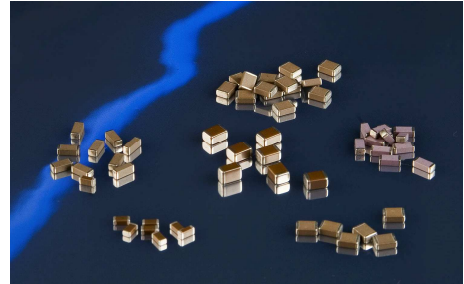


LOW VOLTAGE MULTILAYER CERAMIC CAPACITORS (6.3V to 35V)

DESCRIPTION:

RoHS compliant
 Case sizes: 0603 to 2220
 Rated voltage: 6.3V to 35V
 Dielectric Type I and II
 Pure tin over nickel barrier termination (S code)



I Capacitance range

		NP0 (N series)									
Cr Code	Cr (nF)	R14 (0603)		R15 (0805)		R18 (1206)		S41 (1210)		S43 (1812)	
		16V	25V	16V	25V	16V	25V	16V	25V	16V	25V
102	1.0	0.95	0.95	0.95	0.95	0.95	0.95	1.10	1.10	1.40	1.40
122	1.2	0.95	0.95	0.95	0.95	0.95	0.95	1.10	1.10	1.40	1.40
152	1.5	0.95	0.95	0.95	0.95	0.95	0.95	1.10	1.10	1.40	1.40
182	1.8	0.95	0.95	0.95	0.95	0.95	0.95	1.10	1.10	1.40	1.40
222	2.2	0.95	0.95	1.40	1.40	0.95	0.95	1.10	1.10	1.40	1.40
272	2.7	0.95	0.95	1.40	1.40	0.95	0.95	1.10	1.10	1.40	1.40
332	3.3	0.95	0.95	1.40	1.40	0.95	0.95	1.10	1.10	1.40	1.40
392	3.9			1.40	1.40	0.95	0.95	1.10	1.10	1.40	1.40
472	4.7			1.40	1.40	0.95	0.95	1.10	1.10	1.40	1.40
562	5.6			1.40	1.40	0.95	1.10	1.10	1.10	1.40	1.40
682	6.8			1.40	1.40	0.95	1.40	1.10	1.10	1.40	1.40
822	8.2			1.40	1.40	0.95	1.40	1.10	1.10	1.40	1.40
103	10			1.40	1.40	0.95	1.40	1.10	1.10	1.40	1.40
123	12					1.40		1.40	1.40	1.40	1.40
153	15					1.40		1.40	1.80	1.40	1.40
183	18					1.40		1.40	1.80	1.40	1.40
223	22					1.40		1.40	2.20	1.80	1.80
273	27					1.80		1.40		1.80	1.80
333	33							1.80		1.80	1.80
393	39							1.80		1.80	1.80
473	47							1.80		2.20	2.20
563	56									2.20	
683	83									2.20	
823	82									2.20	
104	100									2.20	
124	120									2.20	
154	150										
224	220										

Maximum thickness of each component in the cells

LOW VOLTAGE MULTILAYER CERAMIC CAPACITORS (6.3V to 35V)

		X7R (X series)																	
Cr	Cr	R14 (0603)				R15 (0805)				R18 (1206)				S41 (1210)			S43 (1812)	S47 (2220)	
		Code	Value	6.3V	10V	16V	25V	6.3V	10V	16V	25V	10V	16V	25V	35V	16V	25V	35V	35V
101	100pF																		
151	150pF			0.95	0.95														
221	220pF			0.95	0.95														
331	330pF			0.95	0.95														
471	470pF			0.95	0.95			0.95	0.95										
681	680pF			0.95	0.95			0.95	0.95										
102	1nF			0.95	0.95			0.95	0.95										
152	1.5nF			0.95	0.95			0.95	0.95										
222	2.2nF			0.95	0.95			0.95	0.95										
332	3.3nF			0.95	0.95			0.95	0.95										
472	4.7nF			0.95	0.95			0.95	0.95										
682	6.8nF			0.95	0.95			0.95	0.95										
103	10nF			0.95	0.95			0.95	0.95										
153	15nF			0.95	0.95			0.95	0.95										
223	22nF			0.95	0.95			0.95	0.95										
333	33nF			0.95	0.95			0.95	0.95										
473	47nF			0.95	0.95			0.95	0.95										
683	68nF			0.95	0.95			0.95	0.95										
104	100nF			0.95	0.95			0.95	0.95	0.95	0.95								
154	150nF			0.95	0.95			0.95	0.95	0.95	0.95								
224	220nF			0.95	0.95			0.95	0.95	0.95	0.95								
334	330nF			0.95	0.95			1.40	1.40	1.10	1.10								
474	470nF			0.95	0.95			1.40	1.40	1.40	1.40								
684	680nF			0.95	0.95			1.40	1.40	1.40	1.40								
105	1.0uF	0.95	0.95	0.95	0.95	1.40	1.40	1.40		1.40	1.40	1.80	1.40	1.40	1.40	2.20	2.20		
225	2.2uF	0.95	0.95	0.95		1.40	1.40	1.40		1.80	1.80	1.80		2.20	2.20	2.20	2.20	2.20	
475	4.7uF					1.40	1.40			1.80	1.80			2.20	2.20			2.20	
685	6.8uF									1.80				2.20	2.20				
106	10uF									1.80				2.20	2.20				2.60

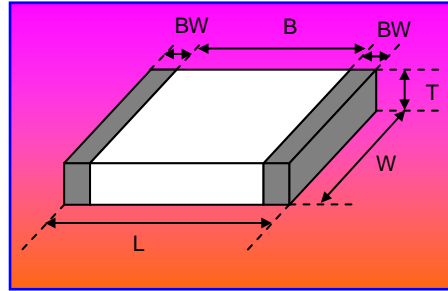
Maximum thickness of each component in the cells

		X5R (B Series)																		
Cr	Cr	R14 (0603)				R15 (0805)				R18 (1206)					S41 (1210)					
		Code	(μF)	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	35V	6.3V	10V	16V	25V
105	1.0	0.95	0.95	0.95	0.95		1.40	1.40	1.40			1.40	1.40	1.80						
225	2.2	0.95	0.95	0.95		1.40	1.40	1.40	1.40		1.80	1.80	1.80				1.80	2.20	2.20	
475	4.7	0.95	0.95			1.40	1.40	1.40	1.40	1.80	1.80	1.80	1.80				2.20	2.20	2.20	
106	10	0.95				1.40	1.40	1.40		1.80	1.80	1.80	1.80			2.20	2.20	2.20	2.20	
226	22					1.40	1.40			1.80	1.80	1.80			2.60	2.60	2.60			
476	47									1.80	1.80				2.60					
107	100														2.60					

Maximum thickness of each component in the cells

LOW VOLTAGE MULTILAYER CERAMIC CAPACITORS (6.3V to 35V)

II Dimensions



Sizes	L	W	T (max)	B (min)	BW (min)
R14 (0603)	1.60±0.10	0.80±0.10	0.90	0.4	0.15
R15 (0805)	2.00±0.20	1.25±0.20	1.40	0.7	0.2
R18 (1206)	3.20±0.30	1.60±0.20	1.80	1.5	0.3
S41 (1210)	3.20±0.30	2.50±0.20	2.60	1.6	0.3
S43 (1812)	4.60±0.30	3.20±0.30	2.20	2.5	0.3
S47 (2220)	5.70±0.40	5.00±0.40	2.60	3.5	0.3

All dimensions in mm.

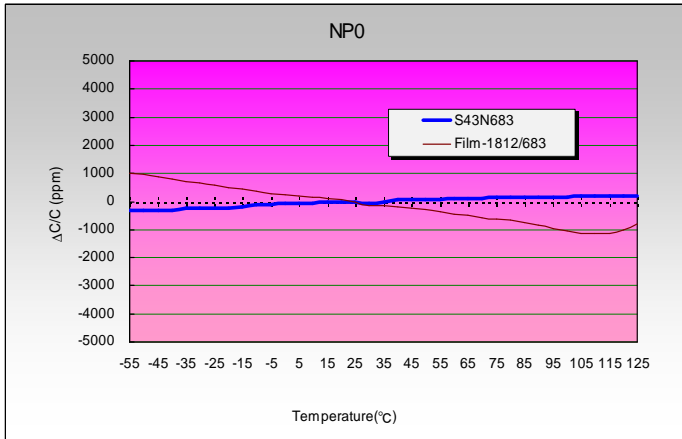
IV Dielectric characteristics

Designation	NP0	X7R	X5R
Temex Ceramics Series	N	X	B
EIA Class	Class I	Class II	Class II
Temperature range	-55°C to +125°C	-55°C to +125°C	-55°C to +85°C
Temperature coefficient	≤ 30ppm/°C	NA	NA
Maximum ΔC/C over Temperature range without voltage applied	NA	± 15%	± 15%
Voltage proof	250% rated voltage	250% rated voltage	250% rated voltage
Insulation resistance	10GΩ or 500ΩF * > 100ΩF **	10GΩ or 500ΩF * > 100ΩF **	10GΩ or 500ΩF * > 100ΩF **
Aging	None	≤ 2.5% (per decade hour)	≤ 2.5% (per decade hour)

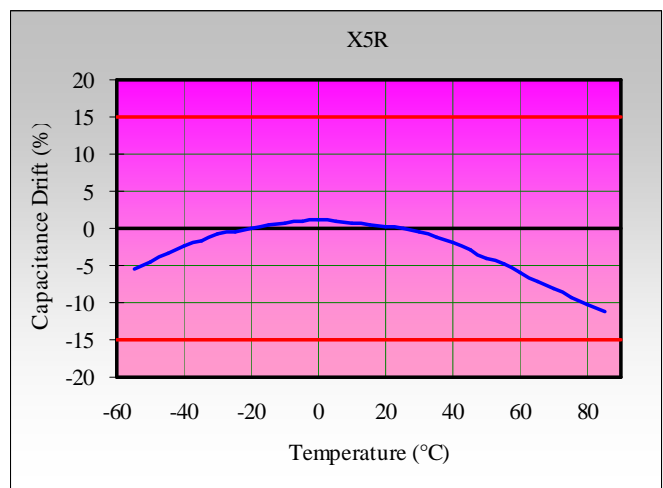
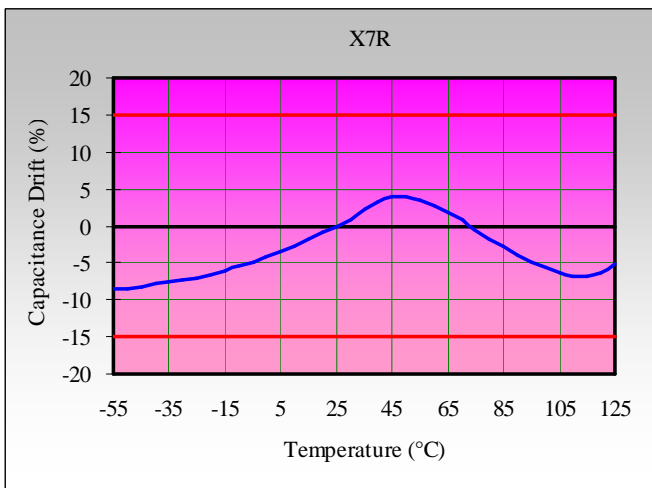
(*): whichever is the less, for $U_r > 10$ volts / (**): for $U_r \leq 10$ volts

LOW VOLTAGE MULTILAYER CERAMIC CAPACITORS (6.3V to 35V)

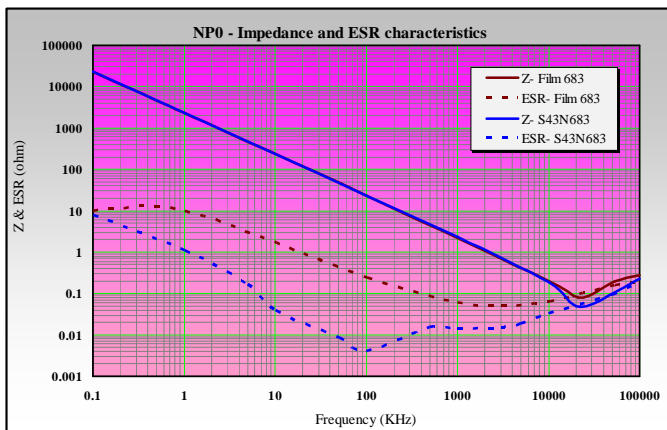
Temperature capacitance coefficient



The NPO products can be used for the replacement of film capacitors. Here is a comparison of the temperature coefficients.

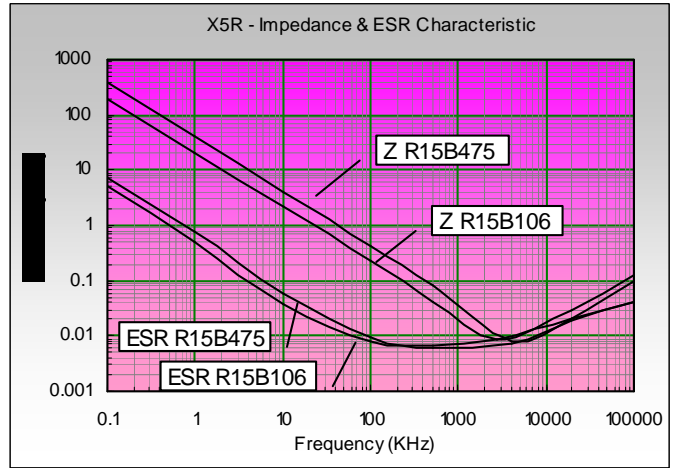
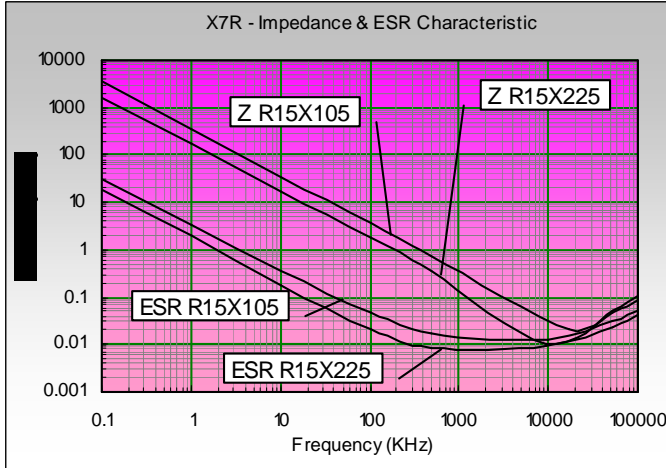


V Electrical characteristics



TEMEX CERAMICS reserves the right to modify herein specifications and information at any time when necessary to provide optimum performance and cost.

LOW VOLTAGE MULTILAYER CERAMIC CAPACITORS (6.3V to 35V)



XI Packaging

Tape and reel

Sizes	Thickness (mm)	Paper Tape (parts/reel)	Plastic Tape (parts/reel)
R14 (0603)	$T \leq 0.90$	4000	-
R15 (0805)	$T \leq 0.90$	4000	-
	$0.90 < T \leq 1.40$	-	3000
R18 (1206)	$T \leq 0.90$	4000	-
	$0.90 < T \leq 1.25$	-	3000
	$T > 1.25$	-	2000
S41 (1210)	$T \leq 1.25$	-	3000
	$T > 1.25$	-	2000
S43 (1812)	$T \leq 2.20$	-	1000
	$T > 2.20$	-	700
S47 (2220)	$T \leq 2.20$	-	1000
	$T > 2.20$	-	700

Diameter of the reel: 180mm.

LOW VOLTAGE MULTILAYER CERAMIC CAPACITORS (6.3V to 35V)

VII How to order

160	S41	B	106	K	S	E
Rated Voltage	Family	Dielectric	Capacitance	Tolerance	Termination	Packaging
<p><u>Ur < 10V</u> The voltage value is got by dividing by 10 the voltage code</p> <p><u>Ur ≥ 10V</u> 1st two digits are significant; third digit denotes number of zeros</p> <p>Examples: 063=6.3V 100=10V 160=16V 250=25V 350=35V</p>	<p>R14 R15 R18 S41 S43 S47</p>	<p>N = NP0 X = X7R B = X5R</p>	<p>1st two digits are significant; third digit denotes number of zeros</p> <p>Examples: 101=100pF 472= 4.7nF 683 = 68nF 104 = 0.1μF 106 = 10μF</p>	<p><u>Class1 diel.</u> F (±1%) G (±2%) J (±5%)</p> <p><u>Class2 diel.</u> K (±10%) M (±20%)</p>	<p>S (Nickel barrier covered by 100% Matte tin plating)</p>	<p>E (tape & reel)</p>