High Temperature and Large Size Multilayer Ceramic Chip Capacitors [High Temperature / Large Stacked Capacitors]

HSC Series

MLCC Design, Suitable for Switchmode Power Supply Filters

◆ Features

- ❑ High CV MLCC design, effectively can replace Tantalum and Aluminum electolytics
- ❑ Inherently low ESR.
- ❑ N leads for through hole applications and J or L lead configuration for surface mount with stress relief against board flexure and thermal excursions.
- ❑ High reliability testing available including space level screening.
- ❑ Custom sizes and values available--contact factory for details or to define your needs.

◆ Application

- ❑ Down Hole Applications
- ❑ Jet Engine Control
- ❑ Power supplies
- ❑ DC-DC converters
- ❑ Surge protection
- ❑ Industrial control circuits
- ❑ Snubbers
- ❑ Filtering, smoothing, and decoupling application
- ❑ HIREL applications
- ❑ Custom applications

◆ Summary of Specification

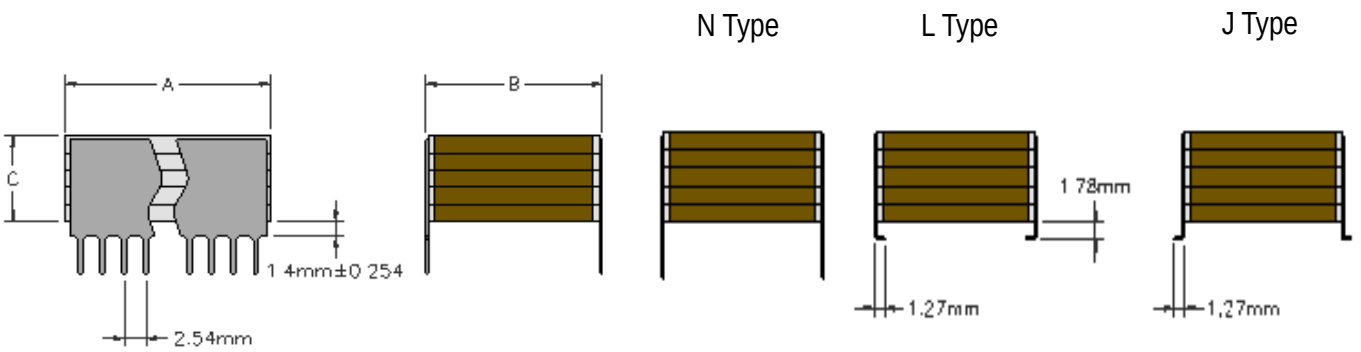
Operating Temperature	-55 to +175 ℃
Rated Voltage	50Vdc to 500Vdc
Temperature Coefficient of Capacitance	NPO : ≤ ± 30ppm/ ℃ , -55 to +125 ℃ (EIA Class Ⅰ)
	X8R : ≤ ± 15% , -55 to +150 ℃ (EIA Class Ⅱ)
Capacitance Range	NPO: 70nF to 9.0uF
	X8R : 460nF to 220uF
Dissipation Factor :	NPO : Q≧ 1000 at 1KHz
	X8R : 2.5%max. at 1KHz
Insulation Resistance	10GΩ or 500/C Ω whichever is smaller
Aging	NPO : 0% , X8R : 2.5% per decade of time
Dielectric Withstanding Voltage	V ≤50V ; 250% Rated Voltage
	100V ≤ V <500V ; 200% Rated Voltage
	500V ≤ V ; 150% Rated Voltage
Tolerance	± 1% & ± 2% tolerances are only available in NPO

◆ How To Order

HSC	3A	J	H	224	K	501	W	H	01

Product Code	Stack and Size	Lead Configuration	Material	Capacitance (pF)	Tolerance	Rated Voltage	Packaging	Special Test Requirement	Special Requirement
HSC: High Temperature and Large Size Multilayer Ceramic Chip Capacitor	The first digit: # of chips in stack Second Digit: Chip Size A B C D	Ex.: J :J Lead L :L Lead N:Straight Lead	Ex.: N: NPO H: X8R	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	B: Bulk W: Waffle pack	Blank: Standard electrical test H: Hi-Rel Testing	Blank: No special requirement 01~99: Customer special requirement

◆ Dimensions



Size Code	A (Max.) mm	B (Max.) mm	C (Max.) mm	Leads per side	Size Code	A (Max.) mm	B (Max.) mm	C (Max.) mm	Leads per side	Size Code	A (Max.) mm	B (Max.) mm	C (Max.) mm	Leads per side
1A	8.7	9.2	3.1	3	1J	15.5	16.8	3.1	6	1S	28.6	32.5	3.1	11
2A	8.7	9.2	6.2	3	2J	15.5	16.8	6.2	6	2S	28.6	32.5	6.2	11
3A	8.7	9.2	9.3	3	3J	15.5	16.8	9.3	6	3S	28.6	32.5	9.3	11
4A	8.7	9.2	12.4	3	4J	15.5	16.8	12.4	6	4S	28.6	32.5	12.4	11
5A	8.7	9.2	15.5	3	5J	15.5	16.8	15.5	6	5S	28.6	32.5	15.5	11
1B	10.7	10.7	3.1	4	1K	16.8	15.5	3.1	6	1T	11.8	11.2	3.1	4
2B	10.7	10.7	6.2	4	2K	16.8	15.5	6.2	6	2T	11.8	11.2	6.2	4
3B	10.7	10.7	9.3	4	3K	16.8	15.5	9.3	6	3T	11.8	11.2	9.3	4
4B	10.7	10.7	12.4	4	4K	16.8	15.5	12.4	6	4T	11.8	11.2	12.4	4
5B	10.7	10.7	15.5	4	5K	16.8	15.5	15.5	6	5T	11.8	11.2	15.5	4
1C	13.6	14.9	3.1	5	1L	8.0	9.9	3.1	3	1U	13.1	15.0	3.1	5
2C	13.6	14.9	6.2	5	2L	8.0	9.9	6.2	3	2U	13.1	15.0	6.2	5
3C	13.6	14.9	9.3	5	3L	8.0	9.9	9.3	3	3U	13.1	15.0	9.3	5
4C	13.6	14.9	12.4	5	4L	8.0	9.9	12.4	3	4U	13.1	15.0	12.4	5
5C	13.6	14.9	15.5	5	5L	8.0	9.9	15.5	3	5U	13.1	15.0	15.5	5
1D	21.6	16.8	3.1	7	1M	9.3	8.6	3.1	3	1V	14.4	13.7	3.1	5
2D	21.6	16.8	6.2	7	2M	9.3	8.6	6.2	3	2V	14.4	13.7	6.2	5
3D	21.6	16.8	9.3	7	3M	9.3	8.6	9.3	3	3V	14.4	13.7	9.3	5
4D	21.6	16.8	12.4	7	4M	9.3	8.6	12.4	3	4V	14.4	13.7	12.4	5
5D	21.6	16.8	15.5	7	5M	9.3	8.6	15.5	3	5V	14.4	13.7	15.5	5
1E	16.6	21.6	3.1	6	1N	10.6	10.2	3.1	4	1W	16.9	20.1	3.1	6
2E	16.6	21.6	6.2	6	2N	10.6	10.2	6.2	4	2W	16.9	20.1	6.2	6
3E	16.6	21.6	9.3	6	3N	10.6	10.2	9.3	4	3W	16.9	20.1	9.3	6
4E	16.6	21.6	12.4	6	4N	10.6	10.2	12.4	4	4W	16.9	20.1	12.4	6
5E	16.6	21.6	15.5	6	5N	10.6	10.2	15.5	4	5W	16.9	20.1	15.5	6
1F	38.2	12.0	3.1	14	1P	9.6	11.2	3.1	4	1X	19.5	17.5	3.1	7
2F	38.2	12.0	6.2	14	2P	9.6	11.2	6.2	4	2X	19.5	17.5	6.2	7
3F	38.2	12.0	9.3	14	3P	9.6	11.2	9.3	4	3X	19.5	17.5	9.3	7
4F	38.2	12.0	12.4	14	4P	9.6	11.2	12.4	4	4X	19.5	17.5	12.4	7
5F	38.2	12.0	15.5	14	5P	9.6	11.2	15.5	4	5X	19.5	17.5	15.5	7
1G	38.2	18.9	3.1	14	1Q	10.6	12.4	3.1	4					
2G	38.2	18.9	6.2	14	2Q	10.6	12.4	6.2	4					
3G	38.2	18.9	9.3	14	3Q	10.6	12.4	9.3	4					
4G	38.2	18.9	12.4	14	4Q	10.6	12.4	12.4	4					
5G	38.2	18.9	15.5	14	5Q	10.6	12.4	15.5	4					
1H	40.6	24.0	3.1	14	1R	25.5	27.3	3.1	10					
2H	40.6	24.0	6.2	14	2R	25.5	27.3	6.2	10					
3H	40.6	24.0	9.3	14	3R	25.5	27.3	9.3	10					
4H	40.6	24.0	12.4	14	4R	25.5	27.3	12.4	10					
5H	40.6	24.0	15.5	14	5R	25.5	27.3	15.5	10					

◆ Capacitance Range

Size Code	NPO Maximum Capacitanc				X8R Maximum Capacitance			
	50V	100V	200V	500V	50V	100V	200V	500V
1A	124	114	983	843	285	225	205	584
2A	244	224	194	164	565	445	405	115
3A	364	334	294	254	845	665	605	175
4A	484	444	394	334	116	886	805	235
5A	604	554	494	424	146	116	106	295
1B	184	174	154	134	455	355	325	964
2B	364	344	304	264	905	705	645	195
3B	544	514	454	394	136	106	965	285
4B	724	684	604	524	186	146	126	385
5B	904	854	754	654	226	176	166	485
1C	354	324	304	244	845	655	595	175
2C	704	644	604	484	166	136	116	345
3C	105	964	904	724	256	196	176	515
4C	145	125	125	964	336	266	236	685
5C	175	165	155	125	426	326	296	855
1D	654	604	554	454	156	116	106	325
2D	135	125	115	904	306	226	206	645
3D	195	185	165	135	456	336	306	965
4D	265	245	225	185	606	446	406	126
5D	325	305	275	225	756	556	506	166
1E	654	604	554	454	166	126	116	345
2E	135	125	115	904	326	246	226	685
3E	195	185	165	135	486	366	336	106
4E	265	245	225	185	646	486	446	136
5E	325	305	275	225	806	606	556	176
1F	774	714	654	564	186	146	136	405
2F	155	145	135	115	366	286	266	805
3F	235	215	195	165	546	426	396	126
4F	305	285	265	225	726	566	526	166
5F	385	355	325	285	906	706	656	206
1G	145	135	125	984	316	246	226	675
2G	285	265	245	195	626	486	446	136
3G	425	395	365	295	936	726	666	206
4G	566	435	485	395	127	966	886	266
5G	705	655	605	495	157	127	117	336
1H	185	165	155	125	446	346	306	925
2H	365	325	305	245	886	686	606	186
3H	545	485	455	365	137	107	906	276
4H	725	645	605	485	177	137	127	366
5H	905	805	755	605	227	177	157	466
1J	454	424	394	324	106	845	705	225
2J	904	844	784	644	206	166	146	445
3J	135	125	115	964	306	256	216	665
4J	185	165	155	125	406	336	286	885
5J	225	215	195	165	506	426	356	116
1K	454	424	394	324	106	845	705	225
2K	904	844	784	644	206	166	146	445
3K	135	125	115	964	306	256	216	665
4K	185	165	155	125	406	336	286	885
5K	225	215	195	165	506	426	356	116
1L	104	923	853	703	235	185	165	464
2L	204	184	174	144	465	365	325	924
3L	304	274	254	214	695	545	485	135
4L	404	364	344	284	925	725	645	185
5L	504	464	424	354	116	905	805	235

◆ Capacitance Range

Size Code	NPO Maximum Capacitanc				X8R Maximum Capacitance			
	50V	100V	200V	500V	50V	100V	200V	500V
1M	104	923	853	703	235	185	165	464
2M	204	184	174	144	465	365	325	924
3M	304	274	254	214	695	545	485	135
4M	404	364	344	284	925	725	645	185
5M	504	464	424	354	116	905	805	235
1N	154	134	124	104	355	275	255	754
2N	304	264	244	204	705	545	505	155
3N	454	394	364	304	106	815	755	225
4N	604	524	484	404	146	116	106	305
5N	754	654	604	504	176	136	126	375
1P	154	134	124	104	355	275	255	754
2P	304	264	244	204	705	545	505	155
3P	454	394	364	304	106	815	755	225
4P	604	524	484	404	146	116	106	305
5P	754	654	604	504	176	136	126	375
1Q	204	184	174	144	465	375	335	884
2Q	404	364	344	284	925	745	665	175
3Q	604	544	514	424	136	116	995	265
4Q	804	724	684	564	186	146	136	355
5Q	105	904	854	704	236	186	166	445
1R	125	115	105	914	306	246	216	635
2R	243	225	205	185	606	486	426	126
3R	365	335	305	275	906	726	636	186
4R	485	445	405	365	127	966	846	256
5R	605	555	505	455	157	127	107	316
1S	185	165	155	125	446	346	306	925
2S	365	325	305	245	886	686	606	186
3S	545	485	455	365	137	107	906	276
4S	725	645	605	485	177	137	127	366
5S	905	805	755	605	227	177	157	466
1T	204	184	174	144	465	375	335	884
2T	404	364	344	284	925	745	665	175
3T	604	544	514	424	136	116	995	265
4T	804	724	684	564	186	146	136	355
5T	105	904	854	704	236	186	166	445
1U	304	274	254	214	705	585	535	155
2U	604	544	505	424	146	116	106	305
3U	904	814	754	634	216	176	156	455
4U	125	105	105	844	286	236	216	605
5U	155	135	125	105	356	296	266	755
1V	304	274	254	214	705	585	535	155
2V	604	544	505	424	146	116	106	305
3V	904	814	754	634	216	176	156	455
4V	125	105	105	844	286	236	216	605
5V	155	135	125	105	356	296	266	755
1W	564	504	464	394	136	106	915	285
2W	115	105	924	784	266	206	186	565
3W	165	155	135	115	396	306	276	845
4W	225	205	185	155	526	406	366	116
5W	285	255	235	195	656	506	456	146
1X	564	504	464	394	136	106	915	285
2X	115	105	924	784	266	206	186	565
3X	165	155	135	115	396	306	276	845
4X	225	205	185	155	526	406	366	116
5X	285	255	235	195	656	506	456	146

▪ ***Other Stacked configuration on other sizes, capacitance values and voltages rating are available. Please contact HEC.***

***Soldering And Handling Precautions:**

The recommended method for soldering large HSC capacitor, is reflow soldering. Wave soldering and manual soldering with Iron is not recommended. Ceramic capacitors must be preheated with less than 2ºC/sec rate to about 50ºC below the reflow temperature. Sudden increase, or decrease in temperature more than the recommended rate, during soldering, may cause internal thermal cracks.

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