Wet Tantalum Capacitor, 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
- Mounting: Solder tag

PERFORMANCE CHARACTERISTICS

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

Voltage Range: 6 V_{DC} to 125 V_{DC}

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^2, 30 h

Bump: 320 m/s^2, 4000 bumps

Shock: -

Acceleration: -

Low air pressure: 1 kPa

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.

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.

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 µF, 75 V_{DC})

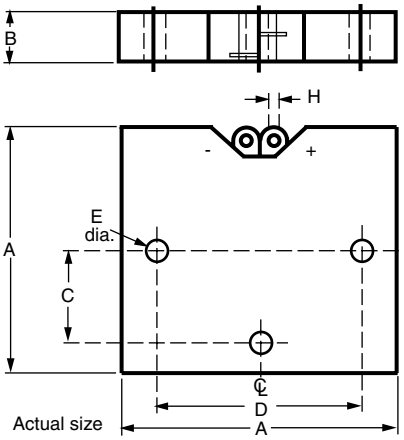
Vishay Part Number: MC2D917M075S

ORDERING INFORMATION

MC2	D	917	M	075	S	-
MODEL	CASE CODE	CAPACITANCE	TOLERANCE	VOLTAGE	TERMINATION AND PACKAGING	
	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	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	Blank = Standard (tin/lead coating) E3 = RoHS compliant (100 % tin coating)

DIMENSIONS in millimeters

MC2 styles



A max.	B max.	C crs.	D crs.	E dia.	H min.	H max.
51.2	11.3	19.0	38.1	4.8	2.41	2.56

RATINGS AND CASE CODES

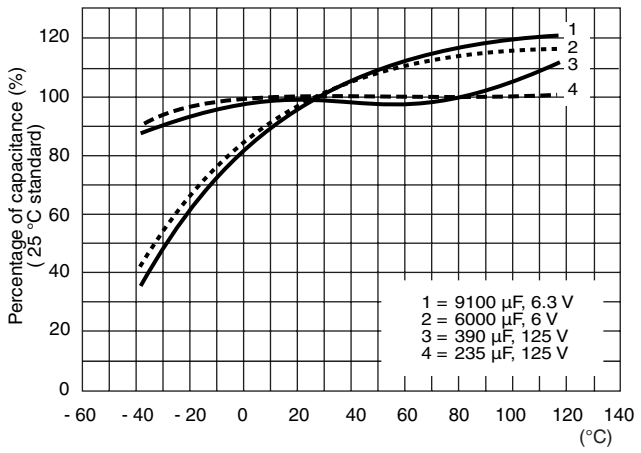
VISHAY PART NUMBERS	CASE CODE	CAP. AT 50 Hz (µF)	VOLTAGE		DISSIPATION FACTOR AT 50 Hz (%)		IMPEDANCE AT 100 kHz (Ω)		LEAKAGE CURRENT (µA)		ΔC AT 50 Hz (%)	
			85 °C	125 °C	25 °C	125 °C	25 °C	- 55 °C	25 °C	125 °C	- 55 °C	125 °C
MC2D397M125S	D	390	125	83.3	7.0	9.0	0.6	9	20	250	- 20.0	10.0
MC2D237M125S	D	235	125	83.3	3.0	4.0	0.6	3	15	250	- 10.0	7.5
MC2D627M100S	D	620	100	66.7	9.0	11.0	0.6	9	20	250	- 28.0	10.0
MC2D477M100S	D	470	100	66.7	7.5	9.5	0.6	9	20	250	- 22.0	10.0
MC2D297M100S	D	280	100	66.7	3.5	4.5	0.6	3	15	250	- 12.5	7.5
MC2D917M075S	D	910	75	50.0	13.0	16.5	0.6	9	20	250	- 40.0	12.5
MC2D757M075S	D	750	75	50.0	11.0	14.0	0.6	9	20	250	- 35.0	12.5
MC2D607M075S	D	600	75	50.0	7.5	10.0	0.6	3	15	250	- 25.0	7.5
MC2D507M075S	D	500	75	50.0	7.0	9.0	0.6	3	15	250	- 20.0	7.5
MC2D417M075S	D	410	75	50.0	5.5	7.0	0.6	3	15	250	- 17.5	7.5
MC2D118M063S	D	1100	63	40.0	15.0	19.0	0.6	9	20	250	- 45.0	12.5
MC2D118M050S	D	1100	50	33.3	14.0	18.0	0.6	3	15	250	- 40.0	10.0
MC2D907M050S	D	900	50	33.3	11.5	15.0	0.6	3	15	250	- 35.0	10.0
MC2D757M050S	D	750	50	33.3	9.5	12.0	0.6	3	15	250	- 30.0	10.0
MC2D208M040S	D	2000	40	25.0	30.0	38.0	0.6	9	25	250	- 55.0	20.0
MC2D168M040S	D	1600	40	25.0	22.0	28.0	0.6	9	25	250	- 50.0	12.5
MC2D138M040S	D	1300	40	25.0	18.0	23.0	0.6	9	25	250	- 50.0	12.5
MC2D168M030S	D	1650	30	20.0	20.0	25.0	0.6	3	25	250	- 50.0	10.0
MC2D138M030S	D	1350	30	20.0	17.0	20.0	0.6	3	25	250	- 45.0	10.0
MC2D278M025S	D	2700	25	16.0	40.0	50.0	0.6	9	25	250	- 65.0	20.0
MC2D248M025S	D	2400	25	16.0	35.0	44.0	0.6	9	25	250	- 60.0	20.0
MC2D298M020S	D	2800	20	13.4	35.0	45.0	0.6	3	25	250	- 60.0	15.0
MC2D238M020S	D	2350	20	13.4	30.0	40.0	0.6	3	25	250	- 55.0	15.0
MC2D198M020S	D	1950	20	13.4	25.0	30.0	0.6	3	25	250	- 50.0	15.0
MC2D398M016S	D	3900	16	10.0	60.0	76.0	0.6	9	50	250	- 75.0	25.0
MC2D338M016S	D	3300	16	10.0	45.0	57.0	0.6	9	40	250	- 70.0	25.0
MC2D348M015S	D	3400	15	10.0	45.0	55.0	0.6	3	40	250	- 65.0	20.0
MC2D628M010S	D	6200	10	6.6	75.0	95.0	0.6	9	75	250	- 80.0	30.0
MC2D518M010S	D	5100	10	6.6	65.0	83.0	0.6	9	50	250	- 80.0	30.0
MC2D418M010S	D	4100	10	6.6	55.0	70.0	0.6	3	50	250	- 70.0	20.0
MC2D508M008S	D	5000	8	5.3	65.0	85.0	0.6	3	50	250	- 75.0	25.0
MC2D918M6R3S	D	9100	6.3	4.0	85.0	108.0	0.6	9	75	250	- 80.0	30.0
MC2D758M6R3S	D	7500	6.3	4.0	80.0	101.0	0.6	9	75	250	- 80.0	30.0
MC2D608M006S	D	6000	6	4.0	75.0	95.0	0.6	3	75	250	- 80.0	25.0

Notes

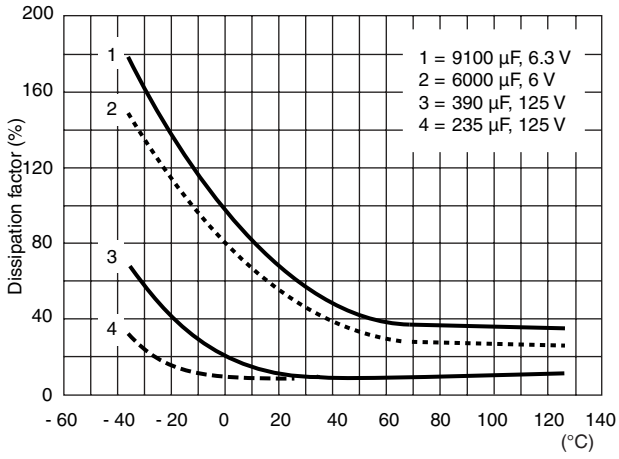
- Capacitance tolerance:
  M = 20 % standard
  K = 10 % special order
- Termination type:
  S = Standard

PERFORMANCE CURVES

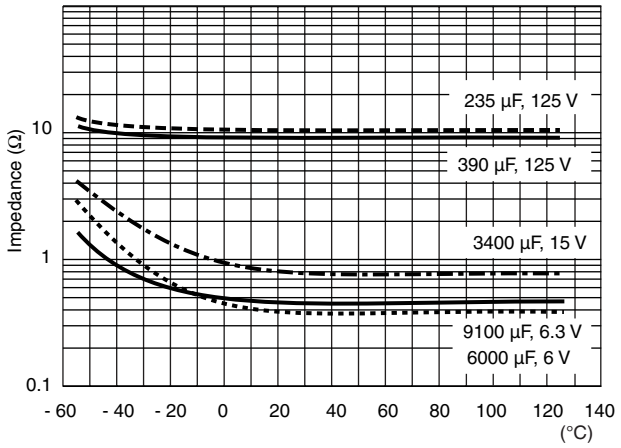
Capacitance/temperature at 50 Hz



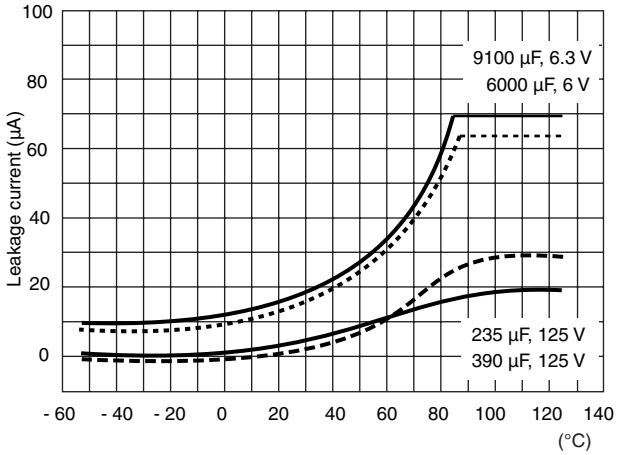
Dissipation factor/temperature at 50 Hz



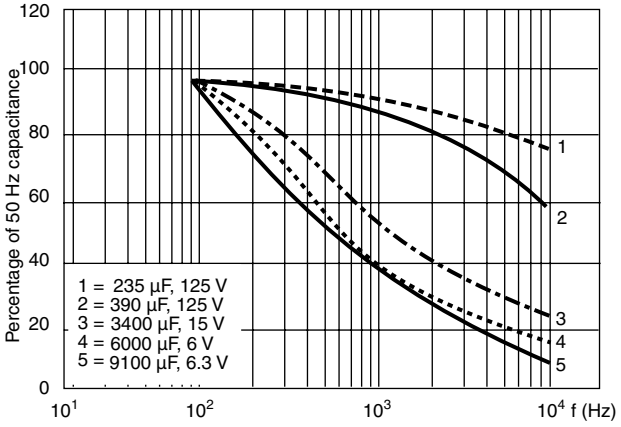
Impedance/temperature at 50 Hz



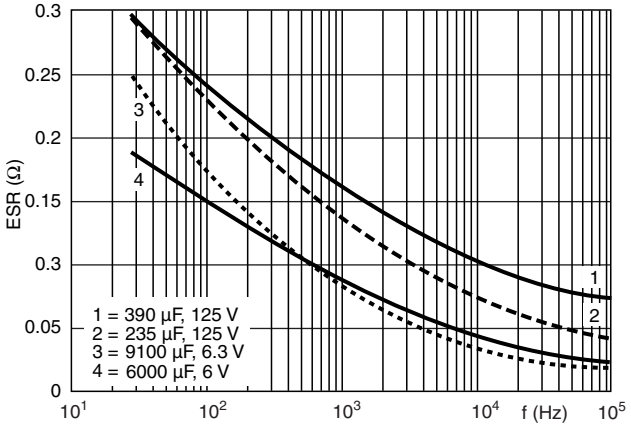
Leakage current/temperature at maximum voltage



Capacitance/frequency at 25 °C

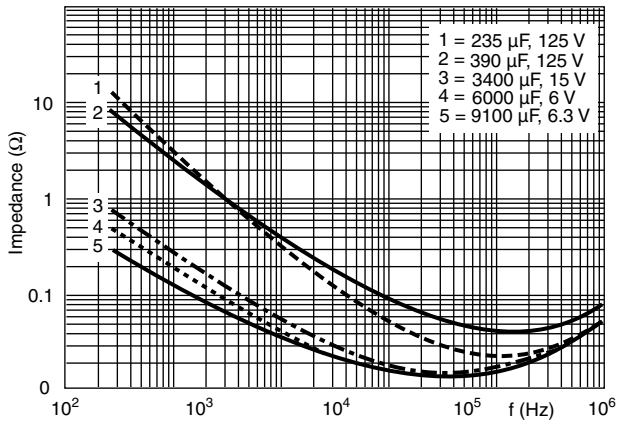


ESR/frequency at 25 °C



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
MC2D235M125S	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
MC2D168M030S	402/1/50165/013	T298M168M030AU
MC2D138M030S	402/1/50165/012	T298M138M030AU
MC2D278M025S	402/1/50165/033	T298E278M025AU
MC2D248M025S	402/1/50165/032	T298E248M025AU
MC2D288M020S	402/1/50165/016	T298M288M020AU
MC2D238M020S	402/1/50165/015	T298M238M020AU
MC2D198M020S	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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