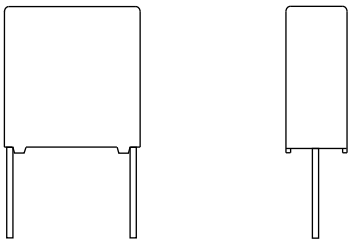
Interference Suppression Film Capacitors
MKP Radial Potted Type



FEATURES

- **AEC-Q200 qualified**
- 7.5 mm to 27.5 mm lead pitch, supplied loose in box, taped on ammopack or reel
- Material categorization:
  For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

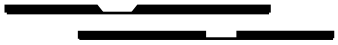
Pb-free

e3

RoHS COMPLIANT

APPLICATIONS

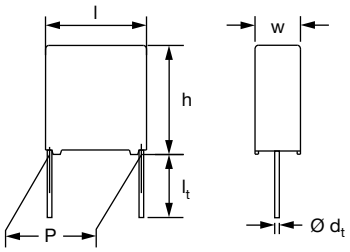
For standard line bypass (between line and ground) Y2 applications.
See also application note: www.vishay.com/doc?28153

QUICK REFERENCE DATA	
Capacitance range (E12 series)	E12 series 0.001 µF to 0.47 µF Preferred values acc. to E6
Capacitance tolerance	± 20 %, ± 10 %, ± 5 %
Rated AC voltage	300 V_{AC}; 50 Hz to 60 Hz
Permissible DC voltage	1000 V_{DC}
Climatic testing class acc. to IEC 60068-1	55/105/56/C for product volumes ≤ 1750 mm^3 55/105/56/B for volumes > 1750 mm^3
Maximum application temperature	105 °C
Reference standards	IEC 60384-14 ed-3 and EN 60384-14 IEC 60065 requires pass. flamm. class B for volumes > 1750 mm^3 UL 60384-14; ENEC; CSA E 384-14-95
Dielectric	Polypropylene film
Electrodes	Metallized film
Construction	Series construction  Triple construction 
Encapsulation	Plastic case, epoxy resin sealed, flame retardant class UL 94 V-0
Leads	Tinned wire
Marking	C-value; tolerance; rated voltage; sub-class; manufacturer's type designation; code for dielectric material; manufacturer location; manufacturer's logo; year and week; safety approvals

Note

- For more detailed data and test requirements, contact rfi@vishay.com

DIMENSIONS



COMPOSITION OF CATALOG NUMBER

TYPE AND PITCHES	
338 6 Y2	7.5 mm
	10.0 mm
	15.0 mm
	22.5 mm
	27.5 mm

MULTIPLIER (nF)	
0.1	2
1	3
10	4
100	5

CAPACITANCE (numerically)

Example:
104 = 10 x 10 = 100 nF
(except special numbers)

BFC2	338	6X	XX	X
2222 (*)	338	6X	XX	X

(*) old ordering code

TYPE	PACKAGING	STANDARD DIMENSIONS	C-TOL.	PREFERRED TYPES
338 6 Y2	Loose in box	Lead length 3.5 mm + 1 mm/- 0.5 mm (pitch 7.5 mm and 10 mm)	20 %	BFC2 338 60
		Lead length 3.5 mm ± 0.3 mm (pitch > 10 mm)		
		Lead length 5 mm ± 1 mm		BFC2 338 62
		Lead length 25 mm ± 2 mm		BFC2 338 64
	Taped ammo	Pitch 7.5 mm only; H = 18.5 mm; P_0 = 12.7 mm		BFC2 338 66
	Taped reel	Pitch 7.5 mm to 15 mm; H = 18.5 mm		BFC2 338 68
	Loose in box	Lead length 3.5 mm + 1 mm/- 0.5 mm (pitch 7.5 mm and 10 mm)	10 %	BFC2 338 61
		Lead length 3.5 mm ± 0.3 mm (pitch > 10 mm)		
		Lead length 5 mm ± 1 mm		BFC2 338 63
		Lead length 25 mm ± 2 mm		BFC2 338 65
	Taped ammo	Pitch 7.5 mm only; H = 18.5 mm; P_0 = 12.7 mm		BFC2 338 67
	Taped reel	Pitch 7.5 mm to 15 mm; H = 18.5 mm		BFC2 338 68
TYPE	**PACKAGING**	**ALTERNATIVE PITCH SIZES AND TOLERANCES**	**C-TOL.**	**PREFERRED TYPES**
338 6 Y2		Packaging like 20 % and alternative pitch sizes	5 %	See tables for details
		Alternative pitch size	10 %/20 %	

Note

(1) For detailed tape specification refer to “Packaging Information” www.vishay.com/doc?28139

SPECIFIC REFERENCE DATA		
DESCRIPTION	**VALUE**	
Rated AC voltage (U_{RAC})	300 V	
Permissible DC voltage (U_{RDC})	1000 V	
Tangent of loss angle	at 1 kHz	at 10 kHz
C ≤ 470 nF	≤ 10 x 10^{-4}	≤ 20 x 10^{-4}
Rated voltage pulse slope $(dU/dt)_R$ at 420 V_{DC}	100 V/µs	
R between leads, for C ≤ 0.33 µF at 100 V; 1 min	> 15 000 MΩ	
RC between leads, for C > 0.33 µF at 100 V; 1 min	> 5000 s	
R between leads and case; 100 V; 1 min	> 30 000 MΩ	
Withstanding (DC) voltage (cut off current 10 mA) (1); rise time ≤ 1000 V/s	3400 V; 1 min	
Withstanding (AC) voltage between leads and case	2100 V; 1 min	
Maximum application temperature	105 °C	

Note

(1) See “Voltage Proof Test for Metalized Film Capacitors”: www.vishay.com/doc?28169

ELECTRICAL DATA AND ORDERING INFORMATION

U_{RAC} (V)	CAP. (µF)	DIMENSIONS w x h x l (mm)	MASS (g) [3]	CATALOG NUMBER BFC2 338 6X XXX AND PACKAGING							
				LOOSE IN BOX					AMMOPACK		REEL Ø = 500 mm [1][2]	
				SHORT LEADS			LONG LEADS					
				l_t = 3.5 mm + 1 mm/ - 0.5 mm	l_t = 5.0 mm ± 1.0 mm	SPQ	l_t = 25.0 mm ± 2.0 mm	SPQ	H = 18.5 mm; P_0 = 12.7 mm	SPQ	H = 18.5 mm; P_0 = 12.7 mm	SPQ
300	PITCH = 7.5 mm ± 0.4 mm; d_t = 0.50 mm ± 0.05 mm; C-tol. = ± 20 % (U_{RDC} = 1000 V)											
	0.0010	4.0 x 9.0 x 10.0	0.4	60102	62102	1500	64102	1000	66102	1250	68129	2500
	0.0012			60122	62122		64122		66122		68131	
	0.0015			60152	62152		64152		66152		68132	
	0.0018			60182	62182		64182		66182		68133	
	0.0022			60222	62222		64222		66222		68134	
	0.0027			60272	62272		64272		66272		68135	
	0.0033	5.0 x 10.5 x 10.0	0.4	60332	62332	1000	64332	1250	66332	1000	68136	2000
	0.0039			60392	62392		64392		66392		68137	
	0.0047	6.0 x 11.5 x 10.0	0.8	60472	62472	750	64472	1000	66472	750	68138	1900
	0.0056			60562	62562		64562		66562		68139	
	PITCH = 10.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-tol. = ± 20 % (U_{RDC} = 1000 V)											
	0.0010	4.0 x 10.0 x 12.5	0.6	68392	68401	1000	68409	1250			68418	1400
	0.0012			68393	68402		68411				68419	
	0.0015			68394	68403		68412				68421	
	0.0018			68395	68404		68413				68422	
	0.0022			68396	68405		68414				68423	
	0.0027			68397	68406		68415				68424	
	0.0033			68398	68407		68416		-	-	68425	
	0.0039			68399	68408		68417				68426	
	0.0047	5.0 x 11.0 x 12.5	0.82	68101	68106	1000	68112	1000			68141	1100
	0.0056			68102	68107		68113				68142	
	0.0068			68103	68108		68114				68143	
	0.0082	6.0 x 12.0 x 12.5	1.1	68104	68109	750	68115	750			68144	900
	0.010			68105	68111		68116				68145	
	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-tol. = ± 20 % (U_{RDC} = 1000 V)											
	0.0068	5.0 x 11.0 x 17.5	1.0	60682	62682	1000	64682	1000			68146	1100
	0.0082			60822	62822		64822				68147	
	0.010			60103	62103		64103				68148	
	0.012			60123	62123		64123		-	-	68149	
	0.015	6.0 x 12.0 x 17.5	1.4	60153	62153	1000	64153	1000			68151	900
	0.018			60183	62183		64183				68152	
	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 20 % (U_{RDC} = 1000 V)											
	0.022	7.0 x 13.5 x 17.5	1.8	60223	62223	750	64223	500			68153	800
	0.027			60273	62273		64273				68154	
	0.033	8.5 x 15.0 x 17.5	2.4	60333	62333	750	64333	500			68155	650
	0.039			60393	62393		64393		-	-	68156	
	0.047	10.0 x 16.5 x 17.5	3.0	60473	62473	500	64473	450			68157	600
	0.056			60563	62563		64563				68158	
	PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 20 % (U_{RDC} = 1000 V)											
	0.047	7.0 x 16.5 x 26.0	2.9	68123	68125	200	68127	250				
	0.056			68124	68126		68128					
	0.068	8.5 x 18.0 x 26.0	3.8	60683	62683	200	64683	250				
	0.082			60823	62823		64823		-	-	-	-
	0.10	10.0 x 19.5 x 26.0	6.8	60104	62104	200	64104	200				
	0.12	12.0 x 22.0 x 26.0	7.8	60124	62124	150	64124	200				
	0.15			60154	62154		64154					

ELECTRICAL DATA AND ORDERING INFORMATION

U_{RAC} (V)	CAP. (µF)	DIMENSIONS w x h x l (mm)	MASS (g) [3]	CATALOG NUMBER BFC2 338 6X XXX AND PACKAGING								
				LOOSE IN BOX					AMMOPACK		REEL Ø = 500 mm [1][2]	
				SHORT LEADS			LONG LEADS					
				l_t = 3.5 mm + 1 mm/ - 0.5 mm	l_t = 5.0 mm ± 1.0 mm	SPQ	l_t = 25.0 mm ± 2.0 mm	SPQ	H = 18.5 mm; P_0 = 12.7 mm	SPQ	H = 18.5 mm; P_0 = 12.7 mm	SPQ
300	PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 20 % (U_{RDC} = 1000 V)											
	0.18 0.22	13.0 x 23.0 x 31.0	9.2	60184 60224	62184 62224	100	64184 64224	125	-	-	-	-
	0.27	15.0 x 25.0 x 31.0	12.3	60274	62274	100	64274	125				
	0.33 0.39	18.0 x 28.0 x 31.0	16.1	60334 60394	62334 62394	100	64334 64394	100				
	0.47	21.0 x 31.0 x 31.0	20.3	60474	62474	50	64474	75				
	PITCH = 7.5 mm ± 0.4 mm; d_t = 0.50 mm ± 0.05 mm; C-tol. = ± 10 % (U_{RDC} = 1000 V)											
	0.0010 0.0012 0.0015 0.0018 0.0022 0.0027	4.0 x 9.0 x 10.0	0.4	61102 61122 61152 61182 61222 61272	63102 63122 63152 63182 63222 63272	1500	65102 65122 65152 65182 65222 65272	1000	67102 67122 67152 67182 67222 67272	1250	68179 68181 68182 68183 68184 68185	2500
	0.0033 0.0039	5.0 x 10.5 x 10.0	0.4	61332 61392	63332 63392	1000	65332 65392	1250	67332 67392	1000	68186 68187	2000
	0.0047 0.0056	6.0 x 11.5 x 10.0	0.8	61472 61562	63472 63562	750	65472 65562	1000	67472 67562	750	68188 68189	1900
	PITCH = 10.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-tol. = ± 10 % (U_{RDC} = 1000 V)											
	0.0010 0.0012 0.0015 0.0018 0.0022 0.0027 0.0033 0.0039	4.0 x 10.0 x 12.5	0.6	68436 68437 68438 68439 68441 68442 68443 68444	68445 68446 68447 68448 68449 68451 68452 68453	1000	68454 68455 68456 68457 68458 68459 68461 68462	1250	-	-	68463 68464 68465 68466 68467 68468 68469 68471	1400
	0.0047 0.0056	5.0 x 11.0 x 12.5	0.82	68159 68161	68164 68165	1000	68168 68169	1000			68191 68192	1100
	0.0068 0.0082	6.0 x 12.0 x 12.5	1.1	68162 68163	68166 68167	750	68171 68172	750			68193 68194	900
	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-tol. = ± 10 % (U_{RDC} = 1000 V)											
	0.0068 0.0082 0.010 0.012	5.0 x 11.0 x 17.5	1.0	61682 61822 61103 61123	63682 63822 63103 63123	1000	65682 65822 65103 65123	1000	-	-	68202 68203 68204 68205	1100
	0.015 0.018	6.0 x 12.0 x 17.5	1.4	61153 61183	63153 63183		65153 65183				68206 68207	900
	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 10 % (U_{RDC} = 1000 V)											
	0.022	7.0 x 13.5 x 17.5	1.8	61223	63223	750	65223	500	-	-	68208	800
	0.027 0.033	8.5 x 15.0 x 17.5	2.4	61273 61333	63273 63333		65273 65333				68209 68211	650
	0.039 0.047	10.0 x 16.5 x 17.5	3	61393 61473	63393 63473	500	65393 65473	450			68212 68213	600

ELECTRICAL DATA AND ORDERING INFORMATION

U_{RAC} (V)	CAP. (µF)	DIMENSIONS w x h x l (mm)	MASS (g) [3]	CATALOG NUMBER BFC2 338 6X XXX AND PACKAGING								
				LOOSE IN BOX					AMMOPACK		REEL Ø = 500 mm [1][2]	
				SHORT LEADS			LONG LEADS					
				l_t = 3.5 mm + 1 mm/ - 0.5 mm	l_t = 5.0 mm ± 1.0 mm	SPQ	l_t = 25.0 mm ± 2.0 mm	SPQ	H = 18.5 mm; P_0 = 12.7 mm	SPQ	H = 18.5 mm; P_0 = 12.7 mm	SPQ
300	PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 10 % (U_{RDC} = 1000 V)											
	0.047	7.0 x 16.5 x 26.0	2.9	68173	68175		68177					
	0.056	8.5 x 18.0 x 26.0	3.8	68174	68176		68178	250				
	0.068			61683	63683	200	65683					
	0.082	10.0 x 19.5 x 26.0	6.8	61823	63823		65823	200	-	-	-	-
	0.10			61104	63104		65104					
	0.12	12.0 x 22.0 x 26.0	7.8	61124	63124	150	65124	200				
	0.15			61154	63154		65154					
	PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 10 % (U_{RDC} = 1000 V)											
	0.18	13.0 x 23.0 x 31.0	9.2	61184	63184		65184	125				
	0.22	15.0 x 25.0 x 31.0	12.3	61224	63224	100	65224					
	0.27	18.0 x 28.0 x 31.0	16.1	61274	63274		65274	100	-	-	-	-
	0.33			61334	63334		65334					
	0.39	21.0 x 31.0 x 31.0	20.3	61394	63394	50	65394	75				
	0.47			61474	63474		65474					
	PITCH = 7.5 mm ± 0.4 mm; d_t = 0.50 mm ± 0.05 mm; C-tol. = ± 5 % (U_{RDC} = 1000 V)											
	0.0010			68215	68225		68235		68335		68346	
	0.0012			68216	68226		68236		68336		68347	
	0.0015	4.0 x 9.0 x 10.0	0.4	68217	68227	1500	68237	1000	68337	1250	68348	2500
	0.0018			68218	68228		68238		68338		68349	
	0.0022			68219	68229		68239		68339		68351	
	0.0027	5.0 x 10.5 x 10.0	0.4	68221	68231	1000	68241	1250	68341	1000	68352	2000
	0.0033			68222	68232		68242		68342		68353	
	0.0039	6.0 x 11.5 x 10.0	0.8	68223	68233	750	68243	1000	68343	750	68354	1900
	0.0047			68224	68234		68244		68344		68355	
	PITCH = 10.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-tol. = ± 5 % (U_{RDC} = 1000 V)											
	0.0010			68481	68489		68498				68507	
	0.0012			68482	68491		68499				68508	
	0.0015			68483	68492		68501				68509	
	0.0018	4.0 x 10.0 x 12.5	0.6	68484	68493	1000	68502	1250			68511	1400
	0.0022			68485	68494		68503				68512	
	0.0027			68486	68495		68504		-	-	68513	
	0.0033			68487	68496		68505				68514	
	0.0039			68488	68497		68506				68515	
	0.0047	5.0 x 11.0 x 12.5	0.82	68245	68249	1000	68254	1000			68357	1100
	0.0056			68246	68251		68255				68358	
	0.0068	6.0 x 12.0 x 12.5	1.1	68247	68252	750	68256	750			68359	900
	0.0082			68248	68253		68257				68361	
	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-tol. = ± 5 % (U_{RDC} = 1000 V)											
	0.0068			68258	68284		68309				68381	
	0.0082	5.0 x 11.0 x 17.5	1.0	68259	68285		68311				68382	1100
	0.010			68261	68286	1000	68312	1000	-	-	68383	
	0.012	6.0 x 12.0 x 17.5	1.4	68262	68287		68313				68384	900
	0.015			68263	68288		68314				68385	

ELECTRICAL DATA AND ORDERING INFORMATION

U_{RAC} (V)	CAP. (µF)	DIMENSIONS w x h x l (mm)	MASS (g) [3]	CATALOG NUMBER BFC2 338 6X XXX AND PACKAGING							
				LOOSE IN BOX					AMMOPACK		REEL Ø = 500 mm [1][2]	
				SHORT LEADS			LONG LEADS					
				l_t = 3.5 mm + 1 mm/ - 0.5 mm	l_t = 5.0 mm ± 1.0 mm	SPQ	l_t = 25.0 mm ± 2.0 mm	SPQ	H = 18.5 mm; P_0 = 12.7 mm	SPQ	H = 18.5 mm; P_0 = 12.7 mm	SPQ
300	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 5 % (U_{RDC} = 1000 V)											
	0.018	7.0 x 13.5 x 17.5	1.8	68264	68289	750	68315	500	-	-	68386	800
	0.022			68265	68291		68316				68387	
	0.027	8.5 x 15.0 x 17.5	2.4	68266	68292		68317				68388	650
	0.033			68267	68293		68318				68389	
	0.039	10.0 x 16.5 x 17.5	3.0	68268	68294	500	68319	450			68391	600
	PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 5 % (U_{RDC} = 1000 V)											
	0.047	7.0 x 16.5 x 26.0	2.9	68269	68295	200	68321	250	-	-	-	-
	0.056	8.5 x 18.0 x 26.0	3.8	68271	68296		68322					
	0.068			68272	68297		68323					
	0.082	10.0 x 19.5 x 26.0	6.8	68273	68298		68324	200				
	0.10	12.0 x 22.0 x 26.0	7.8	68274	68299	150	68325					
	0.12			68275	68301		68326					
	PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-tol. = ± 5 % (U_{RDC} = 1000 V)											
	0.15	13.0 x 23.0 x 31.0	9.2	68276	68302	100	68327	125	-	-	-	-
	0.18			68277	68303		68328					
	0.22	15.0 x 25.0 x 31.5	12.3	68278	68304		68329					
	0.27	18.0 x 28.0 x 31.5	16.1	68279	68305		68331	100				
	0.33			68281	68306		68332					
	0.39	21.0 x 31.0 x 31.0	20.3	68282	68307	50	68333	75				

Notes

- SPQ = Standard Packing Quantity

(1) H = In-tape height; P_0 = Sprocket hole distance; for detailed specifications refer to packaging information: www.vishay.com/doc?28139

(2) Reel diameter = 365 mm is available on request

(3) Weight for short lead product only

APPROVALS

SAFETY APPROVALS Y2	VOLTAGE	VALUE	FILE NUMBERS
EN 60384-14 (ENEC) (= IEC 60384-14 ed-3)	300 V_{AC}	1 nF to 470 nF	FI 2008062 A1
UL 60384-14	300 V_{AC}	1 nF to 470 nF	E354331
CSA-E384-14-95	300 V_{AC}	1 nF to 470 nF	E354331
CB-test certificate	300 V_{AC}	1 nF to 470 nF	FI 5265 A1

The ENEC-approval together with the CB-certificate replace all national marks of the following countries (they have already signed the ENEC-agreement): Austria; Belgium; Czech. Republic; Denmark; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Luxembourg; Netherlands; Norway; Portugal; Slovenian; Spain; Switzerland and United Kingdom.

MOUNTING

Normal Use

The capacitors are designed for mounting on printed-circuit boards. The capacitors packed in bandoliers are designed for mounting in printed circuit boards by means of automatic insertion machines.
For detailed tape specifications refer to packaging information: www.vishay.com/doc?28139

Specific Method of Mounting to Withstand Vibration and Shock

In order to withstand vibration and shock tests, it must be ensured that the stand-off pips are in good contact with the printed-circuit board:

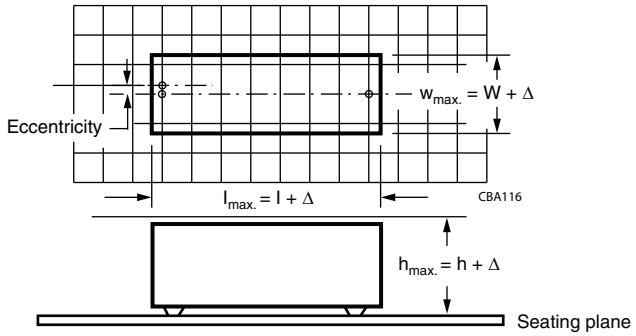
- For pitches ≤ 15 mm capacitors shall be mechanically fixed by the leads
- For larger pitches the capacitors shall be mounted in the same way and the body clamped

Space Requirements on Printed-Circuit Board

The maximum space for length ($l_{max.}$), width ($w_{max.}$), and height ($h_{max.}$) of film capacitors to take in account on the printed-circuit board is shown in the drawings:

- For products with pitch ≤ 15 mm, $\Delta w = \Delta l = 0.3$ mm; $\Delta h = 0.1$ mm
- For products with 15 mm < pitch, ≤ 27.5 mm, $\Delta w = \Delta l = 0.5$ mm; $\Delta h = 0.1$ mm

Eccentricity defined as in drawing. The maximum eccentricity is smaller than or equal to the lead diameter of the product concerned.



SOLDERING CONDITIONS

For general soldering conditions and wave soldering profile, we refer to the application note:
"Soldering Guidelines for Film Capacitors": www.vishay.com/doc?28171

Storage Temperature

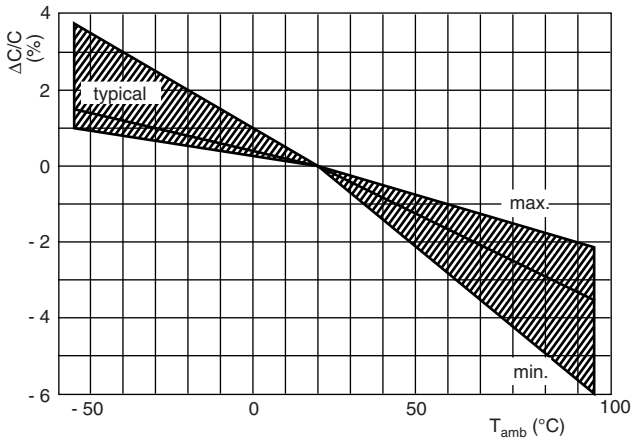
T_{stg} = - 25 °C to + 35 °C with RH maximum 75 % without condensation

Ratings and Characteristics Reference Conditions

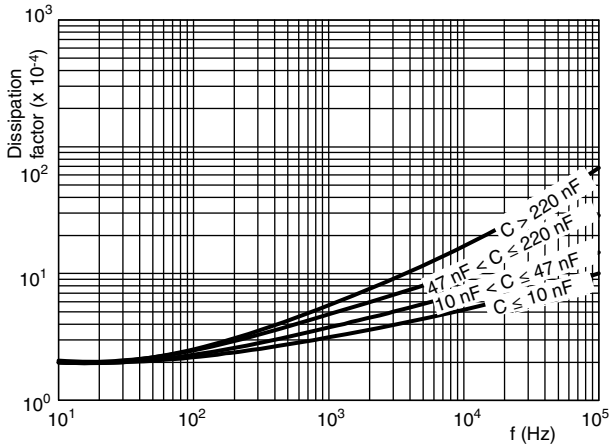
Unless otherwise specified, all electrical values apply to an ambient temperature of 23 °C ± 1 °C, an atmospheric pressure of 86 kPa to 106 kPa and a relative humidity of 50 % ± 2 %.

For reference testing, a conditioning period shall be applied over 96 h ± 4 h by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.

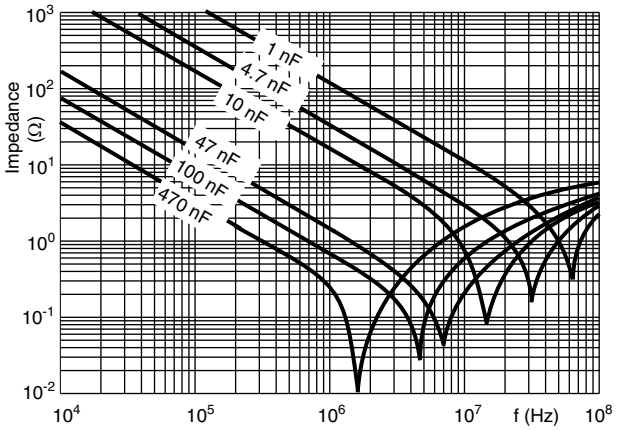
CHARACTERISTICS



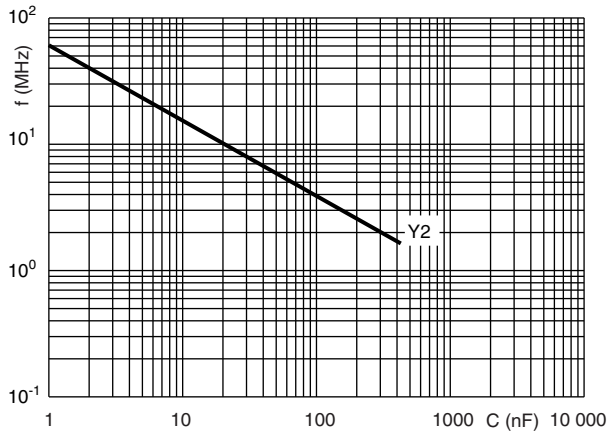
Capacitance as a function of ambient temperature
(typical curve)



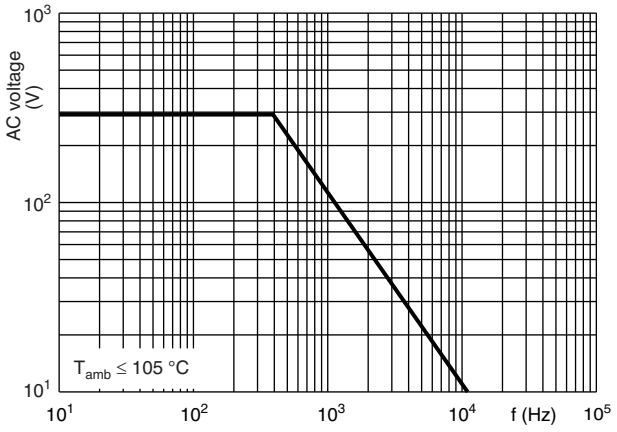
Tangent of loss angle as a function of frequency
(typical curve)



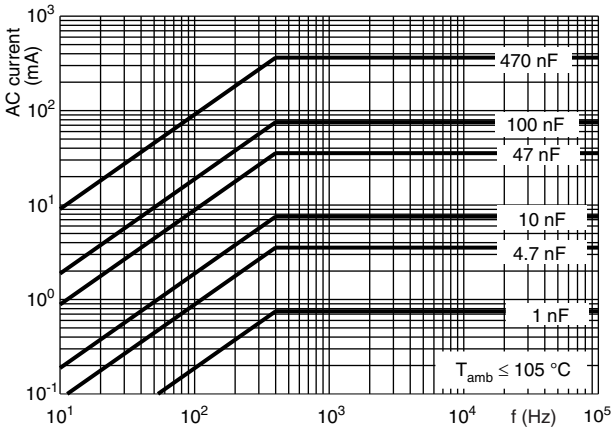
Impedance as a function of frequency
(typical curve)



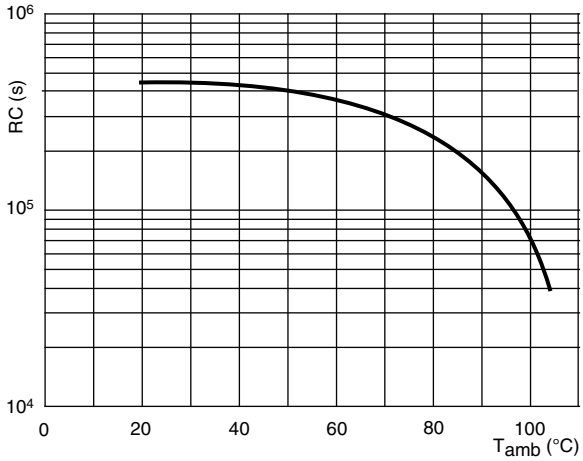
Resonant frequency as a function of capacitance
(typical curve)



Max. RMS voltage as a function of frequency



Max. RMS current as a function of frequency



Insulation resistance as a function of ambient temperature

APPLICATION NOTES

- For X2 electromagnetic interference suppression in **standard across the line application** (50 Hz/60 Hz) with a maximum mains voltage of 310 V_{AC}.
- For series impedance applications we refer to the application note: www.vishay.com/doc?28153.
- For capacitors connected in parallel, normally the proof voltage and possibly the rated voltage must be reduced. For information depending of the capacitance value and the number of parallel connections contact: rfi@vishay.com.
- These capacitors are not intended for continuous pulse applications. For these situations, capacitors of the AC and pulse program must be used.
- The maximum ambient temperature must not exceed 110 °C (125 °C for less than 1000 h) for C ≤ 470 nF and 110 °C for C > 470 nF.
- Rated voltage pulse slope:
  If the pulse voltage is lower than the rated voltage, the values of the specific reference data can be multiplied by 435 V_{DC} and divided by the applied voltage.

INSPECTION REQUIREMENTS

General Notes

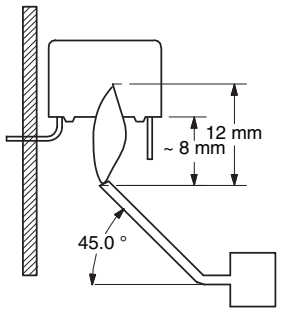
Sub-clause numbers of tests and performance requirements refer to the “Sectional Specification, Publication IEC 60384-14 ed-3 and Specific Reference Data”.

GROUP C INSPECTION REQUIREMENTS		
SUB-CLAUSE NUMBER AND TEST	**CONDITIONS**	**PERFORMANCE REQUIREMENTS**
SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1		
4.1 Dimensions (detail)		As specified in chapters “General Data” of this specification
Initial measurements	Capacitance Tangent of loss angle: at 10 kHz	
4.3 Robustness of terminations	Tensile: Load 10 N; 10 s Bending: Load 5 N; 4 x 90°	No visible damage
4.4 Resistance to soldering heat	No pre-drying Method: 1A Solder bath: 280 °C ± 5 °C Duration: 10 s	

GROUP C INSPECTION REQUIREMENTS		
SUB-CLAUSE NUMBER AND TEST	**CONDITIONS**	**PERFORMANCE REQUIREMENTS**
SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1		
4.19 Component solvent resistance	Isopropylalcohol at room temperature Method: 2 Immersion time: 5 min ± 0.5 min Recovery time: Min. 1 h, max. 2 h	
4.4.2 Final measurements	Visual examination	No visible damage Legible marking
	Capacitance	$\|\Delta C/C\| \leq 5$ % of the value measured initially
	Tangent of loss angle	Increase of tan $\delta \leq 0.008$ Compared to values measured initially
	Insulation resistance	As specified in section "Insulation Resistance" of this specification
SUB-GROUP C1B PART OF SAMPLE OF SUB-GROUP C1		
Initial measurements	Capacitance Tangent of loss angle: at 10 kHz	
4.20 Solvent resistance of the marking:	Isopropylalcohol at room temperature Method: 1 Rubbing material: Cotton wool Immersion time: 5 min ± 0.5 min	No visible damage Legible marking
4.6 Rapid change of temperature	θA = - 55 °C θB = + 105 °C 5 cycles Duration t = 30 min	
4.6.1 Inspection	Visual examination	No visible damage
4.7 Vibration	Mounting: See section "Mounting" of this specification Procedure B4: Frequency range: 10 Hz to 55 Hz Amplitude: 0.75 mm or Acceleration 98 m/s² (whichever is less severe) Total duration 6 h	
4.7.2 Final inspection	Visual examination	No visible damage
4.9 Shock	Mounting: See Section "Mounting" for more information Pulse shape: Half sine Acceleration: 490 m/s² Duration of pulse: 11 ms	
4.9.2 Final measurements	Visual examination	No visible damage
	Capacitance	$\|\Delta C/C\| \leq 5$ % of the value measured initially
	Tangent of loss angle	Increase of tan $\delta \leq 0.008$ Compared to values measured initially
	Insulation resistance	As specified in section "Insulation Resistance" of this specification

GROUP C INSPECTION REQUIREMENTS		
SUB-CLAUSE NUMBER AND TEST	**CONDITIONS**	**PERFORMANCE REQUIREMENTS**
SUB-GROUP C1 COMBINED SAMPLE OF SPECIMENS OF SUB-GROUPS C1A AND C1B		
4.11 Climatic sequence		
4.11.1 Initial measurements	Capacitance Measured in 4.4.2 and 4.9.2 Tangent of loss angle: Measured initially in C1A and C1B	
4.11.2 Dry heat	Temperature: 105 °C Duration: 16 h	
4.11.3 Damp heat cyclic Test Db First cycle		
4.11.4 Cold	Temperature: - 55 °C Duration: 2 h	
4.11.5 Damp heat cyclic Test Db remaining cycles		
4.11.6 Final measurements	Visual examination	No visible damage Legible marking
	Capacitance	$\lvert\Delta C/C\rvert \leq 5$ % of the value measured in 4.11.1.
	Tangent of loss angle	Increase of tan $\delta \leq 0.008$ Compared to values measured in 4.11.1
	Voltage proof 2250 V_{DC}; 1 min between terminations	No permanent breakdown or flash-over
	Insulation resistance	≥ 50 % of values specified in section “Insulation Resistance” of this specification
SUB-GROUP C2		
4.12 Damp heat steady state	56 days, 40 °C, 90 % to 95 % RH, no load Capacitance	
4.12.1 Initial measurements	Tangent of loss angle at 1 kHz	
4.12.3 Final measurements	Visual examination	No visible damage Legible marking
	Capacitance	$\lvert\Delta C/C\rvert \leq 5$ % of the value measured in 4.12.1.
	Tangent of loss angle	Increase of tan $\delta \leq 0.007$ Compared to values measured in 4.12.1.
	Voltage proof 2250 V_{DC}; 1 min between terminations	No permanent breakdown or flash-over
	Insulation resistance	≥ 50 % of values specified in section “Insulation Resistance” of this specification

GROUP C INSPECTION REQUIREMENTS		
SUB-CLAUSE NUMBER AND TEST	**CONDITIONS**	**PERFORMANCE REQUIREMENTS**
SUB-GROUP C3		
4.13.1 Initial measurements	Capacitance Tangent of loss angle: at 10 kHz	
4.13 Impulse voltage	3 successive impulses, full wave, peak voltage: X1: 5 kV Max. 24 pulses	No selfhealing breakdowns or flash-over
4.14 Endurance	Duration: 1000 h 1.7 x U_{RAC} at 105 °C Once in every hour the voltage is increased to 1000 V_{RMS} for 0.1 s via resistor of 47 Ω ± 5 %	
4.14.7 Final measurements	Visual examination	No visible damage Legible marking
	Capacitance	$\lvert\Delta C/C\rvert \leq 10$ % compared to values measured in 4.13.1.
	Tangent of loss angle	Increase of tan $\delta \leq 0.008$ Compared to values measured in 4.13.1.
	Voltage proof 2250 V_{DC}; 1 min between terminations 2100 V_{AC}; 1 min between terminations and case	No permanent breakdown or flash-over
	Insulation resistance	≥ 50 % of values specified in section “Insulation Resistance” of this specification
SUB-GROUP C4		
4.15 Charge and discharge	10 000 cycles charged to 420 V_{DC} Discharge resistance: $R = \frac{420\ V_{DC}}{1.5 \times C\ (dU/dt)}$	
4.15.1 Initial measurements	Capacitance Tangent of loss angle: at 10 kHz	
4.15.3 Final measurements	Capacitance	$\lvert\Delta C/C\rvert \leq 10$ % compared to values measured in 4.15.1.
	Tangent of loss angle	Increase of tan $\delta \leq 0.008$ Compared to values measured in 4.15.1.
	Insulation resistance	≥ 50 % of values specified in section “Insulation Resistance” of this specification

GROUP C INSPECTION REQUIREMENTS		
SUB-CLAUSE NUMBER AND TEST	**CONDITIONS**	**PERFORMANCE REQUIREMENTS**
SUB-GROUP C5		
4.16 Radio frequency characteristic	Resonance frequency	≥ 0.9 times the value as specified in section "Resonant Frequency" of this specification
SUB-GROUP C6		
4.17 Passive flammability Class B	Bore of gas jet: Ø 0.5 mm Fuel: Butane Test duration for actual volume V in mm^3: V ≤ 250: 10 s 250 < V ≤ 500: 20 s 500 < V ≤ 1750: 30 s V > 1750: 60 s One flame application 	After removing test flame from capacitor, the capacitor must not continue to burn for more than 10 s. No burning particle must drop from the sample.
SUB-GROUP C7		
4.18 Active flammability	20 cycles of 5 kV discharges on the test capacitor connected to U_{RAC}.	The cheese cloth around the capacitors shall not burn with a flame. No electrical measurements are required.

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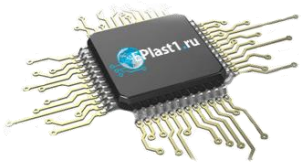
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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