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

INTRODUCTION

By use of the latest techniques of manufacture, Vishay is able to offer a new range of modules giving a size and weight advantage over the well proven MC range while still retaining a very high CV rating.

The MT2 series is an epoxy resin encapsulation of hermetically sealed units to give a robust construction of long life and high reliability under military and avionic environments.

In common with all Castanet capacitors of the “all-tantalum” construction they are capable of withstanding 3 V in reverse, and of handling high levels of ripple current.

The modules incorporate parallel connected 735D series, tubular “all-tantalum” construction capacitors already fully tested to the requirements of BS CECC 30 202 001.

Mounting is by bolting through two 3 mm clearance holes, and the units are stackable.
Metal heatsinks between the modules are recommended if the units are stacked.

APPLICATIONS

The MT2 is ideal for use in military and professional applications, including power supply “smoothing”, filter networks, and timer functions.

WEIGHT

The approximate weight of a module is 65 g.

FEATURES

- High volumetric efficiency
- Withstands high ripple current
- Long life reliability
- Reverse voltage capability
- Stackable
- No silver migration problems

PERFORMANCE CHARACTERISTICS

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

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

Capacitance Range: 220 µF to 6000 µF

SPECIFICATIONS

Environmental Classification: -

Vibration: -

Bump: -

Shock: -

Acceleration: -

Low Air Pressure: -

APPROVALS

These capacitors are available released to:

- BS CECC 30 202 009

REVERSE VOLTAGE CAPABILITY

The MT2 series employ tantalum cathodes which allow the continuous application of reverse potentials not exceeding 3 V over the whole temperature range.

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: MT2B (300 µF, 100 V_{DC})

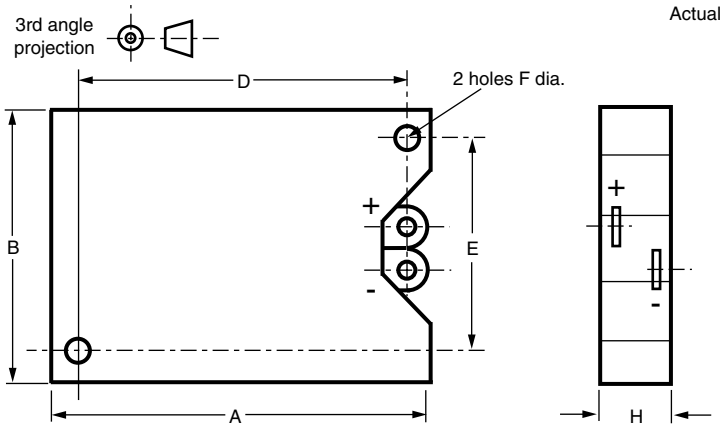
Vishay Part Number: MT2B307M100S

ORDERING INFORMATION

MT2	B	307	M	100	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, center, 2 terminals)

DIMENSIONS in inches [millimeters]

MT2 styles



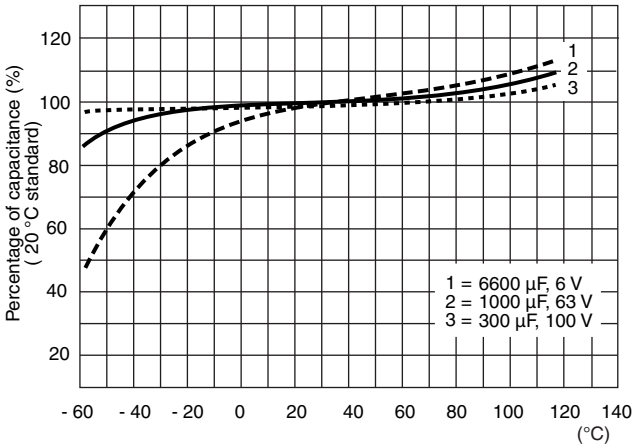
CASE CODE		A	B	H	D	E	F
B	Max.	1.669 [42.4]	1.236 [31.4]	0.445 [11.3]	1.386 [35.2]	0.953 [24.2]	0.131 [3.32]
	Min.	1.638 [41.6]	1.205 [30.6]		1.370 [34.8]	0.937 [23.8]	0.126 [3.20]

STANDARD RATINGS

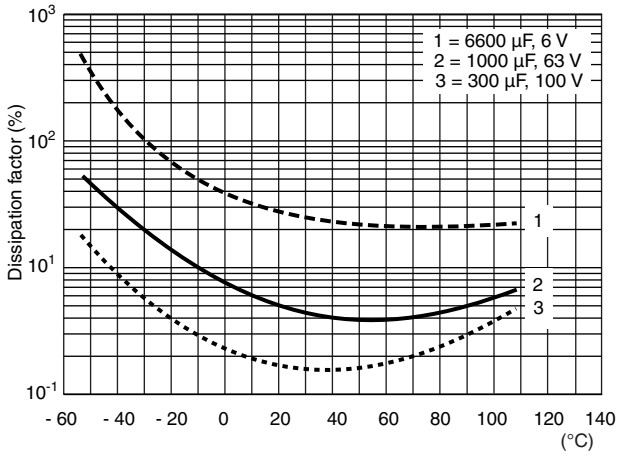
VISHAY PART NUMBERS	CASE CODE	CAPACITANCE AT 100 Hz (µF)	DISSIPATION FACTOR AT 100 Hz (%)		IMPEDANCE AT 100 kHz (Ω)	MAX. DCL (µA)		ΔC AT 100 Hz (%)		
			20 °C	125 °C	-55 °C	20 °C	85 °C/125 °C	-55 °C	85 °C	125 °C
6 V_{DC} AT 85 °C; 4 V_{DC} AT 125 °C										
MT2B608M006S	B	6000	170	170	22	18	54	-90	25	25
6.3 V_{DC} AT 85 °C; 4 V_{DC} AT 125 °C										
MT2B568M6R3S	B	5600	170	170	22	18	54	-90	25	25
8 V_{DC} AT 85 °C; 5 V_{DC} AT 125 °C										
MT2B508M008S	B	5000	138	138	24	21	75	-88	25	25
10 V_{DC} AT 85 °C; 7 V_{DC} AT 125 °C										
MT2B398M010S	B	3900	114	114	23	21	75	-88	25	25
MT2B418M010S	B	4100	114	114	23	21	75	-88	25	25
MT2B478M010S	B	4700	114	114	23	21	75	-88	25	25
MT2B518M010S	B	5100	138	138	24	21	75	-88	25	25
15 V_{DC} AT 85 °C; 10 V_{DC} AT 125 °C										
MT2B348M015S	B	3400	103	103	25	24	96	-84	25	25
16 V_{DC} AT 85 °C; 10 V_{DC} AT 125 °C										
MT2B338M016S	B	3300	103	103	25	24	96	-84	25	25
20 V_{DC} AT 85 °C; 13 V_{DC} AT 125 °C										
MT2B248M020S	B	2350	60	60	24	24	96	-80	25	25
MT2B278M020S	B	2700	95	95	26	24	96	-80	25	25
MT2B268M020S	B	2600	95	95	26	24	96	-80	25	25
25 V_{DC} AT 85 °C; 16 V_{DC} AT 125 °C										
MT2B158M025S	B	1500	60	60	24	24	96	-80	25	25
MT2B168M025S	B	1600	60	60	24	24	96	-80	25	25
MT2B208M025S	B	1950	60	60	24	24	96	-80	25	25
MT2B228M025S	B	2200	60	60	24	24	96	-80	25	25
MT2B248M025S	B	2400	95	95	26	24	96	-80	25	25
30 V_{DC} AT 85 °C; 20 V_{DC} AT 125 °C										
MT2B148M030S	B	1350	45	45	30	27	108	-80	25	25
MT2B178M030S	B	1650	40	40	30	27	108	-80	25	25
40 V_{DC} AT 85 °C; 25 V_{DC} AT 125 °C										
MT2B128M040S	B	1200	43	43	30	24	96	-75	25	25
MT2B138M040S	B	1300	45	45	30	27	108	-80	25	25
50 V_{DC} AT 85 °C; 30 V_{DC} AT 125 °C										
MT2B907M050S	B	900	40	40	33	27	108	-70	25	25
MT2B118M050S	B	1100	40	40	30	27	108	-70	25	25
63 V_{DC} AT 85 °C; 40 V_{DC} AT 125 °C										
MT2B757M063S	B	750	40	40	33	27	108	-70	24	25
MT2B827M063S	B	820	40	40	33	27	108	-70	24	25
MT2B108M063S	B	1000	32	32	31	30	120	-72	25	25
75 V_{DC} AT 85 °C; 50 V_{DC} AT 125 °C										
MT2B337M075S	B	330	11	13	29	9	72	-35	20	20
MT2B347M075S	B	340	11	13	29	9	72	-35	20	20
MT2B397M075S	B	390	12	13	28	9	72	-36	20	20
MT2B417M075S	B	410	17	18	30	27	108	-48	21	22
MT2B477M075S	B	470	17	18	30	27	108	-48	21	22
MT2B507M075S	B	500	17	18	30	27	108	-48	21	22
MT2B587M075S	B	580	37	37	32	30	120	-60	22	22
MT2B607M075S	B	600	37	37	32	30	120	-60	22	22
MT2B687M075S	B	680	37	37	32	30	120	-60	22	22
MT2B757M075S	B	750	40	40	33	30	120	-68	24	25
100 V_{DC} AT 85 °C; 65 V_{DC} AT 125 °C										
MT2B277M100S	B	270	10	12	30	9	72	-24	20	20
MT2B287M100S	B	280	11	13	36	9	72	-35	20	20
MT2B307M100S	B	300	11	13	36	9	72	-35	20	20
125 V_{DC} AT 85 °C; 85 V_{DC} AT 125 °C										
MT2B227M125S	B	220	8	11	42	9	72	-24	15	15
MT2B247M125S	B	235	10	12	39	9	72	-24	18	18

PERFORMANCE CURVES

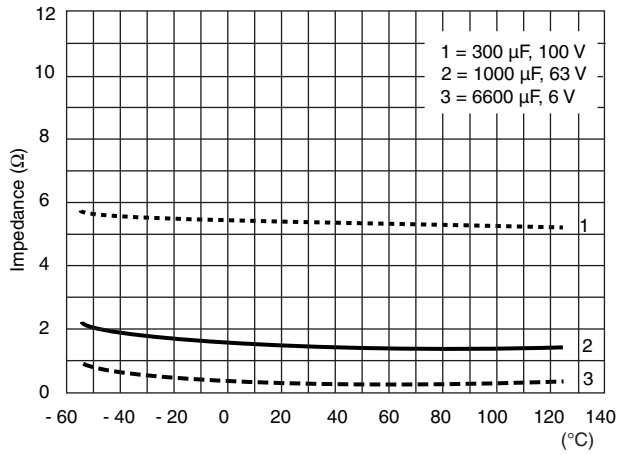
Capacitance/temperature at 100 Hz



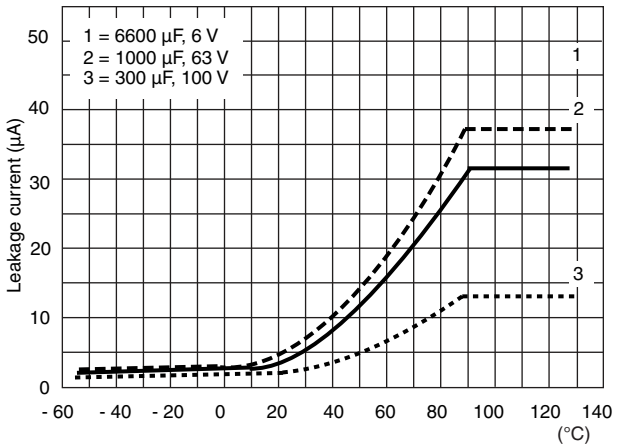
Dissipation factor/temperature at 100 Hz



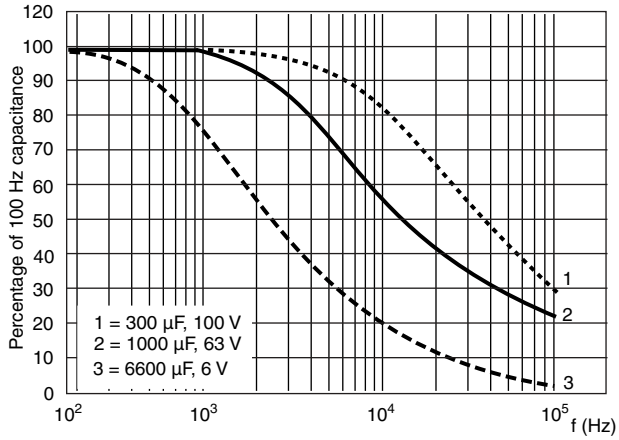
Impedance/temperature at 100 Hz



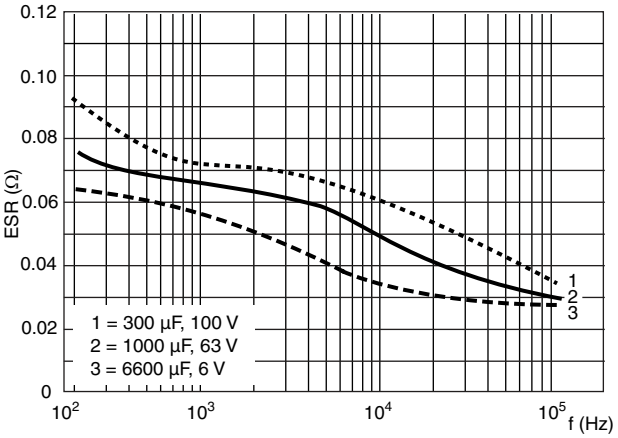
Leakage current/temperature at maximum permitted voltage



Capacitance/frequency at 20 °C

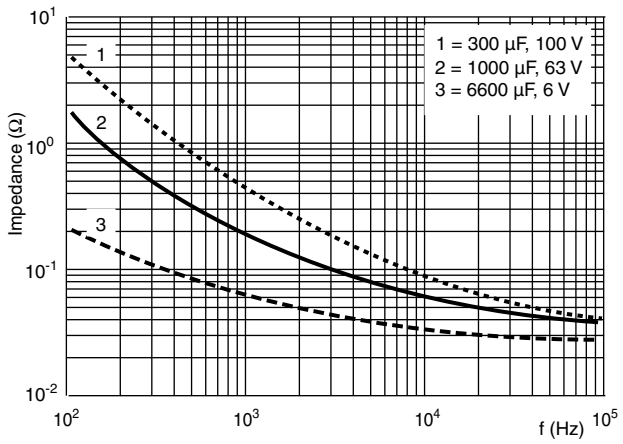


ESR/frequency at 20 °C

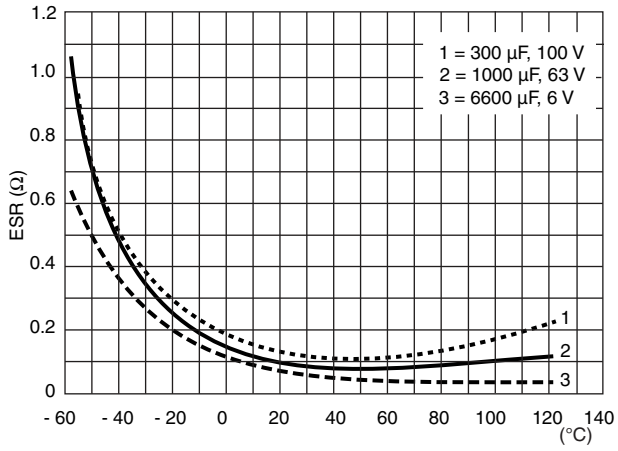


PERFORMANCE CURVES

Impedance/frequency at 20 °C



ESR/frequency at 20 °C



Note

- All performance curves are provided from historic Arcotronics module series TM datasheet information

CROSS REFERENCE

VISHAY PART NUMBER	ARCOTRONICS PART NUMBER
MT2B227M125S	402/1/80115/011
MT2B247M125S	402/1/80115/012
MT2B277M100S	402/1/80114/013
MT2B287M100S	402/1/80114/014
MT2B307M100S	402/1/80114/015
MT2B337M075S	402/1/80113/016
MT2B347M075S	402/1/80113/017
MT2B397M075S	402/1/80113/018
MT2B417M075S	402/1/80113/019
MT2B477M075S	402/1/80113/020
MT2B507M075S	402/1/80113/021
MT2B587M075S	402/1/80113/022
MT2B607M075S	402/1/80113/023
MT2B687M075S	402/1/80113/024
MT2B757M075S	402/1/80113/025
MT2B757M063S	402/1/80112/025
MT2B827M063S	402/1/80112/026
MT2B907M050S	402/1/80111/027
MT2B108M063S	402/1/80112/028
MT2B118M050S	402/1/80111/029
MT2B128M040S	402/1/80110/030
MT2B138M040S	402/1/80110/031
MT2B148M030S	402/1/80109/032
MT2B158M025S	402/1/80108/033
MT2B178M030S	402/1/80109/034

CROSS REFERENCE	
VISHAY PART NUMBER	**ARCOTRONICS PART NUMBER**
MT2B168M025S	402/1/80108/035
MT2B208M025S	402/1/80108/036
MT2B228M025S	402/1/80108/037
MT2B248M020S	402/1/80107/038
MT2B248M025S	402/1/80108/039
MT2B278M020S	402/1/80107/040
MT2B268M020S	402/1/80107/041
MT2B338M016S	402/1/80106/042
MT2B348M015S	402/1/80105/043
MT2B398M010S	402/1/80104/044
MT2B418M010S	402/1/80104/045
MT2B478M010S	402/1/80104/046
MT2B508M008S	402/1/80103/047
MT2B518M010S	402/1/80104/048
MT2B568M6R3S	402/1/80102/049
MT2B608M006S	402/1/80101/050

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