Wet Tantalum Capacitors
Tantalum-Case with Glass-to-Tantalum Hermetic Seal for - 55 °C to + 125 °C Operation

FEATURES

Pb-free Available

RoHS* COMPLIANT

Vishay HE3 represents a major breakthrough in wet tantalum capacitor technology for high-energy applications. The unique case design provides for the highest capacitance per unit volume. The HE3 also utilizes the proven hybrid technology of our SuperTan® product.

The HE3 is housed in an all tantalum, hermetically sealed case, and is manufactured to withstand high stress and hazardous environments. The design provides a unique double seal for improved reliability and performance.

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

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 1000 h life test at a temperature of + 85 °C at the applicable rated DC working voltage.

ORDERING INFORMATION

HE3	C	543	K	025	B	Z	S	S
TYPE	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	TERMINATION AND PACKAGING	RELIABILITY LEVEL	TEMPERATURE	ESR
	See Ratings and Case Code Table	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)	A = 100 % Tin (RoHS compliant) B = Tin/lead and bulk	Z = Non-ER	S = Standard (- 55 °C to + 85 °C)	S = Standard

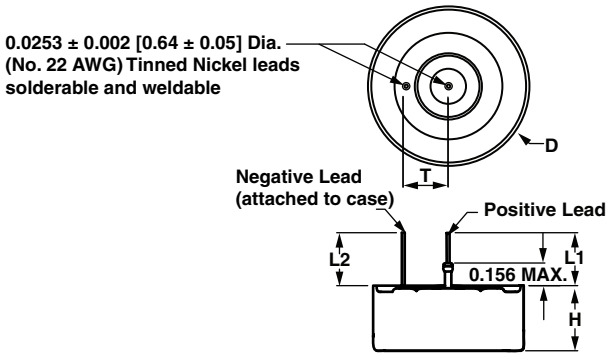
Note
(1) Contact marketing for availability of 10 % tolerance

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

For technical questions, contact: wettants@vishay.com

Wet Tantalum Capacitors
Tantalum-Case with Glass-to-Tantalum Hermetic Seal
for - 55 °C to + 125 °C Operation

DIMENSIONS in inches [millimeters]



CASE CODE / TYPE HE3	D	HEIGHT	L2 (Min.)	L1 (Min.)	T	WEIGHT (g) (Typical)
A	1.400 ± 0.005	0.350 ± 0.015	0.500	0.500	0.40 ± 0.015	48.0
B	1.400 ± 0.005	0.488 ± 0.015	0.500	0.500	0.40 ± 0.015	73.0
C	1.400 ± 0.005 [35.56 ± 0.127]	0.615 ± 0.015 [15.6 ± 0.4]	0.500 [12.70]	0.500 [12.70]	0.40 ± 0.015 [10.2 ± 0.38]	95.0

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER*	MAX. ESR AT + 25 °C, 1 kHz (Ω)	MAX. DCL AT + 25 °C
25 WVDC AT + 85 °C ... 15 WVDC AT + 125 °C				
18 000	A	HE3A183(1)025(2)(3)(4)(5)	0.060	150 µA
24 000	***A***	***HE3A243(1)025(2)(3)(4)(5)***	***0.060***	***150 µA***
36 000	***B***	***HE3B363(1)025(2)(3)(4)(5)***	***0.045***	***200 µA***
48 000	***B***	***HE3B483(1)025(2)(3)(4)(5)***	***0.045***	***200 µA***
54 000	C	HE3C543(1)025(2)(3)(4)(5)	0.035	300 µA
72 000	C	HE3C723(1)025(2)(3)(4)(5)	0.035	350 µA
50 WVDC AT + 85 °C ... 30 WVDC AT + 125 °C				
8000	A	HE3A802(1)050(2)(3)(4)(5)	0.060	170 µA
16 000	B	HE3B163(1)050(2)(3)(4)(5)	0.045	270 µA
24 000	C	HE3C243(1)050(2)(3)(4)(5)	0.035	400 µA
63 WVDC AT + 85 °C ... 40 WVDC AT + 125 °C				
4000	A	HE3A402(1)063(2)(3)(4)(5)	0.060	170 µA
8000	B	HE3B802(1)063(2)(3)(4)(5)	0.045	270 µA
12 000	C	HE3C123(1)063(2)(3)(4)(5)	0.035	400 µA
80 WVDC AT + 85 °C ... 50 WVDC AT + 125 °C				
2800	***A***	***HE3A282(1)080(2)(3)(4)(5)***	***0.075***	***300 µA***
5500	***B***	***HE3B552(1)080(2)(3)(4)(5)***	***0.060***	***400 µA***
8200	C	HE3C822(1)080(2)(3)(4)(5)	0.040	500 µA
100 WVDC AT + 85 °C ... 65 WVDC AT + 125 °C				
1900	***A***	***HE3A192(1)100(2)(3)(4)(5)***	***0.075***	***300 µA***
3800	***B***	***HE3B382(1)100(2)(3)(4)(5)***	***0.060***	***400 µA***
5700	***C***	***HE3C572(1)100(2)(3)(4)(5)***	***0.050***	***500 µA***
125 WVDC AT + 85 °C ... 85 WVDC AT + 125 °C				
1100	***A***	***HE3A112(1)125(2)(3)(4)(5)***	***0.100***	***300 µA***
2200	***B***	***HE3B222(1)125(2)(3)(4)(5)***	***0.085***	***400 µA***
3300	***C***	***HE3C332(1)125(2)(3)(4)(5)***	***0.075***	***500 µA***

Notes

* (1) Standard capacitance tolerance is 20 % or "M". Contact Marketing for availability of 10 % or "K".
(2) Standard termination is "B" or tin/lead. RoHS compliant or 100 % tin is available as "A".
(3) Standard reliability is "Z" or non-established reliability.
(4) Standard temperature range is "S" or - 55 °C to + 125 °C.
(5) Standard ESR is "S".

***** In bold and italic: Preliminary rating and electrical values. Contact Marketing for availability.***

Wet Tantalum Capacitors
Tantalum-Case with Glass-to-Tantalum Hermetic Seal
for - 55 °C to + 125 °C Operation

PERFORMANCE CHARACTERISTICS OF HIGH ENERGY CAPACITORS

ELECTRICAL PERFORMANCE CHARACTERISTICS	
ITEM	**PERFORMANCE CHARACTERISTICS**
Operating Temperature Range	- 55 °C to + 85 °C (to + 125 °C with voltage derating)
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	No continuous reverse voltage permitted
Surge Voltage	The test shall be at 1000 cycles at 110 % of rated voltage at 85 °C. A cycle consists of a one and one half (1.5) min charge and a four and one half (4.5) min discharge through 100 Ω resistor.
Life Test at + 85 °C	1000 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	
Altitude	MIL-STD-202, Method 105 C, Test Condition D	100 000 feet test

MECHANICAL PERFORMANCE CHARACTERISTICS		
ITEM	**TEST and CONDITIONS**	**COMMENTS**
Thermal Shock	MIL-STD-202, Method 107 G	
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 I, Letter D	1.5 h/axis, 12 g
Resistance to solder Heat	MIL-STD-202, Method 210 F	The capacitor must withstand solder dipping of the terminals at 260 °C for 10 s. The capacitor must not be visibly damaged and the electrical characteristics must not be affected.
Solderability	ANSI J-STD-002	
Terminal Strength	MIL-STD-202, Method 211 A	The capacitor terminals must withstand a 5 pound pull test for 5 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 dimensions table, page 2

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.