

# vPolyTan™ Polymer Surface Mount Chip Capacitors, Molded Case, Hi-Rel COTS



## PERFORMANCE / ELECTRICAL CHARACTERISTICS

**Operating Temperature:** -55 °C to +105 °C

**Capacitance Range:** 10 µF to 470 µF

**Capacitance Tolerance:** ± 20 %

**Voltage Rating:** 2.5 V<sub>DC</sub> to 50 V<sub>DC</sub>

## FEATURES

- Ultra low ESR
- High reliability processing including:
  - 100 % surge current tested
  - Accelerated voltage conditioning
  - Thermal shock
  - Statistical leakage screening at elevated temperature and voltage
- High ripple current capability
- Stable capacitance in operating temperature range
- Better capacitance stability vs. frequency
- No wear out effect
- Molded case 7343 EIA size
- Terminations: Ni / Pd / Au
- Compatible with “high volume” automatic pick and place equipment
- Moisture sensitivity level 3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



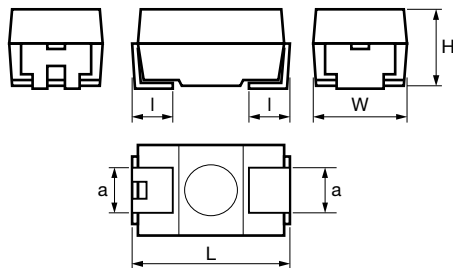
**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

## APPLICATIONS

- Decoupling, smoothing, filtering
- Switch mode and point of load power supply
- Infrastructure equipment
- Storage and networking

## ORDERING INFORMATION

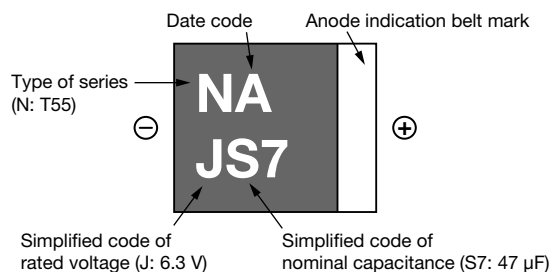
T56	D	107	M	010	C	S	A	025
TYPE	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING	TERMINATION / PACKAGING	RELIABILITY LEVEL	SURGE CURRENT LEVEL	ESR
	See Ratings and Case Codes table.	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	M = ± 20 %	2R5 = 2.5 V 004 = 4 V 6R3 = 6.3 V 010 = 10 V 12R = 12.5 V 016 = 16 V 020 = 20 V 025 = 25 V 035 = 35 V 050 = 50 V	C = lead (Pb)-free solderable coating, 7" reel	S = hi-rel standard (40 h burn-in) Z = non-ER	<b>A = 10 cycles at +25 °C</b> B = 10 cycles at -55 °C / +85 °C S = 3 cycles at +25 °C	Maximum 100 kHz ESR in mΩ

**DIMENSIONS** in inches [millimeters]


CASE CODE	EIA SIZE	L	W	H	I	a
D	7343-30	0.287 ± 0.008 [7.3 ± 0.2]	0.169 ± 0.012 [4.3 ± 0.3]	0.110 ± 0.008 [2.8 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.3]	0.094 ± 0.008 [2.4 ± 0.2]

**RATINGS AND CASE CODES**

μF	4.0 V	6.3 V	10 V	16 V	25 V	35 V	50 V
10							D
22						D	
33					D		
100			D	D	D		
150			D				
220	D	D	D				
330	D	D	D				

**MARKING**


VOLTAGE CODE		CAPACITANCE CODE	
V	CODE	CAP, μF	CODE
2.5	e	10	A7
4	G	15	E7
6.3	J	22	J7
10	A	33	N7
16	C	47	S7
20	D	68	W7
25	E	100	A8
35	V	150	E8
50	H	220	J8
		330	N8
		470	S8



DATE CODE												
YEAR	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
2018	N	P	Q	R	S	T	U	V	W	X	Y	Z
2019	a	b	c	d	e	f	g	h	j	k	l	m
2020	n	p	q	r	s	t	u	v	w	x	y	z
2021	A	B	C	D	E	F	G	H	J	K	L	M

**Note**

- Marking code repeats every four years in alphabetical order (letter of I, i, O, and o are excluded)

STANDARD RATINGS							
CAPACITANCE (μF)	CASE CODE	PART NUMBER	MAX. DCL AT 25 °C (μA)	MAX. DF AT 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (mΩ)	MAX. RIPPLE AT 45 °C 100 kHz I <sub>RMS</sub> (A)	HIGH TEMPERATURE LOAD, TIME (h)
4 V <sub>DC</sub> AT +105 °C							
220	D	T56D227M004C(1)(2)025	88.0	10	25	3.00	2000
330	D	T56D337M004C(1)(2)025	132.0	10	25	3.00	2000
6.3 V <sub>DC</sub> AT +105 °C							
220	D	T56D227M6R3C(1)(2)025	138.6	10	25	3.00	2000
330	D	T56D337M6R3C(1)(2)025	207.9	10	25	3.00	2000
10 V <sub>DC</sub> AT +105 °C							
100	D	T56D107M010C(1)(2)025	100.0	10	25	3.00	2000
150	D	T56D157M010C(1)(2)025	150.0	10	25	3.00	2000
220	D	T56D227M010C(1)(2)025	220.0	10	25	3.00	2000
330	D	T56D337M010C(1)(2)025	330.0	10	25	3.00	2000
16 V <sub>DC</sub> AT +105 °C							
100	D	T56D107M016C(1)(2)050	160.0	10	50	2.12	2000
25 V <sub>DC</sub> AT +105 °C							
33	D	T56D336M025C(1)(2)060	82.5	10	60	1.93	2000
100	D	T56D107M025C(1)(2)060	250.0	10	60	1.93	2000
35 V <sub>DC</sub> AT +105 °C							
22	D	T56D226M035C(1)(2)120	77.0	10	120	1.36	2000
50 V <sub>DC</sub> AT +105 °C							
10	D	T56D106M050C(1)(2)120	50.0	10	120	1.36	2000

**Note**

- Part number definitions:  
(1) Reliability level: Z, S  
(2) Surge current: A, B, S

RECOMMENDED VOLTAGE DERATING GUIDELINES	
CAPACITOR VOLTAGE RATING	OPERATING VOLTAGE
2.5	2.3
4.0	3.6
6.3	5.7
10	9.0
16	12.8
20	16
25	20
35	28
50	40

**POWER DISSIPATION**

CASE CODE	MAXIMUM PERMISSIBLE POWER DISSIPATION (W) AT $\leq +45^{\circ}\text{C}$ IN FREE AIR
D	0.225

**STANDARD PACKAGING QUANTITY**

CASE CODE	UNITS PER 7" REEL
D	500

**PERFORMANCE CHARACTERISTICS**

ITEM	CONDITION	POST TEST PERFORMANCE	
Life test at $+105^{\circ}\text{C}$	2000 h application of rated voltage at $105^{\circ}\text{C}$ , MIL-STD-202 method 108	Capacitance change	Within $\pm 20\%$ of initial value
		Dissipation factor	Within initial limits
		Leakage current	Shall not exceed 300 % of initial limit
Shelf life test at $+105^{\circ}\text{C}$	2000 h no voltage applied at $105^{\circ}\text{C}$ , MIL-STD-202 method 108	Capacitance change	Within $\pm 20\%$ of initial value
		Dissipation factor	Within initial limits
		Leakage current	Shall not exceed 300 % of initial limit
Humidity tests	At $60^{\circ}\text{C}$ / 90 % RH 500 h, no voltage applied	Capacitance change	$-20\%$ to $+50\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Shall not exceed 300 % of initial limit
Resistance to solder heat	MIL-STD-202, method 210, condition J (SnPb capacitors) and K (Pb-free capacitors)	Capacitance change	Within $\pm 20\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Shall not exceed 300 % of initial limit
Stability at low and high temperatures	$-55^{\circ}\text{C}$	Capacitance change	Within $-30\%$ to $0\%$ of initial value
		Dissipation factor	Shall not exceed 150 % of initial limit
		Leakage current	n/a
		Leakage current	n/a
	$25^{\circ}\text{C}$	Capacitance change	Within $\pm 20\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Within initial limit
		Leakage current	Within initial limit
	$85^{\circ}\text{C}$	Capacitance change	Within $-50\%$ to $+30\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Shall not exceed 1000 % of initial value
		Leakage current	Shall not exceed 1000 % of initial value
	$105^{\circ}\text{C}$	Capacitance change	Within $0\%$ to $+50\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Shall not exceed 1000 % of initial limit
		Leakage current	Shall not exceed 1000 % of initial limit
Surge voltage	$105^{\circ}\text{C}$ , 1000 successive test cycles at 1.3 of rated voltage in series with a $33\ \Omega$ resistor at the rate of 30 s ON, 30 s OFF	Capacitance change	Within $\pm 20\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Shall not exceed 300 % of initial limit
Shock (specified pulse)	MIL-STD-202, method 213, condition I, 100 g peak	Capacitance change	Within $\pm 20\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Shall not exceed 300 % of initial limit
Vibration	MIL-STD-202, method 204, condition D, 10 Hz to 2000 Hz 20 g peak	There shall be no mechanical or visual damage to capacitors post-conditioning.	
		Capacitance change	Within $\pm 20\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Shall not exceed 300 % of initial limit
Shear test	Apply a pressure load of 5 N for $10\text{ s} \pm 1\text{ s}$ horizontally to the center of capacitor side body	There shall be no mechanical or visual damage to capacitors post-conditioning.	
		Capacitance change	Within $\pm 20\%$ of initial value
		Dissipation factor	Within initial limit
		Leakage current	Shall not exceed 300 % of initial limit
		Leakage current	Shall not exceed 300 % of initial limit

**PRODUCT INFORMATION**

Polymer Guide	<a href="http://www.vishay.com/doc?40076">www.vishay.com/doc?40076</a>
Moisture Sensitivity	<a href="http://www.vishay.com/doc?40135">www.vishay.com/doc?40135</a>
Infographic	<a href="http://www.vishay.com/doc?48084">www.vishay.com/doc?48084</a>
Sample Board	<a href="http://www.vishay.com/doc?48073">www.vishay.com/doc?48073</a>
<b>FAQ</b>	
Frequently Asked Questions	<a href="http://www.vishay.com/doc?42106">www.vishay.com/doc?42106</a>



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