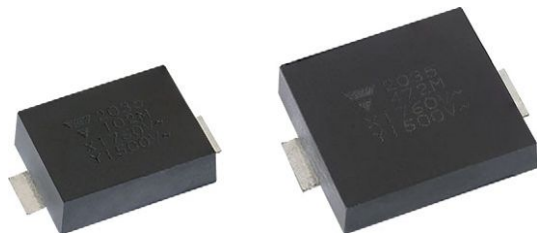




AC Line Rated Ceramic Disc Capacitors Class X1, 760 V_{AC}, Class Y1, 500 V_{AC}



QUICK REFERENCE DATA	
DESCRIPTION	VALUE
Ceramic class	2
Ceramic dielectric	Y5U
Voltage (V _{AC})	500 760
Min. capacitance (pF)	470
Max. capacitance (pF)	4700
Mounting	Surface mount (reflow soldering)

OPERATING TEMPERATURE RANGE

-55 °C to +125 °C

TEMPERATURE CHARACTERISTICS

Y5U

SECTIONAL SPECIFICATIONS

Climatic category (according to EN 60058-1)
Class 2: 55/125/21

MOLDING

According to UL 94 V-0
Epoxy resin, isolating, flame retardant
Halogen-free available
Reinforced insulation

APPROVALS

IEC 60384-14.4
UL 60384-14
DIN EN 60384-14
CSA E60384-1:03, CSA E60384-14:09
CQC11-471112-2009

FEATURES

- Complying with IEC 60384-14 4th edition
- High moisture sensitive level: MSL1
- Humidity class IIB annex I achieved
- Singlelayer AC disc safety capacitors
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- X1, Y1 according to IEC 60384-14.4
- Across-the-line
- Line by-pass
- Antenna coupling

DESIGN

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

CAPACITANCE RANGE

470 pF to 4700 pF

RATED VOLTAGE U_R

IEC 60384-14.4:
(X1): 760 V_{AC}, 50 Hz
(Y1): 500 V_{AC}, 50 Hz
Annex H: 1500 V_{DC}

TEST VOLTAGE

Component test (100 %):
4000 V_{AC}, 50 Hz, 2 s
Random sampling test (destructive test):
4000 V_{AC}, 50 Hz, 60 s
Voltage proof of molding (destructive test):
4000 V_{AC}, 50 Hz, 60 s

INSULATION RESISTANCE

≥ 10 000 MΩ

CAPACITANCE TOLERANCE

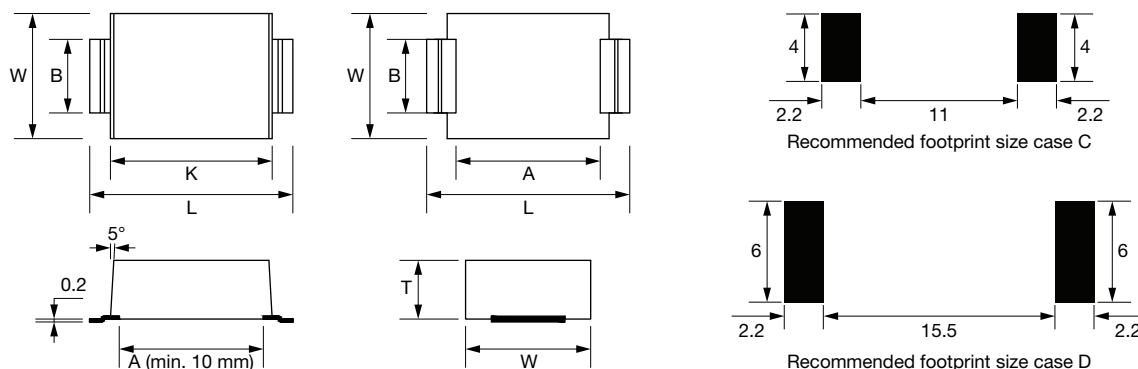
± 20 % (code M)

DISSIPATION FACTOR

Class 2: max. 2.5 % (1 kHz)



DIMENSIONS in millimeters



SIZE CODE	W (± 0.5)	L (± 0.5)	A (± 0.5)	B (± 0.5)	K (± 0.1)	T _{max.}
C	8.60	14.80	10.50	3.50	11.80	4.00
D	14.60	19.20	15.00	5.00	16.20	4.00

TECHNICAL DATA

CAPACITANCE (pF)	TOLERANCE (%)	SIZE CASE	PART NUMBER
			MISSING DIGITS SEE ORDERING CODE BELOW
Y5U (2E3)			
470	± 20	C	SMDY1471MY5UC#
680		C	SMDY1681MY5UC#
1000		C	SMDY1102MY5UC#
1500		C	SMDY1152MY5UC#
2200		D	SMDY1222MY5UD#
3300		D	SMDY1332MY5UD#
3900		D	SMDY1392MY5UD#
4700		D	SMDY1472MY5UD#

ORDERING CODE

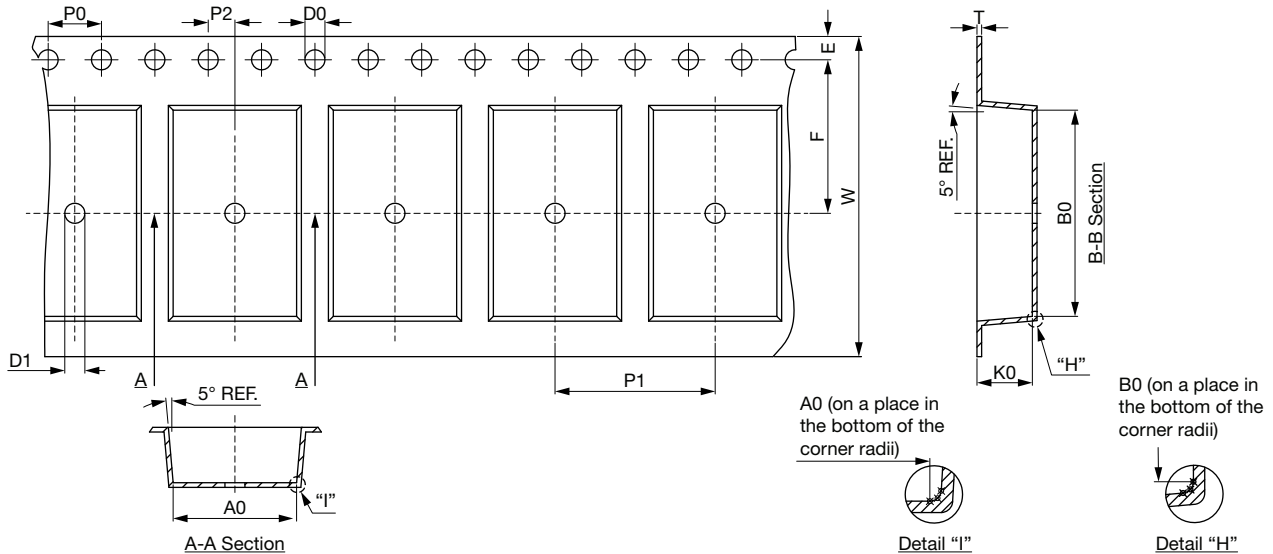
Example	SMDY1	472	M	Y5U	D	B
	Series	Capacitance value	Tolerance code	Temperature coefficient	Size case	Packaging code
						B = bulk R = tape and reel

PACKAGING

SIZE CODE	PACKAGING QUANTITIES	
	BULK	REEL
C	1000	1000
D	500	500

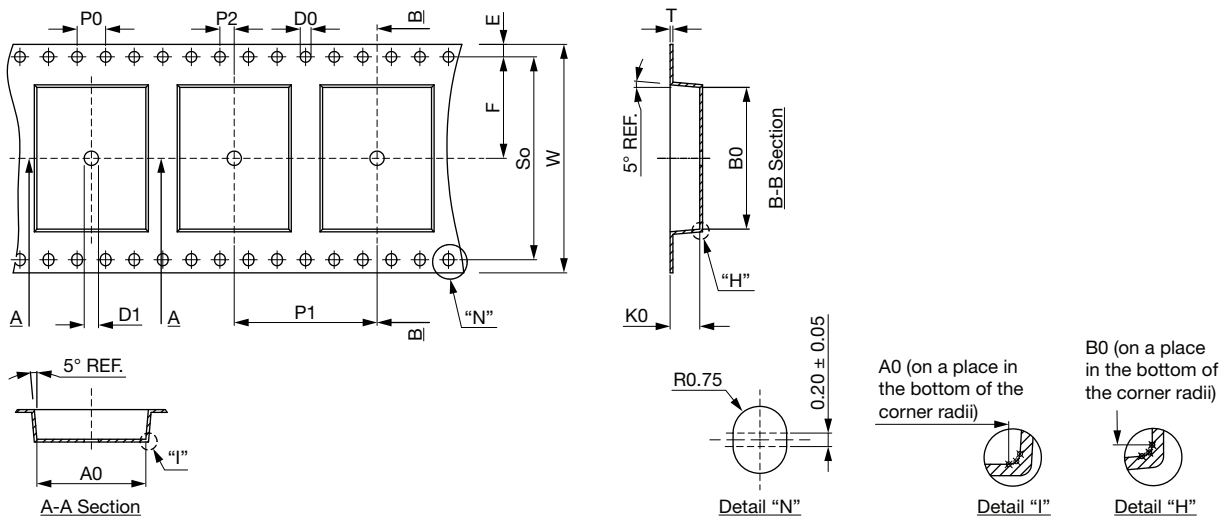


CARRIER TAPE DIMENSIONS FOR CASE C in millimeters



A0	B0	K0	P0	P1	P2	T	W	10P0	E	F	D0	D1
9.25 ± 0.10	15.45 ± 0.10	4.15 ± 0.10	4.00 ± 0.10	12.00 ± 0.10	2.00 ± 0.10	0.35 ± 0.05	24.00 ± 0.30	40.00 ± 0.20	1.75 ± 0.10	11.50 ± 0.10	1.55 ± 0.05	1.5 min.

CARRIER TAPE DIMENSIONS FOR CASE D in millimeters



A0	B0	K0	P0	P1	P2	T	W	10P0	So	E	F	D0	D1
15.25 ± 0.10	19.85 ± 0.10	4.15 ± 0.10	4.00 ± 0.10	20.00 ± 0.10	2.00 ± 0.10	0.35 ± 0.05	32.00 ± 0.30	40.00 ± 0.20	28.40 ± 0.10	1.75 ± 0.10	14.20 ± 0.10	1.50 + 0.10	2.0 min.



APPROVALS			
IEC 60384-14.4 - Safety tests This approval together with CB test certificate substitutes all national approvals.			
CB Certificate			
Y1-capacitor: CB test certificate: DE1-63889/A2	470 pF to 4.7 nF	500 V _{AC}	
X1-capacitor: CB test certificate: DE1-63889/A2	470 pF to 4.7 nF	760 V _{AC}	
VDE			
Y1-capacitor: VDE marks approval: 40052244	470 pF to 4.7 nF	500 V _{AC}	
X1-capacitor: VDE marks approval: 40052244	470 pF to 4.7 nF	760 V _{AC}	
DIN EN 60384-14 VDE 0565-1-1:2006-04 - Safety tests			
Underwriters Laboratories Inc. / Canadian Standards Association			
Y1-capacitor: CSA test certificate:	470 pF to 4.7 nF	500 V _{AC}	
X1-capacitor: CSA test certificate:	470 pF to 4.7 nF	760 V _{AC}	
UL 60384-14, CSA E60384-1:03, CSA E60384-14:09			
Fixed capacitors for electromagnetic interference suppression and connection to the supply mains.			
CQC			
Y1-capacitor: CQC test certificate:	470 pF to 4.7 nF	500 V _{AC}	
X1-capacitor: CQC test certificate:	470 pF to 4.7 nF	760 V _{AC}	

MARKING	
<p>YY: year, ΔΔ: week, XXX: multiplier C-value code, t: tolerance</p>	<p>PN: SMDY1472MY5UDR Lot1: 16M2033201 DC1: 2033 QTY: 500 Lot2: DC2: PO: / Batch:201543CN SO: / Region: 9520 SL: 0010 Ser.No: 1543M11223 RoHS H/F MSL: 1 e3 Pb 10 VDE C UL US CQC</p> <p>1/1</p>

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 %; 1.0 V _{RMS} ± 0.2 V _{RMS} at 1 kHz	Capacitance within specified tolerance
Dissipation factor (DF)		DF ≤ 2.5 %
Insulation resistance (IR)	Measured with 60 s ± 5 s after charging at 500 V _{DC}	Min. 10 000 MΩ
Dielectric strength	4000 V _{AC} 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; 1.5 kV _{AC} at 50 Hz; 1000 h	No visual damage
		ΔC/C < ± 15 %
		DF ≤ 5 %
		IR ≥ 3000 MΩ
Humidity test	500 h +48 h / -0 h; 40 °C ± 2 °C; 90 % to 95 % RH; 760 V _{AC} at 50 Hz; 1500 V _{DC}	No visual damage
		ΔC/C < ± 15 %
		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
		ΔC/C < ± 15 %
		DF ≤ 5 %
		IR ≥ 3000 MΩ
	500 h +48 h / -0 h; 85 °C ± 3 °C / 55 % RH; 760 V _{AC} at 50 Hz; 1500 V _{DC}	No visual damage
		ΔC/C < ± 15 %
		DF ≤ 5 %
		IR ≥ 3000 MΩ
Robustness of termination	Shear test: 10 N for 10 s ± 1 s for soldered on PCB	No damage to capacitor body and pin
Bending test: 3 mm bending constant for 5 s ± 1 s		
Substrate before test		
Specimen (of SMD)		
Support		
Solder		
Substrate during test		
Bending tool		
Radius 340		
20 mm		
D		



PERFORMANCE		
TEST	TEST CONDITION	TEST LIMITS
Resistance to soldering heat (solder bath)	20 mm/s dipping speed; dwell 10 s at 2 mm dipping; 260 °C ± 5 °C	No visual damage
		$\Delta C/C < \pm 10 \%$
		DF ≤ 5 %
		IR ≥ 3000 MΩ
Temperature cycling	-55 °C ~ +125 °C; 5 cycles	Dielectric strength: no failure
		No visual damage
		$\Delta C/C < \pm 30 \%$
		DF ≤ 5 %
Moisture sensitive level	90 °C/24 h; 85 °C / 85 RH / 168 h; reflow 3 times	IR ≥ 3000 MΩ
		Dielectric strength: no failure
		No visual damage
		$\Delta C/C < \pm 15 \%$
Electrical characterization	25 °C and -40 °C, +125 °C	DF ≤ 5 %
		IR ≥ 3000 MΩ
		Capacitance within specified tolerance
		Min. 10 000 MΩ
Mechanical shock	Half-sine; 100 g/s; 6 ms; 3 shocks each of 6 orientation	DF ≤ 5 %
		IR ≥ 10 000 MΩ
		No visual damage
		$\Delta C/C < \pm 10 \%$
Vibration	5 g/s; 1.5 mm amplitude; 20 min; 12 cycles each of orientation; 10 Hz ~ 2000Hz	DF ≤ 5 %
		IR ≥ 10 000 MΩ
		No visual damage
		$\Delta C/C < \pm 10 \%$