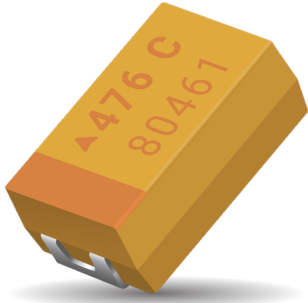


TES LOW ESR – QPL ESCC

Low ESR Tantalum Chip Capacitor

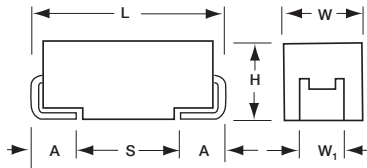


- QPL ESCC approved series
- Manufactured in EU, ESA qualified plant, according to ESCC 3012
- Detailed specification 3012/004
- Low ESR designed parts, multianode D and E case included
- Robust against higher thermo-mechanical stresses during assembly process
- CV range 1.0 - 470uF/6.3 - 50V
- Improved reliability design



For additional information on Q-process please consult the KYOCERA AVX technical publication "[Reaching the Highest Reliability for Tantalum Capacitors](#)"

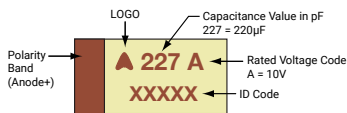
CASE DIMENSIONS: millimeters (inches)



Code	EIA Code	Variant	L±0.20 (0.008)	W+0.20(0.008) -0.10 (0.004)	H+0.20 (0.008) -0.10 (0.004)	W ₁ ±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)	S Min.
A	3216-18	01	3.20 (0.126)	1.60 (0.063)	1.60 (0.063)	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
B	3528-21	02	3.50 (0.138)	2.80 (0.110)	1.90 (0.075)	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
C	6032-28	03	6.00 (0.236)	3.20 (0.126)	2.60 (0.102)	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
D	7343-31	04	7.30 (0.287)	4.30 (0.169)	2.90 (0.114)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
E	7343-43	05	7.30 (0.287)	4.30 (0.169)	4.10 (0.162)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)

W₁ dimension applies to the termination width for A dimensional area only.

MARKING A, B, C, D, E CASE



ESCC DETAIL SPECIFICATION No. 3012/004 Up to Issue 4 - Reference for open orders only HOW TO ORDER PART NUMBER

TES	E	477	K	006	□	U	0	@	^
Type	Case Size	Capacitance Code	Tolerance	Rated DC Voltage	Packaging	ESR Level	LAT	Screening Level	FCSI
	See Table Above	pF Code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	K = ±10% M = ±20%	006 = 6.3Vdc 010 = 10Vdc 012 = 12Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	SnPb Termination X = 4" E = Bulk H = 7"	C = Standard L = Mirror Multianode U = Multianode	0 = N/A 1 = LAT1 2 = LAT2 3 = LAT3	B = Level B (X ray) C = Level C Z = Non-ER (not for flight parts)	0 = N/A 1 = Yes

[Not RoHS Compliant]

TES LOW ESR – QPL ESCC

Low ESR Tantalum Chip Capacitor



ESCC PART NUMBER – MANDATORY FOR ORDERING:

3012 004	01	B	477	K	E	0030
Detail Specification	Variant	Testing Level	Capacitance Code	Tolerance	Voltage	ESR in mΩ
	01	B = Level B (X-ray)	pF code: 1st two digits represent significant figures	K = ±10%	J = 6.3V	
	02	C = Level C	3rd digit represents multiplier (number of zeros to follow)	M = ±20%	A = 10V	
	03				B = 12V	
	04				C = 16V	
	05				D = 20V	
					E = 25V	
					V = 35V	
					T = 50V	

Not RoHS Compliant

ESCC DETAIL SPECIFICATION No. 3012/004 HOW TO ORDER PART NUMBER:

TES	E	477	K	006	□	U	0	A	^
Type	Case Size See Table Above	Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	Tolerance K = ±10% M = ±20%	Rated DC Voltage 006 = 6.3Vdc 010 = 10Vdc 012 = 12Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	Packaging SnPb Termination X = 4" E = bulk H = 7"	ESR Level C = Standard L = Mirror Multinode U = Multinode	LVT 0 = N/A 1 = Yes	Screening Level A = Standard Z = Non-ER (not for flight part)	FCSI 0 = N/A 1 = Yes

Not RoHS Compliant

ESCC PART NUMBER – MANDATORY FOR ORDERING:

3012 004	01	477	K	E	0030
Detail Specification	Variant	Capacitance Code	Tolerance	Voltage	ESR in mΩ
	01	pF code: 1st two digits represent significant figures	K = ±10%	J = 6.3V	
	02	3rd digit represents multiplier (number of zeros to follow)	M = ±20%	A = 10V	
	03			B = 12V	
	04			C = 16V	
	05			D = 20V	
				E = 25V	
				V = 35V	
				T = 50V	

Not RoHS Compliant

TES LOW ESR – QPL ESCC

Low ESR Tantalum Chip Capacitor



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

Capacitance		Rated Voltage DC (V_R) at 85°C							
μF	Code	6.3V (J)	10V (A)	12V (B)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
1.0	105						A(3000)		B(2000)
1.5	155								
2.2	225								
3.3	335					A(2500)		B(1000)	C(1000)
4.7	475				A(2000)		B(1000)	C(600)	D(200)
6.8	685								
10	106		A(1800)			B(1000)	C(600)	D(120)	E(120)
15	156								
22	226	A(900)			B(600)	C(400)		D(100)	
33	336		B(650)			C(300)	D(65)	E(65)	
47	476	B(500)			C(350)	D(55)	E(65)		
68	686								
100	107		C(200)		D(55)	E(45)			
150	157	C(300)	D(45)		E(40)				
220	227		D(35)	E(35)					
330	337	D(35)	E(35)						
470	477	E(30)							

Available Ratings: ESR limits quoted in brackets (mOhms)

OPTION

Packaging: Tape and reel available on request – Contact manufacturer

RATINGS & PART NUMBER REFERENCE, Issue 4 - Reference for open orders only

ESCC Part No.	Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	DCL Max. (μA)	DF Max. (%)	ESR Max. @100kHz (mΩ)	100kHz Ripple Current (mA)			100kHz Ripple Voltage (mV)		
								Ratings			Ratings		
								25°C	85°C	125°C	25°C	85°C	125°C
6.3 Volt @ 85°C (4 Volt @ 125°C)													
301200401#226*J0900	TESA226*006□C0@^	A	22	6.3	1.32	6	900	289	260	115	260	234	104
301200402#476*J0500	TESB476*006□C0@^	B	47	6.3	2.82	6	500	412	371	165	206	186	82
301200403#157*J0300	TESC157*006□C0@^	C	150	6.3	9	6	300	606	545	242	182	163	73
301200404#337*J0035	TESD337*006□L0@^	D	330	6.3	19.8	8	35	2699	2429	1080	94	85	38
301200405#477*J0030	TESE477*006□U0@^	E	470	6.3	28.2	6	30	3000	2700	1200	90	81	36
10 Volt @ 85°C (7 Volt @ 125°C)													
301200401#106*A1800	TESA106*010□C0@^	A	10	10	1	6	1800	204	184	82	367	331	147
301200402#336*A0650	TESB336*010□C0@^	B	33	10	3.3	6	650	362	325	145	235	212	94
301200403#107*A0200	TESC107*010□C0@^	C	100	10	10	6	200	742	667	297	148	133	59
301200404#157*A0045	TESD157*010□L0@^	D	150	10	15	6	45	2380	2142	952	107	96	43
301200404#227*A0035	TESD227*010□L0@^	D	220	10	22	6	35	2699	2429	1080	94	85	38
301200405#337*A0035	TESE337*010□U0@^	E	330	10	33	6	35	2777	2500	1111	97	87	39
12 Volt @ 85°C (8 Volt @ 125°C)													
301200405#227*B0035	TESE227*012□U0@^	E	220	12	26.4	6	35	2777	2500	1111	97	87	39
16 Volt @ 85°C (10 Volt @ 125°C)													
301200401#475*C2000	TESA475*016□C0@^	A	4.7	16	0.75	6	2000	194	174	77	387	349	155
301200402#226*C0600	TESB226*016□C0@^	B	22	16	3.52	6	600	376	339	151	226	203	90
301200403#476*C0350	TESC476*016□C0@^	C	47	16	7.52	6	350	561	505	224	196	177	78
301200404#107*C0055	TESD107*016□L0@^	D	100	16	16	6	55	2153	1938	861	118	107	47
301200405#157*C0040	TESE157*016□U0@^	E	150	16	24	6	40	2598	2338	1039	104	94	42
20 Volt @ 85°C (13 Volt @ 125°C)													
301200401#335*D2500	TESA335*020□C0@^	A	3.3	20	0.66	6	2500	173	156	69	433	390	173
301200402#106*D1000	TESB106*020□C0@^	B	10	20	2	6	1000	292	262	117	292	262	117
301200403#226*D0400	TESC226*020□C0@^	C	22	20	4.4	6	400	524	472	210	210	189	84
301200403#336*D0300	TESC336*020□C0@^	C	33	20	6.6	6	300	606	545	242	182	163	73
301200404#476*D0055	TESD476*020□L0@^	D	47	20	9.4	6	55	2153	1938	861	118	107	47
301200405#107*D0045	TESE107*020□U0@^	E	100	20	20	6	45	2449	2205	980	110	99	44
25 Volt @ 85°C (17 Volt @ 125°C)													
301200401#105*E3000	TESA105*025□C0@^	A	1.0	25	0.25	6	3000	158	142	63	474	427	190
301200402#475*E1000	TESB475*025□C0@^	B	4.7	25	1.18	6	1000	292	262	117	292	262	117
301200403#106*E0600	TESC106*025□C0@^	C	10	25	2.5	6	600	428	385	171	257	231	103
301200404#336*E0065	TESD336*025□L0@^	D	33	25	8.25	6	65	1981	1783	792	129	116	51
301200405#476*E0065	TESE476*025□U0@^	E	47	25	11.8	6	65	2038	1834	815	132	119	53

The parts are supplied in dry pack with Moisture Sensitivity Level (MSL) level 3 - defined according to J-STD-020. 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: KYOCERA AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

TDS-HIRELTANT-0029 | Rev 3

– HIGH RELIABILITY TANTALUM CAPACITORS –

TES LOW ESR – QPL ESCC

Low ESR Tantalum Chip Capacitor



ESCC Part No.	Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	DCL Max. (μA)	DF Max. (%)	ESR Max. @100kHz (mΩ)	100kHz Ripple Current (mA)			100kHz Ripple Voltage (mV)		
								Ratings			Ratings		
								25°C	85°C	125°C	25°C	85°C	125°C
35 Volt @ 85°C (23 Volt @ 125°C)													
301200402#335*V1000	TESB335*035□C0@^	B	3.3	35	1.16	6	1000	292	262	117	292	262	117
301200403#475*V0600	TESC475*035□C0@^	C	4.7	35	1.65	6	600	428	385	171	257	231	103
301200404#106*V0120	TESD106*035□L0@^	D	10	35	3.5	6	120	1458	1312	583	175	157	70
301200404#226*V0100	TESD226*035□L0@^	D	22	35	7.7	6	100	1597	1437	639	160	144	64
301200405#336*V0065	TESE336*035□U0@^	E	33	35	11.6	6	65	2038	1834	815	132	119	53
50 Volt @ 85°C (33 Volt @ 125°C)													
301200402#105*T2000	TESB105*050□C0@^	B	1.0	50	0.5	6	2000	206	186	82	412	271	165
301200403#335*T1000	TESC335*050□C0@^	C	3.3	50	1.65	6	1000	332	298	133	332	298	133
301200404#475*T0200	TESD475*050□L0@^	D	4.7	50	2.35	6	200	1129	1016	452	226	203	90

The parts are supplied in dry pack with Moisture Sensitivity Level (MSL) level 3 - defined according to J-STD-020. 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: KYOCERA AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

RATINGS & PART NUMBER REFERENCE

ESCC Part No.	Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	DCL Max. (µA)	DF Max. (%)	ESR Max. @100kHz (mΩ)	100kHz Ripple Current (mA) Ratings			100kHz Ripple Voltage (mV) Ratings		
								25°C	85°C	125°C	25°C	85°C	125°C
6.3 Volt @ 85°C (4 Volt @ 125°C)													
301200401226*J0900	TESA226*006□C0A^	A	22	6.3	1.32	6	900	289	260	115	260	234	104
301200402476*J0500	TESB476*006□C0A^	B	47	6.3	2.82	6	500	412	371	165	206	186	82
301200403157*J0300	TESC157*006□C0A^	C	150	6.3	9	6	300	606	545	242	182	163	73
301200404337*J0035	TESD337*006□L0A^	D	330	6.3	19.8	8	35	2699	2429	1080	94	85	38
301200405477*J0030	TESE477*006□U0A^	E	470	6.3	28.2	6	30	3000	2700	1200	90	81	36
10 Volt @ 85°C (7 Volt @ 125°C)													
301200401106*A1800	TESA106*010□C0A^	A	10	10	1	6	1800	204	184	82	367	331	147
301200402336*A0650	TESB336*010□C0A^	B	33	10	3.3	6	650	362	325	145	235	212	94
301200403107*A0200	TESC107*010□C0A^	C	100	10	10	6	200	742	667	297	148	133	59
301200404157*A0045	TESD157*010□L0A^	D	150	10	15	6	45	2380	2142	952	107	96	43
301200404227*A0035	TESD227*010□L0A^	D	220	10	22	6	35	2699	2429	1080	94	85	38
301200405337*A0035	TESE337*010□U0A^	E	330	10	33	6	35	2777	2500	1111	97	87	39
12 Volt @ 85°C (8 Volt @ 125°C)													
301200405227*B0035	TESE227*012□U0A^	E	220	12	26.4	6	35	2777	2500	1111	97	87	39
16 Volt @ 85°C (10 Volt @ 125°C)													
301200401475*C2000	TESA475*016□C0A^	A	4.7	16	0.75	6	2000	194	174	77	387	349	155
301200402226*C0600	TESB226*016□C0A^	B	22	16	3.52	6	600	376	339	151	226	203	90
301200403476*C0350	TESC476*016□C0A^	C	47	16	7.52	6	350	561	505	224	196	177	78
301200404107*C0055	TESD107*016□L0A^	D	100	16	16	6	55	2153	1938	861	118	107	47
301200405157*C0040	TESE157*016□U0A^	E	150	16	24	6	40	2598	2338	1039	104	94	42
20 Volt @ 85°C (13 Volt @ 125°C)													
301200401335*D2500	TESA335*020□C0A^	A	3.3	20	0.66	6	2500	173	156	69	433	390	173
301200402106*D1000	TESB106*020□C0A^	B	10	20	2	6	1000	292	262	117	292	262	117
301200403226*D0400	TESC226*020□C0A^	C	22	20	4.4	6	400	524	472	210	210	189	84
301200403336*D0300	TESC336*020□C0A^	C	33	20	6.6	6	300	606	545	242	182	163	73
301200404476*D0055	TESD476*020□L0A^	D	47	20	9.4	6	55	2153	1938	861	118	107	47
301200405107*D0045	TESE107*020□U0A^	E	100	20	20	6	45	2449	2205	980	110	99	44
25 Volt @ 85°C (17 Volt @ 125°C)													
301200401105*E3000	TESA105*025□C0A^	A	1.0	25	0.25	6	3000	158	142	63	474	427	190
301200402475*E1000	TESB475*025□C0A^	B	4.7	25	1.18	6	1000	292	262	117	292	262	117
301200403106*E0600	TESC106*025□C0A^	C	10	25	2.5	6	600	428	385	171	257	231	103
301200404336*E0065	TESD336*025□L0A^	D	33	25	8.25	6	65	1981	1783	792	129	116	51
301200405476*E0065	TESE476*025□U0A^	E	47	25	11.8	6	65	2038	1834	815	132	119	53
35 Volt @ 85°C (23 Volt @ 125°C)													
301200402335*V1000	TESB335*035□C0A^	B	3.3	35	1.16	6	1000	292	262	117	292	262	117
301200403475*V0600	TESC475*035□C0A^	C	4.7	35	1.65	6	600	428	385	171	257	231	103
301200404106*V0120	TESD106*035□L0A^	D	10	35	3.5	6	120	1458	1312	583	175	157	70
301200404226*V0100	TESD226*035□L0A^	D	22	35	7.7	6	100	1597	1437	639	160	144	64
301200405336*V0065	TESE336*035□U0A^	E	33	35	11.6	6	65	2038	1834	815	132	119	53
50 Volt @ 85°C (33 Volt @ 125°C)													
301200402105*T2000	TESB105*050□C0A^	B	1.0	50	0.5	6	2000	206	186	82	412	271	165
301200403335*T1000	TESC335*050□C0A^	C	3.3	50	1.65	6	1000	332	298	133	332	298	133
301200404475*T0200	TESD475*050□L0A^	D	4.7	50	2.35	6	200	1129	1016	452	226	203	90
301200405106*T0120	TESE106*050□L0A^	E	10	50	5	6	120	1800	1300	500	216	156	60

The parts are supplied in dry pack with Moisture Sensitivity Level (MSL) level 3 - defined according to J-STD-020. 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: KYOCERA AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.