A KYOCERA GROUP COMPANY

AVX
Surface Mount Tantalum
Military/Aerospace Products

Contents

As we are anxious that our customers should benefit from the latest developments in the technology and standards, AVX reserves the right to modify the characteristics published in this brochure.

AVX Tantalum
Ask The World Of Us

As the world's broadest line molded tantalum chip supplier, it is our mission to provide **First In Class** Technology, Quality and Service, by establishing progressive design, manufacturing and continuous improvement programs driving toward a single goal:

TOTAL CUSTOMER SATISFACTION

AVX Tantalum Division

Biddeford Surface Mount Military/Aerospace Products

AVX Tantalum Division has for many years been a leading supplier of high reliability tantalum chips to the medical, military and aerospace industry.

As tantalum technology continues to evolve, we are able to offer extended ratings providing more downsizing opportunities, higher bulk capacitance ratings, new case sizes and Low ESR options for critical output filtering applications. Combined with an in-line Weibull grading facility, we are able to supply these products to the most demanding applications.

This brochure is a guide to the latest product families and new ratings (many of which are already being supplied to SCD) and provides the necessary part numbering information to allow users to tailor any of these products to their requirements.

AVX Tantalum Division at Biddeford is an ISO 9001 registered facility offering a wide range of product to address all Military requirements, being the only manufacturer to offer fully molded versions of all hybrid and EIA standard form factors.

Based on the core qualifications maintained for CWR09 and CWR11 product, new products are now available utilizing the latest advances in tantalum technology, which allow active downsizing and component count reduction, yet which incorporate manufacturing in accordance with MIL-PRF-55365 and reliability options from standard to “C” Weibull grading.

A special facility within the plant enables the production of application specific modules and arrays, providing solutions for specialized requirements.

TAZ SERIES AND CWR09

Fully qualified to MIL-PRF-55365, the CWR09 series is a sub-set of the TAZ series represented by the military QPL ratings. This series represents the most flexible of surface mount form factors, offering eight case sizes to cover the full Capacitance/Voltage range. Parts are suited to hybrid or PCB assembly, while case sizes A to E offer a low profile (.050" nom) molded chip configuration. Reliability levels from standard to “C” Weibull grading are available, along with ambient and high/low temperature surge options. The CWR09 series remains the form factor of choice for most military/aerospace tantalum applications due to their low profile and volumetric efficiency. They are also an ideal replacement for conformal coated CWR06 styles in mechanically demanding applications.

TBJ SERIES AND CWR11

Fully qualified to MIL-PRF-55365, this series offers a more limited range of form factors (4 case sizes, A through D) which have the advantage of being designed to EIA standard sizes, using common board layout designs shared with commercial product. Reliability levels from standard to “C” Weibull grading are available, along with ambient and high/low temperature surge options.

COTS-PLUS SERIES: EXTENDED RANGE/LOW ESR

This series has been developed in response to the “Commercial Off The Shelf” initiative taken by many military users to enable cost effective procurement of current technologies. It is based on both TAZ (CWR09) and TBJ (CWR11) form factors. Leadership in tantalum technology has enabled the introduction of extended capacitance/voltage ratings for all standard case sizes, giving the designer scope for downsizing existing assemblies and reducing component count. To reduce time to market for the introduction of extended CV ratings into military applications, these parts are supplied in accordance with MIL-PRF-55365, but are not JAN branded or packaged. These parts can also be supplied to Source Control Drawings for specific military requirements. A standard non-established reliability level is available, together with the options of 100% testing to Weibull “B” or “C” grade. Other options include ambient or high/low temperature surge, additional Group A conformance testing (to MIL-PRF-55365 or alternative) and Low ESR ratings below current MIL-PRF-55365 specification limits. Extended case sizes beyond the CWR standards are also available, especially targeted to high capacitance power supply filtering applications. These allow the conversion of previous through-hole applications to surface mount.

COTS-PLUS AND TAZ

Going beyond the original QPL ratings, the full TAZ series with extended capacitance/voltage ratings is currently available for ratings from 4 - 35V. Reliability levels from standard to “C” Weibull grading are available along with ambient and high/low temperature surge options. A new case size (V case) has been added to extend capacitance ratings to 470 µF; for the large case size (G, H and V case) low ESR options (to sub-100 mΩ levels) are available for critical power supply designs. The COTS-Plus Series also includes standard range alternatives to CWR09.

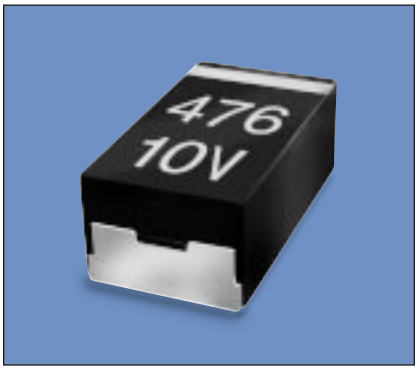
COTS-PLUS AND LOW ESR

Even more so than commercial power supplies, military power supplies require the lowest ESR product (which give maximum ripple handling) with the greatest volumetric efficiency.

The technology that enables AVX to offer the lowest ESR molded tantalum product (in the TPS series) is also available for military applications; again, utilizing the COTS-Plus part numbering system. This allows both standard QPL and extended range/special case size ratings (including V case) with optimized ESR to be specified.

TAZ Series

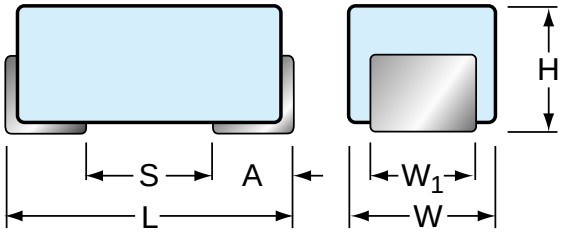
Including CWR09 and COTS-Plus



The TAZ part has fully molded, compliant leadframe construction designed for use in applications utilizing solder (Reflow, Wave or Vapor Phase), conductive adhesive or thermal compression bonding techniques. Each chip is marked with polarity, capacitance code and rated voltage.

The series comprises eight case sizes (see dimensional chart below) with the new V case enabling capacitance values to 470 µF. The C case, with its non-standard aspect ratio, is retained as a QPL (Qualified Product List) only special.

DIMENSIONS: millimeters (inches)



MARKING

(White marking on black body)

Polarity Stripe (+)

Capacitance Code
Rated Voltage

Case Code	Width W ±0.38 (0.015)	Length L ±0.38 (0.015)	Height H ±0.38 (0.015)	Term. Width W_1	Term. Length A ±.13 (.005)	S min
A	1.27 (0.050)	2.54 (0.100)	1.27 (0.050)	1.27±0.13 (0.05±0.005)	0.76 (0.030)	0.38 (0.015)
B	1.27 (0.050)	3.81 (0.150)	1.27 (0.050)	1.27±0.13 (0.05±0.005)	0.76 (0.030)	1.65 (0.065)
D	2.54 (0.100)	3.81 (0.150)	1.27 (0.050)	2.41+0.13/-0.25 (0.095+0.005/-0.01)	0.76 (0.030)	1.65 (0.065)
E	2.54 (0.100)	5.08 (0.200)	1.27 (0.050)	2.41+0.13/-0.25 (0.095+0.005/-0.01)	0.76 (0.030)	2.92 (0.115)
F	2.54 (0.100)	5.59 (0.220)	1.78 (0.070)	3.30±0.13 (0.13±0.005)	0.76 (0.030)	3.43 (0.135)
G	2.79 (0.110)	6.73 (0.265)	2.79 (0.110)	2.67±0.13 (0.105±0.005)	1.27 (0.050)	3.56 (0.140)
H	3.81 (0.150)	7.24 (0.285)	2.79 (0.110)	3.68+0.13/-0.51(0.145+0.005/-0.02)	1.27 (0.050)	4.06 (0.160)
V	5.97 (0.235)	6.93 (0.273)	3.45 (0.136)	3.05±0.13 (0.120±0.005)	1.4 (0.055)	3.38 (0.133)

Case sizes A through E share a common (0.050" nom) height profile, compatible with PCMCIA type II applications. These allow downsizing in all portable applications, ranging from sub-miniature hard-disc drive (HDD)/computer to portable communications/GPS systems. The F case at 0.070" nom offers the versatility of a low profile design, while allowing capacitance ratings to 100 µF for low voltage filtering applications.

Cases G, H and V also offer lower profile and greater volumetric efficiency than their nearest EIA sized counterparts (ref. CWR11). These are especially suited to power supply applications. The V case is a new addition to the series designed to maximize capacitance/voltage ratings while achieving minimum ESR levels and maximum power dissipation. The regular configuration allows for banking (brickwalling) applications where maximum capacitance with minimal ESR and inductance are required in a limited board space.

TAZ Series

Including CWR09 and COTS-Plus

Technical Data:		Unless otherwise specified, all technical data relate to an ambient temperature of 25°C								
Capacitance Range:		0.1 to 470 µF								
Capacitance Tolerance:		±20%, ±10%, ±5%								
Rated DC Voltage: (V_R)	≤85°C:	4	6	10	15	20	25	35	50	
Category Voltage: (V_C)	125°C:	2.7	4	7	10	13	17	23	33	
Surge Voltage: (V_C)	≤85°C:	5.2	8	13	20	26	33	46	65	
	125°C:	3.5	5	9	12	16	21	28	40	
Operating Temperature Range:		-55°C to +125°C								

CWR09 - MIL-PRF-55365/4

Fully qualified to MIL-PRF-55365/4, this series represents the most flexible of surface mount form factors, offering eight case sizes (A through H). This series is fully interchangeable with CWR06 conformal types, while offering the advantages of molded body/compliant termination construction, polarity, capacitance and JAN brand packaging. 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 and outgassing requirements of NASA SP-R-0022A.

PART NUMBERING SYSTEM

CWR09	J	B	225	K	B	A	\TR
Style	Voltage Code	Termination Finish	Capacitance Code	Capacitance Tolerance	Reliability Grade	Surge Test Option	Packaging

TAZ COTS-PLUS SERIES

This series features:

- CWR09 form factor in Standard and Extended ratings.
- Low Profile molded design (Cases A through E).
- Low ESR Ratings (Cases G through V).
- Extended Case size (V) for ratings to 470 µF.
- Weibull Reliability Grading and Surge Test options.

All ratings in this series offer the advantages of molded body/compliant termination construction, polarity, capacitance and voltage marking. 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.

PART NUMBERING SYSTEM

TAZ	H	227	M	006	C	R	SB	08	00
Style	Case Size	Capacitance Code	Capacitance Tolerance	Voltage Code	Standard or Low ESR Range	Packaging	Qualification/ Reliability	Termination Finish	Surge Test Option

Surface Mount Military

CWR09 - MIL-PRF-55365/4 and TAZ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TAZA225*004C□#@0^++	CWR09C^225*@+□	4	2.2	1.0	10	12	6	8	8	8.0	A
TAZA475*004C□#@0^++		4	4.7	1.0	10	12	6	8	8	12.0	A
TAZB475*004C□#@0^++	CWR09C^475*@+□	4	4.7	1.0	10	12	6	8	8	8.0	B
TAZB106*004C□#@0^++		4	10.0	1.0	10	12	8	10	10	8.0	B
TAZD106*004C□#@0^++	CWR09C^106*@+□	4	10.0	1.0	10	12	8	8	10	4.0	D
TAZE156*004C□#@0^++	CWR09C^156*@+□	4	15.0	1.0	10	12	8	10	12	3.5	E
TAZD226*004C□#@0^++		4	22.0	1.0	10	12	8	10	12	4.0	D
TAZE336*004C□#@0^++		4	33.0	2.0	20	24	8	10	12	3.0	E
TAZF336*004C□#@0^++	CWR09C^336*@+□	4	33.0	2.0	20	24	8	10	12	2.2	F
TAZG686*004C□#@0^++	CWR09C^686*@+□	4	68.0	3.0	30	36	10	12	12	1.1	G
TAZF107*004C□#@0^++		4	100.0	4.0	40	48	10	12	12	2.0	F
TAZH107*004C□#@0^++	CWR09C^156*@+□	4	100.0	4.0	40	48	10	12	12	0.9	H
TAZG157*004C□#@0^++		4	150.0	6.0	60	72	10	12	12	1.0	G
TAZA155*006C□#@0^++	CWR09D^155*@+□	6	1.5	1.0	10	12	6	8	8	8.0	A
TAZA335*006C□#@0^++		6	3.3	1.0	10	12	6	8	8	12.0	A
TAZB335*006C□#@0^++	CWR09D^335*@+□	6	3.3	1.0	10	12	6	8	8	8.0	B
TAZB685*006C□#@0^++		6	6.8	1.0	10	12	6	8	8	8.0	B
TAZD685*006C□#@0^++	CWR09D^685*@+□	6	6.8	1.0	10	12	6	8	8	4.5	D
TAZE106*006C□#@0^++	CWR09D^106*@+□	6	10.0	1.0	10	12	8	10	12	3.5	E
TAZD156*006C□#@0^++		6	15.0	1.0	10	12	8	10	12	5.0	D
TAZE226*006C□#@0^++		6	22.0	2.0	20	24	8	10	12	3.5	E
TAZF226*006C□#@0^++	CWR09D^226*@+□	6	22.0	2.0	20	24	8	10	12	2.2	F
TAZG476*006C□#@0^++	CWR09D^476*@+□	6	47.0	3.0	30	36	10	12	12	1.1	G
TAZF686*006C□#@0^++		6	68.0	4.0	40	48	10	12	12	1.5	F
TAZH686*006C□#@0^++	CWR09D^686*@+□	6	68.0	4.0	40	48	10	12	12	0.9	H
TAZG107*006C□#@0^++		6	100.0	6.0	60	72	10	12	12	1.1	G
TAZG107*006L□#@0^++		6	100.0	6.0	60	72	10	12	12	0.150	G
TAZH227*006C□#@0^++		6	220.0	10.0	100	120	10	12	12	0.9	H
TAZH227*006L□#@0^++		6	220.0	10.0	100	120	10	12	12	0.100	H
TAZV477*006L□#@0^++		6	470.0	28.0	280	336	12	14	14	0.055	V

Following the voltage code, C designates Standard, L designates Low ESR Ratings

Part Number Designations

^ = Termination Finish:[1]
For TAZ p/n:
9 = Gold Plated
8 = Hot Solder Dipped
0 = Solder Fused
For CWR p/n:
B = Gold Plated
C = Hot Solder Dipped
K = Solder Fused

 # = Inspection Level:
S = Std. Conformance
L = Optional Group A
For CWR p/n:
M = Military
Conformance per MIL-PRF-55365

*** = Tolerance:**
M = ±20%
K = ±10%
J = ±5% (Special order only)

@ = Failure Rate Level:
Weibull: B = 0.1%/1000 Hrs. (90% conf.) C = 0.01%/1000 Hrs.
Comm: Z = Non ER

+ = Surge Option:
For TAZ p/n:
00 = None
23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
A = 10 cycles, +25°C
B = 10 Cycles, -55°C & +85°C

□ = Packaging:
For TAZ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

(1) V case size is only available as solder fused

Surface Mount Military

CWR09 - MIL-PRF-55365/4 and TAZ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TAZA105*010C□#@0^++	CWR09F^105*@+□	10	1.0	1.0	10	12	6	8	8	10.0	A
TAZA225*010C□#@0^++		10	2.2	1.0	10	12	6	8	8	12.0	A
TAZB225*010C□#@0^++	CWR09F^225*@+□	10	2.2	1.0	10	12	6	8	8	8.0	B
TAZB475*010C□#@0^++		10	4.7	1.0	10	12	6	8	8	8.0	B
TAZD475*010C□#@0^++	CWR09F^475*@+□	10	4.7	1.0	10	12	6	8	8	4.5	D
TAZD685*010C□#@0^++		10	6.8	1.0	10	12	6	8	8	5.0	D
TAZE685*010C□#@0^++	CWR09F^685*@+□	10	6.8	1.0	10	12	6	8	8	3.5	E
TAZD106*010C□#@0^++		10	10.0	1.0	10	12	6	8	8	4.0	D
TAZE156*010C□#@0^++		10	15.0	2.0	20	24	8	10	10	3.0	E
TAZF156*010C□#@0^++	CWR09F^156*@+□	10	15.0	2.0	20	24	8	8	10	2.5	F
TAZE226*010C□#@0^++		10	22.0	3.0	30	36	8	10	10	2.0	E
TAZG336*010C□#@0^++	CWR09F^336*@+□	10	33.0	3.0	30	36	10	12	12	1.1	G
TAZF476*010C□#@0^++		10	47.0	4.0	40	48	10	12	12	1.5	F
TAZH476*010C□#@0^++	CWR09F^476*@+□	10	47.0	5.0	50	60	10	12	12	0.9	H
TAZG686*010C□#@0^++		10	68.0	6.0	60	72	10	12	12	1.1	G
TAZG686*010L□#@0^++		10	68.0	6.0	60	72	10	12	12	0.200	G
TAZH107*010C□#@0^++		10	100.0	10.0	100	120	10	12	12	0.9	H
TAZH107*010L□#@0^++		10	100.0	10.0	100	120	10	12	12	0.100	H
TAZH157*010C□#@0^++		10	150.0	15.0	150	180	10	12	12	0.9	H
TAZH157*010L□#@0^++		10	150.0	15.0	150	180	10	12	12	0.100	H
TAZV337*010L□#@0^++		10	330.0	33.0	330	396	12	14	14	0.060	V
TAZA684*015C□#@0^++	CWR09H^684*@+□	15	0.68	1.0	10	12	6	8	8	12.0	A
TAZA105*015C□#@0^++		15	1.0	1.0	10	12	6	8	8	15.0	A
TAZB155*015C□#@0^++	CWR09H^155*@+□	15	1.5	1.0	10	12	6	8	8	8.0	B
TAZB335*015C□#@0^++		15	3.3	1.0	10	12	6	8	8	9.0	B
TAZD335*015C□#@0^++	CWR09H^335*@+□	15	3.3	1.0	10	12	6	8	8	5.0	D
TAZD475*015C□#@0^++		15	4.7	1.0	10	12	6	8	8	6.0	D
TAZE475*015C□#@0^++	CWR09H^475*@+□	15	4.7	1.0	10	12	6	8	8	4.0	E
TAZE106*015C□#@0^++		15	10.0	2.0	20	24	6	8	8	4.0	E
TAZF106*015C□#@0^++	CWR09H^106*@+□	15	10.0	2.0	20	24	6	8	8	2.5	F
TAZF226*015C□#@0^++		15	22.0	3.0	30	36	8	10	10	3.0	F
TAZG226*015C□#@0^++	CWR09H^226*@+□	15	22.0	4.0	40	48	6	8	8	1.1	G
TAZH336*015C□#@0^++	CWR09H^336*@+□	15	33.0	5.0	50	60	8	8	10	0.9	H
TAZH686*015C□#@0^++		15	68.0	10.0	100	120	8	10	12	0.9	H
TAZH686*015L□#@0^++		15	68.0	10.0	100	120	8	10	12	0.150	H
TAZH107*015C□#@0^++		15	100.0	15.0	150	180	10	12	12	0.9	H
TAZH107*015L□#@0^++		15	100.0	15.0	150	180	10	12	12	0.125	H
TAZV157*015L□#@0^++		15	150.0	23.0	230	276	8	10	12	0.075	V
TAZV227*015L□#@0^++		15	220.0	33.0	330	396	10	12	14	0.075	V

Following the voltage code, C designates Standard, L designates Low ESR Ratings

Part Number Designations

^ = Termination Finish:[1]
For TAZ p/n:
9 = Gold Plated
8 = Hot Solder Dipped
0 = Solder Fused
For CWR p/n:
B = Gold Plated
C = Hot Solder Dipped
K = Solder Fused

 # = Inspection Level:
S = Std. Conformance
L = Optional Group A
For CWR p/n:
M = Military
Conformance per MIL-PRF-55365

*** = Tolerance:**
M = ±20%
K = ±10%
J = ±5% (Special order only)

@ = Failure Rate Level:
Weibull: B = 0.1%/1000 Hrs.
(90% conf.) C = 0.01%/1000 Hrs.
Comm: Z = Non ER

+ = Surge Option:
For TAZ p/n:
00 = None
23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
A = 10 cycles, +25°C
B = 10 Cycles, -55°C & +85°C

□ = Packaging:
For TAZ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

(1) V case size is only available as solder fused

Surface Mount Military

CWR09 - MIL-PRF-55365/4 and TAZ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TAZA474*020C□#@0^++	CWR09J^474*@+□	20	0.47	1.0	10	12	6	8	8	14.0	A
TAZA684*020C□#@0^++		20	0.68	1.0	10	12	6	8	8	15.0	A
TAZB684*020C□#@0^++	CWR09J^684*@+□	20	0.68	1.0	10	12	6	8	8	10.0	B
TAZB105*020C□#@0^++	CWR09J^105*@+□	20	1.0	1.0	10	12	6	8	8	12.0	B
TAZB225*020C□#@0^++		20	2.2	1.0	10	12	6	8	8	9.0	B
TAZD225*020C□#@0^++	CWR09J^225*@+□	20	2.2	1.0	10	12	6	8	8	5.0	D
TAZD335*020C□#@0^++		20	3.3	1.0	10	12	6	8	8	6.0	D
TAZE335*020C□#@0^++	CWR09J^335*@+□	20	3.3	1.0	10	12	6	8	8	4.0	E
TAZE475*020C□#@0^++		20	4.7	1.0	10	12	6	8	8	6.0	E
TAZE685*020C□#@0^++		20	6.8	2.0	20	24	6	8	8	5.0	E
TAZF685*020C□#@0^++	CWR09J^685*@+□	20	6.8	2.0	20	24	6	8	8	2.4	F
TAZF156*020C□#@0^++		20	15.0	3.0	30	36	6	8	8	3.0	F
TAZG156*020C□#@0^++	CWR09J^156*@+□	20	15.0	3.0	30	36	6	8	8	1.1	G
TAZG226*020C□#@0^++		20	22.0	4.0	40	48	6	8	8	2.5	G
TAZG226*020L□#@0^++		20	22.0	4.0	40	48	6	8	8	0.500	G
TAZH226*020C□#@0^++	CWR09J^226*@+□	20	22.0	4.0	40	48	6	8	8	0.9	H
TAZH476*020C□#@0^++		20	47.0	10.0	100	120	8	10	10	0.9	H
TAZH476*020L□#@0^++		20	47.0	10.0	100	120	8	10	10	0.250	H
TAZV107*020L□#@0^++		20	100.0	20.0	200	240	10	12	14	0.095	V
TAZA334*025C□#@0^++	CWR09K^334*@+□	25	0.33	1.0	10	12	6	8	8	15.0	A
TAZB684*025C□#@0^++	CWR09K^684*@+□	25	0.68	1.0	10	12	6	8	8	7.5	B
TAZB105*025C□#@0^++		25	1.0	1.0	10	12	6	8	8	10.0	B
TAZD155*025C□#@0^++	CWR09K^155*@+□	25	1.5	1.0	10	12	6	8	8	6.5	D
TAZD225*025C□#@0^++		25	2.2	1.0	10	12	6	8	8	6.0	D
TAZE225*025C□#@0^++	CWR09K^225*@+□	25	2.2	1.0	10	12	6	8	8	3.5	E
TAZE335*025C□#@0^++		25	3.3	1.0	10	12	6	8	8	4.0	E
TAZF475*025C□#@0^++	CWR09K^475*@+□	25	4.7	2.0	20	24	6	8	8	2.5	F
TAZF685*025C□#@0^++		25	6.8	2.0	20	24	6	8	8	3.0	F
TAZG685*025C□#@0^++	CWR09K^685*@+□	25	6.8	2.0	20	24	6	8	8	1.2	G
TAZG106*025C□#@0^++	CWR09K^106*@+□	25	10.0	3.0	30	36	6	8	8	1.4	G
TAZH156*025C□#@0^++	CWR09K^156*@+□	25	15.0	4.0	40	48	6	8	8	1.0	H
TAZH226*025C□#@0^++		25	22.0	6.0	60	72	6	8	8	0.9	H
TAZH226*025L□#@0^++		25	22.0	6.0	60	72	6	8	8	0.200	H
TAZV686*025L□#@0^++		25	68.0	17.0	170	204	10	12	14	0.095	V

Following the voltage code, C designates Standard, L designates Low ESR Ratings

Part Number Designations

^ = Termination Finish:[1]
For TAZ p/n:
9 = Gold Plated
8 = Hot Solder Dipped
0 = Solder Fused
For CWR p/n:
B = Gold Plated
C = Hot Solder Dipped
K = Solder Fused

 # = Inspection Level:
S = Std. Conformance
L = Optional Group A
For CWR p/n:
M = Military Conformance per MIL-PRF-55365

*** = Tolerance:**
M = ±20%
K = ±10%
J = ±5% (Special order only)

@ = Failure Rate Level:
Weibull: B = 0.1%/1000 Hrs. (90% conf.) C = 0.01%/1000 Hrs.
Comm: Z = Non ER

+ = Surge Option:
For TAZ p/n:
00 = None
23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
A = 10 cycles, +25°C
B = 10 Cycles, -55°C & +85°C

□ = Packaging:
For TAZ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

(1) V case size is only available as solder fused.

Surface Mount Military

CWR09 - MIL-PRF-55365/4 and TAZ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TAZA224*035C□#@0^++	CWR09M^224*@+□	35	0.22	1.0	10	12	6	8	8	18.0	A
TAZB474*035C□#@0^++	CWR09M^474*@+□	35	0.47	1.0	10	12	6	8	8	10.0	B
TAZD105*035C□#@0^++	CWR09M^105*@+□	35	1.0	1.0	10	12	6	8	8	6.5	D
TAZE155*035C□#@0^++	CWR09M^155*@+□	35	1.5	1.0	10	12	6	8	8	4.5	E
TAZF335*035C□#@0^++	CWR09M^335*@+□	35	3.3	1.0	10	12	6	8	8	2.5	F
TAZG475*035C□#@0^++	CWR09M^475*@+□	35	4.7	2.0	20	24	6	8	8	1.5	G
TAZH685*035C□#@0^++	CWR09M^685*@+□	35	6.8	3.0	30	36	6	8	8	1.3	H
TAZH106*035C□#@0^++		35	10.0	4.0	40	48	8	10	10	0.9	H
TAZH106*035L□#@0^++		35	10.0	4.0	40	48	8	10	10	0.300	H
TAZA104*050C□#@0^++	CWR09N^104*@+□	50	0.10	1.0	10	12	6	8	8	22.0	A
TAZA154*050C□#@0^++	CWR09N^154*@+□	50	0.15	1.0	10	12	6	8	8	17.0	A
TAZB224*050C□#@0^++	CWR09N^224*@+□	50	0.22	1.0	10	12	6	8	8	14.0	B
TAZB334*050C□#@0^++	CWR09N^334*@+□	50	0.33	1.0	10	12	6	8	8	12.0	B
TAZD684*050C□#@0^++	CWR09N^684*@+□	50	0.68	1.0	10	12	6	8	8	7.0	D
TAZE105*050C□#@0^++	CWR09N^105*@+□	50	1.0	1.0	10	12	6	8	8	6.0	E
TAZF155*050C□#@0^++	CWR09N^155*@+□	50	1.5	1.0	10	12	6	8	8	4.0	F
TAZF225*050C□#@0^++	CWR09N^225*@+□	50	2.2	2.0	20	24	6	8	8	2.5	F
TAZG335*050C□#@0^++	CWR09N^335*@+□	50	3.3	2.0	20	24	6	8	8	2.0	G
TAZH475*050C□#@0^++	CWR09N^475*@+□	50	4.7	3.0	30	36	6	8	8	1.5	H

Following the voltage code, C designates Standard, L designates Low ESR Ratings

Part Number Designations

^ = Termination Finish:[1]
For TAZ p/n:
9 = Gold Plated
8 = Hot Solder Dipped
0 = Solder Fused
For CWR p/n:
B = Gold Plated
C = Hot Solder Dipped
K = Solder Fused

 # = Inspection Level:
S = Std. Conformance
L = Optional Group A
For CWR p/n:
M = Military Conformance per MIL-PRF-55365

*** = Tolerance:**
M = ±20%
K = ±10%
J = ±5% (Special order only)

@ = Failure Rate Level:
Weibull: B = 0.1%/1000 Hrs. (90% conf.) C = 0.01%/1000 Hrs.
Comm: Z = Non ER

+ = Surge Option:
For TAZ p/n:
00 = None
23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
A = 10 cycles, +25°C
B = 10 Cycles, -55°C & +85°C

□ = Packaging:
For TAZ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

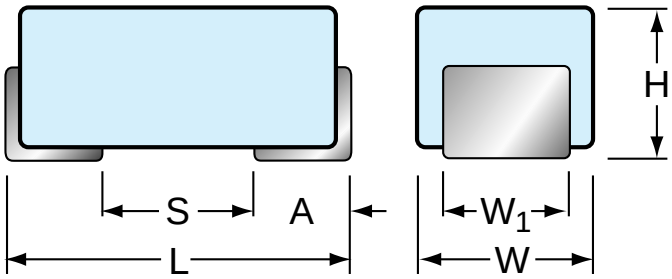
(1) V case size is only available as solder fused.

TBJ Series

Including CWR11 and COTS-Plus

The TBJ Series encompasses five case sizes, A through E, corresponding to EIA-535BAAC, the commercial industry standard. This series also offers molded body/compliant termination construction, polarity and capacitance marking. 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. Standard termination finish is fused solder. Case sizes A through D include QPL ratings available to the CWR11 military part number; other extended range and Low ESR ratings are available in all case sizes.

DIMENSIONS: millimeters (inches)



MILITARY MARKING

(Brown marking on gold body)

Polarity Stripe (+)

"J" for "JAN" Brand
Capacitance Code

Rated Voltage
Manufacturer's ID

Case Code (EIA Code)	Width W	Length L	Height H	Term. Width W_1 ±0.1 (±0.004)	Term. Length A ±0.3 (±0.012)	S min
A (3206)	1.6±0.2 (0.063±0.008)	3.2±0.2 (0.126±0.008)	1.6±0.2 (0.063±0.008)	1.2 (0.047)	0.8 (0.031)	0.8 (0.031)
B (3528)	2.8±0.2 (0.110±0.008)	3.5±0.2 (0.138±0.008)	1.9±0.2 (0.075±0.008)	2.2 (0.087)	0.8 (0.031)	1.1 (0.043)
C (6032)	3.2±0.3 (0.126±0.012)	6.0±0.3 (0.236±0.012)	2.5±0.3 (0.098±0.012)	2.2 (0.087)	1.3 (0.051)	2.5 (0.098)
D (7343)	4.3±0.3 (0.169±0.012)	7.3±0.3 (0.287±0.012)	2.8±0.3 (0.110±0.012)	2.4 (0.094)	1.3 (0.051)	3.8 (0.150)
E (7343H)	4.3±0.3 (0.169±0.012)	7.3±0.3 (0.287±0.012)	2.4±0.3 (0.162±0.012)	2.4 (0.094)	1.3 (0.051)	3.8 (0.150)

Technical Data:		Unless otherwise specified, all technical data relate to an ambient temperature of 25°C								
Capacitance Range:		0.1 to 470 µF								
Capacitance Tolerance:		±20%, ±10%, ±5%								
Rated DC Voltage: (V_R)	≤85°C:	4	6	10	15	20	25	35	50	
Category Voltage: (V_C)	125°C:	2.7	4	7	10	13	17	23	33	
Surge Voltage: (V_C)	≤85°C:	5.2	8	13	20	26	33	46	65	
	125°C:	3.5	5	9	12	16	21	28	40	
Operating Temperature Range:		-55°C to +125°C								

TBJ Series

CWR11 - MIL-PRF-55365/8 and TBJ COTS-Plus

CWR11 - MIL-PRF-55365/8

Fully qualified to MIL-PRF-55365/8, the CWR11 is the military version of EIA-535BAAC, the commercial industry standard. It comprises four case sizes (A through D). This series also offers molded body/compliant termination construction, polarity, capacitance and JAN brand marking. 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. There are three termination finishes available: fused solder plated ("K" per MIL-PRF-55365), hot solder dipped ("C") and gold plated ("B").

PART NUMBERING SYSTEM

CWR11	J	B	225	K	B	A	\TR
Style	Voltage Code	Termination Finish	Capacitance Code	Capacitance Tolerance	Reliability Grade	Surge Test Option	Packaging

TBJ COTS-PLUS SERIES

This series features:

- CWR11 form factor in Standard and Extended ratings.
- Low ESR Ratings (Cases A through E).
- Extended Case size (E) for ratings to 470 µF.
- Weibull Reliability Grading and Surge Test options.

All ratings in this series offer the advantages of molded body/compliant termination construction, polarity, capacitance and voltage marking. 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.

PART NUMBERING SYSTEM

TBJ	D	227	M	006	C	R	SB	00	00
Style	Case Size	Capacitance Code	Capacitance Tolerance	Voltage Code	Standard or Low ESR Range	Packaging	Qualification/ Reliability	Termination Finish	Surge Test Option

Surface Mount Military

CWR11 - MIL-PRF-55365/8 and TBJ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TBJA225(*)004C□#@00++		4	2.2	0.5	5.0	6.0	6	9	9	8.0	A
TBJA475(*)004C□#@00++		4	4.7	0.5	5.0	6.0	6	9	9	8.0	A
TBJA685(*)004C□#@00++		4	6.8	0.5	5.0	6.0	6	9	10	6.5	A
TBJB685(*)004C□#@00++		4	6.8	0.5	5.0	6.0	6	9	9	5.5	B
TBJA106(*)004C□#@00++		4	10.0	0.5	5.0	6.0	6	9	10	6.0	A
TBJB106(*)004C□#@00++		4	10.0	0.5	5.0	6.0	6	9	9	4.0	B
TBJA156(*)004C□#@00++		4	15.0	0.6	6.0	7.2	6	9	10	4.0	A
TBJB156(*)004C□#@00++		4	15.0	0.6	6.0	7.2	6	9	9	3.5	B
TBJA226(*)004C□#@00++		4	22.0	0.9	9.0	10.8	6	9	10	3.5	A
TBJA336(*)004C□#@00++		4	33.0	1.4	14.0	16.8	6	9	9	3.0	A
TBJB336(*)004C□#@00++		4	33.0	1.4	14.0	16.8	6	9	10	2.8	B
TBJC336(*)004C□#@00++		4	33.0	1.3	13.0	15.6	6	9	9	2.2	C
TBJB476(*)004C□#@00++		4	47.0	1.9	19.0	22.8	6	9	10	2.4	B
TBJC686(*)004C□#@00++		4	68.0	2.7	27.0	32.4	6	9	10	1.6	C
TBJD686(*)004C□#@00++		4	68.0	2.7	27.0	32.4	6	9	9	1.1	D
TBJB107(*)004C□#@00++		4	100.0	4.0	40.0	48.0	8	10	12	1.6	B
TBJC107(*)004C□#@00++		4	100.0	4.0	40.0	48.0	6	9	10	1.3	C
TBJD227(*)004C□#@00++		4	220.0	8.8	88.0	105.6	8	10	12	0.9	D
TBJE337(*)004C□#@00++		4	330.0	13.2	132.0	158.4	8	10	12	0.9	E
TBJA155(*)006C□#@00++	CWR11DK155*@+□	6.3	1.5	0.5	5.0	6.0	6	9	9	8.0	A
TBJA225(*)006C□#@00++	CWR11DK225*@+□	6.3	2.2	0.5	5.0	6.0	6	9	9	8.0	A
TBJA335(*)006C□#@00++	CWR11DK335*@+□	6.3	3.3	0.5	5.0	6.0	6	9	9	8.0	A
TBJA475(*)006C□#@00++		6.3	4.7	0.5	5.0	6.0	6	9	10	6.0	A
TBJB475(*)006C□#@00++	CWR11DK475*@+□	6.3	4.7	0.5	5.0	6.0	6	9	9	5.5	B
TBJA685(*)006C□#@00++		6.3	6.8	0.5	5.0	6.0	6	9	10	5.0	A
TBJB685(*)006C□#@00++	CWR11DK685*@+□	6.3	6.8	0.5	5.0	6.0	6	9	9	4.5	B
TBJA106(*)006C□#@00++		6.3	10.0	1.0	10.0	12.0	6	9	10	4.0	A
TBJB106(*)006C□#@00++	CWR11DK106*@+□	6.3	10.0	1.0	10.0	12.0	6	9	9	3.5	B
TBJA156(*)006C□#@00++		6.3	15.0	1.0	10.0	12.0	6	9	10	3.5	A
TBJA156(*)006L□#@00++		6.3	15.0	1.0	10.0	12.0	6	9	10	1.5	A
TBJB156(*)006C□#@00++		6.3	15.0	1.0	10.0	12.0	6	9	10	3.5	B
TBJC156(*)006C□#@00++	CWR11DK156*@+□	6.3	15.0	1.0	10.0	12.0	6	9	9	3.0	C
TBJA226(*)006C□#@00++		6.3	22.0	1.4	14.0	16.8	6	9	10	3.0	A
TBJB226(*)006C□#@00++		6.3	22.0	1.4	14.0	16.8	6	9	10	2.5	B
TBJC226(*)006C□#@00++	CWR11DK226*@+□	6.3	22.0	1.4	14.0	16.8	6	9	9	2.2	C
TBJB336(*)006C□#@00++		6.3	33.0	2.1	21.0	25.2	6	9	10	2.2	B
TBJB336(*)006L□#@00++		6.3	33.0	2.1	21.0	25.2	6	9	10	0.600	B
TBJC336(*)006C□#@00++		6.3	33.0	2.1	21.0	25.2	6	9	10	1.8	C
TBJC476(*)006C□#@00++		6.3	47.0	3.0	30.0	36.0	6	9	10	1.6	C
TBJD476(*)006C□#@00++	CWR11DK476*@+□	6.3	47.0	3.0	30.0	36.0	6	9	9	1.1	D
TBJB686(*)006C□#@00++		6.3	68.0	4.3	43.0	51.6	8	10	12	1.8	B
TBJC686(*)006C□#@00++		6.3	68.0	4.3	43.0	51.6	6	9	10	1.6	C
TBJD686(*)006C□#@00++		6.3	68.0	4.3	43.0	51.6	6	9	10	0.9	D
TBJC107(*)006C□#@00++		6.3	100.0	6.3	63.0	75.6	6	9	10	0.9	C
TBJC107(*)006L□#@00++		6.3	100.0	6.3	63.0	75.6	6	9	10	0.150	C
TBJD107(*)006C□#@00++		6.3	100.0	6.3	63.0	75.6	6	9	10	0.9	D
TBJD157(*)006C□#@00++		6.3	150.0	9.5	95.0	114.0	6	9	10	0.9	D
TBJC227(*)006C□#@00++		6.3	220.0	13.9	139.0	166.8	10	12	14	1.2	C
TBJD227(*)006C□#@00++		6.3	220.0	13.9	139.0	166.8	8	10	12	0.9	D
TBJD227(*)006L□#@00++		6.3	220.0	13.9	139.0	166.8	8	10	12	0.100	D
TBJE337(*)006C□#@00++		6.3	330.0	19.8	198.0	237.6	8	10	12	0.9	E
TBJE337(*)006L□#@00++		6.3	330.0	20.8	208.0	249.6	8	10	12	0.100	E
TBJE477(*)006C□#@00++		6.3	470.0	29.6	296.0	355.2	10	12	14	0.9	E
TBJE477(*)006L□#@00++		6.3	470.0	29.6	296.0	355.2	10	12	14	0.050	E

Following the voltage code, C designates Standard, L Designates low ESR Ratings

Part Number Designations

*** = Tolerance:**
M = ±20%
K = ±10%
J = ±5% (Special order only)

 # = Inspection Level:
S = Std. Conformance
L = Optional Group A
For CWR p/n:
M = Military Conformance per MIL-PRF-55365

@ = Failure Rate Level:
Weibull: B = 0.1%/1000 Hrs.
(90% conf.) C = 0.01%/1000 Hrs.
Comm: Z = Non ER

+ = Surge Option:
For TBJ p/n:
00 = None
23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
A = 10 cycles, +25°C
B = 10 Cycles, -55°C & +85°C

□ = Packaging:
For TBJ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

Surface Mount Military

CWR11 - MIL-PRF-55365/8 and TBJ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TBJA105(*)010C□#@00++	CWR11FK105*@+□	10	1.0	0.5	5.0	6.0	4	6	6	10.0	A
TBJA155(*)010C□#@00++	CWR11FK155*@+□	10	1.5	0.5	5.0	6.0	6	9	9	8.0	A
TBJA225(*)010C□#@00++	CWR11FK255*@+□	10	2.2	0.5	5.0	6.0	6	9	9	8.0	A
TBJA335(*)010C□#@00++		10	3.3	0.5	5.0	6.0	6	9	10	5.5	A
TBJB335(*)010C□#@00++	CWR11FK335*@+□	10	3.3	0.5	5.0	6.0	6	9	9	5.5	B
TBJA475(*)010C□#@00++		10	4.7	0.5	5.0	6.0	6	9	10	5.0	A
TBJB475(*)010C□#@00++	CWR11FK475*@+□	10	4.7	0.5	5.0	6.0	6	9	9	4.5	B
TBJA685(*)010C□#@00++		10	6.8	0.7	7.0	8.4	6	9	10	4.0	A
TBJB685(*)010C□#@00++	CWR11FK685*@+□	10	6.8	0.7	7.0	8.4	6	9	9	3.5	B
TBJA106(*)010C□#@00++		10	10.0	1.0	10.0	12.0	6	9	10	3.0	A
TBJA106(*)010L□#@00++		10	10.0	1.0	10.0	12.0	6	9	10	1.8	A
TBJB106(*)010C□#@00++		10	10.0	1.0	10.0	12.0	6	9	10	2.5	B
TBJC106(*)010C□#@00++		10	10.0	1.0	10.0	12.0	6	9	10	2.5	C
TBJA156(*)010C□#@00++		10	15.0	1.6	16.0	19.2	6	9	10	3.2	A
TBJB156(*)010C□#@00++		10	15.0	1.6	16.0	19.2	6	9	10	2.8	B
TBJC156(*)010C□#@00++	CWR11FK156*@+□	10	15.0	1.5	15.0	18.0	6	9	9	2.5	C
TBJB226(*)010C□#@00++		10	22.0	2.2	22.0	26.4	6	9	10	2.4	B
TBJB226(*)010L□#@00++		10	22.0	2.2	22.0	26.4	6	9	10	0.700	B
TBJC226(*)010C□#@00++		10	22.0	2.2	22.0	26.4	6	9	10	1.0	C
TBJB336(*)010C□#@00++		10	33.0	3.3	33.0	39.6	6	9	10	1.8	B
TBJC336(*)010C□#@00++		10	33.0	3.3	33.0	39.6	6	9	10.	1.6	C
TBJD336(*)010C□#@00++	CWR11FK336*@+□	10	33.0	3.3	33.0	39.6	6	9	9	1.1	D
TBJC476(*)010C□#@00++		10	47.0	4.7	47.0	56.4	6	9	10	1.2	C
TBJD476(*)010C□#@00++		10	47.0	4.7	47.0	56.4	6	9	10	0.9	D
TBJC686(*)010C□#@00++		10	68.0	6.8	68.0	81.6	8	10	12	1.2	C
TBJD686(*)010C□#@00++		10	68.0	6.8	68.0	81.6	6	9	10	0.9	D
TBJC107(*)010C□#@00++		10	100.0	10.0	100.0	120.0	8	10	12	1.2	C
TBJC107(*)010L□#@00++		10	100.0	10.0	100.0	120.0	8	10	12	0.200	C
TBJD107(*)010C□#@00++		10	100.0	10.0	100.0	120.0	6	9	10	0.9	D
TBJD107(*)010L□#@00++		10	100.0	10.0	100.0	120.0	6	9	10	0.100	D
TBJD157(*)010C□#@00++		10	150.0	15.0	150.0	180.0	8	10	12	0.9	D
TBJD157(*)010L□#@00++		10	150.0	15.0	150.0	180.0	8	10	12	0.100	D
TBJD227(*)010C□#@00++		10	220.0	22.0	220.0	264.0	8	10	12	0.9	D
TBJD227(*)010L□#@00++		10	220.0	22.0	220.0	264.0	8	10	12	0.150	D
TBJE227(*)010C□#@00++		10	220.0	22.0	220.0	264.0	8	10	12	0.9	E
TBJE227(*)010L□#@00++		10	220.0	22.0	220.0	264.0	8	10	12	0.100	E
TBJD337(*)010C□#@00++		10	330.0	33.0	330.0	396.0	8	10	12	0.9	D
TBJD337(*)010L□#@00++		10	330.0	33.0	330.0	396.0	8	10	12	0.150	D
TBJE337(*)010C□#@00++		10	330.0	33.0	330.0	396.0	8	10	12	0.9	E
TBJE337(*)010L□#@00++		10	330.0	33.0	330.0	396.0	8	10	12	0.060	E
TBJE477(*)010C□#@00++		10	470.0	47.0	470.0	564.0	10	12	14	0.9	E
TBJE477(*)010L□#@00++		10	470.0	47.0	470.0	564.0	10	12	14	0.050	E

Following the voltage code, C designates Standard, L designates Low ESR Ratings

Part Number Designations

*** = Tolerance:**
M = ±20%
K = ±10%
J = ±5% (Special order only)

 # = Inspection Level:
S = Std. Conformance
L = Optional Group A
For CWR p/n:
M = Military Conformance per MIL-PRF-55365

@ = Failure Rate Level:
Weibull: B = 0.1%/1000 Hrs.
(90% conf.) C = 0.01%/1000 Hrs.
Comm: Z = Non ER

+ = Surge Option:
For TBJ p/n:
00 = None
23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
A = 10 cycles, +25°C
B = 10 Cycles, -55°C & +85°C

□ = Packaging:
For TBJ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

Surface Mount Military

CWR11 - MIL-PRF-55365/8 and TBJ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TBJA684(*)016C□#@00++	CWR11HK684*@+□	16	0.68	0.5	5.0	6.0	4	6	6	12.0	A
TBJA105(*)016C□#@00++	CWR11HK105*@+□	16	1.0	0.5	5.0	6.0	4	6	6	10.0	A
TBJA155(*)016C□#@00++	CWR11HK155*@+□	16	1.5	0.5	5.0	6.0	6	9	9	8.0	A
TBJA225(*)016C□#@00++		16	2.2	0.5	5.0	6.0	6	9	10	5.5	A
TBJB225(*)016C□#@00++	CWR11HK225*@+□	16	2.2	0.5	5.0	6.0	6	9	9	5.0	B
TBJA335(*)016C□#@00++		16	3.3	0.5	5.0	6.0	6	9	10	5.0	A
TBJA335(*)016L□#@00++		16	3.3	0.5	5.0	6.0	6	9	10	3.5	A
TBJB335(*)016C□#@00++	CWR11HK335*@+□	16	3.3	0.5	5.0	6.0	6	8	9	5.0	B
TBJA475(*)016C□#@00++		16	4.7	0.8	8.0	9.6	6	9	10	4.0	A
TBJB475(*)016C□#@00++	CWR11HK475*@+□	16	4.7	0.8	8.0	9.6	6	9	9	4.0	B
TBJA685(*)016C□#@00++		16	6.8	1.1	11.0	13.2	6	9	10	2.5	A
TBJB685(*)016C□#@00++		16	6.8	1.1	11.0	13.2	6	9	10	2.5	B
TBJC685(*)016C□#@00++		16	6.8	1.1	11.0	13.2	6	9	10	2.5	C
TBJB106(*)016C□#@00++		16	10.0	1.6	16.0	19.2	6	9	10	2.8	B
TBJC106(*)016C□#@00++	CWR11HK106*@+□	16	10.0	1.6	16.0	19.2	6	8	9	2.5	C
TBJB156(*)016C□#@00++		16	15.0	2.4	24.0	28.8	6	9	10	2.5	B
TBJB156(*)016L□#@00++		16	15.0	2.4	24.0	28.8	6	9	10	0.800	B
TBJC156(*)016C□#@00++		16	15.0	2.4	24.0	28.8	6	9	10	1.8	C
TBJB226(*)016C□#@00++		16	22.0	3.6	36.0	43.2	6	9	10	2.3	B
TBJC226(*)016C□#@00++		16	22.0	3.6	36.0	43.2	6	9	10	1.6	C
TBJC226(*)016L□#@00++		16	22.0	3.6	36.0	43.2	6	9	10	0.375	C
TBJD226(*)016C□#@00++	CWR11HK226*@+□	16	22.0	3.6	36.0	43.2	6	8	9	1.1	D
TBJC336(*)016C□#@00++		16	33.0	5.3	53.0	63.6	6	9	10	1.5	C
TBJC336(*)016L□#@00++		16	33.0	5.3	53.0	63.6	6	9	10	0.300	C
TBJD336(*)016C□#@00++		16	33.0	5.3	53.0	63.6	6	9	10	0.9	D
TBJC476(*)016C□#@00++		16	47.0	7.6	76.0	91.2	6	9	10	1.5	C
TBJC476(*)016L□#@00++		16	47.0	7.6	76.0	91.2	6	9	10	0.350	C
TBJD476(*)016C□#@00++		16	47.0	7.6	76.0	91.2	6	9	10	0.9	D
TBJD476(*)016L□#@00++		16	47.0	7.6	76.0	91.2	6	9	10	0.150	D
TBJD686(*)016C□#@00++		16	68.0	10.9	109.0	130.8	6	9	10	0.9	D
TBJD107(*)016C□#@00++		16	100.0	16.0	160.0	192.0	6	9	10	0.9	D
TBJD107(*)016L□#@00++		16	100.0	16.0	160.0	192.0	6	9	10	0.125	D
TBJE107(*)016C□#@00++		16	100.0	16.0	160.0	192.0	6	9	10	0.9	E
TBJE107(*)016L□#@00++		16	100.0	16.0	160.0	192.0	6	9	10	0.100	E
TBJD157(*)016C□#@00++		16	150.0	24.0	240.0	288.0	6	9	10	0.9	D
TBJD157(*)016L□#@00++		16	150.0	24.0	240.0	288.0	6	9	10	0.150	D

Following the voltage code, C designates Standard, L designates Low ESR Ratings

Part Number Designations

*** = Tolerance:**
M = ±20%
K = ±10%
J = ±5% (Special order only)

 # = Inspection Level:
S = Std. Conformance
L = Optional Group A
For CWR p/n:
M = Military Conformance per MIL-PRF-55365

@ = Failure Rate Level:
Weibull: B = 0.1%/1000 Hrs.
(90% C = 0.01%/1000 Hrs.
conf.)
Comm: Z = Non ER

+ = Surge Option:
For TBJ p/n:
00 = None
23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
A = 10 cycles, +25°C
B = 10 Cycles, -55°C & +85°C

□ = Packaging:
For TBJ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

Surface Mount Military

CWR11 - MIL-PRF-55365/8 and TBJ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TBJA474(*)020C□#@00++	CWR11JK474*@+□	20	0.47	0.5	5.0	6.0	4	6	6	14.0	A
TBJA684(*)020C□#@00++	CWR11JK684*@+□	20	0.68	0.5	5.0	6.0	4	6	6	12.0	A
TBJA105(*)020C□#@00++	CWR11JK105*@+□	20	1.0	0.5	5.0	6.0	4	6	6	10.0	A
TBJA155(*)020C□#@00++		20	1.5	0.5	5.0	6.0	6	8	10	6.5	A
TBJB155(*)020C□#@00++	CWR11JK155*@+□	20	1.5	0.5	5.0	6.0	6	9	9	6.0	B
TBJB225(*)020C□#@00++	CWR11JK225*@+□	20	2.2	0.5	5.0	6.0	6	8	9	5.0	B
TBJB335(*)020C□#@00++	CWR11JK335*@+□	20	3.3	1.0	10.0	12.0	6	9	9	4.0	B
TBJA475(*)020C□#@00++		20	4.7	1.0	10.0	12.0	6	8	10	4.0	A
TBJA475(*)020L□#@00++		20	4.7	1.0	10.0	12.0	6	8	10	1.8	A
TBJB475(*)020C□#@00++		20	4.7	2.0	20.0	24.0	6	8	10	3.0	B
TBJC475(*)020C□#@00++	CWR11JK475*@+□	20	4.7	1.0	10.0	12.0	6	8	9	3.0	C
TBJB685(*)020C□#@00++		20	6.8	1.4	14.0	16.8	9	8	10	2.5	B
TBJC685(*)020C□#@00++	CWR11JK685*@+□	20	6.8	1.4	14.0	16.8	6	9	9	2.4	C
TBJB106(*)020C□#@00++		20	10.0	0.7	7.0	8.4	6	8	10	2.1	B
TBJB106(*)020L□#@00++		20	10.0	0.7	7.0	8.4	6	8	10	1.0	B
TBJC106(*)020C□#@00++		20	10.0	1.4	14.0	16.8	6	8	10	1.9	C
TBJB156(*)020C□#@00++		20	15.0	3.0	30.0	36.0	6	8	10	2.0	B
TBJC156(*)020C□#@00++		20	15.0	3.0	30.0	36.0	6	8	10	1.7	C
TBJD156(*)020C□#@00++	CWR11JK156*@+□	20	15.0	3.0	30.0	36.0	6	8	9	1.1	D
TBJC226(*)020C□#@00++		20	22.0	4.4	44.0	52.8	6	8	10	1.6	C
TBJD226(*)020C□#@00++		20	22.0	4.4	44.0	52.8	6	8	10	0.9	D
TBJC336(*)020C□#@00++		20	33.0	6.6	66.0	79.2	6	8	10	1.5	C
TBJD336(*)020C□#@00++		20	33.0	6.6	66.0	79.2	6	8	10	0.9	D
TBJD336(*)020L□#@00++		20	33.0	6.6	66.0	79.2	6	8	10	0.200	D
TBJD476(*)020C□#@00++		20	47.0	9.4	94.0	112.8	6	8	10	0.9	D
TBJD686(*)020C□#@00++		20	68.0	13.6	136.0	163.2	6	8	10	0.9	D
TBJE686(*)020C□#@00++		20	68.0	13.6	136.0	163.2	6	8	10	0.9	E
TBJE686(*)020L□#@00++		20	68.0	13.6	136.0	163.2	6	8	10	0.150	E
TBJA334(*)025C□#@00++	CWR11KK334*@+□	25	0.33	0.5	5.0	6.0	4	6	6	15.0	A
TBJA474(*)025C□#@00++	CWR11KK474*@+□	25	0.47	0.5	5.0	6.0	4	6	6	14.0	A
TBJA684(*)025C□#@00++		25	0.68	0.5	5.0	6.0	4	6	8	10.0	A
TBJB684(*)025C□#@00++	CWR11KK684*@+□	25	0.68	0.5	5.0	6.0	4	6	6	7.5	B
TBJA105(*)025C□#@00++		25	1.0	0.5	5.0	6.0	4	6	8	8.0	A
TBJB105(*)025C□#@00++	CWR11KK105*@+□	25	1.0	0.5	5.0	6.0	4	6	6	6.5	B
TBJA155(*)025C□#@00++		25	1.5	0.5	5.0	6.0	6	8	10	7.5	A
TBJA155(*)025L□#@00++		25	1.5	0.5	5.0	6.0	6	8	10	3.0	A
TBJB155(*)025C□#@00++	CWR11KK155*@+□	25	1.5	0.5	5.0	6.0	6	8	9	6.5	B
TBJA225(*)025C□#@00++		25	2.2	0.5	5.0	6.0	6	8	10	7.0	A
TBJB225(*)025C□#@00++		25	2.2	0.5	5.0	6.0	6	8	10	4.5	B
TBJC225(*)025C□#@00++	CWR11KK225*@+□	25	2.2	0.6	6.0	7.2	6	9	9	3.5	C
TBJB335(*)025C□#@00++		25	3.3	0.5	5.0	6.0	6	8	10	3.5	B
TBJC335(*)025C□#@00++	CWR11KK335*@+□	25	3.3	0.9	9.0	10.8	6	8	9	3.5	C
TBJB475(*)025C□#@00++		25	4.7	1.2	12.0	14.4	6	8	10	2.8	B
TBJB475(*)025L□#@00++		25	4.7	1.2	12.0	14.4	6	8	10	1.5	B
TBJC475(*)025C□#@00++	CWR11KK475*@+□	25	4.7	1.2	12.0	14.4	6	9	9	2.5	C
TBJB685(*)025C□#@00++		25	6.8	1.7	17.0	20.4	6	8	10	2.8	B
TBJC685(*)025C□#@00++		25	6.8	1.7	17.0	20.4	6	8	10	2.0	C
TBJD685(*)025C□#@00++	CWR11KK685*@+□	25	6.8	1.7	17.0	20.4	6	9	9	1.4	D
TBJC106(*)025C□#@00++		25	10.0	2.5	25.0	30.0	6	8	10	1.8	C
TBJC106(*)025L□#@00++		25	10.0	2.5	25.0	30.0	6	8	10	0.500	C
TBJD106(*)025C□#@00++	CWR11KK106*@+□	25	10.0	2.5	25.0	30.0	6	8	9	1.2	D
TBJD156(*)025C□#@00++		25	15.0	3.8	38.0	45.6	8	9	9	1.0	D
TBJC226(*)025C□#@00++		25	22.0	5.5	55.0	68.0	6	8	10	1.4	C
TBJD226(*)025C□#@00++		25	22.0	5.5	55.0	68.0	6	8	10	0.9	D
TBJD226(*)025L□#@00++		25	22.0	5.5	55.0	68.0	6	8	10	0.200	D
TBJD336(*)025C□#@00++		25	33.0	8.3	83.0	99.6	6	8	10	0.9	D
TBJE336(*)025C□#@00++		25	33.0	8.3	83.0	99.6	6	8	10	0.9	E
TBJE336(*)025L□#@00++		25	33.0	8.3	83.0	99.6	6	8	10	0.300	E
TBJD476(*)025C□#@00++		25	47.0	11.8	118.0	141.6	6	8	10	0.9	D
TBJD476(*)025L□#@00++		25	47.0	11.8	118.0	141.6	6	8	10	0.250	D

Following the voltage code, C designates Standard, L Designates low ESR Ratings

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J = ±5% (Special order only)

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For CWR p/n:
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23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
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□ = Packaging:
For TBJ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

Surface Mount Military

CWR11 - MIL-PRF-55365/8 and TBJ COTS-Plus

AVX Part Number	QPL Part Number (for reference only)	DC rated voltage (85°C) (volts)	Cap (nom) µF	DC Leakage (max)			Dissipation Factor (max)			ESR (max) 100 kHz +25°C (Ohms)	Case Size
				+25°C (µA)	+85°C (µA)	+125°C (µA)	+25°C (%)	+85/125°C (%)	-55°C (%)		
TBJA104(*)035C□#@00++	CWR11MK104*@+□	35	0.1	0.5	5.0	6.0	4	6	6	24.0	A
TBJA154(*)035C□#@00++	CWR11MK154*@+□	35	0.15	0.5	5.0	6.0	4	6	6	21.0	A
TBJA224(*)035C□#@00++	CWR11MK224*@+□	35	0.22	0.5	5.0	6.0	4	6	6	18.0	A
TBJA334(*)035C□#@00++	CWR11MK334*@+□	35	0.33	0.5	5.0	6.0	4	6	6	15.0	A
TBJA474(*)035C□#@00++		35	0.47	0.5	5.0	6.0	4	6	8	12.0	A
TBJB474(*)035C□#@00++	CWR11MK474*@+□	35	0.47	0.5	5.0	6.0	4	6	6	10.0	B
TBJA684(*)035C□#@00++		35	0.68	0.5	5.0	6.0	4	6	8	8.0	A
TBJB684(*)035C□#@00++	CWR11MK684*@+□	35	0.68	0.5	5.0	6.0	4	6	6	8.0	B
TBJA105(*)035C□#@00++		35	1.00	0.5	5.0	6.0	4	6	6	7.5	A
TBJB105(*)035C□#@00++	CWR11MK105*@+□	35	1.0	0.5	5.0	6.0	4	6	6	6.5	B
TBJA155(*)035C□#@00++		35	1.5	0.5	5.0	6.0	6	8	9	7.5	A
TBJB155(*)035C□#@00++		35	1.5	0.5	5.0	6.0	6	8	9	5.2	B
TBJC155(*)035C□#@00++	CWR11MK155*@+□	35	1.5	0.5	5.0	6.0	6	8	9	4.5	C
TBJB225(*)035C□#@00++		35	2.2	0.8	8.0	9.6	6	8	9	4.2	B
TBJC225(*)035C□#@00++	CWR11MK225*@+□	35	2.2	0.8	8.0	9.6	6	8	9	3.5	C
TBJB335(*)035C□#@00++		35	3.3	1.2	12.0	14.4	6	8	9	3.5	B
TBJC335(*)035C□#@00++	CWR11MK335*@+□	35	3.3	1.2	12.0	14.4	6	8	9	2.5	C
TBJB475(*)035C□#@00++		35	4.7	1.6	16.0	19.2	6	8	9	3.1	B
TBJC475(*)035C□#@00++		35	4.7	1.6	16.0	19.2	6	8	9	2.2	C
TBJC475(*)035L□#@00++		35	4.7	1.6	16.0	19.2	6	8	9	0.600	C
TBJD475(*)035C□#@00++	CWR11MK475*@+□	35	4.7	1.6	16.0	19.2	6	8	9	1.5	D
TBJC685(*)035C□#@00++		35	6.8	2.4	24.0	28.8	6	9	9	1.8	C
TBJD685(*)035C□#@00++		35	6.8	2.4	24.0	28.8	6	9	9	1.3	D
TBJC106(*)035C□#@00++		35	10.0	3.5	35.0	42.0	6	9	9	1.6	C
TBJD106(*)035C□#@00++		35	10.0	3.5	35.0	42.0	6	9	9	1.0	D
TBJD106(*)035L□#@00++		35	10.0	3.5	35.0	42.0	6	9	9	0.300	D
TBJC156(*)035C□#@00++		35	15.0	5.3	53.0	63.6	6	9	9	1.4	C
TBJD156(*)035C□#@00++		35	15.0	5.3	53.0	63.6	6	9	9	0.9	D
TBJD156(*)035L□#@00++		35	15.0	5.3	53.0	63.6	6	9	9	0.300	D
TBJD226(*)035C□#@00++		35	22.0	7.7	77.0	92.4	6	9	9	0.9	D
TBJD226(*)035L□#@00++		35	22.0	7.7	77.0	92.4	6	9	9	0.400	D
TBJE226(*)035C□#@00++		35	22.0	7.7	77.0	92.4	6	9	9	0.9	E
TBJE226(*)035L□#@00++		35	22.0	7.7	77.0	92.4	6	9	9	0.300	E
TBJD336(*)035C□#@00++		35	33.0	11.6	116.0	139.2	6	9	9	0.9	D
TBJD336(*)035L□#@00++		35	33.0	11.6	116.0	139.2	6	9	9	0.300	D
TBJA104(*)050C□#@00++	CWR11NK104*@+□	50	0.10	0.5	5.0	6.0	4	6	6	22.0	A
TBJA154(*)050C□#@00++		50	0.15	0.5	5.0	6.0	4	6	6	21.0	A
TBJB154(*)050C□#@00++	CWR11NK154*@+□	50	0.15	0.5	5.0	6.0	4	6	6	17.0	B
TBJA224(*)050C□#@00++		50	0.22	0.5	5.0	6.0	4	6	6	18.0	A
TBJB224(*)050C□#@00++	CWR11NK224*@+□	50	0.22	0.5	5.0	6.0	4	6	6	14.0	B
TBJB334(*)050C□#@00++	CWR11NK334*@+□	50	0.33	0.5	5.0	6.0	4	6	6	12.0	B
TBJC474(*)050C□#@00++	CWR11NK474*@+□	50	0.47	0.5	5.0	6.0	4	6	6	8.0	C
TBJC684(*)050C□#@00++	CWR11NK684*@+□	50	0.68	0.5	5.0	6.0	4	6	6	7.0	C
TBJC105(*)050C□#@00++	CWR11NK105*@+□	50	1.0	0.5	5.0	6.0	4	6	6	6.0	C
TBJC155(*)050C□#@00++		50	1.5	0.8	8.0	9.6	6	8	9	5.0	C
TBJD155(*)050C□#@00++	CWR11NK155*@+□	50	1.5	0.8	8.0	9.6	6	8	9	4.0	D
TBJD225(*)050C□#@00++	CWR11NK225*@+□	50	2.2	1.1	11.0	13.2	6	8	9	2.5	D
TBJD335(*)050C□#@00++		50	3.3	1.7	17.0	20.4	6	9	9	2.0	D
TBJD475(*)050C□#@00++		50	4.7	2.4	24.0	28.8	6	9	9	1.5	D
TBJD685(*)050C□#@00++		50	6.8	3.4	34.0	40.8	6	6	6	1.0	D

Following the voltage code, C designates Standard, L Designates low ESR Ratings

Part Number Designations

*** = Tolerance:**
M = ±20%
K = ±10%
J = ±5% (Special order only)

 # = Inspection Level:
S = Std. Conformance
L = Optional Group A
For CWR p/n:
M = Military Conformance per MIL-PRF-55365

@ = Failure Rate Level:
Weibull: B = 0.1%/1000 Hrs.
(90% conf.) C = 0.01%/1000 Hrs.
Comm: Z = Non ER

+ = Surge Option:
For TBJ p/n:
00 = None
23 = 10 cycles, +25°C
24 = 10 cycles, -55°C & +85°C
For CWR p/n:
A = 10 cycles, +25°C
B = 10 Cycles, -55°C & +85°C

□ = Packaging:
For TBJ p/n:
B = Bulk
R = 7" T&R
S = 13" T&R
For CWR p/n:
Bulk = Standard
\TR = 7" T&R
\TR13 = 13" T&R
\W = Waffle

CWR09 – MIL-PRF-55365 (Rev. C) Surface Mount Capacitor

TAZ – Microminiature Surface Mount Capacitor

CWR11 – MIL-PRF-55365 (Rev. C) Surface Mount Capacitor (EIA Footprint)

TAJ – Commercial EIA 535BAAC Surface Mount Capacitor
EIA Standard / Extended Range
EIA-J Sizes
Low Profile Series

TPS – Low ESR Surface Mount Capacitor

TAC – Microchip

TAP – Resin Dipped Radial Capacitor

TAR – Molded Axial Capacitor

TAA – Hermetic Sealed Axial Capacitor

TMH – Precision Microminiature Capacitor (Axial or Radial)

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