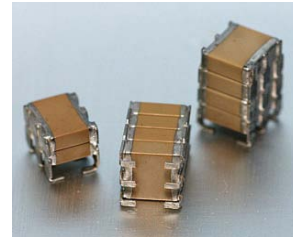


SMC Series Stacked MLCC Capacitors



◆ Features

- Stacked designs offer the high capacitance similar to tantalum but with the advantage of very low ESR.
- 'J', 'L' and 'N' leaded configurations provide mechanical and thermal stress relief.
- Capacitance values up to 34μF
- Voltages from 50V to 1000V.
- Available in NPO and X7R dielectrics.
- HIREL screening available.
- RoHS compliant.

◆ Application

- Power supplies
- DC-DC converters
- Surge protection
- Industrial control circuits
- Snubbers
- Filtering, smoothing and decoupling applications
- HIREL applications
- Custom applications

◆ Summary of Specifications

Operating Temperature	-55 to +125 °C
Rated Voltage	50Vdc to 1000Vdc
Temperature Coefficient of Capacitance	NPO : $\leq \pm 30\text{ppm}/^\circ\text{C}$, -55 to +125 °C (EIA Class I)
	X7R : $\leq \pm 15\%$, -55 to +125 °C (EIA Class II)
Capacitance Range	NPO: 1.0nF to 400nF
	X7R : 27nF to 34uF
Dissipation Factor	NPO : $Q \geq 1000$ at 1KHz
	X7R : 2.5%max. at 1KHz
Insulation Resistance	10GΩ or 500/C Ω whichever is smaller
Aging	NPO : 0% , X7R : 2.5% per decade of time
Dielectric Withstand Voltage	$V \leq 50V$; 250% Rated Voltage
	$100V \leq V < 500V$; 200% Rated Voltage
	$500V \leq V < 1KV$; 150% Rated Voltage
	1000V = 120% Rated Voltage
Tolerance	$\pm 1\%$ & $\pm 2\%$ tolerances are only available in NPO

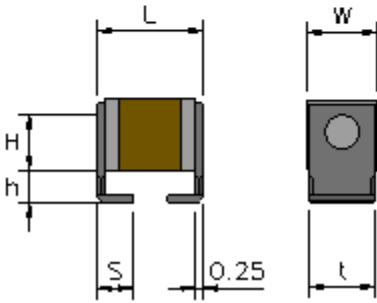
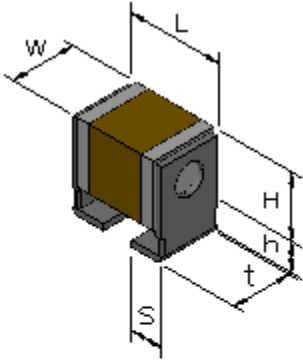
◆ How To Order

SMC	49	J	X	224	K	501	T	H	01
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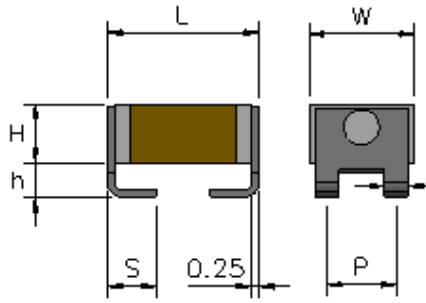
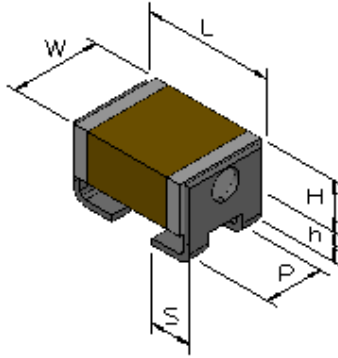
Product Code	Stack and Size	Lead Configuration	Material	Capacitance (pF)	Tolerance	Rated Voltage	Packaging	Special test Requirement	Special Requirement
SMC: Commercial Size Switchmode Stack Capacitor	The first digit : # of chips in stack Second Digit: Chip Size 5 : 1210 6 : 1812 7 : 2220 8 : 1825 9 : 2225	Ex.: J : J Lead for h=0.070" L : L Lead for h=0.070" N : Straight Lead P : J Lead for h=0.045" S : L Lead for h=0.045"	Ex.: N : NPO X : X7R	Ex.: 103 : 10x10 ³ 224 : 22x10 ⁴ 475 : 47x10 ⁵	Ex.: F : +/-1.0% G : +/-2.0% J : +/-5.0% K : +/- 10% M : +/- 20%	Ex.: 050 : 50Vdc 101 : 100Vdc 201 : 200Vdc 501 : 500Vdc 102 : 1000Vdc	Ex.: T : Tape & Reel W : Waffle pack	Ex.: S : Standard electrical test H : Hi-Rel Testing	Blank : No special requirement 01~99 : Customer special requirement

◆ Dimensions

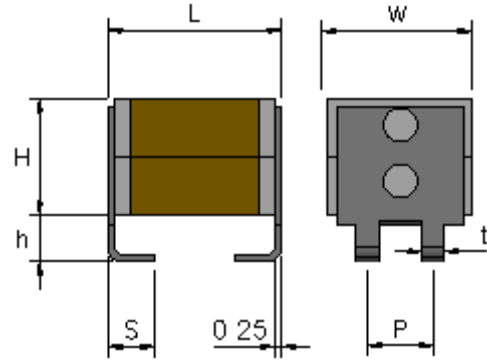
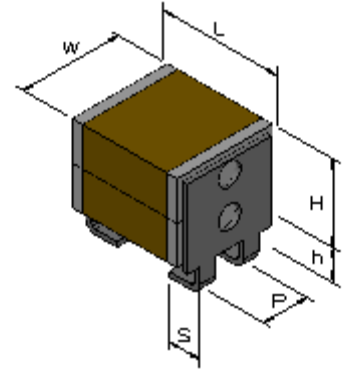
1210 Size



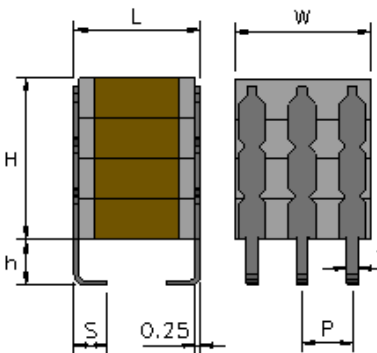
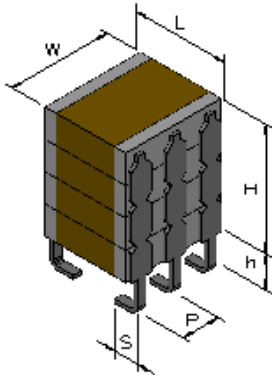
1812 Size



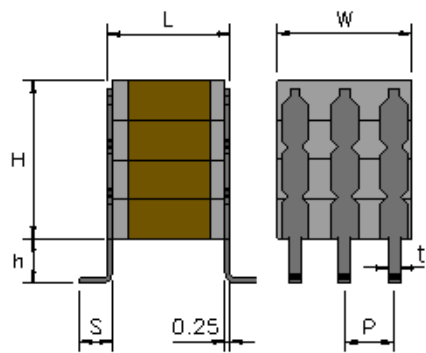
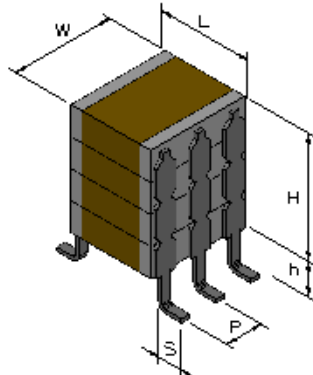
2220 Size



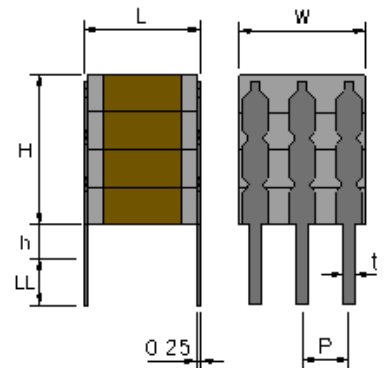
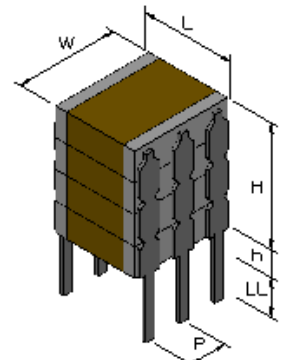
1825/2225 J Type



1825/2225 L Type



1825/2225 N Type



SMC Series - Stacked MLCC Capacitors



Unit : mm [inches]

EIA Size Code	1210		1812		2220		1825	
Size Code	15	25	16	26	17	27	18	28
L	3.80 Max [.150 Max]	3.80 Max [.150 Max]	5.50 Max [.217 Max]	5.50 Max [.217 Max]	6.50 Max [.256 Max]	6.50 Max [.256 Max]	5.35±0.50 [.210±.020]	5.35±0.50 [.210±.020]
W (max.)	2.90 [.114]	2.90 [.114]	4.00 [.157]	4.00 [.157]	5.50 [.217]	5.50 [.217]	6.85 [.270]	6.85 [.270]
H (max.)	2.15 [.083]	4.30 [.165]	2.10 [.083]	4.20 [.165]	2.10 [.083]	4.20 [.165]	2.54 [.100]	5.08 [.200]
S	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]
P			2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]
h* (Typical)	1.30 Max [.051 Max]	1.30 Max [.051 Max]	1.30 Max [.051 Max]	1.30 Max [.051 Max]	1.30 Max [.051 Max]	1.30 Max [.051 Max]	1.78 [.070]	1.78 [.070]
h* (P/S Type)							1.14 [.045]	1.14 [.045]
LL** (min.)					2.54 [.100]	2.54 [.100]	2.54 [.100]	2.54 [.100]
t	2.25±0.1 [.089±.004]	2.25±0.1 [.089±.004]	0.50±0.05 [.020±.002]	0.50±0.05 [.020±.002]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]
# of leads per side	1	1	2	2	2	2	3	3

EIA Size Code	1825			2225				
Size Code	38	48	58	19	29	39	49	59
L	5.35±0.50 [.210±.020]	5.35±0.50 [.210±.020]	5.35±0.50 [.210±.020]	6.35±0.50 [.250±.020]	6.35±0.50 [.250±.020]	6.35±0.50 [.250±.020]	6.35±0.50 [.250±.020]	6.35±0.50 [.250±.020]
W (max.)	6.85 [.270]	6.85 [.270]	6.85 [.270]	6.85 [.270]	6.85 [.270]	6.85 [.270]	6.85 [.270]	6.85 [.270]
H (max.)	7.62 [.300]	10.16 [.400]	12.7 [.500]	2.54 [.100]	5.08 [.200]	7.62 [.300]	10.16 [.400]	12.70 [.500]
S	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]	1.65±0.50 [.065±.020]
P	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]	2.54±0.25 [.100±.010]
h* (Typical)	1.78 [.070]	1.78 [.070]	1.78 [.070]	1.78 [.070]	1.78 [.070]	1.78 [.070]	1.78 [.070]	1.78 [.070]
h* (P/S Type)	1.14 [.045]	1.14 [.045]	1.14 [.045]	1.14 [.045]	1.14 [.045]	1.14 [.045]	1.14 [.045]	1.14 [.045]
LL** (min.)	2.54 [.100]	2.54 [.100]	2.54 [.100]	2.54 [.100]	2.54 [.100]	2.54 [.100]	2.54 [.100]	2.54 [.100]
t	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]	0.50±0.10 [.020±.004]
# of leads per side	3	3	3	3	3	3	3	3

- * 'h' varies depends on the lead style. See lead configuration above
- ** "LL" Applies only to straight (N) leads

◆ Capacitance Range

EIA Chip Size	Size Code	NPO Maximum Capacitance					X7R Maximum Capacitance				
		50V	100V	200V/250V	500V	1000V	50V	100V	200V/250V	500V	1000V
1210	15 (1xCap)	183	103	822	222	102	125	105	224	683	273
	25 (2xCap)	363	203	163	442	204	245	205	444	134	543
1812	16 (1xCap)	293	183	123	822	562	335	155	824	154	683
	26 (2xCap)	583	363	243	163	113	665	305	165	304	134
2220	17 (1xCap)	623	543	453	393	123	475	335	155	274	823
	27 (2xCap)	124	104	903	783	243	945	665	305	544	164
1825	18 (1xCap)	653	563	473	393	123	475	335	155	274	823
	28 (2xCap)	134	114	943	783	243	945	665	305	544	164
	38 (3xCap)	194	164	144	114	363	146	995	455	814	244
	48 (4xCap)	264	224	184	154	483	186	136	605	105	324
2225	58 (5xCap)	324	284	234	194	603	236	166	755	135	414
	19 (1xCap)	813	653	563	473	153	685	475	225	394	104
	29 (2xCap)	164	134	114	943	303	136	945	445	784	204
	39 (3xCap)	244	194	164	144	453	206	146	665	115	304
	49 (4xCap)	324	264	224	184	603	276	186	885	155	404
59 (5xCap)	404	324	284	234	753	346	236	116	195	504	

■ Other stacked configuration with other sizes, capacitance values and voltage rating sare available. Please contact HEC.

*Soldering And Handling Precautions:

The recommended method for soldering large capacitors is reflow soldering. Wave soldering and manual soldering are not recommended. Ceramic capacitors should be preheated to within 50°C of the peak soldering temperature and then use a maximum of 2°/second ramp rate for both heating and cooling. A sudden increase or decrease in temperature during soldering may cause internal thermal cracking.

