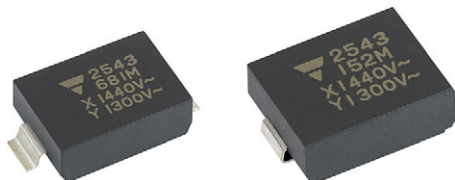




## EMI Suppression Safety Capacitor, Ceramic Disc, Class X1, 440 V<sub>AC</sub>, Class Y1, 300 V<sub>AC</sub>



### LINKS TO ADDITIONAL RESOURCES



QUICK REFERENCE DATA						
DESCRIPTION	VALUE					
Ceramic class	1		2			
Ceramic dielectric	U2J		Y5S		Y5U	
Voltage (V <sub>AC</sub> )	300	440	300	440	300	440
Min. capacitance (pF)	10					
Max. capacitance (pF)	1500					
Mounting	Surface-mount (reflow soldering)					

### OPERATING TEMPERATURE RANGE

-55 °C to +125 °C

### TEMPERATURE CHARACTERISTICS

U2J, Y5S, Y5U

### SECTIONAL SPECIFICATIONS

Climatic category (according to EN 60058-1)  
55 / 125 / 21

### MOLDING

According to UL 94 V-0  
Epoxy resin, isolating, flame retardant  
Halogen-free  
Reinforced insulation  
Moisture sensitivity level: MSL 2a

### APPROVALS

IEC 60384-14  
UL 60384-14  
CQC 60384-14

### FEATURES

- Complying with IEC 60384-14
- Singlelayer disc safety capacitors
- Mounting: surface-mount
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### APPLICATIONS

- X1, Y1 according to IEC 60384-14
- Line-to-line filtering (Class X)
- Line-to-ground filtering (Class Y)
- Primary and secondary coupling (SMPS)
- Industrial and consumer
- EMI / RFI suppression and filtering

### DESIGN

The capacitor consists of a ceramic disc which is copper / silver plated on both sides. Encapsulation is made of flame retardant epoxy resin in accordance with UL 94 V-0.

### CAPACITANCE RANGE

10 pF to 1500 pF

### RATED VOLTAGE U<sub>R</sub>

IEC 60384-14:  
(X1): 440 V<sub>AC</sub>, 50 Hz  
(Y1): 300 V<sub>AC</sub>, 50 Hz  
Annex H: 1500 V<sub>DC</sub>

### TEST VOLTAGE

Component test (100 %):  
4000 V<sub>AC</sub>, 50 Hz, 2 s  
Random sampling test (destructive test):  
4000 V<sub>AC</sub>, 50 Hz, 60 s  
Voltage proof of molding (destructive test):  
4000 V<sub>AC</sub>, 50 Hz, 60 s

### INSULATION RESISTANCE

≥ 10 000 MΩ

### CAPACITANCE TOLERANCE

± 10 % (code K)  
± 20 % (code M)

### DISSIPATION FACTOR

Class 1: max. 0.3 % (1 MHz)  
Class 2: max. 2.5 % (1 kHz)

DIMENSIONS in millimeters					
10 pF TO 680 pF			1000 pF TO 1500 pF		
CAPACITANCE	W	L	T	B	K
10 pF to 680 pF	6.6 ± 0.5	11.9 ± 0.5	4.0 max.	3.0 ± 0.25	9.0 ± 0.25
1000 pF to 1500 pF	8.6 ± 0.5	11.2 ± 0.5	4.0 max.	3.0 ± 0.25	10.2 ± 0.25

Note

- For soldering recommendation please see [www.vishay.com/doc?28572](http://www.vishay.com/doc?28572)

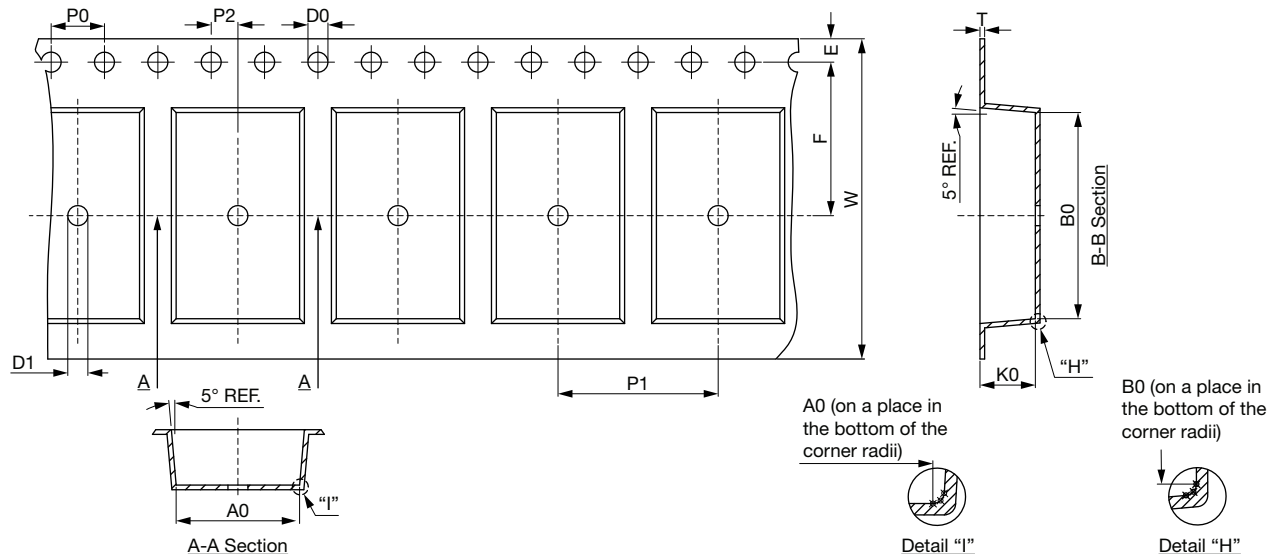
TECHNICAL DATA				
CAPACITANCE (pF)	TOLERANCE (%)	SIZE CODE	PART NUMBER	
			MISSING DIGITS SEE ORDERING CODE BELOW	
10	± 10	A	SMDY1100KU2JARS	
22		A	SMDY1220KU2JARS	
33		A	SMDY1330KU2JARS	
47		A	SMDY1470KY5SARS	
100		A	SMDY1101KY5SARS	
220		A	SMDY1221KY5SARS	
330	± 20	A	SMDY1331MY5UARS	
470		A	SMDY1471MY5UARS	
680		A	SMDY1681MY5UARS	
1000		B	SMDY1102MY5UBRS	
1500		B		
				SMDY1152MY5UBRS

ORDERING CODE							
Example	SMDY1	152	M	Y5U	B	R	S
	Series	Capacitance value	Tolerance code	Temperature coefficient	Size code	Packaging Tape and reel	Internal code



PACKAGING	
<b>CAPACITANCE</b>	<b>PACKAGING QUANTITIES (PCS)</b>
10 pF to 680 pF	1000
1000 pF to 1500 pF	1000

**CARRIER TAPE DIMENSIONS** in millimeters



CAPACITANCE	W	A0	B0	K0	P1	P0	P2	T	E	F	D0	D1	10P0
10 pF to 680 pF	24.00 ± 0.30	7.25 ± 0.10	12.55 ± 0.10	4.10 ± 0.10	12.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	0.35 ± 0.05	1.75 ± 0.10	11.5 ± 0.10	1.55 ± 0.05	1.5 min.	40 ± 0.20
1000 pF to 1500 pF	24.00 ± 0.30	9.25 ± 0.10	11.85 ± 0.10	4.10 ± 0.10	12.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	0.35 ± 0.05	1.75 ± 0.10	11.5 ± 0.10	1.55 ± 0.05	1.5 min.	40 ± 0.20

**APPROVALS**

IEC 60384-14 - Safety tests  
This approval together with CB test certificate substitutes all national approvals.

**CB Certificate** ([www.vishay.com/doc?22268](http://www.vishay.com/doc?22268))

Y1-capacitor: CB test certificate:	DE1-69482	10 pF to 1.5 nF	300 V <sub>AC</sub>
X1-capacitor: CB test certificate:	DE1-69482	10 pF to 1.5 nF	440 V <sub>AC</sub>



**VDE** ([www.vishay.com/doc?22269](http://www.vishay.com/doc?22269))

Y1-capacitor: VDE marks approval:	40059817	10 pF to 1.5 nF	300 V <sub>AC</sub>
X1-capacitor: VDE marks approval:	40059817	10 pF to 1.5 nF	440 V <sub>AC</sub>



DIN EN 60384-14 (VDE 0565-1-1):2014-04; EN 60384-14:2013-08  
DIN EN 60384-14/A1 (VDE 0565-1-1/A1):2017-04; EN 60384-14:2013/A1:2016

**Underwriters Laboratories Inc. / Canadian Standards Association** ([www.vishay.com/doc?22271](http://www.vishay.com/doc?22271))

Y1-capacitor: CSA test certificate:	2575309	10 pF to 1.5 nF	300 V <sub>AC</sub>
X1-capacitor: CSA test certificate:	2575309	10 pF to 1.5 nF	440 V <sub>AC</sub>



UL 60384-14, CSA E60384-1:14, CSA E60384-14:14

Fixed capacitors for electromagnetic interference suppression and connection to the supply mains.

**CQC** ([www.vishay.com/doc?22270](http://www.vishay.com/doc?22270))

Y1-capacitor: CQC test certificate:	CQC25001476496	10 pF to 1.5 nF	300 V <sub>AC</sub>
X1-capacitor: CQC test certificate:	CQC25001476496	10 pF to 1.5 nF	440 V <sub>AC</sub>





MARKING	
<p>YY: year, ΔΔ: week, XXX: capacitance value, t: tolerance code <sup>(1)</sup></p>	<p>PN: SMDY1102MY5UBRS Lot1: DC1: QTY: 1000 Lot2: DC2: PO: / Batch: Ser.No: SO: / Region: 9520 SL: MSL: 2a</p> <p>e3 Pb RoHS H/F MSL: 2a</p> <p>1/1</p>

**Note**

(1) Identify "XXX" and "t" by the ordering code

PERFORMANCE		
TEST	TEST CONDITION	TEST LIMITS
Visual and mechanical inspection	Optical inspection, dimensions measured with caliper	No visual damage, marking legible
Capacitance (C)	25 °C ± 3 °C; RH ≤ 75 %;	Capacitance within specified tolerance
Dissipation factor (DF)	1.0 V <sub>RMS</sub> ± 0.2 V <sub>RMS</sub> at 1 MHz for class 1 1.0 V <sub>RMS</sub> ± 0.2 V <sub>RMS</sub> at 1 kHz for class 2	Class 1: DF ≤ 0.3 %; Class 2: DF ≤ 2.5 %
Insulation resistance (IR)	Measured with 60 s ± 5 s after charging at 500 V <sub>DC</sub>	Min. 10 000 MΩ
Dielectric strength	4000 V <sub>AC</sub> at 50 Hz / 60 Hz for 1 min 50 mA max.	No failure
Solderability of termination	Immerse in solder bath for 2 s with 255 °C ± 5 °C after fluxing	95 % of the terminations are to be soldered
Impulse voltage	3 pulses of 8 kV	No failure
Life test	125 °C; 1000 V <sub>AC</sub> at 50 Hz; 1000 h 125 °C; 2550 V <sub>DC</sub> ; 1000 h	No visual damage
		ΔC/C < ± 15 %
		U2J: DF ≤ 0.5 %; Y5S / Y5U: DF ≤ 5 %
		IR ≥ 3000 MΩ
Humidity test	500 h + 48 h / - 0 h; 40 °C ± 2 °C; 90 % to 95 % RH; 440 V <sub>AC</sub> at 50 Hz	No visual damage
		U2J: ΔC/C < ± 10 %; Y5S / Y5U: ΔC/C < ± 15 %
		U2J: DF ≤ 0.5 %; Y5S / Y5U: DF ≤ 5 %
		IR ≥ 3000 MΩ
	500 h + 48 h / - 0 h; 40 °C ± 2 °C; 90 % to 95 % RH; 1500 V <sub>DC</sub>	No visual damage
		U2J: ΔC/C < ± 10 %; Y5S / Y5U: ΔC/C < ± 15 %
		U2J: DF ≤ 0.5 %; Y5S / Y5U: DF ≤ 5 %
		IR ≥ 3000 MΩ
	500 h + 48 h / - 0 h; 40 °C ± 2 °C; 90 % to 95 % RH; 0 V loading	No visual damage
		U2J: ΔC/C < ± 10 %; Y5S / Y5U: ΔC/C < ± 15 %
		U2J: DF ≤ 0.5 %; Y5S / Y5U: DF ≤ 5 %
		IR ≥ 3000 MΩ
Dielectric strength: no failure		

PERFORMANCE		
TEST	TEST CONDITION	TEST LIMITS
Robustness of termination	Shear test: 17.7 N for 10 s ± 1 s for soldered on PCB 	No damage to capacitor body and pin
	Bending test: 1 mm bending constant for 5 s ± 1 s 	
Resistance to soldering heat (solder bath)	Reflow soldering: peak 260 °C + 0 °C / - 5 °C The area of soldering 230 °C min., 20 s to 40 s	No visual damage U2J: ΔC/C < ± 5 %; Y5S / Y5U: ΔC/C < ± 20 % U2J: DF ≤ 0.3 %; Y5S / Y5U: DF ≤ 2.5 % IR ≥ 3000 MΩ Dielectric strength: no failure
Temperature cycling	-55 °C to +125 °C; 5 cycles	No visual damage ΔC/C < ± 30 % U2J: DF ≤ 0.5 %; Y5S / Y5U: DF ≤ 5 % IR ≥ 3000 MΩ Dielectric strength: no failure
Electrical characterization	25 °C and -55 °C, +125 °C	Capacitance within specified tolerance Class 1: DF ≤ 0.3 %; Class 2: DF ≤ 2.5 % IR ≥ 10 000 MΩ

RELATED DOCUMENTS	
CB Test Certificate	<a href="http://www.vishay.com/doc?22268">www.vishay.com/doc?22268</a>
VDE Marks Approval	<a href="http://www.vishay.com/doc?22269">www.vishay.com/doc?22269</a>
UL Test Certificate	<a href="http://www.vishay.com/doc?22271">www.vishay.com/doc?22271</a>
CQC Test Certificate	<a href="http://www.vishay.com/doc?22270">www.vishay.com/doc?22270</a>
Soldering Recommendation	<a href="http://www.vishay.com/doc?28572">www.vishay.com/doc?28572</a>