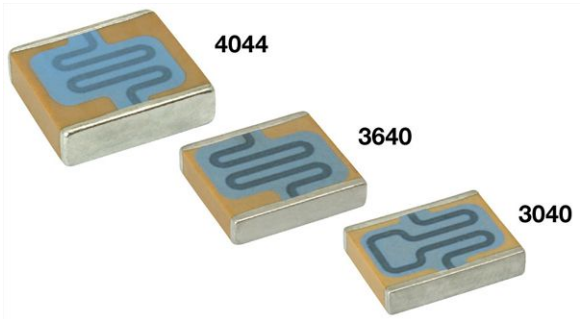
Surface Mount Multilayer Ceramic Chip Capacitors with Integrated Resistor for High Pulse Current Applications



FEATURES

Pb Available

RoHS* Available

HALOGEN FREE

- Integrated resistor on the surface of the capacitor
- Low electrostrictive ceramic formulation for repeated charge and discharge cycles
- High pulse discharge currents
- Excellent reliability and high voltage performance
- Available with tin/lead barrier termination (code “L”)
- Wet built process
- Reliable Noble Metal Electrode (NME) system
- Made with a combination of design, materials and tight process control to achieve very highì field reliability
- Resistor glass overglaze contains lead
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Note

* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information/tables in this datasheet for details.

APPLICATIONS

- Detonation devices (munitions, pyrotechnic, blasting)
- Down hole drilling
- Electronic fuzing

ELECTRICAL SPECIFICATIONS

Note

- Electrical characteristics at + 25 °C unless otherwise specified

Operating Temperature: - 55 °C to + 125 °C

Capacitance Range: 33 nF to 560 nF

Voltage Range: 1000 V_{DC} to 1500 V_{DC}

Temperature Coefficient of Capacitance (TCC):
X5P: ± 10 % from - 55 °C to + 85 °C, with 0 V_{DC} applied
X7R: ± 15 % from - 55 °C to + 125 °C, with 0 V_{DC} applied

Parallel Resistor: 500 MΩ ± 30 %

Dissipation Factor (DF):
2.5 % maximum at 1.0 V_{RMS} and 1 kHz

Aging Rate: 1 % maximum per decade

Insulation Resistance (IR):
At + 25 °C without resistor: 100 000 MΩ minimum or 1000 ΩF, whichever is less.
At + 125 °C without resistor: 10 000 MΩ minimum or 100 ΩF, whichever is less.

Dielectric Strength Test:
Performed per Method 103 of EIA 198-2-E.
Applied test voltages:
1000 V_{DC}/1500 V_{DC}-rated: 120 % of rated voltage

QUICK REFERENCE DATA

DIELECTRIC	CASE	MAXIMUM VOLTAGE (V)	CAPACITANCE	
			MINIMUM	MAXIMUM
X7R (X5P)	3040	1500	33 nF	220 nF
	3640	1500	47 nF	330 nF
	4044	1500	100 nF	560 nF

Note

- Detail ratings see “Selection Chart”

ORDERING INFORMATION

VJ3640 (3)	Y	184	K	X	R	A	T	8R (2)
CASE CODE	DIELECTRIC	CAPACITANCE NOMINAL CODE	CAPACITANCE TOLERANCE	TERMINATION	DC VOLTAGE RATING (1)	MARKING	PACKAGING	PROCESS CODE
3040 3640 4044	Y = X7R (X5P)	Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. **Examples:** 184 = 180 nF 334 = 330 nF	J = ± 5 % K = ± 10 % M = ± 20 %	X = Ni barrier 100 % tin plate matte finish L = Ni barrier with tin lead plated finish min. 4 % lead	G = 1000 V R = 1500 V	A = Unmarked	T = 7" reel/plastic tape	

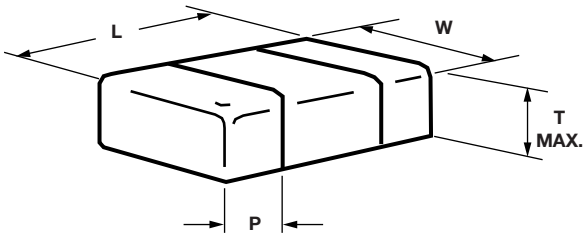
Notes

(1) DC voltage rating should not be exceeded in application. Other application factors may affect the MLCC performance. Consult for questions: mlcc@vishay.com

(2) Process Code must be added to control special requirements

(3) Size designator may be replaced by four digit drawing number used to control non-standard products and/or special requirements

DIMENSIONS in inches [millimeters]



CASE CODE	PART ORDERING NUMBER	LENGTH (L)	WIDTH (W)	MAXIMUM THICKNESS (T)	TERMINATION (P)	
					MINIMUM	MAXIMUM
3040	VJ3040	0.300 ± 0.015 [7.62 ± 0.38]	0.400 ± 0.015 [10.20 ± 0.38]	0.100 [2.54]	0.010 [0.25]	0.030 [0.76]
3640	VJ3640	0.360 ± 0.015 [9.14 ± 0.38]	0.400 ± 0.015 [10.20 ± 0.38]	0.120 [3.05]	0.010 [0.25]	0.030 [0.76]
4044	VJ4044	0.400 ± 0.015 [10.16 ± 0.38]	0.440 ± 0.015 [11.17 ± 0.38]	0.120 [3.05]	0.020 [0.50]	0.040 [1.00]

SELECTION CHART								
DIELECTRIC		X7R (X5P)						
STYLE		VJ3040 (1)		VJ3640 (1)		VJ4044 (1)		
CASE CODE		3040		3640		4044		
VOLTAGE (V_{DC})		1000	1500	1000	1500	1000	1500	
VOLTAGE CODE		G	R	G	R	G	R	
CAP. CODE	CAP.							
223	0.022 µF							
273	0.027 µF							
333	0.033 µF		•					
393	0.039 µF		•					
473	0.047 µF		•		•			
563	0.056 µF	•	•		•			
683	0.068 µF	•	•		•			
823	0.082 µF	•	•		•			
104	0.10 µF	•	•	•	•		•	
124	0.12 µF	•	•	•	•		•	
154	0.15 µF	•		•	•	•	•	
184	0.18 µF	•		•	•	•	•	
224	0.22 µF	•		•		•	•	
274	0.27 µF			•		•	•	
334	0.33 µF			•		•	•	
394	0.39 µF					•		
474	0.47 µF					•		
564	0.56 µF					•		
684	0.68 µF							
824	0.82 µF							
105	1.0 µF							
125	1.2 µF							
155	1.5 µF							
185	1.8 µF							
225	2.2 µF							
275	2.7 µF							
335	3.3 µF							

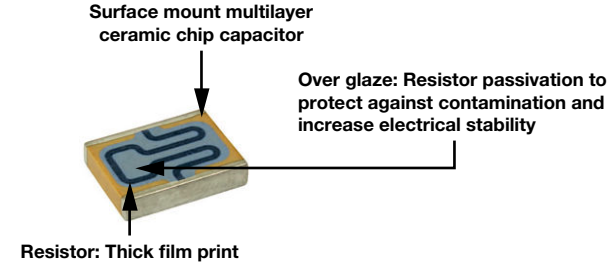
Notes

RoHS-compliant except when supplied with lead (Pb)-containing termination, code “L”

• Plastic tape

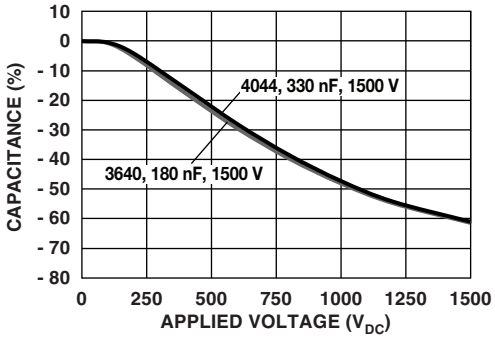
(1) See soldering recommendations within this data book, or visit www.vishay.com/doc?45034

CONSTRUCTION

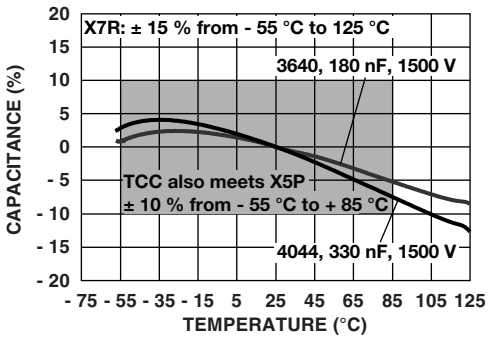


TYPICAL PARAMETERS

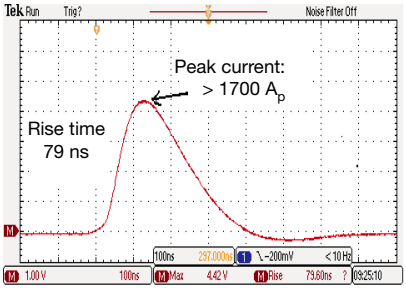
VOLTAGE COEFFICIENT OF CAPACITANCE



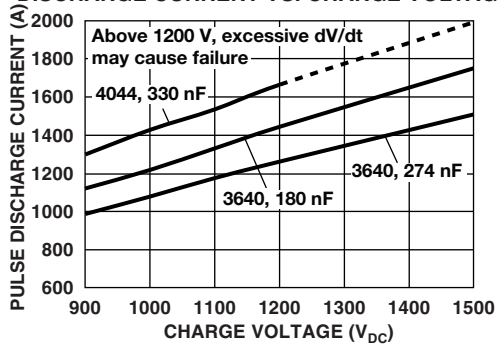
TEMPERATURE COEFFICIENT OF CAPACITANCE



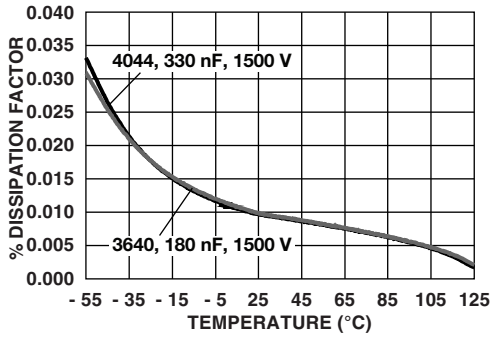
DISCHARGE PULSE OF 4044 CDC



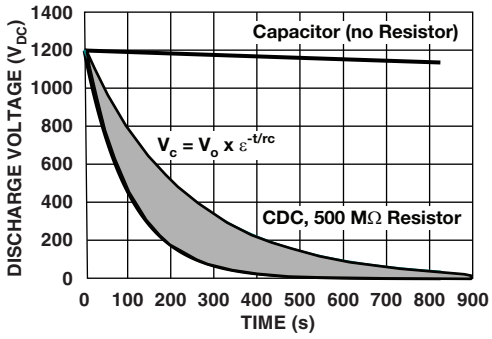
DISCHARGE CURRENT VS. CHARGE VOLTAGE



DISSIPATION FACTOR VS. TEMPERATURE



SELF DISCHARGE VS. TIME



STANDARD PACKAGING QUANTITIES (1)(2)(3)

CASE CODE	TAPE SIZE	7" REEL QUANTITIES
		PLASTIC TAPE PACKAGING CODE "T"
3040	16 mm	500
3640	16 mm	500
4044	24 mm	300

Notes

(1) Vishay Vitramon uses embossed plastic carrier tape
(2) REFERENCE: EIA standard RS 481 - "Taping of Surface Mount Components for Automatic Placement"
(3) n/a = not available

STORAGE AND HANDLING CONDITIONS

(1) Store the components at 5 °C to + 40 °C ambient temperature and ≤ 70 % related humidity conditions.
(2) The product is recommended to be used within a time-frame of 2 years after shipment.
Check solderability in case extended shelf life beyond the expiry date is needed.

Precautions:

a. Do not store products in an environment containing corrosive elements, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. This may cause corrosion or oxidization of the terminations, which can easily lead to poor soldering.
b. Store products on the shelf and avoid exposure to moisture or dust.
c. Do not expose products to excessive shock, vibration, direct sunlight and so on.

RoHS COMPLIANCE UPDATE

The RoHS compliance of the parts in this datasheet is currently under review. For more information, please contact your local Vishay sales representative.

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