

Solid Tantalum Surface Mount Capacitors

TANTAMOUNT® Conformal Coated, Extended Range, Military, MIL-PRF-55365/13 Qualified


FEATURES

- Weibull failure rates B, C, T
- Tape and reel available per EIA 481
- Termination finishes available; gold plate, solder plated, and hot solder dipped
- Mounting: Surface mount
- Compliant to RoHS Directive 2002/95/EC


RoHS*
COMPLIANT

Note

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

PERFORMANCE CHARACTERISTICS

Operating Temperature: - 55 °C to + 125 °C
(above 85 °C, voltage derating is required)

Capacitance Range: 0.33 µF to 330 µF

Capacitance Tolerance: ± 5 %, ± 10 %, ± 20 %

Voltage Rating: 4 V_{DC} to 35 V_{DC}

ORDERING INFORMATION								
CWR16	D	B	335	K	B	A	A	/TR
TYPE	VOLTAGE	TERMINATION FINISH	CAPACITANCE	CAPACITANCE TOLERANCE	FAILURE RATE %/1000 h	CASE CODE	SURGE CURRENT	PACKAGING
	C = 4 V D = 6 V F = 10 V H = 15 V J = 20 V K = 25 V M = 35 V	B = Gold H = Solder plated C = Hot solder dipped	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	J = ± 5 % K = ± 10 % M = ± 20 %	B = 0.1 C = 0.01 T = 0.01 ⁽¹⁾	A B C D E F G H	A = 10 cycles at + 25 °C B = 10 cycles at - 55 °C and + 85 °C C = 10 cycles at - 55 °C and + 85 °C (before Weibull grading) Z = No surge current	Blank = Bulk, plastic tray /FA = Waffle pack /PR = 100 pcs reel /HR = Half reel /TR = Full reel

Note

⁽¹⁾ T level capacitors are recommended for "space applications"

DIMENSIONS in inches [millimeters]						
CASE CODE	L	W	H	P	T ₁	T ₂ (max.)
A	0.100 ± 0.015 [2.54 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
B	0.150 ± 0.015 [3.81 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
C	0.200 ± 0.015 [5.08 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
D	0.150 ± 0.015 [3.81 ± 0.38]	0.100 ± 0.015 [2.54 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
E	0.200 ± 0.015 [5.08 ± 0.38]	0.100 ± 0.015 [2.54 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
F	0.220 ± 0.015 [5.59 ± 0.38]	0.135 ± 0.015 [3.43 ± 0.38]	0.070 ± 0.015 [1.78 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
G	0.265 ± 0.015 [6.73 ± 0.38]	0.110 ± 0.015 [2.79 ± 0.38]	0.110 ± 0.015 [2.79 ± 0.38]	0.050 ± 0.005 [1.27 ± 0.13]	0.005 [0.13]	0.015 [0.38]
H	0.285 ± 0.015 [7.24 ± 0.38]	0.150 ± 0.015 [3.81 ± 0.38]	0.110 ± 0.015 [2.79 ± 0.38]	0.050 ± 0.005 [1.27 ± 0.13]	0.005 [0.13]	0.015 [0.38]

Note

- When solder coated terminations are required, add 0.015" [0.38 mm] to termination dimension tolerance



RATINGS AND CASE CODES							
μF	4 V	6 V	10 V	15 V	20 V	25 V	35 V
0.33							A
0.47						A	
0.68					A		
1.0				A	A	B	
1.5				A	B		
2.2			A	A	B	D	
3.3	A	A	A	B	D	E	
4.7	A	A	B, C	B, C, D	E		
6.8	A	B	B, C, D	D, E	E	F	G
10	B	B	B, C, D, E	D, E	E, F		H
15	B	B, D, E	D, E	E, F	F	G	H
22	B, D	D, E	E	F	G	G, H	
33	D, E	E	F	F, G	H	H	
47	E	F	F, G	G, H	H		
68	E	F, G	G	G, H			
100	F	G	G, H	H			
150	G	G	H				
220	H	H	H				
330	H	H					

STANDARD RATINGS									
CAPACITANCE (μF)	CASE CODE	PART NUMBER	MAX. DCL (μA) AT			MAX. DF (%) AT			MAX. ESR AT + 25 °C 100 kHz (Ω)
			+ 25 °C	+ 85 °C	+ 125 °C	+ 25 °C	+ 85 °C + 125 °C	- 55 °C	
4 V _{DC} AT + 85 °C; 2.7 V _{DC} AT + 125 °C									
3.3	A	CWR16C(1)335(2)(3)A(4)(5)	1	10	12	6	8	8	12
4.7	A	CWR16C(1)475(2)(3)A(4)(5)	1	10	12	6	8	8	12
6.8	A	CWR16C(1)685(2)(3)A(4)(5)	1	10	12	6	8	8	12
10	B	CWR16C(1)106(2)(3)B(4)(5)	1	10	12	8	10	10	8
15	B	CWR16C(1)156(2)(3)B(4)(5)	1	10	12	8	10	10	8
22	B	CWR16C(1)226(2)(3)B(4)(5)	1	10	12	8	10	10	8
22	D	CWR16C(1)226(2)(3)D(4)(5)	1	10	12	8	10	12	4
33	D	CWR16C(1)336(2)(3)D(4)(5)	2	20	24	8	10	12	4
33	E	CWR16C(1)336(2)(3)E(4)(5)	2	20	24	8	10	12	3
47	E	CWR16C(1)476(2)(3)E(4)(5)	2	20	24	8	10	12	3
68	E	CWR16C(1)686(2)(3)E(4)(5)	3	30	36	8	10	12	3
100	F	CWR16C(1)107(2)(3)F(4)(5)	4	40	48	10	12	12	2
150	G	CWR16C(1)157(2)(3)G(4)(5)	6	60	72	10	12	12	1
220	H	CWR16C(1)227(2)(3)H(4)(5)	8	80	96	10	12	12	1
330	H	CWR16C(1)337(2)(3)H(4)(5)	10	100	120	10	12	12	0.9

Note

- Part number definitions:
 - Termination finish: B, C, H
 - Capacitance tolerance: J, K, M
 - Failure rate: B, C, T
 - Surge current: A, B, C, Z
 - Packaging: Blank, /FA, /HR, /PR, /TR



STANDARD RATINGS									
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DCL (μ A) AT			MAX. DF (%) AT			MAX. ESR AT + 25 °C 100 kHz (Ω)
			+ 25 °C	+ 85 °C	+ 125 °C	+ 25 °C	+ 85 °C + 125 °C	- 55 °C	
6 V_{DC} AT + 85 °C; 4 V_{DC} AT + 125 °C									
3.3	A	CWR16D(1)335(2)(3)A(4)(5)	1	10	12	6	8	8	12
4.7	A	CWR16D(1)475(2)(3)A(4)(5)	1	10	12	6	8	8	12
6.8	B	CWR16D(1)685(2)(3)B(4)(5)	1	10	12	6	8	8	8
10	B	CWR16D(1)106(2)(3)B(4)(5)	1	10	12	6	8	8	8
15	B	CWR16D(1)156(2)(3)B(4)(5)	1	10	12	8	10	10	8
15	D	CWR16D(1)156(2)(3)D(4)(5)	1	10	12	8	10	12	5
15	E	CWR16D(1)156(2)(3)E(4)(5)	1	10	12	8	10	12	3
22	D	CWR16D(1)226(2)(3)D(4)(5)	1	10	12	6	8	8	5
22	E	CWR16D(1)226(2)(3)E(4)(5)	2	20	24	8	10	12	3.5
33	E	CWR16D(1)336(2)(3)E(4)(5)	2	20	24	6	8	8	3.5
47	F	CWR16D(1)476(2)(3)F(4)(5)	3	30	36	8	10	12	3.5
68	F	CWR16D(1)686(2)(3)F(4)(5)	4	40	48	10	12	12	1.5
68	G	CWR16D(1)686(2)(3)G(4)(5)	4	40	48	10	12	12	1
100	G	CWR16D(1)107(2)(3)G(4)(5)	6	60	72	10	12	12	1.1
150	G	CWR16D(1)157(2)(3)G(4)(5)	10	100	120	10	12	12	1.1
220	H	CWR16D(1)227(2)(3)H(4)(5)	10	100	120	10	12	12	0.9
330	H	CWR16D(1)337(2)(3)H(4)(5)	20	200	240	10	12	12	0.9
10 V_{DC} AT + 85 °C; 7 V_{DC} AT + 125 °C									
2.2	A	CWR16F(1)225(2)(3)A(4)(5)	1	10	12	6	8	8	12
3.3	A	CWR16F(1)335(2)(3)A(4)(5)	1	10	12	6	8	8	12
4.7	B	CWR16F(1)475(2)(3)B(4)(5)	1	10	12	6	8	8	8
4.7	C	CWR16F(1)475(2)(3)C(4)(5)	1	10	12	6	8	8	5.5
6.8	B	CWR16F(1)685(2)(3)B(4)(5)	1	10	12	6	8	8	8
6.8	C	CWR16F(1)685(2)(3)C(4)(5)	1	10	12	6	8	8	5.5
6.8	D	CWR16F(1)685(2)(3)D(4)(5)	1	10	12	6	8	8	5
10	B	CWR16F(1)106(2)(3)B(4)(5)	1	10	12	8	10	10	8
10	C	CWR16F(1)106(2)(3)C(4)(5)	1	10	12	6	8	8	5.5
10	D	CWR16F(1)106(2)(3)D(4)(5)	1	10	12	6	8	8	4
10	E	CWR16F(1)106(2)(3)E(4)(5)	1	10	12	6	8	8	3.5
15	D	CWR16F(1)156(2)(3)D(4)(5)	1	10	12	6	8	8	5
15	E	CWR16F(1)156(2)(3)E(4)(5)	2	20	24	8	10	10	3
22	E	CWR16F(1)226(2)(3)E(4)(5)	3	30	36	8	10	10	2
33	F	CWR16F(1)336(2)(3)F(4)(5)	3	30	36	8	10	10	1.5
47	F	CWR16F(1)476(2)(3)F(4)(5)	4	40	48	10	12	12	1.5
47	G	CWR16F(1)476(2)(3)G(4)(5)	4	40	48	10	12	12	1
68	G	CWR16F(1)686(2)(3)G(4)(5)	6	60	72	10	12	12	1.1
100	G	CWR16F(1)107(2)(3)G(4)(5)	10	100	120	10	12	12	1.1
100	H	CWR16F(1)107(2)(3)H(4)(5)	10	100	120	10	12	12	0.9
150	H	CWR16F(1)157(2)(3)H(4)(5)	15	150	180	10	12	12	0.9
220	H	CWR16F(1)227(2)(3)H(4)(5)	20	200	240	10	12	12	0.9

Note

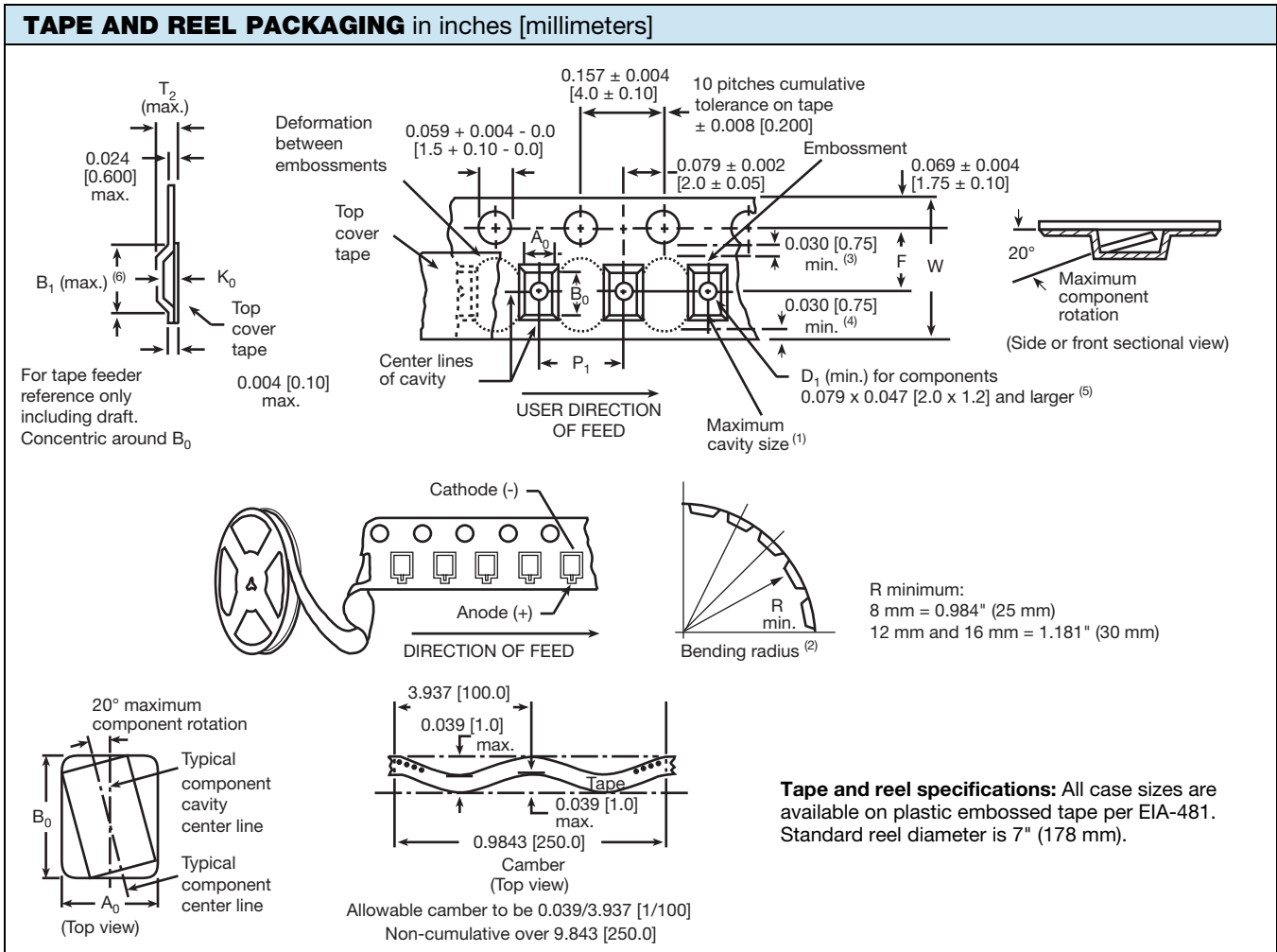
- Part number definitions:
 - Termination finish: B, C, H
 - Capacitance tolerance: J, K, M
 - Failure rate: B, C, T
 - Surge current: A, B, C, Z
 - Packaging: Blank, /FA, /HR, /PR, /TR



STANDARD RATINGS									
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DCL (μ A) AT			MAX. DF (%) AT			MAX. ESR AT + 25 °C 100 kHz (Ω)
			+ 25 °C	+ 85 °C	+ 125 °C	+ 25 °C	+ 85 °C + 125 °C	- 55 °C	
15 V_{DC} AT + 85 °C; 10 V_{DC} AT + 125 °C									
1.0	A	CWR16H(1)105(2)(3)A(4)(5)	1	10	12	6	8	8	15
1.5	A	CWR16H(1)155(2)(3)A(4)(5)	1	10	12	6	8	8	15
2.2	A	CWR16H(1)225(2)(3)A(4)(5)	1	10	12	6	8	8	15
3.3	B	CWR16H(1)335(2)(3)B(4)(5)	1	10	12	6	8	8	9
4.7	B	CWR16H(1)475(2)(3)B(4)(5)	1	10	12	6	8	8	5
4.7	C	CWR16H(1)475(2)(3)C(4)(5)	1	10	12	6	8	8	5.5
4.7	D	CWR16H(1)475(2)(3)D(4)(5)	1	10	12	6	8	8	6
6.8	D	CWR16H(1)685(2)(3)D(4)(5)	1	10	12	6	8	8	6
6.8	E	CWR16H(1)685(2)(3)E(4)(5)	1	10	12	8	10	12	3
10	D	CWR16H(1)106(2)(3)D(4)(5)	2	20	24	6	8	8	6
10	E	CWR16H(1)106(2)(3)E(4)(5)	2	20	24	6	8	8	4
15	E	CWR16H(1)156(2)(3)E(4)(5)	2	20	24	6	8	8	4
15	F	CWR16H(1)156(2)(3)F(4)(5)	2	20	24	8	10	10	3
22	F	CWR16H(1)226(2)(3)F(4)(5)	3	30	36	8	10	10	3
33	F	CWR16H(1)336(2)(3)F(4)(5)	5	50	60	6	8	8	3
33	G	CWR16H(1)336(2)(3)G(4)(5)	6	60	72	8	10	10	1.1
47	G	CWR16H(1)476(2)(3)G(4)(5)	10	100	120	8	10	10	1.1
47	H	CWR16H(1)476(2)(3)H(4)(5)	10	100	120	8	10	10	0.9
68	G	CWR16H(1)686(2)(3)G(4)(5)	10	100	120	8	10	10	1.1
68	H	CWR16H(1)686(2)(3)H(4)(5)	10	100	120	8	10	10	0.9
100	H	CWR16H(1)107(2)(3)H(4)(5)	15	150	180	10	12	12	0.9
20 V_{DC} AT + 85 °C; 13 V_{DC} AT + 125 °C									
0.68	A	CWR16J(1)684(2)(3)A(4)(5)	1	10	12	6	8	8	15
1.0	A	CWR16J(1)105(2)(3)A(4)(5)	1	10	12	6	8	8	15
1.5	B	CWR16J(1)155(2)(3)B(4)(5)	1	10	12	6	8	8	9
2.2	B	CWR16J(1)225(2)(3)B(4)(5)	1	10	12	6	8	8	9
3.3	D	CWR16J(1)335(2)(3)D(4)(5)	1	10	12	6	8	8	6
4.7	E	CWR16J(1)475(2)(3)E(4)(5)	1	10	12	6	8	8	6
6.8	E	CWR16J(1)685(2)(3)E(4)(5)	2	20	24	6	8	8	5
10	E	CWR16J(1)106(2)(3)E(4)(5)	2	20	24	6	8	8	5
10	F	CWR16J(1)106(2)(3)F(4)(5)	2	20	24	6	8	8	3
15	F	CWR16J(1)156(2)(3)F(4)(5)	3	30	36	6	8	8	3
22	G	CWR16J(1)226(2)(3)G(4)(5)	4	40	48	8	10	10	2.5
33	H	CWR16J(1)336(2)(3)H(4)(5)	6	60	72	8	10	10	0.9
47	H	CWR16J(1)476(2)(3)H(4)(5)	10	100	120	8	10	10	0.9
25 V_{DC} AT + 85 °C; 17 V_{DC} AT + 125 °C									
0.47	A	CWR16K(1)474(2)(3)A(4)(5)	1	10	12	6	8	8	15
1.0	B	CWR16K(1)105(2)(3)B(4)(5)	1	10	12	6	8	8	10
2.2	D	CWR16K(1)225(2)(3)D(4)(5)	1	10	12	6	8	8	6
3.3	E	CWR16K(1)335(2)(3)E(4)(5)	1	10	12	6	8	8	4
6.8	F	CWR16K(1)685(2)(3)F(4)(5)	2	20	24	6	8	8	3
15	G	CWR16K(1)156(2)(3)G(4)(5)	4	40	48	6	8	8	1.4
22	G	CWR16K(1)226(2)(3)G(4)(5)	6	60	72	6	8	8	1.4
22	H	CWR16K(1)226(2)(3)H(4)(5)	6	60	72	6	8	8	0.9
33	H	CWR16K(1)336(2)(3)H(4)(5)	10	100	120	8	10	10	0.9
35 V_{DC} AT + 85 °C; 23 V_{DC} AT + 125 °C									
0.33	A	CWR16M(1)334(2)(3)A(4)(5)	1	10	12	6	8	8	22
6.8	G	CWR16M(1)685(2)(3)G(4)(5)	3	30	36	6	8	8	1.5
10	H	CWR16M(1)106(2)(3)H(4)(5)	4	40	48	8	10	10	0.9
15	H	CWR16M(1)156(2)(3)H(4)(5)	6	60	72	6	8	8	0.9

Note

- Part number definitions:
 - (1) Termination finish: B, C, H
 - (2) Capacitance tolerance: J, K, M
 - (3) Failure rate: B, C, T
 - (4) Surge current: A, B, C, Z
 - (5) Packaging: Blank, /FA, /HR, /PR, /TR

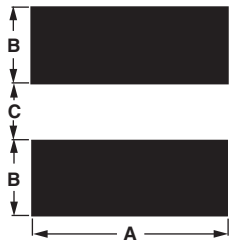


CARRIER TAPE DIMENSIONS in inches [millimeters]							
CASE CODE	TAPE SIZE	B_1 (max.)	D_1 (min.)	F	P_1	T_2 (max.)	W
A	8 mm	0.179 [4.55]	0.039 [1.0]	0.138 ± 0.002 [3.5 ± 0.05]	0.157 ± 0.004 [4.0 ± 0.1]	0.098 [2.5]	0.315 ± 0.004 [8.0 ± 0.10]
B, C, D, E	12 mm	0.323 [8.2]	0.059 [1.5]	0.217 ± 0.002 [5.5 ± 0.05]	0.157 ± 0.004 [4.0 ± 0.1]	0.256 [6.5]	0.472 ± 0.012 [12.0 ± 0.30]
F	12 mm double pitch	0.323 [8.2]	0.059 [1.5]	0.217 ± 0.002 [5.5 ± 0.05]	0.315 ± 0.004 [8.0 ± 0.10]	0.256 [6.5]	0.472 ± 0.012 [12.0 ± 0.30]
G, H	16 mm	0.476 [12.1]	0.059 [1.5]	0.295 ± 0.004 [7.5 ± 0.1]	0.315 ± 0.004 [8.0 ± 0.10]	0.315 [8.0]	0.642 max. [16.3] max.

STANDARD PACKAGING QUANTITY				
CASE CODE	QUANTITY (PCS/REEL)			BULK, PLASTIC TRAY QUANTITY (PCS)
	7", FULL REEL (/TR)	7", HALF REEL (/HR)	7", PARTIAL REEL (/PR)	
A, B, C, D, E	2500	1250	100	75
F	1000	500	100	75
G	600	300	100	60
H	600	300	100	50

Notes

- Bulk capacitors are shipped in plastic trays
- T level capacitors are only shipped in tape and reel/or waffle packaging. Contact factory for waffle pack quantities.

PAD DIMENSIONS in inches [millimeters]			
			
CASE CODE	WIDTH (A)	PAD METALLIZATION (B)	SEPARATION (C)
A	0.065 [1.6]	0.50 [1.3]	0.040 [1.0]
B	0.065 [1.6]	0.70 [1.8]	0.055 [1.4]
C	0.065 [1.6]	0.70 [1.8]	0.120 [3.0]
D	0.115 [2.9]	0.70 [1.8]	0.070 [1.8]
E	0.115 [2.9]	0.70 [1.8]	0.120 [3.0]
F	0.150 [3.8]	0.70 [1.8]	0.140 [3.6]
G	0.125 [3.2]	0.70 [1.8]	0.170 [4.3]
H	0.165 [4.2]	0.90 [2.3]	0.170 [4.3]

POWER DISSIPATION	
CASE CODE	MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (W) IN FREE AIR
A	0.060
B, C	0.075
D, E	0.085
F	0.110
G	0.120
H	0.150



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