

# SCT Series

## High Temperature Stacked Capacitors



### FEATURES

- Multilayer stacked ceramic capacitors
- Dielectric type II
- Capacitance range: 47nf to 390  $\mu$ F
- Voltage range: 50 V<sub>DC</sub> to 500 V<sub>DC</sub>

### TERMINATIONS

- Ag 100% termination developed for high temperature up to 215°C. Less sensitive to thermal shocks and compatible with high melting point solder containing lead.
- DIL type J, L or N are available.

### MARKING

Size	Marking codes	Example
	«TA» logo	TA
All sizes	Cap code + Tolerance code	105M
	Rated voltage value	100 V

### ELECTRICAL SPECIFICATIONS

Description	«X» Series (type II)
CECC	2R1
EIA	X7R
Exxelia Temex Code	X
Operating temperature range	-55°C to +215°C
Maximum $\Delta$ C/°C over Temperature range without voltage applied	$\pm$ 15%
Ageing	$\leq$ 2.5% per decade hour
Dissipation Factor (DF)	$\leq$ 2.5%
Voltage proof	U <sub>R</sub> $\leq$ 200 V: 2.5 x U <sub>R</sub> U <sub>R</sub> > 200 V: 2.0 x U <sub>R</sub>
Insulation Resistance (IR) at 25°C under U <sub>R</sub>	100G $\Omega$ or 1000 $\Omega$ .F whichever is the less
Insulation Resistance (IR) at 125°C under U <sub>R</sub>	10G $\Omega$ or 100 $\Omega$ .F whichever is the less
Measurement Conditions for C and DF at 20°C	$\leq$ 100pF: 1MHz / 1Vrms (no bias) > 100pF: 1KHz / 1Vrms (no bias)
Capacitance versus applied Voltage and Temperature	See page 99

### PACKAGING

«Blister» boxes:

For all products, special «blister» boxes are used to optimize the protection of the parts during the carriage and the storage. Depending upon the termination (with or without connection) and the size, the number of the parts in each box is defined. Please, consult us for more details.

### HOW TO ORDER

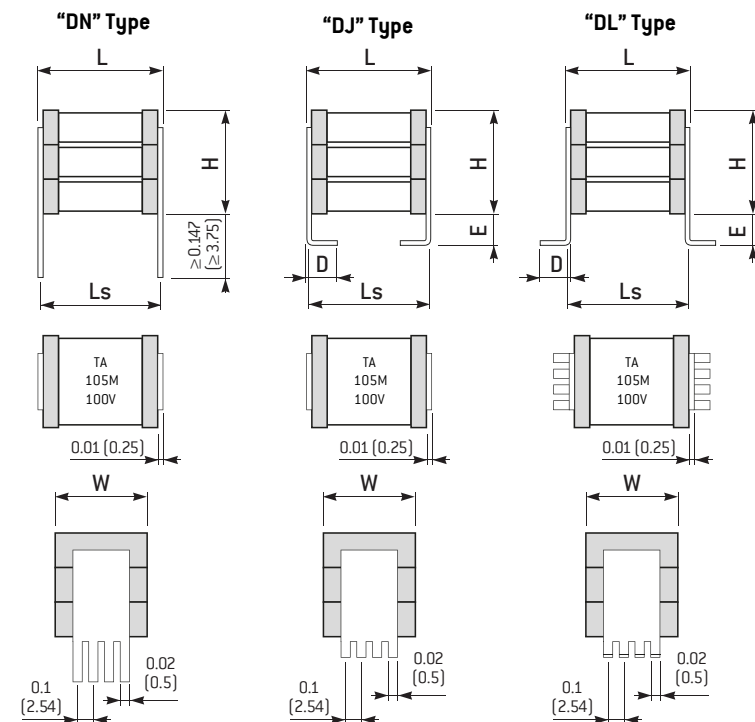
201	SCT	01	X	105	K	R	-	-RoHS
Rated voltage	Series	Exxelia size code	Dielectric code	Capacitance	Tolerance	Termination	Coating	RoHS Compliant
500: 50 V 101: 100 V 201: 200 V 501: 500 V	SCT	00 01 02 04 05 06 07 10 12	X = X7R	1 <sup>st</sup> two digits represent significant figures; last digit specifies the number of zeros to follow. Examples: 104: 0.1 $\mu$ F 335: 3.3 $\mu$ F 156: 15 $\mu$ F 107: 10 $\mu$ F	K = $\pm$ 10% M = $\pm$ 20%	DN DIL N type DJ DIL J type DL DIL L type	RoHS = HMP tinned phosphor bronze, non magnetic.  - = uncoated and no marking U = uncoated and marked	Non-RoHS not available

## High Temperature Stacked Capacitors

### DIMENSIONS in inches (mm)

#### SC SERIES

Dual In Line DIL termination



Note: the marking shown here is just given as an example

Size	L max.	W max.	LS ± 0.02* [±0.5]*	E ± 0.012 [±0.5]**	D ± 0.02 [±0.5]	Number of leads per side	H max.
SCT00	0.300 (7.62)	0.276 (7)	0.250 (6.35)	0.071 (1.8)	0.079 (2)	3	
SCT01	0.402 (10.2)	0.378 (9.6)	0.300 (7.62)	0.059 (1.5)	0.098 (2.5)	3	
SCT02	0.469 (11.9)	0.449 (11.4)	0.400 (10.16)	0.059 (1.5)	0.098 (2.5)	4	
SCT04	0.650 (16.5)	0.552 (14)	0.539 (13.7)	0.059 (1.5)	0.098 (2.5)	5	
SCT05	0.729 (18.5)	0.670 (17)	0.700 (17.78)	0.059 (1.5)	0.098 (2.5)	6	
SCT06	0.701 (17.8)	0.851 (21.6)	0.600 (15.24)	0.059 (1.5)	0.098 (2.5)	7	
SCT07	0.894 (22.7)	0.654 (16.6)	0.800 (20.32)	0.059 (1.5)	0.098 (2.5)	6	
SCT10	0.520 (13.2)	1.083 (27.5)	0.453 (11.5)	0.083 (2.1)	0.102 (2.6)	10	
SCT12	0.945 (24)	1.598 (40.6)	0.800 (20.32)	0.098 (2.5)	0.098 (2.5)	14	

Please, consult the tables of standard ratings

\* Except for the SCT07, tolerance = ± 0.032 in (±0.8mm).

\*\* For the SCT12, tolerance = ± 0.012 in (±0.3mm).

### DERATING RULES

The given voltages in the below capacitance range are the nominal voltages at 125°C.

For higher operating temperatures, the derating rules to be applied on the voltage versus temperature are defined as per the following table :

125°C	200°C	215°C
500V	200V	100V
200V	100V	50V
100V	50V	25V
50V	25V	16V

# SCT Series

## High Temperature Stacked Capacitors

### STANDARD RATINGS

Exxelia size code	2225				3033				3740				5550				Cap. code	
	SCT00				SCT01				SCT02				SCT04					
	U <sub>R</sub>	50 V	100 V	200 V	500 V	50 V	100 V	200 V	500 V	50 V	100 V	200 V	500 V	50 V	100 V	200 V		500 V
47nf				0.118 (3)				0.083 (2.1)										473
56				0.118 (3)				0.083 (2.1)										563
68				0.118 (3)				0.083 (2.1)										683
82				0.118 (3)				0.083 (2.1)										823
100			0.039 (1.8)	0.118 (3)			0.083 (2.1)	0.098 (2.5)					0.118 (3)					104
120			0.039 (1.8)	0.118 (3)			0.083 (2.1)	0.098 (2.5)					0.118 (3)					124
150			0.079 (2)	0.252 (6.4)			0.083 (2.1)	0.098 (2.5)					0.118 (3)					154
180	0.039 (1.8)	0.039 (1.8)	0.079 (2)	0.252 (6.4)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.126 (3.2)				0.083 (2.1)	0.118 (3)					184
220	0.039 (1.8)	0.039 (1.8)	0.098 (2.5)	0.252 (6.4)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.126 (3.2)				0.083 (2.1)	0.118 (3)					224
270	0.039 (1.8)	0.039 (1.8)	0.098 (2.5)	0.378 (9.6)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.138 (3.5)				0.083 (2.1)	0.118 (3)				0.098 (2.5)	274
330	0.039 (1.8)	0.039 (1.8)	0.118 (3)	0.378 (9.6)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.241 (6.1)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.130 (3.3)					0.098 (2.5)	334
390	0.039 (1.8)	0.039 (1.8)	0.118 (3)	0.504 (12.8)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.241 (6.1)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.138 (3.5)					0.098 (2.5)	394
470	0.039 (1.8)	0.039 (1.8)	0.213 (5.4)	0.504 (12.8)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.272 (6.9)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.157 (4)					0.118 (3)	474
560	0.079 (2)	0.079 (2)	0.232 (5.9)	0.551 (14)	0.083 (2.1)	0.083 (2.1)	0.098 (2.5)	0.414 (10.5)	0.083 (2.1)	0.083 (2.1)	0.083 (2.1)	0.169 (4.3)					0.118 (3)	564
680	0.079 (2)	0.079 (2)	0.252 (6.4)	0.630 (16)	0.083 (2.1)	0.083 (2.1)	0.118 (3)	0.414 (10.5)	0.083 (2.1)	0.083 (2.1)	0.098 (2.5)	0.276 (7)					0.118 (3)	684
820	0.079 (2)	0.079 (2)	0.319 (8.1)	0.709 (18)	0.083 (2.1)	0.083 (2.1)	0.138 (3.5)	0.548 (13.9)	0.083 (2.1)	0.083 (2.1)	0.098 (2.5)	0.390 (9.9)				0.118 (3)	0.138 (3.5)	824
1 μF	0.087 (2.2)	0.087 (2.2)	0.378 (9.6)		0.098 (2.5)	0.098 (2.5)	0.174 (4.4)	0.583 (14.8)	0.083 (2.1)	0.083 (2.1)	0.118 (3)	0.406 (10.3)				0.118 (3)	0.165 (4.2)	105
1.2	0.098 (2.5)	0.098 (2.5)	0.504 (12.8)		0.098 (2.5)	0.098 (2.5)	0.213 (5.4)	0.669 (17.6)	0.083 (2.1)	0.083 (2.1)	0.138 (3.5)	0.552 (14)				0.118 (3)	0.252 (6.4)	125
1.5	0.118 (3)	0.118 (3)	0.551 (14)		0.110 (2.8)	0.110 (2.8)	0.260 (6.6)		0.083 (2.1)	0.083 (2.1)	0.157 (4)	0.630 (16)				0.118 (3)	0.378 (9.6)	155
1.8	0.173 (4.4)	0.173 (4.4)	0.630 (16.4)		0.110 (2.8)	0.110 (2.8)	0.347 (8.8)		0.098 (2.5)	0.098 (2.5)	0.233 (5.9)	0.709 (18)	0.098 (2.5)	0.098 (2.5)	0.118 (3)	0.378 (9.6)		185
2.2	0.197 (5.1)	0.197 (5.1)	0.630 (16.4)		0.110 (2.8)	0.110 (2.8)	0.426 (10.8)		0.098 (2.5)	0.098 (2.5)	0.252 (6.4)	0.709 (18)	0.098 (2.5)	0.098 (2.5)	0.118 (3)	0.378 (9.6)		225
2.7	0.232 (5.9)	0.232 (5.9)			0.130 (3.3)	0.130 (3.3)	0.552 (14)		0.110 (2.8)	0.110 (2.8)	0.252 (6.4)		0.098 (2.5)	0.098 (2.5)	0.138 (3.5)	0.504 (12.8)		275
3.3	0.296 (7.5)	0.296 (7.5)			0.150 (3.8)	0.150 (3.8)	0.591 (15)		0.110 (2.8)	0.110 (2.8)	0.378 (9.6)		0.098 (2.5)	0.098 (2.5)	0.157 (4)	0.583 (14.8)		335
3.9	0.339 (8.6)	0.339 (8.6)			0.237 (6)	0.244 (6.2)			0.130 (3.3)	0.130 (3.3)	0.378 (9.6)		0.098 (2.5)	0.098 (2.5)	0.252 (6.4)	0.662 (16.8)		395
4.7	0.378 (9.6)	0.378 (9.6)			0.237 (6)	0.252 (6.4)			0.138 (3.5)	0.138 (3.5)	0.504 (12.8)		0.118 (3)	0.118 (3)	0.378 (9.6)			475
5.6	0.484 (12.3)	0.484 (12.3)			0.276 (7)	0.283 (7.2)			0.142 (3.6)	0.142 (3.6)	0.630 (16)		0.118 (3)	0.118 (3)	0.378 (9.6)			565
6.8	0.504 (12.8)	0.504 (12.8)			0.315 (8)	0.323 (8.2)			0.185 (4.7)	0.185 (4.7)	0.709 (18)		0.118 (3)	0.118 (3)	0.434 (11)			685
8.2	0.630 (16)	0.630 (16)			0.434 (11)	0.441 (11.2)			0.284 (7.2)	0.354 (9)			0.138 (3.5)	0.138 (3.5)	0.438 (11.1)			825
10					0.473 (12)	0.480 (12.2)			0.292 (7.4)	0.354 (9)			0.150 (3.8)	0.150 (3.8)	0.497 (12.6)			106
12					0.552 (14)	0.559 (14.4)			0.414 (10.5)	0.472 (12)			0.252 (6.4)	0.252 (6.4)	0.630 (16)			126
15									0.438 (11.1)	0.492 (12.5)			0.284 (7.2)	0.319 (8.1)				156
18									0.583 (14.8)	0.591 (15)			0.304 (7.7)	0.394 (10.8)				186
22									0.598 (15.2)	0.598 (15.2)			0.315 (8)	0.504 (12.8)				226
27													0.461 (11.7)	0.504 (12.8)				276
33													0.473 (12)	0.583 (14.8)				336
39													0.630 (16)	0.662 (16.8)				396

\* Consult us - The height Hmax in inches (in mm) for the SCT Series is indicated in the cells.

# High Temperature Stacked Capacitors

# SCT Series

## STANDARD RATINGS

Exxelia size code	6560				6080 / 8060				45107				45214				Cap. code
	SCT05				SCT06 / SCT07				SCT10				SCT11				
	U <sub>R</sub>	50 V	100 V	200 V	500 V	50 V	100 V	200 V	500 V	50 V	100 V	200 V	500 V	50 V	100 V	200 V	
270nf				0.098 (2.5)													274
330				0.098 (2.5)													334
390				0.098 (2.5)													394
470				0.098 (2.5)				0.118 (3)									474
560			0.098 (2.5)	0.098 (2.5)				0.118 (3)									564
680			0.098 (2.5)	0.098 (2.5)				0.118 (3)				0.138 (3.5)					684
820			0.098 (2.5)	0.118 (3)				0.118 (3)			0.118 (3)	0.138 (3.5)					824
1 μF	0.098 (2.5)	0.098 (2.5)	0.098 (2.5)	0.118 (3)				0.118 (3)	0.118 (3)	0.118 (3)	0.150 (3.8)						105
1.2	0.098 (2.5)	0.098 (2.5)	0.098 (2.5)	0.138 (3.5)				0.138 (3.5)	0.118 (3)	0.118 (3)	0.118 (3)	0.150 (3.8)					125
1.5	0.098 (2.5)	0.098 (2.5)	0.098 (2.5)	0.157 (4)			0.118 (3)	0.157 (4)	0.118 (3)	0.118 (3)	0.118 (3)	0.252 (6.4)					155
1.8	0.098 (2.5)	0.098 (2.5)	0.098 (2.5)	0.177 (4.5)			0.118 (3)	0.177 (4.5)	0.118 (3)	0.118 (3)	0.118 (3)	0.252 (6.4)					185
2.2	0.098 (2.5)	0.098 (2.5)	0.098 (2.5)	0.272 (6.9)			0.118 (3)	0.272 (6.9)	0.118 (3)	0.118 (3)	0.138 (3.5)	0.252 (6.4)					225
2.7	0.098 (2.5)	0.098 (2.5)	0.118 (3)	0.312 (7.9)			0.118 (3)	0.378 (9.6)	0.118 (3)	0.118 (3)	0.150 (3.8)	0.292 (7.4)			*		275
3.3	0.098 (2.5)	0.098 (2.5)	0.118 (3)	0.331 (8.4)			0.118 (3)	0.398 (10.1)	0.118 (3)	0.118 (3)	0.157 (4)	0.378 (9.6)			*		335
3.9	0.098 (2.5)	0.098 (2.5)	0.138 (3.5)	0.438 (11.1)	0.118 (3)	0.118 (3)	0.138 (3.5)	0.504 (12.8)	0.118 (3)	0.118 (3)	0.213 (5.4)	0.504 (12.8)			*		395
4.7	0.098 (2.5)	0.098 (2.5)	0.157 (4)	0.497 (12.6)	0.118 (3)	0.118 (3)	0.157 (4)	0.583 (14.8)	0.118 (3)	0.118 (3)	0.233 (5.9)	0.583 (14.8)			*		475
5.6	0.098 (2.5)	0.098 (2.5)	0.233 (5.9)	0.662 (16.8)	0.118 (3)	0.118 (3)	0.252 (6.4)	0.583 (14.8)	0.118 (3)	0.118 (3)	0.252 (6.4)	0.583 (14.8)			*		565
6.8	0.098 (2.5)	0.098 (2.5)	0.252 (6.4)	0.819 (20.8)	0.118 (3)	0.118 (3)	0.252 (6.4)	0.661 (16.8)	0.118 (3)	0.118 (3)	0.319 (8.1)	0.662 (16.8)			*		685
8.2	0.118 (3)	0.118 (3)	0.359 (9.1)		0.118 (3)	0.118 (3)	0.378 (9.6)	0.740 (18.8)	0.118 (3)	0.118 (3)	0.378 (9.6)			*	*		825
10	0.118 (3)	0.118 (3)	0.378 (9.6)		0.138 (3.5)	0.138 (3.5)	0.378 (9.6)		0.138 (3.5)	0.138 (3.5)	0.378 (9.6)			*	*		106
12	0.138 (3.5)	0.138 (3.5)	0.504 (12.8)		0.138 (3.5)	0.138 (3.5)	0.504 (12.8)		0.138 (3.5)	0.138 (3.5)	0.504 (12.8)			*	*	*	126
15	0.157 (4)	0.157 (4)	0.583 (14.8)		0.138 (3.5)	0.138 (3.5)	0.504 (12.8)		0.252 (6.4)	0.252 (6.4)	0.504 (12.8)			*	*		156
18	0.252 (6.4)	0.252 (6.4)			0.146 (3.7)	0.146 (3.7)	0.630 (16)		0.252 (6.4)	0.252 (6.4)	0.661 (16.8)			*	*		186
22	0.252 (6.4)	0.252 (6.4)			0.252 (6.4)	0.291 (7.4)	0.740 (18.8)		0.378 (9.6)	0.378 (9.6)				*	*		226
27	0.312 (7.9)	0.378 (9.6)			0.252 (6.4)	0.323 (8.2)	0.740 (18.8)		0.378 (9.6)	0.378 (9.6)				*	*	*	276
33	0.331 (8.4)	0.378 (9.6)			0.280 (7.1)	0.413 (10.5)			0.504 (12.8)	0.504 (12.8)				*	*	*	336
39	0.457 (11.6)	0.504 (12.8)			0.378 (9.6)	0.441 (11.2)			0.504 (12.8)	0.504 (12.8)				*	*		396
47	0.497 (12.6)	0.504 (12.8)			0.378 (9.6)	0.465 (11.8)			0.591 (15)	0.591 (15)				*	*		476
56	0.662 (16.8)	0.669 (17)			0.457 (11.6)	0.472 (12)			0.591 (15)	0.591 (15)				*	*		566
68					0.583 (14.8)	0.591 (15)								*	*		686
82														*			826
100														*			107
120														*			127

\* Consult us - The height Hmax in inches (in mm) for the SCT Series is indicated in the cells.

## STANDARD RATINGS

Exxelia size code	80150				125205				Cap. code
	SCT12				SCT18				
	50 V	100 V	200 V	500 V	50 V	100 V	200 V	500 V	
680nf									684
820									824
1 $\mu$ F									105
1.2									125
1.5									155
1.8									185
2.2									225
2.7				0.157 (4)					275
3.3				0.157 (4)					335
3.9				0.157 (4)					395
4.7				0.157 (4)					475
5.6				0.315 (8)					565
6.8				0.315 (8)					685
8.2			0.157 (4)	0.315 (8)			*		825
10			0.157 (4)	0.315 (8)			*		106
12			0.315 (8)	0.472 (12)			*		126
15			0.315 (8)	0.472 (12)			*		156
18		*	0.315 (8)	0.630 (16)			*		186
22		*	0.315 (8)	*			*	*	226
27		*	0.472 (12)	*			*	*	276
33		0.157 (4)	0.472 (12)	*			*	*	336
39	0.157 (4)	0.157 (4)	0.630 (16)			*	*	*	396
47	0.157 (4)	0.315 (8)	*			*	*	*	476
56	0.315 (8)	0.315 (8)	*			*	*	*	566
68	0.315 (8)	0.315 (8)				*	*		686
82	0.315 (8)	0.315 (8)			*	*	*		826
100	0.315 (8)	0.472 (12)			*	*	*		107
120	0.472 (12)	0.472 (12)			*	*			127
150	0.472 (12)	0.630 (16)			*	*			157
180	0.630 (16)				*	*			187
220					*	*			227
270					*				277
330					*				337
390					*				397

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# General Information

High temperature capacitors are made of class 1 or class 2 ceramic dielectrics featuring special compositions based upon high purity oxides to reduce ionic conduction inherent to the presence of atoms such as sodium.

In addition, all quality controls carried out at intermediate and final production stages (lot acceptance test under  $U_{RC}$  and insulation resistance measurement at operating temperature) are the assurance of enhanced reliability.

High temperature capacitors include :

- chip class 1 (CEC 203 to CEC 233) and class 2 (CNC 203 to 233),
- encapsulated radial leads class 1 and 2 (TCE / TCN 201 to 204),
- encapsulated axial leads class 1 and 2 (TCE / TCN 252 to 254),
- selfprotected radial leads class 1 and 2 (TCE / TCN 212 to 216) and radial leads class 1 and 2 (TCE / TCN 263).

Mechanical stress is eliminated with replacement of epoxy by selfprotected ceramic. This also allows the increase of the capacitance ranges and improves the reliability.

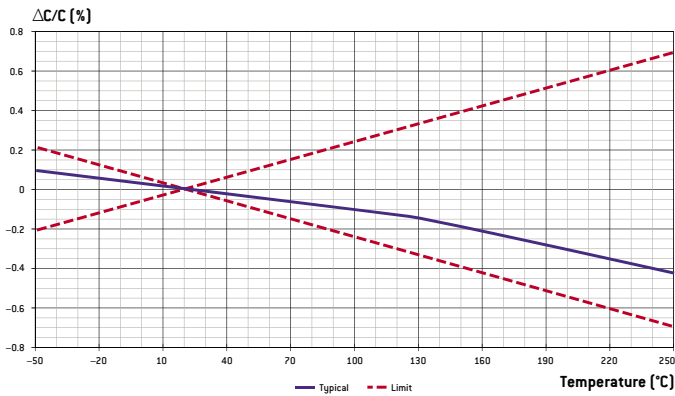
- high voltage varnished capacitors (TCH 279 to 285)
- high capacitance value SCT Series.

They are highly recommended for operation at temperatures of up to 200°C. Capacitors specifically designed for higher operating temperatures (e.g. TCE / TCN 212 to 216 and TCE / TCN 263 to 266) are also available.

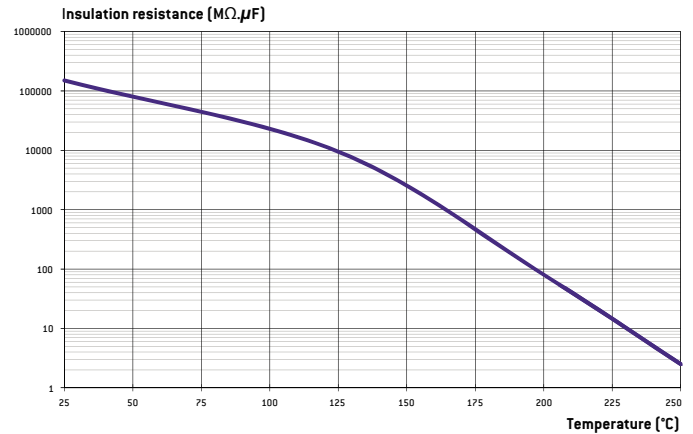
High temperature capacitors are made of class 1 or class 2 ceramic dielectrics featuring special compositions based upon high purity oxides to reduce ionic conduction inherent to the presence of atoms such as sodium.

## TYPICAL CURVES: CE / CN Series, TCE / TCN Series, TCH Series

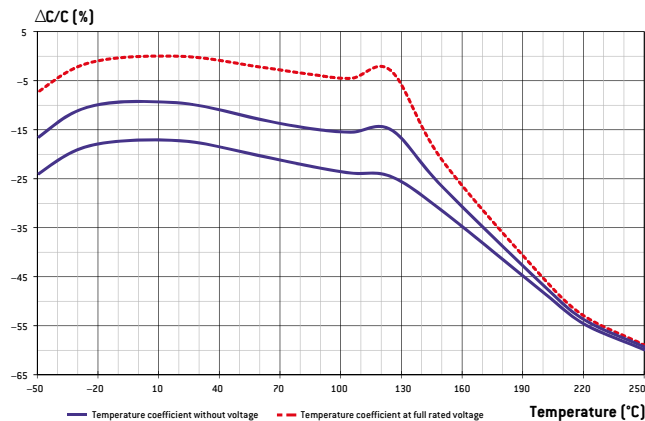
NPO: TYPICAL CAPACITANCE VARIATION VERSUS TEMPERATURE



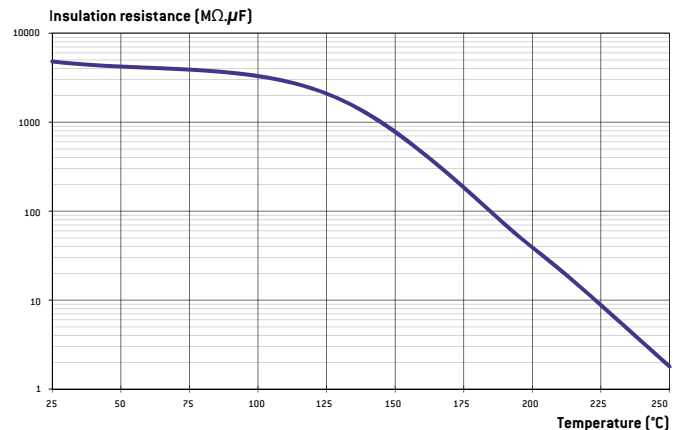
NPO: TYPICAL INSULATION RESISTANCE VERSUS TEMPERATURE



X7R: TYPICAL CAPACITANCE VARIATION VERSUS TEMPERATURE



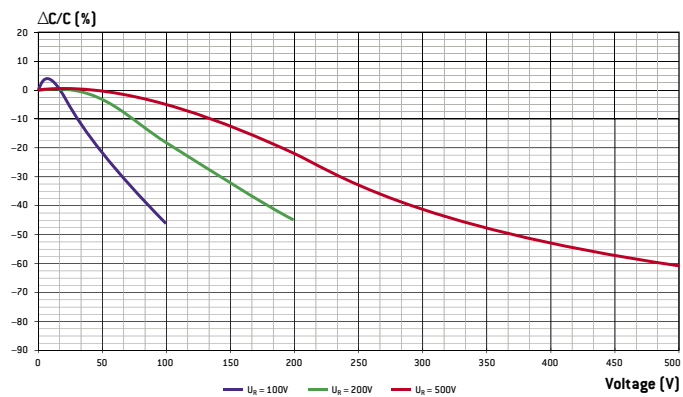
X7R: TYPICAL INSULATION RESISTANCE VERSUS TEMPERATURE



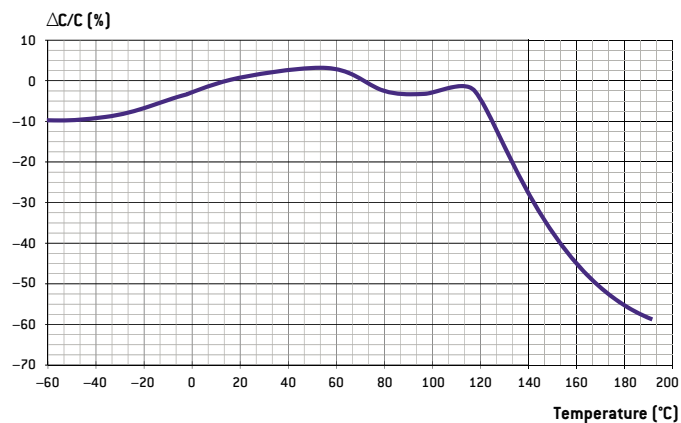
# General Information

## TYPICAL CURVES: SCT Series

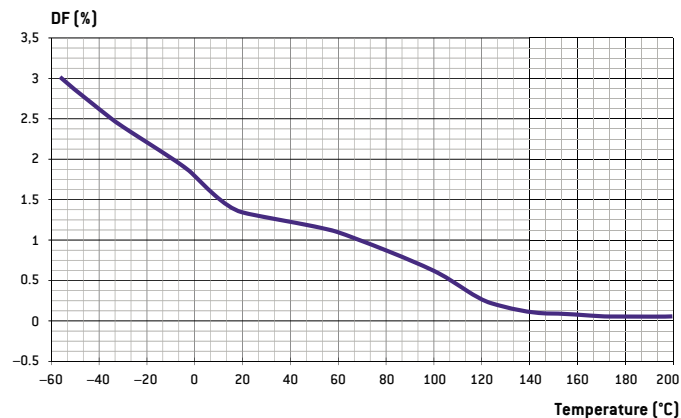
$\Delta C/C$  VERSUS APPLIED VOLTAGE AND RATED VOLTAGE ( $U_R$ )



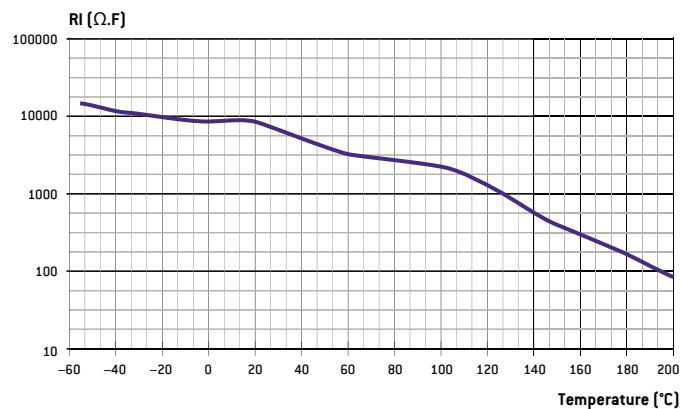
CAPACITANCE VERSUS TEMPERATURE



DIELECTRIC LOSSES VERSUS TEMPERATURE



INSULATION RESISTANCE VERSUS TEMPERATURE



HIGH TEMPERATURE