

R79 Series Single Metallized Polypropylene Film, Radial, 5 mm Lead Spacing, Multipurpose Applications

Overview

The R79 Series is constructed of metallized polypropylene film with radial leads of tinned wire. The radial leads are electrically welded to the metal layer on the ends of the capacitor winding. The capacitor is encapsulated with a self-extinguishing thermosetting resin in a box material meeting the UL 94V-0 requirements.

Applications

Typical applications include timing, oscillator circuits, high frequency coupling and decoupling applications. Not suitable for across-the-line application (see Suppressor Capacitors).

Benefits

- Voltage range: 160 – 630 VDC
- Capacitance range: 0.001 – 0.22 μ F
- Lead Spacing: 5 mm
- Capacitance tolerance: \pm 5%, \pm 10%, \pm 20%
- Climatic category: 55/105/56 IEC 60068-1
- Operating temperature range of -55°C to $+105^{\circ}\text{C}$
- RoHS compliance and lead-free terminations
- Tape and reel packaging in accordance with IEC 60286-2
- Self-healing



Part Number System

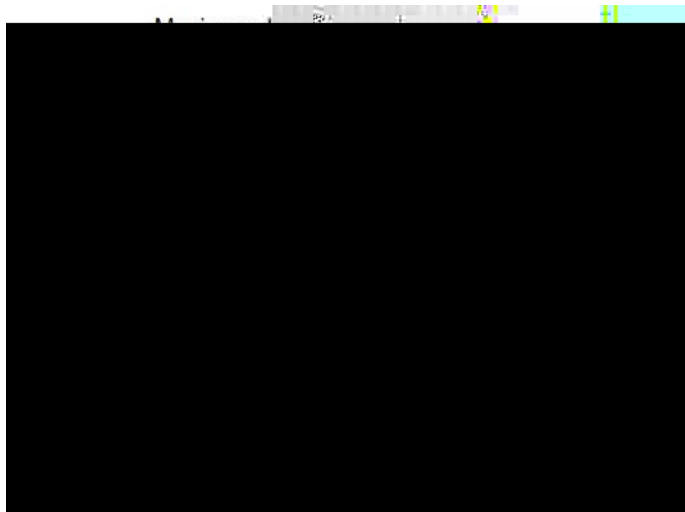
R79	G	C	2390	AA	40	K
Series	Rated Voltage (VDC)	Lead Spacing (mm)	Capacitance Code (pF)	Packaging	Internal Use	Capacitance Tolerance
Metallized Polypropylene	G = 160 I = 250 M = 400 P = 630	C = 5	The last three digits represent significant figures. The first digit specifies the total number of zeros to be added.	See Ordering Options Table	40 45	H = 2.5% J = \pm 5% K = \pm 10%

Ordering Options Table

Lead Spacing Nominal (mm)	Type of Leads and Packaging	Lead Length (mm)	Lead and Packaging Code
5	Standard Lead and Packaging Options		
	Bulk (Bag)–Short Leads	4 +1.5/-0	AA
	Ammo Pack	H ₀ =18.5 +/-0.5	DQ

Performance Characteristics

Dielectric	Polypropylene film				
Plates	Metal layer deposited by evaporation under vacuum				
Winding	Non-inductive type				
Leads	Tinned wire				
Protection	Plastic case, thermosetting resin filled. Box material is solvent resistant and flame retardant according to UL94.				
Related Documents	IEC 60384-16				
Rated Voltage V_R (VDC)	160	250	400	630	
Rated Voltage V_R (VAC)	70	160	200	220	
Capacitance Range (μF)	0.039 – 0.22	0.012 – 0.15	0.0039 – 0.047	0.001 – 0.018	
Capacitance Values	E12 series (IEC 60063) measured @ 1 kHz and +20 \pm 1°C				
Capacitance Tolerance	\pm 2.5%, \pm 5%, \pm 10%				
Operating Temperature Range	-55°C to +105°C				
Rated Temperature T_R	+85°C				
Voltage Derating	Above +85°C DC and AC voltage derating is 1.25%/°C				
Climatic Category	55/105/56 IEC 60068-1				
Storage Conditions	Storage time: \leq 24 months from the date marked on the label package				
	Average relative humidity per year \leq 70%				
	RH \leq 85% for 30 days randomly distributed throughout the year				
	Dew is absent				
	Temperature: -40 to 80°C (see "Maximum Humidity in Storage Conditions" graph below)				

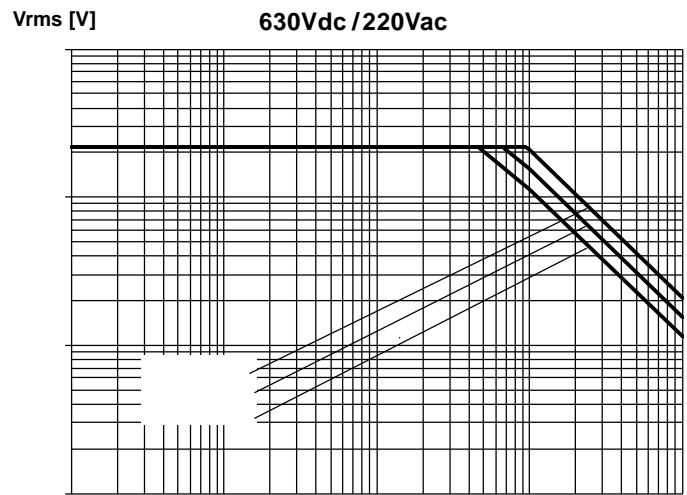
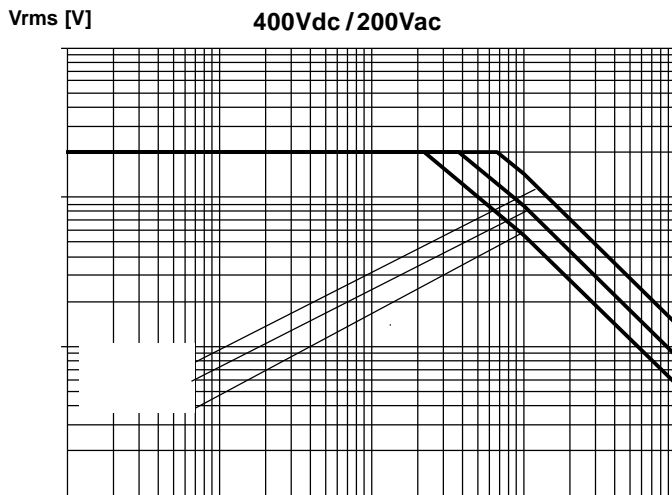
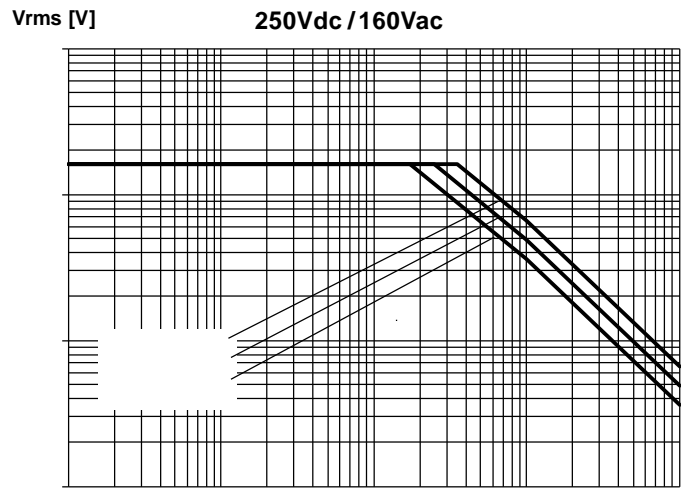
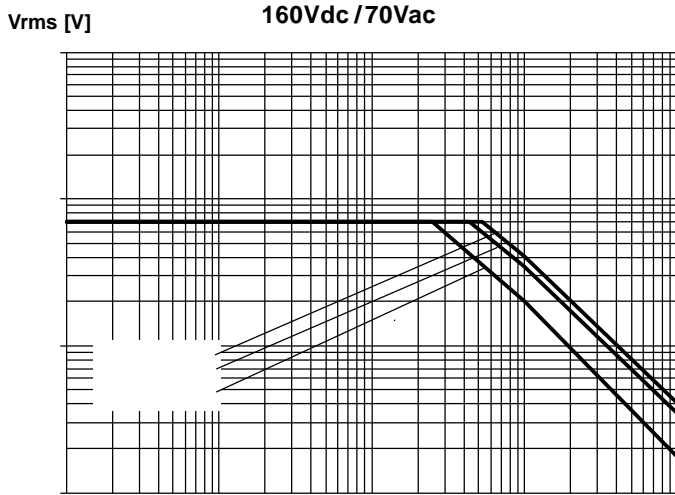


Performance Characteristics cont'd



* *typical value*

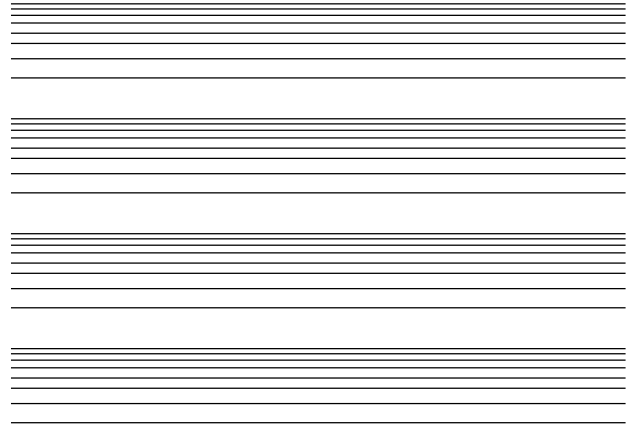
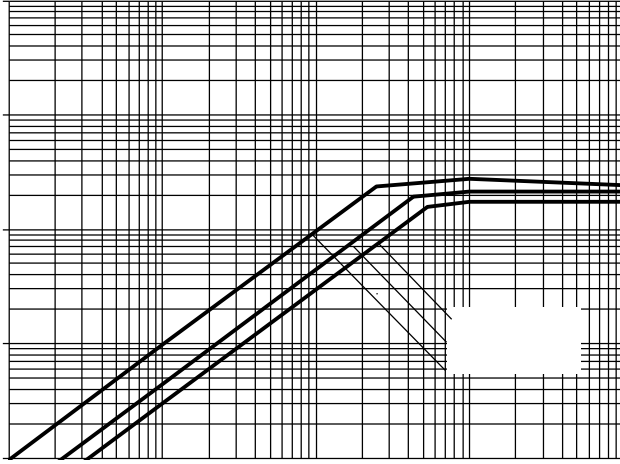
Maximum Voltage (V_{rms}) vs. Frequency (Sinusoidal Waveform/ $T_h \leq 40^\circ C$)



Maximum Current (I_{rms}) vs. Frequency (Sinusoidal Waveform/ $T_h \leq 40^\circ\text{C}$)

I_{rms} [A]

160Vdc / 70Vac



Environmental Test Data

Damp Heat, Steady State Test	Test Conditions:		Performances
	Temperature: Relative humidity (RH): Test duration:	+40°C ± 2°C 93% ± 2% 56 days	Δ C/C ≤ 3%, Δ tanδ ≤ 0.001 @ 1 kHz IR after test ≥ 50% of initial limit
Endurance Test	Test Conditions		Performances
	Temperature: Voltage applied: Test duration:	+85°C ± 2°C 1.25 x V _R (DC) 2,000 hours	Δ C/C ≤ 3%, Δ tanδ ≤ 0.001 @ 10 kHz IR after test ≥ 50% of initial limit
Resistance to Soldering Heat Test	Test Conditions		Performances
	Solder bath temperature: Dipping time (with heat screen):	260°C ± 5°C 10 seconds ± 1 second	Δ C/C ≤ 2%, Δ tanδ ≤ 0.001 @ 10 kHz for C ≤ 1μF IR after test ≥ initial limit

Environmental Compliance

All KEMET pulse capacitors are RoHS Compliant.

Soldering Process

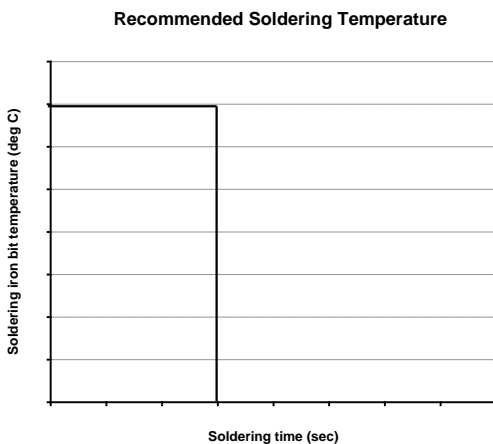
The implementation of the RoHS directive has resulted in the selection of SnAgCu (SAC) alloys or SnCu alloys as primary solder. This has increased the liquidus temperature from that of 183°C for SnPb eutectic alloy to 217 – 221°C for the new alloys. As a result, the heat stress to the components, even in wave soldering, has increased considerably due to higher pre-heat and wave temperatures. Polypropylene capacitors are especially sensitive to heat (the melting point of polypropylene is 160 – 170°C). Wave soldering can be destructive, especially for mechanically small polypropylene capacitors (with lead spacing of 5 mm to 15 mm), and great care has to be taken during soldering. The recommended solder profiles from KEMET should be used. Please consult KEMET with any questions. In general, the wave soldering curve from IEC Publication 61760-1 Edition 2 serves as a solid guideline for successful soldering. Please see Figure 1.

Reflow soldering is not recommended for through-hole film capacitors. Exposing capacitors to a soldering profile in excess of the above the 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. Insert through-hole parts after the curing of surface mount parts. Consult KEMET to discuss the actual temperature profile in the oven, if through-hole components must pass through the adhesive curing process. A maximum two soldering cycles is recommended. Please allow time for the capacitor surface temperature to return to a normal temperature before the second soldering cycle.

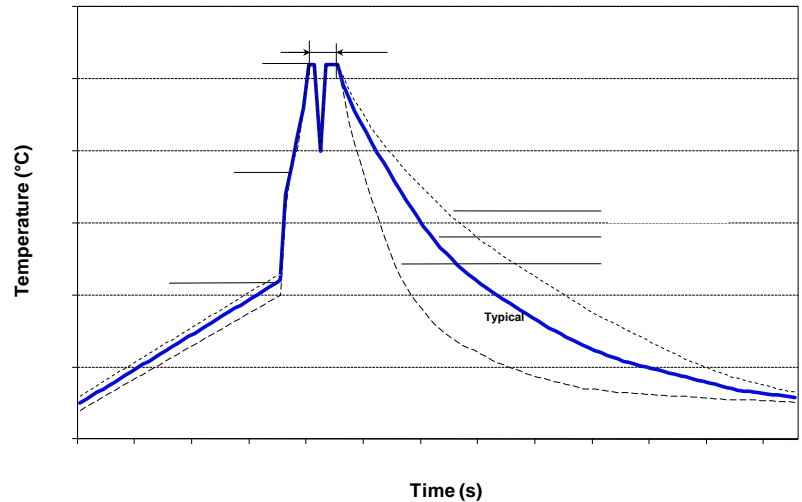
Manual Soldering Recommendations

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



The soldering iron tip temperature should be set at 350°C (+10°C maximum) with the soldering duration not to exceed more than 3 seconds.

Wave Soldering Recommendations



Soldering Process cont'd

Wave Soldering Recommendations cont'd

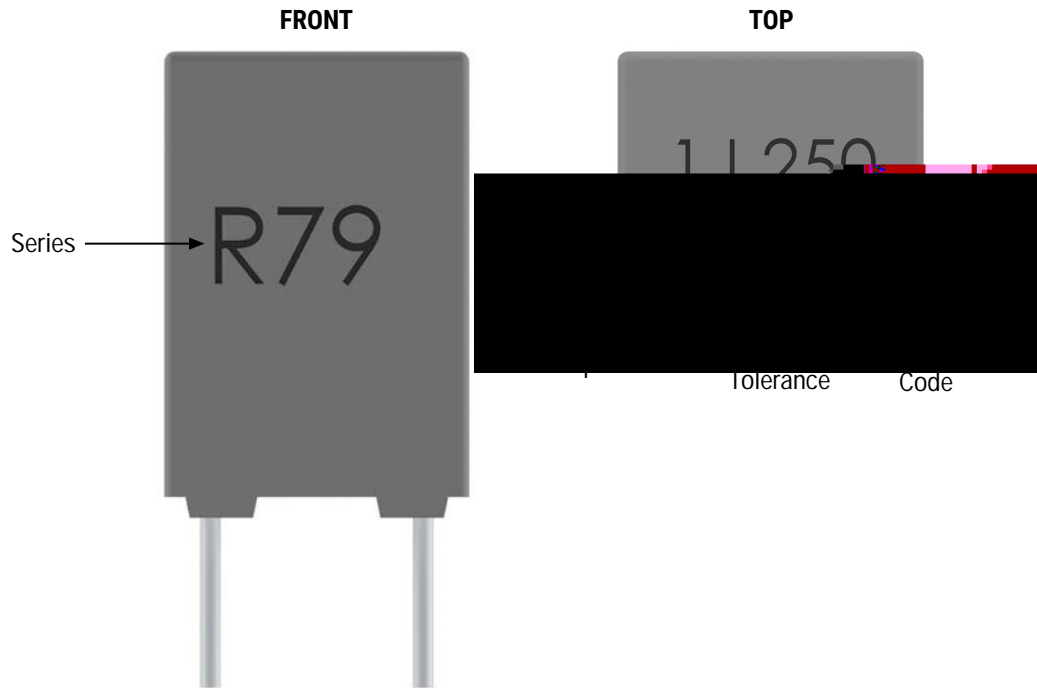
1. The table indicates the maximum set-up temperature of the soldering process
Figure 1

Dielectric Film Material	Maximum Preheat Temperature			Maximum Peak Soldering Temperature	
	Capacitor Pitch ≤ 10 mm	Capacitor Pitch = 15 mm	Capacitor Pitch > 15 mm	Capacitor Pitch ≤ 15 mm	Capacitor Pitch > 15 mm
Polyester	130°C	130°C	130°C	270°C	270°C
Polypropylene	100°C	110°C	130°C	260°C	270°C
Paper	130°C	130°C	140°C	270°C	270°C
Polyphenylene Sulphide	150°C	150°C	160°C	270°C	270°C

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

Dielectric Film Material	Maximum temperature measured inside the element
Polyester	160°C
Po0 g0 m 13 3620.014 Tc -0.014 T54 Tw -16.36o	

Marking



Packaging Quantities

Lead Spacing	Thickness (mm)	Height (mm)	Length (mm)	Bulk Short Leads	Bulk Long Leads	Standard Reel Ø 355 mm	Large Reel Ø 500 mm	Ammo Taped
5	3.5	7.5	7.2	2,000	3,000	1,800		2,500
	4.5	9.5	7.2	1,500	2,000	1,400		1,900
	5.0	10	7.2	1,000	1,500	1,200		1,700
	6.0	11	7.2	2,000	1,000	1,000		1,400
	7.2	13	7.2	1,500	750	800		1,150

Lead Taping & Packaging (IEC 60286–2) cont'd

Ammo Specifications

Dimensions (mm)		
H	W	T
360*	340	59

* Lower dimension available upon request (Maximum 295 mm)

Reel Specifications

Dimensions (mm)		
D	H	W
355	30	55 Maximum

Manufacturing Date Code (IEC–60062)

Y = Year, Z = Month			
Year	Code	Month	Code
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	0
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		

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