Wet Tantalum Capacitor, Button, All-Tantalum Case, Non-Polar, - 55 °C to + 125 °C Operation

INTRODUCTION

This conveniently-packaged non-polar button unit employs a non-solid electrolyte, and has a sintered tantalum anode. The anode is produced from medium capacitance powder and the lower CV product allows a tighter specification of capacitance stability, dissipation factor and leakage current.

The cathode is also of tantalum, and overcomes the restrictions of a silver cathode system in allowing a high ripple current rating.

The ANP2 capacitor is based upon the CH capacitor design, but with twin tantalum electrodes made of sintered compacts of high purity tantalum powder. The dielectric layer of tantalum pentoxide is formed on each compact to withstand rated voltage. This enables the capacitor to be used where DC bias may fluctuate positively or negatively. The system is then enclosed between a tantalum plate and a tantalum cup, with an outer nickel case.

The seal is a highly efficient system comprising a PTFE gasket clamped between coined plates of tantalum by a work-hardened nickel ring. This type of seal, common to all button styles, is largely responsible for their long life and high reliability under severe military environments.

The combination of the tantalum pentoxide dielectric stability and the extremely efficient seal has been shown to ensure that there is no significant difference in electrical parameters or instant use behaviour after 10 years storage or longer. A shelf life in excess of 20 years is confidently expected.

There are four types of terminations and mounting options are available. These include a treated stud or bolt, PCB pins, a tab for panels, and ribbons leads slotted through-holes. These are illustrated in the photograph, and dimensional table drawing.

APPLICATIONS

The ANP series is designed for use in general military and professional applications. For example: Power supply “smoothing”, filter networks, switching, by-pass, timer functions, and where reverse potential occur.

WEIGHT

The ANP2 style with a stud termination weighs approximately 18.1 g, including the nut. The ANP2 styles, which has a printed circuit board mounting, weighs approximately 17.3 g.

FEATURES

- All-Tantalum electrodes eliminate silver migration
- Withstands high ripple current
- Long life reliability
- Non-polar design
- Mounting: Through-hole

PERFORMANCE CHARACTERISTICS

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

Voltage Range: 3 V_{DC} to 75 V_{DC}

Capacitance Range: 33 µF to 470 µF

SPECIFICATIONS

Environmental classification: 55/125/56

Vibration: 10 Hz to 2000 Hz, 0.75 mm or 98 m/s^2, 150 h

Bump: 390 m/s^2, 4000 bumps

Shock: 981 m/s^2

Acceleration: 981 m/s^2

Low air pressure: 1 kPa

REVERSE VOLTAGE CAPABILITY

The ANP2 employs twin tantalum electrodes, which allows the continuous application of full rated voltage in both directions.

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.

ORDERING PROCEDURE

Example: ANP2C (220 µF, 10 V_{DC})

Vishay Part Number: ANP2B227M010A

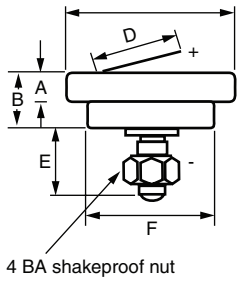
ORDERING INFORMATION

ANP2	C	227	M	100	A	-
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)	A = Stud B = PC mount pins C = Twin tag or ribbon D = Panel or potting tag	Blank = Standard (tin/lead coating) E3 = RoHS compliant (100 % tin coating)

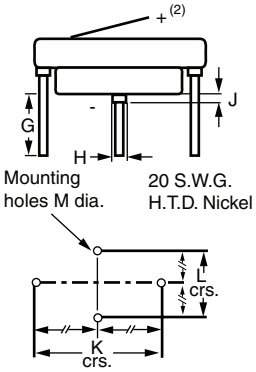
DIMENSIONS in millimeters

The ANP2 series is comprised of two case sizes, differing in depth of cup only. The case size dimensions are shown in the table. Four mounting styles are available in both case sizes.

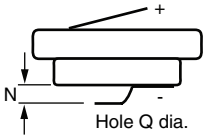
Stud



PC Pins

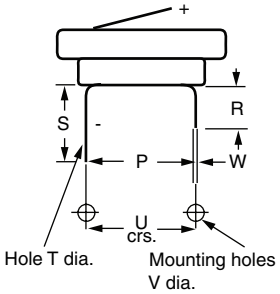


Potting Tag



This mounting style is suitable for panel thickness of up to 1.2 mm

Twin Tag or Ribbons



A	B	C	D	E	F	G	H	J	K crs.	L crs.	M dia.	N nom.	P dia.	Q	R	S	T dia.	U crs.	V dia.	W nom.
3.6	6.7 (1)	21.8	8.4 (2)	8.4	16.2	8.4	1.8	0.8	20.3	10.2	1.1	2.4	13.1	1.0	7.5	10.7	1.6	13.0	3.5	0.30

Notes

- All dimensions are in mm, and are maximum unless otherwise stated

(1) For C case size, case height is 8.5 mm

(2) Width of anode tag 4.22 mm max.

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
ANP2C226(1)075(2)	C	22	75	50	3.0	3.0	1.0	5.0	2.0	50	- 5.0	12.5
ANP2B156(1)075(2)	B	15	75	50	3.0	3.0	1.0	5.0	2.0	50	- 5.0	12.5
ANP2C336(1)050(2)	C	33	50	33.3	5.0	6.0	1.0	5.0	2.0	50	- 10	12.5
ANP2B226(1)050(2)	B	22	50	33.3	5.0	6.0	1.0	5.0	2.0	50	- 10	12.5
ANP2C476(1)040(2)	C	47	40	26.6	6.0	7.0	1.0	5.0	2.0	50	- 15	12.5
ANP2B336(1)040(2)	B	33	40	26.6	6.0	7.0	1.0	5.0	2.0	50	- 15	12.5
ANP2C686(1)030(2)	C	68	30	20	8.0	10	1.0	5.0	2.0	50	- 20	12.5
ANP2B476(1)030(2)	B	47	30	20	8.0	10	1.0	5.0	2.0	50	- 20	12.5
ANP2C107(1)020(2)	C	100	20	13.4	10	12	1.0	5.0	2.0	50	- 30	12.5
ANP2B686(1)020(2)	B	68	20	13.4	10	12	1.0	5.0	2.0	50	- 30	12.5
ANP2C157(1)015(2)	C	150	15	10	12	15	1.0	5.0	2.0	50	- 30	12.5
ANP2B107(1)015(2)	B	100	15	10	10	12	1.0	5.0	2.0	50	- 30	12.5
ANP2C227(1)010(2)	C	220	10	6.6	15	20	1.0	5.0	2.0	50	- 35	12.5
ANP2B157(1)010(2)	B	150	10	6.6	12	15	1.0	5.0	2.0	50	- 30	12.5
ANP2C337(1)006(2)	C	330	6	4	20	30	1.0	5.0	2.0	50	- 35	15
ANP2B227(1)006(2)	B	220	6	4	15	20	1.0	5.0	2.0	50	- 35	15
ANP2C477(1)003(2)	C	470	3	2	25	38	1.0	5.0	2.0	50	- 40	25
ANP2B337(1)003(2)	B	330	3	2	20	30	1.0	5.0	2.0	50	- 40	20

Notes

- (1) = Capacitance tolerance:
  M = 20 % standard
  K = 10 % special order
- (2) = Termination type:
  A = Stud or bolt
  B = Pins for PCB
  C = Twin tags or ribbons
  D = Potting tag

CROSS REFERENCE

VISHAY PART NUMBER	ARCOTRONICS PART NUMBER	NATO PART NUMBER
ANP2C226M075A	402/1/50040/002	5910-99-014-3038
ANP2B156M075A	402/1/50039/001	5910-99-014-3037
ANP2C336M050A	402/1/50040/003	5910-99-014-3040
ANP2B226M050A	402/1/50039/002	5910-99-014-3039
ANP2C476M040A	402/1/50040/004	5910-99-014-3042
ANP2B336M040A	402/1/50039/003	5910-99-014-3041
ANP2C686M030A	402/1/50040/005	5910-99-014-3044
ANP2B476M030A	402/1/50039/004	5910-99-014-3043
ANP2C107M020A	402/1/50040/006	5910-99-014-3046
ANP2B686M020A	402/1/50039/005	5910-99-014-3045
ANP2C157M015A	402/1/50040/007	5910-99-014-3048
ANP2B107M015A	402/1/50039/006	5910-99-014-3047
ANP2C227M010A	402/1/50040/008	5910-99-014-3050
ANP2B157M010A	402/1/50039/007	5910-99-014-3049
ANP2C337M006A	402/1/50040/009	5910-99-014-3052

CROSS REFERENCE		
VISHAY PART NUMBER	**ARCOTRONICS PART NUMBER**	**NATO PART NUMBER**
ANP2B227M006A	402/1/50039/008	5910-99-014-3051
ANP2C477M003A	402/1/50040/010	5910-99-014-3055
ANP2B337M003A	402/1/50039/009	5910-99-014-3053
ANP2C226K075A	402/1/50040/022	N/a
ANP2B156K075A	402/1/50039/021	N/a
ANP2C336K050A	402/1/50040/023	N/a
ANP2B226K050A	402/1/50039/022	N/a
ANP2C476K040A	402/1/50040/024	N/a
ANP2B336K040A	402/1/50039/023	N/a
ANP2C686K030A	402/1/50040/025	N/a
ANP2B476K030A	402/1/50039/024	N/a
ANP2C107K020A	402/1/50040/026	N/a
ANP2B686K020A	402/1/50039/025	N/a
ANP2C157K015A	402/1/50040/027	N/a
ANP2B107K015A	402/1/50039/026	N/a
ANP2C227K010A	402/1/50040/028	N/a
ANP2B157K010A	402/1/50039/027	N/a
ANP2C337K006A	402/1/50040/029	N/a
ANP2B227K006A	402/1/50039/028	N/a
ANP2C477K003A	402/1/50040/030	N/a
ANP2B337K003A	402/1/50039/029	N/a
ANP2C226M075D	402/1/50042/002	5910-99-014-3102
ANP2B156M075D	402/1/50041/001	5910-99-014-3101
ANP2C336M050D	402/1/50042/003	5910-99-014-3104
ANP2B226M050D	402/1/50041/002	5910-99-014-3103
ANP2C476M040D	402/1/50042/004	5910-99-014-3106
ANP2B336M040D	402/1/50041/003	5910-99-014-3105
ANP2C686M030D	402/1/50042/005	5910-99-014-3108
ANP2B476M030D	402/1/50041/004	5910-99-014-3107
ANP2C107M020D	402/1/50042/006	5910-99-014-3110
ANP2B686M020D	402/1/50041/005	5910-99-014-3109
ANP2C157M015D	402/1/50042/007	5910-99-014-3112
ANP2B107M015D	402/1/50041/006	5910-99-014-3111
ANP2C227M010D	402/1/50042/008	5910-99-014-3114
ANP2B157M010D	402/1/50041/007	5910-99-014-3113
ANP2C337M006D	402/1/50042/009	5910-99-014-3116
ANP2B227M006D	402/1/50041/008	5910-99-014-3115
ANP2C477M003D	402/1/50042/010	5910-99-014-3118
ANP2B337M003D	402/1/50041/009	5910-99-014-3117
ANP2C226K075D	402/1/50042/022	N/a
ANP2B156K075D	402/1/50041/021	N/a
ANP2C336K050D	402/1/50042/023	N/a
ANP2B226K050D	402/1/50041/022	N/a
ANP2C476K040D	402/1/50042/024	N/a

CROSS REFERENCE		
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ANP2C686K030D	402/1/50042/025	N/a
ANP2B476K030D	402/1/50041/024	N/a
ANP2C107K020D	402/1/50042/026	N/a
ANP2B686K020D	402/1/50041/025	N/a
ANP2C157K015D	402/1/50042/027	N/a
ANP2B107K015D	402/1/50041/026	N/a
ANP2C227K010D	402/1/50042/028	N/a
ANP2B157K010D	402/1/50041/027	N/a
ANP2C337K006D	402/1/50042/029	N/a
ANP2B227K006D	402/1/50041/028	N/a
ANP2C477K003D	402/1/50042/030	N/a
ANP2B337K003D	402/1/50041/029	N/a
ANP2C226M075B	402/1/50150/002	5910-99-014-3070
ANP2B156M075B	402/1/50149/001	5910-99-014-3069
ANP2C336M050B	402/1/50150/003	5910-99-014-3072
ANP2B226M050B	402/1/50149/002	5910-99-014-3071
ANP2C476M040B	402/1/50150/004	5910-99-014-3074
ANP2B336M040B	402/1/50149/003	5910-99-014-3073
ANP2C686M030B	402/1/50150/005	5910-99-014-3076
ANP2B476M030B	402/1/50149/004	5910-99-014-3075
ANP2C107M020B	402/1/50150/006	5910-99-014-3078
ANP2B686M020B	402/1/50149/005	5910-99-014-3077
ANP2C157M015B	402/1/50150/007	5910-99-014-3080
ANP2B107M015B	402/1/50149/006	5910-99-014-3079
ANP2C227M010B	402/1/50150/008	5910-99-014-3082
ANP2B157M010B	402/1/50149/007	5910-99-014-3081
ANP2C337M006B	402/1/50150/009	5910-99-014-3084
ANP2B227M006B	402/1/50149/008	5910-99-014-3083
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ANP2B337M003B	402/1/50149/009	5910-99-014-3085
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ANP2B336K040B	402/1/50149/023	N/a
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CROSS REFERENCE		
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ANP2B227K006B	402/1/50149/028	N/a
ANP2C477K003B	402/1/50150/030	N/a
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ANP2B156M075C	402/1/50043/001	N/a
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ANP2B336M040C	402/1/50043/003	N/a
ANP2C686M030C	402/1/50044/005	N/a
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ANP2B156K075C	402/1/50043/021	N/a
ANP2C336K050C	402/1/50044/023	N/a
ANP2B226K050C	402/1/50043/022	N/a
ANP2C476K040C	402/1/50044/024	N/a
ANP2B336K040C	402/1/50043/023	N/a
ANP2C686K030C	402/1/50044/025	N/a
ANP2B476K030C	402/1/50043/024	N/a
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ANP2B157K010C	402/1/50043/027	N/a
ANP2C337K006C	402/1/50044/029	N/a
ANP2B227K006C	402/1/50043/028	N/a
ANP2C477K003C	402/1/50044/030	N/a
ANP2B337K003C	402/1/50043/029	N/a

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