)

Dimension		0402			0603			0805					1206				
Cap(pF)	code	100V	200V	250V	100V	200V	250V	100V	200V	250V	500V	630V	100V	200V	250V	500V	630V
0.5	0R5	N	N	N	S	S	S	A	A	A	A	A					
1.0	1R0	N	N	N	S	S	S	A	A	A	A	A					
1.2	1R2	N	N	N	S	S	S	A	A	A	A	A	X			X	
1.5	1R5	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
1.8	1R8	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
2.2	2R2	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
2.7	2R7	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
3.3	3R3	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
3.9	3R9	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
4.7	4R7	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
5.6	5R6	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
6.8	6R8	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
8.2	8R2	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
10	100	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
12	120	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
15	150	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
18	180	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
22	220	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
27	270	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
33	330	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
39	390	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
47	470	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
56	560	N	N	N	S	S	S	A	A	A	A	A	X	X	X	X	X
68	680	N	N		S	S	S	A	A	A	A	A	X	X	X	X	X
82	820	N	N		S	S	S	A	A	A	X	X	X	X	X	X	X
100	101	N	N		S	S	S	A	A	X	X	X	X	X	X	X	X
120	121	N			S	S	S	A	A	X	C	C	X	X	X	X	X
150	151	N			S	S	S	A	X	X	C	C	X	X	X	X	X
180	181	N			S	S	S	A	X	C	C	C	X	X	X	X	X
220	221	N			S	S	S	A	C	C	C	C	X	X	X	X	X
270	271				S	B	B	A	C	C	C	C	X	X	M	M	M
330	331				S	B	B	A	C	C	C	C	X	X	M	M	M
390	391				S	B	B	X	C	C	C	C	X	X	M	M	M
470	471				S	B	B	X	C	C	I	I	X	M	M	M	M
560	561				S	B	B	X	C	C	I	I	X	M	C	C	C
680	681				S	B	B	X	C	C	I	I	X	M	C	C	C
820	821				S	B	B	X	C	C	I	I	X	M	E	E	E
1000	102				S	B	B	X	C	C	I	I	X	M	E	E	E
1200	122				B	B	B	X	C	C	I	I	X	M	E	E	E
1500	152				B	B	B	X	C	C	I	I	X	C	E	E	E
1800	182				B	B	B	X	C	C	I	I	X	C	E	E	E
2200	222				B	B	B	X	C	C	I	I	M	C	E	E	E
2700	272							C	C/I	C/I			M	C	E	E	E
3300	332							C	I	I			C	C	E	E	E
3900	392							C	I	I			C	E	E	E	E
4700	472							C	I	I			C	E	E	E	E
5600	562							C					E	E	E	E	E
6800	682							C					E	E	E	E	C/E
8200	822							C					E	E	E	E	E
10000	103							C					E	E	E	E	E
12000	123							C					P				
15000	153							C					P				
18000	183							C					P				
22000	223							C					P				
27000	273																
33000	333																

HITANO
ENTERPRISE CORP. ®

Size and capacitance range NPO 100V ~ 630V (Medium Voltage)

Dimension		1210					1808					1812				
Cap(pF)	code	100V	200V	250V	500V	630V	100V	200V	250V	500V	630V	100V	200V	250V	500V	630V
2.2	2R2						C	C	C	C	C					
2.7	2R7						C	C	C	C	C					
3.3	3R3						C	C	C	C	C					
3.9	3R9						C	C	C	C	C					
4.7	4R7						C	C	C	C	C					
5.6	5R6						C	C	C	C	C					
6.8	6R8						C	C	C	C	C					
8.2	8R2						C	C	C	C	C					
10	100	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
12	120	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
15	150	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
18	180	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
22	220	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
27	270	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
33	330	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
39	390	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
47	470	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
56	560	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
68	680	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
82	820	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
100	101	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
120	121	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
150	151	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
180	181	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
220	221	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C
270	271	M	M	M	M	M	C	C	C	F	F	C	C	C	C	C
330	331	M	M	M	M	M	C	C	C	F	F	C	C	C	C	C
390	391	M	M	M	M	M	C	C	C	F	F	C	C	C	C	C
470	471	M	M	M	M	M	C	C	C	F	F	C	C	C	C	C
560	561	M	M	M	M	M	C	C	C	F	F	C	C	C	C	C
680	681	M	M	M	M	M	C	C	C	F	F	C	C	C	C	C
820	821	M	M	M	M	M	C	C	C	F	F	C	C	C	C	C
1000	102	M	C	C	C	C	C	C	C	F	F	C	C	C	C	C
1200	122	M	C	C	C	C	C	C	C	F	F	C	C	C	C	C
1500	152	M	C	C	C	C	C	C	C	F	F	C	C	C	C	C
1800	182	M	C	C	C	C	C	C	C	F	F	C	C	C	C	C
2200	222	M	C	C	C	C	C	C	C	F	F	C	C	C	C	C
2700	272	M	C	C	C	C	C	C	C	F	F	C	C	C	C	C
3300	332	M	C	C	C	C	C	C	C	F	F	C	C	C	C	C
3900	392	M	C	C	C	C	C	C	C			C	C	C	C	C
4700	472	M	E/C	E/C	C	C	C	C	C			C	C	C	C	C
5600	562	C	E/C	E/C	C	C	C	E	E			C	C	C	C	C
6800	682	C	E	E	E/C	E/C	C	E	E			C	C	C	C	C
8200	822	C	E	E	E	E	E	F	F			C	C	C	C	C
10000	103	E	F	F	F	F	E	F	F			C	C	C	C	C
12000	123	E	C/E/F	C/E/F	F	F						C	E	E	E	E
15000	153	F	C/E/F	C/E/F	G	G						C	E	E	E	E
18000	183	F/G	E/F/G	E/F	G	G						E	F	F	F	F
22000	223	F/G	E/F/G	E/F	G	G						E	F	F	F	F
27000	273	F	F	F	G	G						F	G	G		
33000	333	F	F/G	F/G	G	G						F				
39000	393	F	F	F								G				
47000	473	F	F	F								G				
56000	563											G				
68000	683											G				
82000	823											G				
100000	104											G				

HITANO
ENTERPRISE CORP. ®

Size and capacitance range NPO 100V ~ 630V (Medium Voltage)

Dimension		1825					2220					2225				
Cap(pF)	code	100V	200V	250V	500V	630V	100V	200V	250V	500V	630V	100V	200V	250V	500V	630V
10	100	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
12	120	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
15	150	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
18	180	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
22	220	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
27	270	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
33	330	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
39	390	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
47	470	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
56	560	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
68	680	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
82	820	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
100	101	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
120	121	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
150	151	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
180	181	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
220	221	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
270	271	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
330	331	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
390	391	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
470	471	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
560	561	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
680	681	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
820	821	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
1000	102	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
1200	122	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
1500	152	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
1800	182	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2200	222	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2700	272	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
3300	332	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
3900	392	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
4700	472	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
5600	562	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
6800	682	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
8200	822	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
10000	103	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
12000	123	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
15000	153	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
18000	183	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
22000	223	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
27000	273	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
33000	333	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
39000	393	F	F	F	G	G	F	F	F	G	F	F	F	F	F	F
47000	473	F	F	F			F	G	G	G	F	F	F	F	F	F
56000	563	F	G	G			F	G	G		G	F	G	G	G	G
68000	683	F	G	G			F	G	G		H	F	G	G	G	G
82000	823	G					G				H	F	G	G	G	
100000	104	G					G				H	G	G	G		
120000	124															
150000	154															
180000	184															
220000	224															

HITANO
ENTERPRISE CORP.®

Size and capacitance range NPO 1000V ~ 6000V (High Voltage)

Dimension		0805	1206				1210			
Cap.(pF)	Code	1000V	1000V	1500V	2000V	3000V	1000V	1500V	2000V	3000V
1.5	1R5	C	X	X	X					
1.8	1R8	C	X	X	X					
2.2	2R2	C	X	X	X					
2.7	2R7	C	X	X	X					
3.3	3R3	C	X	X	X					
3.9	3R9	C	X	X	X					
4.7	4R7	C	X	X	X					
5.0	5R0	C	X	X	X					
5.6	5R6	C	X	X	X					
6.8	6R8	C	X	X	X					
8.2	8R2	C	X	X	X					
10	100	C	X	X	X	E	M	M	M	F
12	120	C	X	X	X	E	M	M	M	F
15	150	C	X	X	X	E	M	M	M	F
18	180	C	X	X	X	E	M	M	M	F
22	220	C	X	X	X	E	M	M	M	F
27	270	C	X	X	X	E	M	M	M	F
33	330	C	X	M	M	E	M	M	M	F
39	390	C	X	M	M	E	M	M	M	F
47	470	C	X	M	M	E	M	M	M	F
56	560	C	X	C	C	E	M	C	C	F
68	680	C	X	C	C	E	M	C	C	F
82	820	C	X	C	C	E	M	C	C	F
100	101	C	X	C	C	E	C	C	C	F
120	121	C	X/C	E	E	E	C	C	C	F
150	151	C	C	E	E		C	E	E	F
180	181	C	E/C	E	E		C	E	E	F
220	221	C	E/C	E	E		E	E	E	F
270	271	C	E/C	P	P		E	F	F	G
330	331	C	E/C	P/E	P/E		E	F	F	
390	391	C	E/C	P/E	P/E		E	G	G	
470	471		E/C	E	E		E	C	C	
560	561		E				E	G	G	
680	681		E				E	G	G	
820	821		E				E	G	G	
1000	102		E				E	G	G	
1200	122		E				E	F	F	
1500	152		E				F	G	G	
1800	182		E				G	G	G	
2200	222		E				G			
2700	272		E				G			
3300	332		E				G			
3900	392		E				G			
4700	472		E				G			
5600	562						G			
6800	682						G			
8200	822						G			
10000	103						G			

HITANO
ENTERPRISE CORP. ®

Size and capacitance range NPO 1000V ~ 6000V (High Voltage)

Dimension		1808						1812					1825			
Cap.(pF)	Code	1000V	1500V	2000V	3000V	4000V	6000V	1000V	1500V	2000V	3000V	4000V	1000V	1500V	2000V	3000V
1.5	1R5															
1.8	1R8															
2.2	2R2	C	C	C	C	C										
2.7	2R7	C	C	C	C	C										
3.3	3R3	C	C	C	C	C	C*									
3.9	3R9	C	C	C	C	C	C*									
4.7	4R7	C	C	C	C	C	C*									
5.0	5R0	C	C	C	C	C	C*									
5.6	5R6	C	C	C	C	C	C*									
6.8	6R8	C	C	C	C	C	C*									
8.2	8R2	C	C	C	C	C	C*									
10	100	C	C	C	C	C	C*	C	C	C	C	C	F	F	F	F
12	120	C	C	C	C	C	C*	C	C	C	C	C	F	F	F	F
15	150	C	C	C	C	C	C*	C	C	C	C	C	F	F	F	F
18	180	C	C	C	C	C	C*	C	C	C	C	C	F	F	F	F
22	220	C	C	C	C	E	C*	C	C	C	C	C	F	F	F	F
27	270	C	C	C	C	E	C*	C	C	C	C	C	F	F	F	F
33	330	C	C	C	C	E*	C*	C	C	C	C	C	F	F	F	F
39	390	C	C	C	C	F*	E*	C	C	C	C	C*	F	F	F	F
47	470	C	C	C	C		E*	C	C	C	C	C*	F	F	F	F
56	560	C	C	C	C		E*	C	C	C	C	E*	F	F	F	F
68	680	C	C	C	C		F*	C	C	C	C	E*	F	F	F	F
82	820	C	C	C	C		F*	C	C	C	C	F*	F	F	F	F
100	101	C	C	C	F		F*	C	C	C	C	F*	F	F	F	F
120	121	C	C	C	F			C	C	C	C	G*	F	F	F	F
150	151	C	F	F	F			C	C	C	C		F	F	F	F
180	181	C	F	F	F			C	C	C	F		F	F	F	F
220	221	C	F	F	F			C	C	C	F		F	F	F	F
270	271	F	F	F	F			C	F	F	F		F	F	F	F
330	331	F	F	F	F			C	F	F	F		F	F	F	F
390	391	F	F	F	F			C	F	F	F		F	F	F	F
470	471	F	F	F	F			F	F	F	F		F	F	F	F
560	561	F	F	F				F	F	F	F		F	F	F	F
680	681	F	F	F				F	F	F	F		F	F	F	F
820	821	F	F	F				F	F	F	G		F	F	F	F
1000	102	F	F	F				F	F	F	G		F	F	F	F
1200	122	F	F	F				F	F	F	R		F	F	F	
1500	152	F	F	F				F	F	F			F	F	F	
1800	182	F	F	F				E	F	F			F	F	F	
2200	222	F						F	F	F			F	F	F	
2700	272							F	G	G			F	F	F	
3300	332							F	G	G			F	F	F	
3900	392							G					F	F	F	
4700	472							F/G					F	F	F	
5600	562							G					F			
6800	682												F			
8200	822												G			
10000	103												G			
12000	123															

HITANO
ENTERPRISE CORP. ®

Size and capacitance range NPO 1000V ~ 6000V (High Voltage)

Dimension		2220					2225				
Cap.(pF)	Code	1000V	1500V	2000V	3000V	4000V	1000V	1500V	2000V	3000V	4000V
1.5	1R5										
1.8	1R8										
2.2	2R2										
2.7	2R7										
3.3	3R3										
3.9	3R9										
4.7	4R7										
5.0	5R0										
5.6	5R6										
6.8	6R8										
8.2	8R2										
10	100	F	F	F	F	F	F	F	F	F	F
12	120	F	F	F	F	F	F	F	F	F	F
15	150	F	F	F	F	F	F	F	F	F	F
18	180	F	F	F	F	F	F	F	F	F	F
22	220	F	F	F	F	F	F	F	F	F	F
27	270	F	F	F	F	F	F	F	F	F	F
33	330	F	F	F	F	F	F	F	F	F	F
39	390	F	F	F	F	F	F	F	F	F	F
47	470	F	F	F	F	F	F	F	F	F	F
56	560	F	F	F	F	F	F	F	F	F	F
68	680	F	F	F	F	F	F	F	F	F	F
82	820	F	F	F	F	F	F	F	F	F	F
100	101	F	F	F	F	F	F	F	F	F	F
120	121	F	F	F	F	F	F	F	F	F	
150	151	F	F	F	F	F	F	F	F	F	
180	181	F	F	F	F	F	F	F	F	F	
220	221	F	F	F	F	F	F	F	F	F	
270	271	F	F	F	F	G	F	F	F	F	
330	331	F	F	F	F	G	F	F	F	F	
390	391	F	F	F	F		F	F	F	F	
470	471	F	F	F	F		F	F	F	F	
560	561	F	F	F	F		F	F	F	F	
680	681	F	F	F	F		F	F	F	F	
820	821	F	F	F	F		F	F	F	F	
1000	102	F	F	F	F		F	F	F	F	
1200	122	F	F	F	F		F	F	F	F	
1500	152	F	F	F	F		F	F	F	F	
1800	182	F	F	F			F	F	F	F	
2200	222	F	F	F			F	F	F	F	
2700	272	F	F	F			F	F	F	G	
3300	332	F	F	F			F	F	F	G	
3900	392	F	F	F			F	F	F		
4700	472	F	F	F			F	F	F		
5600	562	F					F	F	F		
6800	682	F					F	F	F		
8200	822	G					F	G	G		
10000	103	G					G	G	G		
12000	123										

HITANO
ENTERPRISE CORP. ®

Size and capacitance range X7R 6.3V ~ 50V (Low Voltage)

Cap(pF)	EIA Size	0201					0402					0603					0805				
	Code	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V
100	101			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
120	121			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
150	151			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
180	181			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
220	221			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
270	271			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
330	331			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
390	391			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
470	471			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
560	561			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
680	681			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
820	821			L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
1000	102	L	L	L	L	L		N	N	N	N		S	S	S	S		X	X	X	X
1200	122	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
1500	152	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
1800	182	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
2200	222	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
2700	272	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
3300	332	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
3900	392	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
4700	472	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
5600	562	L	L	L	L			N	N	N	N		S	S	S	S		X	X	X	X
6800	682	L	L	L				N	N	N	N		S	S	S	S		X	X	X	X
8200	822	L	L	L				N	N	N	N		S	S	S	S		X	X	X	X
10000	103	L	L	L	L		N	N	N	N	N		S	S	S	S		X	X	X	X
12000	123							N	N	N	N/K		S	S	S	S		X	X	X	X
15000	153							N	N	N	N/K		S	S	S	S		X	X	X	X
18000	183							N	N	N	N/K		S	S	S	S		X	X	X	X
22000	223		L	L			N	N	N	N	N/K		S	S	S	S		X	X	X	X
27000	273							N	N	N	N/K		S	S	S	S		X	X	X	X
33000	333							N	N	N	N/K		S	S	B	B		X	X	X	X
39000	393							N	N	N	N/K		S	S	B	B		X	X	X	X
47000	473							N	N	N	N/K		S	S	B	B		X	X	X	X
56000	563							N	N	N	K		S	S	B	B		X	X	X	X
68000	683							N	N	N	K		S	S	B	B		X	X	X	X
82000	823							N	N	N	K		S	S	B	B		X	X	X	X/C
100000	104						N	N	N	N	K		S	S	B	B		X	X	X	X/C
120000	124												S	S	B			X	X	X	C
150000	154												S	S	B	B		C	C	C	C
180000	184												S	S	B			C	C	C	C
220000	224						N	N	N	N			S	S	B	B		C	C	C	C/I
270000	274											B	B	B	B		C	C	C	C	I
330000	334												B	B	B	B		C	C	C	I
390000	394												B	B	B			C	C	C	I
470000	474						N	N				B	B	B	B	B		C	C	C	I
560000	564												B	B				C	C	C	I
680000	684											B	B	B				C	C	C	I
820000	824												B	B				C	C	C	I

HITANO
ENTERPRISE CORP.®

Size and capacitance range X7R 6.3V ~ 50V (Low Voltage)

Cap(pF)	EIA Size	1206					1210					1812				1825		2220		2225	
	Code	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	10V	16V	25V	50V	25V	50V	25V	50V	25V	50V
100	101				X	X															
120	121				X	X															
150	151		X	X	X	X															
180	181		X	X	X	X															
220	221		X	X	X	X				M	M										
270	271		X	X	X	X				M	M			C	C						
330	331		X	X	X	X				M	M			C	C						
390	391		X	X	X	X				M	M			C	C						
470	471		X	X	X	X				M	M			C	C						
560	561		X	X	X	X				M	M			C	C						
680	681		X	X	X	X				M	M			C	C						
820	821		X	X	X	X				M	M			C	C						
1000	102		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
1200	122		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
1500	152		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
1800	182		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
2200	222		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
2700	272		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
3300	332		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
3900	392		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
4700	472		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
5600	562		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
6800	682		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
8200	822		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
10000	103		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
12000	123		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
15000	153		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
18000	183		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
22000	223		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
27000	273		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
33000	333		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
39000	393		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
47000	473		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
56000	563		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
68000	683		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
82000	823		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
100000	104		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
120000	124		X	X	X	X		M	M	M	M	C	C	C	C	F	F	F	F	F	F
150000	154		M	M	M	M		M	M	M	M	C	C	C	C	F	F	F	F	F	F
180000	184		M	M	M	M		M	M	M	M	C	C	C	C	F	F	F	F	F	F
220000	224		M	M	M	M		M	M	M	M	C	C	C	C	F	F	F	F	F	F
270000	274		M	M	M	C		M	M	M	M	C	C	C	C	F	F	F	F	F	F
330000	334		M	M	M	C		M	M	M	C	C	C	C	C	F	F	F	F	F	F
390000	394		M	M	C	P		M	M	M	C	C	C	C	C	F	F	F	F	F	F
470000	474		J	J	C/J	P		M	M	M	C	C	C	C	C	F	F	F	F	F	F
560000	564		J	J	C/J	P		C	C	C	C	C	C	C	C	F	F	F	F	F	F
680000	684		J	J	C/J	P		C	C	C	C	C	C	C	F	F	F	F	F	F	F
820000	824		J	J	C/J	P		C	C	C	C	C	C	C	F	F	F	F	F	F	F

HITANO
ENTERPRISE CORP. ®

Size and capacitance range X7R 100V ~ 630V (Medium Voltage)

Dimension		0402	0603			0805					1206					
Cap(pF)	code	100V	100V	200V	250V	100V	200V	250V	500V	630V	100V	200V	250V	500V	400V 450V	630V
100	101	N	S	B	B	X	X	X	X	X	X	C	C	C		C
120	121	N	S	B	B	X	X	X	X	X	X	C	C	C		C
150	151	N	S	B	B	X	X	X	X	X	X	C	C	C		C
180	181	N	S	B	B	X	X	X	X	X	X	C	C	C		C
220	221	N	S	B	B	X	X	X	X	X	X	C	C	C		C
270	271	N	S	B	B	X	X	X	X	X	X	C	C	C		C
330	331	N	S	B	B	X	X	X	X	X	X	C	C	C		C
390	391	N	S	B	B	X	X	X	X	X	X	C	C	C		C
470	471	N	S	B	B	X	X	X	X	X	X	C	C	C		C
560	561	N	S	B	B	X	X	X	X	X	X	C	C	C		C
680	681	N	S	B	B	X	X	X	X	X	X	C	C	C		C
820	821	N	S	B	B	X	X	X	X	X	X	C	C	C		C
1000	102	N	S	B	B	X	X	X	X	X	X	C	C	C		C
1200	122	N	S	B	B	X	X	X	X	X	X	C	C	C		C
1500	152	N	S	B	B	X	X	X	X	X	X	C	C	C		C
1800	182	N	S	B	B	X	X	X	X	X	X	C	C	C		C
2200	222	N	S	B	B	X	X	X	X	X	X	C	C	C		C
2700	272	N	S	B	B	X	X	X	X	X	X	C	C	C		C
3300	332	N	S	B	B	X	X	X	X	X	X	C	C	C		C
3900	392	N	S	B	B	X	X	X	X	X	X	C	C	C		C
4700	472	N	S	B	B	X	X	X	C	C	X	C	C	C		C
5600	562		S	B	B	X	X	X	C	C	X	C	C	C		C
6800	682		S	B	B	X	X	X	C	C	X	C	C	C		C
8200	822		S	B	B	X	X	X	C	C	X	C	C	C		C
10000	103		S	B	B	X	C	C	C	C	X	C	C	C		C
12000	123		B			X	C	C	C	C	X	C	C	C		C
15000	153		B			X	C	C	C	C	X	C	C	C		C
18000	183		B			X	C	C	C	C	X	C	C	C		C
22000	223		B			X	C	C	C	C	X	C	C	E		E
27000	273		B			C	C	C	C	C	X	C	C	E		E
33000	333		B			C	C	C	C		X	E	E	E		E
39000	393		B			C	C	C			X	E	E	E		E
47000	473		B			C	C	C			X	E	E	E		E
56000	563		B			C	C	C			X	E	E	E		E
68000	683		B			C	C	C			X	E	E		E	
82000	823		B			C	C				C	E	E		E	
100000	104		B			C	C				C	E	E		E	
120000	124					I					C	E	E			
150000	154					I					E	E	E			
180000	184					I					E	E	E			
220000	224					I					E	E	E			
270000	274					I					E					
330000	334					I					E					
390000	394					I					E					
470000	474					I					E					
560000	564										P					
680000	684										P					
820000	824										P					

HITANO
ENTERPRISE CORP. ®

Size and capacitance range X7R 100V ~ 630V (Medium Voltage)

Dimension		1210						1808		1812					
Cap(pF)	code	100V	200V	250V	400V 450V	500V	630V	500V	630V	100V	200V	250V	450V	500V	630V
100	101														
120	121														
150	151							C	C						
180	181							C	C						
220	221	M	M	M		C	C	C	C						
270	271	M	M	M		C	C	C	C	C	C	C	C	C	C
330	331	M	M	M		C	C	C	C	C	C	C	C	C	C
390	391	M	M	M		C	C	C	C	C	C	C	C	C	C
470	471	M	M	M		C	C	C	C	C	C	C	C	C	C
560	561	M	M	M		C	C	C	C	C	C	C	C	C	C
680	681	M	M	M		C	C	C	C	C	C	C	C	C	C
820	821	M	M	M		C	C	C	C	C	C	C	C	C	C
1000	102	M	M	M		C	C	C	C	C	C	C	C	C	C
1200	122	M	M	M		C	C	C	C	C	C	C	C	C	C
1500	152	M	M	M		C	C	C	C	C	C	C	C	C	C
1800	182	M	M	M		C	C	C	C	C	C	C	C	C	C
2200	222	M	M	M		C	C	C	C	C	C	C	C	C	C
2700	272	M	M	M		C	C	C	C	C	C	C	C	C	C
3300	332	M	M	M		C	C	C	C	C	C	C	C	C	C
3900	392	M	M	M		C	C	C	C	C	C	C	C	C	C
4700	472	M	M	M		C	C	C	C	C	C	C	C	C	C
5600	562	M	M	M		C	C	F	F	C	C	C	C	C	C
6800	682	M	M	M		C	C	F	F	C	C	C	C	C	C
8200	822	M	M	M		C	C	F	F	C	C	C	C	C	C
10000	103	M	M	M		C	C	F	F	C	C	C	C	C	C
12000	123	M	M	M		C	C	F	F	C	C	C	C	C	C
15000	153	M	M	M		C	C	F	F	C	C	C	C	C	C
18000	183	M	M	M		C	C	F	F	C	C	C	C	C	C
22000	223	M	M	M		C	C	F	F	C	C	C	C	C	C
27000	273	M	M	M		E	E	F	F	C	C	C	C	C	C
33000	333	M	M	M		E	E	F	F	C	C	C	C	C	C
39000	393	M	M	M		E	E	F	F	C	C	C	C	C	C
47000	473	M	C	C		E	E	F	F	C	C	C	C	C	C
56000	563	M	C	E		E	E	F	F	C	C	C	F	F	F
68000	683	M	E	E		F/E	F/E	F	F	C	C	C	F	F	F
82000	823	M	E	E		F	F	F	F	C	C	C	F	F	F
100000	104	M	E	E		F	F			C	C	C	F	F	F
120000	124	M	E	E	G	G	G			C	C	C	G	G	G
150000	154	C	G	G	G	G	G			C	F	F	G	G	G
180000	184	C	G	G	G					C	F	F	G	G	G
220000	224	C	G	G	G					C	F	F	G	G	G
270000	274	E	G	G	G					C	F	F	G	G	
330000	334	E	G	G	G					C	F	F	G	G	
390000	394	G	G	G						C	F	F	G	G	
470000	474	G	G	G						F	F	F	G	G	
560000	564	G	G	G						F	G	G	G		
680000	684	F	G	G						F	G	G	G		
820000	824	F								F	G	G	H		

HITANO
ENTERPRISE CORP. ®

Size and capacitance range X7R 100V ~ 630V (Medium Voltage)

Dimension		1825					2220					2225				
Cap(pF)	code	100V	200V	250V	500V	630V	100V	200V	250V	500V	630V	100V	200V	250V	500V	630V
1000	102	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
1200	122	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
1500	152	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
1800	182	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2200	222	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2700	272	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
3300	332	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
3900	392	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
4700	472	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
5600	562	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
6800	682	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
8200	822	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
10000	103	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
12000	123	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
15000	153	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
18000	183	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
22000	223	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
27000	273	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
33000	333	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
39000	393	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
47000	473	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
56000	563	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
68000	683	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
82000	823	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
100000	104	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
120000	124	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
150000	154	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
180000	184	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
220000	224	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
270000	274	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
330000	334	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
390000	394	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
470000	474	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
560000	564	F	F	F	G	G	F	F	F	G	G	F	F	F	F	F
680000	684	F	F	F			F	F	F	G	G	F	F	F		
820000	824	F	F	F			F	F	F	H	H	F	F	F		

HITANO
ENTERPRISE CORP. ®

Size and capacitance range X7R 1000V ~ 5000V (High Voltage)

Dimension		0805	1206				1210			1808				
Cap.(pF)	Code	1000V	1000V	1500V	2000V	2500V	1000V	1500V	2000V	1000V	1500V	2000V	3000V	4000V
100	101	X	C	C	C	C	C	C	C					
120	121	X	C	C	C	C	C	C	C					
150	151	X	C	C	C	C	C	C	C	C	C	C	C	F*
180	181	X	C	C	C	C	C	C	C	C	C	C	C	F*
220	221	X	C	C	C	C	C	C	C/E	C	C	C	C	F*
270	271	X	C	C	C	C	C	C	C/E	C	C	C	C	F*
330	331	X	C	C	C	C	C	C	C/E	C	C	C	F	F*
390	391	X	C	C	C	C	C	C	C/E	C	C	C	F	F*
470	471	X	C	C	C	C	C	C	C/E	C	C	C	F	F*
560	561	X	C	C	C	C	C	C	C/E	C	C	C	F	F*
680	681	X	C	C	C	C*	C	C	C/E	C	C	C	F	F*
820	821	X	C	C	C	C*	C	C	C/E	C	C	C	F	F*
1000	102	X	C	C	C	C*	C	C	C/E	C	C	C/E	F	F*
1200	122	X	C	C/E	E	E*	C	G	C/E	C	F	F	F	
1500	152	C	C	C/E	E	E*	C	G	F	C	F	F	F	
1800	182	C	C	C/E	E	E*	C	G	F	C	F	F	F	
2200	222	C	C	C/E	E	E*	C	G	F	C	F	F	F	
2700	272	C	C	C/E	E	E*	C	G	G	C	F	F	F	
3300	332	C	C	C/E	E	E*	C	G	G	C	F	F	F	
3900	392	C	C	C/E		E*	E	G	G	C	F	F	F*	
4700	472	C	C	C/E		E*	E	G/F	G/F	C	F	F	F*	
5600	562	C	C	C/E			E	G	G*	F	F	F	F*	
6800	682	C	C	C/E*			E	G	G*	F	F	F	F*	
8200	822	C	C	C/E*			E	G	G*	F	F*	F*	F*	
10000	103	C	C	C/E*			E	G	G*	F	F*	F*	F*	
12000	123		E	C/E*			E	G		F				
15000	153		E	E			E	G		F				
18000	183		E	E			E	G		F				
22000	223		E	E			E	G		F				
27000	273						E	G		F				
33000	333						E	G		F				
39000	393						F			F				
47000	473						G			F				
56000	563									F				
68000	683													

* Surface coating only.

HITANO
ENTERPRISE CORP.®

Size and capacitance range X7R 1000V ~ 5000V (High Voltage)

Dimension		1812					1825				
Cap.(pF)	Code	1000V	1500V	2000V	3000V	4000V	1000V	1500V	2000V	3000V	4000V
270	271	C	C	C	F	F*					F*
330	331	C	C	C	F	F*					F*
390	391	C	C	C	F	F*					F*
470	471	C	C	C	F	F*					F*
560	561	C	C	C	F	F*					F*
680	681	C	C	C	F	F*					F*
820	821	C	C	C	F	F*					F*
1000	102	C	C	C	F	F*	F	F	F	F	F*
1200	122	C	C	C	F	G*	F	F	F	F	G*
1500	152	C	C	C	F	G*	F	F	F	F	G*
1800	182	C	C	C	G	G*	F	F	F	F	G*
2200	222	C	C	C	G*		F	F	F	F*	
2700	272	C	C	C	G*		F	F	F	F*	
3300	332	C	F	F	G*		F	F	F	F*	
3900	392	C	F	F	G*		F	F	F	F*	
4700	472	C	F	F	G*		F	F	F	F*	
5600	562	C	G	G			F	F	F	G*	
6800	682	C	G	G			F	F	F	G*	
8200	822	C	G	G			F	F	F	G*	
10000	103	C	E/G/F	E/G/F			F	F	F	G*	
12000	123	F	E/G/F				F	G	G	H*	
15000	153	F	E/G/F				F	G	G	H*	
18000	183	G	E/G/F				F	G	G	H*	
22000	223	G	F/G				F	G	G		
27000	273	G					F	H	H		
33000	333	G					F	H	H		
39000	393	G					F	H	H		
47000	473	G/F					F	H	H		
56000	563	G					F	H			
68000	683	G					F				
82000	823	G					F				
100000	104	G					G				
120000	124										
150000	154										
180000	184										
220000	224										
270000	274										
330000	334										

* Surface coating only.

HITANO
ENTERPRISE CORP. ®

Size and capacitance range X7R 1000V ~ 5000V (High Voltage)

Dimension		2211		2220						2225					
Cap.(pF)	Code	3000V	4000V	1000V	1500V	2000V	3000V	4000V	5000V	1000V	1500V	2000V	3000V	4000V	5000V
270	271	F	F*					F*	F*					F*	F*
330	331	F	F*					F*	F*					F*	F*
390	391	F	F*					F*	F*					F*	F*
470	471	F	F*					F*	F*				E	F*	F*
560	561	F	F*					F*	F*					F*	F*
680	681	F	F*					F*	F*					F*	F*
820	821	F	F*					F*	F*					F*	F*
1000	102	F	F*	F	F	F	F	F*	F*	F	F	F	F	F*	F*
1200	122	G	G*	F	F	F	F	G*	F*	F	F	F	F	G*	F*
1500	152	G	G*	F	F	F	F	G*	F*	F	F	F	F	G*	F*
1800	182	G	G*	F	F	F	F	G*	F*	F	F	F	F	G*	F*
2200	222	G		F	F	F	F*		F*	F	F	F	F*		F*
2700	272	G		F	F	F	F*		F*	F	F	F	F*		F*
3300	332	G		F	F	F	F*		F*	F	F	F	F*		F*
3900	392			F	F	F	F*		F*	F	F	F	F*		F*
4700	472			F	F	F	F*		F/G*	F	F	F	F*		F/G*
5600	562			F	F	F	F*			F	F	F	G*		
6800	682			F	F	F	G*			F	F	F	G*		
8200	822			F	G	G	G*			F	F	F	G*		
10000	103			F	G/F	G/F	G*			F	F	F	G*		
12000	123			F	G	G	H*			F	G	G	G*		
15000	153			F	G	G	H*			F	G	G	G*		
18000	183			F	H	H	H*			F	G	G	H*		
22000	223			F	H	H/G				F	G/F	G/F			
27000	273			F	H	H/G				F	G	G			
33000	333			F	H	H				F	G	G			
39000	393			F	H	H				F	G	H			
47000	473			F	H	H				F	G	H			
56000	563			F	H	H				F	G	H			
68000	683			F						F	G				
82000	823			F						F	G				
100000	104			G/F						G	G				
120000	124			G/F						H					
150000	154			H						H					
180000	184			H						H					
220000	224			H						H					
270000	274									F/G/H					
330000	334									F/G/H					
390000	394														

* Surface coating only.

HITANO
ENTERPRISE CORP.®

Size and capacitance range X5R 4V ~ 50V

Cap(pF)	EIA Size	0201						0402						0603					
	Code	4V	6.3V	10V	16V	25V	50V	4V	6.3V	10V	16V	25V	50V	4V	6.3V	10V	16V	25V	50V
100	101				L	L	L												
120	121																		
150	151				L	L	L												
180	181																		
220	221				L	L	L												
270	271																		
330	331				L	L	L												
390	391																		
470	471				L	L	L												
560	561																		
680	681				L	L	L												
820	821																		
1000	102			L	L	L	L												
1500	152			L	L	L													
2200	222			L	L	L													
2700	272																		
3300	332			L	L	L													
4700	472			L	L	L													
6800	682			L	L	L													
10000	103		L	L	L	L	L												
15000	153		L	L									N						
22000	223		L	L								N	N						
27000	273																		
33000	333		L	L							N		N						
39000	393																		
47000	473		L	L					N	N	N		N						
56000	563		L	L															
68000	683		L	L					N	N	N		K						
82000	823																		
100000	104		L	L	L	L			N	N	N	N	K					S	
150000	154								N	N	N	N							
220000	224								N	N	N	N	N		B	B	B	B	B
270000	274																		
330000	334		L						N	N	N				B	B	B	B	
390000	394																		
470000	474	L	L						N	N	N/K	K	K		B	B	B	B	B
680000	684								N	N					B	B	B	B	
820000	824																		

HITANO
ENTERPRISE CORP.®

Size and capacitance range X5R 1000V ~ 5000V (High Voltage)

Dimension		2211		2220						2225					
Cap.(pF)	Code	3000V	4000V	1000V	1500V	2000V	3000V	4000V	5000V	1000V	1500V	2000V	3000V	4000V	5000V
270	271	F	F*					F*	F*					F*	F*
330	331	F	F*					F*	F*					F*	F*
390	391	F	F*					F*	F*					F*	F*
470	471	F	F*					F*	F*				E	F*	F*
560	561	F	F*					F*	F*					F*	F*
680	681	F	F*					F*	F*					F*	F*
820	821	F	F*					F*	F*					F*	F*
1000	102	F	F*	F	F	F	F	F*	F*	F	F	F	F	F*	F*
1200	122	G	G*	F	F	F	F	G*	F*	F	F	F	F	G*	F*
1500	152	G	G*	F	F	F	F	G*	F*	F	F	F	F	G*	F*
1800	182	G	G*	F	F	F	F	G*	F*	F	F	F	F	G*	F*
2200	222	G		F	F	F	F*		F*	F	F	F	F*		F*
2700	272	G		F	F	F	F*		F*	F	F	F	F*		F*
3300	332	G		F	F	F	F*		F*	F	F	F	F*		F*
3900	392			F	F	F	F*		F*	F	F	F	F*		F*
4700	472			F	F	F	F*		F/G*	F	F	F	F*		F/G*
5600	562			F	F	F	F*			F	F	F	G*		
6800	682			F	F	F	G*			F	F	F	G*		
8200	822			F	G	G	G*			F	F	F	G*		
10000	103			F	G/F	G/F	G*			F	F	F	G*		
12000	123			F	G	G	H*			F	G	G	G*		
15000	153			F	G	G	H*			F	G	G	G*		
18000	183			F	H	H	H*			F	G	G	H*		
22000	223			F	H	H/G				F	G/F	G/F			
27000	273			F	H	H/G				F	G	G			
33000	333			F	H	H				F	G	G			
39000	393			F	H	H				F	G	H			
47000	473			F	H	H				F	G	H			
56000	563			F	H	H				F	G	H			
68000	683			F						F	G				
82000	823			F						F	G				
100000	104			G/F						G	G				
120000	124			G/F						H					
150000	154			H						H					
180000	184			H						H					
220000	224			H						H					
270000	274									F/G/H					
330000	334									F/G/H					
390000	394														

* Surface coating only.

HITANO
ENTERPRISE CORP. ®

Size capacitance range X7R 6.3 ~ 630V (High capacitance)

Dimension		0402	0603					0805					1206						
Cap(pF)	code	6.3V	6.3	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	35	50	100
1000000	105	N	B	B	B	B	B		C	C	C	I		J	J	J		P	P
1200000	125															P		P	E/P
1500000	155								I	I	I		J	J	J	P		P	E/P
1800000	185															P		P	P
2200000	225		B	B	B			I	I	I	I	I	J	J	J	P		P	P
2700000	275																		
3300000	335													P	P	P			
3900000	395																		
4700000	475		B					I	I	I	I		P	P	P	P		P	
5600000	565																		
6800000	685																		
8200000	825																		
10000000	106							I	I	I			P	P	P	P	P		
12000000	126																		
15000000	156																		
18000000	186																		
22000000	226												P	P	P*				
47000000	476																		

Dimension		1210						1812								1825				
Cap(pF)	code	6.3V	10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	200V	250V	450V	25V	50V	100V	200V	250V
1000000	105		C	C	C	C	F	C	C	C	F	F	G	G	H	F	F	F	F	F
1200000	125				P	P/G	F/G			C	C	C				F	F	F	G	
1500000	155			E	E	G	G			C	C	C				F	F	F	G	
1800000	185					G	G			E	E	E				F	F	F	G	
2200000	225			E	E/G	G	G			E	E	E				F	F	F	G	
2700000	275					G	G			F	F	F				F	F	F		
3300000	335			E	E/G	G	G			F	F	F				F	F	F		
3900000	395				G	G	G			F	F	F				F	F	F		
4700000	475		F	F	F/G	F/G	G			G	G	G				F	F	F		
5600000	565				G	G				G	G					F	F	F		
6800000	685				G	G				G	G					F	F	F		
8200000	825				G	G				G	G					G	G	G		
10000000	106		F	F	F/G	G				G	G					G	G	G		
12000000	126									G										
15000000	156									G										
18000000	186									G										
22000000	226		G	G	G					G										
47000000	476	G	G																	

Dimension		2220							2225						
Cap(pF)	code	25V	50V	100V	200V	250V	500V	630V	25V	50V	100V	200V	250V	500V	630V
1000000	105	F	F	F	F	F	H	H	F	F	F	F	F		
1200000	125	F	F	F	G	G			F	F	F	G	G		
1500000	155	F	F	F	G	G			F	F	F	G	G		
1800000	185	F	F	F	G	G			F	F	F	G	G		
2200000	225	F	F	F	G	G			F	F	F	G	G		
2700000	275	F	F	F					F	F	F	G	G		
3300000	335	F	F	F					F	F	F				
3900000	395	F	F	F					F	F	F				
4700000	475	F	F	F					F	F	F				
5600000	565	F	F	F					F	F	F				
6800000	685	F	F	F					F	F	F				
8200000	825	G	G	G					G	G	G				
10000000	106	G	G	G					G	G	G				
12000000	126	H	H						F/G						
15000000	156	H	H						F/G						
18000000	186	H	H												
22000000	226	H	H												
27000000	276	H													
33000000	336	H													
39000000	396	H													
47000000	476	R													

HITANO
ENTERPRISE CORP.®

Size capacitance range X7S 4 ~ 100V

Cap(pF)	EIA Size	0201
	Code	10V
100000	104	L
150000	154	
220000	224	
330000	334	
470000	474	
680000	684	

Dimension		0402				0603					0805						
Cap(pF)	code	6.3V	10V	16V	25V	4V	6.3V	10V	16V	25V	4V	6.3V	10V	16V	25V	50V	100
1000000	105		K						B								
1500000	155																
2200000	225		K						B	B							
3300000	335																
4700000	475														I		
6800000	685																
10000000	106													I			
22000000	226																
47000000	476																
100000000	107																
220000000	227																

Dimension		1206				1210			
Cap(pF)	code	6.3V	10V	16V	25V	6.3V	10V	16V	25V
1000000	105								
1500000	155								
2200000	225								
3300000	335								
4700000	475								
6800000	685								
10000000	106								
22000000	226			P					
47000000	476	P*							
100000000	107					G*			
220000000	227								

"*" Means M tolerance only.

HITANO
ENTERPRISE CORP.®

Size capacitance range X6S 4 ~ 100V

Cap(pF	EIA Size	0201					0402				
	Code	4V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	50V
100000	104	L	L	L	L	L	N				
150000	154										
220000	224		L	L*			N				
330000	334										
470000	474	L					K/N				
680000	684										

Dimension		0201		0402				0603					0805					
Cap(pF)	code	4V	6.3V	6.3V	10V	16V	25V	4V	6.3V	10V	16V	25V	4V	6.3V	10V	16V	25V	50V
1000000	105			N	N	N	K											
1500000	155																	
2200000	225			K	K	K			B	B	B	B				I		
3300000	335																	
4700000	475							B	B	B	B	B						
6800000	685																	
10000000	106			K				B*	B*	B	B		I	I	I	I	I	
22000000	226							B*	B*				I	I*	I*			
47000000	476												I*					
100000000	107												I*					
220000000	227																	

Dimension		1206				1210				
Cap(pF)	code	6.3V	10V	16V	25V	6.3V	10V	16V	25V	100
1000000	105									
1500000	155									
2200000	225									
3300000	335									
4700000	475									
6800000	685									
10000000	106				P					
22000000	226		P	P*	P				G	
47000000	476	P				G	G	G		
100000000	107					G*				
220000000	227									

"*" Means M tolerance only.

Size capacitance range X5R 4 ~ 50V (High capacitance)

Dimension		0201			0402						0603					
Cap(pF)	code	6.3V	10V	16V	4V	6.3V	10V	16V	25V	50	4V	6.3V	10V	16V	25V	50V
1000000	105	L*	L*	L*		N	N	N	N			B	B	B	B	B
1500000	155											B	B			
2200000	225	L*	L*			N	N	K	K			B	B	B	B	B*
3300000	335											B	B			
4700000	475					K	K					B	B	B*	B*	
6800000	685															
10000000	106				K*	K*	K*				B	B	B	B	B*	
22000000	226					K*					B*	B*	B*			
47000000	476										B*	B*				
100000000	107															
220000000	227															

Dimension		0805						1206					
Cap(pF)	code	4V	6.3V	10V	16V	25V	50V	4V	6.3V	10V	16V	25V	50V
1000000	105			C	C	C	I						P
1500000	155		I	I	I	I				J	J		
2200000	225		I	I	I	I	I			J	J	P	P
3300000	335		I	I	I	I				P	P	P	
4700000	475		I	I	I	I	I		P	P	P	P	P
6800000	685								P	P			
10000000	106		I	I	I	I	I		P	P	P	P	P
22000000	226		I	I*	I*	I*			P	P	P	P	
47000000	476		I*	I*					P	P	P*		
100000000	107	I*							P*				
220000000	227							P*					

Dimension		1210						
Cap(pF)	code	4V	6.3V	10V	16V	25V	35V	50V
1000000	105							
1500000	155			F	F			
2200000	225			F	F			
3300000	335							
4700000	475			F	F	F		
6800000	685							
10000000	106		F	F	F	F	G	G
22000000	226		G	G	G	G	G	
47000000	476		G	G	G	G*		
100000000	107		G*	G*	G*			
220000000	227	G*	G*					

"*" Means M tolerance only.

HITANO
ENTERPRISE CORP. ®

Thickness Code & Standard Packing Q'ty per reel

Chip Size	Thickness Code	Chip Thickness	Q'ty of carboard tape in		Q'ty of Embosses tape in	
			7" reel	13" reel	7" reel	13" reel
0201	L	0.30±0.03	15k	70k	-	-
0402	N	0.50±0.05	10k	50k	-	-
	Q	0.50 +0.02/-0.05	10k	50k	-	-
	K	0.50±0.20	10k	-	-	-
0603	U	0.50±0.10	4k	-	-	-
	S	0.80±0.07	4k	15k	-	-
	B	0.80 +0.15/-0.10	4k	15k	-	-
0805	U	0.50±0.10	4k	15k	-	-
	A	0.60±0.10	4k	15k	-	-
	X	0.80±0.10	4k	15k	-	-
	T	0.85±0.10	4k	15k	-	-
	C	1.25±0.10	-	-	3k	10k
	I	1.25±0.20	-	-	3k	10k
1206	X	0.80±0.10	4k	15k	-	-
	T	0.85±0.10	4k	15k	-	-
	M	0.95±0.10	-	-	3k	10k
	J	1.15±0.15	-	-	3k	10k
	C	1.25±0.10	-	-	3k	10k
	E	1.60±0.20	-	-	2k	10k
	P	1.60 +0.30/-0.10	-	-	2k	9k
1210	T	0.85±0.10	-	-	3k	10k
	M	0.95±0.10	-	-	3k	10k
	C	1.25±0.10	-	-	3k	10k
	E	1.60±0.20	-	-	2k	-
	F	2.00±0.20	-	-	1k	6k
	G	2.50±0.30	-	-	1k	6k
1808	C	1.25±0.10	-	-	2k	10k
	E	1.60±0.20	-	-	2k	8k
	F	2.00±0.20	-	-	1k	6k
1812	C	1.25±0.10	-	-	1k	5k
	E	1.60±0.20	-	-	1k	-
	F	2.00±0.20	-	-	1k	-
	G	2.50±0.30	-	-	0.5k	3k
	H	2.80±0.30	-	-	0.5k	-
1825	E	1.60±0.20	-	-	1k	-
	F	2.00±0.20	-	-	1k	-
	G	2.50±0.30	-	-	0.5k	-
	H	2.80±0.30	-	-	0.5k	-
2220	E	1.60±0.20	-	-	1k	-
	F	2.00±0.20	-	-	1k	-
	G	2.50±0.30	-	-	0.5k	-
	H	2.80±0.30	-	-	0.5k	-
2225	E	1.60±0.20	-	-	1k	-
	F	2.00±0.20	-	-	1k	-
	G	2.50±0.30	-	-	0.5k	-
	H	2.80±0.30	-	-	0.5k	-

HITANO
ENTERPRISE CORP. ®

RELIABILITY TEST CONDITIONS AND REQUIREMENTS

<table>
<tr><th>No.</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>1.</td><td>Visual and Dimensions</td><td>---</td><td>* No remarkable defect.
* Dimensions to confirm to individual specification sheet.</td></tr>
<tr><td>2.</td><td>Capacitance</td><td rowspan="2">* Class I : (C0G)
Cap.≤1000pF, 1.0±0.2Vrms, 1MHz±10%.
Cap.>1000pF, 1.0±0.2Vrms, 1KHz±10%.
* Class II : (X7R, X7S, X6S, X5R)
Cap.≤10μF, 1.0±0.2Vrms, 1KHz±10%**.
Cap.>10μF, 0.5±0.2Vrms, 120Hz±20%.

** Test condition : 0.5±0.2Vrms, 1KHz±10%.
X7R:
0805=106(6.3V), 0603/475(6.3V)
X5R:
0201≧224 (6.3V,10V,16V)#1,
0402≧475 (6.3V,16V), 0402≧225(10V),
0603=106 (6.3V)
X7R & X5R(≥10V) & 01R5X103≤6.3V &
01R5X104≤10V
TT18X≧475(10V) , TT15X series
X6S:
0201/474(4V),0201≧104 (6.3V,10V#1),
0402≧225 (6.3V),
0402/475 (10V), 0603/106 (6.3V),
X7S:
0402/225(6.3V)

#1 Excluding
X5R/0201/105(6.3V);225(10V),
X6S/0201/104(10V)
(1.0±0.2Vrms，1KHz±10%)

Before initial measurement (Class II only) : To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</td><td> Shall not exceed the limits given in the detailed spec.</td></tr>
<tr><td>3.</td><td>Q/D.F.
(Tangent of loss angle)</td><td>* X7R:
<table>
<tr><th>Rated</th><th>D.F.≤</th><th colspan="2">Exception of D.F.≤</th></tr>
<tr><td rowspan="3">≥100V</td><td rowspan="3">≤2.5%</td><td>≤3.5%</td><td>1206≥0.47μF, 1812≥4.7μF, 1825≥4.7μF, 2220≥4.7μF, 2225≥4.7μF</td></tr>
<tr><td>≤5%</td><td>0603≥0.068μF, 0805>0.1μF, 1206>1μF, 1210≥2.2μF</td></tr>
<tr><td>≤10%</td><td>0805>0.22μF, 1210≥3.3μF</td></tr>
<tr><td rowspan="3">50V</td><td rowspan="3">≤2.5%</td><td>≤3.5%</td><td>0201(50V), 0603≥0.047μF, 0805≥0.1μF, 1206≥0.47μF,
1210≥2.2μF, 1812≥4.7μF, 1825≥4.7μF, 2220≥4.7μF, 2225≥4.7μF</td></tr>
<tr><td>≤5%</td><td>0201≥0.01uF, 1210≥4.7μF</td></tr>
<tr><td>≤10%</td><td>0402≥0.012μF, 0603>0.1μF, 0805≥1μF, 1206≥2.2μF, 1210≥10μF</td></tr>
<tr><td>35V</td><td>≤3.5%</td><td>≤10%</td><td>0603≥1μF, 0805≥2.2μF, 1206≥2.2μF, 1210≥10μF</td></tr>
<tr><td rowspan="4">25V</td><td rowspan="4">≤3.5%</td><td>≤5%</td><td>0201≥0.01μF, 0805≥1μF, 1210≥10μF</td></tr>
<tr><td>≤7%</td><td>0603≥0.33μF,</td></tr>
<tr><td>≤10%</td><td>0201≥0.1μF, 0402≥0.056μF, 0603≥0.47μF, 0805≥2.2μF,
1206≥2.2μF, 1210≥22μF</td></tr>
<tr><td>≤12.5%</td><td>0402≥0.47μF, 0805=10μF</td></tr>
<tr><td rowspan="3">16V</td><td rowspan="3">≤3.5%</td><td>≤5%</td><td>0201≥0.01μF, 0402≥0.033μF, 0603≥0.15μF, 0805≥0.68μF,
1206≥2.2μF, 1210≥4.7μF</td></tr>
<tr><td>≤10%</td><td>0201≥0.1uF(0201/X7R≥0.022μF), 0402≥0.22uF, 0603≥0.15μF,
0805≥2.2μF, 1206≥4.7μF, 1210≥22μF</td></tr>
<tr><td>≤12.5%</td><td>0402=1μF;0805=10μF</td></tr>
<tr><td rowspan="3">10V</td><td rowspan="3">≤5%</td><td>≤10%</td><td>0201≥0.012μF, 0402≥0.33μF(0402/X7R≥0.22μF), 0603≥0.33μF,
0805≥2.2μF, 1206≥2.2μF, 1210≥22μF</td></tr>
<tr><td>≤12.5%</td><td>0805=10μF</td></tr>
<tr><td>≤15%</td><td>0201≥0.1μF, 0402≥1μF, 0603≥10μF</td></tr>
<tr><td rowspan="2">6.3V</td><td rowspan="2">≤10%</td><td>≤15%</td><td>0201≥0.1μF, 0402≥1μF, 0603≥10μF, 0805≥4.7μF, 1206≥47μF,
1210≥100μF</td></tr>
<tr><td>≤20%</td><td>0402≥2.2μF</td></tr>
<tr><td>4V</td><td>≤15%</td><td>---</td><td>---</td></tr>
</table>
* X5R:
<table>
<tr><th>Rated</th><th>D.F.≦</th><th colspan="2">Exception of D.F. ≦</th></tr>
<tr><td rowspan="3">≧100V</td><td rowspan="3">≦2.5%</td><td>≦3%</td><td>1206≧0.47μF</td></tr>
<tr><td>≦5%</td><td>0603≧0.068μF; 0805＞0.1μF; 1206≧1μF; 1210≧2.2μF</td></tr>
<tr><td>≦10%</td><td>0805＞0.22μF; 1210≧3.3μF</td></tr>
<tr><td rowspan="4">50V</td><td rowspan="4">≦2.5%</td><td>≦3%</td><td>0201(50V); 0603≧0.047μF; 0805≧0.18μF; 1206≧0.47μF</td></tr>
<tr><td>≦5%</td><td>0201≧0.01uF; 1210≧3.3μF</td></tr>
<tr><td>≦10%</td><td>0402≧0.012μF; 0603>0.1μF; 0805≧1μF;1206≧2.2μF; 1210≧10μF</td></tr>
<tr><td>≦12.5%</td><td>1206=10μF</td></tr>
<tr><td>35V</td><td>≦3.5%</td><td>≦10%</td><td>0603≧1μF; 0805≥2.2μF; 1206≧2.2μF; 1210≧10μF</td></tr>
<tr><td rowspan="4">25V</td><td rowspan="4">≦3.5%</td><td>≦5%</td><td>0201=0.01μF; 0805≧1μF</td></tr>
<tr><td>≦7%</td><td>0603≧0.33μF</td></tr>
<tr><td>≦10%</td><td>0201>0.01μF; 0402≧0.10μF; 0603≧0.47μF;
0805≧2.2μF; 1206≧4.7μF; 1210≧10μF</td></tr>
<tr><td>≦12.5%</td><td>0402≧0.47μF;0805=10μF</td></tr>
<tr><td rowspan="3">16V</td><td rowspan="3">≦3.5%</td><td>≦5%</td><td>0201=0.01μF; 0402≧0.033μF; 0603≧0.15μF;
0805≧0.68μF; 1206≧2.2μF; 1210≧4.7μF</td></tr>
<tr><td>≦10%</td><td>0201>0.01uF; 0402≧ 0.22uF;
0603>0.47μF; 0805≧2.2μF; 1206≧4.7μF; 1210≧22μF</td></tr>
<tr><td>≦12.5%</td><td>0402≧1μF;0805=10μF</td></tr>
<tr><td rowspan="3">10V</td><td rowspan="3">≦5%</td><td>≦10%</td><td>0201≧0.012μF; 0402≧0.22μF;
0603≧0.33μF; 0805≧2.2μF; 1206≧2.2μF; 1210≧22μF; 01R5/X5R</td></tr>
<tr><td>≦12.5%</td><td>0805=10μF</td></tr>
<tr><td>≦15%</td><td>0201>0.1μF; 0402≧1μF; 0603≧10μF</td></tr>
<tr><td rowspan="2">6.3V</td><td rowspan="2">≦10%</td><td>≦15%</td><td>0201>0.1μF; 0402≧1μF; 0603≧10μF;
0805≧4.7μF; 1206≧47μF; 1210≧100μF</td></tr>
<tr><td>≦20%</td><td>0402≧2.2μF</td></tr>
<tr><td>4V</td><td>≦15%</td><td>---</td><td>---</td></tr>
</table></td></tr>
</table>

HITANO
ENTERPRISE CORP. ®

RELIABILITY TEST CONDITIONS AND REQUIREMENTS

<table>
<tr><th>No.</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>3.</td><td>Q/D.F.
(Tangent of loss angle)</td><td></td><td>
* X7S:
<table>
<tr><th>Rated vol.</th><th>D.F.≦</th><th colspan="2">Exception of D.F. ≦</th></tr>
<tr><td rowspan="3">≧100V</td><td rowspan="3">≦2.5%</td><td>≦3%</td><td>1206≧0.47μF</td></tr>
<tr><td>≦5%</td><td>0603≧0.068μF;0805＞0.1μF;1206≧1μF;1210≧2.2μF</td></tr>
<tr><td>≦10%</td><td>0805＞0.22μF;1210≧3.3μF</td></tr>
<tr><td rowspan="3">50V</td><td rowspan="3">≦2.5%</td><td>≦3%</td><td>0201(50V); 0603≧0.047μF; 0805≧0.18μF;1206≧0.47μF</td></tr>
<tr><td>≦5%</td><td>0201≧0.01uF; 1210≧3.3μF</td></tr>
<tr><td>≦10%</td><td>0402≧0.012μF;0603>0.1μF; 0805≧1μF;
1206≧2.2μF;1210≧10μF</td></tr>
<tr><td>35V</td><td>≦3.5%</td><td>≦10%</td><td>0603≧1μF;0805≥2.2μF;1206≧2.2μF;1210≧10μF</td></tr>
<tr><td rowspan="4">25V</td><td rowspan="4">≦3.5%</td><td>≦5%</td><td>0201≧0.01μF;0805≧1μF;1210≧10μF</td></tr>
<tr><td>≦7%</td><td>0603≧0.33μF</td></tr>
<tr><td>≦10%</td><td>0201≧0.1μF;0402≧0.10μF;0603≧0.47μF;
0805≧2.2μF; 1206≧4.7μF;1210≧22μF</td></tr>
<tr><td>≦12.5%</td><td>0402≧0.47μF</td></tr>
<tr><td rowspan="2">16V</td><td rowspan="2">≦3.5%</td><td>≦5%</td><td>0201≧0.01μF;0402≧0.033μF;0603≧0.15μF;
0805≧0.68μF;1206≧2.2μF;1210≧4.7μF</td></tr>
<tr><td>≦10%</td><td>0201≧0.1uF; 0402≧ 0.22uF;
0603>0.47μF;0805≧2.2μF;1206≧4.7μF; 1210≧22μF</td></tr>
<tr><td rowspan="2">10V</td><td rowspan="2">≦5%</td><td>≦10%</td><td>0201≧0.012μF;0402≧0.22μF;
0603≧0.33μF; 0805≧2.2μF;1206≧2.2μF;1210≧22μF</td></tr>
<tr><td>≦15%</td><td>0201≧0.1μF; 0402≧1μF</td></tr>
<tr><td>6.3V</td><td>≦10%</td><td>≦15%</td><td>0201≧0.1μF;0402≧1μF;0603≧10μF;
0805≧4.7μF; 1206≧47μF; 1210≧100μF</td></tr>
<tr><td>4V</td><td>≦15%</td><td>---</td><td>---</td></tr>
</table>
* X6S:
<table>
<tr><th>Rated vol.</th><th>D.F. .≦</th><th colspan="2">Exception of D.F. .≦</th></tr>
<tr><td rowspan="3">>100V</td><td rowspan="3">≦2.5%</td><td>≦3%</td><td>1206≧0.47μF</td></tr>
<tr><td>≦5%</td><td>0603≧0.068μF;0805＞0.1μF;1206≧1μF;1210≧2.2μF</td></tr>
<tr><td>≦10%</td><td>0805＞0.22μF;1210≧3.3μF</td></tr>
<tr><td rowspan="3">50V</td><td rowspan="3">≦2.5%</td><td>≦3%</td><td>0201(50V); 0603≧0.047μF; 0805≧0.18μF;1206≧0.47μF</td></tr>
<tr><td>≦5%</td><td>0201≧0.01uF;1210≧3.3μF</td></tr>
<tr><td>≦10%</td><td>0402≧0.012μF;0603>0.1μF; 0805≧1μF;
1206≧2.2μF;1210≧10μF</td></tr>
<tr><td>35V</td><td>≦3.5%</td><td>≦10%</td><td>0603≧1μF;0805≥2.2μF;1206≧2.2μF;1210≧10μF</td></tr>
<tr><td rowspan="4">25V</td><td rowspan="4">≦3.5%</td><td>≦5%</td><td>0201≧0.01μF;0805≧1μF;1210≧10μF</td></tr>
<tr><td>≦7%</td><td>0603≧0.33μF</td></tr>
<tr><td>≦10%</td><td>0201≧0.1μF; 0402≧0.10μF;0603≧0.47μF;
0805≧2.2μF; 1206≧4.7μF;1210≧22μF</td></tr>
<tr><td>≦12.5%</td><td>0402≧0.47μF;0805=10μF</td></tr>
<tr><td rowspan="3">16V</td><td rowspan="3">≦3.5%</td><td>≦5%</td><td>0201≧0.01μF;0402≧0.033μF;0603≧0.15μF;
0805≧0.68μF;1206≧2.2μF;1210≧4.7μF</td></tr>
<tr><td>≦10%</td><td>0201≧0.1uF; 0402≧0.22uF;
0603>0.47μF; 0805≧2.2μF;1206≧4.7μF;1210≧22μF</td></tr>
<tr><td>≦12.5%</td><td>0402=1μF;0805=10μF</td></tr>
<tr><td rowspan="3">10V</td><td rowspan="3">≦5%</td><td>≦10%</td><td>0201≧0.012μF;0402≧0.22μF;
0603≧0.33μF; 0805≧2.2μF;1206≧2.2μF;1210≧22μF</td></tr>
<tr><td>≦12.5%</td><td>0805=10μF</td></tr>
<tr><td>≦15%</td><td>0201≧0.1μF; 0402≧1μF</td></tr>
<tr><td>6.3V</td><td>≦10%</td><td>≦15%</td><td>0201≧0.1μF;0402≧0.47μF; 0603≧10μF;
0805≧4.7μF;1206≧47μF; 1210≧100μF</td></tr>
<tr><td>4V</td><td>≦15%</td><td>---</td><td>---</td></tr>
</table>
</td></tr>
<tr><td>4.</td><td>Temperature Coefficient (Temperature characteristic of capacitance)</td><td>
* With no electrical load.
<table>
<tr><th>T.C.</th><th>Operating Temp.</th></tr>
<tr><td>X7R/X7S</td><td>-55~125°C at 25°C</td></tr>
<tr><td>X6S</td><td>-55~105°C at 25°C</td></tr>
<tr><td>X5R</td><td>-55~ 85°C at 25°C</td></tr>
<tr><td>COG</td><td>-55~125°C at 25°C</td></tr>
</table>
* Measurement voltage for X7R/X7S/X6S/X5R :
<table>
<tr><th>Size</th><th>Cap. Range</th><th>Condition</th></tr>
<tr><td rowspan="3">0201</td><td>Cap.<0.1μF</td><td>1V</td></tr>
<tr><td>0.1μF≤Cap.<1μF</td><td>0.2V</td></tr>
<tr><td>Cap.≥1μF</td><td>0.1V</td></tr>
<tr><td rowspan="4">0402</td><td>Cap.<0.1μF</td><td>1V</td></tr>
<tr><td>Cap.=1μF</td><td>0.5V</td></tr>
<tr><td>1μF<Cap.<10μF</td><td>0.2V</td></tr>
<tr><td>Cap.≥10μF</td><td>0.1V</td></tr>
<tr><td rowspan="3">0603</td><td>Cap.≤1μF</td><td>1V</td></tr>
<tr><td>1μF<Cap.≤4.7μF</td><td>0.5V</td></tr>
<tr><td>Cap.>4.7μF</td><td>0.2V</td></tr>
<tr><td rowspan="3">0805</td><td>Cap.<10μF</td><td>1V</td></tr>
<tr><td>Cap.=10μF</td><td>0.5V</td></tr>
<tr><td>Cap.>10μF</td><td>0.2V</td></tr>
<tr><td rowspan="3">1206/1210</td><td>Cap.≤10μF</td><td>1V</td></tr>
<tr><td>10μF<Cap.≤100μF</td><td>0.5V</td></tr>
<tr><td>Cap.>100μF</td><td>0.2V</td></tr>
</table>
</td><td>
<table>
<tr><th>T.C.</th><th>Capacitance Change</th></tr>
<tr><td>C0G</td><td>Within ±30ppm/°C</td></tr>
<tr><td>X7R</td><td>Within ±15%</td></tr>
<tr><td>X5R</td><td>Within ±15%</td></tr>
<tr><td>X7S</td><td>Within ±22%</td></tr>
<tr><td>X6S</td><td>Within ±22%</td></tr>
</table>
</td></tr>
</table>

HITANO ENTERPRISE CORP. ®

RELIABILITY TEST CONDITIONS AND REQUIREMENTS

<table>
<tr><th>No.</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>5.</td><td>Insulation Resistance</td><td>
<table>
<tr><td>Rated Vol.(V)</td><td>Apply Voltage</td><td>Charge Time</td></tr>
<tr><td>≤100</td><td>1 times of U_R</td><td>Max. 120 sec.</td></tr>
<tr><td>200≤V≤500</td><td>1 times of U_R</td><td>60 sec.</td></tr>
<tr><td>>500</td><td>500Vdc</td><td>60 sec.</td></tr>
</table>
</td><td>
* ≥10GΩ or RxC≥500Ω-F, whichever is smaller.
* Except :
<table>
<tr><td>Rated voltage (X7R/X5R)</td><td>I.R.</td></tr>
<tr><td>≥100V : All X7R</td><td rowspan="7">≥10GΩ or RxC≥100Ω-F, whichever is smaller</td></tr>
<tr><td>50V : 0402>0.01μF, 0603≥1μF, 0805≥1μF, 1206≥4.7μF, 1210≥4.7μF, 1812≥10μF, 2220≥22μF</td></tr>
<tr><td>35V : 0805≥2.2μF, 1206≥2.2μF, 1210≥10μF</td></tr>
<tr><td>25V : 0402≥1μF, 0603≥2.2μF, 0805≥2.2μF, 1206≥10μF, 1210≥10μF</td></tr>
<tr><td>16V : 0201≥0.1μF, 0402≥0.22μF, 0603≥1μF, 0805≥2.2μF, 1206≥10μF, 1210≥47μF</td></tr>
<tr><td>10V : 0201≥47nF, 0402≥0.47μF, 0603≥0.47μF, 0805≥2.2μF, 1206≥4.7μF, 1210≥47μF</td></tr>
<tr><td>6.3V; 4V</td></tr>
<tr><td>Rated voltage (X7R/X7S/X6S/X5R)</td><td>I.R.</td></tr>
<tr><td>100V : 1210≥3.3μF</td><td rowspan="11">RxC≥50Ω-F</td></tr>
<tr><td>50V : 0402≥0.1μF, 0603≥2.2μF, 0805≥10μF, 1206≥10μF</td></tr>
<tr><td>35V : 0603≥1μF</td></tr>
<tr><td>25V : 0201≥0.1μF, 0402≥2.2μF, 0603≥10μF, 0805≥10μF, 1206≥22μF</td></tr>
<tr><td>16V : 0603≥10μF, 0402≥1μF, 0201≥0.22μF</td></tr>
<tr><td>10V : 0201>0.1μF, 0402≥1μF, 0603≥10μF, 0805≥47μF</td></tr>
<tr><td>6.3V : 0201≥0.1μF, 0603>4.7μF, 0805≥47μF, 1206≥10μF</td></tr>
<tr><td>4V : 0603≥22μF, 0805≥47μF, 1206≥100μF</td></tr>
<tr><td>All X7S items; All X6S items</td></tr>
</table>
</td></tr>
<tr><td>6.</td><td>Dielectric Strength (Voltage proof)</td><td>
<table>
<tr><td>Rated Voltage</td><td>Condition</td></tr>
<tr><td>≤100</td><td>2.5 times of U_R</td></tr>
<tr><td>100<V≤250</td><td>2.0 times of U_R</td></tr>
<tr><td>250<V≤500</td><td>1.5 times of U_R</td></tr>
<tr><td>630<V≤3000V</td><td>1.2 times of U_R</td></tr>
<tr><td>3000<V≤5000V</td><td>1.1 times of U_R</td></tr>
<tr><td>≥5000V</td><td>1.0 times of U_R</td></tr>
</table>
* Duration : 1 to 5 sec.
* Charge and discharge current less than 50mA.
</td><td>* No evidence of damage or flash over during test.</td></tr>
<tr><td>7.</td><td>Solderability</td><td>* Solder temperature : 235±5°C for (0201~1210).
* Solder temperature : 245±5°C for (1808~2225).
* Dipping time : 2±0.5 sec.</td><td>* 75% min. coverage of all metalized area.</td></tr>
<tr><td>8.</td><td>Resistance to Soldering Heat</td><td>* Solder temperature : 260±5°C.
* Dipping time : 10±1 sec.
* Preheating : 120 to 150°C for 1 minute before immerse the capacitor in a eutectic solder.
* Before initial measurement (Class II only) : To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp. ≥1KVdc for 48±4hrs
* Measurement to be made after keeping at room temp.for 24±2 hrs (Class I) or 48±4 hrs (Class II).</td><td>* No remarkable damage.
* Cap. change :
C0G : Within ±2.5% or ±0.25pF, whichever is larger.
X7R, X5R,X6S,X7S : Within ±7.5%.
* D.F.(Q)/I.R. : To meet initial requirements.
* 25% max. leaching on each edge.</td></tr>
<tr><td>9.</td><td>Temperature Cycle (Rapid change of temperature)</td><td>* Conduct the five cycles according to the temperatures and time.
<table>
<tr><td>Step</td><td>Temp.(°C)</td><td>Time(min.)</td></tr>
<tr><td>1</td><td>Min. operating temp. +0/-3</td><td>30±3</td></tr>
<tr><td>2</td><td>Room temp.</td><td>2~3</td></tr>
<tr><td>3</td><td>Max. operating temp. +3/-0</td><td>30±3</td></tr>
<tr><td>4</td><td>Room temp.</td><td>2~3</td></tr>
</table>
* Before initial measurement (Class II only) : To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.
* Measurement to be made after keeping at room temp. for 24±2 hrs (Class I) or 48±4 hrs (Class II).</td><td>* No remarkable damage.
* Cap. change :
C0G : Within ±2.5% or ±0.25pF, whichever is larger.
X7R, X5R ,X7S, X6S : Within ±7.5%
* Q for C0G : To meet initial requirements.
* D.F.(Class II) : ≤150% of initial requirement.
* I.R. : To meet initial requirements.</td></tr>
</table>

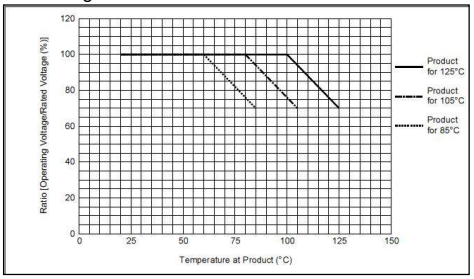
HITANO
ENTERPRISE CORP. ®

RELIABILITY TEST CONDITIONS AND REQUIREMENTS

<table>
<tr><th>No.</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>10.</td><td>Humidity (Damp Heat) Steady State</td><td>* Test temp. : 40±2°C.
* Humidity : 90~95%RH.
* Test time : 500 +24/-0hrs.
* Before initial measurement (Class II only) : To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.
* Measurement to be made after keeping at room temp. for 24Ñ2 hrs (Class I) or 48Ñ4 hrs (Class II).</td><td>* No remarkable damage.
* Cap. change :
C0G : Within ±5.0% or ±0.5pF, whichever is larger.
X7R, X5R, X6S, X7S : Within ±12.5% for ≥10V**, within ±25% for 6.3V.
**10V : Within ±25% for 0603≥4.7μF, 0402≥1μF, 0201≥0.1μF.
* Q/DF for C0G :
Cap.>30pF, Q≥350.
10pF≤Cap.≤30pF, Q≥275+2.5C.
Cap.<10pF, Q≥200+10C.
X5R: RxC≥10Ω-F.
* D.F.(Class II) : ≤200% of initial requirement.
* I.R. : ≥10V, ≥1GΩ or R×C≥50Ω-F, whichever is smaller.
Class II (X7R, X5R, X7S,X6S)
* Except :
<table>
<tr><th>Rated voltage</th><th>I.R.</th></tr>
<tr><td>100V : All X7R; 1210≥3.3μF</td><td rowspan="8">≥1GΩ or RxC≥10Ω-F, whichever is smaller</td></tr>
<tr><td>50V : 0402>0.01μF, 0603≥1μF, 0805≥1μF, 1206≥4.7μF, 1210≥4.7μF</td></tr>
<tr><td>35V : 0603≥1μF, 0805≥2.2μF, 1206≥2.2μF, 1210≥10μF</td></tr>
<tr><td>25V : 0201≥0.1uF, 0402≥0.22μF, 0603≥2.2μF, 0805≥2.2μF, 1206≥10μF, 1210≥10μF</td></tr>
<tr><td>16V : 0201≥0.1uF, 0402≥0.22μF, 0603≥1μF, 0805≥2.2μF, 1206≥10μF, 1210≥47μF</td></tr>
<tr><td>10V : 0201≥47nF, 0402≥0.47μF, 0603≥0.47μF, 0805≥2.2μF, 1206≥4.7μF, 1210≥47μF</td></tr>
<tr><td>6.3V; 4V; All X6S/X7S items; Size≥1812</td></tr>
</table></td></tr>
<tr><td>11.</td><td>Humidity (Damp Heat) Load</td><td>* Test temp. : 40±2°C.
* Humidity : 90~95%RH.
* Test time : 500 +24/-0hrs.
* To apply voltage : Rated voltage.
* Before initial measurement (Class II only) : To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.
* Measurement to be made after keeping at room temp. for 24±2 hrs (Class I) or 48±4 hrs (Class II).</td><td>* No remarkable damage.
* Cap. change :
C0G : Within ±7.5% or ±0.75pF, whichever is larger.
X7R, X5R,X7S, X6S : Within ±12.5% for ≥10V**, within ±25% for 6.3V.
**10V : Within ±25% for 0603≥4.7μF, 0402≥1μF, 0201≥0.1μF.
* Q for C0G : Cap.≥30pF, Q≥200; Cap.<30pF, Q≥100+10/3C.
* I.R.:
NP0, X7R: ≥500MΩ or RxC≥25Ω-F whichever is smaller.
X5R: RxC≥5Ω-F.
* D.F.(Class II) : ≤200% of initial requirement.
* I.R. : ≥10V, ≥500MΩ or RxC≥25Ω-F, whichever is smaller.
Class II (X7R, X5R, X7S, X6S)
* Except :
<table>
<tr><th>Rated voltage</th><th>I.R.</th></tr>
<tr><td>100V : All X7R; 1210≥3.3μF</td><td rowspan="8">≥500MΩ or RxC≥5Ω-F, whichever is smaller</td></tr>
<tr><td>50V : 0402>0.01μF, 0603≥1μF, 0805≥1μF, 1206≥4.7μF, 1210≥4.7μF</td></tr>
<tr><td>35V : 0603≥1μF, 0805≥2.2μF, 1206≥2.2μF, 1210≥10μF</td></tr>
<tr><td>25V : 0201≥0.1uF, 0402≥0.22μF, 0603≥2.2μF, 0805≥2.2μF, 1206≥10μF, 1210≥10μF</td></tr>
<tr><td>16V : 0201≥0.1uF, 0402≥0.22μF, 0603≥1μF, 0805≥2.2μF, 1206≥10μF, 1210≥47μF</td></tr>
<tr><td>10V : 0201≥47nF, 0402≥0.47μF, 0603≥0.47μF, 0805≥2.2μF, 1206≥4.7μF, 1210≥47μF</td></tr>
<tr><td>6.3V; 4V; All X6S/X7S items; Size≥1812</td></tr>
</table></td></tr>
</table>

HITANO
ENTERPRISE CORP. ®

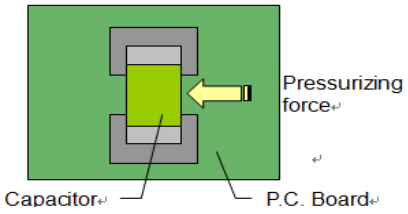
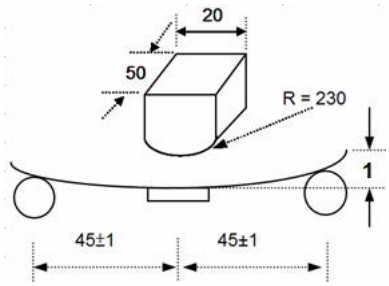
RELIABILITY TEST CONDITIONS AND REQUIREMENTS

<table>
<tr><th>No.</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>12.</td><td>High Temperature Load (Endurance)</td><td>
* Test temp. :
C0G,X7R, X7S : 125±3°C.
* X5R : 85±3°C.
X6S : 105±3°C.
* To apply voltage :
(1) 10V≤Ur≤100V : 200% of rated voltage.
or ≤6.3V or Cap.≥10μF : 150% of rated voltage.
(2) 200V≤Ur≤500V : 150% of rated voltage.
(3) 400V~450V : 120% of rated voltage
(4) =630V : 120% of rated voltage.
(5) 100% of rated voltage for below range :
<table>
<tr><th>Size</th><th>Dielectric</th><th>Rated</th><th>Capacitance</th></tr>
<tr><td>0201</td><td>X5R/X7R/X7S/X6S</td><td>≤10V</td><td>C≥0.1μF</td></tr>
<tr><td></td><td></td><td>≥16V</td><td>C>0.1μF</td></tr>
<tr><td>0402</td><td>X5R/X7R/X7S/X6S</td><td>6.3V, 10V, 16V, 25V</td><td>C≥1.0μF</td></tr>
<tr><td rowspan="3">0603</td><td rowspan="3">X5R/X7R/X7S/X6S</td><td>4V</td><td>C≥22μF</td></tr>
<tr><td>6.3V,10V</td><td>C≥4.7μF</td></tr>
<tr><td>25V, 35V</td><td>C≥1.0μF</td></tr>
<tr><td rowspan="3">0805</td><td rowspan="3">X5R/X7R/X7S/X6S</td><td>4V</td><td>C≥47μF</td></tr>
<tr><td>6.3V</td><td>C≥22μF</td></tr>
<tr><td>10V~50V</td><td>C≥10μF</td></tr>
<tr><td>1206</td><td>X5R/X7R/X7S/X6S</td><td>≤6.3V</td><td>C≥47μF</td></tr>
<tr><td rowspan="2">1210</td><td>X5R/X7R/X7S/X6S</td><td>16V</td><td>C≥47μF</td></tr>
<tr><td>X7R</td><td>≥100V</td><td>C≥3.3μF</td></tr>
</table>
(5) 150% of rated voltage for below range :
<table>
<tr><th>Size</th><th>Dielectric</th><th>Rated Voltage</th><th>Capacitance</th></tr>
<tr><td rowspan="2">0201</td><td>X5R/X7R/X7S/X6S</td><td>16V/25V</td><td>C≥0.1μF</td></tr>
<tr><td>X7R</td><td>16V</td><td>C≥0.022μF</td></tr>
<tr><td rowspan="2">0402</td><td rowspan="2">X5R/X7R/X7S/X6S</td><td>50V</td><td>C≥0.1μF</td></tr>
<tr><td>10~25V</td><td>C≥0.22μF</td></tr>
<tr><td rowspan="2">0603</td><td>X7R</td><td>≥50V</td><td>C≥0.082μF</td></tr>
<tr><td>X5R/X7R/X7S/X6S</td><td>10V,16V, 50V</td><td>C≥1.0μF</td></tr>
<tr><td rowspan="3">0805</td><td>X5R/X7R/X7S/X6S</td><td>10~50V</td><td>C≥4.7μF</td></tr>
<tr><td rowspan="2">X5R/X7R/X7S</td><td>50V</td><td>C≥0.47μF</td></tr>
<tr><td>≥100V</td><td>C≥0.12μF</td></tr>
<tr><td>1206</td><td>X5R/X7R/X7S/X6S</td><td>≥50V</td><td>C≥1.0μF</td></tr>
<tr><td rowspan="2">1210</td><td>X5R/X7R/X7S/X6S</td><td>≤100V</td><td>C≥1.0μF</td></tr>
<tr><td>X7R</td><td>>100V</td><td>C≥0.22μF</td></tr>
<tr><td rowspan="2">1812</td><td rowspan="2">X7R</td><td>≤50V</td><td>C≥4.7μF</td></tr>
<tr><td>100V</td><td>C≥1.0μF</td></tr>
<tr><td>1825
2220
2225</td><td>X7R</td><td>≥100V</td><td>C≥1.0μF</td></tr>
</table>
(6) 120% of rated voltage for below range :
<table>
<tr><th>Size</th><th>Dielectric</th><th>Rated Voltage</th><th>Capacitance</th></tr>
<tr><td>2220</td><td>X7R</td><td>≥100V</td><td>C≥15μF</td></tr>
</table>
* Test time : 1000 +24/-0 hrs.
* Before initial measurement (Class II only) : To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.
* Measurement to be made after keeping at room temp. for 48±4 hrs (Class II).
** De-rating conditions :


</td><td>
* No remarkable damage.
* Cap. change :
C0G : Within ±3.0% or ±0.3pF, whichever is larger.
X7R, X5R,X7S, X6S : Within ±12.5% for ≥10V**, within ±25% for ≤6.3V.
**10V : Within ±25% for 0603≥4.7μF, 0402≥1μF, 0201≥0.1μF.
* Q for C0G :
Cap.>30pF, Q≥350.
10pF≤Cap.≤30pF, Q≥275+2.5C.
D.F.(Class II) : ≤200% of initial requirement.
* I.R. : ≥10V, ≥1GΩ or RxC≥50Ω-F, whichever is smaller.
* Except :
<table>
<tr><th>Rated voltage</th><th>I.R.</th></tr>
<tr><td>100V : All X7R; 1210≥3.3μF</td><td rowspan="6">≥1GΩ or RxC≥10Ω-F, whichever is smaller</td></tr>
<tr><td>50V : 0402>0.01μF, 0603≥1μF, 0805≥1μF, 1206≥4.7μF, 1210≥4.7μF</td></tr>
<tr><td>35V : 0603≥1μF, 0805≥2.2μF, 1206≥2.2μF, 1210≥10μF</td></tr>
<tr><td>25V : 0201≥0.1uF, 0402≥0.22μF, 0603≥2.2μF, 0805≥2.2μF, 1206≥10μF, 1210≥10μF</td></tr>
<tr><td>16V : 0201≥0.1uF, 0402≥0.22μF, 0603≥1μF, 0805≥2.2μF, 1206≥10μF, 1210≥47μF</td></tr>
<tr><td>10V : 0201≥47nF, 0402≥0.47μF, 0603≥0.47μF, 0805≥2.2μF, 1206≥4.7μF, 1210≥47μF</td></tr>
<tr><td>6.3V; 4V; All X6S/X7S items; Size≥1812</td></tr>
</table>
</td></tr>
</table>

HITANO ENTERPRISE CORP. ®

RELIABILITY TEST CONDITIONS AND REQUIREMENTS

<table>
<tr><th>No.</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>13.</td><td>Adhesive Strength of Termination (Robustness of termination)</td><td>* Capacitors mounted on a substrate. A force of 2N(0201) or 5N(0402~0603) or 10N(>0603) applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10±1 second.
 
</td><td>* No remarkable damage or removal of the terminations.</td></tr>
<tr><td>14.</td><td>Resistance to Flexure of Substrate (Substrate bending test)</td><td>* The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1mm per second until the deflection becomes 1mm.
 

Unit : mm</td><td>* No remarkable damage.
<table><tr><th>Dielectric</th><th>Cap. Change</th></tr><tr><td>C0G ≤50V</td><td>Within ±5.0% or ±0.5pF, whichever is larger</td></tr><tr><td>C0G ≥100V</td><td>Within ±3.0% or ±2.0pF, whichever is larger</td></tr><tr><td>X7R, X5R,X7S,X6S</td><td>Within ±12.5%</td></tr></table>(This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test)</td></tr>
<tr><td>15.</td><td>Vibration Resistance</td><td>* Vibration frequency : 10~55 Hz/min.
* Total amplitude : 1.5mm.
* Test time : 6 hrs. (Two hrs each in three mutually perpendicular directions)
* Before initial measurement (Class II only) : To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.
* Measurement to be made after keeping at room temp. for 24±2 hrs (Class I) or 48±4 hrs (Class II).</td><td>* No remarkable damage.
* Cap. change and D.F. : To meet initial spec.</td></tr>
</table>

HITANO
ENTERPRISE CORP. ®

PACKAGE DIMENSION AND QUANTITY

1. EMBOSSED TAPE DIMENSIONS

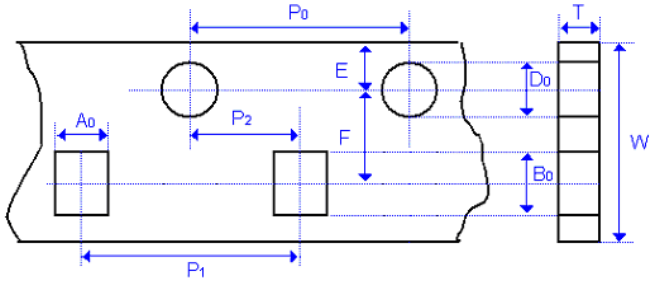


Fig. 1 The dimension of paper tape

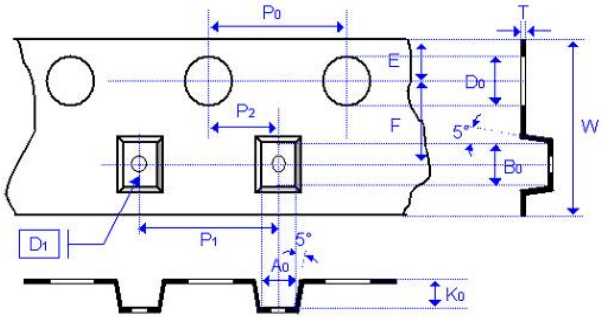


Fig. 2 The dimension of plastic tape

Size	0201	0402	0603	0805	
Chip Thickness	0.30±0.03	0.50±0.05 0.50±0.10	0.80±0.07 0.80 +0.15/-0.1	0.80±0.10	1.25±0.10 1.25±0.20
A_0	0.40±0.10	0.70±0.20	1.05 ±0.30	1.50±0.20	<1.80
B_0	0.70±0.10	1.20±0.20	1.80±0.30	2.30±0.20	<2.70
T	≤0.55	≤0.80	≤1.20	0.95±0.05	0.23±0.05
K_0	-	-	-	-	<2.50
W	8.00±0.30	8.00±0.30	8.00±0.30	8.00±0.10	8.00±0.10
P_0	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
$10xP_0$	40.00±0.10	40.00±0.10	40.00±0.20	40.00±0.20	40.00±0.20
P_1	2.00±0.05	2.00±0.05	4.00±0.10	4.00±0.10	4.00±0.10
P_2	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
D_0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50 +0.10/-0	1.50 +0.10/-0
D_1	-	-	-	-	1.00±0.10
E	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.05	1.75±0.10
F	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05
Unit :	mm	mm	mm	mm	mm

Size	1206			1210	
Chip Thickness	0.80±0.10	0.95±0.10 1.25±0.10	1.60±0.20 1.60+0.3/-0/1	0.95±0.10 1.25±0.10 1.60±0.20	2.50±0.30
A_0	2.00±0.10	<2.00	<2.50	<3.05	<3.20
B_0	3.50±0.50	<3.70	<4.00	<3.80	<4.00
T	0.95±0.05	0.23±0.05	0.23±0.05	0.23±0.05	0.23±0.05
K_0	-	<2.50	<2.50	<2.50	<3.50
W	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10
P_0	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
$10xP_0$	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20
P_1	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
P_2	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
D_0	1.50 +0.10/-0	1.50 +0.10/-0	1.50 +0.10/-0	1.50 +0.10/- 0	1.50 +0.10/-0
D_1	-	1.00±0.10	1.50±0.10	1.50±0.10	1.00±0.10
E	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10
F	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05
Unit :	mm	mm	mm	mm	mm

HITANO
ENTERPRISE CORP. ®

PACKAGE DIMENSION AND QUANTITY

Size	1812			1825	
Chip Thickness	1.25±0.10 1.60±0.20 2.00±0.20	2.50±0.30 2.80±0.30	3.10±0.30	1.60±0.20 2.00±0.20	2.50±0.30 2.80±0.30
A_0	<3.90	<3.90	<3.90	<6.80	<6.80
B_0	<5.30	<5.30	<5.30	<5.30	<5.30
T	0.25±0.05	0.25±0.05	0.25±0.05	0.30±0.10	0.30±0.10
K_0	<2.50	<3.00	<3.60	<2.50	<3.10
W	12.00±0.20	12.00±0.20	12.00±0.20	12.00±0.20	12.00±0.20
P_0	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
$10xP_0$	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20
P_1	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10
P_2	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
D_0	1.50 +0.10/-0	1.50 +0.10/-0	1.50 +0.10/-0	1.50 +0.10/-0	1.50 +0.10/-0
D_1	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10
E	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10
F	5.50±0.05	5.50±0.05	5.50±0.05	5.50±0.05	5.50±0.05
Unit :	mm	mm	mm	mm	mm

Size	2220			2225	
Chip Thickness	1.40±0.15 1.60±0.20 2.00±0.20	2.50±0.30 2.80±0.30	3.10±0.30	1.60±0.20 2.00±0.20	2.50±0.30 2.80±0.30
A_0	<5.80	<6.80	<5.60	<6.80	<6.80
B_0	<6.50	<6.50	<6.50	<6.50	<6.50
T	0.30±0.10	0.30±0.10	0.30±0.10	0.30±0.10	0.30±0.10
K_0	<2.50	<3.10	<4.20	<2.50	<3.10
W	12.00±0.20	12.00±0.20	12.00±0.20	12.00±0.20	12.00±0.20
P_0	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
$10xP_0$	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20
P_1	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10
P_2	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
D_0	1.50 +0.10/-0	1.50 +0.10/-0	1.50 +0.10/-0	1.50 +0.10/-0	1.50 +0.10/-0
D_1	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10
E	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10
F	5.50±0.05	5.50±0.05	5.50±0.05	5.50±0.05	5.50±0.05
Unit :	mm	mm	mm	mm	mm

PACKAGE DIMENSION AND QUANTITY

2. REEL DIMENSIONS

Size	0201, 0402, 0603, 0805, 1206, 1210		1808,1812, 1825,2220, 2225	2220, 2225
Reel size	7”	13”	7”	13”
C	13.0 +0.5/-0.2	13.0 +0.7/-0.3	13.0 +0.5/-0.2	13.5 ±0.5
W_1	8.4+1.5	8.4+1.5	12.2 +2.0/-0	12.2 +2.0/-0
W	14.4max	14.4max	shall accommodate tape width without interference	
A	178.0 ±0.10	330.0 ±1.0	178.0 ±0.10	330.0 ±1.0
N	60.0 +1.0/-0	100 ±1.0	60.0 +1.0/-0	100 ±1.0

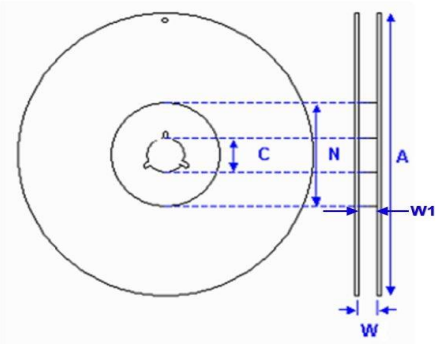


Fig. 3 The dimension of reel

APPLICATION NOTES

STORAGE

To prevent the damage of solderability of terminations, the following storage conditions are recommended :

Indoors under 5 ~ 40°C and 20% ~ 70% RH.

No harmful gases containing sulfuric acid, ammonia, hydrogen sulfide or chlorine.

Packaging should not be opened until the capacitors are required for use. If opened, the pack should be re-sealed as soon as is practicable. Taped product should be stored out of direct sunlight, which might promote deterioration in tape or adhesion performance. The product is recommended to be used within 12 months after shipment and checked the solderability before use.

HANDLING

Chip capacitors are dense, hard, brittle, and abrasive materials. They are liable to suffer mechanical damage, in the form of cracks or chips. Chip Capacitors should be handled with care to avoid contamination or damage. To use vacuum or plastic tweezers to pick up or plastic tweezers is recommended for manual placement. Tape and reeled packages are suitable for automatic pick and placement machine.

PREHEAT

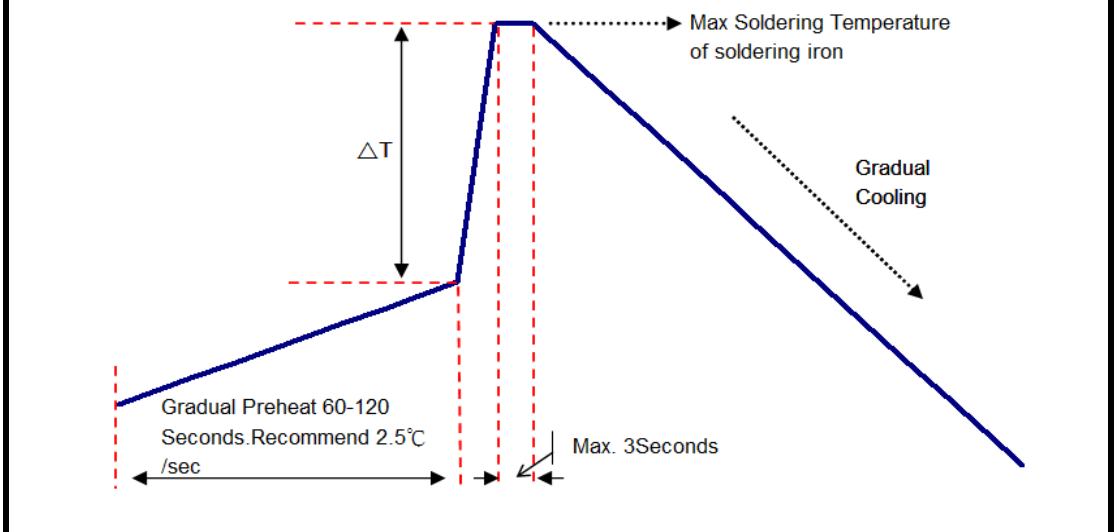
In order to minimize the risk of thermal shock during soldering, a carefully controlled preheat is required. The rate of preheat should not exceed 3°C per second.

SOLDERING

Use mildly activated rosin fluxes do not use activated flux. The amount of solder in each solder joint should be controlled to prevent the damage of chip capacitors caused by the stress between solder, chips, and substrate.

a.) Hand soldering :

Fig. 1 Hand Soldering Profile



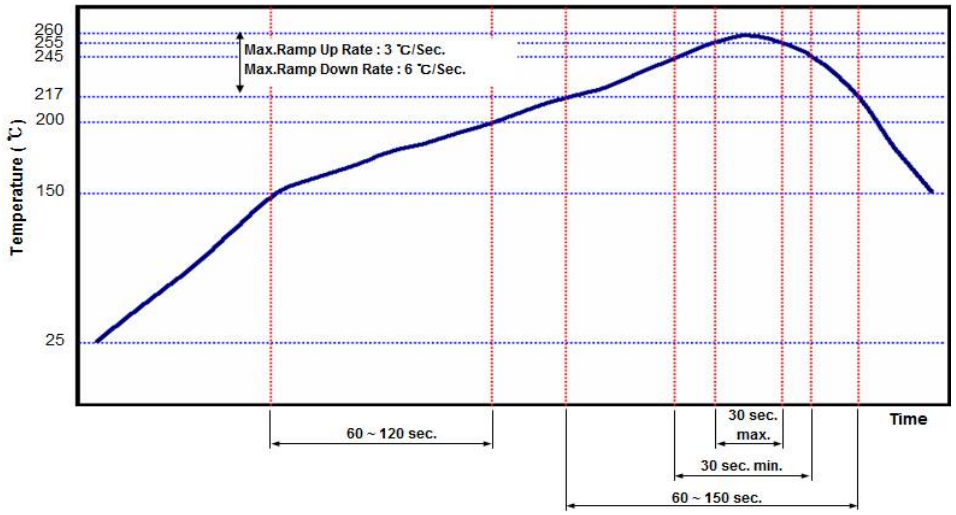
Chip Size	Pre-Heat temp.	ΔT	Max. soldering iron temp.
≤1206	≥150°C	≤150°C	≤350°C
1210~2225	≥150°C	≤130°C	≤280°C

* Soldering iron tip diameter ≤1.0 mm and wattage max. 20W.
* The Capacitors shall be pre-heated and that the temperature gradient between the devices and the tip of the soldering iron.
* The required amount of solder shall be melted on the soldering tip.
* The tip of iron should not contact the ceramic body directly.
* The Capacitors shall be cooled gradually at room temperature after soldering.
* Forced air cooling is not allowed.

APPLICATION NOTES

b.) Reflow soldering :

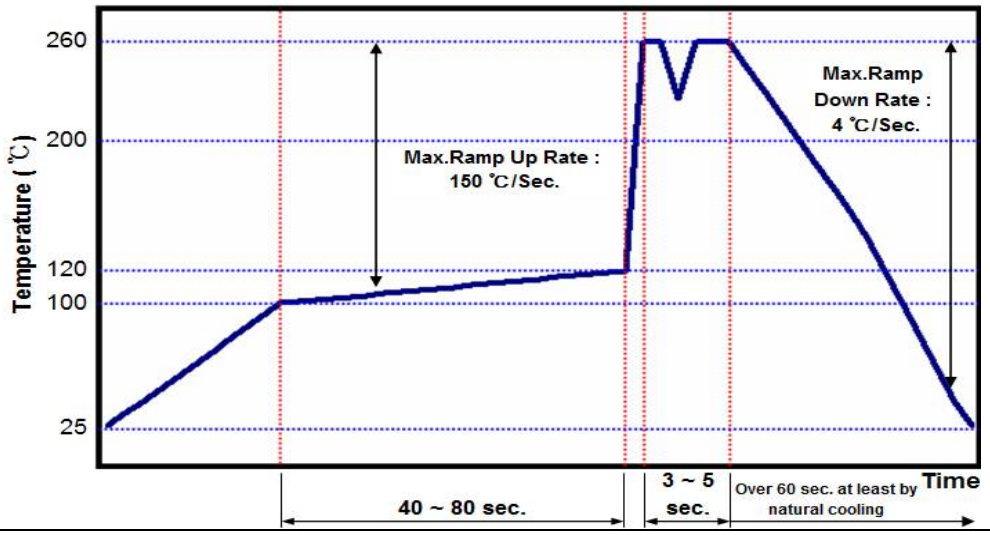
Fig. 2 Reflow soldering profile



For Sn/Ag/Cu Series solder paste (Pb-Free)

c.) Wave soldering :

Fig. 3 Wave soldering profile



For Sn/Ag/Cu Series solder paste (Pb-Free)

Soldering conditions :

Class I :

Size Inch (mm)	Temper. Char.	Capacitance	Condition	
			Wave	Reflow
≤0402 (1005)	Class I	All	X	O
0603 (1608)	Class I	All	O	O
0805 (2012)	Class I	All	O	O
1206 (3216)	Class I	All	O	O
		Thickness >0.95mm	X	O
≥1210 (3225)	Class I	All	X	O
Coating Products	All	All	X	O

HITANO
ENTERPRISE CORP. ®

APPLICATION NOTES

Soldering conditions :
Class II :

Size Inch (mm)	Temper. Char.	Capacitance	Condition	
			Wave	Reflow
≤0402 (1005)	Class II	All	X	O
0603 (1608)	Class II	Cap. <2.2μF	O	O
		Cap. ≥2.2μF	X	O
0805 (2012)	Class II	Thickness ≤ 0.95mm	O	O
		Thickness > 0.95mm	X	O
1206 (3216)	Class II	Thickness ≤ 0.95mm	O	O
		Thickness > 0.95mm	X	O
≥1210 (3225)	Class II	All	X	O
Coating Products	All	All	X	O

Soldering height :

The solder climbing minimum height is suggesting to 25% of chip thickness or 500um whichever is less. (Reference from IPC-610E)	

COOLING

After soldering, cool the chips and the substrate gradually to room temperature. Natural cooling in air is recommended to minimize stress in the solder joint.

CLEANING

All flux residues must be removed by using suitable electronic-grade vapor-cleaning solvents to eliminate contamination that could cause electrolytic surface corrosion. Good results can be obtained by using ultrasonic cleaning of the solvent. The choice of the proper system is depends upon many factors such as component mix, flux, and solder paste and assembly method. The ability of the cleaning system to remove flux residues and contamination from under the chips is very important.