

⊕ Ceramic Capacitors

Up to 8 kV



HIGH VOLTAGE
SMD CAPACITORS

COG (NPO) and X7R Dielectrics



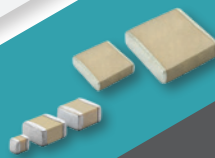
SMD SAFETY-CERTIFIED
CAPACITORS

High Voltage Up to 50 kV_{DC}



715C

Up to 7.2 kV



HIFREQ

X1 / Y1 and X1 / Y2,
Up to 20 nF, for
Industrial Applications



VY1, VY1 COMPACT,
VY2, SMD Y1, AND 440L

AEC-Q200 Qualified



GA...31G, GA...34G,
GA...31M, GA...EDG,
VJ...X1A, VJ...X2A

X1 / Y1 and X1 / Y2,
Automotive Grade,
AEC-Q200 Qualified



AY1 AND AY2

Leaded High Voltage
10 kV, 15 kV, and 20 kV












HVCC









CERAMIC CAPACITORS

Focus Products




Ceramic Safety Capacitors

Series	Voltage		Capacitance	Tolerance	Temperature Characteristics
	Y Rating	X Rating			
 SMDY1 Series EMI suppression safety capacitor; class X1: 760 V _{AC} ; class Y1: 500 V _{AC} ; SMD component reflow solderable	500 V _{AC}	760 V _{AC}	470 pF to 4.7 nF	± 20 %	Y5U
 YY1 Series EMI Suppression safety capacitor; class X1: 760 V _{AC} ; class Y1: 500 V _{AC} ; this series includes mini sized VY1...Y5V	500 V _{AC}	760 V _{AC}	10 pF to 4.7 nF	± 10 % / ± 20 %	U2J / Y5S / Y5U / Y5V
 YY1 Compact Series EMI Suppression safety capacitor; compact size and high pulse strength; class X1: 760 V _{AC} ; class Y1: 500 V _{AC}	500 V _{AC}	760 V _{AC}	470 pF to 4.7 nF	± 20 %	Y5U
 VY2 Series EMI Suppression safety capacitor; class X1: 440 V _{AC} ; class Y2: 300 V _{AC} ; this series includes mini sized VY2...Y5V	300 V _{AC}	440 V _{AC}	10 pF to 10 nF	± 10 % / ± 20 %	U2J / Y5S / Y5U / Y5V
 AY1 Series EMI Suppression safety capacitor for automotive applications; class X1: 760 V _{AC} ; class Y1: 500 V _{AC}	500 V _{AC}	760 V _{AC}	470 pF to 4.7 nF	± 20 %	Y5U
 AY2 Series EMI Suppression safety capacitor for automotive applications; class X1: 440 V _{AC} ; class Y2: 300 V _{AC}	300 V _{AC}	440 V _{AC}	10 pF to 10 nF	± 10 % / ± 20 %	U2J / Y5S / Y5U / Y5V
 WKP Series EMI Suppression safety capacitor; class X1: 760 V _{AC} ; class Y1: 500 V _{AC}	500 V _{AC}	760 V _{AC}	33 pF to 4.7 nF	± 10 % / ± 20 %	U2J / Y5S / Y5T / Y5U
 WYO Series EMI Suppression safety capacitor; class X1: 440 V _{AC} ; class Y2: 250 V _{AC}	250 V _{AC}	440 V _{AC}	1.0 nF to 12 nF	± 20 %	Y5U
 440L Series EMI Suppression safety capacitor; class X1: 760 V _{AC} ; class Y1: 500 V _{AC}	500 V _{AC}	760 V _{AC}	10 pF to 20 nF	± 10 % / ± 20 %	C0G / U2J / P3K / R3L / X7R / Y5U



High Voltage Ceramic Capacitors

Series	Voltage	Capacitance	Tolerance	Temperature Characteristics	Dissipation Factor	Terminal
 715C Series (Class 1, Class 2) High voltage class 1 and class 2 ceramic DC disc capacitors; screw terminal mounting; 15 kV _{DC} to 50 kV _{DC}	10 kV _{DC} to 50 kV _{DC}	100 pF to 20 nF	± 20 % / +80 %, -20 %	N4700 / Y5U	0.2 % (class 1) / 2.0 % (class 2)	Screw
 HPD Series High voltage disc capacitors; 20 kV _{DC} ; screw mounting; class 2 ceramic	20 kV _{DC}	350 pF to 5.0 nF	± 20 %	Z5U	0.5 %	Screw
 660R Series High voltage ceramic DC disc capacitors with axial leads; 10 kV _{DC} to 30 kV _{DC}	10 kV _{DC} to 30 kV _{DC}	100 pF to 10 nF	± 20 % / +80 %, -20 %	N4700 / X7R / Z5U	0.2 % (class 1) / 2.0 % (class 2)	Axial leaded
 HVCC Series High voltage ceramic DC disc capacitors with radial leads; 10 kV _{DC} to 20 kV _{DC}	10 kV _{DC} to 20 kV _{DC}	100 pF to 2.0 nF	± 10 % / ± 20 %	Y6P	< 1.5 %	Radial leaded
 615R Series High voltage ceramic DC disc capacitors with radial leads; 10 kV _{DC} to 20 kV _{DC}	10 kV _{DC} to 20 kV _{DC}	100 pF to 3.3 nF	± 20 % / +80 %, -20 %	T3M / X5F / Y5R / Y5U / Z5U	0.2 % (class 1) / 2.0 % (class 2)	Radial leaded
 HIK Series High voltage ceramic single layer DC disc capacitors; class 2; low loss (0.5 %); 15 kV _{DC}	15 kV _{DC}	100 pF to 1.5 nF	± 20 %	Y5T	0.5 %	Radial leaded

Leaded MLCCs for Automotive Applications

Series	Voltage	Capacitance	Tolerance	Temperature Characteristics	Terminal
 A...P Series Axial leaded multilayer ceramic capacitors for automotive applications; class 1 and class 2; 50 V _{DC} , 100 V _{DC} , 200 V _{DC} ; 160 °C	50 V _{DC} to 200 V _{DC}	100 pF to 1.0 μF	± 5 % / ± 10 % / ± 20 %	C0G / X7R	Axial leaded
 K...G Series Radial leaded multilayer ceramic capacitors for automotive applications; class 1 and class 2; 50 V _{DC} , 100 V _{DC} , 200 V _{DC} ; 160 °C	50 V _{DC} to 200 V _{DC}	100 pF to 1.0 μF	± 5 % / ± 10 % / ± 20 %	C0G / X7R	Radial leaded
 K...H Series Radial leaded multilayer ceramic capacitors for automotive applications; class 1 and class 2; 50 V _{DC} , 100 V _{DC} , 200 V _{DC} ; 175 °C; 200 °C for max. 500 h	50 V _{DC} to 200 V _{DC}	100 pF to 1.0 μF	± 5 % / ± 10 % / ± 20 %	C0G / X0U	Radial leaded

Ceramic SMD Capacitors for General Applications

Series	Capacitance	Voltage	Sizes	Dielectric	Process
 VJ Commercial Series Excellent ESD performance; robust design due to wet build process; polymer (flexible) termination available	1 pF to 6.8 μF	16 V to 1000 V	0402, 0603, 0805, 1206, 1210, 1808, 1812, 1825, 2220, 2225, 3640	C0G (NP0), X7R	Wet build, noble metal electrode
 VJ...W1BC Basic Commodity High capacitance values; ultra small 0201 size	0.5 pF to 100 μF	10 V to 100 V	0201, 0402, 0603, 0805, 1206, 1210	C0G (NP0), X5R, X7R, Y5V	Dry sheet, base metal electrode



CERAMIC CAPACITORS

Focus Products

Ceramic SMD Capacitors for Special Applications

Series	Capacitance	Voltage	Sizes	Dielectric	Process	
GA...31G, GA...34G Automotive Series	1 pF to 1 μF	16 V to 3000 V	0402, 0603, 0805, 1206, 1210, 1812	COG (NP0), X7R, X8R	<ul style="list-style-type: none"> Wet build Noble metal electrode 	
Ag / Pd termination for epoxy bonding; polymer (flexible) termination available; robust design due to wet build process						
GA...31G Automotive Extended Bending MLCC	100 pF to 470 nF	16 V to 630 V	0603, 0805, 1206, 1210	COG (NP0), X7R		
Flexible termination with typically more than 5 mm bending; robust design due to wet build process						
GA...31M / GA...34G HIFREQ Automotive Series	0.1 pF to 5.1 nF	25 V to 1500 V	0402, 0603, 0805, 0505, 1111, 1206	Q: > 2000 (at 1 MHz)		
Highest Q factor; HIFREQ dielectric (D) with TCC characteristic of COG (NP0); Vishay Green						
GA...EDG Automotive ESD MLCC	1 nF to 1 μF	25 V to 200 V	0603, 0805, 1206	COG (NP0), X7R		
Excellent ESD performance; robust design due to wet build process						
VJ...X1A and VJ...X2A Automotive Safety Certified Capacitors	10 pF to 12 nF	250 V _{AC}	2008, 2220	COG (NP0), X7R		
Acc. AEC-Q200; VDE; CSA; cCSAus; X1 / Y2 and X2 class; IEC 60384-14; CAN / CSA - E60384-14:09; ANSI / UL 60384-14-2009						
VJ X8R	330 pF to 220 nF	25 V to 100 V	0402, 0603, 0805, 1206, 1210	X8R		
High temperature dielectric with TCC of ± 15 % up to +150 °C						
VJ BX Series	510 pF to 100 nF	50 V	0505, 1111	BX		
Low equivalent series resistance, TCC of ± 15 % , -25 % from -55 °C to +125 °C with 100 % rated V _{DC} applied						
VJ...32 Lead Baring Termination Series	1 pF to 1μF	16 V to 630 V	0402, 0603, 0805, 1206, 1210	COG (NP0), X7R		
Tin / lead (Pb) termination finish min. 4 % lead; AEC-Q200 qualified; tin whisker mitigation, low orbit satellite applications						
Non-magnetic Series for IR Reflow Soldering	1 pF to 6.8 nF	6.3 V to 3000 V	0402, 0603, 0805, 1206, 1210, 1808, 1812, 1825, 2220, 2225, 3640, 0505, 1111, 2525, 3838	COG (NP0), X5R, X7R		
Non-magnetic safety screened; copper barrier termination; also see HIFREQ series						

Ceramic SMD Capacitors for Military and High Reliability Applications

Series	Capacitance	Voltage	Sizes	Dielectric	Process	
Hi-Rel Series	1 pF to 6.8 μF	6.3 V to 600 V	0402, 0603, 0805, 1206, 1210, 1808, 1812, 1825, 2220, 2225, 3640	COG (NP0), X5R, X7R	<ul style="list-style-type: none"> Wet build Noble metal electrode 	
MIL-PRF-55681 group testing (A only, full A and C); several life test and voltage conditioning options; customer-specific requirements						
CDR	1 pF to 470 nF	6.3 V to 100 V	CDR01 (0805), CDR02 (1805), CDR03 (1808), CDR04 (1812), CDR06 (2225), CDR31 (0805), CDR32 (1206), CDR33 (1210), CDR34 (1812), CDR35 (1825), CDR36 (0603), CDR37 (0402)	BP, BR, BX		
Several failure rate options; high reliability tested per MIL-PRF-55681; cage code 2770A						
DSCC 03028 / 03029 / 05006 / 05007	1 pF to 470 nF	6.3 V to 200 V	0402, 0603, 0805, 1206	BP, BR, BX		
Full group "C"; several life test and voltage conditioning options; cage code 2770A						
DSCC 05001 / 05002 / 05003	1 pF to 100 pF	50 V to 250 V	0402, 0603, 0805	High Q		
High Q for high frequency operation with full group "C"; several life test and voltage conditioning options; CAGE CODE 2770A						
MIL-PRF-123	1 pF to 470 nF	50 V to 100 V	CKS51 (0805), CKS55 (1206), CKS52 (1210), CKS53 (1808), CKS56 (1812), CKS57 (1825), CKS54 (2225)	BP, BX		
Space-level reliability tested per MIL-PRF-123; nickel barrier with tin / lead (pb) finish for solder assembly; silver palladium for conductive epoxy assembly						

RF - High Frequency SMD Capacitors

Series	Capacitance	Voltage	Sizes	Dielectric / DF	Process
HIFREQ Series	1.8 nF to 12 nF	25 V to 7200 V	0402, 0603, 0805, 0505, 1111, 2525, 3838	Q: > 2000 (at 1 MHz)	<ul style="list-style-type: none"> Wet build Noble metal electrode
Highest Q factor; Vishay Green available; terminations for soldering: Ni barrier with 100 % matte tin (Sn) or tin / lead (SnPb), non-magnetic Cu barrier with Sn; for conductive attach: AgPd					
Hi Temperature HT Series	0.1 pF to 3.3 nF	25 V to 500 V	0402, 0603, 0805, 0505, 1111	Q: > 2000 (at 1 MHz)	
Operating temperature up to 200 °C (first in industry)					
VJ...W1BC High Q	0.5 pF to 3.3 nF	16 V to 100 V	0402, 0603	Q: > 1000	<ul style="list-style-type: none"> Dry sheet
High Q; stable dielectric					
VJ...W1BC Ultra High Q / Low ESR	0.1 pF to 100 pF	10 V to 250 V	0201, 0402, 0603, 0805	Q: > 1400	
High Q; low ESR; stable dielectric; ultra small 0201 size; BME electrode system					

High Voltage and Safety-Certified Ceramic SMD Capacitors

Series	Capacitance	Voltage	Sizes	Dielectric	Process
HVArc Guard® Series	10 pF to 270 nF	250 V to 2500 V	0805, 1206, 1210, 1808, 1812, 2220, 2225	COG (NP0), X7R	
Prevents arcing over; polymer (flexible) termination available for X7R					
Open Mode Design Series	10 pF to 1.8 μF	16 V to 3000 V	0805, 1206, 1210, 1808, 1812, 1825, 2220, 2225	COG (NP0), X7R	<ul style="list-style-type: none"> Wet build Noble metal electrode
Reduces risk of short circuit due to bending crack; polymer (flexible) termination available					
Safety-Certified Capacitors COG(NP0), X7R	10 pF to 12 nF	250 V _{AC}	2008, 2220	COG (NP0), X7R	
VDE; CSA; cCSAus; X1 / Y2 and X2 class; IEC 60384-14; CAN / CSA - E60384-14:14, ANSI / UL 60384-14-2014					
Source Energy Capacitor	4.7 nF to 560 nF	1000 V, 1500 V	1812, 1825, 2225, 3040, 3640, 4044	X7R (Y5P)	
Low electrostrictive ceramic for charge and discharge cycles					
HV High Voltage Series	10 pF to 560 nF	500 V to 8000 V	1206, 1210, 1808, 1812, 1825, 2220, 2225, 3040, 3640, 4044	COG (NP0), X7R	
High reliability serial design; low electrostrictive ceramic for charge and discharge cycles					



Wide Range of **Ceramic Capacitors** (SMD and Leaded) With **Stable Characteristics** for Various Applications

Advantages of Vishay Ceramic Capacitors

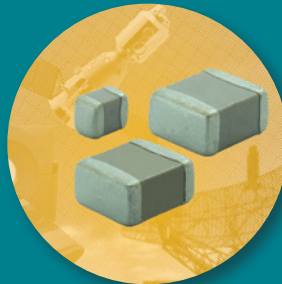
- Wide range of sizes and voltages
- Several termination options
- Robust and reliable design with high stability
- Customized options available

For the Following **Applications**

- High voltage generation and AC mains filtering
- High frequency and high voltage / power
- High reliability, medical, military, and space
- Automotive



Go Vishay Green with our halogen-free, AEC-Q200 approved AY1 and AY2 safety capacitors for AC line filtering in onboard chargers



Vishay's HIFREQ series MLCCs offer high voltages and high Q for RF applications

Useful Links

- Ceramic MLCC SMD Capacitors Gateway Page www.vishay.com/capacitors/ceramic/ceramic-multilayer-smd/
- Ceramic Singlelayer Capacitors Gateway Page www.vishay.com/capacitors/ceramic/ceramic-singlelayer/
- Ceramic Leaded MLCC Capacitors Gateway Page www.vishay.com/capacitors/ceramic/ceramic-multilayer-leaded/

ISO 9001 / IATF 16949 / OHSAS 18001 / ISO 14001
ISO 13485:2003
IEC 60384-14, CAN/CSA-E60384-14, ANSI/UL 60384-14
AEC-Q200 Qualified and MIL-PRF-55681 (CAGE CODE 2770A)
See specific datasheets if applicable

**HALOGEN
FREE**

The DNA of tech.™