

TBJ Series



CWR11 - MIL-PRF-55365/8 Established Reliability, COTS-Plus & Space Level



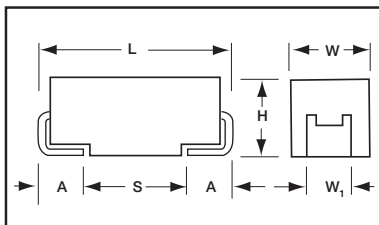
Fully qualified to MIL-PRF-55365/8, the CWR11 is the military version of EIA-535BAAC, with four case sizes designed for maximum packaging efficiency on 8mm & 12mm tape for high volume production (ensuring no TCE mismatch with any substrate). This construction is compatible with a wide range of SMT board assembly processes including wave or reflow solder, conductive epoxy or compression bonding techniques. The part also carries full polarity, capacitance / voltage and JAN brand marking.

For Space Level applications, AVX SRC9000 qualification is recommended (see ratings table for part number availability).

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these are "H", "K", "C" and "B" termination, respectively, per MIL-PRF-55365).

The molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and outgassing requirements of NASA SP-R-0022A.

The series is qualified to MIL-PRF-55365 Weibull "B", "C", "D" and "T" levels, with all surge options ("A", "B" & "C") available.



MARKING

(Brown marking on gold body)



Polarity Stripe (+)

"J" for "JAN" Brand
Capacitance Code

Rated Voltage
Manufacturer's ID

CASE DIMENSIONS: millimeters (inches)

| Case Code | EIA Metric | Length (L) | Width (W) | Height (H) | Term. Width (W _t) ±0.10 (±0.004) | Term. Length A ±0.30(±0.012) | S min |
|-----------|------------|----------------------------|----------------------------|----------------------------|--|------------------------------|--------------|
| A | 3216-18 | 3.20±0.20 (0.126±0.008) | 1.60±0.20 (0.063±0.008) | 1.60±0.20 (0.063±0.008) | 1.20 (0.047) | 0.80 (0.031) | 1.80 (0.071) |
| B | 3528-21 | 3.50±0.20 (0.138±0.008) | 2.80±0.20 (0.110±0.008) | 1.90±0.20 (0.075±0.008) | 2.20 (0.087) | 0.80 (0.031) | 1.40 (0.055) |
| C | 6032-28 | 6.00±0.30 (0.236±0.012) | 3.20±0.30 (0.126±0.012) | 2.50±0.30 (0.098±0.012) | 2.20 (0.087) | 1.30 (0.051) | 2.90 (0.114) |
| D | 7343-31 | 7.30±0.30 (0.287±0.012) | 4.30±0.30 (0.169±0.012) | 2.80±0.30 (0.110±0.012) | 2.40 (0.094) | 1.30 (0.051) | 4.40 (0.173) |

CAPACITANCE AND RATED VOLTAGE, V_R (MIL VOLTAGE CODE) RANGE CASE SIZE

| Capacitance | | Rated voltage DC (V _R) to 85°C | | | | | | | |
|-------------|------|--|--------|---------|---------|---------|---------|---------|---------|
| μF | Code | 4V (C) | 6V (D) | 10V (F) | 15V (H) | 20V (J) | 25V (K) | 35V (M) | 50V (N) |
| 0.10 | 104 | | | | | | | A | A |
| 0.15 | 154 | | | | | | | A | B |
| 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 |
| 1.0 | 105 | | | A | A | A | B | B | C |
| 1.5 | 155 | | A | A | A | B | B | C | D |
| 2.2 | 225 | A | A | A | B | B | C | C | D |
| 3.3 | 335 | | A | B | B | B | C | C | D |
| 4.7 | 475 | A | B | B | B | C | C | D | D |
| 6.8 | 685 | B | B | B | B | C | D | D | |
| 10 | 106 | B | B | | C | | D | | |
| 15 | 156 | B | C | C | | D | D | | |
| 22 | 226 | | C | | D | D | | | |
| 33 | 336 | C | | D | D | | | | |
| 47 | 476 | | D | | | | | | |
| 68 | 686 | D | D | | | | | | |
| 100 | 107 | D | | | | | | | |
| 150 | 157 | | | | | | | | |
| 220 | 227 | | | | | | | | |
| 330 | 337 | | | | | | | | |



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HOW TO ORDER

COTS-PLUS & MIL QPL (CWR11):

| | | | | | | | | | | | |
|-------------|------------------|---|---|---|--|---|---|--|--|--|---|
| TBJ | D | 686 | * | 006 | C | □ | # | @ | 0 | ^ | ++ |
| Type | Case Size | Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) | Capacitance Tolerance M = ±20% K = ±10% J = ±5% | Voltage Code 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc | Standard or Low ESR Range C = Std ESR L = Low ESR | Packaging B = Bulk R = 7" T&R S = 13" T&R W = Waffle See page 6 for additional packaging options. | Inspection Level S = Std. Conformance L = Group A M = MIL (JAN) CWR11 | Reliability Grade Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level Z = Non-ER | Qualification Level 0 = N/A 9 = SRC9000 | Termination Finish H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn (COTS-Plus only) | Surge Test Option 00 = None 23 = 10 Cycles, +25°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull |



CWR11 P/N CROSS REFERENCE:

| | | | | | | | |
|--------------|---|--|---|---|--|--|--|
| CWR11 | D | ^ | 686 | * | @ | + | □ |
| Type | Voltage Code C = 4Vdc D = 6Vdc F = 10Vdc H = 15Vdc J = 20Vdc K = 25Vdc M = 35Vdc N = 50Vdc | Termination Finish H = Solder Plated K = Solder Fused C = Hot Solder Dipped B = Gold Plated | Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) | Capacitance Tolerance M = ±20% K = ±10% J = ±5% | Reliability Grade Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level A = Non-ER | Surge Test Option A = 10 cycles, +25°C B = 10 cycles, -55°C & +85°C C = 10 cycles, -55°C & +85°C before Weibull If blank, None required | Packaging Bulk = Standard TR = 7" T&R TR13 = 13" T&R W = Waffle See page 6 for additional packaging options. |

SPACE LEVEL OPTIONS TO SRC9000*:

| | | | | | | | | | | | |
|-------------|------------------|---|---|---|--|---|--|---|---|---|--|
| TBJ | D | 686 | * | 006 | C | □ | L | @ | 9 | ^ | ++ |
| Type | Case Size | Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) | Capacitance Tolerance M = ±20% K = ±10% J = ±5% | Voltage Code 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc | Standard or Low ESR Range C = Std ESR L = Low ESR | Packaging B = Bulk R = 7" T&R S = 13" T&R W = Waffle See page 6 for additional packaging options. | Inspection Level L = Group A | Reliability Grade Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. | Qualification Level 9 = SRC9000 | Termination Finish H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated | Surge Test Option 45 = 10 cycles, -55°C & +85°C before Weibull |

*Contact factory for AVX SRC9000 Space Level SCD details.

TECHNICAL SPECIFICATIONS

| | | | | | | | | | | |
|-------------------------------------|---|-----|-----|------|------|------|------|------|------|--|
| Technical Data: | Unless otherwise specified, all technical data relate to an ambient temperature of 25°C | | | | | | | | | |
| Capacitance Range: | 0.1 µF to 100 µF | | | | | | | | | |
| Capacitance Tolerance: | ±5%; ±10%; ±20% | | | | | | | | | |
| Rated Voltage: (V _R) | ≤85°C: | 4 | 6 | 10 | 16 | 20 | 25 | 35 | 50 | |
| Category Voltage: (V _C) | 125°C: | 2.7 | 4 | 6.7 | 10 | 13.3 | 16.7 | 23.3 | 33.3 | |
| Surge Voltage: (V _S) | ≤85°C: | 5.3 | 8 | 13.3 | 20 | 26.7 | 33.3 | 46.7 | 66.7 | |
| | 125°C: | 3.5 | 5.3 | 8.7 | 13.3 | 17.8 | 22.2 | 31.1 | 44.5 | |
| Temperature Range: | -55°C to +125°C | | | | | | | | | |



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CWR11 - MIL-PRF-55365/8 Established Reliability, COTS-Plus & Space Level

| RATING & PART NUMBER REFERENCE | | | | Parametric Specifications by Rating per MIL-PRF-55365/8 | | | | | | | | | Typical Ripple Data by Rating | | | | | | |
|--------------------------------|--------------------------------|--------------------------------|---|---|-------------------------------------|------------------------------------|---------------|---------------|----------------|--------------|--------------------|--------------|-------------------------------|---------------------------------|---------------------------------|----------------------------------|---------------------------------|---------------------------------|----------------------------------|
| | | | | Cap @ 120Hz μF @ 25°C | DC Rated Voltage V @ +85°C | ESR @ 100kHz Ohms @ +25°C | DCL max | | | DF Max | | | Power Dissipation W | 25°C Ripple A (100kHz) | 85°C Ripple A (100kHz) | 125°C Ripple A (100kHz) | 25°C Ripple V (100kHz) | 85°C Ripple V (100kHz) | 125°C Ripple V (100kHz) |
| | | | | | | | +25°C (μA) | +85°C (μA) | +125°C (μA) | +25°C (%) | +(85/125)°C (%) | -55°C (%) | | | | | | | |
| CWR11K^106^@+□ | TBJ D 106 * 025 C □ # @ 0 ^ ++ | TBJ D 106 * 025 C □ L @ 9 ^ ++ | D | 10 | 25 | 1.2 | 2.5 | 25 | 30 | 6 | 8 | 9 | 0.150 | 0.35 | 0.32 | 0.14 | 0.42 | 0.38 | 0.17 |
| CWR11K^156^@+□ | TBJ D 156 * 025 C □ # @ 0 ^ ++ | TBJ D 156 * 025 C □ L @ 9 ^ ++ | D | 15 | 25 | 1 | 3.8 | 38 | 45.6 | 6 | 9 | 9 | 0.150 | 0.39 | 0.35 | 0.15 | 0.39 | 0.35 | 0.15 |
| CWR11M^104^@+□ | TBJ A 104 * 035 C □ # @ 0 ^ ++ | TBJ A 104 * 035 C □ L @ 9 ^ ++ | A | 0.1 | 35 | 24 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.075 | 0.06 | 0.05 | 0.02 | 1.34 | 1.21 | 0.54 |
| CWR11M^154^@+□ | TBJ A 154 * 035 C □ # @ 0 ^ ++ | TBJ A 154 * 035 C □ L @ 9 ^ ++ | A | 0.15 | 35 | 21 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.075 | 0.06 | 0.05 | 0.02 | 1.25 | 1.13 | 0.50 |
| CWR11M^224^@+□ | TBJ A 224 * 035 C □ # @ 0 ^ ++ | TBJ A 224 * 035 C □ L @ 9 ^ ++ | A | 0.22 | 35 | 18 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.075 | 0.06 | 0.06 | 0.03 | 1.16 | 1.05 | 0.46 |
| CWR11M^334^@+□ | TBJ A 334 * 035 C □ # @ 0 ^ ++ | TBJ A 334 * 035 C □ L @ 9 ^ ++ | A | 0.33 | 35 | 15 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.075 | 0.07 | 0.06 | 0.03 | 1.06 | 0.95 | 0.42 |
| CWR11M^474^@+□ | TBJ B 474 * 035 C □ # @ 0 ^ ++ | TBJ B 474 * 035 C □ L @ 9 ^ ++ | B | 0.47 | 35 | 10 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.085 | 0.09 | 0.08 | 0.04 | 0.92 | 0.83 | 0.37 |
| CWR11M^684^@+□ | TBJ B 684 * 035 C □ # @ 0 ^ ++ | TBJ B 684 * 035 C □ L @ 9 ^ ++ | B | 0.68 | 35 | 8 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.085 | 0.10 | 0.09 | 0.04 | 0.82 | 0.74 | 0.33 |
| CWR11M^105^@+□ | TBJ B 105 * 035 C □ # @ 0 ^ ++ | TBJ B 105 * 035 C □ L @ 9 ^ ++ | B | 1 | 35 | 6.5 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.085 | 0.11 | 0.10 | 0.05 | 0.74 | 0.67 | 0.30 |
| CWR11M^155^@+□ | TBJ C 155 * 035 C □ # @ 0 ^ ++ | TBJ C 155 * 035 C □ L @ 9 ^ ++ | C | 1.5 | 35 | 4.5 | 0.5 | 5 | 6 | 6 | 8 | 9 | 0.110 | 0.16 | 0.14 | 0.06 | 0.70 | 0.63 | 0.28 |
| CWR11M^225^@+□ | TBJ C 225 * 035 C □ # @ 0 ^ ++ | TBJ C 225 * 035 C □ L @ 9 ^ ++ | C | 2.2 | 35 | 3.5 | 0.8 | 8 | 9.6 | 6 | 8 | 9 | 0.110 | 0.18 | 0.16 | 0.07 | 0.62 | 0.56 | 0.25 |
| CWR11M^335^@+□ | TBJ C 335 * 035 C □ # @ 0 ^ ++ | TBJ C 335 * 035 C □ L @ 9 ^ ++ | C | 3.3 | 35 | 2.5 | 1.2 | 12 | 14.4 | 6 | 8 | 9 | 0.110 | 0.21 | 0.19 | 0.08 | 0.52 | 0.47 | 0.21 |
| CWR11M^475^@+□ | TBJ D 475 * 035 C □ # @ 0 ^ ++ | TBJ D 475 * 035 C □ L @ 9 ^ ++ | D | 4.7 | 35 | 1.5 | 1.7 | 17 | 20.4 | 6 | 8 | 9 | 0.150 | 0.32 | 0.28 | 0.13 | 0.47 | 0.43 | 0.19 |
| CWR11M^685^@+□ | TBJ D 685 * 035 C □ # @ 0 ^ ++ | TBJ D 685 * 035 C □ L @ 9 ^ ++ | D | 6.8 | 35 | 1.3 | 2.4 | 24 | 28.8 | 6 | 9 | 9 | 0.150 | 0.34 | 0.31 | 0.14 | 0.44 | 0.40 | 0.18 |
| CWR11N^104^@+□ | TBJ A 104 * 050 C □ # @ 0 ^ ++ | TBJ A 104 * 050 C □ L @ 9 ^ ++ | A | 0.1 | 50 | 22 | 0.5 | 5 | 12 | 6 | 8 | 8 | 0.075 | 0.06 | 0.05 | 0.02 | 1.28 | 1.16 | 0.51 |
| CWR11N^154^@+□ | TBJ B 154 * 050 C □ # @ 0 ^ ++ | TBJ B 154 * 050 C □ L @ 9 ^ ++ | B | 0.15 | 50 | 17 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.085 | 0.07 | 0.06 | 0.03 | 1.20 | 1.08 | 0.48 |
| CWR11N^224^@+□ | TBJ B 224 * 050 C □ # @ 0 ^ ++ | TBJ B 224 * 050 C □ L @ 9 ^ ++ | B | 0.22 | 50 | 14 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.085 | 0.08 | 0.07 | 0.03 | 1.09 | 0.98 | 0.44 |
| CWR11N^334^@+□ | TBJ B 334 * 050 C □ # @ 0 ^ ++ | TBJ B 334 * 050 C □ L @ 9 ^ ++ | B | 0.33 | 50 | 12 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.085 | 0.08 | 0.08 | 0.03 | 1.01 | 0.91 | 0.40 |
| CWR11N^474^@+□ | TBJ C 474 * 050 C □ # @ 0 ^ ++ | TBJ C 474 * 050 C □ L @ 9 ^ ++ | C | 0.47 | 50 | 8 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.110 | 0.12 | 0.11 | 0.05 | 0.94 | 0.84 | 0.38 |
| CWR11N^684^@+□ | TBJ C 684 * 050 C □ # @ 0 ^ ++ | TBJ C 684 * 050 C □ L @ 9 ^ ++ | C | 0.68 | 50 | 7 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.110 | 0.13 | 0.11 | 0.05 | 0.88 | 0.79 | 0.35 |
| CWR11N^105^@+□ | TBJ C 105 * 050 C □ # @ 0 ^ ++ | TBJ C 105 * 050 C □ L @ 9 ^ ++ | C | 1 | 50 | 6 | 0.5 | 5 | 6 | 4 | 6 | 6 | 0.110 | 0.14 | 0.12 | 0.05 | 0.81 | 0.73 | 0.32 |
| CWR11N^155^@+□ | TBJ D 155 * 050 C □ # @ 0 ^ ++ | TBJ D 155 * 050 C □ L @ 9 ^ ++ | D | 1.5 | 50 | 4 | 0.8 | 8 | 9.6 | 6 | 8 | 9 | 0.150 | 0.19 | 0.17 | 0.08 | 0.77 | 0.70 | 0.31 |
| CWR11N^225^@+□ | TBJ D 225 * 050 C □ # @ 0 ^ ++ | TBJ D 225 * 050 C □ L @ 9 ^ ++ | D | 2.2 | 50 | 2.5 | 1.1 | 11 | 13.2 | 6 | 8 | 9 | 0.150 | 0.24 | 0.22 | 0.10 | 0.61 | 0.55 | 0.24 |
| CWR11N^335^@+□ | TBJ D 335 * 050 C □ # @ 0 ^ ++ | TBJ D 335 * 050 C □ L @ 9 ^ ++ | D | 3.3 | 50 | 2 | 1.7 | 17 | 20.4 | 6 | 9 | 9 | 0.150 | 0.27 | 0.25 | 0.11 | 0.55 | 0.49 | 0.22 |
| CWR11N^475^@+□ | TBJ D 475 * 050 C □ # @ 0 ^ ++ | TBJ D 475 * 050 C □ L @ 9 ^ ++ | D | 4.7 | 50 | 1.5 | 2.4 | 24 | 28.8 | 6 | 9 | 9 | 0.150 | 0.32 | 0.28 | 0.13 | 0.47 | 0.43 | 0.19 |

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

