

## Wet Tantalum Capacitor, Button Assembly or Array, All-Tantalum Case, - 55 °C to 125 °C Operation



### FEATURES

- All-Tantalum electrodes eliminate silver migration
- Withstands high ripple current
- Long life reliability
- Reverse voltage capability
- Stackable

### PERFORMANCE CHARACTERISTICS

**Operating Temperature:** - 55 °C to + 125 °C

**Voltage Range:** 6 V<sub>DC</sub> to 125 V<sub>DC</sub>

**Capacitance Range:** 235 µF to 9100 µF

### SPECIFICATIONS

**Environmental Classification:** 55/125/56

**Vibration:** 10 Hz to 2000 Hz, 0.75 mm or 99 m/s<sup>2</sup>, 30 h

**Bump:** 320 m/s<sup>2</sup>, 4000 bumps

**Shock:** -

**Acceleration:** -

**Low Air Pressure:** 1 kPa

### REVERSE VOLTAGE CAPABILITY

Module units are polar capacitors which allow the application of reverse potentials not exceeding 3 V at temperatures up to 125 °C.

### SURGE VOLTAGE

The surge voltage capability is 115 % of the voltage rating at the relevant temperature.

### TEMPERATURE RANGE

The capacitor is designed for operation between - 55 °C and + 125 °C, with linear voltage derating above + 85 °C to 66 % of the rated voltage at + 125 °C.

### CAPACITANCE TOLERANCE

The standard capacitance tolerance is ± 20 % although special tolerances are available by arrangement.

### INTRODUCTION

The module series of capacitors comprise five individual button units which are connected in parallel to give a very high capacitance.

The epoxy resin encapsulation within an epoxy resin box, measuring approx. 50 mm x 50 mm x 10 mm gives an extremely robust construction which lends itself to bank mounting.

The MC module incorporated CA2 or CE2 style buttons. These button capacitor styles are of all-tantalum construction using a tantalum anode and tantalum cathode with a non-solid electrolyte. This well-proven construction with its highly efficient seal combined with the resin encapsulation gives an extremely robust module of long life and high reliability under military and avionic environments with the capability of withstanding 3 V in reverse, and of handling high levels of ripple current.

### APPLICATIONS

These units are designed for use in general military, space avionics and professional applications. For example: Power supply smoothing, filter network, timer functions.

### WEIGHT

The approximate weight of a module is 130 g.

**APPLICATION INFORMATION**

Capacitors may be operated at less than the rated voltage, resulting in significantly reduced leakage current values.

In timing circuits, or other applications where the device is subjected only to a DC voltage, the ballistic or DC capacitance will be somewhat larger than measured at 50 Hz.

The parametric information must necessarily be brief, although additional comprehensive data is available on request, and the tests tailored to customers' requirements can be made.

**RELIABILITY**

All capacitors are subjected to burn-in. This is to remove infant mortalities and ensure reliability. The capacitor lifetime is enhanced when the unit is subjected to a reduced ripple current, a low ambient temperature, and is externally cooled. The use of a heat sink is recommended.

**STACKING**

The units are suitable for stacking by use of through bolts. It is strongly recommended that a metal heat sink is used between each unit in order to eliminate the possibility of hot spots.

**ESTABLISHED FAILURE RATE**

The MT range incorporates 735D capacitors which are structurally similar to and subjected to the same processes as our 135D and MIL-PRF-39006 range which is to an established failure rate of level R, 0.01 % per 1000 h at a 60 % confidence level. The CECC system of testing does not readily yield data to prove these levels, but in-house testing supports this figure.

Although failure rates derived from life tests are a useful guide, in practice capacitors rarely see conditions of a steady DC voltage and temperature. The construction of the MT module gives an ability to handle the high ripple currents at high frequencies, reverse voltages up to 3 V, and extremes of temperature likely to be encountered in modern circuitry.

**ALTERNATIVE CONSTRUCTION**

Alternative constructions based on the module range with differing terminal configurations and capacitor combinations including series connected units are available.

**ORDERING PROCEDURE**

Example: MC2D (910  $\mu$ F, 75 V<sub>DC</sub>)

Vishay Part Number: MC2D917M075S

<b>ORDERING INFORMATION</b>					
MC2	D	917	M	075	S
MODEL	CASE CODE	CAPACITANCE	TOLERANCE	VOLTAGE	TERMINATION AND PACKAGING
	See Standard Ratings table.	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	M = 20 % (std) K = 10 % (special order)	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).	S = Standard (Ag/Cu)

<b>DIMENSIONS</b> in inches [millimeters]							
<b>MC2 styles</b>							
<b>CASE CODE</b>	<b>A max.</b>	<b>H max.</b>	<b>C crs.</b>	<b>D crs.</b>	<b>E dia.</b>	<b>B min.</b>	<b>B max.</b>
D	2.016 [51.2]	0.445 [11.3]	0.748 [19.0]	1.500 [38.1]	0.189 [4.8]	0.095 [2.41]	0.101 [2.56]



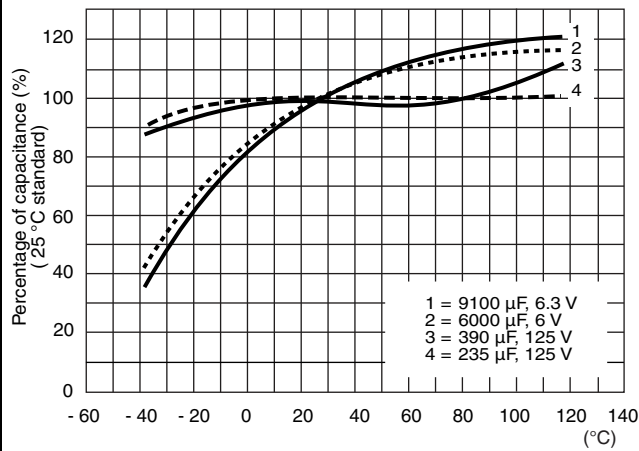
STANDARD RATINGS										
VISHAY PART NUMBERS	CASE CODE	CAPACITANCE AT 50 Hz ( $\mu$ F)	DISSIPATION FACTOR AT 50 Hz (%)		IMPEDANCE AT 100 kHz ( $\Omega$ )		MAX. DCL ( $\mu$ A)		$\Delta$ C AT 50 Hz (%)	
			25 °C	125 °C	25 °C	- 55 °C	25 °C	125 °C	- 55 °C	125 °C
			6 V <sub>DC</sub> AT 85 °C; 4 V <sub>DC</sub> AT 125 °C							
MC2D608M006S	D	6000	75.0	95.0	0.6	3	75	250	- 80.0	25.0
6.3 V <sub>DC</sub> AT 85 °C; 4 V <sub>DC</sub> AT 125 °C										
MC2D918M6R3S	D	9100	85.0	108.0	0.6	9	75	250	- 80.0	30.0
MC2D758M6R3S	D	7500	80.0	101.0	0.6	9	75	250	- 80.0	30.0
8 V <sub>DC</sub> AT 85 °C; 5.3 V <sub>DC</sub> AT 125 °C										
MC2D508M008S	D	5000	65.0	85.0	0.6	3	50	250	- 75.0	25.0
10 V <sub>DC</sub> AT 85 °C; 6.6 V <sub>DC</sub> AT 125 °C										
MC2D628M010S	D	6200	75.0	95.0	0.6	9	75	250	- 80.0	30.0
MC2D518M010S	D	5100	65.0	83.0	0.6	9	50	250	- 80.0	30.0
MC2D418M010S	D	4100	55.0	70.0	0.6	3	50	250	- 70.0	20.0
15 V <sub>DC</sub> AT 85 °C; 10 V <sub>DC</sub> AT 125 °C										
MC2D348M015S	D	3400	45.0	55.0	0.6	3	40	250	- 65.0	20.0
16 V <sub>DC</sub> AT 85 °C; 10 V <sub>DC</sub> AT 125 °C										
MC2D398M016S	D	3900	60.0	76.0	0.6	9	50	250	- 75.0	25.0
MC2D338M016S	D	3300	45.0	57.0	0.6	9	40	250	- 70.0	25.0
20 V <sub>DC</sub> AT 85 °C; 13.4 V <sub>DC</sub> AT 125 °C										
MC2D288M020S	D	2800	35.0	45.0	0.6	3	25	250	- 60.0	15.0
MC2D248M020S	D	2350	30.0	40.0	0.6	3	25	250	- 55.0	15.0
MC2D208M020S	D	1950	25.0	30.0	0.6	3	25	250	- 50.0	15.0
25 V <sub>DC</sub> AT 85 °C; 16 V <sub>DC</sub> AT 125 °C										
MC2D278M025S	D	2700	40.0	50.0	0.6	9	25	250	- 65.0	20.0
MC2D248M025S	D	2400	35.0	44.0	0.6	9	25	250	- 60.0	20.0
30 V <sub>DC</sub> AT 85 °C; 20 V <sub>DC</sub> AT 125 °C										
MC2D178M030S	D	1650	20.0	25.0	0.6	3	25	250	- 50.0	10.0
MC2D148M030S	D	1350	17.0	20.0	0.6	3	25	250	- 45.0	10.0
40 V <sub>DC</sub> AT 85 °C; 25 V <sub>DC</sub> AT 125 °C										
MC2D208M040S	D	2000	30.0	38.0	0.6	9	25	250	- 55.0	20.0
MC2D168M040S	D	1600	22.0	28.0	0.6	9	25	250	- 50.0	12.5
MC2D138M040S	D	1300	18.0	23.0	0.6	9	25	250	- 50.0	12.5
50 V <sub>DC</sub> AT 85 °C; 33.3 V <sub>DC</sub> AT 125 °C										
MC2D118M050S	D	1100	14.0	18.0	0.6	3	15	250	- 40.0	10.0
MC2D907M050S	D	900	11.5	15.0	0.6	3	15	250	- 35.0	10.0
MC2D757M050S	D	750	9.5	12.0	0.6	3	15	250	- 30.0	10.0
63 V <sub>DC</sub> AT 85 °C; 40 V <sub>DC</sub> AT 125 °C										
MC2D118M063S	D	1100	15.0	19.0	0.6	9	20	250	- 45.0	12.5
75 V <sub>DC</sub> AT 85 °C; 50 V <sub>DC</sub> AT 125 °C										
MC2D917M075S	D	910	13.0	16.5	0.6	9	20	250	- 40.0	12.5
MC2D757M075S	D	750	11.0	14.0	0.6	9	20	250	- 35.0	12.5
MC2D607M075S	D	600	7.5	10.0	0.6	3	15	250	- 25.0	7.5
MC2D507M075S	D	500	7.0	9.0	0.6	3	15	250	- 20.0	7.5
MC2D417M075S	D	410	5.5	7.0	0.6	3	15	250	- 17.5	7.5
100 V <sub>DC</sub> AT 85 °C; 66.7 V <sub>DC</sub> AT 125 °C										
MC2D627M100S	D	620	9.0	11.0	0.6	9	20	250	- 28.0	10.0
MC2D477M100S	D	470	7.5	9.5	0.6	9	20	250	- 22.0	10.0
MC2D287M100S	D	280	3.5	4.5	0.6	3	15	250	- 12.5	7.5
125 V <sub>DC</sub> AT 85 °C; 83.3 V <sub>DC</sub> AT 125 °C										
MC2D397M125S	D	390	7.0	9.0	0.6	9	20	250	- 20.0	10.0
MC2D247M125S	D	235	3.0	4.0	0.6	3	15	250	- 10.0	7.5

**Notes**

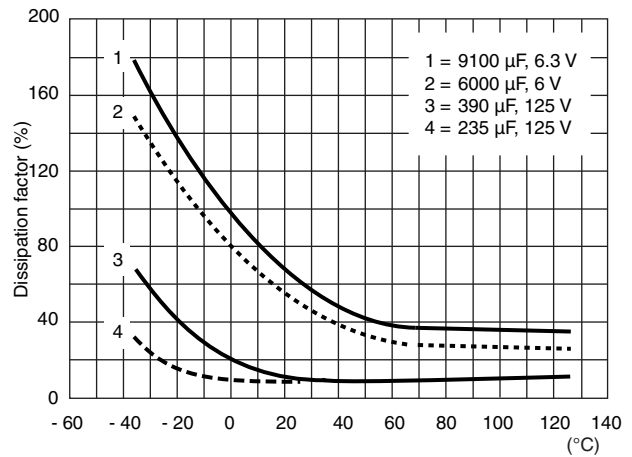
- Capacitance tolerance:  
M = 20 % standard  
K = 10 % special order
- Termination type:  
S = Standard

**PERFORMANCE CURVES**

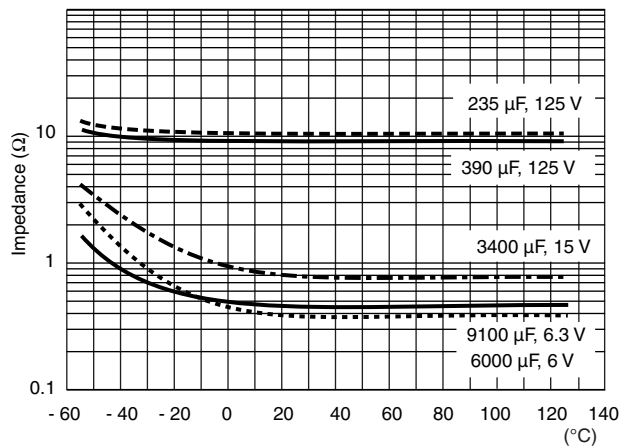
Capacitance/temperature at 50 Hz



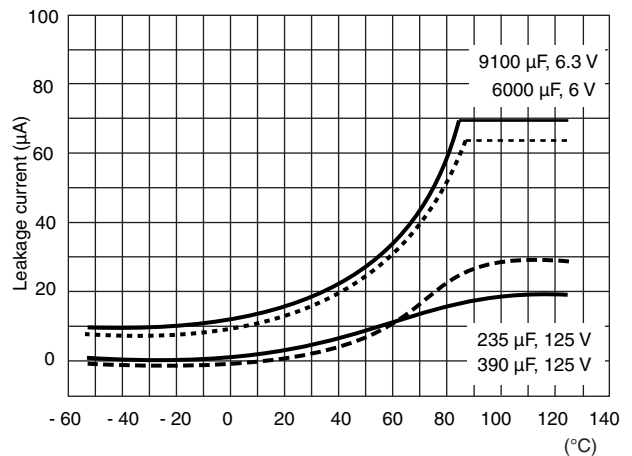
Dissipation factor/temperature at 50 Hz



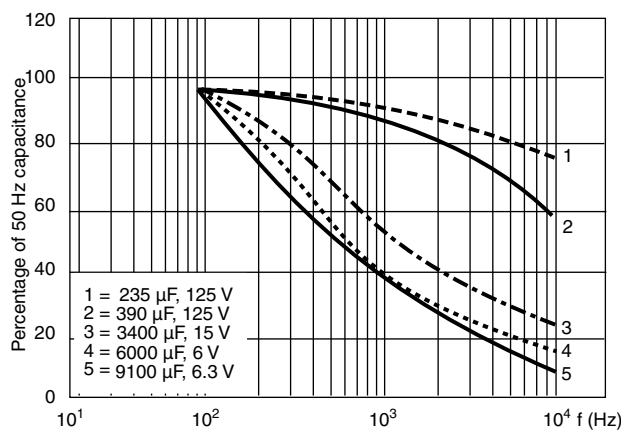
Impedance/temperature at 50 Hz



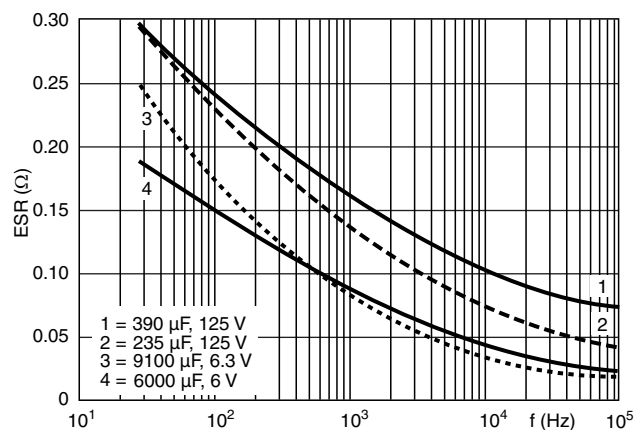
Leakage current/temperature at maximum voltage



Capacitance/frequency at 25 °C

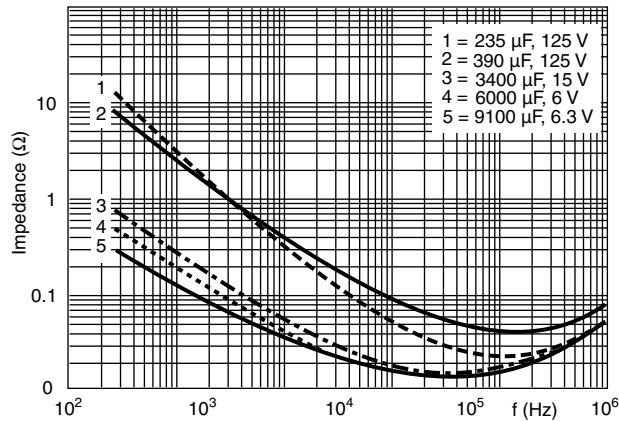


ESR/frequency at 25 °C



**PERFORMANCE CURVES**

Impedance/frequency at 25 °C


**Note**

- All performance curves are provided from historic Arcotronics module series M/ME datasheet information

**CROSS REFERENCE**

VISHAY PART NUMBER	ARCOTRONICS PART NUMBER	KEMET PART NUMBER
MC2D397M125S	402/1/50165/023	T298E397M125AU
MC2D247M125S	402/1/50165/003	T298M237M125AU
MC2D627M100S	402/1/50165/025	T298E627M100AU
MC2D477M100S	402/1/50165/024	T298E477M100AU
MC2D287M100S	402/1/50165/004	T298M287M100AU
MC2D917M075S	402/1/50165/027	T298E917M075AU
MC2D757M075S	402/1/50165/026	T298E757M075AU
MC2D607M075S	402/1/50165/008	T298M607M075AU
MC2D507M075S	402/1/50165/007	T298M507M075AU
MC2D417M075S	402/1/50165/006	T298M417M075AU
MC2D118M063S	402/1/50165/028	T298E118M063AU
MC2D118M050S	402/1/50165/011	T298M118M050AU
MC2D907M050S	402/1/50165/010	T298M907M050AU
MC2D757M050S	402/1/50165/009	T298M757M050AU
MC2D208M040S	402/1/50165/031	T298E208M040AU
MC2D168M040S	402/1/50165/030	T298E168M040AU
MC2D138M040S	402/1/50165/029	T298E138M040AU
MC2D178M030S	402/1/50165/013	T298M168M030AU
MC2D148M030S	402/1/50165/012	T298M138M030AU
MC2D278M025S	402/1/50165/033	T298E278M025AU
MC2D248M025S	402/1/50165/032	T298E248M025AU
MC2D288M020S	402/1/50165/016	T298M288M020AU
MC2D248M020S	402/1/50165/015	T298M238M020AU
MC2D208M020S	402/1/50165/014	T298M198M020AU
MC2D398M016S	402/1/50165/035	T298E398M016AU
MC2D338M016S	402/1/50165/034	T298E338M016AU
MC2D348M015S	402/1/50165/017	T298M348M015AU
MC2D628M010S	402/1/50165/037	T298E628M010AU
MC2D518M010S	402/1/50165/036	T298E518M010AU
MC2D418M010S	402/1/50165/018	T298M418M010AU
MC2D508M008S	402/1/50165/019	T298M508M008AU
MC2D918M6R3S	402/1/50165/039	T298E918M006AU
MC2D758M6R3S	402/1/50165/038	T298E758M006AU
MC2D608M006S	402/1/50165/020	T298M608M006AU



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