Solid Tantalum Surface Mount Capacitors TANTAMOUNT® Conformal Coated, Military MIL-PRF-55365/4 Qualified

FEATURES

- Weibull failure rates B, C, D, T
  Exponential failure rates M, P, R, S
- Tape and reel available per EIA 481
- Termination finishes available; gold plate, solder plated and hot solder dipped
- Mounting: Surface mount
- Compliant to RoHS Directive 2002/95/EC

Pb-free Available

RoHS* COMPLIANT

Note

* Pb containing terminations are not RoHS compliant, exemptions may apply

PERFORMANCE CHARACTERISTICS

Operating Temperature: - 55 °C to + 125 °C
(above 85 °C, voltage derating is required)
Capacitance Range: 0.10 µF to 100 µF

Capacitance Tolerance: ± 5 %, ± 10 %, ± 20 %
Voltage Rating: 4 V_{DC} to 50 V_{DC}

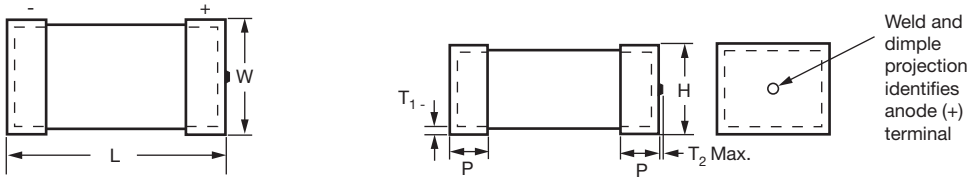
ORDERING INFORMATION

CWR06	D	B	155	K	B	A	/TR
TYPE	VOLTAGE	TERMINATION FINISH	CAPACITANCE	CAPACITANCE TOLERANCE	FAILURE RATE %/1000 h	SURGE CURRENT (OPTIONAL)	PACKAGING
	C = 4 V D = 6 V F = 10 V H = 15 V J = 20 V K = 25 V M = 35 V N = 50 V	B = Gold C = Hot solder dipped H = Solder plate	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	J = ± 5 % K = ± 10 % M = ± 20 %	M = 1.0 P = 0.1 R = 0.01 S = 0.001 B = 0.1 C = 0.01 D = 0.001 (1) T = 0.01 (2)	A = 10 cycles at + 25 °C B = 10 cycles at - 55 °C and + 85 °C C = 10 cycles at - 55 °C and + 85 °C (before Weibull grading)	Blank = Bulk, plastic tray /FA = Waffle pack /PR = 100 pcs reel /HR = Half reel /TR = Full reel

Notes

(1) Contact marketing for availability of Weibull D failure rate for 50 V ratings
(2) T level capacitors are recommended for "space applications"

DIMENSIONS in inches [millimeters]



CASE CODE	L	W	H	P	T_1	T_2 (MAX.)
A	0.100 ± 0.015 [2.54 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
B	0.150 ± 0.015 [3.81 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
C	0.200 ± 0.015 [5.08 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
D	0.150 ± 0.015 [3.81 ± 0.38]	0.100 ± 0.015 [2.54 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
E	0.200 ± 0.015 [5.08 ± 0.38]	0.100 ± 0.015 [2.54 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
F	0.220 ± 0.015 [5.59 ± 0.38]	0.135 ± 0.015 [3.43 ± 0.38]	0.070 ± 0.015 [1.78 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
G	0.265 ± 0.015 [6.73 ± 0.38]	0.110 ± 0.015 [2.79 ± 0.38]	0.110 ± 0.015 [2.79 ± 0.38]	0.050 ± 0.005 [1.27 ± 0.13]	0.005 [0.13]	0.015 [0.38]
H	0.285 ± 0.015 [7.24 ± 0.38]	0.150 ± 0.015 [3.81 ± 0.38]	0.110 ± 0.015 [2.79 ± 0.38]	0.050 ± 0.005 [1.27 ± 0.13]	0.005 [0.13]	0.015 [0.38]

Note

- When solder coated terminations are required, add 0.015" [0.38 mm] to termination dimension tolerances

RATINGS AND CASE CODES

µF	4 V	6 V	10 V	15 V	20 V	25 V	35 V	50 V
0.10								A
0.15								A
0.22							A	B
0.33						A		B
0.47					A		B	C
0.68				A	B	B	C	D
1.0			A		B	C	D	E
1.5		A		B	C	D	E	F
2.2	A		B	C	D	E		F
3.3		B	C	D	E		F	G
4.7	B	C	D	E		F	G	H
6.8	C	D	E		F	G	H	
10	D	E		F		G		
15	E		F		G	H		
22		F		G	H			
33	F		G	H				
47		G	H					
68	G	H						
100	H							

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL (µA) AT			MAX. DF (%) AT			MAX. ESR AT + 25 °C 100 kHz (Ω)
			+ 25 °C	+ 85 °C	+ 125 °C	+ 25 °C	+ 85 °C + 125 °C	- 55 °C	
4 V_{DC} AT + 85 °C; 2.7 V_{DC} AT + 125 °C									
2.2	A	CWR06C(1)225(2)(3)(4)(5)	1.0	10	12	6	8	8	8.0
4.7	B	CWR06C(1)475(2)(3)(4)(5)	1.0	10	12	6	8	8	8.0
6.8	C	CWR06C(1)685(2)(3)(4)(5)	1.0	10	12	6	8	8	5.5
10	D	CWR06C(1)106(2)(3)(4)(5)	1.0	10	12	8	8	10	4.0
15	E	CWR06C(1)156(2)(3)(4)(5)	1.0	10	12	8	10	12	3.5
33	F	CWR06C(1)336(2)(3)(4)(5)	2.0	20	24	8	10	12	2.2
68	G	CWR06C(1)686(2)(3)(4)(5)	3.0	30	36	10	12	12	1.1
100	H	CWR06C(1)107(2)(3)(4)(5)	4.0	40	48	10	12	12	0.9
6 V_{DC} AT + 85 °C; 4 V_{DC} AT + 125 °C									
1.5	A	CWR06D(1)155(2)(3)(4)(5)	1.0	10	12	6	8	8	8.0
3.3	B	CWR06D(1)335(2)(3)(4)(5)	1.0	10	12	6	8	8	8.0
4.7	C	CWR06D(1)475(2)(3)(4)(5)	1.0	10	12	6	8	8	5.5
6.8	D	CWR06D(1)685(2)(3)(4)(5)	1.0	10	12	6	8	8	4.5
10	E	CWR06D(1)106(2)(3)(4)(5)	1.0	10	12	8	10	12	3.5
22	F	CWR06D(1)226(2)(3)(4)(5)	2.0	20	24	8	10	12	2.2
47	G	CWR06D(1)476(2)(3)(4)(5)	3.0	30	36	10	12	12	1.1
68	H	CWR06D(1)686(2)(3)(4)(5)	4.0	40	48	10	12	12	0.9

Notes

(1) Termination finish: B, C, H
(2) Capacitance tolerance: J, K, M
(3) Failure rate: B, C, D, M, P, R, S, T
(4) Surge current (optional): A, B, C
(5) Packaging: Blank, /FA, /HR, /PR, /TR
* 5 % tolerance is not available for the 0.33 µF/50 V design

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL (µA) AT			MAX. DF (%) AT			MAX. ESR AT + 25 °C 100 kHz (Ω)
			+ 25 °C	+ 85 °C	+ 125 °C	+ 25 °C	+ 85 °C + 125 °C	- 55 °C	
10 V_{DC} AT + 85 °C; 7 V_{DC} AT + 125 °C									
1.0	A	CWR06F(1)105(2)(3)(4)(5)	1.0	10	12	6	8	8	12.0
2.2	B	CWR06F(1)225(2)(3)(4)(5)	1.0	10	12	6	8	8	8.0
3.3	C	CWR06F(1)335(2)(3)(4)(5)	1.0	10	12	6	8	8	5.5
4.7	D	CWR06F(1)475(2)(3)(4)(5)	1.0	10	12	6	8	8	4.5
6.8	E	CWR06F(1)685(2)(3)(4)(5)	1.0	10	12	6	8	8	3.5
15	F	CWR06F(1)156(2)(3)(4)(5)	2.0	20	24	8	8	10	2.5
33	G	CWR06F(1)336(2)(3)(4)(5)	3.0	30	36	10	12	12	1.1
47	H	CWR06F(1)476(2)(3)(4)(5)	5.0	50	60	10	12	12	0.9
15 V_{DC} AT + 85 °C; 10 V_{DC} AT + 125 °C									
0.68	A	CWR06H(1)684(2)(3)(4)(5)	1.0	10	12	6	8	8	12.0
1.5	B	CWR06H(1)155(2)(3)(4)(5)	1.0	10	12	6	8	8	8.0
2.2	C	CWR06H(1)225(2)(3)(4)(5)	1.0	10	12	6	8	8	5.5
3.3	D	CWR06H(1)335(2)(3)(4)(5)	1.0	10	12	6	8	8	5.0
4.7	E	CWR06H(1)475(2)(3)(4)(5)	1.0	10	12	6	8	8	4.0
10	F	CWR06H(1)106(2)(3)(4)(5)	2.0	20	24	6	8	8	2.5
22	G	CWR06H(1)226(2)(3)(4)(5)	4.0	40	48	6	8	8	1.1
33	H	CWR06H(1)336(2)(3)(4)(5)	5.0	50	60	8	8	10	0.9
20 V_{DC} AT + 85 °C; 13 V_{DC} AT + 125 °C									
0.47	A	CWR06J(1)474(2)(3)(4)(5)	1.0	10	12	8	8	10	16.0
0.68	B	CWR06J(1)684(2)(3)(4)(5)	1.0	10	12	6	8	8	14.0
1.0	B	CWR06J(1)105(2)(3)(4)(5)	1.0	10	12	6	8	8	12.0
1.5	C	CWR06J(1)155(2)(3)(4)(5)	1.0	10	12	6	8	8	6.0
2.2	D	CWR06J(1)225(2)(3)(4)(5)	1.0	10	12	6	8	8	5.0
3.3	E	CWR06J(1)335(2)(3)(4)(5)	1.0	10	12	6	8	8	4.0
6.8	F	CWR06J(1)685(2)(3)(4)(5)	2.0	20	24	6	8	8	2.4
15	G	CWR06J(1)156(2)(3)(4)(5)	3.0	30	36	6	8	8	1.1
22	H	CWR06J(1)226(2)(3)(4)(5)	4.0	40	48	6	8	8	0.9
25 V_{DC} AT + 85 °C; 17 V_{DC} AT + 125 °C									
0.33	A	CWR06K(1)334(2)(3)(4)(5)	1.0	10	12	6	8	8	15.0
0.68	B	CWR06K(1)684(2)(3)(4)(5)	1.0	10	12	6	8	8	10.0
1.0	C	CWR06K(1)105(2)(3)(4)(5)	1.0	10	12	6	8	8	6.5
1.5	D	CWR06K(1)155(2)(3)(4)(5)	1.0	10	12	6	8	8	6.5
2.2	E	CWR06K(1)225(2)(3)(4)(5)	1.0	10	12	6	8	8	3.5
4.7	F	CWR06K(1)475(2)(3)(4)(5)	2.0	20	24	6	8	8	2.5
6.8	G	CWR06K(1)685(2)(3)(4)(5)	2.0	20	24	6	8	8	1.2
10	G	CWR06K(1)106(2)(3)(4)(5)	3.0	30	36	6	8	8	1.4
15	H	CWR06K(1)156(2)(3)(4)(5)	4.0	40	48	6	8	8	1.0

Notes

(1) Termination finish: B, C, H
(2) Capacitance tolerance: J, K, M
(3) Failure rate: B, C, D, M, P, R, S, T
(4) Surge current (optional): A, B, C
(5) Packaging: Blank, /FA, /HR, /PR, /TR
* 5 % tolerance is not available for the 0.33 µF/50 V design

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL (µA) AT			MAX. DF (%) AT			MAX. ESR AT + 25 °C 100 kHz (Ω)
			+ 25 °C	+ 85 °C	+ 125 °C	+ 25 °C	+ 85 °C + 125 °C	- 55 °C	
35 V_{DC} AT + 85 °C; 23 V_{DC} AT + 125 °C									
0.22	A	CWR06M(1)224(2)(3)(4)(5)	1.0	10	12	6	8	8	24.0
0.47	B	CWR06M(1)474(2)(3)(4)(5)	1.0	10	12	6	8	8	17.0
0.68	C	CWR06M(1)684(2)(3)(4)(5)	1.0	10	12	6	8	8	10.0
1.0	D	CWR06M(1)105(2)(3)(4)(5)	1.0	10	12	6	8	8	6.5
1.5	E	CWR06M(1)155(2)(3)(4)(5)	1.0	10	12	6	8	8	4.5
3.3	F	CWR06M(1)335(2)(3)(4)(5)	1.0	10	12	6	8	8	2.5
4.7	G	CWR06M(1)475(2)(3)(4)(5)	2.0	20	24	6	8	8	1.5
6.8	H	CWR06M(1)685(2)(3)(4)(5)	3.0	30	36	6	8	8	1.3
50 V_{DC} AT + 85 °C; 33 V_{DC} AT + 125 °C									
0.10	A	CWR06N(1)104(2)(3)(4)(5)	1.0	10	12	6	8	8	75.0
0.15	A	CWR06N(1)154(2)(3)(4)(5)	1.0	10	12	6	8	8	25.0
0.22	B	CWR06N(1)224(2)(3)(4)(5)	1.0	10	12	6	8	8	17.0
0.33 *	B	CWR06N(1)334(2)(3)(4)(5)	1.0	10	12	6	8	8	12.0
0.47	C	CWR06N(1)474(2)(3)(4)(5)	1.0	10	12	6	8	8	8.0
0.68	D	CWR06N(1)684(2)(3)(4)(5)	1.0	10	12	6	8	8	7.0
1.0	E	CWR06N(1)105(2)(3)(4)(5)	1.0	10	12	6	8	8	6.0
1.5	F	CWR06N(1)155(2)(3)(4)(5)	1.0	10	12	6	8	8	4.0
2.2	F	CWR06N(1)225(2)(3)(4)(5)	2.0	20	24	6	8	8	2.5
3.3	G	CWR06N(1)335(2)(3)(4)(5)	2.0	20	24	6	8	8	2.0
4.7	H	CWR06N(1)475(2)(3)(4)(5)	3.0	30	36	6	8	8	1.5

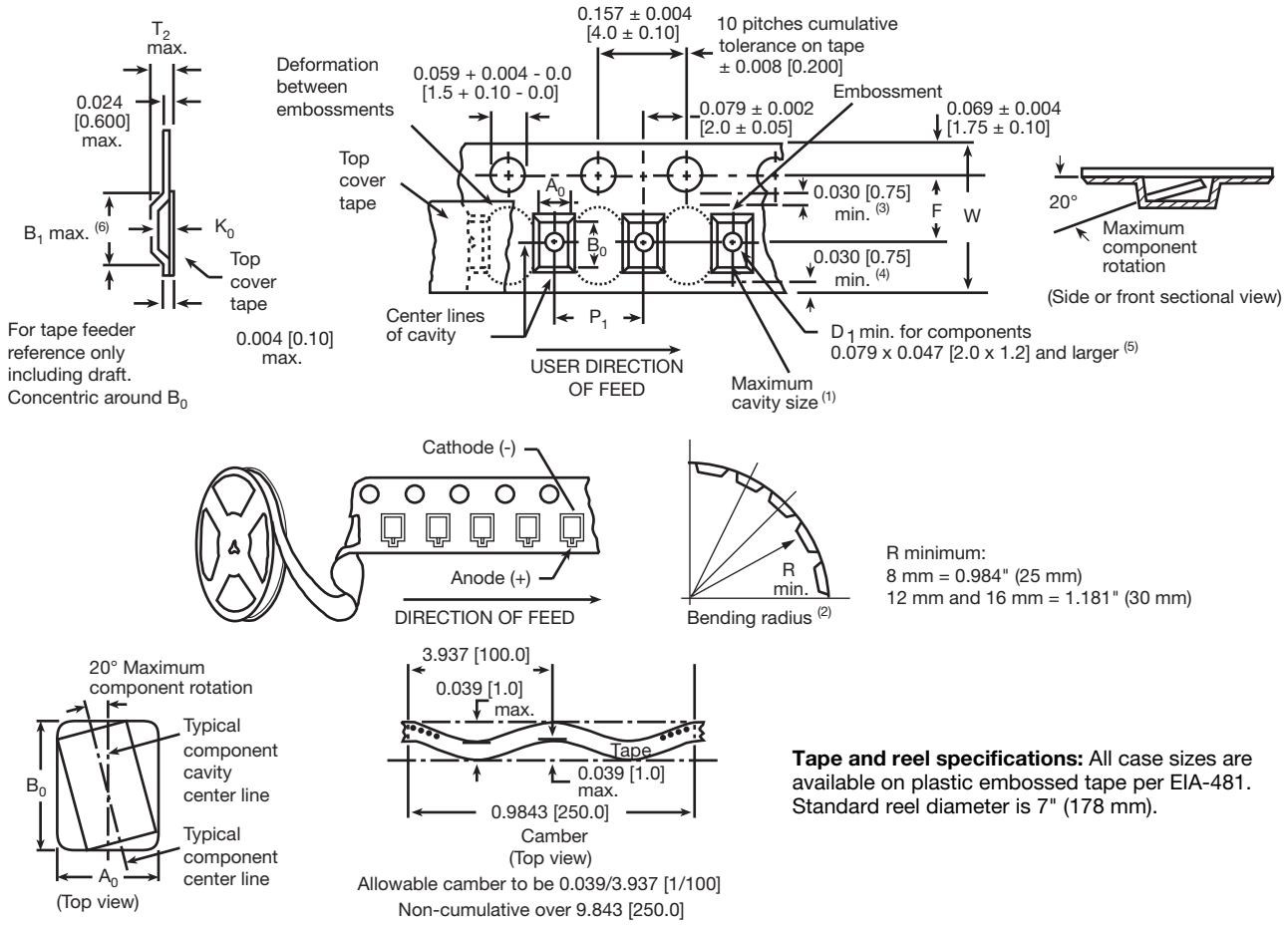
Notes

(1) Termination finish: B, C, H
(2) Capacitance tolerance: J, K, M
(3) Failure rate: B, C, D, M, P, R, S, T
(4) Surge current (optional): A, B, C
(5) Packaging: Blank, /FA, /HR, /PR, /TR
* 5 % tolerance is not available for the 0.33 µF/50 V design

TAPE AND REEL PACKAGING in inches [millimeters]

Note

- Metric dimensions will govern. Dimensions in inches are rounded and for reference only.



Tape and reel specifications: All case sizes are available on plastic embossed tape per EIA-481. Standard reel diameter is 7" (178 mm).

Notes

(1) A_0, B_0, K_0, are determined by the maximum dimensions to the ends of the terminals extending from the component body and/or the body dimensions of the component. The clearance between the ends of the terminals or body of the component to the sides and depth of the cavity (A_0, B_0, K_0) must be within 0.002" (0.05 mm) minimum and 0.020" (0.50 mm) maximum. The clearance allowed must also prevent rotation of the component within the cavity of not more than 20°.

(2) Tape with components shall pass around radius "R" without damage. The minimum trailer length may require additional length to provide "R" minimum for 12 mm embossed tape for reels with hub diameters approaching N minimum.

(3) This dimension is the flat area from the edge of the sprocket hole to either outward deformation of the carrier tape between the embossed cavities or to the edge of the cavity whichever is less.

(4) This dimension is the flat area from the edge of the carrier tape opposite the sprocket holes to either the outward deformation of the carrier tape between the embossed cavity or to the edge of the cavity whichever is less.

(5) The embossed hole location shall be measured from the sprocket hole controlling the location of the embossement. Dimensions of embossement location shall be applied independent of each other.

(6) B_1 dimension is a reference dimension tape feeder clearance only.

CARRIER TAPE DIMENSIONS in inches [millimeters]

CASE CODE	TAPE SIZE	B_1 (max.)	D_1 (min.)	F	P_1	T_2 (max.)	W
A	8 mm	0.179 [4.55]	0.039 [1.0]	0.138 ± 0.002 [3.5 ± 0.05]	0.157 ± 0.004 [4.0 ± 0.1]	0.098 [2.5]	0.315 + 0.004 [8.0 ± 0.10]
B, C, D, E	12 mm	0.323 [8.2]	0.059 [1.5]	0.217 ± 0.002 [5.5 ± 0.05]	0.157 ± 0.004 [4.0 ± 0.1]	0.256 [6.5]	0.472 ± 0.012 [12.0 ± 0.30]
F	12 mm double pitch	0.323 [8.2]	0.059 [1.5]	0.217 ± 0.002 [5.5 ± 0.05]	0.315 ± 0.004 [8.0 ± 0.10]	0.256 [6.5]	0.472 ± 0.012 [12.0 ± 0.30]
G, H	16 mm	0.476 [12.1]	0.059 [1.5]	0.295 ± 0.004 [7.5 ± 0.1]	0.315 ± 0.004 [8.0 ± 0.10]	0.315 [8.0]	0.642 max. [16.3] max.

STANDARD PACKAGING QUANTITY

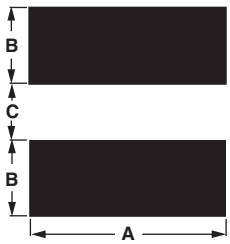
CASE CODE	QUANTITY (PCS/REEL)			BULK, PLASTIC TRAY QUANTITY (PCS)
	7", FULL REEL (/TR)	7", HALF REEL (/HR)	7", PARTIAL REEL (/PR)	
A, B, C, D, E	2500	1250	100	75
F	1000	500	100	75
G	600	300	100	60
H	600	300	100	50

Notes

(1) Bulk capacitors are shipped in plastic trays

(2) T level capacitors are only shipped in tape and reel/or waffle packaging. Contact factory for waffle pack quantities

PAD DIMENSIONS in inches [millimeters]



CASE CODE	WIDTH (A)	PAD METALLIZATION (B)	SEPARATION (C)
A	0.065 [1.6]	0.050 [1.3]	0.040 [1.0]
B	0.065 [1.6]	0.070 [1.8]	0.055 [1.4]
C	0.065 [1.6]	0.070 [1.8]	0.120 [3.0]
D	0.115 [2.9]	0.070 [1.8]	0.070 [1.8]
E	0.115 [2.9]	0.070 [1.8]	0.120 [3.0]
F	0.150 [3.8]	0.070 [1.8]	0.140 [3.6]
G	0.125 [3.2]	0.070 [1.8]	0.170 [4.3]
H	0.165 [4.2]	0.090 [2.3]	0.170 [4.3]

POWER DISSIPATION

CASE CODE	MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (W) IN FREE AIR
A	0.060
B, C	0.075
D, E	0.085
F	0.110
G	0.120
H	0.150

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