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Messrs. : 一般共用

Date : 2026/03/12

APPROVAL SHEET

Product Name : Vertical Stacked Capacitors

Part No. : VE Series

Description : Size 2220, C0G/X7R/X7T, 25~1000Vdc

PREPARED BY	APPROVED BY

信昌電子陶瓷股份有限公司

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SPECIFICATION

FOR

Product Name : Vertical Stacked Capacitors

Part No. : VE Series

Description : Size 2220, C0G/X7R/X7T, 25~1000Vdc

SPEC. No. : VE-000-001-01

DATE : 2026/03/12

DRAWN BY	CHECEKED BY	APPROVED BY
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PSA 信昌電子陶瓷股份有限公司

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1. INTRODUCTION

VE Series green type capacitors are manufactured by using green materials without lead and cadmium. These capacitors to achieve a unique structure of high reliability. The use of metal lead frame, can absorb the heat and mechanical stress. ESR (equivalent series resistance), ESL (equivalent series inductance) is small, the most suitable for high frequency operation of the rectifier power supply.

2. FEATURES

- a. High reliability and stability.
- b. Higher mechanical endurance.
- c. Anti thermal stress and mechanical stress.
- d. Improved vibration performance.
- e. More capacitance without changing footprint.
- f. RoHS Compliant.

3. APPLICATIONS

- a. DC to DC converter.
- b. High voltage coupling/DC blocking.
- c. Back-lighting inverters.
- d. Snubbers in high frequency power converters.
- e. Power supplies.
- f. Surge protection.
- g. Filtering, smoothing, and decoupling application.

4. HOW TO ORDER

<u>VE</u>	<u>2H</u>	<u>X</u>	<u>336</u>	<u>M</u>	<u>101</u>	<u>L</u>	<u>T</u>	<u>M</u>	<u>M</u>
PDC Family	Size	Dielectric	Capacitance	Tolerance	Rated Voltage	Packaging	Thickness	Control Code	Control Code-2
Table 1	Table 2	Table 3	Table 4	Table 5	Table 6	Table 7	Table 8	Table 9	Table 10

Table 1 PDC Family	
Code	Description
VE	Vertical Stacked Capacitors Series

Table 6 Rated Voltage					
Code	Description	Code	Description	Code	Description
250	25Vdc	201	200Vdc	501	500Vdc
500	50Vdc	251	250Vdc	631	630Vdc
101	100Vdc	401	400Vdc	102	1000Vdc

Table 2 Stack chip quantity and chip size			
The first digit : # of chips in stack			
Second digit code : chip size (below)			
Code	Description	Code	Description
H	2220 (5750)		

Table 7 Packaging Type			
Code	Description	Code	Description
B	Bulk	T	Tray package
L	Tape and 13" Reel, Embossed Tape		

Table 3 Dielectric Material Characteristics			
Code	Description	Code	Description
N	C0G	X	X7R
T	X7T		

Table 8 Thickness Description					
Code	Description	Code	Description	Code	Description
A	3.00±0.35 mm	J	7.80±0.35 mm	S	5.00±0.50 mm
B	3.60±0.35 mm	K	8.40±0.35 mm	T	6.40±0.50 mm
C	4.20±0.35 mm	L	9.00±0.35 mm	U	1.70±0.25 mm
D	4.80±0.35 mm	M	9.60±0.35 mm	V	2.10±0.25 mm
E	5.40±0.35 mm	N	10.20±0.35 mm	W	2.50±0.25 mm
F	6.00±0.35 mm	P	10.80±0.35 mm		
G	6.60±0.35 mm	Q	11.40±0.35 mm		
H	7.20±0.35 mm	R	12.00±0.35 mm		

Table 4 Capacitance Rule Code			
Code	Description	Code	Description
R47	0.47pF	102	102=10x10 ² =1000pF
OR5	0.5pF	104	104=10x10 ⁴ =100nF
100	100=10x10 ⁰ =10pF	106	106=10x10 ⁶ =10μF

Table 5 Tolerance					
Code	Description	Code	Description	Code	Description
A	±0.05 pF	I	-10% ~ 0%	Q	±0.03 pF
B	±0.10 pF	J	±5 %	Z	-20% ~ +80%
C	±0.25 pF	K	±10 %	X	+10% ~ +20%
D	±0.50 pF	L	0% ~ +10%		
F	±1 %	M	±20 %		
G	±2 %	N	-5% ~ +10%		
H	±3 %	P	±0.02 pF		

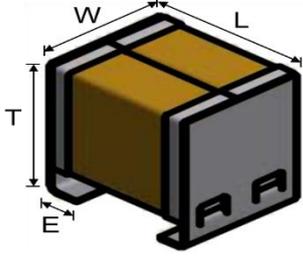
Table 9 Special Control Code			
Code	Description	Code	Description
M	M type lead		

Table 10 Special Control Code-2			
Code	Description	Code	Description
Blank	General products	M	Automotive

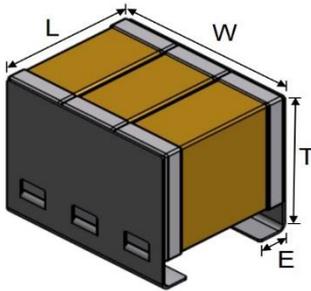


5. EXTERNAL DIMENSIONS

V2

Size Inch (mm)	2220 (5750)	
L (mm)	6.00±0.50	
W (mm)	5.60±0.50	
Code / T (mm)	G/6.60±0.35 T/6.40±0.50	
E (mm)	1.20±0.15	
		Fig. 5.1 The outline of Vertical Stacked Capacitors

V3

Size Inch (mm)	2220 (5750)	
L (mm)	6.00±0.50	
W (mm)	7.50±0.50	
Code / T (mm)	G/6.60±0.35 T/6.40±0.50	
E (mm)	1.20±0.15	
		Fig. 5.1 The outline of Vertical Stacked Capacitors



Prosperity Dielectrics Co., Ltd.

6. GENERAL ELECTRICAL DATA

Dielectric	C0G	X7R												
Size	2220	2220												
Rated voltage (WVDC)	25V, 50V, 100V, 200V, 250V, 500V, 630V, 1000V	25V, 50V, 100V, 200V, 250V, 500V, 630V, 1000V												
Capacitance range	220nF Max.	820μF Max.												
Capacitance tolerance	Reference to Table 5	Reference to Table 5												
Tan δ	<table border="1"> <tr> <th>Cap. Range</th> <th>Q Spec.</th> </tr> <tr> <td>Cap.<30pF</td> <td>Q≥400+20C</td> </tr> <tr> <td>Cap.≥30pF</td> <td>Q≥1000</td> </tr> </table>	Cap. Range	Q Spec.	Cap.<30pF	Q≥400+20C	Cap.≥30pF	Q≥1000	<table border="1"> <tr> <th>Cap. Range</th> <th>D.F. Spec.</th> </tr> <tr> <td>1812~2225≥4.7μF</td> <td>≤5.0%</td> </tr> <tr> <td>Other</td> <td>≤2.5%</td> </tr> </table>	Cap. Range	D.F. Spec.	1812~2225≥4.7μF	≤5.0%	Other	≤2.5%
Cap. Range	Q Spec.													
Cap.<30pF	Q≥400+20C													
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Cap. Range	D.F. Spec.													
1812~2225≥4.7μF	≤5.0%													
Other	≤2.5%													
Capacitance & Tan δ Test condition	Measured at the condition of 30~70% related humidity For 25°C at ambient temperature	Measured at the condition of 30~70% related humidity Preconditioning for Class II MLCC : Perform a heat treatment at 150±10°C for 1 hour, then leave in ambient condition (25°C) for 24±2 hours before measurement												
	<table border="1"> <tr> <th>Cap. Range</th> <th>Test Condition</th> </tr> <tr> <td>Cap.<1000pF</td> <td>1.0±0.2Vrms, 1.0MHz±10%</td> </tr> <tr> <td>Cap.≥1000pF</td> <td>1.0±0.2Vrms, 1.0KHz±10%</td> </tr> </table>	Cap. Range	Test Condition	Cap.<1000pF	1.0±0.2Vrms, 1.0MHz±10%	Cap.≥1000pF	1.0±0.2Vrms, 1.0KHz±10%	<table border="1"> <tr> <th>Cap. Range</th> <th>Test Condition</th> </tr> <tr> <td>Cap.≤10μF</td> <td>1.0±0.2Vrms, 1.0KHz±10%</td> </tr> <tr> <td>Cap.>10μF</td> <td>0.5±0.2Vrms, 120Hz±20%</td> </tr> </table>	Cap. Range	Test Condition	Cap.≤10μF	1.0±0.2Vrms, 1.0KHz±10%	Cap.>10μF	0.5±0.2Vrms, 120Hz±20%
Cap. Range	Test Condition													
Cap.<1000pF	1.0±0.2Vrms, 1.0MHz±10%													
Cap.≥1000pF	1.0±0.2Vrms, 1.0KHz±10%													
Cap. Range	Test Condition													
Cap.≤10μF	1.0±0.2Vrms, 1.0KHz±10%													
Cap.>10μF	0.5±0.2Vrms, 120Hz±20%													
Insulation resistance at Ur	≥10GΩ or RxC≥500Ω-F, whichever is smaller	≥10GΩ or RxC≥100Ω-F, whichever is smaller												
Operating temperature	-55 to +125°C	-55 to +125°C												
Capacitance characteristic	±30ppm / °C	±15%												
Termination	M type lead	M type lead												

Dielectric	X7T
Size	2220
Rated voltage (WVDC)	250V, 450V, 630V
Capacitance range	1μF Max.
Capacitance tolerance	Reference to Table5
Tan δ	≤2.5%
Capacitance & Tan δ Test condition	Measured at the condition of 30~70% related humidity Preconditioning for Class II MLCC : Perform a heat treatment at 150±10°C for 1 hour, then leave in ambient condition for 24±2 hours before measurement 1.0±0.2Vrms, 1.0KHz±10%, at 25°C ambient temperature
Insulation resistance at Ur	≥10GΩ or RxC≥100Ω-F, whichever is smaller
Operating temperature	-55 to +125°C
Capacitance characteristic	+22% ~ -33%
Termination	M type lead



7. CAPACITANCE RANGE (Max.)

7-1. C0G

Dimension	Code	Rated Voltage							
		25V	50V	100V	200V	250V	500V	630V	1000V
2220	2H	-	-	-	-	-	224(M)	224(M)	-
	3H	334(M)	334(M)	334(M)	224(M)	224(M)	184(M)	184(M)	993(J)

(M) means M tolerance only.

7-2. X7R

Dimension	Code	Rated Voltage							
		25V	50V	100V	200V	250V	500V	630V	1000
2220	2H	826(M)	476(M)	396(M)	-	-	225(M)	225(M)	105(M)
	3H	226(M)	226(M)	226(M)	475(M)	475(M)	135(M)	135(M)	394(M)

(M) means M tolerance only.

7-3. X7T

Dimension	Code	Rated Voltage		
		250V	450V	630V
2220	3H	685(M)	335(M)	185(M)

(M) means M tolerance only

7-4. Customizable, Please contact the liaison



8. RELIABILITY TEST CONDITIONS AND REQUIREMENTS

No.	Item	Test Condition	Requirements																		
1.	Visual and Dimensions	---	* No remarkable defect. * Dimensions to confirm to individual specification sheet.																		
2.	Capacitance	* Class I : Cap.≤1000pF, 1.0±0.2Vrms, 1MHz±10%. Cap.>1000pF, 1.0±0.2Vrms, 1KHz±10%.	* Shall not exceed the limits given in the detailed spec.																		
3.	Q/D.F. (Dissipation Factor)	* Class II : Cap.≤10μF, 1.0±0.2Vrms, 1KHz±10%. Cap.>10μF, 0.5±0.2Vrms, 120Hz±20%.	<table border="1"> <thead> <tr> <th>Dielectric</th> <th>Cap. Range</th> <th>Q/D.F.</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Class I (C0G)</td> <td>Cap.≥30pF</td> <td>Q≥1000</td> </tr> <tr> <td>Cap.<30pF</td> <td>Q≥400+20C</td> </tr> <tr> <td rowspan="2">Class II (X7R/X7T)</td> <td>1812~2220≥4.7μF</td> <td>D.F.≤5.0%</td> </tr> <tr> <td>Other</td> <td>D.F.≤2.5%</td> </tr> </tbody> </table>	Dielectric	Cap. Range	Q/D.F.	Class I (C0G)	Cap.≥30pF	Q≥1000	Cap.<30pF	Q≥400+20C	Class II (X7R/X7T)	1812~2220≥4.7μF	D.F.≤5.0%	Other	D.F.≤2.5%					
Dielectric	Cap. Range	Q/D.F.																			
Class I (C0G)	Cap.≥30pF	Q≥1000																			
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Class II (X7R/X7T)	1812~2220≥4.7μF	D.F.≤5.0%																			
	Other	D.F.≤2.5%																			
4.	Temperature Coefficient	* With no electrical load. <table border="1"> <thead> <tr> <th>T.C.</th> <th>Operating Temp.</th> </tr> </thead> <tbody> <tr> <td>C0G</td> <td>-55~125°C at 25°C</td> </tr> <tr> <td>X7R</td> <td>-55~125°C at 25°C</td> </tr> <tr> <td>X7T</td> <td>-55~125°C at 25°C</td> </tr> </tbody> </table>	T.C.	Operating Temp.	C0G	-55~125°C at 25°C	X7R	-55~125°C at 25°C	X7T	-55~125°C at 25°C	<table border="1"> <thead> <tr> <th>T.C.</th> <th>Capacitance Change</th> </tr> </thead> <tbody> <tr> <td>C0G</td> <td>Within ±30ppm/°C</td> </tr> <tr> <td>X7R</td> <td>Within ±15%</td> </tr> <tr> <td>X7T</td> <td>Within +22% ~ -33%</td> </tr> </tbody> </table>	T.C.	Capacitance Change	C0G	Within ±30ppm/°C	X7R	Within ±15%	X7T	Within +22% ~ -33%		
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5.	Insulation Resistance	<table border="1"> <thead> <tr> <th>Rated Vol. (V)</th> <th>Apply Voltage</th> <th>Test Time</th> </tr> </thead> <tbody> <tr> <td>≤100</td> <td>1 times of U_R</td> <td>Max. 120 sec.</td> </tr> <tr> <td>100<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> </tbody> </table>	Rated Vol. (V)	Apply Voltage	Test Time	≤100	1 times of U _R	Max. 120 sec.	100<V≤500	1 times of U _R	60 sec.	>500	500Vdc	60 sec.	<table border="1"> <thead> <tr> <th>Dielectric</th> <th>Requirements</th> </tr> </thead> <tbody> <tr> <td>Class I</td> <td>≥10GΩ or RxC≥500Ω-F, whichever is smaller</td> </tr> <tr> <td>Class II</td> <td>≥10GΩ or RxC≥100Ω-F, whichever is smaller</td> </tr> </tbody> </table>	Dielectric	Requirements	Class I	≥10GΩ or RxC≥500Ω-F, whichever is smaller	Class II	≥10GΩ or RxC≥100Ω-F, whichever is smaller
Rated Vol. (V)	Apply Voltage	Test Time																			
≤100	1 times of U _R	Max. 120 sec.																			
100<V≤500	1 times of U _R	60 sec.																			
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6.	Dielectric Strength	<table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>Condition</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>* Duration : 1 to 5 sec. * Charge and discharge current less than 50mA.</p>	Rated Voltage	Condition	≤100	2.5 times of U _R	100<V≤250	2.0 times of U _R	250<V≤500	1.5 times of U _R	630≤V≤3000V	1.2 times of U _R	* No evidence of damage or flash over during test.								
Rated Voltage	Condition																				
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7.	Temperature Cycle	<p>* Conduct the 100 cycles according to the temperatures and time.</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temp.(°C)</th> <th>Time(min.)</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>* 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).</p>	Step	Temp.(°C)	Time(min.)	1	Min. operating temp. +0/-3	30±3	2	Room temp.	2~3	3	Max. operating temp. +3/-0	30±3	4	Room temp.	2~3	<p>* No remarkable damage. * Cap. change : C0G Within ±2.5% or ±0.25pF, whichever is larger. X7R/X7T Within ±7.5%. * Q/D.F. : C0G : Q≥100% of initial requirement. X7R/X7T : D.F.≤150% of initial requirement. * I.R. : To meet the initial requirement.</p>			
Step	Temp.(°C)	Time(min.)																			
1	Min. operating temp. +0/-3	30±3																			
2	Room temp.	2~3																			
3	Max. operating temp. +3/-0	30±3																			
4	Room temp.	2~3																			

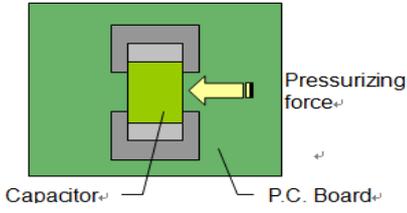
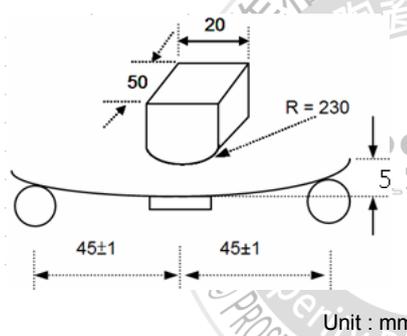


8. RELIABILITY TEST CONDITIONS AND REQUIREMENTS

No.	Item	Test Condition	Requirements																																							
8.	Humidity (Damp Heat) Steady State	* 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 24±2 hrs (Class I) or 48±4 hrs (Class II).	* No remarkable damage. * Cap. change : COG Within ±5.0% or ±0.5pF, whichever is larger. X7R/X7T Within ±12.5%. * Q/D.F. : COG : Q≥350. X7R/X7T : D.F.≤200% of initial requirement. * I.R. (Class I) : ≥1GΩ or RxC≥50Ω-F, whichever is smaller. * I.R. (Class II) : ≥1GΩ or RxC≥10Ω-F, whichever is smaller.																																							
9.	Humidity (Damp Heat) Load	* Test temp. : 40±2°C. * Humidity : 90~95%RH. * Test time : 500 +24/-0hrs. * To apply voltage : Rated voltage (500V max.). * 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).	* No remarkable damage. * Cap. change : COG Within ±7.5% or ±0.75pF, whichever is larger. X7R/X7T Within ±12.5%. * Q/D.F. : COG : Q≥200. X7R/X7T : D.F.≤200% of initial requirement. * I.R. : ≥500MΩ or RxC≥25Ω-F, whichever is smaller.																																							
10.	High Temperature Load (Endurance)	* Test temp. : 125±3°C. * To apply voltage : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Dielectric</th> <th>Rated Vol.(V)</th> <th>Apply Voltage</th> </tr> </thead> <tbody> <tr> <td rowspan="5">COG/X7R</td> <td>≤100</td> <td>2.0 times of U_R</td> </tr> <tr> <td>200≤V≤ 500</td> <td>1.5 times of U_R</td> </tr> <tr> <td>450</td> <td>1.2 times of U_R</td> </tr> <tr> <td>630</td> <td>1.2 times of U_R</td> </tr> <tr> <td>≥1000</td> <td>1.0 times of U_R</td> </tr> </tbody> </table> * Exception items (X7R only) : (1) 150% of rated voltage for below range : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Rated Vol.(V)</th> <th>Size</th> <th>Cap. Range</th> </tr> </thead> <tbody> <tr> <td>ALL</td> <td>ALL</td> <td>Cap.≥106</td> </tr> <tr> <td>50V & 100V</td> <td>2220</td> <td>Cap.≥105</td> </tr> </tbody> </table> (2) 120% of rated voltage for below range : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Size</th> <th>Dielectric</th> <th>Rated Voltage</th> <th>Capacitance</th> </tr> </thead> <tbody> <tr> <td>2220</td> <td>X7R</td> <td>≥100V</td> <td>Cap.≥15μF</td> </tr> </tbody> </table> (3) 100% of rated voltage for below range : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Size</th> <th>Dielectric</th> <th>Rated Voltage</th> <th>Capacitance</th> </tr> </thead> <tbody> <tr> <td>2220</td> <td>X7R</td> <td>≥100V</td> <td>Cap.≥22μF</td> </tr> </tbody> </table> X7T : 125±3°C. 250 150% of rated voltage = 375V 450 120% of rated voltage = 540V 630 100% of rated voltage = 630V * 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 24±2 hrs (Class I) or 48±4 hrs (Class II).	Dielectric	Rated Vol.(V)	Apply Voltage	COG/X7R	≤100	2.0 times of U _R	200≤V≤ 500	1.5 times of U _R	450	1.2 times of U _R	630	1.2 times of U _R	≥1000	1.0 times of U _R	Rated Vol.(V)	Size	Cap. Range	ALL	ALL	Cap.≥106	50V & 100V	2220	Cap.≥105	Size	Dielectric	Rated Voltage	Capacitance	2220	X7R	≥100V	Cap.≥15μF	Size	Dielectric	Rated Voltage	Capacitance	2220	X7R	≥100V	Cap.≥22μF	* No remarkable damage. * Cap. change : COG Within ±3.0% or ±0.3pF, whichever is larger. X7R/X7T Within ±12.5%. * Q/D.F. : COG : Q≥350. X7R/X7T : D.F.≤200% of initial requirement. * I.R. (Class I) : ≥1GΩ or RxC≥50Ω-F, whichever is smaller. * I.R. (Class II) : ≥1GΩ or RxC≥10Ω-F, whichever is smaller.
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8. RELIABILITY TEST CONDITIONS AND REQUIREMENTS

No.	Item	Test Condition	Requirements						
11.	Adhesive Strength of Termination	<p>* Capacitors mounted on a substrate. A force of 10N applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10±1 second.</p>  <p>Capacitor P.C. Board</p>	<p>* No remarkable damage or removal of the terminations.</p>						
12.	Bending Test	<p>* 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 5mm and then the pressure shall be maintained for 5±1 sec.</p>  <p>Unit : mm</p>	<p>* No remarkable damage.</p> <table border="1" data-bbox="805 862 1500 985"> <thead> <tr> <th>Dielectric</th> <th>Cap. Change</th> </tr> </thead> <tbody> <tr> <td>C0G</td> <td>Within ±3.0% or ±2.0pF, whichever is larger</td> </tr> <tr> <td>X7R/X7T</td> <td>Within ±12.5%</td> </tr> </tbody> </table> <p>(This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test)</p>	Dielectric	Cap. Change	C0G	Within ±3.0% or ±2.0pF, whichever is larger	X7R/X7T	Within ±12.5%
Dielectric	Cap. Change								
C0G	Within ±3.0% or ±2.0pF, whichever is larger								
X7R/X7T	Within ±12.5%								
13.	Vibration Resistance	<p>* 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).</p>	<p>* No remarkable damage. * Cap. change and D.F. : To meet initial spec.</p>						
14	Resistance to Soldering Heat	<p>* Reflow soldering : Peak 260±5°C. * Preheating : 120 to 150°C for 1 minute before immerse the capacitor in a eutectic solder. * Before initial measurement (Class II only) : Perform 150 +0/-10°C for 1 hr and then set for 48±4 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).</p>	<p>* No remarkable damage. * Cap. Change : C0G : Within ±2.5% or ±0.25pF, whichever is larger. X7R /X7T: Within ±7.5%. * Q/D.F. & I.R. : To meet the initial requirement.</p>						



9. PACKAGE DIMENSION AND QUANTITY

9.1. PACKAGE QUANTITY

PDC Family & Size	Thickness (mm)	Plastic tape
		13" reel
VE2H	ALL	0.5k
VE3H	ALL	0.4k
For other chip size, please contact the liaison		

9.2. EMBOSSED TAPE DIMENSIONS

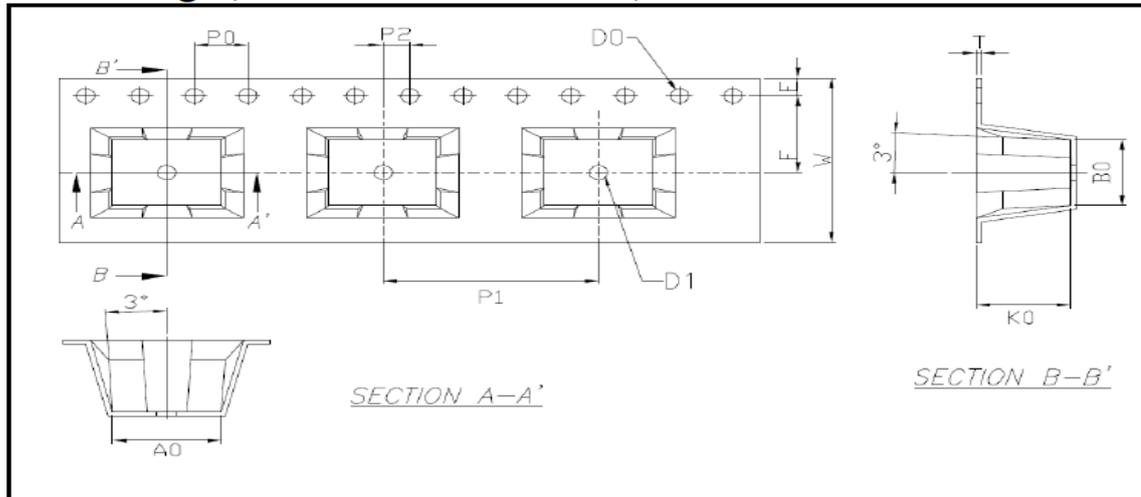


Fig. 9.1 The dimension of plastic tape

Size	VE2H	VE3H
Chip Thickness	6.40±0.50	6.60±0.35
W	16.00±0.30	16.00±0.30
E	1.75±0.10	1.75±0.10
F	7.50±0.10	7.50±0.10
P_1	16.00±0.10	16.00±0.10
P_0	4.00±0.10	4.00±0.10
10xP0	40.00±0.20	40.00±0.20
P_2	2.00±0.10	2.00±0.10
D_0	Ø1.50 +0.10/-0	Ø1.50 +0.10/-0
T	0.40±0.05	0.40±0.05
A_0	5.75±0.10	8.05±0.10
B_0	6.50±0.10	6.40±0.10
K_0	6.85±0.10	7.00±0.10
Unit :	mm	mm

* For other chip size, please contact the liaison.



9. PACKAGE DIMENSION AND QUANTITY

9.3. REEL DIMENSIONS

Reel size	13"	
A	16.50±0.10mm	
B	2.30±0.10mm	
C	100.00±0.10mm	

Fig. 9.2 The dimension of reel

10. FOOTPRINT DIMENSIONS

V2

Size	2220	Fig. 10.1 Illustration of Footprint
D1	7.3~8.7	
D2	1.5~2.0	
D3	4.3~4.7	
D4	1.5~2.0	
D5	5.2~5.7	

V3

Size	2220	Fig. 10.1 Illustration of Footprint
D1	7.3~8.7	
D2	1.5~2.0	
D3	4.3~4.7	
D4	1.5~2.0	
D5	7.9~8.4	



11. 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.

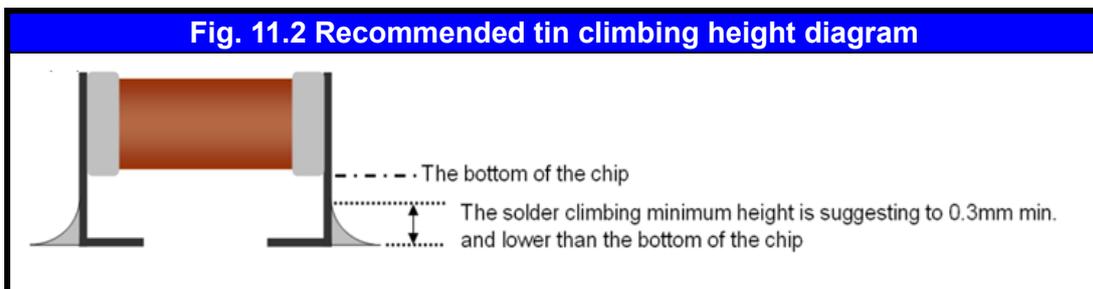
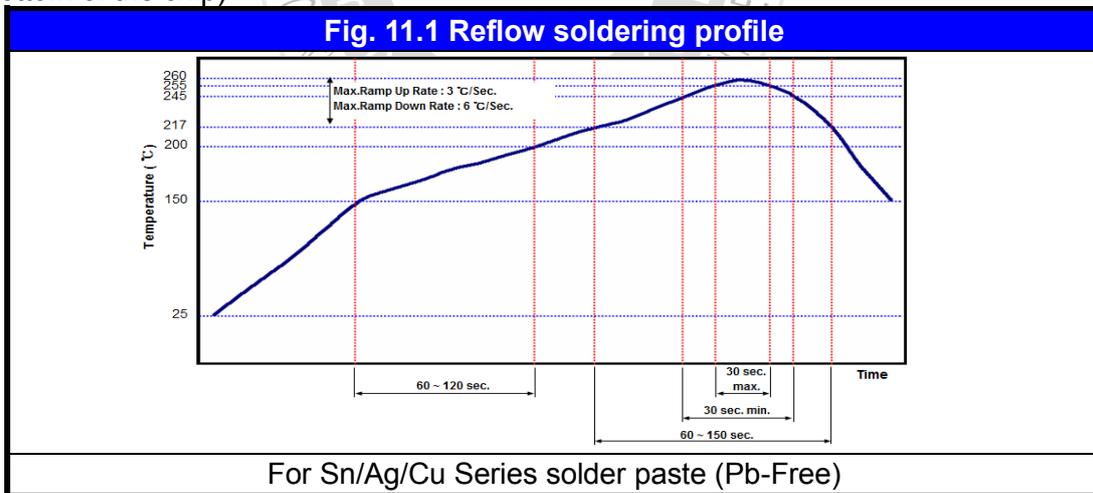
PREHEAT

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.) Reflow soldering : (Please make sure that solder is smoothly applied higher than 0.3mm and lower than the level of the bottom of the chip)



11. APPLICATION NOTES

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 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.

