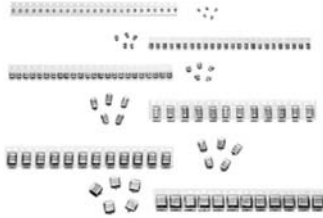


Solid Tantalum Chip Capacitors, TANTAMOUNT[®], Hi-Rel COTS, Conformal Coated


FEATURES

- High reliability; Weibull grading available
- Surge current testing per MIL-PRF-55365 options available
- Standard and low ESR options
- Terminations: SnPb, standard. 100 % tin available
- Compliant to RoHS Directive 2002/95/EC
- Mounting: Surface mount


RoHS*
COMPLIANT

Note

* Pb containing terminations are not RoHS compliant, exemptions may apply

PERFORMANCE/ELECTRICAL CHARACTERISTICS
www.vishay.com/doc?40088

Operating Temperature: - 55 °C to + 85 °C
(to + 125 °C with voltage derating)

Capacitance Range: 0.15 µF to 680 µF

Capacitance Tolerance: ± 20 %, ± 10 % standard

Voltage Rating: 4 V_{DC} to 50 V_{DC}

ORDERING INFORMATION								
T95	D	107	K	010	E	A	A	S
TYPE	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	TERMINATION AND PACKAGING	RELIABILITY LEVEL	SURGE CURRENT	ESR
	See Ratings and Case Codes table.	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	K = ± 10 % M = ± 20 %	This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating. A decimal point is indicated by an "R" (6R3 = 6.3 V).	E: Sn/Pb solder/ 7" (178 mm) reels L: Sn/Pb solder/ 7" (178 mm) ½ reel C: 100 % tin/ 7" (178 mm) reels H: 100 % tin/ 7" (178 mm) ½ reel	A = 1.0 % Weibull B = 0.1 % Weibull (1) C = 0.01 % Weibull (1) S = Hi-rel standard burn-in Z = Non-established reliability	A = 10 cycles at + 25 °C B = 10 cycles at - 55 °C/+ 85 °C S = 3 cycles at + 25 °C	S = Std. L = Low

Note

(1) Weibull 0.1 % and 0.01 % may not be available on all ratings. See detailed notes in ratings table or contact marketing for availability

DIMENSIONS in inches [millimeters]							
CASE CODE	L (MAX.)	W	H	A	B	D (REF.)	J (MAX.)
A	0.146 [3.7]	0.072 ± 0.012 [1.83 ± 0.3]	0.056 ± 0.012 [1.4 ± 0.3]	0.031 ± 0.012 [0.8 ± 0.3]	0.085 ± 0.016 [2.2 ± 0.40]	0.114 [2.9]	0.004 [0.10]
B	0.157 [4.0]	0.110 + 0.012/- 0.016 [2.8 + 0.3/- 0.4]	0.075 + 0.012/- 0.024 [1.9 + 0.3/- 0.6]	0.031 ± 0.012 [0.8 ± 0.3]	0.098 ± 0.016 [2.5 ± 0.40]	0.138 [3.5]	0.004 [0.10]
C	0.280 [7.1]	0.126 ± 0.012 [3.2 ± 0.3]	0.098 ± 0.012 [2.5 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.3]	0.181 ± 0.024 [4.6 ± 0.60]	0.236 [6.0]	0.004 [0.10]
D	0.295 [7.5]	0.169 ± 0.012 [4.3 ± 0.3]	0.110 ± 0.012 [2.8 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.3]	0.181 ± 0.024 [4.6 ± 0.60]	0.252 [6.0]	0.004 [0.10]



DIMENSIONS in inches [millimeters]							
CASE CODE	L (MAX.)	W	H	A	B	D (REF.)	J (MAX.)
R	0.283 max. [7.20 max.]	0.236 + 0.012/- 0.024 [6.0 + 0.30/- 0.60]	0.138 ± 0.012 [3.50 ± 0.30]	0.051 ± 0.012 [1.30 ± 0.30]	0.181 ± 0.024 [4.60 ± 0.60]	0.244 [6.20]	0.004 [0.10]
S	0.143 max. [3.63 max.]	0.072 ± 0.008 [1.83 ± 0.20]	0.048 ± 0.008 [1.22 ± 0.20]	0.023 ± 0.010 [0.58 ± 0.25]	0.085 ± 0.015 [2.16 ± 0.37]	0.114 [2.90]	0.004 [0.10]
V	0.143 max. [3.63 max.]	0.104 ± 0.010 [2.65 ± 0.25]	0.051 ± 0.010 [1.30 ± 0.25]	0.023 ± 0.010 [0.58 ± 0.25]	0.085 ± 0.015 [2.16 ± 0.37]	0.114 [2.90]	0.004 [0.10]
X	0.285 max. [7.24 max.]	0.104 ± 0.010 [2.65 ± 0.25]	0.051 ± 0.010 [1.30 ± 0.25]	0.039 ± 0.020 [1.00 ± 0.50]	0.200 ± 0.027 [5.08 ± 0.69]	0.244 [6.20]	0.004 [0.10]
Y	0.285 max. [7.24 max.]	0.104 ± 0.010 [2.65 ± 0.25]	0.069 ± 0.010 [1.75 ± 0.25]	0.039 ± 0.020 [1.00 ± 0.50]	0.200 ± 0.027 [5.08 ± 0.69]	0.244 [6.20]	0.004 [0.10]
Z	0.285 max. [7.24 max.]	0.104 ± 0.010 [2.65 ± 0.25]	0.104 ± 0.010 [2.65 ± 0.25]	0.039 ± 0.020 [1.00 ± 0.50]	0.200 ± 0.027 [5.08 ± 0.69]	0.244 [6.20]	0.004 [0.10]

Note

- The anode termination (D less B) will be a minimum of 0.010" (0.25 mm)

RATINGS AND CASE CODES								
µF	4 V	6.3 V	10 V	16 V	20 V	25 V	35 V	50 V
0.15							S	
0.22							S	
0.33							S	
0.47							S	
0.68						S	S	
1.0						S	S	
1.5					S	S	V	
2.2				S	S	V	X	
3.3			S	S	V	X		
4.7		S	S	V	X		Y	C
6.8	S	S	V	A/X	X	Y	Z	C/D
10	S	V	X	X	Y	C/Y	Z	
15	V	X	B/X	B/Y	Z	Z	R	R
22	X	X	Y	B/Z	Z		R	R
33	X		Z	Z		D/R	R	
47	Y	Y	Z		R	D/R	R	
68	Y	Z		R		D/R		
100	Z		R	C/D	R	R		
120			D/R		R			
150			D/R	D	R			
180				R	R			
220			D/R	R				
270	D							
330	R	C	D/R	R				
390		R						
470		D	R					
680		R	R					



STANDARD RATINGS							
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)	STD. (S) MAX. ESR AT + 25 °C 100 kHz ⁽¹⁾ (Ω)	LOW (L) MAX. ESR AT + 25 °C 100 kHz ⁽¹⁾ (Ω)	AVAILABLE RELIABILITY LEVELS
4 V_{DC} AT + 85 °C; 2.7 V_{DC} AT + 125 °C							
6.8	S	T95S685(1)004(2)(3)(4)(5)	0.5	6	4.000	2.000	A, S, Z
10	S	T95S106(1)004(2)(3)(4)(5)	0.5	6	4.000	2.000	A, S, Z
15	V	T95V156(1)004(2)(3)(4)(5)	0.6	6	3.000	1.500	A, S, Z
22	X	T95X226(1)004(2)(3)(4)(5)	0.9	6	2.000	1.000	A, S, Z
33	X	T95X336(1)004(2)(3)(4)(5)	1.3	6	2.000	1.000	A, S, Z
47	Y	T95Y476(1)004(2)(3)(4)(5)	1.9	6	1.200	0.600	A, S, Z
68	Y	T95Y686(1)004(2)(3)(4)(5)	2.7	6	1.200	0.600	A, S, Z
100	Z	T95Z107(1)004(2)(3)(4)(5)	4.0	6	0.800	0.400	A, S, Z
270	D	T95D277(1)004(2)(3)(4)(5)	10.8	8	0.130	0.060	A, S, Z
330	R	T95R337(1)004(2)(3)(4)(5)	13.2	8	0.130	0.080	A, S, Z
6.3 V_{DC} AT + 85 °C; 4 V_{DC} AT + 125 °C							
4.7	S	T95S475(1)6R3(2)(3)(4)(5)	0.5	6	4.000	2.000	A, S, Z
6.8	S	T95S685(1)6R3(2)(3)(4)(5)	0.5	6	4.000	2.000	A, S, Z
10	V	T95V106(1)6R3(2)(3)(4)(5)	0.6	6	3.000	1.500	A, S, Z
15	X	T95X156(1)6R3(2)(3)(4)(5)	0.9	6	2.000	1.000	A, S, Z
22	X	T95X226(1)6R3(2)(3)(4)(5)	1.4	6	2.000	1.000	A, S, Z
47	Y	T95Y476(1)6R3(2)(3)(4)(5)	2.8	6	1.200	0.600	A, S, Z
100	Z	T95Z107(1)6R3(2)(3)(4)(5)	6.0	6	0.800	0.400	A, S, Z
180	R	T95R187(1)6R3(2)(3)(4)(5)	10.8	8	0.130	0.080	A, S, Z
220	D	T95R227(1)6R3(2)(6)(4)(5)	22.0	8	0.140	0.065	A, B, S, Z
220	R	T95R227(1)6R3(2)(3)(4)(5)	13.2	8	0.130	0.080	A, S, Z
330	C	T95C337(1)6R3(2)(7)(4)(5)	20.8	8	0.080	0.170	A, B, C, S, Z
390	R	T95R397(1)6R3(2)(3)(4)(5)	23.4	8	0.130	0.045	A, S, Z
470	D	T95D477(1)6R3(2)(3)(4)(5)	28.2	10	0.130	0.060	A, S, Z
680	R	T95R687(1)6R3(2)(3)(4)(5)	40.8	12	0.090	0.045	A, S, Z
10 V_{DC} AT + 85 °C; 7 V_{DC} AT + 125 °C							
3.3	S	T95S335(1)010(2)(3)(4)(5)	0.5	6	5.000	2.500	A, S, Z
4.7	S	T95S475(1)010(2)(3)(4)(5)	0.5	6	4.000	2.000	A, S, Z
6.8	V	T95V685(1)010(2)(3)(4)(5)	0.7	6	4.000	2.000	A, S, Z
10	X	T95X106(1)010(2)(3)(4)(5)	1.0	6	3.000	1.500	A, S, Z
15	B	T95B156(1)010(2)(6)(4)(5)	1.5	6	0.750	0.550	A, B, S, Z
15	X	T95X156(1)010(2)(3)(4)(5)	1.5	6	2.000	1.000	A, S, Z
22	Y	T95Y226(1)010(2)(6)(4)(5)	2.2	6	1.200	0.600	A, B, S, Z
33	Z	T95Z336(1)010(2)(6)(4)(5)	3.3	6	0.800	0.400	A, B, S, Z
47	Z	T95Z476(1)010(2)(3)(4)(5)	4.7	6	0.800	0.400	A, S, Z
100	R	T95R107(1)010(2)(3)(4)(5)	10.0	8	0.140	0.075	A, S, Z
120	D	T95D127(1)010(2)(7)(4)(5)	12.0	8	0.140	0.085	A, B, C, S, Z
120	R	T95R127(1)010(2)(6)(4)(5)	12.0	8	0.140	0.070	A, B, S, Z

Notes

- Part number definitions:
 - (1) Capacitance tolerance: K, M
 - (2) Termination and packaging: C, E, H, L
 - (3) Reliability level: A, S, Z
 - (4) Surge current: A, B, S
 - (5) ESR: L, S
 - (6) Reliability level: A, B, S, Z
 - (7) Reliability level: A, B, C, S, Z
- (1) Empty cells: Not available



STANDARD RATINGS							
CAPACITANCE (μF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)	STD. (S) MAX. ESR AT + 25 °C 100 kHz ⁽¹⁾ (Ω)	LOW (L) MAX. ESR AT + 25 °C 100 kHz ⁽¹⁾ (Ω)	AVAILABLE RELIABILITY LEVELS
10 V_{DC} AT + 85 °C; 7 V_{DC} AT + 125 °C							
150	D	T95D157(1)010(2)(3)(4)(5)	15.0	8	0.140	0.075	A, S, Z
150	R	T95R157(1)010(2)(3)(4)(5)	15.0	8	0.130	0.065	A, S, Z
220	D	T95D227(1)010(2)(6)(4)(5)	22.0	8	0.140	0.065	A, B, S, Z
220	R	T95R227(1)010(2)(3)(4)(5)	22.0	8	0.130	0.055	A, S, Z
330	D	T95D337(1)010(2)(7)(4)(5)	33.0	8	0.140	0.065	A, B, C, S, Z
330	R	T95R337(1)010(2)(3)(4)(5)	33.0	8	0.130	0.045	A, S, Z
470	R	T95R477(1)010(2)(6)(4)(5)	47.0	8	0.130	0.045	A, B, S, Z
680	R	T95R687(1)010(2)(6)(4)S	68.0	14	0.090		A, B, S, Z
16 V_{DC} AT + 85 °C; 10 V_{DC} AT + 125 °C							
2.2	S	T95S225(1)016(2)(3)(4)(5)	0.5	6	7.000	3.500	A, S, Z
3.3	S	T95S335(1)016(2)(3)(4)(5)	0.5	6	5.000	2.500	A, S, Z
4.7	V	T95V475(1)016(2)(3)(4)(5)	0.8	6	4.000	2.000	A, S, Z
6.8	A	T95A685(1)016(2)(3)(4)(5)	1.1	6	2.800	0.800	A, S, Z
6.8	X	T95X685(1)016(2)(3)(4)(5)	1.1	6	3.000	1.500	A, S, Z
10	X	T95X106(1)016(2)(3)(4)(5)	1.6	6	3.000	1.500	A, S, Z
15	B	T95B156(1)016(2)(3)(4)(5)	2.4	6	0.750	0.550	A, S, Z
15	Y	T95Y156(1)016(2)(6)(4)(5)	2.4	6	1.200	0.600	A, B, S, Z
22	B	T95B226(1)016(2)(6)(4)(5)	3.5	6	0.750	0.500	A, B, S, Z
22	Z	T95Z226(1)016(2)(3)(4)(5)	3.5	6	0.800	0.400	A, S, Z
33	Z	T95Z336(1)016(2)(3)(4)(5)	5.3	6	0.800	0.400	A, S, Z
68	R	T95R686(1)016(2)(3)(4)(5)	10.9	6	0.600	0.095	A, S, Z
100	C	T95C107(1)016(2)(6)(4)(5)	16.0	8	0.600	0.090	A, B, S, Z
100	D	T95D107(1)016(2)(6)(4)(5)	16.0	8	0.140	0.080	A, B, S, Z
150	D	T95D157(1)016(2)(6)(4)(5)	24.0	8	0.140	0.085	A, B, S, Z
180	R	T95R187(1)016(2)(6)(4)(5)	28.8	8	0.130	0.055	A, B, S, Z
220	R	T95R227(1)016(2)(6)(4)(5)	35.2	8	0.120	0.055	A, B, S, Z
330	R	T95R337(1)016(2)(6)(4)(5)	52.8	14	0.110	0.055	A, B, S, Z
20 V_{DC} AT + 85 °C; 13 V_{DC} AT + 125 °C							
1.5	S	T95S155(1)020(2)(3)(4)(5)	0.5	6	7.000	3.500	A, S, Z
2.2	S	T95S225(1)020(2)(3)(4)(5)	0.5	6	7.000	3.500	A, S, Z
3.3	V	T95V335(1)020(2)(3)(4)(5)	0.7	6	6.000	3.000	A, S, Z
4.7	X	T95X475(1)020(2)(3)(4)(5)	0.9	6	3.000	1.500	A, S, Z
6.8	X	T95X685(1)020(2)(3)(4)(5)	1.4	6	3.000	1.500	A, S, Z
10	Y	T95Y106(1)020(2)(3)(4)(5)	2.0	6	2.000	1.000	A, S, Z
15	Z	T95Z156(1)020(2)(3)(4)(5)	3.0	6	1.200	0.600	A, S, Z
22	Z	T95Z226(1)020(2)(3)(4)(5)	4.4	6	0.800	0.400	A, S, Z
47	R	T95R476(1)020(2)(3)(4)(5)	9.4	6	0.200	0.110	A, S, Z
100	R	T95R107(1)020(2)(6)(4)S	20.0	8	0.140		A, B, S, Z
120	R	T95R127(1)020(2)(6)(4)(5)	24.0	8	0.140	0.080	A, B, S, Z
150	R	T95R157(1)020(2)(3)(4)(5)	30.0	8	0.140	0.075	A, S, Z

Notes

- Part number definitions:
 - (1) Capacitance tolerance: K, M
 - (2) Termination and packaging: C, E, H, L
 - (3) Reliability level: A, S, Z
 - (4) Surge current: A, B, S
 - (5) ESR: L, S
 - (6) Reliability level: A, B, S, Z
 - (7) Reliability level: A, B, C, S, Z
- (1) Empty cells: Not available



STANDARD RATINGS							
CAPACITANCE (μF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)	STD. (S) MAX. ESR AT + 25 °C 100 kHz ⁽¹⁾ (Ω)	LOW (L) MAX. ESR AT + 25 °C 100 kHz ⁽¹⁾ (Ω)	AVAILABLE RELIABILITY LEVELS
25 V_{DC} AT + 85 °C; 17 V_{DC} AT + 125 °C							
0.68	S	T95S684(1)025(2)(3)(4)(5)	0.5	4	10.000	5.000	A, S, Z
1.0	S	T95S105(1)025(2)(3)(4)(5)	0.5	4	7.000	3.500	A, S, Z
1.5	S	T95S155(1)025(2)(3)(4)(5)	0.5	6	7.000	3.500	A, S, Z
2.2	V	T95V225(1)025(2)(3)(4)(5)	0.6	6	4.000	2.000	A, S, Z
4.7	X	T95X475(1)025(2)(3)(4)(5)	1.2	6	3.000	1.500	A, S, Z
6.8	Y	T95Y685(1)025(2)(3)(4)(5)	1.7	6	2.000	1.000	A, S, Z
10	C	T95C106(1)025(2)(3)(4)(5)	2.5	6	0.570	0.280	A, S, Z
10	Y	T95Y106(1)025(2)(3)(4)(5)	2.5	6	2.000	1.000	A, S, Z
15	Z	T95Z156(1)025(2)(3)(4)(5)	3.8	6	1.200	0.600	A, S, Z
33	D	T95D336(1)025(2)(3)(4)(5)	8.3	6	0.260	0.130	A, S, Z
33	R	T95R336(1)025(2)(3)(4)(5)	8.3	6	0.250	0.130	A, S, Z
47	D	T95D476(1)025(2)(6)(4)(5)	11.8	6	0.260	0.130	A, B, S, Z
47	R	T95R476(1)025(2)(3)(4)(5)	11.8	6	0.200	0.108	A, S, Z
68	D	T95D686(1)025(2)(6)(4)(5)	17.0	8	0.260	0.200	A, B, S, Z
68	R	T95R686(1)025(2)(6)(4)(5)	17.0	6	0.200	0.095	A, B, S, Z
100	R	T95R107(1)025(2)(6)(4)(5)	25.0	8	0.200	0.090	A, B, S, Z
35 V_{DC} AT + 85 °C; 23 V_{DC} AT + 125 °C							
0.15	S	T95S154(1)035(2)(3)(4)(5)	0.5	4	36.000	18.000	A, S, Z
0.22	S	T95S224(1)035(2)(3)(4)(5)	0.5	4	30.000	15.000	A, S, Z
0.33	S	T95S334(1)035(2)(3)(4)(5)	0.5	4	24.000	12.000	A, S, Z
0.47	S	T95S474(1)035(2)(3)(4)(5)	0.5	4	18.000	9.000	A, S, Z
0.68	S	T95S684(1)035(2)(3)(4)(5)	0.5	4	10.000	5.000	A, S, Z
1.0	S	T95S105(1)035(2)(3)(4)(5)	0.5	4	7.000	3.500	A, S, Z
1.5	V	T95V155(1)035(2)(3)(4)(5)	0.5	6	6.000	3.000	A, S, Z
2.2	X	T95X225(1)035(2)(3)(4)(5)	0.8	6	4.000	2.000	A, S, Z
4.7	Y	T95Y475(1)035(2)(3)(4)(5)	1.6	6	1.600	0.800	A, S, Z
6.8	Z	T95Z685(1)035(2)(6)(4)(5)	2.4	6	1.600	0.800	A, B, S, Z
10	Z	T95Z106(1)035(2)(3)(4)(5)	3.5	6	1.200	0.600	A, S, Z
15	D	T95D156(1)035(2)(3)(4)(5)	5.3	6	0.410	0.270	A, S, Z
15	R	T95R156(1)035(2)(3)(4)(5)	5.3	6	0.380	0.190	A, S, Z
22	R	T95R226(1)035(2)(3)(4)(5)	7.7	6	0.280	0.240	A, S, Z
33	R	T95R336(1)035(2)(3)(4)(5)	11.6	6	0.280	0.200	A, S, Z
47	R	T95R476(1)035(2)(6)(4)(5)	16.5	6	0.280	0.320	A, B, S, Z
50 V_{DC} AT + 85 °C; 33 V_{DC} AT + 125 °C							
4.7	C	T95C475(1)050(2)(6)(4)(5)	2.4	6	1.400	0.800	A, B, S, Z
6.8	C	T95C685(1)050(2)(6)(4)(5)	3.4	6	1.300	0.700	A, B, S, Z
6.8	D	T95D685(1)050(2)(3)(4)(5)	3.4	6	0.820	0.450	A, S, Z
10	R	T95R106(1)050(2)(6)(4)(5)	5.0	6	0.650	0.500	A, B, S, Z
15	R	T95R156(1)050(2)(3)(4)(5)	7.5	6	0.400	0.350	A, S, Z
22	R	T95R226(1)050(2)(3)(4)(5)	11.0	6	0.390	0.300	A, S, Z

Notes

- Part number definitions:
 - (1) Capacitance tolerance: K, M
 - (2) Termination and packaging: C, E, H, L
 - (3) Reliability level: A, S, Z
 - (4) Surge current: A, B, S
 - (5) ESR: L, S
 - (6) Reliability level: A, B, S, Z
 - (7) Reliability level: A, B, C, S, Z
- (1) Empty cells: Not available



RECOMMENDED VOLTAGE DERATING GUIDELINES (for temperatures below + 85 °C)	
STANDARD CONDITIONS. FOR EXAMPLE: OUTPUT FILTERS	
Capacitor Voltage Rating	Operating Voltage
4.0	2.5
6.3	3.6
10	6.0
16	10
20	12
25	15
35	24
50	28
SEVERE CONDITIONS. FOR EXAMPLE: INPUT FILTERS	
Capacitor Voltage Rating	Operating Voltage
4.0	2.5
6.3	3.3
10	5.0
16	8.0
20	10
25	12
35	15
50	24

POWER DISSIPATION	
CASE CODE	MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (W) IN FREE AIR
A	0.075
B	0.085
C	0.110
D	0.150
R	0.250
S	0.080
V	0.095
X	0.110
Y	0.120
Z	0.135

STANDARD PACKAGING QUANTITY		
CASE CODE	UNITS PER REEL	
	7" FULL REEL	7" HALF REEL
A	2000	1000
B	2000	1000
C	500	250
D	500	250
R	600	300
S	2500	1250
V	2500	1250
X	2000	1000
Y	1500	750
Z	1500	750

PRODUCT INFORMATION	
Conformal Coated Guide	www.vishay.com/doc?40150
Moisture Sensitivity	www.vishay.com/doc?40135
SELECTOR GUIDES	
Solid Tantalum Selector Guide	www.vishay.com/doc?49053
Solid Tantalum Chip Capacitors	www.vishay.com/doc?40091
FAQ	
Frequently Asked Questions	www.vishay.com/doc?40110



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