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 critcal systems
- Fuse characteristics: Guaranteed fuse protection at 9 A, 100 ms

Pb-free Available

RoHS* COMPLIANT

PERFORMANCE CHARACTERISTICS

Operating Temperature: - 55 °C to + 85 °C
(To + 125 °C with voltage derating)
Capacitance Range: 15 µF to 1500 µF

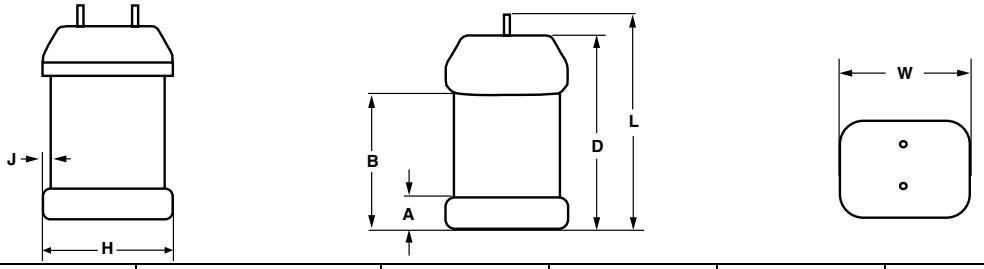
Capacitance Tolerance: ± 10 %, ± 20 % standard
Voltage Rating: 4 WVDC to 63 WVDC

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 (1) 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: (1) 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_{RMS} (A)
4 WVDC at + 85 °C, SURGE = 5.2 V . . . 2.7 WVDC at + 125 °C, SURGE = 3.4 V						
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
6.3 WVDC at + 85 °C, SURGE = 8 V . . . 4 WVDC at + 125 °C, SURGE = 5 V						
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
10 WVDC at + 85 °C, SURGE = 13 V . . . 7 WVDC at + 125 °C, SURGE = 8 V						
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
16 WVDC at + 85 °C, SURGE = 20 V . . . 10 WVDC at + 125 °C, SURGE = 12 V						
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

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_{RMS} (A)
20 WVDC at + 85 °C, SURGE = 26 V . . . 13 WVDC at + 125 °C, SURGE = 16 V						
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
25 WVDC at + 85 °C, SURGE = 32 V . . . 17 WVDC at + 125 °C, SURGE = 20 V						
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
35 WVDC at + 85 °C, SURGE = 46 V . . . 23 WVDC at + 125 °C, SURGE = 28 V						
47	R	T98R476(1)035(2)(3)(4)	17	6	110	1.8
50 WVDC at + 85 °C, SURGE = 65 V . . . 33 WVDC at + 125 °C, SURGE = 38 V						
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
63 WVDC at + 85 °C, SURGE = 81 V . . . 42 WVDC at + 125 °C, SURGE = 54 V						
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

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.