

HIGH CAPACITANCE CERAMIC CAPACITORS

Stacked multilayer ceramic capacitors



STACKED MULTILAYER CERAMIC CAPACITORS SC00 & SC10 SERIES

Specially developed to meet the requirements of SMPS and DC-DC converters manufacturers, those two new ranges of stacked capacitors are particularly suitable for filtering, decoupling and smoothing purpose in avionics, automotive, and medical equipment.

Using advance technology for multilayer ceramic capacitors, these series are able to achieve long operating life with a high reliability level.

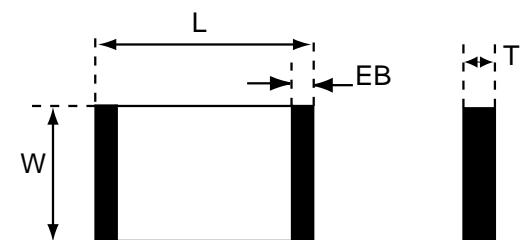
For the SC00 series, bare chips and radial leaded devices are also available under "R2229" ref. instead of « SC00 ». The available range is indicated in shaded boxes of the table. See also section "How to order" for details.



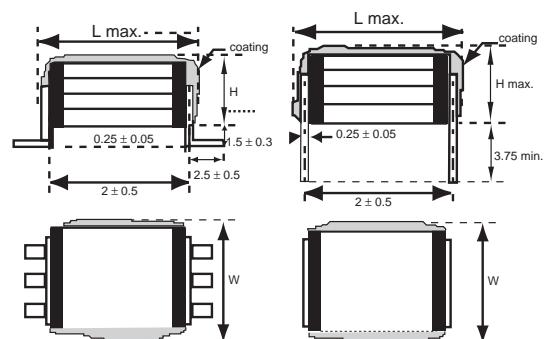
Dimensions

All dimensions are given in millimeters.

Size R2229	L	W max.	T max.	End band (EB)	Termination
Chip	5.7 ± 0.4	7.4	3.0	0.3/1.4	Ag-Pd
Radial (*)	7.6 max.	8.7	4.3	Wire Ø 0.5	Length of leads: 25 mm



Size	L max.	W max.	Z	H max.	Number of leads per side
SC00	7.4	8.5	6.35	12.8	3
SC10	13.2	27.5	11.5	14.8	10



Electrical characteristics

Cr range	Ur	Tolerance on capacitance	Voltage proof 50 mA 5s	Insulation resistance Ur ; 20°C	Operating temperature range	Dissipation factor	ΔC/C over temperature range	Ageing rate
see table	see table	±10% (K) ±20% (M)	2.5 Ur (except for 500V: 2 Ur)	≥ 1000 MΩ . μF	- 55°C to 125°C	≤ 2.5%	- Without applied voltage: ±20% max. - Under Ur: +20%, -30% (except for 500V: +20%, -45%)	≤ 2% per decade hour

Product range

Cr (μ F)	Ur (V) -->	SC00 (R2229)				SC10			
		50	100	200	500	50	100	200	500
0.10				2.0	3.2				
0.12				2.0	3.2				
0.15				2.2	6.4				
0.18				2.2	6.4				
0.22				2.7	6.4				
0.27				2.7	9.6				
0.33	2.2	2.2	4.4	9.6					
0.39	2.2	2.2	4.4	12.8					
0.47	2.2	2.2	5.4						
0.56	2.2	2.2	5.4						
0.68	2.2	2.2	8.1				2.7		
0.82	2.2	2.2	8.1				2.2	3.2	
1.0	2.4	2.4	10.8		2.2	2.2	2.2	3.2	
1.2	2.7	2.7	10.8		2.2	2.2	2.2	3.7	
1.5	2.7	2.7			2.2	2.2	2.7	6.4	
1.8	4.8	4.8			2.2	2.2	2.7	6.4	
2.2	4.8	4.8			2.2	2.2	2.7	6.4	
2.7	5.4	5.4			2.2	2.2	3.2	7.4	
3.3	5.4	5.4			2.2	2.2	3.2	9.6	
3.9	8.1	8.1			2.2	2.2	5.4	12.8	
4.7	8.1	8.1			2.2	2.2	5.9	14.8	
5.6	10.8	10.8			2.7	2.7	6.4		
6.8					2.7	2.7	8.1		
8.2					3.2	3.2	9.6		
10.0					3.2	3.2	9.6		
12.0					3.7	3.7	12.8		
15.0					6.4	6.4			
22.0					6.4	64			
27.0					9.6	9.6			
33.0					9.6	9.6			
39.0					12.8	12.8			
47.0					12.8	12.8			
56.0									
68.0									

Values shown in shaded boxes are available as:

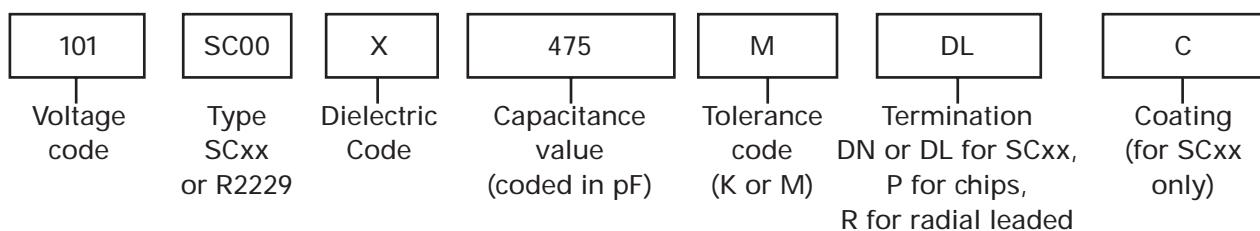
- bare chip
- Radial leaded devices
- SC00 type with DIL straight or in "L" shape

Values indicated are the maximum height H for SC00 and SC10 types.

Marking

- Bare chips (size 2229) are unmarked
- Radial leaded devices and SCxx series are marked with capacitance and tolerance code, rated voltage and for SC10 only the manufacturer logo (TA).

How to order



"SC" ASSEMBLIES

How to order

- Each assembly referred to as "SC xx" is made of 1 to "n" basic chips stacked to give the appropriate capacitance / voltage requirements. They will be referenced as: SC01 to SC07: each assembly being build from the corresponding chip size:

SC00 - 2229
 SC01 - 3033
 SC02 - 3740
 SC03 - 5440
 SC04 - 5550
 SC05 - 6560
 SC06 - 6080
 SC07 - 8060
 SC10 - 45107

- Once the capacitance / voltage has been chosen, (tables 4, 5) then the type of termination has to be defined:
 - wire terminations (4 wires)
see table 1
 - D.I.L. terminations ("J", "L" or "N" variant)
- see table 2
 - Ribbon terminations ("J" or "L" variant)
see table 3

For each variant the H dimension will be found in either table 4 or 5 since it is directly related to the number of chips which have been stacked together to obtain the desired capacitance value.

- How to build the reference to be ordered

xxx	SC xx	X	xxx	X	X X	•
3 digits for the rated voltage 50 V: 500 63 V: 630 100 V: 101 200 V: 201 250 V: 251 400 V: 401 500 V: 501	Basic Assembly size SC00 SC01 SC02 SC03 SC04 SC05 SC06 SC07 SC10	Dielectric code X = X7R	Capacitance code 0.1 μ F = 104 1 μ F = 105 10 μ F = 106 100 μ F = 107	Tolerance code K = $\pm 10\%$ M = $\pm 20\%$ Z = -20% / +80%	Termination code Wire: 4 Wires: W4 D.I.L.: J shape: DJ (consult us) L shape: DL (standard) N shape: DN (standard) Ribbon: J shape: RJ (on special) L shape: RL request	Varnish coating: C

For special capacitance, values, voltage, tolerance, mechanical variant, please consult us.

GENERAL CHARACTERISTICS

■ Capacitance range (C_r):	0.1 to 100 μ F										
■ Rated voltage (U_r):	50 to 500 V										
■ Tolerance on capacitance:	$\pm 10\% (K) \pm 20\% (M)$										
■ Voltage proof (50 mA max. 5 sec)	$2.5 \times U_r$										
■ Overvoltage pulse capability (50 / 63 V rated)	80 V for 100 ms 10000 cycles F = 1 Hz @ 100° C										
■ Maximum capacitance change over temperature range: $\left(\frac{\Delta C}{C} \% \right)$ without applied voltage	$\pm 15\% (X7R dielectric)$										
■ Temperature range	-55° C to +125° C										
■ Dissipation factor (DF): (1 kHz - 20° C)	$\leq 25 \times 10^{-3}$										
■ Insulation resistance: (U_r - 20° C)	$R_i \times C \geq 1 \text{ 000 } M\Omega \times \mu\text{F} \text{ (sec)}$										
■ Ageing rate	$\leq 2.5\% / \text{decade hour}$										
■ E.S.R. versus frequency (500 kHz - 20° C)	$\leq 10 \text{ m}\Omega \pm 5 \text{ m}\Omega$ see curves for detail										
■ E.S.L.	$\leq 10 \text{ nH}$										
■ Ripple current (Irms)	<table border="1"> <thead> <tr> <th>Tamb</th> <th>20° C</th> <th>50° C</th> <th>75° C</th> <th>100° C</th> </tr> </thead> <tbody> <tr> <td>correct. factor</td> <td>application notes</td> <td>x 0.85</td> <td>x 0.7</td> <td>x 0.5</td> </tr> </tbody> </table>	Tamb	20° C	50° C	75° C	100° C	correct. factor	application notes	x 0.85	x 0.7	x 0.5
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■ Thermal Resistance

Capacitors mounted on an infinite heat sink in still air ($T_a = 20$ to $100^\circ C$)

Thermal resistance is expressed in $^\circ C / W$ - Leaded devices: 2 mm lead length

Chips	2225	3033	3740	5550	6560	6080/8060
	28	20	20	20	20	20
Leaded devices	CC 08	CC 10	CC 13	CC 17	CC 20	CC 18/CC 23
	40	40	34	28	26	26