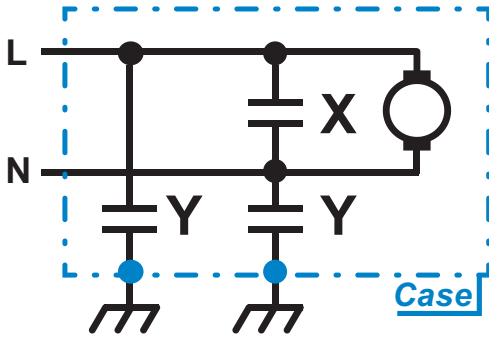


EMI SAFETY CAPACITOR SOLUTIONS

Safety Capacitors

Film, Ceramic Disc and Multilayer EMI Suppression Capacitors

Typical Circuit

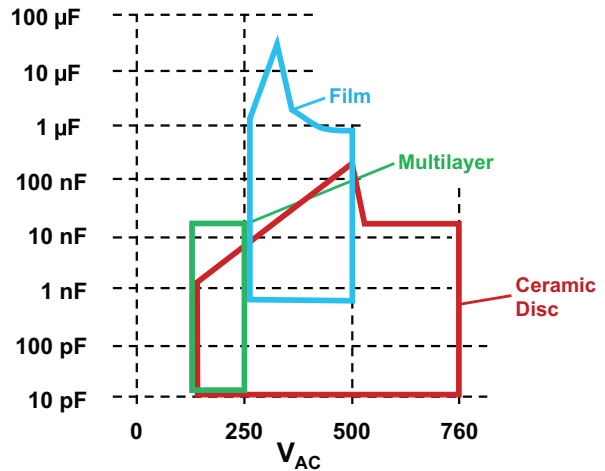


CLASS X

Differential Mode Filtering
Across the Line

Sub Class	Peak Impulse Voltage	Typical Application
X1	4.0 kV	High Pulse
X2	2.5 kV	General Purpose
X3	1.2 kV	General Purpose

Safety Capacitor Environment



CLASS Y

Common Mode Filtering
Line to Ground

Sub Class	Peak Impulse Voltage	Typical Application
Y1	8.0 kV	High Pulse
Y2	5.0 kV	General Purpose
Y3	Not pulse rated	General Purpose
Y4	2.5 kV	General Purpose

BENEFITS FROM VISHAY

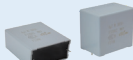




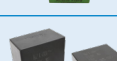
- All three capacitor technologies available from one source
- Wide product range
 - X2 from 10 pF up to 40 µF
- C0G (NP0) material available up to 1 nF nominal capacitance value in surface-mount capacitor
- Surface-mount product meets IEC 60384-14 min. 4 mm creepage at 1 nF in X1 / Y2 with COG (NP0)
- Y1 leaded ceramic up to 10 kV pulse strength guaranteed
- AEC-Q200 qualification available
 - F339X2 AEC-Q200 qualified
 - F340Y2 AEC-Q200 qualified
 - F340X1 AEC-Q200 qualified
 - F339X1 480 V_{AC} AEC-Q200 qualified
 - AY2 leaded ceramic 3000 temp cycles from -55 °C to +125 °C
- Vishay RFI X and Y Film Capacitors are available with THB Grades up to Grade IIIB Certified
- 85°C/ 85% RH/ 1000h/UNAC
- VY1*C withstands THB testing: 85 °C / 85 % RH / 500 V_{AC} / 1000 h












EMI SAFETY CAPACITOR SOLUTIONS

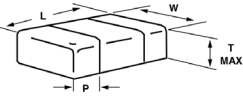
Safety Capacitors

The DNA of tech.®

RFI X and Y Film Capacitors							
Series	Rated AC Voltage (V)	Capacitance Min. (µF)	Capacitance Max. (µF)	Rated Temperature (°C)	Construction	Agency Approvals	Pitch
 F339X2 305 V_{AC}	305	0.1	4.7	105	Mono	IEC / EN / UL / CSA / CQC	15 mm to 27.5 mm
THB Vishay Automotive Grade X2 class capacitor; AEC-Q200 qualified; IEC 60384-14: 2013 / AMD1: 2016 Grade IIB; 85 °C, 85 % RH, 500 h at U _{RAC} ; compliant with 85 °C, 85 % RH, 1000 h at 240 V _{AC}							
 F340X2 305 V_{AC}	305	1	20	105	Mono	IEC / EN / UL / CSA / CQC	27.5 mm to 52.5 mm
THB interference suppression film capacitor class X2; IEC 60384-14: 2013 / AMD1: 2016 Grade IIB; 85 °C, 85 % RH, 1000 h at U _{RAC}							
 F340Y2 305 V_{AC}	305	0.001	1	105	Series	IEC / EN / UL / CSA / CQC	7.5 mm to 37.5 mm
THB Vishay Automotive Grade Y2 class capacitor; AEC-Q200 qualified; IEC 60384-14: 2013 / AMD1: 2016 Grade IIB; 85 °C, 85 % RH, 1000 h at U _{RAC} . Maximum permissible temperature 125 °C for limited time							
 F340X1 480 V_{AC}	480	0.22	8.2	105	Series	IEC / EN / UL / CSA / CQC	27.5 mm to 52.5 mm
THB interference suppression film capacitor class X1; Vishay Automotive Grade; AEC-Q200 qualified, IEC 60384-14: 2013 / AMD1: 2016 Grade IIB; 85 °C, 85 % RH, 1000 h at U _{RAC} ; maximum applicable AC voltage is 530 V _{AC}							
 F1773X2	253	0.01	2.2	100	Series	IEC / EN / UL / CSA	
Axial X2 capacitor for low building height applications							
 F339X1 480 V_{AC}	480	1	1	105	Series	IEC / EN / UL / CSA	10 mm to 27.5 mm
THB interference suppression film capacitor class X1; Vishay Automotive Grade; AEC-Q200 qualified for 15 mm to 22.5 mm pitch, THB 85 °C, 85 % RH, 500 h at 400 V							

Ceramic Safety Capacitors					
Series	Voltage		Capacitance	Tolerance	Temperature Characteristics
	Y Rating	X Rating			
 YY1 Series	500 V _{AC}	760 V _{AC}	10 pF to 4.7 nF	± 10 % / ± 20 %	U2J / Y5S / Y5U / Y5V
AC-line rated ceramic disc capacitors; class X1: 760 V _{AC} ; class Y1: 500 V _{AC} ; this series includes mini sized YY1...Y5V					
 YY1 Compact Series	500 V _{AC}	760 V _{AC}	470 pF to 4.7 nF	± 20 %	Y5U
Compact size and high pulse strength; AC-line rated ceramic disc capacitors; class X1: 760 V _{AC} ; class Y1: 500 V _{AC}					
 YY2 Series	300 V _{AC}	440 V _{AC}	10 pF to 10 nF	± 10 % / ± 20 %	U2J / Y5S / Y5U / Y5V
AC-line rated ceramic disc capacitors; class X1: 440 V _{AC} ; class Y2: 300 V _{AC} ; this series includes mini sized YY2...Y5V					
 AY1 Series	500 V _{AC}	760 V _{AC}	470 pF to 4.7 nF	± 20 %	Y5U
AC-line rated ceramic disc capacitors for automotive applications; class X1: 760 V _{AC} ; class Y1: 500 V _{AC}					
 AY2 Series	300 V _{AC}	440 V _{AC}	10 pF to 10 nF	± 10 % / ± 20 %	U2J / Y5S / Y5U
AC-line rated ceramic disc capacitors for automotive applications; class X1: 440 V _{AC} ; class Y2: 300 V _{AC}					
 WKP Series	500 V _{AC}	760 V _{AC}	33 pF to 4.7 nF	± 10 % / ± 20 %	U2J / Y5S / Y5T / Y5U
AC-line rated ceramic disc capacitors; class X1: 760 V _{AC} ; class Y1: 500 V _{AC}					
 WYO Series	250 V _{AC}	440 V _{AC}	1.0 nF to 12 nF	± 20 %	Y5U
AC-line rated ceramic disc capacitors; class X1: 440 V _{AC} ; class Y2: 300 V _{AC}					
 440L Series	500 V _{AC}	760 V _{AC}	10 pF to 20 nF	± 10 % / ± 20 %	C0G / U2J / P3K / R3L
AC-line rated ceramic disc capacitors; class X1: 760 V _{AC} ; class Y1: 500 V _{AC}					
 SMDY1 Series	500 V _{AC}	760 V _{AC}	470 pF to 4.7 nF	± 20 %	Y5U
Safety capacitor for EMI/RFI suppression; class X1:760 V _{AC} ; class Y1: 500 V _{AC} ; 1500 VDC (IEC60384-14 Annex H); Humidity robustness grade IIB; MSL 2a					

Surface-Mount Ceramic Capacitors							
TCC	Rating	Rated AC Voltage	Body Size	Capacitance (pF)		Rated Temperature	Agency Approvals
				Min.	Max.		
C0G(NP0)	X1 / Y2	250	2008	10	220	-55 °C to +125 °C	IEC EN CAN/CSA cCSAus ANSI/UL
			2220	47	1000		
			2008	10	390		
X7R	X1 / Y2	250	2008	100	1000		
			2220	270	4700		
			2008	100	2700		
	X2		2220	270	12,000		

DIMENSIONS in inches (millimeters)							
	Body size	Length (L)	Width (W)	Maximum Thickness	Term. (P)		
					Min.	Max.	
	2008	0.200 ± 0.010 (5.08 ± 0.25)	0.080 ± 0.010 (2.03 ± 0.25)	0.086 (2.18)	0.010 (0.25)	0.030 (0.76)	
2220	0.220 ± 0.008 (5.59 ± 0.20)	0.200 ± 0.010 (5.08 ± 0.25)	0.086 (2.18)	0.010 (0.25)	0.030 (0.76)		