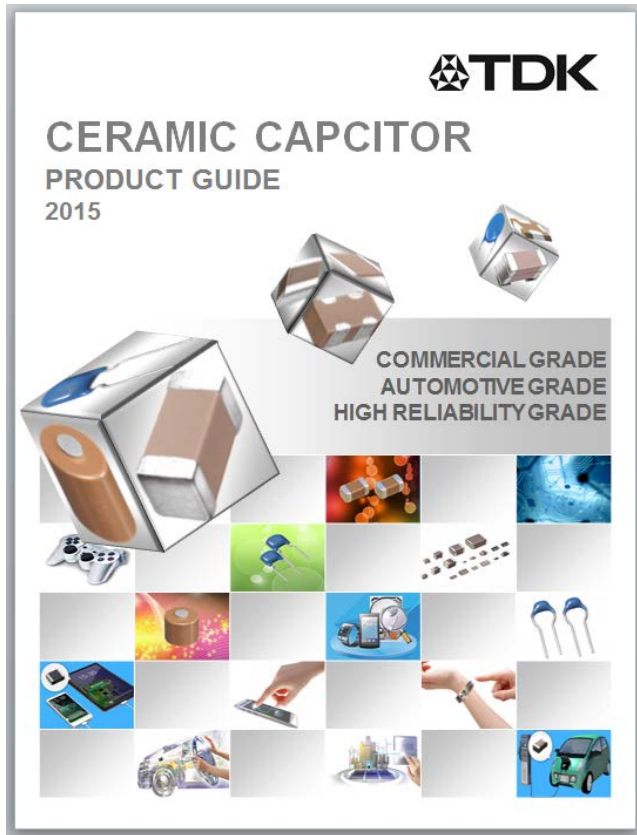


Product Line Summary

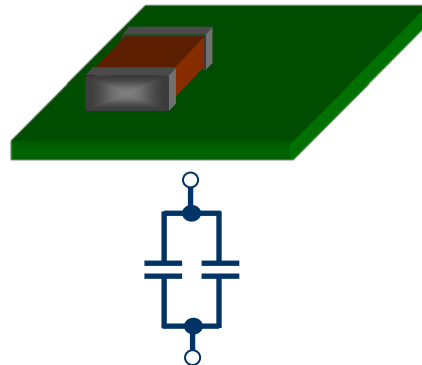
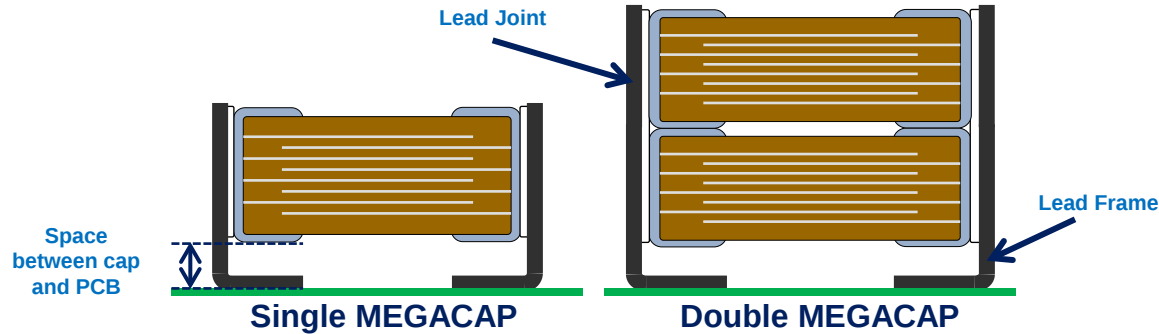


TDK offers 18 Ceramic Capacitor Families

PRODUCT LINE SUMMARY			TDK
	COMMERCIAL GRADE	AUTOMOTIVE GRADE	HIGH RELIABILITY
Features		Characteristics	
GENERAL VOLTAGE - TDK's proprietary internal electrode structure - Wide capacitance range up to 100µF - Available voltage rating of 4V to 50V - Superior mechanical strength and reliability - Low ESR characteristics - Easy mounting	MID VOLTAGE - Advanced dielectric - Wide capacitance - Higher voltage rating - Voltage rating of - High mechanical - Excellent DC bias	HIGH VOLTAGE - Up to 5000V rating - Wide case size of - Improved with - Low ESR at high - Low dielectric co - Complies with	HIGH TEMP. - Stable temperature 150°C - Highly precise (±7.5%) up to 125 - Available in both
MEGACAP TYPE [CKG Series] - Twice the capacitance - Lower ESR and - Capable of absor - Improved heat g - Improved vibrati	SOFT TERM. - Improved board t - resistance, therm - properties - Conductive resin - solder joint parts - RoHS, VEE, and	OPEN MODE - Increase resistanc - temperature cycle - Wider distance b - electrode and the - Reduces the risk - XTR and XTR tem	2in1 / 4in1 ARRAY [CKC Series] - Available as 2-in - Reduced PCB sp - Unique electrode 2-in-1 design also
LOW PROFILE [CGB Series] - Available in three - thin as 0.2mm - Capacitance offer - ideal for height-re - phone and DGA U	ULTRA HIGH VOLTAGE [UHV, FHV Series] - Available for power circuit breakers, distribution lines, and high voltage power supply applications - Voltage rating up to 50kV DC and 25kV AC - Excellent withstanding voltage rating with up to 1.5kVrms with no breakdown (60s, in oil)		
REVERSED GEOMETRY - Flipped geometry provides low inductance (less than 400 pH) - allows adequate high frequency current to IC - Provides stabilization of power line voltage - High frequency noise suppression		3-Terminal Filter [YFF Series] - Small and high-performance EMC components - Good attenuation characteristic in high frequency ranges - New available in Automotive grade	
ULTRA LOW INDUCTANCE [CLL Series] - Unique internal structure with inductance less than 150 pH - Ultra-low ESL is created by attenuating the flow of current so the magnetic fields cancel out - Contains no lead and supports lead-free soldering		CONDUCTIVE EPOXY - AgPdCu termination for conductive glue mounting - Reduce risk of silver migration - Improved mechanical/thermal strength when use with conductive glue - AEC Q-208 compliant - RoHS, VEE, and REACH compliant	
SERIAL DESIGN [CEU Series] - Improved bending resistance (Board Flex Resistance) - Improved temperature cycle performance - allow space reduction on PCB - Ultra high reliability (series cap + soft termination) - RoHS, VEE, and REACH compliant		ESD PROTECTION - Compliant with the IEC 61000-4-2 standard for ESD immunity - Available with COG and NPQ thermal characteristics - Stable capacitance values regardless of DC bias, temperature or aging effects - Qualified to AEC-Q200	
RADIAL LEAD TYPE [FK Series] - Provides large electrostatic capacity - High level of reliability under specified conditions - Small residual inductance - Provides good frequency characteristics - Leads are formed with a "kink" to achieve consistent insertion heights for improved solderability		LEADED DISC TYPE [CGCK, CGDC Series] - TDK proprietary material provide low dissipation factor - Compatible with halogen-free external resin coating - Flame-resistant, reinforced outer insulation prevents fire, electrical shock, and other potential hazards - X1F2 Insulation Sub Class for "Line to Ground" and "across the Line" Applications	
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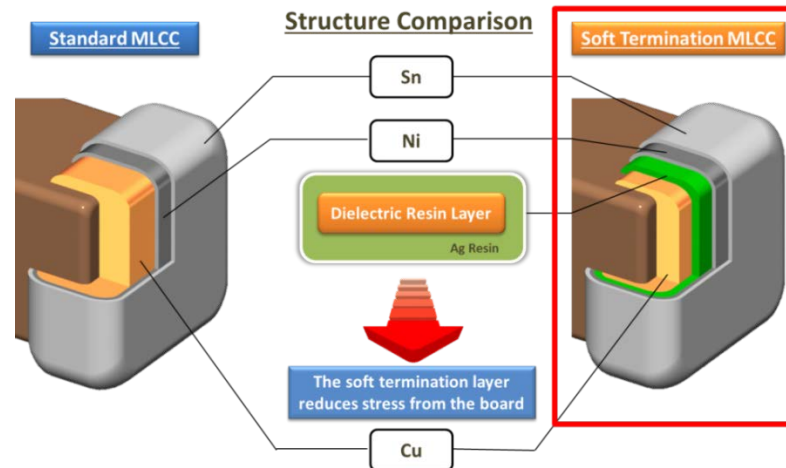
MEGACAP Type

- ❏ The added lead frame in MEGACAPs allow capacitors to be stacked on top of each other and be elevated from the board

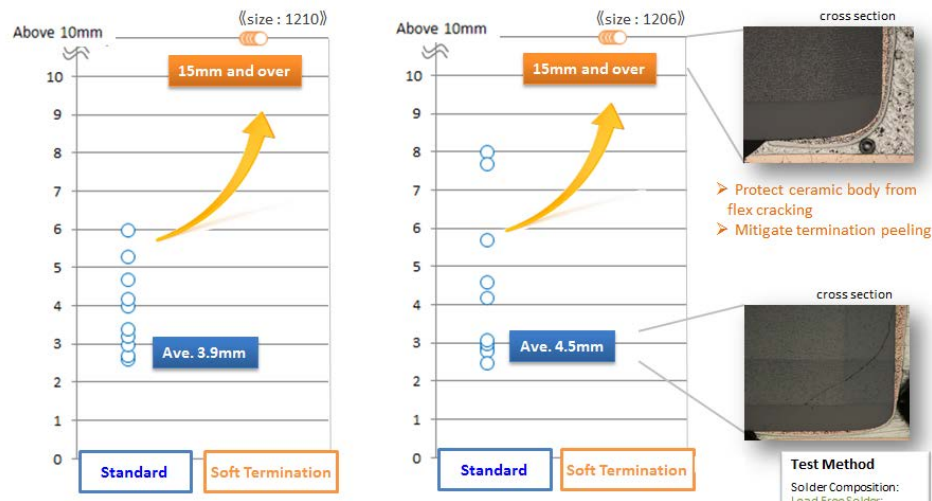


Soft Termination

- The added resin layer absorbs bending stress to protect the ceramic from cracking

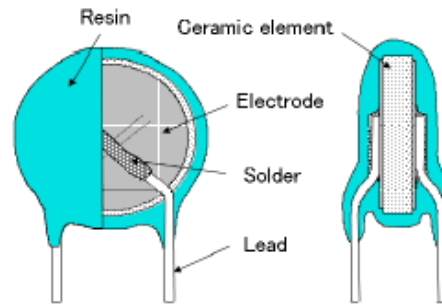


- Bending strength greatly increases due to soft termination



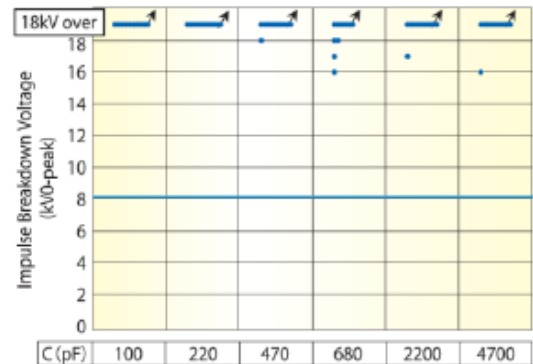
Leaded Disc Type

- Flame-resistant reinforced outer insulation prevents fires and electrical shock



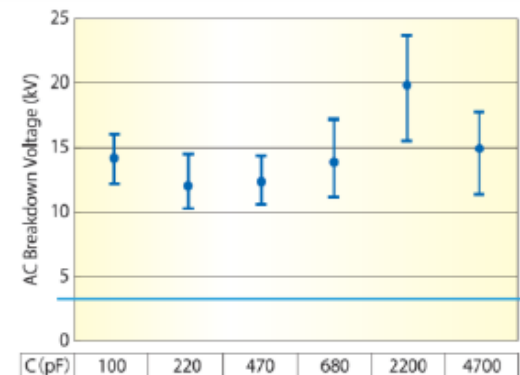
- High voltage series with higher reliability due to copper electrode material

Impulse Withstanding Voltage Characteristics



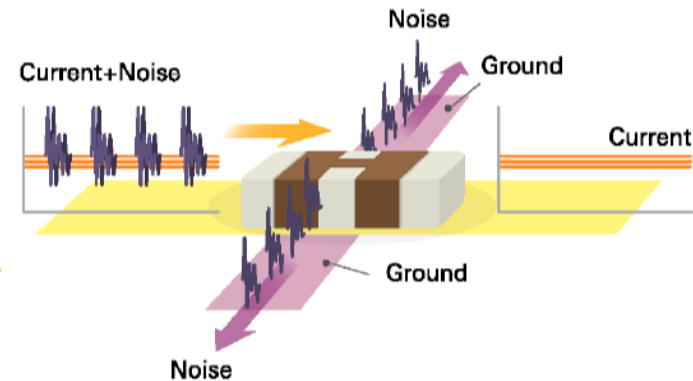
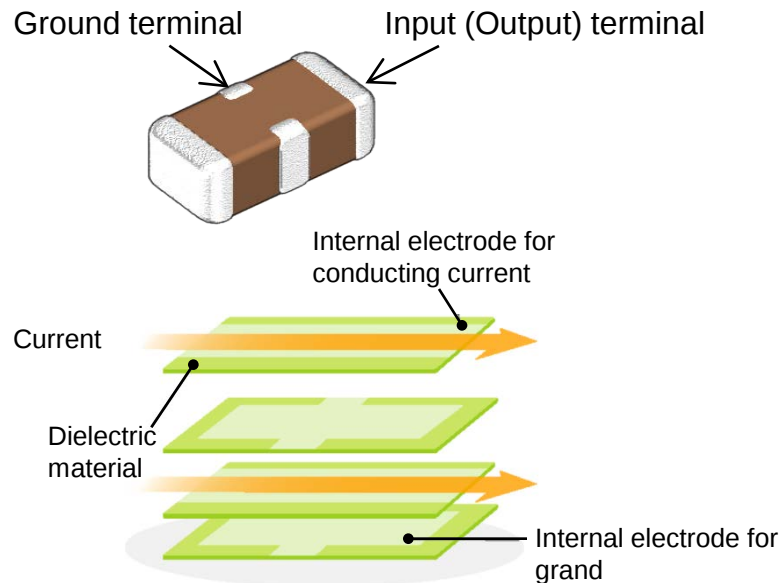
High impulse voltage characteristics based on International Standard IEC60384-14; Impulse test (8kV)

Withstanding Voltage Characteristics



Withstanding Voltage: 4kVAC/60s, High breakdown voltage level

3-Terminal Filters



- YFF series are constructed with 3 terminals and alternating ground and conductive layers.
- This structure makes the distance from chip to ground shorter and reduces the ESL.



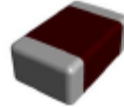
NOISE SUPPRESSION

Ferrite Multi-layer

TDK Series

MLP series

Light-load, Buck



Solid magnetic shielding
Better efficiency at Light load DC-DC converters

Suitable apps:

WiFi / Blue Tooth , GPS, Camera module, etc.

Ferrite Wire-wound

TDK Series

VLS-E series

VLS-CX Series

VLF-M series

Mid-load, Boost / Buck



Generic use in the current design
Wide variety (case size, height, material, etc..)

Suitable apps:

Single core AP, Baseband, Memory, PA, etc.



High performance w/ Hi-inductance
Better efficiency for Boost converter

Suitable apps:

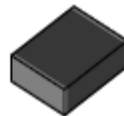
LCD / LED / AMOLED backlight, driver, Flash, etc.

Metal Thin-film

TDK Series

TFM series

Heavy-load, Buck



Higher saturation w/ better magnetic density
Better efficiency at Heavy load

Suitable apps:

Dual(Quad) core AP, High speed BB, LTE, etc.

Metal Wire Wound

VLS-HBX Series

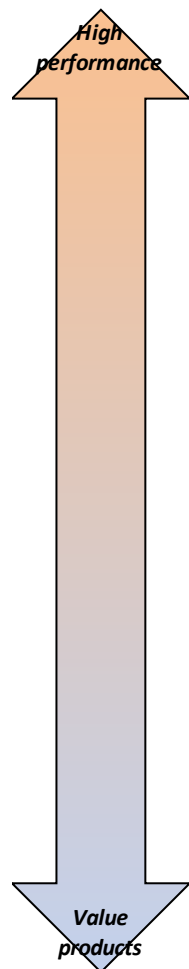


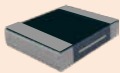
Heavy Load, Buck

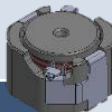
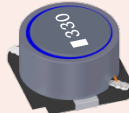
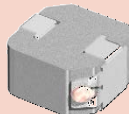
Metal core material for high saturation current
Wirewound provides good Rdc. Shielded.

Dual (Quad) core AP, High speed BB, LTE, etc.

TDK Power Form Factor PUI Product Line up



	Material	Process	Products Height (Max)	Case Size	TDK P#	Inductance Range	Rated Current (IDC1)
TFM-GHM-TAA 	Metal	Thin-Film	1.0	2520(1008)	TFM252010GHM-****TAA	0.33uH~2.2uH	5.4A~3.5A
				2016(0806)	TFM201610GHM-****TAA	0.24uH~2.2uH	5.5A~2.6A
VLS-HBX-1 	Metal	Wire Wound	1.2	2520(1008)	VLS252012HBX-****-1	0.24uH~10.0uH	4.25A~0.85A
				2016(0806)	VLS201612HBX-****-1	0.24uH~10.0uH	4.25A~0.67A
			1.0	2520(1008)	VLS252010HBX-****-1	0.24uH~10.0uH	3.91A~0.68A
				2016(0806)	VLS201610HBX-****-1	0.24uH~10.0uH	3.74A~0.61A
VLS-CX 	Ferrite	Wire Wound	1.2	2520(1008)	VLS252012CX-***	1.0uH~22uH	2.38A~0.54A
				2016(0806)	VLS201612CX-****	1.0uH~22uH	1.87~0.40A
			1.0	2520(1008)	VLS252010CX-****	0.47uH~22uH	3.08A~0.45A
				2016(0806)	VLS201610CX-****	0.24uH~22uH	3.08A~0.38A
MLP 	Ferrite	Multilayer	1.0	2520(1008)	MLP2520W****	0.47uH~4.7uH	3.1A~0.5A
				2016(0806)	MLP2016W***	0.24uH~0.47uH	3.6A~2.6A
			1.2	2520(1008)	MLP2520H/V****S	1.0uH~4.7uH	2.5A~0.35A
				2520(1008)	MLP2520H/V****M	0.47uH~4.7uH	3.4A~0.3A
			1.0	2016(0806)	MLP2016H/V****M	0.47uH~4.7uH	2.4A~0.2A
				2012(0805)	MLP2012H/V****M	0.47uH~4.7uH	1.7A~0.2A

Core Material	Shield	Current Products	Platform Process Products																																				
Ferrite	Half	VLC series VLC5045 type VLC6045 type 	VLS-EX series VLS5045EX VLS6045EX 																																				
		VLP series VLP5045 type VLP6045 type VLP4040 type 																																					
	Full	VLCF series VLCF40** type VLCF50** type 	CLF series  <table><thead><tr><th></th><th>Sample</th><th>MP</th></tr></thead><tbody><tr><td>CLF3020NIT</td><td>2015.4Q</td><td>2016.2Q</td></tr><tr><td>CLF4020NIT</td><td>2015.4Q</td><td>2016.2Q</td></tr><tr><td>CLF5030NIT</td><td>2015.3Q</td><td>2016.1Q</td></tr><tr><td>CLF6030NIT</td><td>2015.3Q</td><td>2016.1Q</td></tr><tr><td>CLF6045NIT</td><td>AVAILABLE</td><td>2015.3Q</td></tr><tr><td>CLF7030NIT</td><td>2015.3Q</td><td>2016.1Q</td></tr><tr><td>CLF7045NIT</td><td>AVAILABLE</td><td>2015.3Q</td></tr><tr><td>CLF10040NIT</td><td>2015.3Q</td><td>2016.1Q</td></tr><tr><td>CLF10060NIT</td><td>2015.3Q</td><td>2016.1Q</td></tr><tr><td>CLF12555NIT</td><td>2015.3Q</td><td>2016.1Q</td></tr><tr><td>CLF12577NIT</td><td>2015.3Q</td><td>2016.1Q</td></tr></tbody></table>		Sample	MP	CLF3020NIT	2015.4Q	2016.2Q	CLF4020NIT	2015.4Q	2016.2Q	CLF5030NIT	2015.3Q	2016.1Q	CLF6030NIT	2015.3Q	2016.1Q	CLF6045NIT	AVAILABLE	2015.3Q	CLF7030NIT	2015.3Q	2016.1Q	CLF7045NIT	AVAILABLE	2015.3Q	CLF10040NIT	2015.3Q	2016.1Q	CLF10060NIT	2015.3Q	2016.1Q	CLF12555NIT	2015.3Q	2016.1Q	CLF12577NIT	2015.3Q	2016.1Q
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VLF series VLF100** type VLF120** type 																																							
RLF series RLF70** type RLF101** type RLF125** type 																																							
Metal		SPM series SPM3010/3012/3015/3020 SPM4010/4012/4015/4020 SPM5020/30 SPM6530/6550 	SPM Series SPM3010 ~ SPM17xx 