

## TANTAMOUNT® Low ESR, Hi-Rel COTS, Built-In Fuse Conformal Coated



### FEATURES

- High reliability; Weibull failure rate grading available
- Surge current testing per MIL-PRF-55365 options available
- Ultra-low ESR
- Terminations: SnPb, standard. 100 % Tin available
- Circuit protection for mission or safety critical systems
- Fuse characteristics: Guaranteed fuse protection at 9 A, 100 ms


**RoHS\***  
COMPLIANT

### PERFORMANCE CHARACTERISTICS

**Operating Temperature:** - 55 °C to + 85 °C

(To + 125 °C with voltage derating)

**Capacitance Range:** 15 µF to 1500 µF

**Capacitance Tolerance:** ± 10 %, ± 20 % standard

**Voltage Rating:** 4 WVDC to 63 WVDC

ORDERING INFORMATION							
T98	R	227	K	020	E	S	A
TYPE	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	TERMINATION/ PACKAGING (Available options are series dependent)	RELIABILITY LEVEL	SURGE CURRENT
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.	K = ± 10 % M = ± 20 %	This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating. A decimal point is indicated by an "R" (6R3 = 6.3 V).	E = Sn/Pb Solder/7" (178 mm) reel L = Sn/Pb Solder/7" (178 mm), 1/2 reel C = 100 % Tin/7" (178 mm), reel H = 100 % Tin/7" (178 mm), 1/2 reel	A = 1.0 % Weibull B = 0.1 % Weibull <sup>(1)</sup> S = 40 h Burn-in Z = Non-Established Reliability	A = 10 Cycles at + 25 °C B = 10 Cycles at - 55 °C/+ 85 °C S = 3 Cycles at 25 °C	

**Note:** <sup>(1)</sup> Available on select ratings. See ratings table on page 7

DIMENSIONS in inches [millimeters]							
CASE CODE	L (MAX.)	W	H	A	B	D (REF.)	J (MAX.)
E	0.287 ± 0.012 [7.3 ± 0.3]	0.173 ± 0.016 [4.4 ± 0.4]	0.157 ± 0.016 [4.0 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.253 [6.4]	0.004 [0.1]
F	0.287 ± 0.012 [7.3 ± 0.3]	0.238 ± 0.016 [6.0 ± 0.4]	0.187 ± 0.016 [4.7 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.243 [6.2]	0.004 [0.1]
R	0.287 ± 0.012 [7.3 ± 0.3]	0.238 + 0.016/- 0.024 [6.0 + 0.4/- 0.6]	0.142 ± 0.016 [3.6 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.243 [6.2]	0.004 [0.1]
V	0.287 ± 0.012 [7.3 ± 0.3]	0.173 ± 0.016 [4.4 ± 0.4]	0.079 [2.0] Max.	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.253 [6.4]	0.004 [0.1]
Z	0.287 ± 0.012 [7.3 ± 0.3]	0.238 ± 0.016 [6.0 ± 0.4]	0.238 ± 0.016 [6.0 ± 0.4]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.243 [6.2]	0.004 [0.1]

**Note:** The anode termination (D less B) will be a minimum of 0.012" [0.3 mm]

\* Pb containing terminations are not RoHS compliant, exemptions may apply



RATINGS AND CASE CODE										
µF	4 V	6.3 V	10 V	16 V	20 V	25 V	35 V	50 V	63 V	75 V
10										
15								E/R		
22								R	F	
33								F		
47							R	Z		
68						R				
100										
150						F				
220				E	R					
330		V	E		F					
470	V	E	E							
680	E	E	R							
1000	E/R	R								
1500	R									
2200										

**Note:**

- All ratings are preliminary, contact marketing for availability

STANDARD RATINGS						
CAPACITANCE (µF)	CASE CODE	PART NUMBER*	MAX. DCL at + 25 °C (µA)	MAX. DF at + 25 °C 120 Hz (%)	(PRELIMINARY) MAX. ESR at + 25 °C 100 kHz (mΩ)	MAX. RIPPLE 100 kHz I <sub>RMS</sub> (A)
<b>4 WVDC at + 85 °C, SURGE = 5.2 V . . . 2.7 WVDC at + 125 °C, SURGE = 3.4 V</b>						
470	V	T98V477(1)004(2)(3)(4)	19	8	60	2.2
680	E	T98E687(1)004(2)(3)(4)	27	6	55	2.9
1000	E	T98E108(1)004(2)(3)(4)	40	8	50	3.3
1000	R	T98R108(1)004(2)(3)(4)	40	8	48	3.7
1500	R	T98R158(1)004(2)(3)(4)	60	8	45	4.1
<b>6.3 WVDC at + 85 °C, SURGE = 8 V . . . 4 WVDC at + 125 °C, SURGE = 5 V</b>						
330	V	T98V337(1)6R3(2)(3)(4)	21	8	65	2.0
470	E	T98E477(1)6R3(2)(3)(4)	30	6	60	2.7
680	E	T98E687(1)6R3(2)(3)(4)	43	6	55	2.9
1000	R	T98R108(1)6R3(2)(3)(4)	63	8	50	3.5
<b>10 WVDC at + 85 °C, SURGE = 13 V . . . 7 WVDC at + 125 °C, SURGE = 8 V</b>						
330	E	T98E337(1)010(2)(3)(4)	33	6	65	2.5
470	E	T98E477(1)010(2)(3)(4)	47	6	58	2.8
680	R	T98R687(1)010(2)(3)(4)	68	6	58	2.9
<b>16 WVDC at + 85 °C, SURGE = 20 V . . . 10 WVDC at + 125 °C, SURGE = 12 V</b>						
220	E	T98E227(1)016(2)(3)(4)	35	8	70	2.3

**Notes:**

- All ratings are preliminary, contact marketing for availability

\* Contact factory for availability

(1) Capacitance Tolerance: K, M

(2) Termination and Packaging: C, E, H, L

(3) Reliability Level: A, B, S, Z

(4) Surge Current: A, B, S



<b>STANDARD RATINGS</b>						
<b>CAPACITANCE (<math>\mu</math>F)</b>	<b>CASE CODE</b>	<b>PART NUMBER*</b>	<b>MAX. DCL at + 25 °C (<math>\mu</math>A)</b>	<b>MAX. DF at + 25 °C 120 Hz (%)</b>	<b>(PRELIMINARY) MAX. ESR at + 25 °C 100 kHz (m<math>\Omega</math>)</b>	<b>MAX. RIPPLE 100 kHz I<sub>RMS</sub> (A)</b>
<b>20 WVDC at + 85 °C, SURGE = 26 V . . . 13 WVDC at + 125 °C, SURGE = 16 V</b>						
220	R	T98R227(1)020(2)(3)(4)	44	8	110	1.8
330	F	T98F337(1)020(2)(3)(4)*	66	10	130	1.4
<b>25 WVDC at + 85 °C, SURGE = 32 V . . . 17 WVDC at + 125 °C, SURGE = 20 V</b>						
68	R	T98R686(1)025(2)(3)(4)	17	6	130	1.6
150	F	T98F157(1)025(2)(3)(4)	38	8	110	1.8
<b>35 WVDC at + 85 °C, SURGE = 46 V . . . 23 WVDC at + 125 °C, SURGE = 28 V</b>						
47	R	T98R476(1)035(2)(3)(4)	17	6	110	1.8
<b>50 WVDC at + 85 °C, SURGE = 65 V . . . 33 WVDC at + 125 °C, SURGE = 38 V</b>						
15	E	T98E156(1)050(2)(3)(4)	8	6	330	0.8
15	R	T98R156(1)050(2)(3)(4)	8	6	280	1.0
22	R	T98R226(1)050(2)(3)(4)	11	6	200	0.8
33	F	T98F336(1)050(2)(3)(4)	17	6	180	0.8
47	Z	T98Z476(1)050(2)(3)(4)*	24	6	175	1.1
<b>63 WVDC at + 85 °C, SURGE = 81 V . . . 42 WVDC at + 125 °C, SURGE = 54 V</b>						
22	F	T98F226(1)063(2)(3)(4)*	14	6	230	0.9

**Notes:**

- All ratings are preliminary, contact marketing for availability

- \* Contact factory for availability

- (1) Capacitance Tolerance: K, M

- (2) Termination and Packaging: C, E, H, L

- (3) Reliability Level: A, B, S, Z

- (4) Surge Current: A, B, S



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