Solid-Electrolyte TANTALEX™ Capacitors, Hermetically Sealed, Axial-Lead, CECC Approved

FEATURES

- Terminations: tin / lead (SnPb), 100 % tin (RoHS-compliant)
- Hermetically sealed metal case with plastic film insulation
- Extended capacitance range (type 749DX)
- High operational stability with both time and temperature
- Low leakage current
- Low dissipation factor
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS* Available

HALOGEN FREE GREEN (5-2008) Available

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

PERFORMANCE CHARACTERISTICS

Operating Temperature:
-55 °C to +85 °C (types CTS13)
-55 °C to +125 °C (types CTS1, 749DX)

SPECIFICATIONS

CECC		BS	
30201-001		749DX 9073-N001	749DX
30201-002	CTS1		
30201-005	CTS13		
30201-029	749DX		

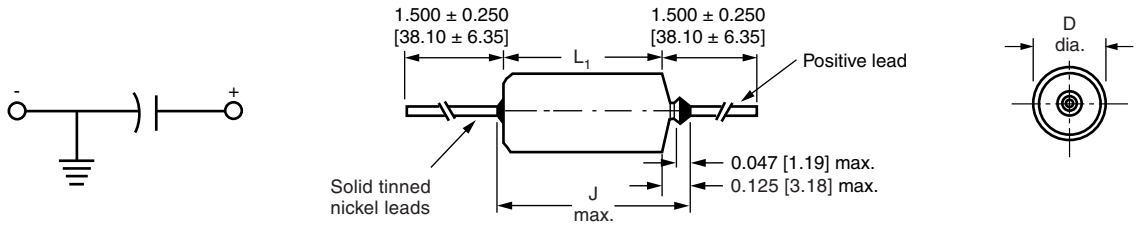
APPLICATIONS

Performance and reliability has been proven in a wide range of applications such as: filtering, by-pass, coupling, energy storage, timing circuits.

ORDERING INFORMATION

CTS13	105	X0	040	A	2	P	E3
TYPE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT +85 °C	CASE CODE	STYLE NUMBER	PACKAGING	RoHS-COMPLIANT
Identifies the basic capacitor design CTS1 = CECC 30201-002 CTS13 = CECC 30201-005 749DX = CECC 30201-001 / CECC 30201-029	Expressed in picofarads. First two digits are significant. Third digit is the number of zeros following.	X0 = ± 20 % X9 = ± 10 % X5 = ± 5 % * * Special order	Expressed in volts. Where necessary, zeros precede the voltage rating to complete the 3 digit block 6R3 = 6.3 V	See Ratings and Case Codes table.	0 = bare case 2 = plastic-film insulation	See Tape and Reel Packaging	E3 = 100 % tin termination (RoHS-compliant) Blank = SnPb termination

DIMENSIONS in inches [millimeters]



CASE CODE	L_1 ± 0.031 [0.79]	J max.	D max.	LEAD DIAMETER + 10 %, - 0.05
A	0.286 [7.26]	0.402 [10.2]	0.141 [3.6]	0.020 [0.5]
B	0.474 [12.04]	0.590 [15.0]	0.192 [4.9]	0.020 [0.5]
C	0.686 [17.42]	0.807 [20.5]	0.295 [7.5]	0.025 [0.6]
D	0.786 [19.96]	0.945 [24.0]	0.364 [9.1]	0.025 [0.6]

RATINGS AND CASE CODES - TYPE CTS1

C_R (µF)	RATED VOLTAGE U_R (+85 °C)						
	6.3 V	10 V	16 V	25 V	40 V	50 V	63 V
	CATEGORY VOLTAGE U_C (+125 °C)						
	4 V	6.3 V	10 V	13 V	25 V	33 V	40 V
0.10							A
0.12							A
0.15							A
0.18							A
0.22							A
0.27						A	A
0.33						A	A
0.39						A	A
0.47					A	A	A
0.56					A	A	A
0.68					A	A	A
0.82					A	A	B
1.0					A	A	B
1.2					A	B	B
1.5				A	B	B	B
1.8			A		B	B	B
2.2			A		B	B	B
2.7			A		B	B	B
3.3			A		B	B	B
3.9		A			B	B	B
4.7		A			B	B	C
5.6	A				B	C	C
6.8	A				B	C	C
8.2				B	C	C	C
10				B	C	C	C
12			B		C	C	D
15			B		C	C	D
18			B		C	C	D
22			B		C	D	
27		B		C	D		
33		B		C	D		
39	B		C		D		
47	B		C		D		
56	B		C	D			
68			C	D			
82		C	D				
100		C	D				
120	C		D				
150	C		D				
180		D					
220		D					
270	D						
330	D						

RATINGS AND CASE CODES - TYPE CTS13

C_R (µF)	RATED VOLTAGE U_R (+85 °C)							
	6.3 V	10 V	16 V	20 V	25 V	40 V	50 V	63 V
0.10								A
0.12								A
0.15								A
0.18								A
0.22								A
0.27							A	A
0.33							A	A
0.39							A	A
0.47						A	A	A
0.56						A	A	A
0.68						A	A	A
0.82						A	A	B
1.0						A	A	B
1.2					A	A	B	B
1.5					A	B	B	B
1.8				A		B	B	B
2.2				A		B	B	B
2.7			A			B	B	B
3.3			A			B	B	B
3.9		A				B	B	B
4.7		A				B	B	C
5.6	A					B	C	C
6.8	A					B	C	C
8.2					B	C	C	C
10					B	C	C	C
12				B		C	C	D
15				B		C	C	D
18			B			C	C	D
22			B			C	D	
27		B			C	D		
33		B			C	D		
39	B			C		D		
47	B			C		D		
56	B		C		D			
68			C		D			
82		C		D				
100		C		D				
120	C		D					
150	C		D					
180		D						
220		D						
270	D							
330	D							

RATINGS AND CASE CODES - TYPE 749DX

C_R (µF)	RATED VOLTAGE U_R (+85 °C)								
	6.3 V	10 V	16 V	20 V	25 V	35 V	40 V	50 V	63 V
	CATEGORY VOLTAGE U_C (+125 °C)								
	4 V	6.3 V	10 V	13 V	16 V	23 V	25 V	33 V	40 V
0.068									
0.10						A	A		A
0.12						A	A		A
0.15						A	A		A
0.18						A	A		A
0.22						A	A		A
0.27						A	A		A
0.33						A	A		A
0.39						A	A		A
0.47						A	A		A
0.56						A	A		A
0.68						A	A		A
0.82						A	A	A	B
1.0						A	A	A	B
1.2					A	B	B	B	B
1.5					A	B	B	B	B
1.8				A		B	B	B	B
2.2				A		B	B	B	B
2.7			A			B	B	B	B
3.3			A			B	B	B	B
3.9		A				B	B	B	B
4.7		A				B	B	B	C
5.6	A					B	B	C	C
6.8	A					B	B	C	C
8.2					B	C	C	C	C
10					B	C	C	C	C
12				B		C	C	C	D
15				B		C	C	C	D
18			B			C	C	C	D
22			B			C	C	D	
27		B			C	D	D		
33		B			C	D	D		
39		B		C		D	D		
47	B			C		D			
56	B		C		D	D			
68			C		D				
82		C		D					
100		C		D					
120		C	D						
150	C		D						
180	C	D							
220		D							
270	D								
330	D								

STANDARD RATINGS / EXTENDED RATINGS - CTS1

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
6.3 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C					
5.6	A	CTS1565(1)6R3A(2)(3)	1.0	6	10
6.8	A	CTS1685(1)6R3A(2)(3)	1.0	6	10
39	B	CTS1396(1)6R3B(2)(3)	2.3	6	5
47	B	CTS1476(1)6R3B(2)(3)	2.8	6	5
56	B	CTS1566(1)6R3B(2)(3)	3.4	6	5
120	C	CTS1127(1)6R3C(2)(3)	7.2	6	2
150	C	CTS1157(1)6R3C(2)(3)	9.0	6	2
270	D	CTS1277(1)6R3D(2)(3)	16.2	6	1
330	D	CTS1337(1)6R3D(2)(3)	19.8	8	1
10 V_{DC} AT +85 °C; 6.3 V_{DC} AT +125 °C					
3.9	A	CTS1395(1)010A(2)(3)	1.0	6	10
4.7	A	CTS1475(1)010A(2)(3)	1.0	6	10
27	B	CTS1276(1)010B(2)(3)	2.7	6	5
33	B	CTS1336(1)010B(2)(3)	3.3	6	5
82	C	CTS1826(1)010C(2)(3)	8.2	6	2
100	C	CTS1107(1)010C(2)(3)	10.0	6	2
180	D	CTS1187(1)010D(2)(3)	18.0	6	1
220	D	CTS1227(1)010D(2)(3)	22.0	8	1
16 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C					
1.8	A	CTS1185(1)016A(2)(3)	1.0	6	10
2.2	A	CTS1225(1)016A(2)(3)	1.0	6	10
2.7	A	CTS1275(1)016A(2)(3)	1.0	6	10
3.3	A	CTS1335(1)016A(2)(3)	1.0	6	10
12	B	CTS1126(1)016B(2)(3)	1.9	6	5
15	B	CTS1156(1)016B(2)(3)	2.4	6	5
18	B	CTS1186(1)016B(2)(3)	2.9	6	5
22	B	CTS1226(1)016B(2)(3)	3.5	6	5
39	C	CTS1396(1)016C(2)(3)	6.2	6	2
47	C	CTS1476(1)016C(2)(3)	7.5	6	2
56	C	CTS1566(1)016C(2)(3)	9.0	6	2
68	C	CTS1686(1)016C(2)(3)	10.9	6	2
82	D	CTS1826(1)016D(2)(3)	13.1	6	1
100	D	CTS1107(1)016D(2)(3)	16.0	6	1
120	D	CTS1127(1)016D(2)(3)	19.2	8	1
150	D	CTS1157(1)016D(2)(3)	24.0	8	1
25 V_{DC} AT +85 °C; 16 V_{DC} AT +125 °C					
1.5	A	CTS1155(1)025A(2)(3)	1.0	6	10
8.2	B	CTS1825(1)025B(2)(3)	2.1	6	5
10	B	CTS1106(1)025B(2)(3)	2.5	6	5
27	C	CTS1276(1)025C(2)(3)	6.8	6	2
33	C	CTS1336(1)025C(2)(3)	8.3	6	2
56	D	CTS1566(1)025D(2)(3)	14.0	6	1
68	D	CTS1686(1)025D(2)(3)	17.0	6	1

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

STANDARD RATINGS / EXTENDED RATINGS - CTS1

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
40 V_{DC} AT +85 °C; 25 V_{DC} AT +125 °C					
0.47	A	CTS1474(1)040A(2)(3)	1.0	6	10
0.56	A	CTS1564(1)040A(2)(3)	1.0	6	10
0.68	A	CTS1684(1)040A(2)(3)	1.0	6	10
0.82	A	CTS1824(1)040A(2)(3)	1.0	6	10
1.0	A	CTS1105(1)040A(2)(3)	1.0	6	10
1.2	A	CTS1125(1)040A(2)(3)	1.0	6	10
1.5	B	CTS1155(1)040B(2)(3)	1.0	6	5
1.8	B	CTS1185(1)040B(2)(3)	1.0	6	5
2.2	B	CTS1225(1)040B(2)(3)	1.0	6	5
2.7	B	CTS1275(1)040B(2)(3)	1.1	6	5
3.3	B	CTS1335(1)040B(2)(3)	1.3	6	5
3.9	B	CTS1395(1)040B(2)(3)	1.6	6	5
4.7	B	CTS1475(1)040B(2)(3)	1.9	6	5
5.6	B	CTS1565(1)040B(2)(3)	2.2	6	5
6.8	B	CTS1685(1)040B(2)(3)	2.7	6	5
8.2	C	CTS1825(1)040C(2)(3)	3.3	6	2
10	C	CTS1106(1)040C(2)(3)	4.0	6	2
12	C	CTS1126(1)040C(2)(3)	4.8	6	2
15	C	CTS1156(1)040C(2)(3)	6.0	6	2
18	C	CTS1186(1)040C(2)(3)	7.2	6	2
22	C	CTS1226(1)040C(2)(3)	8.8	6	2
27	D	CTS1276(1)040D(2)(3)	10.8	6	1
33	D	CTS1336(1)040D(2)(3)	13.2	6	1
39	D	CTS1396(1)040D(2)(3)	15.6	6	1
47	D	CTS1476(1)040D(2)(3)	18.8	6	1
50 V_{DC} AT +85 °C; 33 V_{DC} AT +125 °C					
0.27	A	CTS1274(1)050A(2)(3)	1.0	6	n/a
0.33	A	CTS1334(1)050A(2)(3)	1.0	6	10
0.39	A	CTS1394(1)050A(2)(3)	1.0	6	10
0.47	A	CTS1474(1)050A(2)(3)	1.0	6	10
0.56	A	CTS1564(1)050A(2)(3)	1.0	6	10
0.68	A	CTS1684(1)050A(2)(3)	1.0	6	10
0.82	A	CTS1824(1)050A(2)(3)	1.0	6	10
1.0	A	CTS1105(1)050A(2)(3)	1.0	6	10
1.2	B	CTS1125(1)050B(2)(3)	1.0	6	5
1.5	B	CTS1155(1)050B(2)(3)	1.0	6	5
1.8	B	CTS1185(1)050B(2)(3)	1.0	6	5
2.2	B	CTS1225(1)050B(2)(3)	1.1	6	5
2.7	B	CTS1275(1)050B(2)(3)	1.4	6	5
3.3	B	CTS1335(1)050B(2)(3)	1.7	6	5
3.9	B	CTS1395(1)050B(2)(3)	2.0	6	5

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

STANDARD RATINGS / EXTENDED RATINGS - CTS1					
CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
50 V_{DC} AT +85 °C; 33 V_{DC} AT +125 °C					
4.7	B	CTS1475(1)050B(2)(3)	2.4	6	5
5.6	C	CTS1565(1)050C(2)(3)	2.8	6	2
6.8	C	CTS1685(1)050C(2)(3)	3.4	6	2
8.2	C	CTS1825(1)050C(2)(3)	4.1	6	2
10	C	CTS1106(1)050C(2)(3)	5.0	6	2
12	C	CTS1126(1)050C(2)(3)	6.0	6	2
15	C	CTS1156(1)050C(2)(3)	7.5	6	2
18	C	CTS1186(1)050C(2)(3)	9.0	6	2
22	D	CTS1226(1)050D(2)(3)	11.0	6	1
63 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C					
0.10	A	CTS1104(1)063A(2)(3)	1.0	6	n/a
0.12	A	CTS1124(1)063A(2)(3)	1.0	6	n/a
0.15	A	CTS1154(1)063A(2)(3)	1.0	6	n/a
0.18	A	CTS1184(1)063A(2)(3)	1.0	6	n/a
0.22	A	CTS1224(1)063A(2)(3)	1.0	6	n/a
0.27	A	CTS1274(1)063A(2)(3)	1.0	6	n/a
0.33	A	CTS1334(1)063A(2)(3)	1.0	6	10
0.39	A	CTS1394(1)063A(2)(3)	1.0	6	10
0.47	A	CTS1474(1)063A(2)(3)	1.0	6	10
0.56	A	CTS1564(1)063A(2)(3)	1.0	6	10
0.68	A	CTS1684(1)063A(2)(3)	1.0	6	10
0.82	B	CTS1824(1)063B(2)(3)	1.0	6	5
1.0	B	CTS1105(1)063B(2)(3)	1.0	6	5
1.2	B	CTS1125(1)063B(2)(3)	1.0	6	5
1.5	B	CTS1155(1)063B(2)(3)	1.0	6	5
1.8	B	CTS1185(1)063B(2)(3)	1.1	6	5
2.2	B	CTS1225(1)063B(2)(3)	1.4	6	5
2.7	B	CTS1275(1)063B(2)(3)	1.7	6	5
3.3	B	CTS1335(1)063B(2)(3)	2.1	6	5
3.9	B	CTS1395(1)063B(2)(3)	2.5	6	5
4.7	C	CTS1475(1)063C(2)(3)	3.0	6	2
5.6	C	CTS1565(1)063C(2)(3)	3.5	6	2
6.8	C	CTS1685(1)063C(2)(3)	4.3	6	2
8.2	C	CTS1825(1)063C(2)(3)	5.2	6	2
10	C	CTS1106(1)063C(2)(3)	6.3	6	2
12	D	CTS1126(1)063D(2)(3)	7.6	6	1
15	D	CTS1156(1)063D(2)(3)	9.5	6	1
18	D	CTS1186(1)063D(2)(3)	11.3	6	1

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

STANDARD RATINGS / EXTENDED RATINGS - CTS13

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
6.3 V_{DC} AT +85 °C					
5.6	A	CTS13565(1)6R3A(2)(3)	1.0	6	10
6.8	A	CTS13685(1)6R3A(2)(3)	1.0	6	10
39	B	CTS13396(1)6R3B(2)(3)	2.3	6	5
47	B	CTS13476(1)6R3B(2)(3)	2.8	6	5
56	B	CTS13566(1)6R3B(2)(3)	3.4	6	5
120	C	CTS13127(1)6R3C(2)(3)	7.2	6	2
150	C	CTS13157(1)6R3C(2)(3)	9.0	6	2
270	D	CTS13277(1)6R3D(2)(3)	16.2	6	1
330	D	CTS13337(1)6R3D(2)(3)	19.8	8	1
10 V_{DC} AT +85 °C					
3.9	A	CTS13395(1)010A(2)(3)	1.0	6	10
4.7	A	CTS13475(1)010A(2)(3)	1.0	6	10
27	B	CTS13276(1)010B(2)(3)	2.7	6	5
33	B	CTS13336(1)010B(2)(3)	3.3	6	5
82	C	CTS13826(1)010C(2)(3)	8.2	6	2
100	C	CTS13107(1)010C(2)(3)	10.0	6	2
180	D	CTS13187(1)010D(2)(3)	18.0	6	1
220	D	CTS13227(1)010D(2)(3)	22.0	8	1
16 V_{DC} AT +85 °C					
2.7	A	CTS13275(1)016A(2)(3)	1.0	6	10
3.3	A	CTS13335(1)016A(2)(3)	1.0	6	10
18	B	CTS13186(1)016B(2)(3)	2.9	6	5
22	B	CTS13226(1)016B(2)(3)	3.5	6	5
56	C	CTS13566(1)016C(2)(3)	9.0	6	2
68	C	CTS13686(1)016C(2)(3)	10.9	6	2
120	D	CTS13127(1)016D(2)(3)	19.2	8	1
150	D	CTS13157(1)016D(2)(3)	24.0	8	1
20 V_{DC} AT +85 °C					
1.8	A	CTS13185(1)020A(2)(3)	1.0	6	10
2.2	A	CTS13225(1)020A(2)(3)	1.0	6	10
12	B	CTS13126(1)020B(2)(3)	2.4	6	5
15	B	CTS13156(1)020B(2)(3)	3.0	6	5
39	C	CTS13396(1)020C(2)(3)	7.8	6	2
47	C	CTS13476(1)020C(2)(3)	9.4	6	2
82	D	CTS13826(1)020D(2)(3)	16.4	6	1
100	D	CTS13107(1)020D(2)(3)	20.0	8	1
25 V_{DC} AT +85 °C					
1.2	A	CTS13125(1)025A(2)(3)	1.0	6	10
1.5	A	CTS13155(1)025A(2)(3)	1.0	6	10
8.2	B	CTS13825(1)025B(2)(3)	2.1	6	5
10	B	CTS13106(1)025B(2)(3)	2.5	6	5
27	C	CTS13276(1)025C(2)(3)	6.8	6	2
33	C	CTS13336(1)025C(2)(3)	8.3	6	2
56	D	CTS13566(1)025D(2)(3)	14.0	6	1
68	D	CTS13686(1)025D(2)(3)	17.0	6	1

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

STANDARD RATINGS / EXTENDED RATINGS - CTS13

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
		40 V_{DC} AT +85 °C			
0.47	A	CTS13474(1)040A(2)(3)	1.0	6	10
0.56	A	CTS13564(1)040A(2)(3)	1.0	6	10
0.68	A	CTS13684(1)040A(2)(3)	1.0	6	10
0.82	A	CTS13824(1)040A(2)(3)	1.0	6	10
1.0	A	CTS13105(1)040A(2)(3)	1.0	6	10
1.2	A	CTS13125(1)040A(2)(3)	1.0	6	10
1.5	B	CTS13155(1)040B(2)(3)	1.0	6	5
1.8	B	CTS13185(1)040B(2)(3)	1.0	6	5
2.2	B	CTS13225(1)040B(2)(3)	1.0	6	5
2.7	B	CTS13275(1)040B(2)(3)	1.1	6	5
3.3	B	CTS13335(1)040B(2)(3)	1.3	6	5
3.9	B	CTS13395(1)040B(2)(3)	1.6	6	5
4.7	B	CTS13475(1)040B(2)(3)	1.9	6	5
5.6	B	CTS13565(1)040B(2)(3)	2.2	6	5
6.8	B	CTS13685(1)040B(2)(3)	2.7	6	5
8.2	C	CTS13825(1)040C(2)(3)	3.3	6	2
10	C	CTS13106(1)040C(2)(3)	4.0	6	2
12	C	CTS13126(1)040C(2)(3)	4.8	6	2
15	C	CTS13156(1)040C(2)(3)	6.0	6	2
18	C	CTS13186(1)040C(2)(3)	7.2	6	2
22	C	CTS13226(1)040C(2)(3)	8.8	6	2
27	D	CTS13276(1)040D(2)(3)	10.8	6	1
33	D	CTS13336(1)040D(2)(3)	13.2	6	1
39	D	CTS13396(1)040D(2)(3)	15.6	6	1
47	D	CTS13476(1)040D(2)(3)	18.8	6	1
		50 V_{DC} AT +85 °C			
0.27	A	CTS13274(1)050A(2)(3)	1.0	6	n/a
0.33	A	CTS13334(1)050A(2)(3)	1.0	6	10
0.39	A	CTS13394(1)050A(2)(3)	1.0	6	10
0.47	A	CTS13474(1)050A(2)(3)	1.0	6	10
0.56	A	CTS13564(1)050A(2)(3)	1.0	6	10
0.68	A	CTS13684(1)050A(2)(3)	1.0	6	10
0.82	A	CTS13824(1)050A(2)(3)	1.0	6	10
1.0	A	CTS13105(1)050A(2)(3)	1.0	6	10
1.2	B	CTS13125(1)050B(2)(3)	1.0	6	5
1.5	B	CTS13155(1)050B(2)(3)	1.0	6	5
1.8	B	CTS13185(1)050B(2)(3)	1.0	6	5
2.2	B	CTS13225(1)050B(2)(3)	1.1	6	5
2.7	B	CTS13275(1)050B(2)(3)	1.4	6	5
3.3	B	CTS13335(1)050B(2)(3)	1.7	6	5
3.9	B	CTS13395(1)050B(2)(3)	2.0	6	5

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

STANDARD RATINGS / EXTENDED RATINGS - CTS13					
CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
		50 V_{DC} AT +85 °C			
4.7	B	CTS13475(1)050B(2)(3)	2.4	6	5
5.6	C	CTS13565(1)050C(2)(3)	2.8	6	2
6.8	C	CTS13685(1)050C(2)(3)	3.4	6	2
8.2	C	CTS13825(1)050C(2)(3)	4.1	6	2
10	C	CTS13106(1)050C(2)(3)	5.0	6	2
12	C	CTS13126(1)050C(2)(3)	6.0	6	2
15	C	CTS13156(1)050C(2)(3)	7.5	6	2
18	C	CTS13186(1)050C(2)(3)	9.0	6	2
22	D	CTS13226(1)050D(2)(3)	11.0	6	1
		63 V_{DC} AT +85 °C			
0.10	A	CTS13104(1)063A(2)(3)	1.0	6	n/a
0.12	A	CTS13124(1)063A(2)(3)	1.0	6	n/a
0.15	A	CTS13154(1)063A(2)(3)	1.0	6	n/a
0.18	A	CTS13184(1)063A(2)(3)	1.0	6	n/a
0.22	A	CTS13224(1)063A(2)(3)	1.0	6	n/a
0.27	A	CTS13274(1)063A(2)(3)	1.0	6	n/a
0.33	A	CTS13334(1)063A(2)(3)	1.0	6	10
0.39	A	CTS13394(1)063A(2)(3)	1.0	6	10
0.47	A	CTS13474(1)063A(2)(3)	1.0	6	10
0.56	A	CTS13564(1)063A(2)(3)	1.0	6	10
0.68	A	CTS13684(1)063A(2)(3)	1.0	6	10
0.82	B	CTS13824(1)063B(2)(3)	1.0	6	5
1.0	B	CTS13105(1)063B(2)(3)	1.0	6	5
1.2	B	CTS13125(1)063B(2)(3)	1.0	6	5
1.5	B	CTS13155(1)063B(2)(3)	1.0	6	5
1.8	B	CTS13185(1)063B(2)(3)	1.1	6	5
2.2	B	CTS13225(1)063B(2)(3)	1.4	6	5
2.7	B	CTS13275(1)063B(2)(3)	1.7	6	5
3.3	B	CTS13335(1)063B(2)(3)	2.1	6	5
3.9	B	CTS13395(1)063B(2)(3)	2.5	6	5
4.7	C	CTS13475(1)063C(2)(3)	3.0	6	2
5.6	C	CTS13565(1)063C(2)(3)	3.5	6	2
6.8	C	CTS13685(1)063C(2)(3)	4.3	6	2
8.2	C	CTS13825(1)063C(2)(3)	5.2	6	2
10	C	CTS13106(1)063C(2)(3)	6.3	6	2
12	D	CTS13126(1)063D(2)(3)	7.6	6	1
15	D	CTS13156(1)063D(2)(3)	9.5	6	1
18	D	CTS13186(1)063D(2)(3)	11.3	6	1

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

STANDARD RATINGS / EXTENDED RATINGS - 749DX					
CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
6.3 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C					
5.6	A	749DX565(1)6R3A(2)(3)	1.0	6	10
6.8	A	749DX685(1)6R3A(2)(3)	1.0	6	10
47	B	749DX476(1)6R3B(2)(3)	2.8	6	5
56	B	749DX566(1)6R3B(2)(3)	3.4	6	5
150	C	749DX157(1)6R3C(2)(3)	9.0	8	2
180	C	749DX187(1)6R3C(2)(3)	10.8	8	2
270	D	749DX277(1)6R3D(2)(3)	16.2	8	1
330	D	749DX337(1)6R3D(2)(3)	19.8	8	1
10 V_{DC} AT +85 °C; 6.3 V_{DC} AT +125 °C					
3.9	A	749DX395(1)010A(2)(3)	1.0	6	10
4.7	A	749DX475(1)010A(2)(3)	1.0	6	10
27	B	749DX276(1)010B(2)(3)	2.7	6	5
33	B	749DX336(1)010B(2)(3)	3.3	6	5
39	B	749DX396(1)010B(2)(3)	3.9	6	5
82	C	749DX826(1)010C(2)(3)	8.2	6	2
100	C	749DX107(1)010C(2)(3)	10.0	6	2
120	C	749DX127(1)010C(2)(3)	12.0	8	2
180	D	749DX187(1)010D(2)(3)	18.0	8	1
220	D	749DX227(1)010D(2)(3)	22.0	8	1
16 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C					
2.7	A	749DX275(1)016A(2)(3)	1.0	6	10
3.3	A	749DX335(1)016A(2)(3)	1.0	6	10
18	B	749DX186(1)016B(2)(3)	2.9	6	5
22	B	749DX226(1)016B(2)(3)	3.5	6	5
56	C	749DX566(1)016C(2)(3)	9.0	6	2
68	C	749DX686(1)016C(2)(3)	10.9	6	2
120	D	749DX127(1)016D(2)(3)	19.2	8	1
150	D	749DX157(1)016D(2)(3)	24.0	8	1
20 V_{DC} AT +85 °C; 13 V_{DC} AT +125 °C					
1.8	A	749DX185(1)020A(2)(3)	1.0	6	10
2.2	A	749DX225(1)020A(2)(3)	1.0	6	10
12	B	749DX126(1)020B(2)(3)	2.4	6	5
15	B	749DX156(1)020B(2)(3)	3.0	6	5
39	C	749DX396(1)020C(2)(3)	7.8	6	2
47	C	749DX476(1)020C(2)(3)	9.4	6	2
82	D	749DX826(1)020D(2)(3)	16.4	6	1
100	D	749DX107(1)020D(2)(3)	20.0	6	1
25 V_{DC} AT +85 °C; 16 V_{DC} AT +125 °C					
1.2	A	749DX125(1)025A(2)(3)	1.0	6	10
1.5	A	749DX155(1)025A(2)(3)	1.0	6	10
8.2	B	749DX825(1)025B(2)(3)	2.1	6	5

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

STANDARD RATINGS / EXTENDED RATINGS - 749DX					
CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
25 V_{DC} AT +85 °C; 16 V_{DC} AT +125 °C					
10	B	749DX106(1)025B(2)(3)	2.5	6	5
27	C	749DX276(1)025C(2)(3)	6.8	6	2
33	C	749DX336(1)025C(2)(3)	8.3	6	2
56	D	749DX566(1)025D(2)(3)	14.0	6	1
68	D	749DX686(1)025D(2)(3)	17.0	6	1
35 V_{DC} AT +85 °C; 23 V_{DC} AT +125 °C					
0.10	A	749DX104(1)035A(2)(3)	1.0	6	n/a
0.12	A	749DX124(1)035A(2)(3)	1.0	6	n/a
0.15	A	749DX154(1)035A(2)(3)	1.0	6	n/a
0.18	A	749DX184(1)035A(2)(3)	1.0	6	n/a
0.22	A	749DX224(1)035A(2)(3)	1.0	6	n/a
0.27	A	749DX274(1)035A(2)(3)	1.0	6	n/a
0.33	A	749DX334(1)035A(2)(3)	1.0	6	n/a
0.39	A	749DX394(1)035A(2)(3)	1.0	6	n/a
0.47	A	749DX474(1)035A(2)(3)	1.0	6	n/a
0.56	A	749DX564(1)035A(2)(3)	1.0	6	n/a
0.68	A	749DX684(1)035A(2)(3)	1.0	6	10
0.82	A	749DX824(1)035A(2)(3)	1.0	6	10
1.0	A	749DX105(1)035A(2)(3)	1.0	6	10
1.2	B	749DX125(1)035B(2)(3)	1.0	6	5
1.5	B	749DX155(1)035B(2)(3)	1.0	6	5
1.8	B	749DX185(1)035B(2)(3)	1.0	6	5
2.2	B	749DX225(1)035B(2)(3)	1.0	6	5
2.7	B	749DX275(1)035B(2)(3)	1.0	6	5
3.3	B	749DX335(1)035B(2)(3)	1.2	6	5
3.9	B	749DX395(1)035B(2)(3)	1.4	6	5
4.7	B	749DX475(1)035B(2)(3)	1.6	6	5
5.6	B	749DX565(1)035B(2)(3)	2.0	6	5
6.8	B	749DX685(1)035B(2)(3)	2.4	6	5
8.2	C	749DX825(1)035C(2)(3)	2.9	6	2
10	C	749DX106(1)035C(2)(3)	3.5	6	2
12	C	749DX126(1)035C(2)(3)	4.2	6	2
15	C	749DX156(1)035C(2)(3)	5.3	6	2
18	C	749DX186(1)035C(2)(3)	6.3	6	2
22	C	749DX226(1)035C(2)(3)	7.7	6	2
27	D	749DX276(1)035D(2)(3)	9.5	6	1
33	D	749DX336(1)035D(2)(3)	11.6	6	1
39	D	749DX396(1)035D(2)(3)	13.7	6	1
47	D	749DX476(1)035D(2)(3)	16.5	6	1
56	D	749DX566(1)035D(2)(3)	19.6	6	1

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

STANDARD RATINGS / EXTENDED RATINGS - 749DX

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
40 V_{DC} AT +85 °C; 25 V_{DC} AT +125 °C					
0.10	A	749DX104(1)040A(2)(3)	1.0	6	n/a
0.12	A	749DX124(1)040A(2)(3)	1.0	6	n/a
0.15	A	749DX154(1)040A(2)(3)	1.0	6	n/a
0.18	A	749DX184(1)040A(2)(3)	1.0	6	n/a
0.22	A	749DX224(1)040A(2)(3)	1.0	6	n/a
0.27	A	749DX274(1)040A(2)(3)	1.0	6	n/a
0.33	A	749DX334(1)040A(2)(3)	1.0	6	n/a
0.39	A	749DX394(1)040A(2)(3)	1.0	6	n/a
0.47	A	749DX474(1)040A(2)(3)	1.0	6	n/a
0.56	A	749DX564(1)040A(2)(3)	1.0	6	n/a
0.68	A	749DX684(1)040A(2)(3)	1.0	6	10
0.82	A	749DX824(1)040A(2)(3)	1.0	6	10
1.0	A	749DX105(1)040A(2)(3)	1.0	6	10
1.2	B	749DX125(1)040B(2)(3)	1.0	6	5
1.5	B	749DX155(1)040B(2)(3)	1.0	6	5
1.8	B	749DX185(1)040B(2)(3)	1.0	6	5
2.2	B	749DX225(1)040B(2)(3)	1.0	6	5
2.7	B	749DX275(1)040B(2)(3)	1.1	6	5
3.3	B	749DX335(1)040B(2)(3)	1.3	6	5
3.9	B	749DX395(1)040B(2)(3)	1.6	6	5
4.7	B	749DX475(1)040B(2)(3)	1.9	6	5
5.6	B	749DX565(1)040B(2)(3)	2.2	6	5
6.8	B	749DX685(1)040B(2)(3)	2.7	6	5
8.2	C	749DX825(1)040C(2)(3)	3.3	6	2
10	C	749DX106(1)040C(2)(3)	4.0	6	2
12	C	749DX126(1)040C(2)(3)	4.8	6	2
15	C	749DX156(1)040C(2)(3)	6.0	6	2
18	C	749DX186(1)040C(2)(3)	7.2	6	2
22	C	749DX226(1)040C(2)(3)	8.8	6	2
27	D	749DX276(1)040D(2)(3)	10.8	6	1
33	D	749DX336(1)040D(2)(3)	13.2	6	1
39	D	749DX396(1)040D(2)(3)	15.6	6	1
50 V_{DC} AT +85 °C; 33 V_{DC} AT +125 °C					
0.82	A	749DX824(1)050A(2)(3)	1.0	6	10
1.0	A	749DX105(1)050A(2)(3)	1.0	6	10
1.2	B	749DX125(1)050B(2)(3)	1.0	6	5
1.5	B	749DX155(1)050B(2)(3)	1.0	6	5
1.8	B	749DX185(1)050B(2)(3)	1.0	6	5
2.2	B	749DX225(1)050B(2)(3)	1.1	6	5
2.7	B	749DX275(1)050B(2)(3)	1.4	6	5
3.3	B	749DX335(1)050B(2)(3)	1.7	6	5

Note

- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

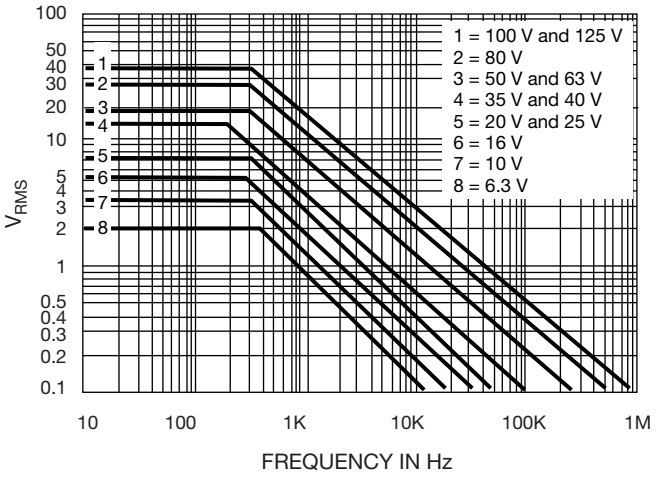
STANDARD RATINGS / EXTENDED RATINGS - 749DX					
CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (µA)	MAX. DF AT +25 °C 120 Hz (%)	MAX. IMPEDANCE AT +25 °C 100 kHz (Ω)
50 V_{DC} AT +85 °C; 33 V_{DC} AT +125 °C					
3.9	B	749DX395(1)050B(2)(3)	2.0	6	5
4.7	B	749DX475(1)050B(2)(3)	2.4	6	5
5.6	C	749DX565(1)050C(2)(3)	2.8	6	2
6.8	C	749DX685(1)050C(2)(3)	3.4	6	2
8.2	C	749DX825(1)050C(2)(3)	4.1	6	2
10	C	749DX106(1)050C(2)(3)	5.0	6	2
12	C	749DX126(1)050C(2)(3)	6.0	6	2
15	C	749DX156(1)050C(2)(3)	7.5	6	2
18	C	749DX186(1)050C(2)(3)	9.0	6	2
22	D	749DX226(1)050D(2)(3)	11.0	6	1
63 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C					
0.10	A	749DX104(1)063A(2)(3)	1.0	6	n/a
0.12	A	749DX124(1)063A(2)(3)	1.0	6	n/a
0.15	A	749DX154(1)063A(2)(3)	1.0	6	n/a
0.18	A	749DX184(1)063A(2)(3)	1.0	6	n/a
0.22	A	749DX224(1)063A(2)(3)	1.0	6	n/a
0.27	A	749DX274(1)063A(2)(3)	1.0	6	n/a
0.33	A	749DX334(1)063A(2)(3)	1.0	6	n/a
0.39	A	749DX394(1)063A(2)(3)	1.0	6	n/a
0.47	A	749DX474(1)063A(2)(3)	1.0	6	n/a
0.56	A	749DX564(1)063A(2)(3)	1.0	6	n/a
0.68	A	749DX684(1)063A(2)(3)	1.0	6	10
0.82	B	749DX824(1)063B(2)(3)	1.0	6	5
1.0	B	749DX105(1)063B(2)(3)	1.0	6	5
1.2	B	749DX125(1)063B(2)(3)	1.0	6	5
1.5	B	749DX155(1)063B(2)(3)	1.0	6	5
1.8	B	749DX185(1)063B(2)(3)	1.1	6	5
2.2	B	749DX225(1)063B(2)(3)	1.4	6	5
2.7	B	749DX275(1)063B(2)(3)	1.7	6	5
3.3	B	749DX335(1)063B(2)(3)	2.1	6	5
3.9	B	749DX395(1)063B(2)(3)	2.5	6	5
4.7	C	749DX475(1)063C(2)(3)	3.0	6	2
5.6	C	749DX565(1)063C(2)(3)	3.5	6	2
6.8	C	749DX685(1)063C(2)(3)	4.3	6	2
8.2	C	749DX825(1)063C(2)(3)	5.2	6	2
10	C	749DX106(1)063C(2)(3)	6.3	6	2
12	D	749DX126(1)063D(2)(3)	7.6	6	1
15	D	749DX156(1)063D(2)(3)	9.5	6	1
18	D	749DX186(1)063D(2)(3)	11.3	6	1

Note

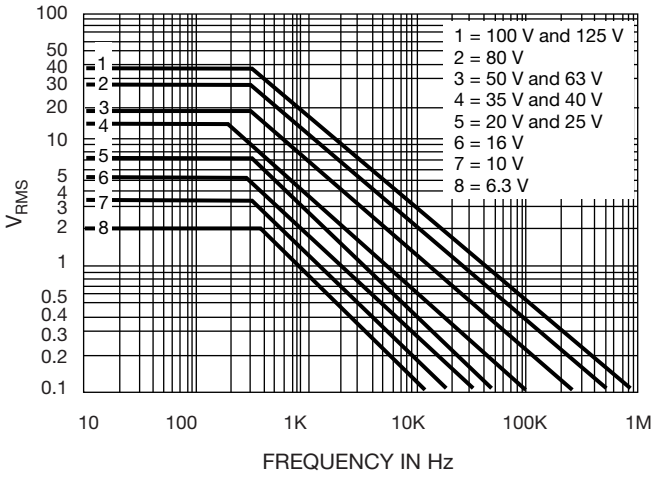
- Part number definitions:
  (1) Capacitance tolerance code: X5, X9, X0
  (2) Style number: 0 or 2
  (3) Packaging code

TYPICAL CURVES RIPPLE VOLTAGE AT +25 °C

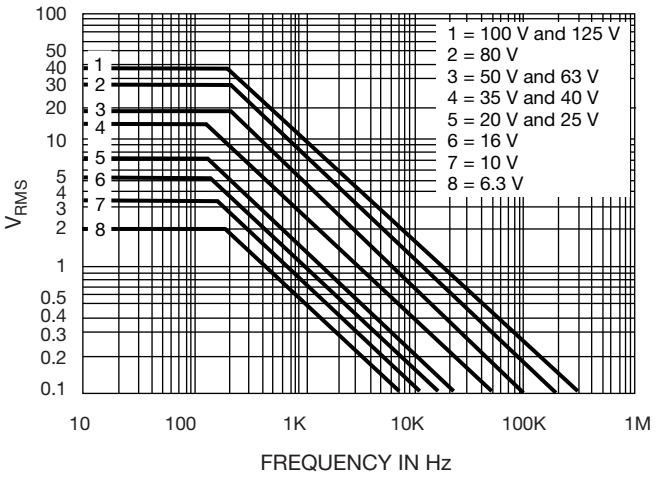
CASE “A”



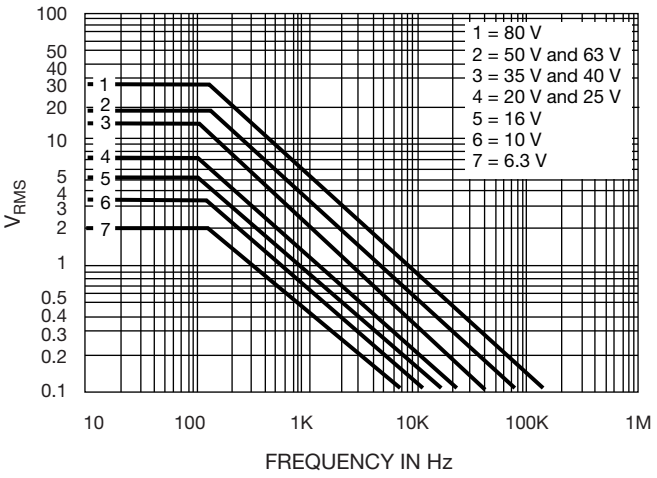
CASE “B”



CASE “C”



CASE “D”



PRODUCT INFORMATION	
Mounting of Through Hole Components	www.vishay.com/doc?40108
Solid Tantalum Capacitors (With MnO_2 Electrolyte) Voltage Derating	www.vishay.com/doc?40246
SELECTOR GUIDES	
Quick Reference Guide	www.vishay.com/doc?40037
Selector Guide	www.vishay.com/doc?49054
Parameter Comparison Guide	www.vishay.com/doc?40033
FAQ	
Frequently Asked Questions	www.vishay.com/doc?40110

PERFORMANCE CHARACTERISTICS

1. Operating Temperature:

-55 °C to +85 °C with rated DC voltage U_R applied, +85 °C to +125 °C with linear voltage derating to category voltage U_C (only for types CTS1, 749DX).

2. Capacitance and Tolerance:

Capacitance measured at 100 Hz and +25 °C shall be within the specified tolerance limits of the nominal rating. Capacitance measurement shall be made by means of a polarized capacitance bridge. The polarizing voltage shall be of 2.2 V. The maximum voltage applied during measurements shall be 1.0 V_{RMS} at 100 Hz and +25 °C.

3. Reverse Voltage:

These capacitors are capable of withstanding peak voltage in the reverse direction equal to: 15 % of the rated DC voltage at +25 °C, 5 % of the rated DC voltage at +85 °C.

4. Surge Voltage:

Table 1

PRODUCT TYPE	SURGE VOLTAGE AT +85 °C	SURGE VOLTAGE AT +125 °C
CTS13	1.30 U_R	-
749DX / CTS1	1.30 U_R	1.30 U_C

Capacitors shall withstand the surge voltage applied in series with a 1000 W resistor, at the rate of 1.5 min on, 5.5 min off, for 1000 successive test cycles at +85 °C or at +125 °C. After test, dissipation factor and leakage current shall meet the initial requirements at +25 °C (see below), capacitance change shall not exceed ± 10 % of initial value at +25 °C.

5. Leakage Current:

Rated voltage U_R shall be applied to capacitors during five minutes with a resistor of 1000 W in series with each capacitor, before making DC leakage current measurements. The leakage current shall not exceed the following limits:

Table 2

TEMPERATURE	CTS1 / CTS13 / 749DX
+25 °C	0.01 C_R x U_R or 1 µA whichever is greater
+85 °C	0.1 C_R x U_R or 10 µA whichever is greater
+125 °C	0.125 C_R x U_R or 12.5 µA whichever is greater

6. Dissipation Factor:

The dissipation factor, when measured at 100 Hz, shall not exceed the values below:

Table 3

TEMP.	CTS1 / CTS13		749DX	
	$C_RU_R \leq 1900$	$C_RU_R > 1900$	$C_R \leq 100$	$C_R > 100$
-55 °C	9 %	11 %	8 %	10 %
+25 °C	6 %	8 %	6 %	8 %
+85 °C	9 %	11 %	-	-
+125 °C (1)	12 %	14 %	10 %	11 %

Note
(1) Not applicable for CTS13

7. Stability at Low and High Temperature:

Capacitance change with temperature shall not exceed the limits of the following table, leakage current and dissipation factor shall be within the limits specified in Tables 2 and 3.

Table 4

TEMPERATURE	CTS1 / CTS13 / 749DX
-55 °C	-10 %
+85 °C	+12 %
+125 °C (1)	+15 %

Note
(1) Not applicable for CTS13

8. Impedance:

The impedance measured at 100 kHz and 25 °C shall not exceed the following values:

Table 5

CASE CODE	Z (W) (1)
A	10
B	5
C	2
D	1

Note
(1) Not applicable for $C_R \leq 0.68$ µF

9. Life Test:

After 2000 h at +85 °C with rated DC voltage applied, or after 2000 h at +125 °C with category DC voltage applied (for types CTS1, 749DX only) capacitors shall meet the requirements in Table 6.

Table 6

PRODUCT TYPE	CAPACITANCE CHANGE	DISSIPATION FACTOR	DC LEAKAGE CURRENT
CTS1 CTS13 749DX	Within ± 10 % of initial value at +25 °C	Within initial requirement at +25 °C	Within 125 % of initial requirements at +25 °C

PERFORMANCE CHARACTERISTICS (Continued)

10. Humidity Test:

After 56 days (1350 h) at +40 °C, 90 % to 95 % of relative humidity (per IEC 68-2-3) with no voltage applied, capacitors shall meet the requirements in Table 7 below.

Table 7

CAPACITANCE CHANGE	Within ± 3 % of initial value
DC LEAKAGE CURRENT	Within initial requirement at +25 °C - Table 2
DISSIPATION FACTOR	Within initial requirement at +25 °C - Table 3

Table 8

CAPACITANCE CHANGE	Within ± 5 % of initial value at +25 °C
DC LEAKAGE CURRENT	Within initial requirement at +25 °C - Table 2
DISSIPATION FACTOR	Within initial requirement at +25 °C - Table 3

Typical values of charge-discharge current (per above test conditions).

RATED VOLTAGE U_R (V)	CHARGE-DISCHARGE CURRENT (A)
6.3	13
10	20
16	32
25	50
40	80
50	100
63	126

11. Insulation Test:

For capacitors with insulating sleeves, a DC voltage of 100 V shall be applied for one minute between the case of the capacitor and a metal “V” block in intimate contact with the insulating sleeve. The insulating resistance measured in these conditions shall be at least 100 MΩ.

12. Lead Pull Test:

Leads shall withstand the following test (IEC 68-2-2): tensile stress of 5N (cases A and B) or 10N (cases C and D) for 10 s in any direction

One bend in each direction
Two consecutive rotations of 180°

GUIDE TO APPLICATION

1. AC Ripple Current:

The maximum allowable ripple current shall be determined from the formula:

$$I_{RMS} = \sqrt{\frac{P}{R_{ESR}}}$$

where,

P = power dissipation in W at +25 °C as given below

R_{ESR} = the capacitor equivalent series resistance at the specified frequency.

2. AC Ripple Voltage:

The maximum allowable ripple voltage shall be determined from the formula:

$$V_{RMS} = \sqrt{\frac{P}{R_{ESR}}} \times Z$$

where,

Z = the capacitor impedance at the specified frequency.

The calculations are summarized on the graphs in table “Typical Curves Ripple Voltage at +25 °C” giving the maximum available ripple voltage as a function of frequency.

However, the sum of the peak AC voltage plus the DC voltage shall not exceed the rated DC voltage at +85 °C of the capacitor. The sum of the negative peak AC voltage plus the DC voltage shall not allow a voltage reversal exceeding 15 % of the rated DC voltage.

3. AC Ripple Current or Voltage Derating Factor:

If these capacitors are to be operated at temperatures above +25 °C, the permissible RMS ripple current or voltage shall be calculated using the derating factors in the table below:

TEMPERATURE	DERATING FACTOR
+25 °C	1.0
+55 °C	0.8
+85 °C	0.6
+125 °C	0.4

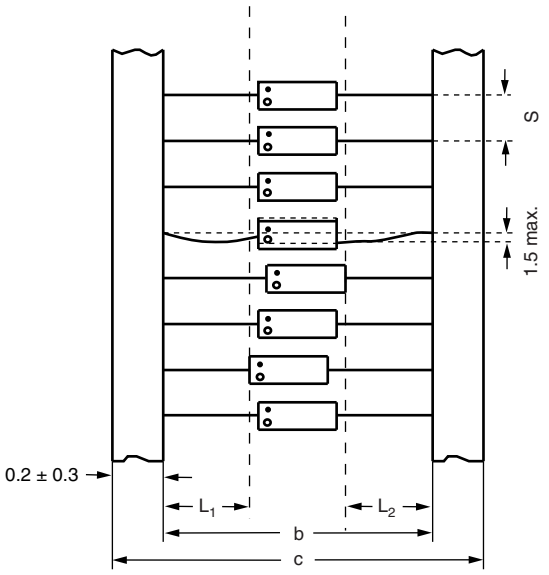
4. Power Dissipation:

Power dissipation will be affected by the heat sinking capability of the mounting surface. Non-sinusoidal ripple current may produce heating effects which differ from those shown in the following table. It is important that the equivalent I_{RMS} value be established when calculating permissible operating levels.

CASE CODE	POWER DISSIPATION AT +25 °C (W)
A	0.115
B	0.145
C	0.185
D	0.225

TAPE AND REEL PACKAGING

Meets EIA standard RS-296



L_1 - L_2 = 1.5 mm max.
S = component spacing
(cumulative tolerance on 20 units = 4 mm)
b = tape spacing
c = overall length

STANDARD PACKAGING QUANTITY AND DIMENSIONS in millimeters

CASE SIZE	REEL AND AMMO S	REEL PACK					AMMO PACK			BULK
		OPTION P		OPTION R		QTY PER REEL	OPTION G		QTY PER BOX	QTY PER PACK
		B	C MAX.	B	C MAX.		B	C MAX.		
A	5.0 ± 0.3	63 ± 2	78	53 ± 2	68	1000	53 ± 2	68	500	100
B	5.0 ± 0.3	63 ± 2	78	53 ± 2	68	1000	53 ± 2	68	500	75
C	10.0 ± 0.3	63 ± 2	78	63 ± 2	78	500	53 ± 2	68	250	50
D	10.0 ± 0.3	63 ± 2	78	63 ± 2	78	500	53 ± 2	68	250	25
PACKAGING CODE		P		R			G			B

MARKING

Capacitors shall be marked with Vishay Sprague marking (circled 2); the type number; rated capacitance and tolerance (with a letter code, if different from ± 20 %, K = ± 10 %; J = ± 5 %) ; rated DC voltage at +85 °C and the date code of manufacture.

Capacitors shall be marked on one end with a “plus” sign (+) to identify the positive terminal.

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.