

Solid Tantalum Surface Mount Capacitors

TANTAMOUNT® Molded Case, Military MIL-PRF-55365/8 Qualified



FEATURES

- Molded case available in four case codes
- Compatible with “High Volume” automatic pick and place equipment
- Weibull failure rate codes B, C, D and T
- Termination: H = Solder plated, K = Solder fused
- Surge current options A, B and C
- Mounting: Surface mount

PERFORMANCE/ELECTRICAL CHARACTERISTICS

www.vishay.com/doc?40088

Operating Temperature: - 55 °C to + 85 °C
(to + 125 °C with voltage derating)

Capacitance Range: 0.10 µF to 100 µF

Capacitance Tolerance: ± 5 %, ± 10 %, ± 20 %

Voltage Rating: 4 V_{DC} to 50 V_{DC}

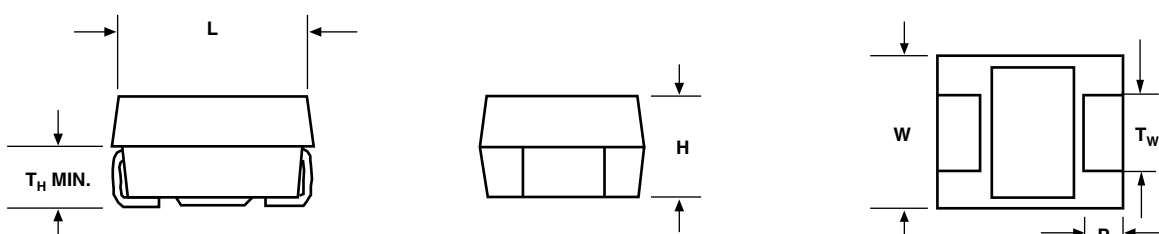
ORDERING INFORMATION

CWR11	D	H	155	K	B	A	/HR
TYPE	VOLTAGE	TERMINATION FINISH	CAPACITANCE	CAPACITANCE TOLERANCE	FAILURE RATE %/1000 h	SURGE CURRENT (OPTIONAL)	PACKAGING OPTION
	C = 4 V D = 6 V F = 10 V H = 15 V J = 20 V K = 25 V M = 35 V N = 50 V	H = Solder plated K = Solder fused	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 T = 0.01 ⁽¹⁾	A = + 25 °C after Weibull B = - 55 °C/+ 85 °C after Weibull C = - 55 °C/+ 85 °C before Weibull	Blank = Full reel /PR = 100 pcs reel /HR = half reel /PT = Bulk, plastic tray

Note

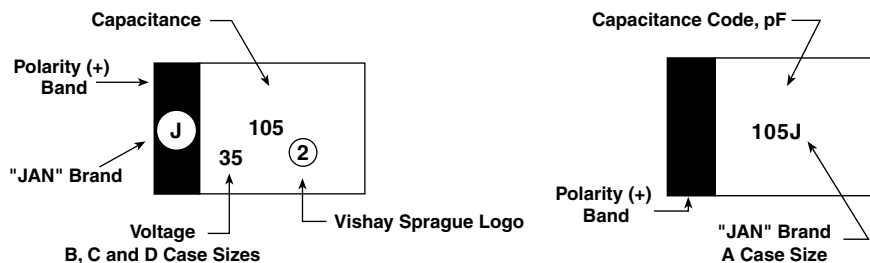
⁽¹⁾ T level capacitors are recommended for “Space applications”

DIMENSIONS in inches [millimeters]

							
CASE CODE	EIA SIZE	L	W	H	P	T _W	T _H MIN.
A	3216-18	0.126 ± 0.008 [3.2 ± 0.20]	0.063 ± 0.008 [1.6 ± 0.20]	0.063 ± 0.008 [1.6 ± 0.20]	0.031 ± 0.012 [0.80 ± 0.30]	0.047 ± 0.004 [1.2 ± 0.10]	0.028 [0.70]
B	3528-21	0.138 ± 0.008 [3.5 ± 0.20]	0.110 ± 0.008 [2.8 ± 0.20]	0.075 ± 0.008 [1.9 ± 0.20]	0.031 ± 0.012 [0.80 ± 0.30]	0.087 ± 0.004 [2.2 ± 0.10]	0.028 [0.70]
C	6032-28	0.236 ± 0.012 [6.0 ± 0.30]	0.126 ± 0.012 [3.2 ± 0.30]	0.098 ± 0.012 [2.5 ± 0.30]	0.051 ± 0.012 [1.3 ± 0.30]	0.087 ± 0.004 [2.2 ± 0.10]	0.039 [1.0]
D	7343-31	0.287 ± 0.012 [7.3 ± 0.30]	0.170 ± 0.012 [4.3 ± 0.30]	0.110 ± 0.012 [2.8 ± 0.30]	0.051 ± 0.012 [1.3 ± 0.30]	0.095 ± 0.004 [2.4 ± 0.10]	0.039 [1.0]

RATINGS AND CASE CODES

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

MARKING

STANDARD RATINGS

CAPACITANCE (μF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE (μA) AT			MAX. DF 120 Hz (%) 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	CWR11C(5)225(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	8.0
4.7	A	CWR11C(5)475(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	8.0
6.8	B	CWR11C(5)685(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	5.5
10	B	CWR11C(5)106(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	4.0
15	B	CWR11C(5)156(1)(2)(3)(4)	0.6	6.0	7.2	6	9	9	3.5
33	C	CWR11C(5)336(1)(2)(3)(4)	1.3	13.0	15.6	6	9	9	2.2
68	D	CWR11C(5)686(1)(2)(3)(4)	2.7	27.0	32.4	6	9	9	1.1
100	D	CWR11C(5)107(1)(2)(3)(4)	4.0	40.0	48.0	8	12	12	0.9
6 V _{DC} AT + 85 °C; 4 V _{DC} AT + 125 °C									
1.5	A	CWR11D(5)155(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	8.0
2.2	A	CWR11D(5)225(1)(2)(3)(4)	0.5	5.0	6.0	6	6	9	8.0
3.3	A	CWR11D(5)335(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	8.0

Note

- Part number definitions:
 - Capacitance tolerance: J, K, M
 - Failure rate: B, C, D, M, P, R, S, T
Exponential failure rate levels M, P, R, and S are inactive for new design per MIL-PRF-55365
Capacitors qualified to Weibull failure rate levels are substitutable for exponential failure rate levels
 - Surge current (optional): A, B, C
 - Packaging: Blank, /HR, /PR, /PT
 - Termination: K - solder plated, H - solder fused



STANDARD RATINGS									
CAPACITANCE (μF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE (μA) AT			MAX. DF 120 Hz (%) AT			MAX. ESR AT + 25 °C 100 kHz (Ω)
			+ 25 °C	+ 85 °C	+ 125 °C	+ 25 °C	+ 85 °C + 125 °C	- 55 °C	
6 V _{DC} AT + 85 °C; 4 V _{DC} AT + 125 °C									
4.7	B	CWR11D(5)475(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	5.5
6.8	B	CWR11D(5)685(1)(2)(3)(4)	0.5	5.0	6.0	6	6	9	4.5
10	B	CWR11D(5)106(1)(2)(3)(4)	0.6	6.0	7.2	6	9	9	3.5
15	C	CWR11D(5)156(1)(2)(3)(4)	0.9	9.0	10.8	6	6	9	3.0
22	C	CWR11D(5)226(1)(2)(3)(4)	1.4	14.0	16.8	6	9	9	2.2
47	D	CWR11D(5)476(1)(2)(3)(4)	2.8	28.0	33.6	6	6	9	1.1
68	D	CWR11D(5)686(1)(2)(3)(4)	4.3	43.0	51.6	6	9	9	0.9
10 V _{DC} AT + 85 °C; 7 V _{DC} AT + 125 °C									
1.0	A	CWR11F(5)105(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	10.0
1.5	A	CWR11F(5)155(1)(2)(3)(4)	0.5	5.0	6.0	6	6	9	8.0
2.2	A	CWR11F(5)225(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	8.0
3.3	B	CWR11F(5)335(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	5.5
4.7	B	CWR11F(5)475(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	4.5
6.8	B	CWR11F(5)685(1)(2)(3)(4)	0.7	7.0	8.4	6	9	9	3.5
15	C	CWR11F(5)156(1)(2)(3)(4)	1.5	15.0	18.0	6	6	9	2.5
33	D	CWR11F(5)336(1)(2)(3)(4)	3.3	33.0	39.6	6	9	9	1.1
47	D	CWR11F(5)476(1)(2)(3)(4)	4.7	47.0	56.4	6	9	9	0.9
15 V _{DC} AT + 85 °C; 10 V _{DC} AT + 125 °C									
0.68	A	CWR11H(5)684(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	12.0
1.0	A	CWR11H(5)105(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	10.0
1.5	A	CWR11H(5)155(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	8.0
2.2	B	CWR11H(5)225(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	5.5
3.3	B	CWR11H(5)335(1)(2)(3)(4)	0.5	5.0	6.0	6	8	9	5.0
4.7	B	CWR11H(5)475(1)(2)(3)(4)	0.7	7.0	8.4	6	9	9	4.0
10	C	CWR11H(5)106(1)(2)(3)(4)	1.6	16.0	19.2	6	8	9	2.5
22	D	CWR11H(5)226(1)(2)(3)(4)	3.3	33.0	39.6	6	8	9	1.1
33	D	CWR11H(5)336(1)(2)(3)(4)	5.3	53.0	63.6	6	9	9	0.9
20 V _{DC} AT + 85 °C; 13 V _{DC} AT + 125 °C									
0.47	A	CWR11J(5)474(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	14.0
0.68	A	CWR11J(5)684(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	12.0
1.0	A	CWR11J(5)105(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	10.0
1.5	B	CWR11J(5)155(1)(2)(3)(4)	0.5	5.0	6.0	6	9	9	6.0
2.2	B	CWR11J(5)225(1)(2)(3)(4)	0.5	5.0	6.0	6	8	9	5.0
3.3	B	CWR11J(5)335(1)(2)(3)(4)	0.7	7.0	8.4	6	9	9	4.0
4.7	C	CWR11J(5)475(1)(2)(3)(4)	1.0	10.0	12.0	6	8	9	3.0
6.8	C	CWR11J(5)685(1)(2)(3)(4)	1.4	14.0	16.8	6	9	9	2.4
15	D	CWR11J(5)156(1)(2)(3)(4)	3.0	30.0	36.0	6	8	9	1.1
22	D	CWR11J(5)226(1)(2)(3)(4)	4.4	44.0	52.8	6	9	9	0.9
25 V _{DC} AT + 85 °C; 17 V _{DC} AT + 125 °C									
0.33	A	CWR11K(5)334(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	15.0
0.47	A	CWR11K(5)474(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	14.0
0.68	B	CWR11K(5)684(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	7.5
1.0	B	CWR11K(5)105(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	6.5
1.5	B	CWR11K(5)155(1)(2)(3)(4)	0.5	5.0	6.0	6	8	9	6.5
2.2	C	CWR11K(5)225(1)(2)(3)(4)	0.6	6.0	7.2	6	9	9	3.5
3.3	C	CWR11K(5)335(1)(2)(3)(4)	0.9	9.0	10.8	6	8	9	3.5
4.7	C	CWR11K(5)475(1)(2)(3)(4)	1.2	12.0	14.4	6	9	9	2.5
6.8	D	CWR11K(5)685(1)(2)(3)(4)	1.7	17.0	20.4	6	9	9	1.4
10	D	CWR11K(5)106(1)(2)(3)(4)	2.5	25.0	30.0	6	8	9	1.2
15	D	CWR11K(5)156(1)(2)(3)(4)	3.8	38.0	45.6	6	9	9	1.0

Note

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 - Packaging: Blank, /HR, /PR, /PT
 - Termination: K - solder plated, H - solder fused

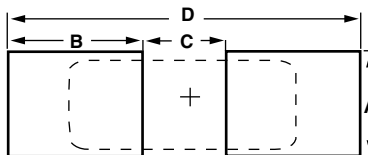


STANDARD RATINGS									
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE (μ A) AT			MAX. DF 120 Hz (%) AT			MAX. ESR AT + 25 °C 100 kHz (Ω)
			+ 25 °C	+ 85 °C	+ 125 °C	+ 25 °C	+ 85 °C + 125 °C	- 55 °C	
35 V _{DC} AT + 85 °C; 23 V _{DC} AT + 125 °C									
0.10	A	CWR11M(5)104(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	24.0
0.15	A	CWR11M(5)154(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	21.0
0.22	A	CWR11M(5)224(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	18.0
0.33	A	CWR11M(5)334(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	15.0
0.47	B	CWR11M(5)474(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	10.0
0.68	B	CWR11M(5)684(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	8.0
1.0	B	CWR11M(5)105(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	6.5
1.5	C	CWR11M(5)155(1)(2)(3)(4)	0.5	5.0	6.0	6	8	9	4.5
2.2	C	CWR11M(5)225(1)(2)(3)(4)	0.8	8.0	9.6	6	8	9	3.5
3.3	C	CWR11M(5)335(1)(2)(3)(4)	1.2	12.0	14.4	6	8	9	2.5
4.7	D	CWR11M(5)475(1)(2)(3)(4)	1.7	17.0	20.4	6	8	9	1.5
6.8	D	CWR11M(5)685(1)(2)(3)(4)	2.4	24.0	28.8	6	9	9	1.3
50 V _{DC} AT + 85 °C; 33 V _{DC} AT + 125 °C									
0.10	A	CWR11N(5)104(1)(2)(3)(4)	0.5	5.0	12.0	6	8	8	22.0
0.15	B	CWR11N(5)154(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	17.0
0.22	B	CWR11N(5)224(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	14.0
0.33	B	CWR11N(5)334(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	12.0
0.47	C	CWR11N(5)474(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	8.0
0.68	C	CWR11N(5)684(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	7.0
1.0	C	CWR11N(5)105(1)(2)(3)(4)	0.5	5.0	6.0	4	6	6	6.0
1.5	D	CWR11N(5)155(1)(2)(3)(4)	0.8	8.0	9.6	6	8	9	4.0
2.2	D	CWR11N(5)225(1)(2)(3)(4)	1.1	11.0	13.2	6	8	9	2.5
3.3	D	CWR11N(5)335(1)(2)(3)(4)	1.7	17.0	20.4	6	9	9	2.0
4.7	D	CWR11N(5)475(1)(2)(3)(4)	2.4	24.0	28.8	6	9	9	1.5

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Capacitors qualified to Weibull failure rate levels are substitutable for exponential failure rate levels
 - Surge current (optional): A, B, C
 - Packaging: Blank, /HR, /PR, /PT
 - Termination: K - solder plated, H - solder fused

RECOMMENDED VOLTAGE DERATING GUIDELINES (for temperatures below + 85 °C)	
STANDARD CONDITIONS. FOR EXAMPLE: OUTPUT FILTERS	
Capacitor Voltage Rating	Operating Voltage
4.0	2.5
6.0	3.6
10	6.0
15	10
20	12
25	15
35	24
50	28
SEVERE CONDITIONS. FOR EXAMPLE: INPUT FILTERS	
Capacitor Voltage Rating	Operating Voltage
4.0	2.5
6.0	3.0
10	5.0
15	7.5
20	10
25	12
35	15
50	24

PAD DIMENSIONS in inches [millimeters]


CASE CODE	A (min.)	B (nom.)	C (nom.)	D (nom.)
A	0.071 [1.80]	0.067 [1.70]	0.053 [1.35]	0.187 [4.75]
B	0.118 [3.00]	0.071 [1.80]	0.065 [1.65]	0.207 [5.25]
C	0.118 [3.00]	0.094 [2.40]	0.118 [3.00]	0.307 [7.80]
D	0.157 [4.00]	0.098 [2.50]	0.150 [3.80]	0.346 [8.80]

POWER DISSIPATION

CASE CODE	MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (W) IN FREE AIR
A	0.075
B	0.085
C	0.110
D	0.150

STANDARD PACKAGING QUANTITY

CASE CODE	UNITS PER REEL			BULK, PLASTIC TRAY QUANTITIES
	7" REEL	HALF 7" REEL (/HR)	PARTIAL 7" REEL (/PR)	
A	2000	1000	100	50
B	2000	1000	100	50
C	500	250	100	50
D	500	250	100	50

Notes

- Bulk capacitors are shipped in plastic trays
- T level capacitors are only shipped in tape and reel/or waffle packaging
Contact factory for waffle pack quantities

PRODUCT INFORMATION

COTS Guide	www.vishay.com/doc?40083
Pad Dimensions	
Packaging Dimensions	
Moisture Sensitivity	www.vishay.com/doc?40135
SELECTOR GUIDES	
Solid Tantalum Selector Guide	www.vishay.com/doc?49053
Solid Tantalum Chip Capacitors	www.vishay.com/doc?40091
FAQ	
Frequently Asked Questions	www.vishay.com/doc?40110



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Material Category Policy

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