Electronic Components KEMET CHARGED.

Overview

7KH 5 6HULHV FRQVLVWV RI PHWDOOL]HG SRO\SURS\OHQH ILOP encapsulated with self-extinguishing resin in a box of material meeting the requirements of UL 94 V–0.

$SSOLFDWLRQV

For worldwide use in electromagnetic interference (EMI) suppression in across-the-line applications requiring X2 safety FODVV LQ FDVHV ZKHUH IDLOXUH RI WKH FDSDFLWRU failure would not result in exposure to electric shock. Not for use in "series with mains" type applications.

%HQHÀWV

- Approvals: ENEC, UL, cUL, CQC
- Class X2 (IEC 60384-14)
- Rated voltage: 275 VAC 50/60 Hz
- Capacitance range: 0.01 – 10 µF
- Lead spacing: 10.0 – 37.5 mm
- Capacitance tolerance: ±20%, ±10%
- Climatic category: 40/110/56, IEC 60068–1
- Tape and reel in accordance with IEC 60286–2
- RoHS Compliant and lead-free terminations
- 2SHUDWLQJ WHPSHUDWXUH UDQJH RI Û& WR Û&
- 100% screening factory test at 2,200 VDC/1,500 VAC
- Self-healing properties

3DUW 1XPEHU 6\VWHP

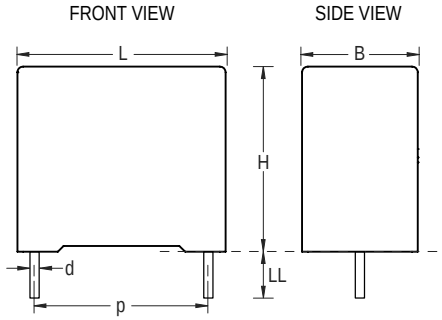
R46	K	I				M
Series	Rated Voltage (VAC)	Lead Spacing (mm)	Capacitance Code (pF)	Packaging	Internal Use	Capacitance Tolerance
X2, Metallized Polypropylene	K = 275	F = 10.0 I = 15.0 N = 22.5 R = 27.5 W = 37.5	The last three digits UHSUHVHQW FDSDFLWDQFH ¿JXUHV 7KH ¿UVW GLJLWV VSHFL¿HV number of zeros to be added.	See Ordering Options Table	01 02 L2 M1 M2 N0 N1 N2	K = ±10% M = ±20%

2UGHULQJ 2SWLRQV 7DEOH

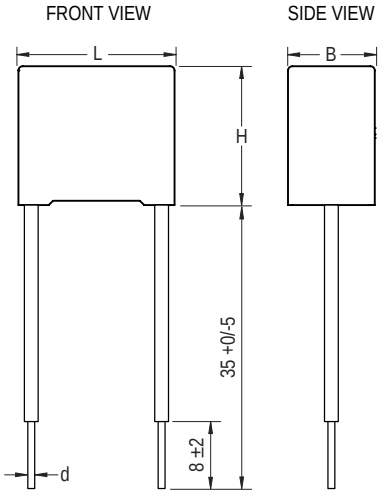
Lead Spacing 1RPLQDO PP	7\SH RI /HDGV DQG 3DFNDJLQJ	/HDG /HQJWK and 3DFNDJLQJ &RGH
	6WDQGDUG /HDG DQG 3DFNDJLQJ 2SWLRQV	
	Bulk (Bag) – Short Leads	00
	Ammo Pack	H_0 DQ
	2WKHU /HDG DQG 3DFNDJLQJ 2SWLRQV	
	Tape & Reel (Large Reel)	H_0 CK
	Bulk (Bag) – Short Leads	JA
	Bulk (Bag) – Short Leads	JB
	Bulk (Bag) – Short Leads	JE
	Bulk (Bag) – Short Leads	JH
	Bulk (Bag) – Long Leads	JM
	Bulk (Bag) – Long Leads	40
	Bulk (Bag) – Long Leads	50
	Bulk (Bag) – Insulated Rigid Leads	V S 51
	Bulk (Bag) – Insulated Flexible Leads	V S 52
	6WDQGDUG /HDG DQG 3DFNDJLQJ 2SWLRQV	
	Bulk (Bag) – Short Leads	00
	Tape & Reel (Large Reel)	H_0 CK
	2WKHU /HDG DQG 3DFNDJLQJ 2SWLRQV	
	Bulk (Bag) – Short Leads	JA
	Bulk (Bag) – Short Leads	JB
	Bulk (Bag) – Short Leads	JE
	Bulk (Bag) – Short Leads	JH
	Bulk (Bag) – Long Leads	JM
	Bulk (Bag) – Long Leads	40
	Bulk (Bag) – Long Leads	50
	Bulk (Bag) – Insulated Rigid Lead	V S 51
	Bulk (Bag) – Insulated Flexible Le	V S 52
	6WDQGDUG /HDG DQG 3DFNDJLQJ 2SWLRQV	
	Bulk (Bag) – Short Leads	00
	2WKHU /HDG DQG 3DFNDJLQJ 2SWLRQV	
	Bulk (Bag) – Short Leads	JA
	Bulk (Bag) – Short Leads	JB
	Bulk (Bag) – Short Leads	JE
	Bulk (Bag) – Short Leads	JH
	Bulk (Bag) – Long Leads	JM
	Bulk (Bag) – Long Leads	40
	Bulk (Bag) – Long Leads	50
	Bulk (Bag) – Insulated Rigid Lead	V S 51
	Bulk (Bag) – Insulated Flexible Le	V S 52

'LPHQVLRQV ² 0LOOLPHWHUV

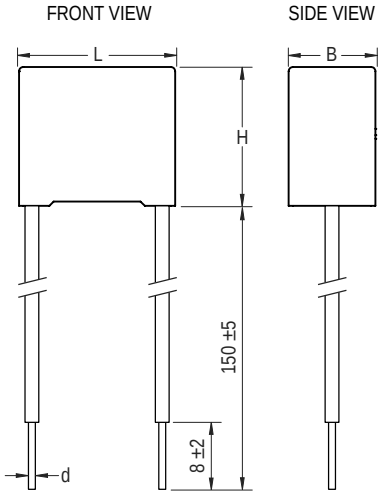
Loose



Insulated Rigid Leads



Insulated Flexible Leads 0.5 mm²

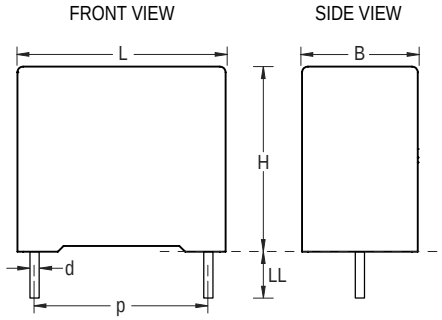


p		B		H		L		d	
Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
10.0		4.0		9.0		13.0		0.6	
10.0		5.0		11.0		13.0		0.6	
10.0		6.0		12.0		13.0		0.6	
15.0		5.0		11.0		18.0		0.6	
15.0		6.0		12.0		18.0		0.6	
15.0		6.0		17.5		18.0		0.6	
15.0		7.5		13.5		18.0		0.6	
15.0		7.5		18.5		18.0		0.8	
15.0		8.5		14.5		18.0		0.6	
15.0		9.0		12.5		18.0		0.6	
15.0		10.0		16.0		18.0		0.8	
15.0		11.0		19.0		18.0		0.8	
15.0		13.0		12.0		18.0		0.8	
22.5		6.0		15.0		26.5		0.8	
22.5		7.0		16.0		26.5		0.8	
22.5		10.0		18.5		26.5		0.8	
22.5		11.0		20.0		26.5		0.8	
27.5		9.0		17.0		32.0		0.8	
27.5		11.0		20.0		32.0		0.8	
27.5		13.0		22.0		32.0		0.8	
27.5		13.0		25.0		32.0		0.8	
27.5		14.0		28.0		32.0		0.8	
27.5		18.0		33.0		32.0		0.8	
27.5		22.0		37.0		32.0		0.8	

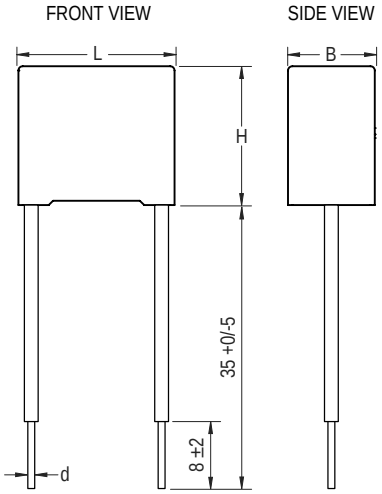
1 R W H 6 H H 2 U G H U L Q J 2 S W L R Q V R S D W L R Q V R U O H D G

'LPHQVLRQV ² 0LOOLPHWHUV FRQW G

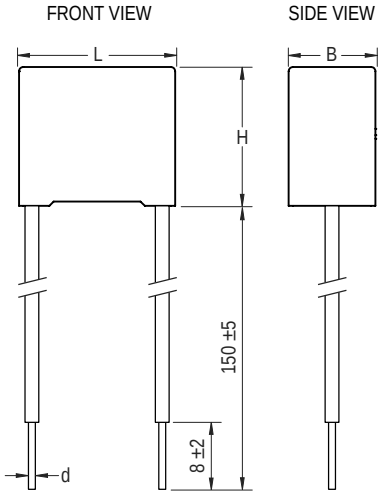
Loose



Insulated Rigid Leads



Insulated Flexible Leads 0.5 mm²



p		B		H		L		d	
Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
37.5		11.0		22.0		41.5		1.0	
37.5		13.0		24.0		41.5		1.0	
37.5		16.0		28.5		41.5		1.0	
37.5		19.0		32.0		41.5		1.0	
37.5		20.0		40.0		41.5		1.0	
37.5		24.0		44.0		41.5		1.0	
37.5		30.0		45.0		41.5		1.0	
		1RWH 6HH 2UGHULQJ 2SWLRQV 7DEOH RQ SDJH							

Performance Characteristics

Dielectric	Polypropylene
Plates	Metal layer deposited by evaporation under vacuum
Winding	Non-inductive type
Leads	Tinned wire
Protection	[illegible]
Related documents	IEC 60384-14, EN 60384-14
Rated Voltage (V_R)	275 VAC (50/60 Hz), 560 VDC
Capacitance Range	0.010 µF to 10 µF
Capacitance Values	[illegible]
Capacitance Tolerance	±10%, ±20%
Temperature Range	[illegible]
Climatic Category	40/110/56 IEC 60068-1
Storage Conditions	[illegible]
	[illegible]
	[illegible]
	Dew is absent
	Temperature: [illegible]
Approvals	ENEC, UL, cUL, CQC

3HUIRUPDQFH &KDUDFWHULVWLFV FRQW G

'LVVLSDWLRQ / ” # N+] ƒ& ƒ& W\SLFDO[	
Test Voltage Between Terminals	The 100% screening factory test is carried out at 2,200 VDC/1,500 VAC. The voltage level is selected to meet requirements in applicable equipment standards. All electrical characteristics are checked after the test. It is no permitted to repeat this test as there is a risk to damage the capacitor. KEMET is not liable in such case for any
Insulation Resistance	0HDVXUHPHQW&RQGLWLRQV ±

Minimum Values Between Terminals			
Voltage Charge	Voltage Charge Time	&”)	&!)
100 VDC	1 minute	• ‡ 0 • ‡ 0	• 0 ‡ • 0 ‡

In DC Applications	5HFRPPHQGHG9DOWDJH&

* Typical value

,PSHGDQFH *UDSK

(QYLURQPHQWDO 7HVW 'DWD

7HVW	,(& 3XEOLFI	3URFHGXUH
Endurance	EN/IEC 60384–14	1.25 x V_R VAC 50 Hz, once every hour increase to 1,000 VAC for 0 second, 1,000 hours at upper rated temperature
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each 10 – 55 Hz at 0.75 mm or 98 m/s²
Bump	IEC 60068–2–29 Test Eb	1,000 bumps at 390 m/s²
Change of Temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles
Active Flammability	IEC 60384–14	V_R V X U J H D Q G V S L N H 9 S X O V H V H F R Q G V
Passive Flammability	IEC 60384–14	, (& ± , (& ± 1 H H G O H À D P H W H V W
Damp Heat Steady State	IEC 60068–2–78 Test Cab	ƒ & D Q G 5 + G D \ V

$SSURYDOV

0DUN	6SHFLÀFDW	)LOH 1XPE
	EN/IEC 60384-14	V4413
	UL 60384-14 and CAN/CSA E60384-14 (310VAC)	E97797
	IEC 60384-14	CQC08001026549 CQC11001060118 CQC13001087757 CQC14001116028 CQC13001101266 CQC14001116000

(QYLURQPHQWDO &RPSOLDQFH

All KEMET EMI capacitors are RoHS Compliant.

7DEOH ² 5DWLQJV 3DUW 1XPEHU 5HIHUHQFH

I							

6ROGHULQJ 3URFHVV

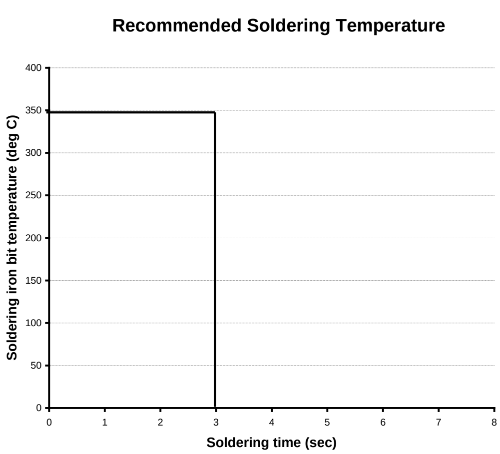
The implementation of the RoHS directive has resulted in the selection of SnAgCu (SAC) alloys or SnCu alloys as primary increased the liquidus temperature from that of 183ºC for SnPb eutectic alloy to 217 – 221ºC for the new alloys. As a result to the components, even in wave soldering, has increased considerably due to higher pre-heat and wave temperatures. Po capacitors are especially sensitive to heat (the melting point of polypropylene is 160 – 170ºC). Wave soldering can be destr for mechanically small polypropylene capacitors (with lead spacing of 5 mm to 15 mm), and great care has to be taken duri UHFRPPHQGHGVROGHULQJSURILOHV7KHSDUDPHWHUVRIWKHZDYHVROGHULQJFXUYH from IEC Publication 61760-1 Edition 2 serves as a solid guideline for successful soldering. Please see Figure 1.

5HÀRZVROGHULQJLVQRWUHFRPPHQGHG recommended limits may result to degradation or permanent damage to the capacitors.

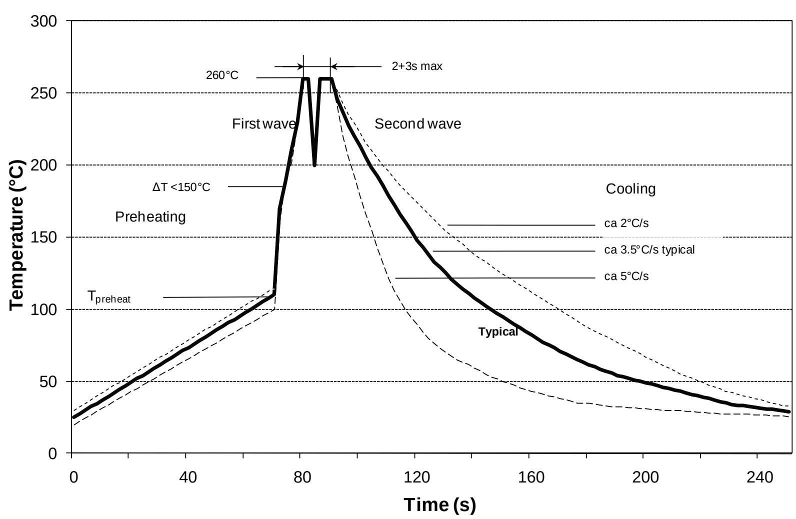
Do not place the polypropylene capacitor through an adhesive curing oven to cure resin for surface mount components. Ins KRSODFHWKHFDSDFLWRUVDIWHUFXULQJ components must pass through the adhesive curing process. A maximum two soldering cycles is recommended. Please allow time for capacitor surface temperature to return to a normal temperature before the second soldering cycle.

0DQXDO 6ROGHULQJ 5HFRPPHQGDWLRQV :DYH 6ROGHULQJ 5HFRPPHQGDWLRQV

Following is the recommendation for manual soldering with a soldering iron.



The soldering iron tip temperature should be set DW ƒ& ƒ& PD[LPXP ZLWK WKH VROGHULQJ duration not to exceed more than 3 seconds.



6ROGHULQJ 3URFHVV FRQW G

:DYH 6ROGHULQJ 5HFRPPHQGDWLRQV FRQW G

1. The table indicates the maximum set-up temperature of the soldering process
Figure 1

'LHOHFWULF)LOP 0DWHULDO	0D[LPXP 3UHKHDW 7HPSHUDWXUH			0D[LPXP 3HDN 6ROGHULQJ 7HPSHUDWXUH	
	Capacitor Pitch ” P P	Capacitor Pitch = 15 mm	Capacitor Pitch > 15 mm	Capacitor Pitch ” P P	Capacitor Pitch > 15 mm
Polyester	ƒ &	ƒ &		ƒ & ƒ &	ƒ &
Polypropylene	ƒ &	ƒ &	ƒ &	ƒ &	ƒ &
Paper	ƒ &	ƒ &	ƒ &	ƒ &	ƒ &
Polyphenylene Sulphide	ƒ &	ƒ &	ƒ &	ƒ &	ƒ &

2. The maximum temperature measured inside the capacitor:
Set the temperature so that inside the element the maximum temperature is below the limit:

'LHOHFWULF)LOP 0DWHULDO	0D[LPXP WHPSHUDWXUH PHDVXUHG LQVLGH WKH HOHPHQW
Polyester	ƒ &
Polypropylene	ƒ &
Paper	ƒ &
Polyphenylene sulphide	ƒ &

Temperature monitored inside the capacitor.

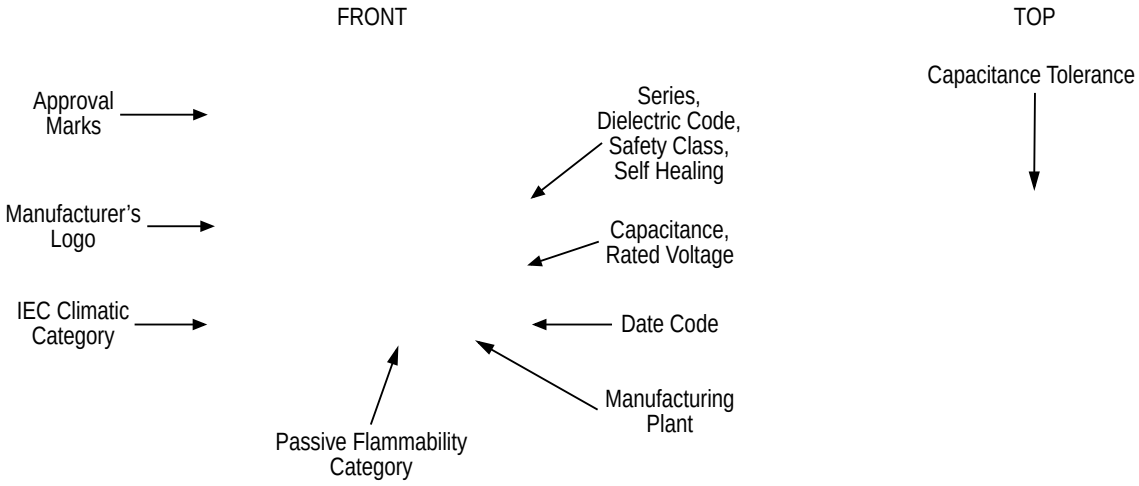
6HOHFWLYH 6ROGHULQJ 5HFRPPHQGDWLRQV

6HOHFWLYH VROGHULQJ LV D VROGHULQJ PHWKRG ZKHUH WKH FLUFXLW ERDUG ZLWK FRPSRQHQWV LV SUHKHDWHG DQG WUDQVSRUWHG RYHU D PROWHQ VROGHU EDWK. :KHQ WKH ERDUG LV over the bath, it is stopped and pre-designed solder pots are lifted from the bath with molten solder only at the places of components, and pressed against the lower surface of the board to solder the components.

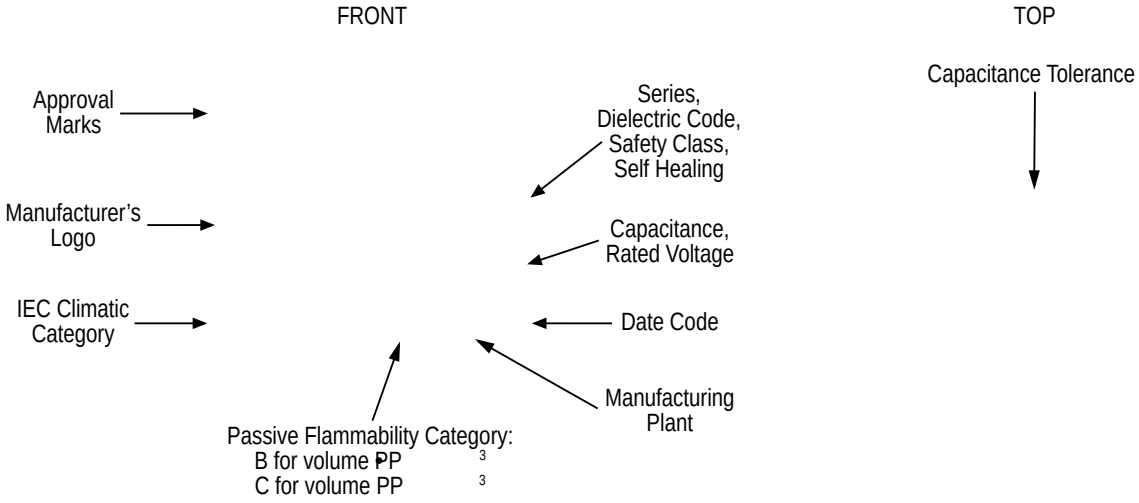
7KH WHPSHUDWXUH SURILOH RI VHOHFWLYH VROGHULQJ LV VLPLODU WR WKH SURILOH RI WZR EDWKV. WKHUH LV RQO\ RQH EDWK. In selective soldering, the risk of overheating is greater than LQ GRXEOH ZDYH VROGHULQJ DQG JUHDW FDUH PXVW EH WDNHQ WKDW WKH FRPSRQHQWV DUH QRW RYHUKHDWHG

0 D U N L Q J

Lead Spacing 10 mm

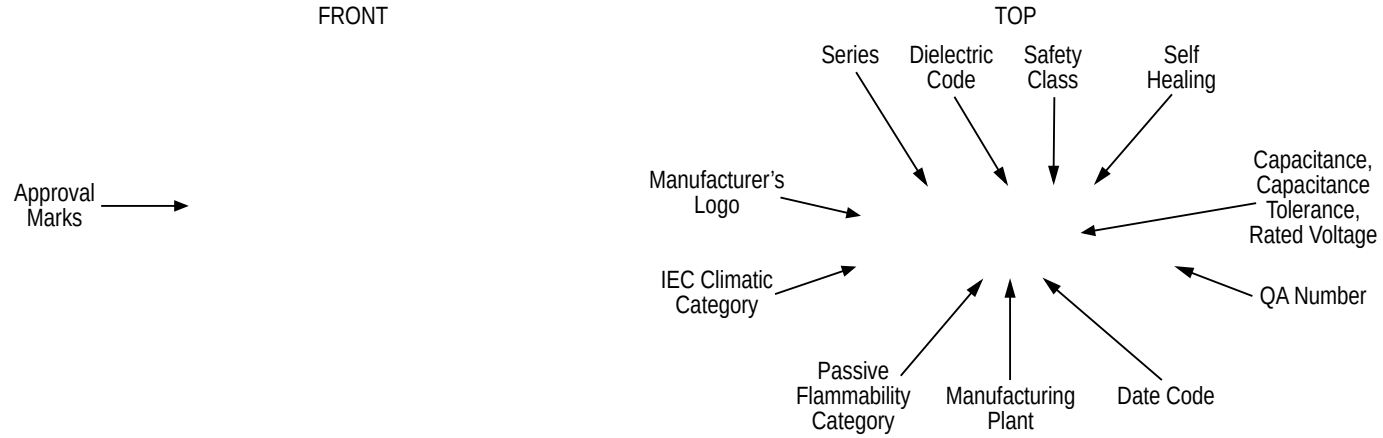


Lead Spacing 15 mm, 22.5 mm (small case sizes)



0DUNLQJ FRQW G

Lead Spacing 22.5 mm (large case sizes), 27.5 mm, 37.5 mm

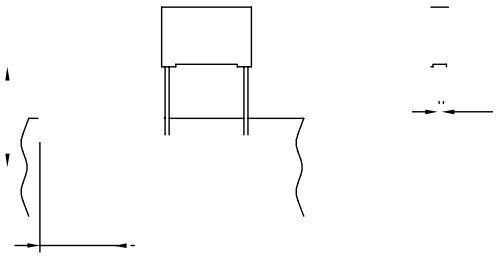


0DQXIDFWXULQJ 'DWH &RG			
Y = Year, Z = Month			
Year	&RGH	0RQWK	&RGH
2000	M	January	1
2001	N	February	2
2002	P	March	3
2003	R	April	4
2004	S	May	5
2005	T	June	6
2006	U	July	7
2007	V	August	8
2008	W	September	9
2009	X	October	O
2010	A	November	N
2011	B	December	D
2012	C		
2013	D		
2014	E		
2015	F		
2016	H		
2017	J		
2018	K		
2019	L		
2020	M		

3DFNDJLQJ 4XDQWLWLHV

Lead Spacing P P	7 K L F N Q H V V K/W Q J W K % X O N /HDG V P P	K/W Q J W K % X O N 6 K R U W /HDG V P P	% X O N /HDG V P P	6 W D Q G D U G Reel i P P	Large Reel i P P	$ P P R 7D S H G
	4	9	13	2000	1800	750	1500	1000
	5	11	13	1300	1500	600	1250	800
	6	12	13	1000	1200	500	1000	680
	5	11	18	2000	1000	600	1250	800
	6	12	18	1750	900	500	1000	680
	6	17.5	18	1000	700	500	1000	680
	7.5	13.5	18	1000	700	350	800	500
	7.5	18.5	18	900	500	–	800	500
	8.5	14.5	18	1000	500	300	700	440
	9	12.5	18	1000	520	270	650	410
	10	16	18	750	500	300	600	380
	11	19	18	450	350	–	500	340
	13	12	18	750	490	200	480	280
	6	15	26.5	805	500	–	700	464
	7	16	26.5	700	500	–	550	380
	10	18.5	26.5	396	300	–	350	235
	11	20	26.5	360	250	–	350	217
	9	17	32	816	408	–	450	–
	11	20	32	560	336	–	350	–
	13	22	32	480	288	–	300	–
	13	25	32	480	288	–	–	–
	14	28	32	352	176	–	–	–
	18	33	32	256	128	–	–	–
	22	37	32	168	112	–	–	–
	11	22	41.5	420	252	–	–	–
	13	24	41.5	360	216	–	–	–
	16	28.5	41.5	216	108	–	–	–
	19	32	41.5	192	96	–	–	–
	20	40	41.5	126	84	–	–	–
	24	44	41.5	108	72	–	–	–
	30	45	41.5	90	60	–	–	–

/HDG 7DSLQJ 3DFNDJLQJ ,(& [2]



7DSLQJ 6SHFLÀFDWLRQ

'HVFULSWLRQ6QPERO		'LPHQVLRQV PP				
		Lead Space				Tol.
		10	15	22.5	27.5	
		Fig. 1	Fig. 2	Fig. 3	Fig. 3	
Lead wire diamete	d	0.6	0.6-0.8	0.8	0.8	±0.05
Taping lead space	P	25.4	25.4	38.1	38.1	±1
) H H G K R O H O H D H	P_0 V S D F H	12.7	12.7	12.7	12.7	“
Centering of the lead wire	P_1	7.7	5.2	7.8	5.3	±0.7
Centering of the body	P_2	12.7	12.7	19.05	19.05	±1.3
/ H D G V S D F L Q J	S L W F K	10	15	22.5	27.5	
Component alignment	¨ K	0	0	0	0	±2
Height of component from tape center	H_0	18.5	18.5	18.5	18.5	±0.5
Carrier tape width	W	18	18	18	18	
Hold down tape width	W_0	9	10	10	10	Minimum
Hole position	W_1	9	9	9	9	±0.5
Hold down tape position	W_2	3	3	3	3	Maximum
Feed hole diameter	D_0	4	4	4	4	±0.2
Tape thickness	t	0.7	0.7	0.7	0.7	±0.2

* Also available in 15 mm.

** Max 1 mm on 20 lead spaces.

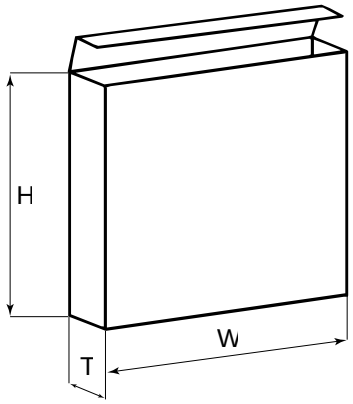
*** Pitches 15 mm and 10 mm taped to 7.5 mm (crimped leads) available upon request.

**** H_0 = 16.5 mm available upon request.

/HDG 7DSLQJ 3DFNDJLQJ ,(& ² FRQW G

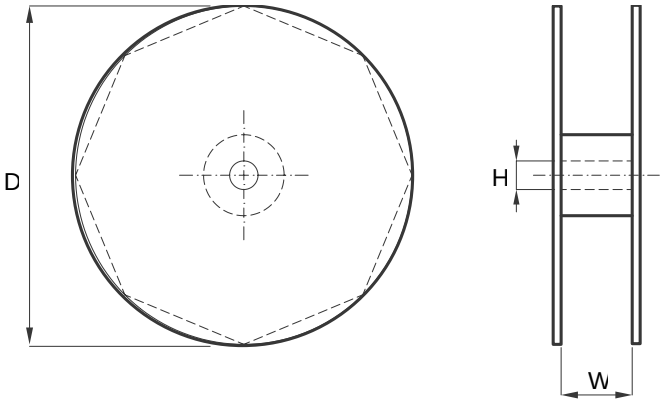
$PPR 6SHFLÀ FDWLRQV

'LPHQVLRQV PP		
H	W	7
360	340	59



5HHO 6SHFLÀ FDWLRQV

Reel Size	'LPHQVLRQV		
	D	H	W
Standard	355	30	55 Maximum
Large	500	25	



.(0(7 &RUSRUDWH(QXUSH :RUOG +HDGTXDUWHUV

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Simpsonville, SC 29681

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Greenville, SC 29606

www.kemet.com
Tel: 864-963-6300
Fax: 864-963-6521

&RUSRUDWH 2IÀFHV

Fort Lauderdale, FL
Tel: 954-766-2800

1RUWK $PHULFD

1RUWKHDVW

Wilmington, MA
Tel: 978-658-1663

6RXWKHDVW

Lake Mary, FL
Tel: 407-855-8886

&HQWUDO

Novi, MI
Tel: 248-994-1030

Irving, TX
Tel: 972-915-6041

:HVW

Milpitas, CA
Tel: 408-433-9950

0H[LFR

Guadalajara, Jalisco
Tel: 52-33-3123-2141

6RXWKHUQ (XURSH

Sasso Marconi, Italy
Tel: 39-051-939111

Skopje, Macedonia
Tel: 389-2-55-14-623

&HQWUDO (XURSH

Landsberg, Germany
Tel: 49-8191-3350800

Kamen, Germany
Tel: 49-2307-438110

1RUWKHUQ (XURSH

Wyboston, United Kingdom
Tel: 44-1480-273082

Espoo, Finland
Tel: 358-9-5406-5000

$VLD

1RUWKHDVW $VLD

Hong Kong
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Beijing, China
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verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed.

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