

Wet Tantalum Capacitors, High Energy, Ultra High Capacitance, Robust Mechanical Performance



FEATURES

- High energy, very high capacitance design
- All tantalum, hermetically sealed case
- Utilizes Vishay proven SuperTan® technology
- 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

LINKS TO ADDITIONAL RESOURCES



PERFORMANCE CHARACTERISTICS

Operating Temperature:

-55 °C to +85 °C (to +125 °C with voltage derating)

Capacitance Tolerance:

at 120 Hz, +25 °C ± 20 % standard
± 10 % available as special

Contact marketing for availability of 10 % tolerance

APPLICATIONS

- Industrial
- Avionics / military / space
- Ideal for capacitor banks

DC Leakage Current (DCL Max.):

at +25 °C: leakage current shall not exceed the values listed in the Standard Ratings tables.

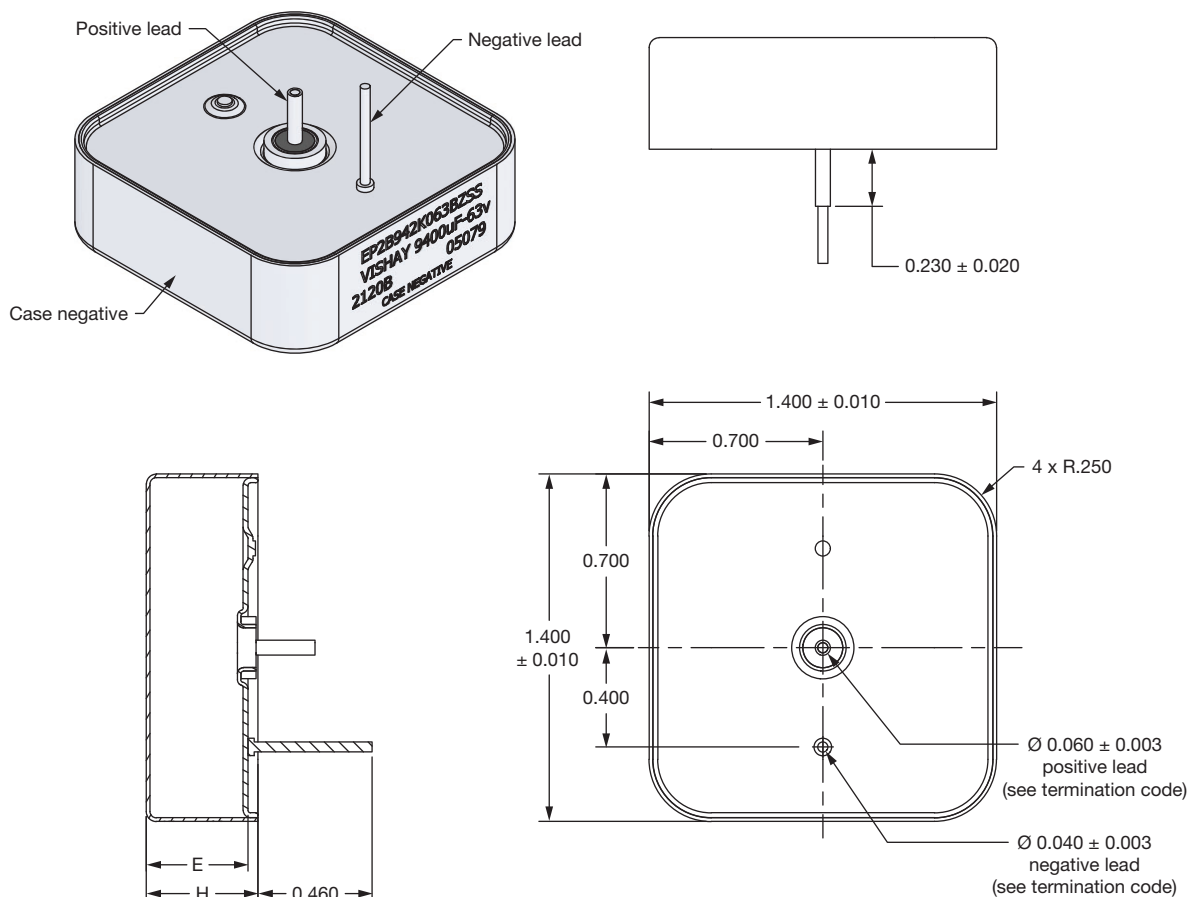
Life Test:

capacitors are capable of withstanding a 2000 h life test at a temperature of +85 °C at the applicable rated DC working voltage.

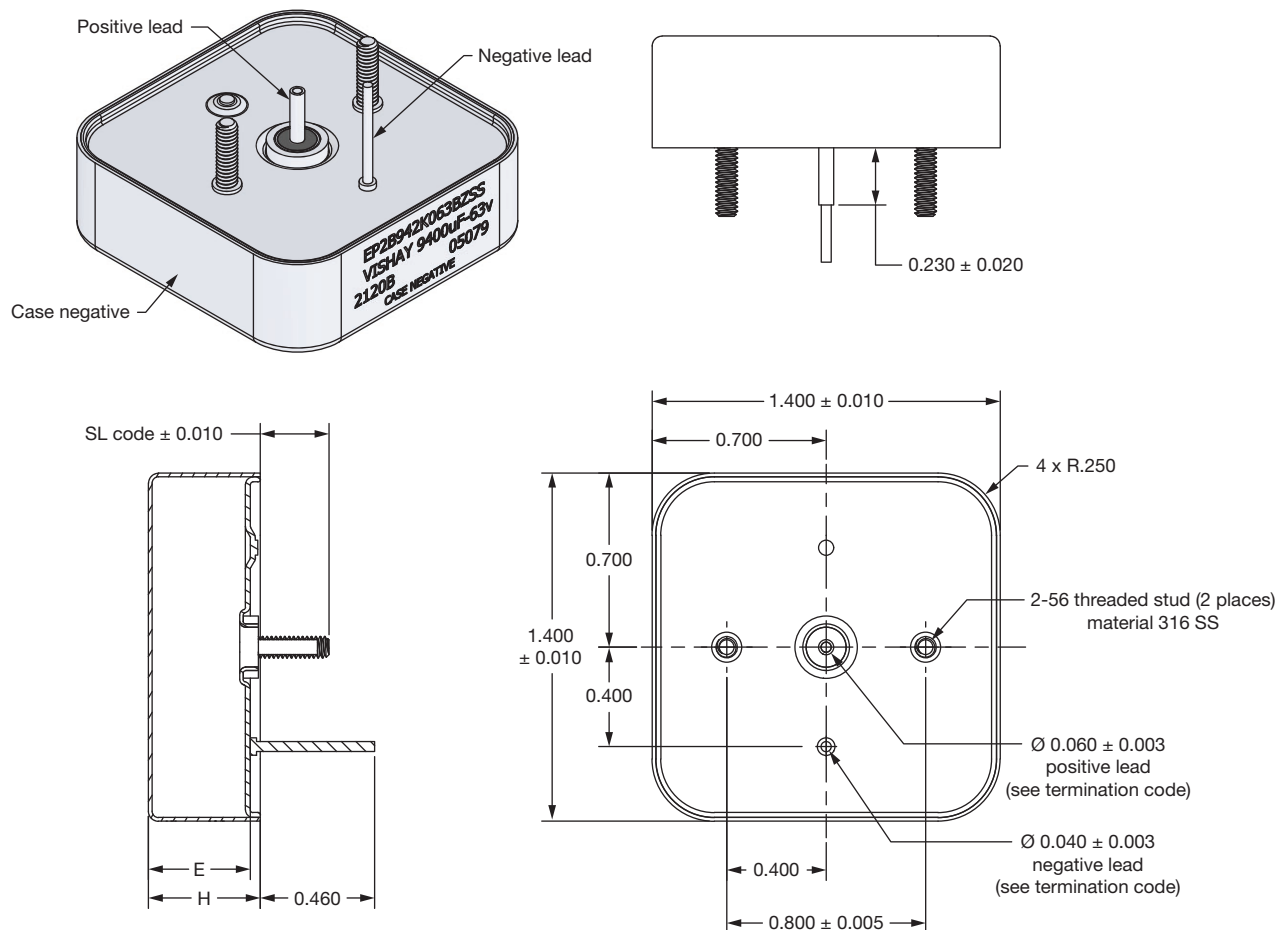
ORDERING INFORMATION								
EP2	C	543	K	025	B	Z	S	
TYPE	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT +85 °C	TERMINATION CODE	RELIABILITY LEVEL	ESR	MOUNTING STUD LENGTH
	See Dimensions sheets	This is expressed in microfarads. The first two digits are the significant figures. The third is the number of zeros to follow.	K = 10 % ⁽¹⁾ M = 20 %	This is expressed in V. To complete the three-digit block, zeros precede the voltage rating. A decimal point is indicated by an "R" (6R3 = 6.3 V)	See termination / mounting options in the Dimensions sheets.	Z = non-ER	S = standard	Blank = not applicable A = 0.21" B = 0.27" C = 0.40" D = 0.15" E = 0.18" F = 0.35"

Note

⁽¹⁾ Contact marketing for availability of 10 % tolerance

DIMENSIONS - RADIAL TERMINATION in inches


CASE SIZE	H	E (REF.)	TERMINATION CODE	TERMINATION / MOUNTING OPTION
B	0.45 ± 0.015	0.41	A	100 % tin (RoHS-compliant) radial
C	0.6 ± 0.015	0.56	B	Tin / lead radial

DIMENSIONS - RADIAL TERMINATION WITH STUDS in inches


CASE SIZE	H	E (REF.)	TERMINATION CODE	TERMINATION / MOUNTING OPTION
B	0.45 ± 0.015	0.41	C	100 % tin (RoHS-compliant) radial
C	0.6 ± 0.015	0.56	D	Tin / lead radial



STANDARD RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. ESR AT +25 °C, 1 kHz (Ω)	MAX. DCL AT +25 °C (μ A)	MAX. DCL AT +85 °C (mA)	WEIGHT (g)
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C, SURGE VOLTAGE = 27.5 V_{DC}						
48 000	B ⁽¹⁾	EP2B483(1)025(2)(3)(4)	0.02	250	2	80
72 000	C ⁽¹⁾	EP2C723(1)025(2)(3)(4)	0.015	350	2.5	108
35 V_{DC} AT +85 °C; 21 V_{DC} AT +125 °C, SURGE VOLTAGE = 38.5 V_{DC}						
32 000	B ⁽¹⁾	EP2B323(1)035(2)(3)(4)	0.022	250	2	82
36 000	B ⁽²⁾	EP2B363(1)035(2)(3)(4)	0.022	250	2	88
47 000	C ⁽¹⁾	EP2C473(1)035(2)(3)(4)	0.017	350	2.5	110
48 000	C ⁽²⁾	EP2C483(1)035(2)(3)(4)	0.017	350	2.5	110
58 000	C ⁽²⁾	EP2C583(1)035(2)(3)(4)	0.017	350	3	118
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C, SURGE VOLTAGE = 55 V_{DC}						
17 000	B ⁽¹⁾	EP2B173(1)050(2)(3)(4)	0.027	100	1.5	80
22 000	B ⁽²⁾	EP2B223(1)050(2)(3)(4)	0.027	150	1.5	88
24 000	B ⁽²⁾	EP2B243(1)050(2)(3)(4)	0.027	150	1.5	92
23 000	C ⁽¹⁾	EP2C233(1)050(2)(3)(4)	0.018	200	2.5	105
33 000	C ⁽²⁾	EP2C333(1)050(2)(3)(4)	0.018	200	2	122
34 000	C ⁽²⁾	EP2C343(1)050(2)(3)(4)	0.018	200	2.5	122
63 V_{DC} AT +85 °C; 38 V_{DC} AT +125 °C, SURGE VOLTAGE = 69 V_{DC}						
9400	B	EP2B942(1)063(2)(3)(4)	0.025	150	1.5	86
12 000	B ⁽²⁾	EP2B123(1)063(2)(3)(4)	0.025	150	1.5	92
14 000	C	EP2C143(1)063(2)(3)(4)	0.017	200	2	115
19 000	C ⁽²⁾	EP2C193(1)063(2)(3)(4)	0.017	250	2.5	122
80 V_{DC} AT +85 °C; 48 V_{DC} AT +125 °C, SURGE VOLTAGE = 88 V_{DC}						
6000	B ⁽¹⁾	EP2B602(1)080(2)(3)(4)	0.03	150	1.5	86
8000	B ⁽²⁾	EP2B802(1)080(2)(3)(4)	0.03	150	1.5	92
9000	C ⁽¹⁾	EP2C902(1)080(2)(3)(4)	0.025	200	2	115
12 000	C ⁽²⁾	EP2C123(1)080(2)(3)(4)	0.025	250	2.5	122
100 V_{DC} AT +85 °C; 60 V_{DC} AT +125 °C, SURGE VOLTAGE = 110 V_{DC}						
4200	B ⁽¹⁾	EP2B422(1)100(2)(3)(4)	0.035	100	1.5	80
4400	B ⁽²⁾	EP2B442(1)100(2)(3)(4)	0.035	150	1.5	80
5800	B ⁽²⁾	EP2B582(1)100(2)(3)(4)	0.035	150	1.5	90
5600	C ⁽¹⁾	EP2C562(1)100(2)(3)(4)	0.025	150	2.5	105
6600	C ⁽²⁾	EP2C662(1)100(2)(3)(4)	0.025	200	2	115
7900	C ⁽²⁾	EP2C792(1)100(2)(3)(4)	0.025	250	2.5	120
110 V_{DC} AT +85 °C; 66 V_{DC} AT +125 °C, SURGE VOLTAGE = 121 V_{DC}						
4000	B ⁽²⁾	EP2B402(1)110(2)(3)(4)	0.05	150	1.5	95
6000	C ⁽²⁾	EP2B602(1)110(2)(3)(4)	0.035	200	2	125
125 V_{DC} AT +85 °C; 75 V_{DC} AT +125 °C, SURGE VOLTAGE = 137.5 V_{DC}						
2700	B ⁽¹⁾	EP2B272(1)125(2)(3)(4)	0.05	150	1.5	80
3000	B ⁽²⁾	EP2B302(1)125(2)(3)(4)	0.05	150	1.5	85
3600	B ⁽²⁾	EP2B362(1)125(2)(3)(4)	0.05	150	1.5	90
3600	C ⁽¹⁾	EP2C362(1)125(2)(3)(4)	0.035	250	2.5	105
4500	C ⁽²⁾	EP2C452(1)125(2)(3)(4)	0.035	200	2	115
5300	C ⁽²⁾	EP2C532(1)125(2)(3)(4)	0.035	250	2.5	122

Notes

- Part number definitions:
 - Standard capacitance tolerance is 20 % or "M". Contact marketing for availability of 10 % or "K"
 - Standard termination is "B" (tin / lead) or "D" (tin / lead with mounting lugs).
RoHS-compliant is "A" (100 % tin) or "C" (100 % tin with mounting lugs)
 - Standard reliability is "Z" or non-established reliability
 - Standard ESR is "S"
- Preliminary rating, specification subject to change. Contact marketing for availability
- Requires export license for shipments outside the US. Contact marketing for availability

**PERFORMANCE CHARACTERISTICS OF HIGH ENERGY CAPACITORS**

ELECTRICAL PERFORMANCE CHARACTERISTICS	
ITEM	PERFORMANCE CHARACTERISTICS
Operating temperature range	Per MIL-PRF-39006. -55 °C to +85 °C or +125 °C with voltage derating (see Standard Ratings table)
Storage temperature range	Per MIL-PRF-39006. -62 °C to +130 °C
Capacitor tolerance	± 20 % ± 10 % at 120 Hz
ESR	Limits per Standard Ratings table
DC leakage current (DCL max.)	At 25 °C the leakage current shall not exceed values listed in the Standard Rating table.
Reverse voltage	There shall be no continuous reverse voltage. Transient reverse voltage surges are acceptable under the following conditions: a) The peak reverse voltage is equal to or less than 1.0 V and the product of the peak current times the duration of the reverse transient is 0.05 A or less b) The repetition rate of the reverse voltage surges is less than 10 Hz
Surge voltage	The test shall be at 1000 cycles at 110 % of rated voltage at 85 °C. A cycle consists of a 30 s charge and a 330 s discharge through 1000 Ω resistor.
Life test	2000 h at +85 °C

ENVIRONMENTAL CHARACTERISTICS		
ITEM	TEST AND CONDITIONS	COMMENTS
Hermeticity	MIL-STD-202, method 112 C/IIIa	The capacitor shall be hermetically sealed such that the case does not leak electrolyte or vent any gas when exposed to a vacuum.
Moisture resistance	MIL-STD-202, method 106	6 V polarity
Altitude	MIL-STD-202, method 105 C, test condition D	100 000 feet test
Fungus	MIL-PRF-39006	The capacitor materials shall not support fungus growth and shall not be a nutrient to fungus.

MECHANICAL PERFORMANCE CHARACTERISTICS		
ITEM	TEST AND CONDITIONS	COMMENTS
Thermal shock	MIL-STD-202, method 107 G	Test condition A
Shock	MIL-STD-202, method 213 B test condition G	11 ms, 50 g
Vibration - high frequency	MIL-STD-202, method 204 D test condition D	12 sweeps/axis, 20 g peak
Vibration - random	MIL-STD-202, method 214 A test condition II, letter E	1.5 h/axis, 19.64 g
Resistance to solder heat	MIL-STD-202, method 210 F, test conditions A and B	
Solderability	MIL-STD-202, method 208	
Terminal strength	MIL-STD-202, method 211 A	The capacitor terminals must withstand a 5 pound pull test for 5 s to 10 s. The capacitor must not be visibly damaged and the electrical characteristics must not be affected.
Part markings	MIL-STD-202, method 215 J	The capacitor shall be permanently and legibly marked on the circumference of the case. The markings shall be resistant to solvents.
Weight (mass)		See Standard Ratings table
Seal	MIL-PRF-39006	
MSL	J-STD-033	Not applicable
Packaging	MIL-PRF-39006	All units are shipped in individual bulk packages.
Stud mounting		Tighten nuts only ½ to ¾ turn beyond point of initial contact, equivalent to 24 to 28 maximum inch-ounces torque. Maximum pre-load tension ~ 15 pounds. Lock washers are not recommended; use an adhesive lock nut conforming to MIL-S-22473E, grade A - red



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