Innovative Service Around the Globe YAGEO

DATA SHEET

SURFACE-MOUNT CERAMIC MULTILAYER CAPACITORS

Hi Q Series

Class 1, NP0

16 V TO 250 V

0.2 pF to 100 pF

RoHS compliant & Halogen Free

YAGEO Phycomp

Product Specification – March 30, 2018 V.15



SCOPE

This specification describes NP0 series chip capacitors with lead-free terminations.

APPLICATIONS

- Consumer electronics for example
  - Tuners
  - Television receivers
  - All types of cameras
- Telecommunications
- Data processing

FEATURES

- Supplied in tape on reel
- Nickel-barrier end termination
- RoHS compliant
- Halogen Free compliant

ORDERING INFORMATION - GLOBAL PART NUMBER, PHYCOMP CTC & 12NC

All part numbers are identified by the series, size, tolerance, TC material, packing style, voltage, process code, termination and capacitance value.

YAGEO/ PHYCOMP BRAND ordering code

GLOBAL PART NUMBER (PREFERRED)

CQ	xxxx	x	x	NPO	x	BN	xxx
	(1)	(2)	(3)		(4)		(5)

(1) SIZE – INCH BASED (METRIC)

0201 (0603)
0402 (1005)
0603 (1608)
0805 (2012)

(2) TOLERANCE

0.2pF to 2.0pF
A = ±0.05 pF
B = ±0.1 pF
C = ±0.25 pF

2.1pF to 5.0pF
A = ±0.05 pF
B = ±0.1 pF
C = ±0.25 pF
D = ±0.5 pF

5.1pF to 9.9pF
B = ±0.1 pF
C = ±0.25 pF
D = ±0.5 pF

10pF and over
F = ±1%
G = ±2%
J = ±5%

(3) PACKING STYLE

R = Paper/PE taping reel; Reel 7 inch
P = Paper/PE taping reel; Reel 13 inch

(4) RATED VOLTAGE

7 = 16 V	0=100V
8 = 25 V	A=200V
9 = 50 V	Y=250V

(5) CAPACITANCE VALUE

2 significant digits + number of zeros
The 3rd digit signifies the multiplying factor, and letter R is decimal point
Example: 121 = 12 x 10^1 = 120 pF

CONSTRUCTION

The capacitor consists of a rectangular block of ceramic dielectric in which a number of interleaved metal electrodes are contained. This structure gives rise to a high capacitance per unit volume.

The inner electrodes are connected to the two end terminations and finally covered with a layer of plated tin (NiSn). The terminations are lead-free. A cross section of the structure is shown in Fig.1.

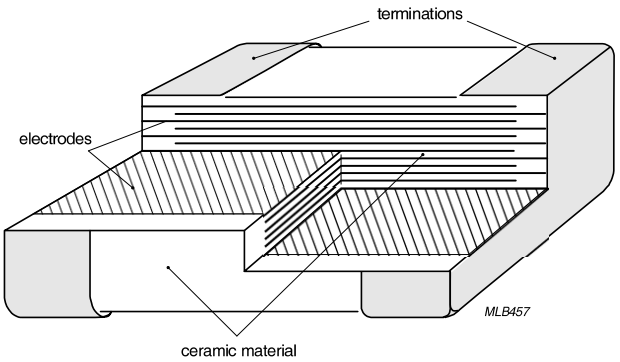


Fig. 1 Surface mounted multilayer ceramic capacitor construction

DIMENSION

Table 1 For outlines see fig. 2

TYPE	L_1 (mm)	W (mm)	T (MM)	L_2 / L_3 (mm)		L_4 (mm)
				min.	max.	min.
0201	0.6 ±0.03	0.3 ±0.03	Refer to table 2 to 5	0.10	0.20	0.20
0402	1.0 ±0.05	0.5 ±0.05		0.15	0.30	0.40
0603	1.6 ±0.10	0.8 ±0.10		0.20	0.60	0.40
0805	2.0 ±0.20	1.25 ±0.20		0.25	0.75	0.55

OUTLINES

For dimension see Table 1

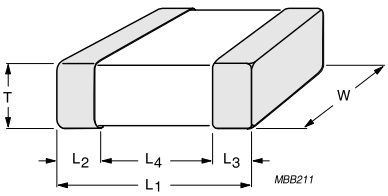


Fig. 2 Surface mounted multilayer ceramic capacitor dimension

CAPACITANCE RANGE & THICKNESS FOR NP0

Table 2 Sizes from 0201 to 0402

CAP.	0201		0402		
	25 V	50 V	50 V	100V	250V
0.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
0.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
0.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
0.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
0.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
0.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
0.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
0.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
1.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
Tape Wi	8mm		Tape Wid	8mm	

CAP.	0201		0402		
	25 V	50V	50 V	100V	250V
2.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
2.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
3.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
4.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
Tape Width			8mm		

NOTE

1. Values in shaded cells indicate thickness class in mm

CAPACITANCE RANGE & THICKNESS FOR NP0

CAP.	0201		0402		
	25 V	50 V	50 V	100 V	250 V
5.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
5.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
6.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
7.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
Tape Width			8mm		

CAP.	0201		0402		
	25 V	50 V	50 V	100 V	250 V
8.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
8.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.0 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.1 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.2 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.3 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.4 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.5 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.6 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.7 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.8 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
9.9 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
10 pF	0.3±0.03	0.3±0.03	0.5±0.05	0.5±0.05	0.5±0.05
12 pF			0.5±0.05	0.5±0.05	0.5±0.05
15 pF			0.5±0.05	0.5±0.05	0.5±0.05
18 pF			0.5±0.05	0.5±0.05	0.5±0.05
22 pF			0.5±0.05	0.5±0.05	0.5±0.05
27 pF			0.5±0.05	0.5±0.05	0.5±0.05
33 pF			0.5±0.05	0.5±0.05	0.5±0.05
39 pF			0.5±0.05	0.5±0.05	0.5±0.05
47 pF			0.5±0.05	0.5±0.05	0.5±0.05
56 pF			0.5±0.05	0.5±0.05	0.5±0.05
68 pF			0.5±0.05	0.5±0.05	0.5±0.05
82 pF			0.5±0.05	0.5±0.05	0.5±0.05
100 pF			0.5±0.05	0.5±0.05	0.5±0.05
Tape Width			8mm		

NOTE

Values in shaded cells indicate thickness class in mm

CAPACITANCE RANGE & THICKNESS FOR NP0

Table 4 Sizes from 0603 to 0805

CAP.	0603		0805		
	50 V	100/250 V	50 V	100V	250V
0.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
0.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
0.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
0.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
0.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
0.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
0.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
0.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
1.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
Tape Width			8mm		

CAP.	0603		0805		
	50 V	100/250 V	50 V	100V	250V
2.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
2.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
3.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
4.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
Tape Width			8mm		

NOTE

2. Values in shaded cells indicate thickness class in mm

CAPACITANCE RANGE & THICKNESS FOR NP0

CAP.	0603		0805		
	50 V	100/250 V	50 V	100 V	250 V
5.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
5.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
6.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
7.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
Tape Width			8mm		

CAP.	0603		0805		
	50 V	100/250 V	50 V	100 V	250 V
8.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
8.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.0 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.1 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.2 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.3 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.4 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.5 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.6 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.7 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.8 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
9.9 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
10 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
12 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
15 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
18 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
22 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
24 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
27 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
33 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
39 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
47 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
56 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
68 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
82 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
100 pF	0.8±0.1	0.8±0.1	0.6±0.1	0.6±0.1	0.6±0.1
Tape Width			8mm		

NOTE

Values in shaded cells indicate thickness class in mm

THICKNESS CLASSES AND PACKING QUANTITY

Table 5

SIZE CODE	THICKNESS CLASSIFICATION	TAPE WIDTH QUANTITY PER REEL	Ø180 MM / 7 INCH		Ø330 MM / 13 INCH		QUANTITY PER BULK CASE
			Paper/PE	Blister	Paper/PE	Blister	
0201	0.3 ±0.03 mm	8 mm	15,000	---	50,000	---	---
0402	0.5 ±0.05 mm	8 mm	10,000	---	50,000	---	---
0603	0.8 ±0.1 mm	8 mm	4,000	---	15,000	---	---
0805	0.6 ±0.1 mm	8 mm	4,000	---	20,000	---	---

ELECTRICAL CHARACTERISTICS

NP0 DIELECTRIC CAPACITORS; NISN TERMINATIONS

Unless otherwise stated all electrical values apply at an ambient temperature of 20±1 °C, an atmospheric pressure of 86 to 106 kPa, and a relative humidity of 63 to 67%.

Table 6

DESCRIPTION			VALUE
Capacitance range			0.2 pF to 100 pF
Capacitance tolerance			
	C < 10 pF		±0.05 pF, ±0.1 pF, ±0.25 pF, ±0.5 pF
	C ≥ 10 pF		±1%, ±2%, ±5%
Q value			
	C < 30 pF	≤ 50V	Q ≥ (400 + 20C)
		≥100V	Q ≥ (800 + 20C) C: pF
	C ≥ 30 pF	≤ 50V	Q ≥ 1000
		≥100V	Q ≥1400
Insulation resistance after 1 minute at U_r (DC)			R_{ins} ≥ 10 GΩ or R_{ins} × C_r ≥ 500 seconds whichever is less
Maximum capacitance change as a function of temperature (temperature characteristic/coefficient):			±30 ppm/°C
Operating temperature range:			–55 °C to +125 °C

SOLDERING RECOMMENDATION

Table 7

SOLDERING METHOD	SIZE 0201	0402	0603	0805
Reflow	O	O	O	O
Wave	---	---	O	O

TESTS AND REQUIREMENTS

Table 8 Test procedures and requirements

TEST	TEST METHOD		PROCEDURE	REQUIREMENTS
Mounting	IEC 60384-21/22	4.3	The capacitors may be mounted on printed-circuit boards or ceramic substrates	No visible damage
Visual inspection and dimension check		4.4	Any applicable method using × 10 magnification	In accordance with specification
Capacitance		4.5.1	Class 1: f = 1 MHz for C ≤ 1 nF, measuring at voltage 1 V_{rms} at 20 °C f = 1 KHz for C > 1 nF, measuring at voltage 1 V_{rms} at 20 °C	Within specified tolerance
Q value		4.5.2	Class 1: f = 1 MHz for C ≤ 1 nF , measuring at voltage 1 V_{rms} at 20 °C f = 1 KHz for C > 1 nF, measuring at voltage 1 V_{rms} at 20 °C	In accordance with specification
Insulation resistance		4.5.3	At U_r (DC) for 1 minute	In accordance with specification

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Temperature coefficient	4.6	Capacitance shall be measured by the steps shown in the following table. The capacitance change should be measured after 5 min at each specified temperature stage. (1) Class I Temperature Coefficient shall be calculated from the formula as below Temp, Coefficient = $\frac{C2 - C1}{C1 \times \Delta T} \times 10^6$ [ppm/℃] C1: Capacitance at step c C2: Capacitance at 125℃ ΔT: 100℃(=125℃-25℃)	Class1: Δ C/C: ±30ppm
Adhesion	4.7	A force applied for 10 seconds to the line joining the terminations and in a plane parallel to the substrate	Force size ≥ 0603: 5N size = 0402: 2.5N size = 0201: 1N
Bond strength of plating on end face	4.8	Mounting in accordance with IEC 60384-22 paragraph 4.3 Conditions: bending 1 mm at a rate of 1 mm/s, radius jig 5 mm	No visible damage ΔC/C NP0: within ±1% or 0.5 pF whichever is greater
ESR		Measuring frequency: 1 ± 0.2GHz at room temperature.	0.2pF ≤ C ≤ 1pF : 350mΩ / C max 1pF < C ≤ 5pF : 300mΩ max 5pF < C ≤ 10pF : 250mΩ max C : Nominal cap (pF)
		Measuring frequency: 500 ± 50MHz at room temperature.	10pF < C ≤ 100pF :400mΩ max

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Resistance to soldering heat	IEC 60384-21/22 4.9	Precondition: 150 +0/–10 °C for 1 hour, then keep for 24 ±1 hours at room temperature Preheating: for size ≤ 1206: 120 °C to 150 °C for 1 minute Preheating: for size >1206: 100 °C to 120 °C for 1 minute and 170 °C to 200 °C for 1 minute Solder bath temperature: 260 ±5 °C Dipping time: 10 ±0.5 seconds Recovery time: 24 ±2 hours	Dissolution of the end face plating shall not exceed 25% of the length of the edge concerned ΔC/C NP0: within ±0.5% or 0.5 pF whichever is greater Q value within initial specified value R_{ins} within initial specified value
Solderability	4.10	Preheated the temperature of 80 °C to 140 °C and maintained for 30 seconds to 60 seconds. Test conditions for lead containing solder alloy Temperature: 235 ±5 °C Dipping time: 2 ±0.2 seconds Depth of immersion: 10 mm Alloy Composition: 60/40 Sn/Pb Number of immersions: 1 Test conditions for lead-free containing solder alloy Temperature: 245 ±5 °C Dipping time: 3 ±0.3 seconds Depth of immersion: 10 mm Alloy Composition: SAC305 Number of immersions: 1	The solder should cover over 95% of the critical area of each termination
Rapid change of temperature	4.11	Preconditioning; 150 +0/–10 °C for 1 hour, then keep for 24 ±1 hours at room temperature 5 cycles with following detail: 30 minutes at lower category temperature 30 minutes at upper category temperature Recovery time 24 ±2 hours	No visual damage ΔC/C NP0: within ±1% or 1 pF whichever is greater Q value meet initial specified value R_{ins} meet initial specified value

TEST	TEST METHOD		PROCEDURE	REQUIREMENTS
Damp heat with U_r load	IEC 60384-21/22	4.13	1. Preconditioning, class 2 only: 150 +0/-10 °C /1 hour, then keep for 24 ±1 hour at room temp 2. Initial measure: Spec: refer to initial spec C 3. Damp heat test: 500 ±12 hours at 40 ±2 °C; 90 to 95% R.H. 1.0 U_r applied 4. Recovery: Class 1: 6 to 24 hours 5. Final measure: C P.S. If the capacitance value is less than the minimum value permitted, then after the other measurements have been made the capacitor shall be preconditioned according to *"IEC 60384 4.1"* and then the requirement shall be met.	No visual damage after recovery ΔC/C NP0: within ±7.5% or 0.75pF whichever is greater Q value: ≥30pF: Q ≥ 200 ≤30pF: Q ≥ 100+10C/3 I.R.: NP0: ≥ 500 MΩ or $R_{ins} \times C_r \geq 25s$ whichever is less
Endurance		4.14	1. Preconditioning, class 2 only: 150 +0/-10 °C /1 hour, then keep for 24 ±1 hour at room temp 2. Initial measure: Spec: refer to initial spec C 3. Endurance test: Temperature: NP0: 125 °C Specified stress voltage applied for 1,000 hours: Applied 2.0 x Ur for 16V to 100V product. Applied 1.5 x Ur for 200V to 250V product. 4. Recovery time: 24 ±2 hours 5. Final measure: C P.S. If the capacitance value is less than the minimum value permitted, then after the other measurements have been made the capacitor shall be preconditioned according to *"IEC 60384 4.1"* and then the requirement shall be met.	No visual damage ΔC/C NP0: within ±3% or 0.3pF whichever is greater Q value: ≥30pF: Q ≥ 350 10pF to 30pF: Q ≥ 275+5C/2 ≤10pF: Q ≥ 200+10C NP0: ≥ 1,000 MΩ or $R_{ins} \times C_r \geq 50\Omega.F$ whichever is less
Voltage proof	IEC 60384-1	4.6	Specified stress voltage applied for 1 minute $U_r \leq 100$ V: series applied 2.5 U_r $100 V < U_r \leq 200$ V series applied (1.5 U_r + 100) $200 V < U_r \leq 500$ V series applied (1.3 U_r + 100) $U_r > 500$ V: 1.3 U_r I: 7.5 mA	No breakdown or flashover

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 15	Mar.30, 2018	-	- Add 0603/100V, 250 V capacitance range
Version 14	Feb. 14, 2018	-	- Revised ESR requirements (0.2pF to 1pF)
Version 13	Jul. 5, 2016	-	- Add 0201/50V and 0402/100V, 250V Capacitance range
Version 12	Feb. 23, 2016	-	- Size update
Version 11	Mar 19, 2014	-	- Size update
Version 10	Mar 19, 2014	-	- Tests and requirements
Version 9	Feb. 27, 2014	-	- Tolerance update
Version 8	Oct. 28, 2013	-	- Rated voltage update
Version 7	Oct. 09, 2013	-	- Rated voltage update
Version 6	Jun. 24, 2013	-	- Tolerance update
Version 5	Apr. 15, 2013	-	- Tolerance update
Version 4	Mar. 28, 2013	-	- Capacitance range & thickness update
Version 3	Feb. 07, 2013	-	- Capacitance range & thickness update
Version 2	Dec. 25, 2012	-	- Capacitance range & thickness update
Version 1	Dec. 03, 2012	-	- Capacitance range & thickness update
Version 0	Nov. 23, 2012	-	- New datasheet for HiQ NP0 series with RoHS compliant

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