

# TAZ Series

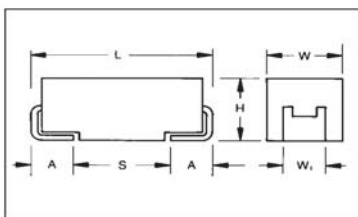
## CWR29 - MIL-PRF-55365/11



A low ESR version of CWR09 and CWR19 that is fully qualified to MIL-PRF-55365/11, this series represents the most flexible of surface mount form factors, offering nine case sizes. The molded construction is compatible with a wide range of SMT board assembly processes including wave or reflow solder, conductive epoxy or compression bonding techniques. The five smaller cases are characterized by their low profile construction;

with the A case being the world's smallest molded military tantalum. There are three termination finishes available: fused solder plated ("K" per MIL-PRF-55365), hot solder dipped ("C") and gold plated ("B"). In addition, the molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and requirements of NASA SP-R-0022A (Outgassing).

### CASE DIMENSIONS: millimeters (inches)



Case Code	Length (L) ±0.38 (0.015)	Width (W) ±0.38 (0.015)	Height (H) ±0.38 (0.015)	Term. Width (W1)	Term. Length (A) ±0.13 (0.005)	S min
A	2.54 (0.100)	1.27 (0.050)	1.27 (0.050)	1.27±0.13 (0.050±0.005)	0.76 (0.030)	0.38 (0.015)
B	3.81 (0.150)	1.27 (0.050)	1.27 (0.050)	1.27±0.13 (0.050±0.005)	0.76 (0.030)	1.65 (0.065)
C	5.08 (0.200)	1.27 (0.050)	1.27 (0.050)	1.27±0.13 (0.050±0.005)	0.76 (0.030)	2.92 (0.115)
D	3.81 (0.150)	2.54 (0.100)	1.27 (0.050)	2.41 <sup>+0.13</sup> <sub>(0.095<sup>+0.005</sup>-0.25</sub> -0.010)	0.76 (0.030)	1.65 (0.065)
E	5.08 (0.200)	2.54 (0.100)	1.27 (0.050)	2.41 <sup>+0.13</sup> <sub>(0.095<sup>+0.005</sup>-0.25</sub> -0.010)	0.76 (0.030)	2.92 (0.115)
F	5.59 (0.220)	3.43 (0.135)	1.78 (0.070)	3.30±0.13 (0.130±0.005)	0.76 (0.030)	3.43 (0.135)
G	6.73 (0.265)	2.79 (0.110)	2.79 (0.110)	2.67±0.13 (0.105±0.005)	1.27 (0.050)	3.56 (0.140)
H	7.24 (0.285)	3.81 (0.150)	2.79 (0.110)	3.68 <sup>+0.13</sup> <sub>(0.145<sup>+0.005</sup>-0.51</sub> -0.020)	1.27 (0.050)	4.06 (0.160)
X	6.93 Max (0.273)	5.41 Max (0.213)	2.74 Max (0.108)	3.05±0.13 (0.120±0.005)	1.19 (0.047)	N/A

### MARKING

(White marking on black body)



Polarity stripe (+)  
Capacitance Code  
Rated Voltage

### HOW TO ORDER

Type	Voltage Code	Termination Finish	Capacitance Code	Capacitance Tolerance	Reliability Grade	Case Size	Surge Test Option	Packaging
CWR29	J	-	225	*	@	D	+	T
	C = 4Vdc D = 6Vdc F = 10Vdc H = 15Vdc J = 20Vdc K = 25Vdc M = 35Vdc N = 50Vdc	K = Fused solder Plated C = Hot solder dip B = Gold Plated	pF code: 1 <sup>st</sup> two digits represent significant figures 3 <sup>rd</sup> digit represents multiplier (number of zeros to follow)	M = ±20% K = ±10% J = ±5%	Weibull: B = 0.1%/1000 Hrs. (90% C = 0.01%/1000 Hrs. conf.) Comm: Z = Non ER	A = 10 cycles, +25°C B = 10 cycles, -55°C & +85°C C = 10 cycles, -55°C & +85°C before Weibull Z = None required	Bulk = Standard TR = 7" T&R TR13 = 13" T&R W = Waffle	

### TECHNICAL SPECIFICATIONS

Technical Data:		Unless otherwise specified, all technical data relate to an ambient temperature of 25°C									
Capacitance Range:	0.1µF to 330µF										
Capacitance Tolerance:	±5%; ±10%; ±20%										
Rated Voltage (V <sub>R</sub> )	≤ +85°C:	4	6	10	15	20	25	35	50		
Category Voltage (V <sub>C</sub> )	125°C:	2.7	4	7	10	13	17	23	33		
Surge Voltage (V <sub>S</sub> )	≤ +85°C:	5.2	8	13	20	26	32	46	65		
Surge Voltage (V <sub>S</sub> )	125°C:	3.4	5	8	13	16	20	28	40		
Temperature Range:	-55°C to +125°C										

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## CAPACITANCE AND RATED VOLTAGE, $V_R$ (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated voltage DC ( $V_R$ ) to 85°C							
$\mu\text{F}$	Code	4V (C)	6V (D)	10V (F)	15V (H)	20V (J)	25V(K)	35V(M)	50V(N)
0.10	104								A
0.15	154								A
0.22	224							A	B
0.33	334						A	A	B
0.47	474					A	A	B	C
0.68	684				A	A/B	B	C	D
1.0	105			A	A	A/B	B/C	D	E
1.5	155		A	A/B	A/B	B/C	D	E	F
2.2	225	A		A/B	A/C	B/D	D/E		F
3.3	335	A	A/B	A/C	B/D	D/E	E	F	G
4.7	475	A/B	A/C	B/C/D	B/C/D/E	E	F	G	H
6.8	685	A/C	B/D	B/C/D/E	D/E	E/F	F/G	G/H	
10	106	B/D	B/E	B/C/D/E	D/E/F	E/F	G	H	
15	156	B/E	B/D/E	D/E/F	E/F	F/G	G/H	X	
22	226	B/D	D/E/F	E	F/G	G/H	G/H/X		
33	336	D/E/F	E	F/G	F/G/H	H	H/X		
47	476	E	F/G	F/G/H	G/H	H/X			
68	686	E/G	F/G/H	G	G/H				
100	107	F/H	G	G/H	H				
150	157	G	G	H/X					
220	227	G	H	H					
330	337	H	H						

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### RATINGS & PART NUMBER REFERENCE

Part Number	Case Size	Cap (nom) (µF)	DC rated voltage (85°C) (volts)	ESR (max) 100 kHz +25°C (Ohms)	DC Leakage (max)			Discipation Factor (max)		
					+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)
CWR29C-225*@A+	A	2.2	4	4	1	10	12	6	8	8
CWR29C-335*@A+	A	3.3	4	6	1	10	12	6	8	8
CWR29C-475*@A+	A	4.7	4	6	1	10	12	6	8	8
CWR29C-475*@B+	B	4.7	4	3.2	1	10	12	6	8	8
CWR29C-685*@A+	A	6.8	4	6	1	10	12	6	8	8
CWR29C-685*@C+	C	6.8	4	2.2	1	10	12	6	8	8
CWR29C-106*@B+	B	10	4	3.2	1	10	12	8	10	10
CWR29C-106*@D+	D	10	4	1.3	1	10	12	8	8	10
CWR29C-156*@B+	B	15	4	3.2	1	10	12	8	10	10
CWR29C-156*@E+	E	15	4	1	1	10	12	8	10	12
CWR29C-226*@B+	B	22	4	3.2	1	10	12	8	10	10
CWR29C-226*@D+	D	22	4	1.3	1	10	12	8	10	12
CWR29C-336*@D+	D	33	4	1.3	2	20	24	8	10	12
CWR29C-336*@E+	E	33	4	0.9	2	20	24	8	10	12
CWR29C-336*@F+	F	33	4	0.6	2	20	24	8	10	12
CWR29C-476*@E+	E	47	4	0.9	2	20	24	8	10	12
CWR29C-686*@E+	E	68	4	0.9	3	30	36	8	10	12
CWR29C-686*@G+	G	68	4	0.275	3	30	36	10	12	12
CWR29C-107*@F+	F	100	4	0.55	4	40	48	10	12	12
CWR29C-107*@H+	H	100	4	0.18	4	40	48	10	12	12
CWR29C-157*@G+	G	150	4	0.25	6	60	72	10	12	12
CWR29C-227*@G+	G	220	4	0.2	8	80	96	10	12	12
CWR29C-337*@H+	H	330	4	0.18	10	100	120	10	12	12
CWR29D-155*@A+	A	1.5	6	4	1	10	12	6	8	8
CWR29D-335*@A+	A	3.3	6	6	1	10	12	6	8	8
CWR29D-335*@B+	B	3.3	6	3.2	1	10	12	6	8	8
CWR29D-475*@A+	A	4.7	6	6	1	10	12	6	8	8
CWR29D-475*@C+	C	4.7	6	2.2	1	10	12	6	8	8
CWR29D-685*@B+	B	6.8	6	3.2	1	10	12	6	8	8
CWR29D-685*@D+	D	6.8	6	1.5	1	10	12	6	8	8
CWR29D-106*@B+	B	10	6	3.2	1	10	12	6	8	8
CWR29D-106*@E+	E	10	6	1	1	10	12	8	10	12
CWR29D-156*@B+	B	15	6	3.2	1	10	12	8	10	10
CWR29D-156*@D+	D	15	6	1.7	1	10	12	8	10	12
CWR29D-156*@E+	E	15	6	0.9	1	10	12	8	10	12
CWR29D-226*@D+	D	22	6	1.7	1	10	12	6	8	8
CWR29D-226*@E+	E	22	6	1	2	20	24	8	10	12
CWR29D-226*@F+	F	22	6	0.6	2	20	24	8	10	12
CWR29D-336*@E+	E	33	6	1	2	20	24	6	8	8
CWR29D-476*@F+	F	47	6	1	3	30	36	8	10	12
CWR29D-476*@G+	G	47	6	0.275	3	30	36	10	12	12
CWR29D-686*@F+	F	68	6	0.4	4	40	48	10	12	12
CWR29D-686*@G+	G	68	6	0.25	4	40	48	10	12	12
CWR29D-686*@H+	H	68	6	0.18	4	40	48	10	12	12
CWR29D-107*@G+	G	100	6	0.275	6	60	72	10	12	12
CWR29D-157*@G+	G	150	6	0.275	10	100	120	10	12	12
CWR29D-227*@H+	H	220	6	0.18	10	100	120	10	12	12
CWR29D-337*@H+	H	330	6	0.18	20	200	240	10	12	12
CWR29F-105*@A+	A	1	10	5	1	10	12	6	8	8
CWR29F-225*@A+	A	2.2	10	6	1	10	12	6	8	8
CWR29F-225*@B+	B	2.2	10	3.2	1	10	12	6	8	8
CWR29F-335*@A+	A	3.3	10	6	1	10	12	6	8	8
CWR29F-335*@C+	C	3.3	10	2.2	1	10	12	6	8	8
CWR29F-475*@B+	B	4.7	10	3.2	1	10	12	6	8	8
CWR29F-475*@C+	C	4.7	10	2.2	1	10	12	6	8	8
CWR29F-475*@D+	D	4.7	10	1.5	1	10	12	6	8	8
CWR29F-685*@B+	B	6.8	10	3.2	1	10	12	6	8	8
CWR29F-685*@C+	C	6.8	10	2.2	1	10	12	6	8	8
CWR29F-685*@D+	D	6.8	10	1.7	1	10	12	6	8	8
CWR29F-685*@E+	E	6.8	10	1	1	10	12	6	8	8
CWR29F-106*@B+	B	10	10	3.2	1	10	12	8	10	10
CWR29F-106*@C+	C	10	10	2.2	1	10	12	6	8	8
CWR29F-106*@D+	D	10	10	1.3	1	10	12	6	8	8
CWR29F-106*@E+	E	10	10	1	1	10	12	6	8	8
CWR29F-156*@D+	D	15	10	1.7	2	20	24	6	8	8
CWR29F-156*@E+	E	15	10	0.9	2	20	24	8	10	10
CWR29F-156*@F+	F	15	10	0.7	2	20	24	8	8	10
CWR29F-226*@E+	E	22	10	0.6	3	30	36	8	10	10

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### RATINGS & PART NUMBER REFERENCE

Part Number	Case Size	Cap (nom) (μF)	DC rated voltage (85°C) (volts)	ESR (max) 100 kHz +25°C (Ohms)	DC Leakage (max)			Discipation Factor (max)		
					+25°C (μA)	+85°C (μA)	+125°C (μA)	+25°C (%)	+85/125°C (%)	-55°C (%)
CWR29F-336*@F+	F	33	10	0.4	3	30	36	8	10	10
CWR29F-336*@G+	G	33	10	0.275	3	30	36	10	12	12
CWR29F-476*@F+	F	47	10	0.4	4	40	48	10	12	12
CWR29F-476*@G+	G	47	10	0.25	4	40	48	10	12	12
CWR29F-476*@H+	H	47	10	0.18	5	50	60	10	12	12
CWR29F-686*@G+	G	68	10	0.275	6	60	72	10	12	12
CWR29F-107*@G+	G	100	10	0.275	10	100	120	10	12	12
CWR29F-107*@H+	H	100	10	0.18	10	100	120	10	12	12
CWR29F-157*@H+	H	150	10	0.18	15	150	180	10	12	12
CWR29F-157*@X+	X	150	10	0.065	15	150	180	10	12	12
CWR29F-227*@H+	H	220	10	0.18	20	200	240	10	12	12
CWR29H^684*@A+	A	0.68	15	6	1	10	12	6	8	8
CWR29H^105*@A+	A	1	15	7.5	1	10	12	6	8	8
CWR29H^155*@A+	A	1.5	15	7.5	1	10	12	6	8	8
CWR29H^155*@B+	B	1.5	15	3.2	1	10	12	6	8	8
CWR29H^225*@A+	A	2.2	15	7.5	1	10	12	6	8	8
CWR29H^225*@C+	C	2.2	15	2.2	1	10	12	6	8	8
CWR29H^335*@B+	B	3.3	15	3.6	1	10	12	6	8	8
CWR29H^335*@D+	D	3.3	15	1.7	1	10	12	6	8	8
CWR29H-475*@B+	B	4.7	15	2	1	10	12	6	8	8
CWR29H-475*@C+	C	4.7	15	2.2	1	10	12	6	8	8
CWR29H-475*@D+	D	4.7	15	2	1	10	12	6	8	8
CWR29H-475*@E+	E	4.7	15	1.2	1	10	12	6	8	8
CWR29H-685*@D+	D	6.8	15	2	1	10	12	6	8	8
CWR29H-685*@E+	E	6.8	15	0.9	1	10	12	8	10	12
CWR29H-106*@D+	D	10	15	2	2	20	24	6	8	8
CWR29H-106*@E+	E	10	15	1.2	2	20	24	6	8	8
CWR29H-106*@F+	F	10	15	0.667	2	20	24	6	8	8
CWR29H-156*@E+	E	15	15	1.2	2	20	24	6	8	8
CWR29H-156*@F+	F	15	15	0.8	2	20	24	8	10	10
CWR29H-226*@F+	F	22	15	0.8	3	30	36	8	10	10
CWR29H-226*@G+	G	22	15	0.275	4	40	48	6	8	8
CWR29H-336*@F+	F	33	15	0.8	5	50	60	6	8	8
CWR29H-336*@G+	G	33	15	0.275	5	60	72	8	10	10
CWR29H-336*@H+	H	33	15	0.18	5	50	60	8	8	10
CWR29H-476*@G+	G	47	15	0.275	10	100	120	8	10	10
CWR29H-476*@H+	H	47	15	0.18	10	100	120	8	10	10
CWR29H-686*@G+	G	68	15	0.275	10	100	120	8	10	10
CWR29H-686*@H+	H	68	15	0.18	10	100	120	8	10	10
CWR29H-107*@H+	H	100	15	0.18	15	150	180	10	12	12
CWR29J-474*@A+	A	0.47	20	7.5	1	10	12	8	8	10
CWR29J-684*@A+	A	0.68	20	7.5	1	10	12	6	8	8
CWR29J-684*@B+	B	0.68	20	5.6	1	10	12	6	8	8
CWR29J-105*@A+	A	1	20	7.5	1	10	12	6	8	8
CWR29J-105*@B+	B	1	20	4.8	1	10	12	6	8	8
CWR29J-155*@B+	B	1.5	20	3.6	1	10	12	6	8	8
CWR29J-155*@C+	C	1.5	20	2.4	1	10	12	6	8	8
CWR29J-225*@B+	B	2.2	20	3.6	1	10	12	6	8	8
CWR29J-225*@D+	D	2.2	20	1.7	1	10	12	6	8	8
CWR29J-335*@D+	D	3.3	20	2	1	10	12	6	8	8
CWR29J-335*@E+	E	3.3	20	1.2	1	10	12	6	8	8
CWR29J-475*@E+	E	4.7	20	1.7	1	10	12	6	8	8
CWR29J-685*@E+	E	6.8	20	1.5	2	20	24	6	8	8
CWR29J-685*@F+	F	6.8	20	0.7	2	20	24	6	8	8
CWR29J-106*@E+	E	10	20	1.5	2	20	24	6	8	8
CWR29J-106*@F+	F	10	20	0.8	2	20	24	6	8	8
CWR29J-156*@F+	F	15	20	0.8	3	30	36	6	8	8
CWR29J-156*@G+	G	15	20	0.275	3	30	36	6	8	8
CWR29J-226*@G+	G	22	20	0.625	4	40	48	6	8	8
CWR29J-226*@H+	H	22	20	0.18	4	40	48	6	8	8
CWR29J-336*@H+	H	33	20	0.18	6	60	72	8	10	10
CWR29J-476*@H+	H	47	20	0.18	10	100	120	8	10	10
CWR29J-476*@X+	X	47	20	0.11	10	100	120	8	10	10

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Part Number	Case Size	Cap (nom) (μF)	DC rated voltage (85°C) (volts)	ESR (max) 100 kHz +25°C (Ohms)	DC Leakage (max)			Discipation Factor (max)		
					+25°C (μA)	+85°C (μA)	+125°C (μA)	+25°C (%)	+85/125°C (%)	-55°C (%)
CWR29K-334*@A+	A	0.33	25	7.5	1	10	12	6	8	8
CWR29K-474*@A+	A	0.47	25	7.5	1	10	12	6	8	8
CWR29K-684*@B+	B	0.68	25	4	1	10	12	6	8	8
CWR29K-105*@B+	B	1	25	4	1	10	12	6	8	8
CWR29K-105*@C+	C	1	25	2.6	1	10	12	6	8	8
CWR29K-155*@D+	D	1.5	25	1.7	1	10	12	6	8	8
CWR29K-225*@D+	D	2.2	25	2	1	10	12	6	8	8
CWR29K-225*@E+	E	2.2	25	1	1	10	12	6	8	8
CWR29K-335*@E+	E	3.3	25	1.2	1	10	12	6	8	8
CWR29K-475*@F+	F	4.7	25	0.7	2	20	24	6	8	8
CWR29K-685*@F+	F	6.8	25	0.8	2	20	24	6	8	8
CWR29K-685*@G+	G	6.8	25	0.3	2	20	24	6	8	8
CWR29K-106*@G+	G	10	25	0.35	3	30	36	6	8	8
CWR29K-156*@G+	G	15	25	0.35	4	40	48	6	8	8
CWR29K-156*@H+	H	15	25	0.2	4	40	48	6	8	8
CWR29K-226*@G+	G	22	25	0.35	6	60	72	6	8	8
CWR29K-226*@H+	H	22	25	0.18	6	60	72	6	8	8
CWR29K-226*@X+	X	22	25	0.16	6	60	72	6	8	8
CWR29K-336*@H+	H	33	25	0.18	10	100	120	6	8	8
CWR29K-336*@X+	X	33	25	0.13	10	100	120	8	10	10
CWR29M-224*@A+	A	0.22	35	12	1	10	12	6	8	8
CWR29M-334*@A+	A	0.33	35	12	1	10	12	6	8	8
CWR29M-474*@B+	B	0.47	35	6.8	1	10	12	6	8	8
CWR29M-684*@C+	C	0.68	35	4	1	10	12	6	8	8
CWR29M-105*@D+	D	1	35	2.2	1	10	12	6	8	8
CWR29M-155*@E+	E	1.5	35	1.3	1	10	12	6	8	8
CWR29M-335*@F+	F	3.3	35	0.7	1	10	12	6	8	8
CWR29M-475*@G+	G	4.7	35	0.375	2	20	24	6	8	8
CWR29M-685*@G+	G	6.8	35	0.375	3	30	36	6	8	8
CWR29M-685*@H+	H	6.8	35	0.5	3	30	36	6	8	8
CWR29M-106*@H+	H	10	35	0.5	4	40	48	8	10	10
CWR29M-156*@X+	X	15	35	0.19	6	60	72	6	8	8
CWR29N-104*@A+	A	0.1	50	12	1	10	12	6	8	8
CWR29N-154*@A+	A	0.15	50	12	1	10	12	6	8	8
CWR29N-224*@B+	B	0.22	50	6.8	1	10	12	6	8	8
CWR29N-334*@B+	B	0.33	50	4.8	1	10	12	6	8	8
CWR29N-474*@C+	C	0.47	50	3.2	1	10	12	6	8	8
CWR29N-684*@D+	D	0.68	50	2.3	1	10	12	6	8	8
CWR29N-105*@E+	E	1	50	1.7	1	10	12	6	8	8
CWR29N-155*@F+	F	1.5	50	1.1	1	10	12	6	8	8
CWR29N-225*@F+	F	2.2	50	0.7	2	20	24	6	8	8
CWR29N-335*@G+	G	3.3	50	0.5	2	20	24	6	8	8
CWR29N-475*@H+	H	4.7	50	0.5	3	30	36	6	8	8