

TWA SERIES

COTS-Plus – Wet Electrolytic Tantalum Capacitor



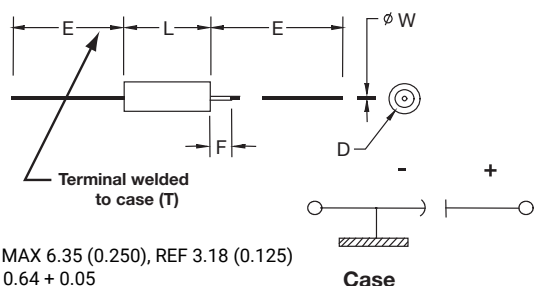
GENERAL DESCRIPTION

The TWA series is an axial leaded wet electrolytic tantalum capacitor with a unique cathode system that promotes very high CV (Capacitance/Voltage) per cc in traditional MIL-PRF-39006 case sizes.

The series also utilizes a welded tantalum can and header assembly to provide a hermetic seal and subsequent long operating lifetime.

The construction is similar to DLA 93026 with capability of meeting harsh shock and vibration conditions.

OUTLINE DIMENSIONS



F MAX 6.35 (0.250), REF 3.18 (0.125)
W 0.64 ± 0.05
(0.025 ± 0.002)
T 2.380 (0.094)

CASE DIMENSIONS: millimeters (inches)

DLA Case Size	Case Size	L +0.79 (0.031) -0.41 (0.016)	D Without Insulating Sleeve ±0.41 (0.016)	D With Insulating Sleeve Max	E ±6.35 (0.250)
T1	A	11.51 (0.453)	4.78 (0.188)	5.56 (0.219)	38.10 (1.500)
T2	B	16.28 (0.641)	7.14 (0.281)	7.92 (0.312)	57.15 (2.250)
T3	D	19.46 (0.766)	9.52 (0.375)	10.31 (0.406)	57.15 (2.250)
T4	E	26.97 (1.062)	9.52 (0.375)	10.31 (0.406)	57.15 (2.250)

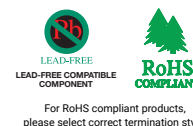
VOLTAGE RATINGS (Operating Temperature -55°C to 125°C)

Voltage (DC)									
Rated Voltage: (V _R)	85°C	15	25	30	50	60	75	100	125
Derated Voltage: (V _D)	125°C	10	15	20	30	40	50	65	85
Surge Voltage: (V _S)	85°C	17.3	28.8	34.5	57.5	69	86.3	115	144

HOW TO ORDER PART NUMBER:

TWA	E	407	*	100	□	B	#	Z	0	^	00
Type	Case Size	Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	Capacitance Tolerance K = ±10% M = ±20%	Voltage Code	Insulation Sleeve C = Without Sleeve S = With Sleeve	Packaging B = Tray Pack	Qualification E = Extended range S = COTS+ L = Group A	Reliability Z = Non-ER	Qualification Level 0 = N/A	Termination Finish 0 = Sn/Pb 60/40 7 = Matte tin	Custom Test Options 00 = Standard 01 = Random vibration*

* Please contact the factory for additional details and availability.



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RIPPLE CURRENT MULTIPLIERS vs. Frequency, temperature and applied voltage^{1/2/}

Frequency of Applied Ripple Current		120Hz				800Hz				1kHz			
Ambient Still Air Temperature (°C)		≤55	85	105	125	≤55	85	105	125	≤55	85	105	125
% of 85°C Rated Peak Voltage	100%	0.60	0.39	–	–	0.71	0.43	–	–	0.72	0.45	–	–
	90%	0.60	0.46	–	–	0.71	0.55	–	–	0.72	0.55	–	–
	80%	0.60	0.52	0.35	–	0.71	0.62	0.42	–	0.72	0.62	0.42	–
	70%	0.60	0.58	0.44	–	0.71	0.69	0.52	–	0.72	0.70	0.52	–
	66-2/3%	0.60	0.60	0.46	0.27	0.71	0.71	0.55	0.32	0.72	0.72	0.55	0.32

Frequency of Applied Ripple Current		10kHz				40kHz				100kHz			
Ambient Still Air Temperature (°C)		≤55	85	105	125	≤55	85	105	125	≤55	85	105	125
% of 85°C Rated Peak Voltage	100%	0.88	0.55	–	–	1.00	0.63	–	–	1.10	0.69	–	–
	90%	0.88	0.67	–	–	1.00	0.77	–	–	1.10	0.85	–	–
	80%	0.88	0.76	0.52	–	1.00	0.87	0.59	–	1.10	0.96	0.65	–
	70%	0.88	0.85	0.64	–	1.00	0.97	0.73	–	1.10	1.07	0.80	–
	66-2/3%	0.88	0.88	0.68	0.40	1.00	1.00	0.77	0.45	1.10	1.10	0.85	0.50

1/ At 125°C the rated voltage of the capacitors decreases to 66 2/3 of the 85°C rated voltage.

2/ The peak of the applied ac ripple voltage plus the applied dc voltage must not exceed the dc voltage rating of the capacitors.

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

Capacitance		Rated Voltage DC (VR) to 85°C							
μF	Code	15V	25V	30V	50V	60V	75V	100V	125V
10	106							A ^(M)	A
15	156							A	
22	226							B	
27	276								B
33	336						A		
47	476				B	A			B
68	686		A		A		A ^(M)	B	
82	826								E
100	107			A	A ^(M)	B	B		D
110	117						B		
120	127		A		B				D
150	157				B	B		D	E
220	227			B	B		E	D,E	E
270	277		B						
330	337		B		E		D,E	E	E
390	397	D				D			
400	407							E	
470	477			B	D,E		E	E	E
560	567		B			E		E	E
660	667						E		
680	687		E	D,E	E	E	E		
750	757		D,E	D,E	E	E	E	E	
1000	108		D,E	D,E	D,E	E	E		
1200	128		D		E				
1500	158		E	E	E				
1800	188		E						
2200	228		E			E ^(M)			
3000	308				E				
4700	478		E						
5600	568								

Available Ratings ^(M tolerance only)



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-0031 | Rev 5

– HIGH RELIABILITY TANTALUM CAPACITORS –

TWA SERIES

COTS-Plus – Wet Electrolytic Tantalum Capacitor



RATINGS & PART NUMBER REFERENCE

ENERGY

Part Number	Cap (µF) 25°C at 120Hz	DC Rated Voltage (V) at 85°C	ESR max (ohms) at 120Hz	DC Leakage max (µA)		Impedance max (Ohms) -55°C at 120Hz	Maximum Capacitance Change (%)			AC Ripple (mA rms) 85°C at 40kHz	Case Size		Energy (mJ)	Energy / volume (mJ/mm³)
				+25°C	+85°C & +125°C		-55°C	+85°C	+125°C		KYOCERA AVX	DLA		
15 Volts														
TWAD397*015□BSZ0*00	390	15	1.7	7	28	48	-70	25	25	1396	D	T3	33.78	0.024
25 Volts														
TWAA686*025□BEZ0*00	68	25	2.5	0.6	3	45	-40	12	15	850	A	T1	13.29	0.064
TWAA127*025□BSZ0000	120	25	1.3	1	5	25	-42	8	12	1250	A	T1	23.46	0.114
TWAA127*025□BEZ0*00*	120	25	2.3	2	10	35	-42	20	25	1250	A	T1	23.46	0.114
TWAB277*025□BEZ0*00	270	25	0.9	4	20	17.5	-50	18	28	1800	B	T2	52.79	0.081
TWAB337*025□BEZ0*00	330	25	1.3	2	20	25	-60	10	15	1550	B	T2	64.52	0.099
TWAB567*025□BSZ0*00	560	25	0.83	2	10	12	-65	10	15	2100	B	T2	109.48	0.168
TWAE687*025□BEZ0*00	680	25	0.75	3	12	12	-50	8	15	2100	E	T4	132.94	0.069
TWAD757*025□BEZ0*00	750	25	1	3	25	15	-50	8	15	2000	D	T3	146.63	0.106
TWAE757*025□BEZ0*00	750	25	0.75	3.5	16	9	-55	10	18	2200	E	T4	146.63	0.076
TWAD108*025□BEZ0*00	1000	25	1	4	30	15	-50	8	15	2300	D	T3	195.50	0.141
TWAE108*025□BEZ0*00	1000	25	0.7	4	20	9	-55	10	18	2400	E	T4	195.50	0.102
TWAD128*025□B#Z0*00	1200	25	0.65	5	20	7	-70	12	18	2600	D	T3	234.60	0.169
TWAE158*025□BEZ0*00	1500	25	0.5	6	24	7	-65	15	20	2850	E	T4	293.25	0.153
TWAE188*025□BSZ0*00	1800	25	0.5	6	25	7	-75	12	20	3100	E	T4	351.90	0.183
TWAE228*025□BSZ0*00	2200	25	0.5	10	80	10	-90	30	50	3200	E	T4	430.10	0.224
TWAE478*025□B#Z0*00	4700	25	0.5	30	180	5	-90	60	80	4250	E	T4	918.85	0.479
30 Volts														
TWAA107*030□BSZ0000	100	30	1.3	1	5	25	-38	8	12	1200	A	T1	28.35	0.137
TWAA107*030□BEZ0*00*	100	30	2.3	2	10	35	-38	20	25	1200	A	T1	28.35	0.137
TWAB227*030□BEZ0*00	220	30	2	1.9	10	40	-40	18	28	1200	B	T2	62.37	0.096
TWAB477*030□BSZ0*00	470	30	0.85	2	10	15	-65	10	18	1800	B	T2	133.25	0.205
TWAD687*030□BEZ0*00	680	30	1	3.3	25	15	-50	8	15	1900	D	T3	192.78	0.139
TWAE687*030□BEZ0*00	680	30	0.8	4.5	18	10	-60	8	15	2100	E	T4	192.78	0.100
TWAD757*030□BEZ0*00	750	30	1	3.6	30	15	-50	8	15	2000	D	T3	212.63	0.154
TWAE757*030□BEZ0*00	750	30	0.8	5	20	10	-65	10	18	2200	E	T4	212.63	0.111
TWAD108*030□B#Z0*00	1000	30	0.7	7	25	7	-70	10	18	2500	D	T3	283.50	0.205
TWAE108*030□BEZ0*00	1000	30	0.7	5	20	7	-70	10	18	2500	E	T4	283.50	0.148
TWAE158*030□BSZ0*00	1500	30	0.6	12	35	6	-72	10	20	3000	E	T4	425.25	0.222
50 Volts														
TWAB476*050□BSZ0*00	47	50	3	0.8	8	70	-28	13	15	1155	B	T2	37.39	0.057
TWAA686*050□BSZ0000	68	50	1.5	1	5	35	-25	8	15	1050	A	T1	54.09	0.262
TWAA686*050□BEZ0*00*	68	50	2.5	2	10	45	-25	20	25	1050	A	T1	54.09	0.262
TWAA107M050□BSZ0*00	100	50	5	2	15	70	-45	50	95	1500	A	T1	79.55	0.385
TWAB127*050□BEZ0*00	120	50	2	2	10	40	-45	8	15	1200	B	T2	95.46	0.147
TWAB157*050□BEZ0*00	150	50	2	2	10	25	-50	8	15	1400	B	T2	119.33	0.183
TWAB227*050□BSZ0*00	220	50	0.9	2	10	17.5	-50	8	15	1800	B	T2	175.01	0.269
TWAB227*050□BEZ0*00*	220	50	0.9	4	20	17.5	-50	18	28	1800	B	T2	175.01	0.269
TWAE337*050□B#Z0*00	330	50	0.8	2.5	25	15	-50	8	15	1900	E	T4	262.52	0.137
TWAD477*050□BSZ0*00	470	50	0.75	3	25	10	-50	8	15	2100	D	T3	373.89	0.270
TWAD477*050□BEZ0*00*	470	50	1	3	25	11	-50	8	15	2100	D	T3	373.89	0.270
TWAE477*050□B#Z0*00	470	50	0.75	3	30	10	-50	8	15	2200	E	T4	373.89	0.195
TWAE687*050□B#Z0*00	680	50	0.7	5	40	8	-58	10	20	2750	E	T4	540.94	0.282
TWAE757*050□BEZ0*00	750	50	0.6	12	60	8	-50	15	20	2800	E	T4	596.63	0.311
TWAD108*050□BEZ0*00	1000	50	1.5	20	125	12	-90	100	140	2500	D	T3	795.50	0.575
TWAE108*050□BSZ0*00	1000	50	1.0	12	90	20	-90	30	50	3200	E	T4	795.50	0.415
TWAE108*050□BEZ0*00*	1000	50	0.7	11	110	20	-70	30	40	3200	E	T4	795.50	0.415
TWAE128*050□BSZ0*00	1200	50	1.0	12	90	20	-90	30	50	3200	E	T4	954.60	0.498
TWAE158*050□BSZ0*00	1500	50	1	35	130	6	-75	45	55	3500	E	T4	1193.25	0.622
TWAE308M050□B#Z0*00	3000	50	0.3	30	150	3.5	-80	60	85	3100	E	T4	2386.50	1.244
TWAE308K050□BSZ0*00	3000	50	0.6	30	150	5	-90	90	100	3100	E	T4	2386.50	1.244
60 Volts														
TWAA476*060□BSZ0000	47	60	2	1	5	44	-25	8	12	1050	A	T1	53.93	0.261
TWAA476*060□BEZ0*00*	47	60	2	2	10	55	-25	15	25	1050	A	T1	53.93	0.261
TWAB107*060□BSZ0*00	100	60	1.5	1.7	10	30	-35	12	20	1650	B	T2	114.75	0.176
TWAB107*060□BEZ0*00*	100	60	2.5	1.7	10	40	-40	8	15	1100	B	T2	114.75	0.176
TWAB157*060□BSZ0000	150	60	1.1	2	10	20	-40	8	15	1650	B	T2	172.13	0.264
TWAB157*060□BEZ0*00*	150	60	1.5	2	10	30	-35	12	20	1650	B	T2	172.13	0.264
TWAD397*060□B#Z0*00	390	60	0.9	3	25	15	-60	8	15	2100	D	T3	447.53	0.323
TWAE567*060□B#Z0*00	560	60	0.8	5	40	10	-58	8	15	2750	E	T4	642.60	0.335
TWAE687*060□BEZ0*00	680	60	0.6	13	65	8	-50	15	20	2800	E	T4	780.30	0.407
TWAE757*060□BEZ0*00	750	60	0.6	15	75	8	-50	15	20	2800	E	T4	860.63	0.449
TWAE108*060□BSZ0*00	1000	60	1	12	90	20	-90	30	50	3200	E	T4	1147.50	0.598

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COTS-Plus Wet Electrolytic Tantalum Capacitor of Contents



RATINGS & PART NUMBER REFERENCE

ENERGY

Part Number	Cap (µF) 25°C at 120Hz	DC Rated Voltage (V) at 85°C	ESR max (ohms) at 120Hz	DC Leakage max (µA)		Impedance max (Ohms) -55°C at 120Hz	Maximum Capacitance Change (%)			AC Ripple (mA rms) 85°C at 40kHz	Case Size		Energy (mJ)	Energy / volume (mJ/mm ³)
				+25°C	+85°C & +125°C		-55°C	+85°C	+125°C		KYOCERA AVX	DLA		
TWAE108*060□BEZ0*00*	1000	60	0.5	20	60	4.5	-70	30	60	3200	E	T4	1147.50	0.598
TWAE228M060□BEZ0*00	2200	60	0.5	40	120	3.0	-80	60	80	3000	E	T4	2524.50	1.316
75 Volt														
TWAA336*075□BSZ0000	33	75	2.5	1	5	66	-25	5	9	1050	A	T1	59.25	0.287
TWAA336*075□BEZ0*00*	33	75	2.5	2	10	70	-25	15	25	1050	A	T1	59.25	0.287
TWAA686M075□BSZ0*00	68	75	5	2	15	70	-45	50	95	1500	A	T1	122.09	0.591
TWAB107*075□BEZ0*00	100	75	2.5	2	10	40	-35	6	10	1400	B	T2	179.55	0.276
TWAB117*075□BSZ0000	110	75	1.3	2	10	24	-35	6	10	1650	B	T2	197.51	0.303
TWAB117*075□BEZ0*00*	110	75	1.5	2	10	30	-35	12	20	1650	B	T2	197.51	0.303
TWAE227*075□B#Z0*00	220	75	1.1	2.5	30	20	-50	6	10	1800	E	T4	395.01	0.206
TWAD337*075□BSZ0*00	330	75	1	3	30	12	-45	6	10	2100	D	T3	592.52	0.428
TWAD337*075□BEZ0*00*	330	75	1.2	3	30	15	-60	10	20	2100	D	T3	592.52	0.428
TWAE337*075□BEZ0*00	330	75	1	3	40	12	-50	6	10	2200	E	T4	592.52	0.309
TWAE477*075□B#Z0*00	470	75	0.9	5	50	12	-55	6	10	2750	E	T4	843.89	0.440
TWAE667*075□BSZ0*00	660	75	0.7	12	120	10	-70	30	40	2750	E	T4	1185.03	0.418
TWAE687*075□BEZ0*00*	680	75	0.9	11	110	10	-70	30	40	2750	E	T4	1220.94	0.636
TWAE757*075□B#Z0*00	750	75	0.7	12	120	10	-70	30	40	3800	E	T4	1346.63	0.702
TWAE108*075□BEZ0*00	1000	75	0.5	30	90	4.5	-70	30	60	3500	E	T4	1795.50	0.936
100 Volt														
TWAA106M100□BSZ0*00	10	100	3.5	5	25	190	-18	10	30	1050	A	T1	31.96	0.155
TWAA156*100□BSZ0000	15	100	3.5	1	5	125	-18	3	10	1050	A	T1	47.93	0.232
TWAA156*100□BEZ0*00*	15	100	5.5	7	35	140	-18	10	30	1050	A	T1	47.93	0.232
TWAB226*100□BSZ0*00	22	100	4	1	5	100	-10	8	15	1065	B	T2	70.30	0.108
TWAB686*100□BSZ0000	68	100	2.1	2	10	37	-30	4	12	1650	B	T2	217.29	0.334
TWAB686*100□BEZ0*00*	68	100	2.5	2	10	37	-30	4	12	1650	B	T2	217.29	0.334
TWAD157*100□B#Z0*00	150	100	1.6	3	25	22	-35	6	12	2100	D	T3	479.33	0.346
TWAD227*100□BEZ0*00	220	100	1.4	5	25	18	-50	10	15	2500	D	T3	703.01	0.508
TWAE227*100□B#Z0*00	220	100	1.2	5	50	15	-40	6	12	2750	E	T4	703.01	0.366
TWAE337*100□B#Z0*00	330	100	0.8	6	60	10	-45	7	20	3600	E	T4	1054.52	0.550
TWAE407*100□B#Z0*00	400	100	0.8	10	150	10	-50	10	35	4100	E	T4	1278.20	0.666
TWAE477*100□BSZ0*00	470	100	0.7	15	150	10	-50	10	35	4100	E	T4	1501.89	0.783
TWAE567*100□BSZ0*00	560	100	1.0	25	200	10	-60	45	110	4100	E	T4	1789.48	0.933
TWAE757*100□BEZ0*00	750	100	0.6	30	150	5	-60	50	120	4200	E	T4	2396.63	1.249
125 Volt														
TWAA106*125□BSZ0000	10	125	5.5	1	5	175	-15	3	10	1050	A	T1	49.96	0.242
TWAA106M125□BEZ0*00*	10	125	5.5	1	5	190	-15	10	30	1050	A	T1	49.96	0.242
TWAB276*125□BSZ0*00	27	125	4	2	10	100	-10	8	15	1200	B	T2	134.88	0.207
TWAB476*125□B#Z0*00	47	125	2.3	2	10	47	-25	5	12	1650	B	T2	234.79	0.360
TWAE826*125□BSZ0*00	82	125	1.6	2	10	39	-24	10	20	1900	E	T4	409.63	0.213
TWAD107*125□B#Z0*00	100	125	1.8	3	25	35	-35	5	12	2100	D	T3	499.55	0.361
TWAD127*125□BEZ0*00	120	125	1.8	3	25	35	-35	5	12	2100	D	T3	599.46	0.433
TWAE157*125□B#Z0*00	150	125	1.6	5	50	20	-35	6	12	2750	E	T4	749.33	0.391
TWAE227*125□BEZ0*00	220	125	1.4	10	50	12	-40	8	15	3600	E	T4	1099.01	0.573
TWAE337*125□B#Z0*00	330	125	1	15	150	20	-60	20	60	2500	E	T4	1648.52	0.859
TWAE477*125□BSZ0*00	470	125	1	30	160	25	-70	30	70	3500	E	T4	2347.89	1.224
TWAE567*125□BSZ0*00	560	125	1	30	160	25	-70	40	120	4200	E	T4	2797.48	1.458

Energy is calculated by this formula (consider derating factor):

$$\text{Energy} = \frac{1}{2} C \times ((V_r \times X)^2 - V_x^2)$$

where C = Capacitance

V_r = Rated Voltage

X = Recommended derating factor

V_x = 3V (invariable)

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

NOTE: KYOCERA AVX reserves the rights to supply higher voltage rating in the same case size, to the same reliability standards.

*Not recommended for new designs, for new design use part number with Inspection level "S" – COTS-Plus

$$\text{DF} = 2\pi f C \times (\text{ESR})$$

$$2\pi = 6.28$$

$$f = 120\text{Hz}$$

C = Actual measured capacitance

ESR = Actual measured ESR

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

KYOCERA AVX:

TWAE108K060CBSZ0000	TWAE687K050CBSZ0000	TWAA156K100CBSZ0000	TWAB227K050CBSZ0000
TWAD107K125CBSZ0000	TWAB567K025CBSZ0000	TWAA476K060CBSZ0000	TWAE157K125CBSZ0000
TWAB157K060CBSZ0000	TWAD108K030CBSZ0000	TWAB477K030CBSZ0000	TWAE228K025CBSZ0000
TWAE158K030CBSZ0000	TWAD477K050CBSZ0000	TWAE227K100CBSZ0000	TWAB117K075CBSZ0000
TWAB686K100CBSZ0000	TWAB476K125CBSZ0000	TWAD157K100CBSZ0000	TWAD128K025CBSZ0000
TWAD337K075CBSZ0000	TWAE567K060CBSZ0000	TWAA686K050CBSZ0000	TWAE188K025CBSZ0000
TWAE477K075CBSZ0000	TWAA336K075CBSZ0000	TWAD397K060CBSZ0000	TWAA106K125CBSZ0000
TWAA107K030CBSZ0000	TWAA127K025CBSZ0000	TWAE157M125CBSZ0000	TWAE158K050CBSZ0000
TWAA336K075SBSZ0000	TWAB157K060SBSZ0000	TWAD107K125SBSZ0000	TWAD397K060SBSZ0000
TWAE108K050SBSZ0000	TWAE109K010SBSZ0000	TWAE227M100SBSZ0000	TWAE477K075SBSZ0000
TWAE108K060SBSZ0000	TWAB117M075CBSZ0000	TWAB686M100CBSZ0000	TWAD108M060CBSZ0000
TWAD397M060CBSZ0000	TWAE108M060CBSZ0000	TWAE228M025CBSZ0000	TWAE687M050CBSZ0000
TWAD337M075CBSZ0000	TWAB157M060CBSZ0000	TWAB567M025CBSZ0000	TWAD157M100CBSZ0000
TWAE128K050CBSZ0000	TWAA106M125CBSZ0000	TWAA476M060CBSZ0000	TWAB476M125CBSZ0000
TWAE757K075SBSZ0000	TWAE227K100SBSZ0000	TWAD128M025CBSZ0000	TWAD337K075SBSZ0000
TWAE158M050CBSZ0000	TWAA106K125SBSZ0000	TWAA336M075SBSZ0000	TWAA476K060SBSZ0000
TWAA686K050SBSZ0000	TWAB117M075SBSZ0000	TWAB157M060SBSZ0000	TWAB227K050SBSZ0000
TWAB227M050SBSZ0000	TWAB476K125SBSZ0000	TWAB567K025SBSZ0000	TWAB567M025SBSZ0000
TWAD128M025SBSZ0000	TWAD157K100SBSZ0000	TWAD157M100SBSZ0000	TWAD337M075SBSZ0000
TWAE108M060SBSZ0000	TWAE128K050SBSZ0000	TWAE158K050SBSZ0000	TWAE228K025SBSZ0000
TWAE228M025SBSZ0000	TWAE407K100SBSZ0000	TWAE567K060SBSZ0000	TWAE108K030SBEZ0000
TWAB127K050SBEZ0000	TWAD107K125SBEZ0000	TWAE227K125SBEZ0000	TWAA686K025SBEZ0000
TWAE157K125SBEZ0000	TWAE407M100CBEZ0700	TWAE687M075CBEZ0700	TWAE687M060CBEZ0700
TWAE757M030CBEZ0700	TWAE687M030CBEZ0700	TWAE477M100CBEZ0700	TWAE757M075CBEZ0700
TWAE478M025CBEZ0700	TWAE108M050CBEZ0700	TWAE757M060CBEZ0700	TWAD108M050CBEZ0700