



## Wet Tantalum Capacitors Surface Mount, Molded Case



### 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 %

**DC Leakage Current (DCL Max.):** at +25 °C and above:  
Leakage current shall not exceed the values listed in the  
Standard Ratings table.

**Life Test:** capacitors are capable of withstanding a 2000 h  
life test at a temperature of +85 °C or +125 °C at the  
applicable rated DC working voltage.

Following life test:

1. DCL, measured at +85 °C rated voltage, shall not be in excess of the original requirement.
2. The equivalent series resistance shall not exceed 150 % of the initial requirement.
3. Change in capacitance shall not exceed 10 % from the initial measurement.

### FEATURES

- Terminations: standard tin/lead (SnPb), 100 % tin (RoHS compliant) terminations available
- Very high capacitance, 10 µF to 470 µF  
6 V to 125 V, -55 °C to +125 °C
- Very low ESR
- High ripple current capability
- Low DCL
- Model M34 wet tantalum electrolytic chip capacitors incorporate the advantages of all the varieties of electrolytic capacitors and eliminate most of the disadvantages. These units have a transient reverse voltage capability and a higher ripple current capability than any other electrolytic type with similar combinations of capacitance and case size
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
Available

### 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

### APPLICATION NOTES

- a) No continuous reverse voltage permissible.
- b) Transient reverse voltage surges are acceptable under the following conditions:  
The peak reverse voltage does not exceed 1.5 V and the peak current times the duration of the reverse transient does not exceed 0.05 A. In addition, the repetition frequency of the reverse voltage surge is less than 10 Hz.
- c) The peak of the applied AC ripple and the applied DC voltage must not exceed the DC voltage rating of the capacitor.

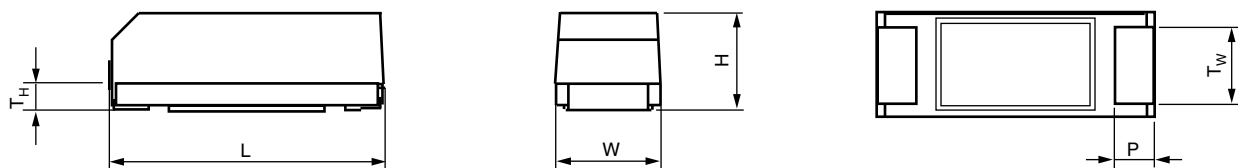
ORDERING INFORMATION								
M34	C	826	M	125	B	Z	S	S
MODEL	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT +85 °C	TERMINATION AND PACKAGING	RELIABILITY LEVEL	TEMP.	ESR
	See Ratings and Case Codes table	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	K = ± 10 % M = ± 20 %	This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating.	A = 100 % tin (RoHS compliant), bulk B = std, tin / lead, bulk	Z = non-ER	S = std.	S = std.

### Note

- Packaging: The use of formed plastic tubes for packing bulk components is standard

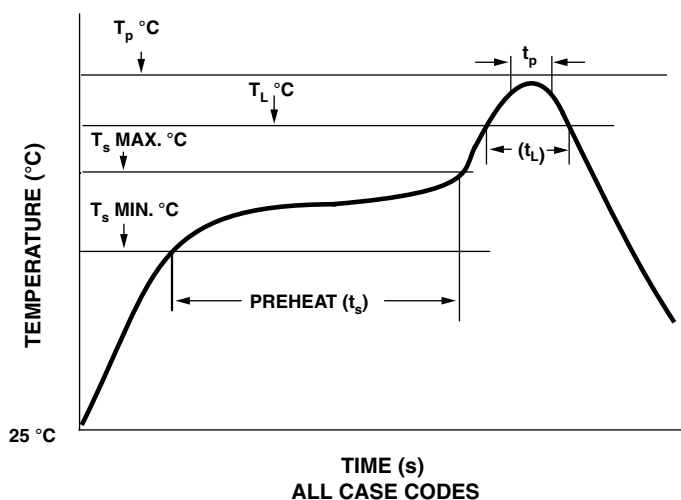


**DIMENSIONS** in inches [millimeters]



CASE CODE	L (MAX.)	W	H	P (MIN.)	Tw	Th (MIN.)
C	0.835 [21.2]	0.315 ± 0.012 [8 ± 0.3]	0.295 ± 0.012 [7.5 ± 0.3]	0.118 [3.0]	0.236 ± 0.012 [6.0 ± 0.3]	0.075 [1.9]

**RECOMMENDED REFLOW PROFILES**



T <sub>p</sub>	T <sub>p</sub>	t <sub>p</sub>	T <sub>L</sub>	T <sub>L</sub>	T <sub>s</sub> MIN.	T <sub>s</sub> MIN.	T <sub>s</sub> MAX.	T <sub>s</sub> MAX.	t <sub>s</sub>	t <sub>s</sub>	t <sub>L</sub>
Lead (Pb)-free	Sn/Pb		Lead (Pb)-free	Sn/Pb	Lead (Pb)-free	Sn/Pb	Lead (Pb)-free	Sn/Pb	Lead (Pb)-free	Sn/Pb	
245 °C	220 °C	10	217 °C	183 °C	150 °C	100 °C	200 °C	150 °C	60 to 150	60 to 90	60

**MOUNTING**

Due to the size and weight of these capacitors, we recommend that a supplemental mounting restraint to be used in printed circuit board attachment in addition to the reflowed solder.

One recommendation is to use an adhesive such as defined in the J-STD-001DS.

This is the Space Application Electronic Hardware Addendum to J-STD-001 (Requirements for Solder Electrical and Electronic Assemblies).



STANDARD RATINGS											
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER	MAX. ESR	MAX. ESR	MAX. DCL ( $\mu$ A) AT		MAX. CAPACITANCE CHANGE (%) AT			MAX. RIPPLE 40 kHz RMS (mA)	
			AT +25 °C 120 Hz ( $\Omega$ )	AT -55 °C 120 Hz ( $\Omega$ )	+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C		
<b>6 V<sub>DC</sub> AT +85 °C; 4 V<sub>DC</sub> AT +125 °C</b>											
470	C	M34C477(1)006(2)ZSS	0.9	12	1.0	3.0	-75	+10	+20	1500	
<b>10 V<sub>DC</sub> AT +85 °C; 7 V<sub>DC</sub> AT +125 °C</b>											
330	C	M34C337(1)010(2)ZSS	1.0	15	1.0	3.0	-70	+8	+20	1400	
<b>15 V<sub>DC</sub> AT +85 °C; 10 V<sub>DC</sub> AT +125 °C</b>											
150	C	M34C157(1)015(2)ZSS	1.1	25	1.0	3.0	-45	+8	+20	1400	
<b>25 V<sub>DC</sub> AT +85 °C; 15 V<sub>DC</sub> AT +125 °C</b>											
120	C	M34C127(1)025(2)ZSS	1.3	25	1.0	5.0	-42	+8	+12	1250	
<b>30 V<sub>DC</sub> AT +85 °C; 20 V<sub>DC</sub> AT +125 °C</b>											
100	C	M34C107(1)030(2)ZSS	1.3	25	1.0	5.0	-38	+8	+12	1200	
<b>50 V<sub>DC</sub> AT +85 °C; 30 V<sub>DC</sub> AT +125 °C</b>											
68	C	M34C686(1)050(2)ZSS	1.5	35	1.0	5.0	-25	+8	+15	1050	
<b>60 V<sub>DC</sub> AT +85 °C; 40 V<sub>DC</sub> AT +125 °C</b>											
47	C	M34C476(1)060(2)ZSS	2.0	44	1.0	5.0	-25	+8	+12	1050	
<b>75 V<sub>DC</sub> AT +85 °C; 50 V<sub>DC</sub> AT +125 °C</b>											
33	C	M34C336(1)075(2)ZSS	2.5	66	1.0	5.0	-25	+5	+9	1050	
<b>100 V<sub>DC</sub> AT +85 °C; 65 V<sub>DC</sub> AT +125 °C</b>											
15	C	M34C156(1)100(2)ZSS	3.5	125	1.0	5.0	-18	+3	+10	1050	
<b>125 V<sub>DC</sub> AT +85 °C; 85 V<sub>DC</sub> AT +125 °C</b>											
10	C	M34C106(1)125(2)ZSS	5.5	175	1.0	5.0	-15	+3	+10	1050	

**Note**

- Part number definitions:
  - Capacitance tolerance: K, M
  - Termination / packaging: A = 100 % tin (RoHS compliant), bulk; B = Std, tin/lead, bulk
 Reliability level: Z = non-ER  
 Temperature: S = std  
 ESR: S = std

**PERFORMANCE CHARACTERISTICS OF M34 CAPACITORS**

ELECTRICAL CHARACTERISTICS	
ITEM	PERFORMANCE CHARACTERISTICS
Operating temperature range	-55 °C to +125 °C
Capacitor tolerance	$\pm 20 \%$ , $\pm 10 \%$ , at 120 Hz
Capacitance change (maximum)	Limits per standard ratings table
ESR	Limits per standard ratings table
AC ripple current	Limits per standard ratings table
DCL (maximum leakage current)	Limits per standard ratings table
Impedance (maximum)	Limits per standard ratings table
Reverse voltage	Reverse voltage shall be in accordance with DSCC drawing 93026. There shall be no continuous reverse voltage. Transient reverse voltage surges are acceptable under the following conditions: <ol style="list-style-type: none"> <li>Peak reverse voltage is equal to or less than 1.5 V and the product of the peak current times the duration of the reverse transient is 0.05 A or less.</li> <li>The repetition rate of the reverse voltage surges is less than 10 Hz.</li> </ol>
Surge voltage	Surge voltage shall be in accordance with MIL-PRF-39006 and Table II of DSCC93026. The DC rated surge voltage is the maximum voltage to which the capacitors should be subjected under any conditions. This includes transients and ripple at the highest line voltage. The surge voltage is 115 % of rated DC working voltage.
Life test	The capacitors shall be capable of withstanding a 2000 h life test at 85 °C at rated voltage



ENVIRONMENTAL CHARACTERISTICS		
ITEM	CONDITION	COMMENTS
Hermeticity	MIL-PRF-39006	There shall be no evidence of leakage after testing to MIL-PRF-39006 specifications.
Moisture resistance	MIL-PRF-39006	Tested in accordance to MIL-PRF-39006 for 30 cycles.
Altitude	MIL-STD-202G, method 105 D	100 000 feet test

MECHANICAL CHARACTERISTICS		
ITEM	CONDITION	COMMENTS
Thermal shock	MIL-STD-202G, method 107 A	Per M39006 and DSCC93026, 30 cycles
Shock	MIL-STD-202G, method 213 I	Per M39006 and DSCC93026, 100 g
Vibration (high frequency)	MIL-STD-202G, method 204 D	Per M39006 and DSCC93026, 20 g
Resistance to solder heat	MIL-STD-202G, method 210 F	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	The terminations must be solderable per the MIL standard.
Terminals	MIL-STD-1276	All terminals shall be permanently secured internally and externally, as applicable. All external joints shall be welded.
Part markings	MIL-STD-1285	The part marking shall include Vishay name, trademark, capacitance, voltage, date code and lot symbol.
Weight (typical) in g	3.5	

PAD DIMENSIONS in millimeters				
CASE CODE	A (MIN.)	B (NOM.)	C (NOM.)	D (NOM.)
C	22.7	14.7	4.0	6.4

STANDARD PACKAGING QUANTITY		
SERIES	CASE CODE	BULK/TUBE
M34	C	10 pcs



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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