General Purpose Metallized Polyester Film Capacitors R82, Radial, 5 mm Lead Spacing, 50 – 400 VDC (Automotive Grade)



Overview

The R82 is constructed of metallized polyester film (wound or stacked technology) with radial leads of tinned wire. Radial leads are electrically welded to the contact metal layer on the ends of the capacitor winding. The capacitor is encapsulated with thermosetting resin in a box of material meeting the UL 94 V-0 requirements.

Automotive grade devices meet the demanding Automotive Electronics Council's AEC-Q200 qualification requirements.

Applications

Typical applications include blocking, coupling, decoupling, timing, and oscillator circuits. Not suitable for across-theline application (see Suppressor Capacitors).

Benefits

- Voltage range: 50 400 VDC
- Capacitance range: 0.001 4.7 μF
- · Lead Spacing: 5 mm
- Capacitance tolerance: ±5%, ±10%, ±20%
- Climatic category: 55/105/56
- Operating temperature range of -55°C to +105°C
- RoHS compliance and lead-free terminations
- Tape & Reel packaging in accordance with IEC 60286-2
- Self-healing
- Automotive grade (AEC-Q200)

Part Number System

R82	D	С	3470	AA	60	J
Series	Rated Voltage (VDC)	Length (mm)	Capacitance Code (pF)	Packaging	Internal Use	Capacitance Tolerance
Metallized Polyester	C = 50 D = 63 E = 100 I = 250 M = 400	C = 5.0	The last three digits represent significant figures. First digit specifies the number of zeros to be added.	See Ordering Options Table	30 50 60 70	J = ±5% K = ±10% M = ±20%

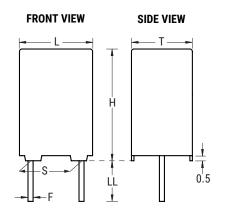




Ordering Options Table

Lead Spacing Nominal (mm)	Type of Leads and Packaging	LL Lead Length (mm)	Lead and Packaging Code
	Standard Lead and Packaging Options		
	Bulk – Short leads	4 +1.5/-0	AA
	Ammo Pack	$H_0 = 18.5 \pm 0.5$	DQ
	Other Lead and Packaging Options		
_	Tape & Reel (Standard Reel Ø 355 mm)	H ₀ = 18.5 ±0.5	СК
5	Bulk – Short leads	2.7 +0.5/-0	JA
	Bulk – Short leads	3.5 +0.5/-0	JB
	Bulk – Short leads	10 ±1	JC
	Bulk – Short leads	4.0 +0.5/-0	JE
	Bulk – Short leads	3.2 +0.3/-0.2	JH
	Bulk – Long leads	17 +1/-2	Z3

Dimensions – Millimeters



S		Т		Н		L		F	
Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
5.0	±0.4	2.5	+0.1/-0.5	6.5	+0.1/-0.5	7.2	+0.2/-0.5	0.5	±0.05
5.0	±0.4	3.5	+0.1/-0.5	7.5	+0.1/-0.5	7.2	+0.2/-0.5	0.5	±0.05
5.0	±0.4	4.5	+0.1/-0.5	9.5	+0.1/-0.5	7.2	+0.3/-0.5	0.5	±0.05
5.0	±0.4	5.0	+0.1/-0.5	10.0	+0.1/-0.5	7.2	+0.3/-0.5	0.5	±0.05
5.0	±0.4	6.0	+0.1/-0.5	11.0	+0.1/-0.5	7.2	+0.3/-0.5	0.5	±0.05
5.0	±0.4	7.2	+0.1/-0.5	13.0	+0.1/-0.5	7.2	+0.3/-0.5	0.6	±0.05
	Note: See Ordering Options Table for lead length (LL/H $_0$) options.								



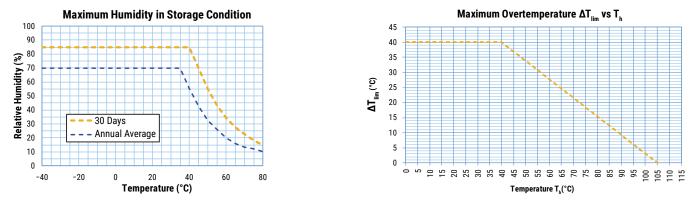
Performance Characteristics

Dielectric	Polyester film (polyethylene terephthalate).								
Plates	Metal layer de	Metal layer deposited by evaporation under vacum.							
Winding	Non-inductive type.								
Leads	Tinned wire.								
Protection	Plastic case, t UL94.	hermosetting re	sin filled. Box ma	terial is solvent	resistant and flar	me retardant acco	ording to		
Related Documents	IEC 60384-2								
Rated Voltage $V_{_R}$ (VDC)	50	63	100	250	250	400	400		
Rated Voltage V _R (VAC)	30	40	63	140	160	160	200		
Capacitance Range (µF)	2.2 - 4.7	0.1 - 1.5	0.001 - 1	0.022 - 0.22	0.0068 - 0.15	0.0068 - 0.068	0.001 - 0.047		
Capacitance Values	E6 series (IEC	60063) measure	ed at 1 kHz and +:		`	· · · · · · · · · · · · · · · · · · ·			
Capacitance Tolerance	±5%, ±10%, ±2	0%							
Operating Temperature Range	-55°C to 105°	-55°C to 105°C							
Rated Temperature T _R	+85°C	+85°C							
Voltage Derating	Above +85°C I	DC and AC voltag	ge derating is 1.2	5%/°C					
Climatic Category	55/105/56 IEC	60068-1							
	Storage time: \leq 24 months from the date marked on the label package								
	Average relative humidity per year ≤ 70%								
Storage Conditions	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)								
Test Voltage	1.4 x V _R VDC f	or 2 seconds (be	tween terminatio	ons) at +25°C ±5	°C				
Capacitance Drift	Maximum 3% to 60%	after a 2 year sto	orage period at a	temperature of	+10°C to +40°C a	nd a relative hum	idity of 40%		
	Operational lif	e > 200,000 hou	rs						
Reliability (Reference IEC 61709)	Failure rate ≤ 1 FIT, T = +40°C, V = 0.5 x V _R								
``````````````````````````````````````	Failure criteria	: open or short o	circuit, cap. chan	ge > 10%, DF 2 t	imes the catalog	limits, IR < 0.005	x initial limit		
Maximum Pulse Steepness		ng to Table 1. For ied by the factor		Itages lower tha	n rated voltage ('	Vpp <v<sub>R), the spe</v<sub>	cified dv/dt		
Temperature Coefficient	+400 (±200) p	pm/°C at 1 kHz							
Self Inductance (Lead Length ~ 2 mm)	Approximately	7 nH. Maximum	n 1nH per 1 mm le	ead and capacite	or length.				



### **Performance Characteristics cont.**

		Maximum Values at 25°C ±5°C						
Dissipation Factor tanδ	Frequency		C ≤ 0.1 µF	C > 0.1 µF				
	1 kHz		0.80%	0.80%				
	10 kHz		1.20%	1.20%				
	100 kHz		2.50%	-				
	Measured at +25°C ±5°C, according to IEC 60384–2							
	Minimum Values Between Terminals							
Insulation Resistance	Voltage charge/time	C ≤ 0.33 µF	0.33 µF < C ≤ 1.0 µF	C > 1.0 µF				
	50 VDC for V _R < 100 VDC 1 minute	≥ 15,000 MΩ	≥ 5,000 MΩ • μF	≥ 1,000 MΩ • μF				
	100 VDC for V _R ≥ 100 VDC 1 minute	≥ 30,000 MΩ						



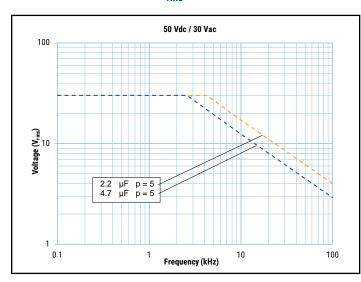
*T_h* is the maximum ambient temperature surrounding the capacitor or hottest contact point (e.g. tracks), whichever is higher, in the worst operation conditions in °C.

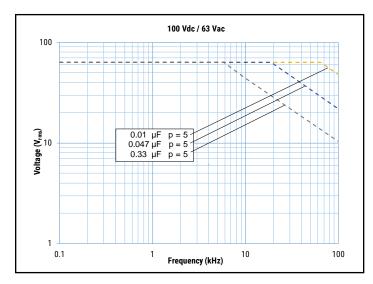
### Qualification

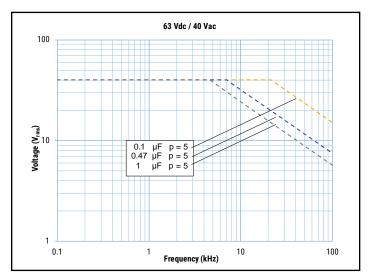
Automotive grade products meet or exceed the requirements outlined by the Automotive Electronics Council. Details regarding test methods and conditions are referenced in document AEC-Q200, Stress Test Qualification for Passive Components. For additional information regarding the Automotive Electronics Council and AEC-Q200, please visit their website at www.aecouncil.com.

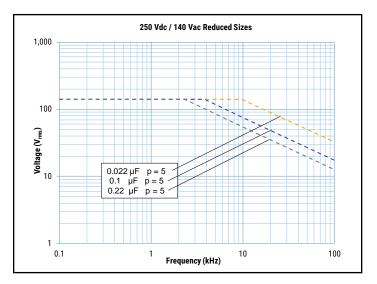


# Maximum Voltage ( $V_{rms}$ ) vs. Frequency (Sinusoidal Waveform/Th $\leq$ 40°C)



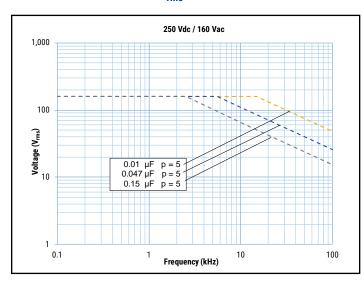


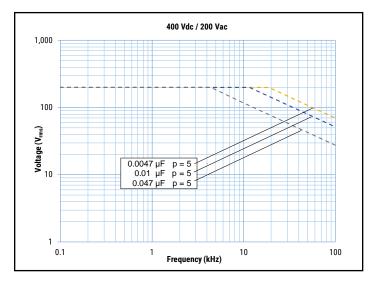


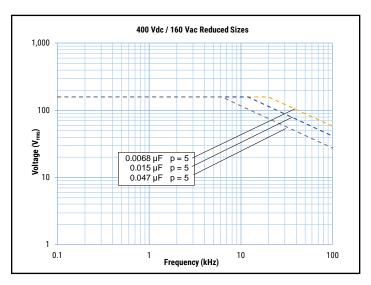




# Maximum Voltage ( $V_{rms}$ ) vs. Frequency (Sinusoidal Waveform/Th $\leq$ 40°C) cont.







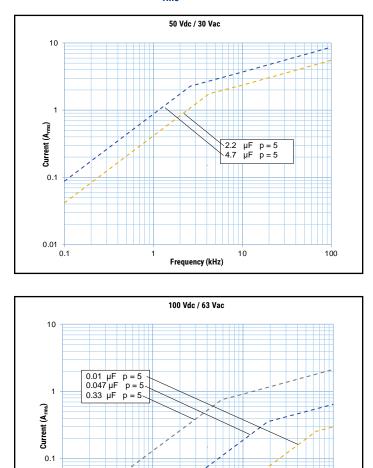
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# Maximum Current ( $I_{rms}$ ) vs. Frequency (Sinusoidal Waveform/Th $\leq$ 40°C)

100

10

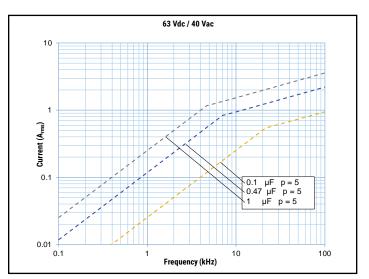


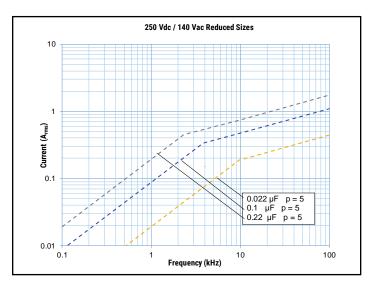
0.01

0.1

1

Frequency (kHz)

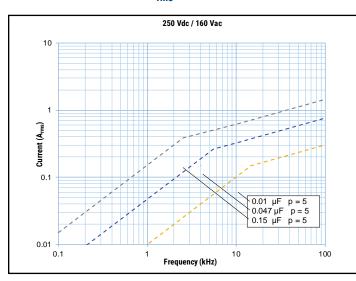


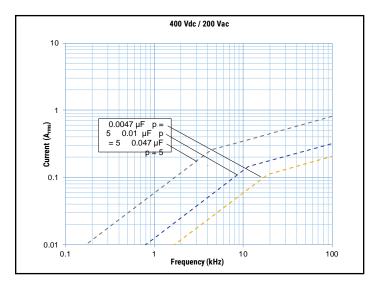


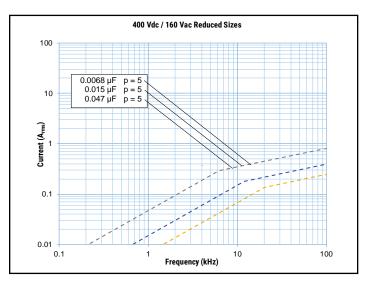
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# Maximum Current ( $I_{rms}$ ) vs. Frequency (Sinusoidal Waveform/Th ≤ 40°C) cont.







8



#### **Environmental Test Data**

Damp Heat, Steady State Test	Test Cor	nditions:	Performances
	Temperature: Relative humidity (RH): Test duration:	+40°C ±2°C 93% ±2% 56 days	$\Delta$ C/C $\leq$ 5%, $\Delta$ tan $\delta \leq$ 0.5% at 1 kHz IR after test $\geq$ 50% of initial limit
Endurance Test	Test Co	nditions	Performances
	Temperature: Voltage applied: Test duration:	+105°C ±2°C 1.25 x V _c 2,000 hours	Δ C/C ≤ 5%, Δ tanδ ≤ 0.003 at 10 kHz for C ≤ 1 μF Δ tanδ ≤ 0.002 at 1 kHz for C > 1 μF IR after test ≥ 50% of initial limit
Resistance to Soldering Heat Test	Test Co	nditions	Performances
	Solder bath temperature: Dipping time (with heat	260°C ±5°C	$ \Delta C/C  \le 2\%$ , $\Delta \tan \delta \le 0.003$ at 10 kHz for C $\le 1\mu$ F
	screen):	10 seconds ±1 second	Δ tanδ ≤ 0.002 at 1 kHz for C > 1μF IR after test ≥ initial limit

#### **Environmental Compliance**

All KEMET MKT capacitors are RoHS Compliant.

#### Table 1 – Ratings & Part Number Reference

	Capacitance		Dime	nsions i	n mm	Lead	dV/dt	Maximum K _o	KEMET	Legacy Part
VDC	VAC	Value (µF)	т	Н	L	Spacing (S)	(V/µs)	(V²/μs)	Part Number	Number
50	30	2.2	6.0	11.0	7.2	5.0	100	10000	82CC4220(1)70(2)	R82CC4220(1)70(2)
50	30	3.3	7.2	13.0	7.2	5.0	25	2500	82CC4330(1)30(2)	R82CC4330(1)30(2)
50	30	4.7	7.2	13.0	7.2	5.0	25	2500	82CC4470(1)30(2)	R82CC4470(1)30(2)
63	40	0.10	2.5	6.5	7.2	5.0	160	20160	82DC3100(1)50(2)	R82DC3100(1)50(2)
63	40	0.15	2.5	6.5	7.2	5.0	160	20160	82DC3150(1)60(2)	R82DC3150(1)60(2)
63	40	0.22	2.5	6.5	7.2	5.0	160	20160	82DC3220(1)60(2)	R82DC3220(1)60(2)
63	40	0.33	3.5	7.5	7.2	5.0	160	20160	82DC3330(1)60(2)	R82DC3330(1)60(2)
63	40	0.47	3.5	7.5	7.2	5.0	160	20160	82DC3470(1)60(2)	R82DC3470(1)60(2)
63	40	0.68	4.5	9.5	7.2	5.0	160	20160	82DC3680(1)60(2)	R82DC3680(1)60(2)
63	40	1.0	5.0	10.0	7.2	5.0	160	20160	82DC4100(1)60(2)	R82DC4100(1)60(2)
63	40	1.5	6.0	11.0	7.2	5.0	160	20160	82DC4150(1)60(2)	R82DC4150(1)60(2)
100	63	0.0010	2.5	6.5	7.2	5.0	200	40000	82EC1100(1)50(2)	R82EC1100(1)50(2)
100	63	0.0015	2.5	6.5	7.2	5.0	200	40000	82EC1150(1)50(2)	R82EC1150(1)50(2)
100	63	0.0022	2.5	6.5	7.2	5.0	200	40000	82EC1220(1)50(2)	R82EC1220(1)50(2)
VDC	VAC	Capacitance Value (µF)	T (mm)	H (mm)	L (mm)	Lead Spacing (S)	dV/dt (V/µs)	Max K _o (V²/µs)	KEMET Part Number	Legacy Part Number

(1) Insert lead and packaging code. See Ordering Options Table for available options.

(2) J = 5%, K = 10%, M = 20%

Bold denotes wound capacitor technology



#### Table 1 – Ratings & Part Number Reference cont.

		Capacitance	Dime	nsions i	n mm	Lead	dV/dt	Maximum K	KEMET	Legacy Part
VDC	VAC	Value (µF)	Т	Н	L	Spacing (S)	(V/µs)	(V²/μs)	Part Number	Number
100	63	0.0033	2.5	6.5	7.2	5.0	200	40000	82EC1330(1)50(2)	R82EC1330(1)50(2)
100	63	0.0047	2.5	6.5	7.2	5.0	200	40000	82EC1470(1)50(2)	R82EC1470(1)50(2)
100	63	0.0068	2.5	6.5	7.2	5.0	200	40000	82EC1680(1)50(2)	R82EC1680(1)50(2)
100	63	0.010	2.5	6.5	7.2	5.0	200	40000	82EC2100(1)50(2)	R82EC2100(1)50(2)
100	63	0.015	2.5	6.5	7.2	5.0	200	40000	82EC2150(1)50(2)	R82EC2150(1)50(2)
100	63	0.022	2.5	6.5	7.2	5.0	200	40000	82EC2220(1)50(2)	R82EC2220(1)50(2)
100	63	0.033	2.5	6.5	7.2	5.0	200	40000	82EC2330(1)50(2)	R82EC2330(1)50(2)
100	63	0.047	2.5	6.5	7.2	5.0	200	40000	82EC2470(1)60(2)	R82EC2470(1)60(2)
100	63	0.056	2.5	6.5	7.2	5.0	200	40000	82EC2560(1)60(2)	R82EC2560(1)60(2)
100	63	0.068	2.5	6.5	7.2	5.0	200	40000	82EC2680(1)60(2)	R82EC2680(1)60(2)
100	63	0.10	2.5	6.5	7.2	5.0	200	40000	82EC3100(1)70(2)	R82EC3100(1)70(2)
100	63	0.15	3.5	7.5	7.2	5.0	200	40000	82EC3150(1)70(2)	R82EC3150(1)70(2)
100	63	0.22	3.5	7.5	7.2	5.0	200	40000	82EC3220(1)70(2)	R82EC3220(1)70(2)
100	63	0.33	4.5	9.5	7.2	5.0	200	40000	82EC3330(1)70(2)	R82EC3330(1)70(2)
100	63	0.47	4.5	9.5	7.2	5.0	200	40000	82EC3470(1)70(2)	R82EC3470(1)70(2)
100	63	0.68	5.0	10.0	7.2	5.0	200	40000	82EC3680(1)70(2)	R82EC3680(1)70(2)
100	63	1.00	6.0	11.0	7.2	5.0	200	40000	82EC4100(1)70(2)	R82EC4100(1)70(2)
250	140	0.022	2.5	6.5	7.2	5.0	130	65000	82IC2220(1)60(2)	R82IC2220(1)60(2)
250	140	0.047	3.5	7.5	7.2	5.0	130	65000	82IC2470(1)60(2)	R82IC2470(1)60(2)
250	140	0.068	3.5	7.5	7.2	5.0	130	65000	82IC2680(1)60(2)	R82IC2680(1)60(2)
250	140	0.10	4.5	9.5	7.2	5.0	130	65000	82IC3100(1)60(2)	R82IC3100(1)60(2)
250	140	0.15	5.0	10.0	7.2	5.0	130	65000	82IC3150(1)60(2)	R82IC3150(1)60(2)
250	140	0.22	6.0	11.0	7.2	5.0	130	65000	82IC3220(1)60(2)	R82IC3220(1)60(2)
250	160	0.0068	2.5	6.5	7.2	5.0	250	125000	82IC1680(1)50(2)	R82IC1680(1)50(2)
250	160	0.010	2.5	6.5	7.2	5.0	250	125000	82IC2100(1)50(2)	R82IC2100(1)50(2)
250	160	0.015	2.5	6.5	7.2	5.0	250	125000	82IC2150(1)50(2)	R82IC2150(1)50(2)
250	160	0.022	3.5	7.5	7.2	5.0	250	125000	82IC2220(1)50(2)	R82IC2220(1)50(2)
250	160	0.033	3.5	7.5	7.2	5.0	250	125000	82IC2330(1)50(2)	R82IC2330(1)50(2)
250	160	0.047	4.5	9.5	7.2	5.0	250	125000	82IC2470(1)50(2)	R82IC2470(1)50(2)
250	160	0.068	4.5	9.5	7.2	5.0	250	125000	82IC2680(1)50(2)	R82IC2680(1)50(2)
250	160	0.10	5.0	10.0	7.2	5.0	250	125000	82IC3100(1)55(2)	R82IC3100(1)55(2)
250	160	0.15	6.0	11.0	7.2	5.0	250	125000	82IC3150(1)50(2)	R82IC3150(1)50(2)
400	160	0.0068	2.5	6.5	7.2	5.0	200	160000	82MC1680(1)60(2)	R82MC1680(1)60(2)
400	160	0.015	3.5	7.5	7.2	5.0	200	160000	82MC2150(1)60(2)	R82MC2150(1)60(2)
400	160	0.033	4.5	9.5	7.2	5.0	200	160000	82MC2330(1)60(2)	R82MC2330(1)60(2)
400	160	0.047	5.0	10.0	7.2	5.0	200	160000	82MC2470(1)60(2)	R82MC2470(1)60(2)
400	160	0.068	6.0	11.0	7.2	5.0	200	160000	82MC2680(1)60(2)	R82MC2680(1)60(2)
400	200	0.0010	2.5	6.5	7.2	5.0	400	320000	82MC1100(1)50(2)	R82MC1100(1)50(2)
400	200	0.0015	2.5	6.5	7.2	5.0	400	320000	82MC1150(1)50(2)	R82MC1150(1)50(2)
400	200	0.0022	2.5	6.5	7.2	5.0	400	320000	82MC1220(1)50(2)	R82MC1220(1)50(2)
400	200	0.0033	2.5	6.5	7.2	5.0	400	320000	82MC1330(1)50(2)	R82MC1330(1)50(2)
400	200	0.0047	2.5	6.5	7.2	5.0	400	320000	82MC1470(1)50(2)	R82MC1470(1)50(2)
400	200	0.0068	3.5	7.5	7.2	5.0	400	320000	82MC1680(1)50(2)	R82MC1680(1)50(2)
400	200	0.010	3.5	7.5	7.2	5.0	400	320000	82MC2100(1)50(2)	R82MC2100(1)50(2)
400	200	0.015	4.5	9.5	7.2	5.0	400	320000	82MC2150(1)50(2)	R82MC2150(1)50(2)
400	200	0.022	4.5	9.5	7.2	5.0	400	320000	82MC2220(1)50(2)	R82MC2220(1)50(2)
400	200	0.033	5.0	10.0	7.2	5.0	400	320000	82MC2330(1)50(2)	R82MC2330(1)50(2)
400	200	0.047	6.0	11.0	7.2	5.0	400	320000	82MC2470(1)50(2)	R82MC2470(1)50(2)
VDC	VAC	Capacitance Value (µF)	T (mm)	H (mm)	L (mm)	Lead Spacing (S)	dV/dt (V/µs)	Max K (V²/µs)	KEMET Part Number	Legacy Part Number

(1) Insert lead and packaging code. See Ordering Options Table for available options.
(2) J = 5%, K = 10%, M = 20%



#### **Soldering Process**

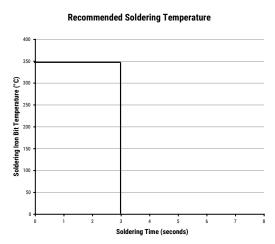
The implementation of the RoHS directive has resulted in the selection of SnAgCu (SAC) alloys or SnCu alloys as primary solder. This has increased the liquidus temperature from that of 183°C for SnPb eutectic alloy to 217 – 221°C for the new alloys. As a result, the heat stress to the components, even 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 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.

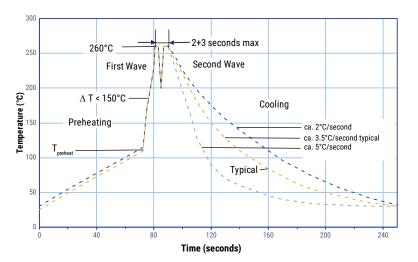
#### **Manual Soldering Recommendations**

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.**

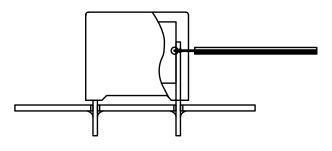
#### Wave Soldering Recommendations cont.

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

Dielectric		mum heat erature	Maximum Peak Soldering Temperature		
Film Material	Capacitor Pitch ≤ 15 mm	Capacitor Pitch > 15 mm	Capacitor Pitch ≤ 15 mm	Capacitor Pitch > 15 mm	
Polyester	130°C	130°C	270°C	270°C	
Polypropylene	110°C	130°C	260°C	270°C	
Paper	130°C	140°C	270°C	270°C	
Polyphenylene Sulphide	150°C	160°C	270°C	270°C	

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
Polypropylene	110°C
Paper	160°C
Polyphenylene Sulphide	160°C



Temperature monitored inside the capacitor.

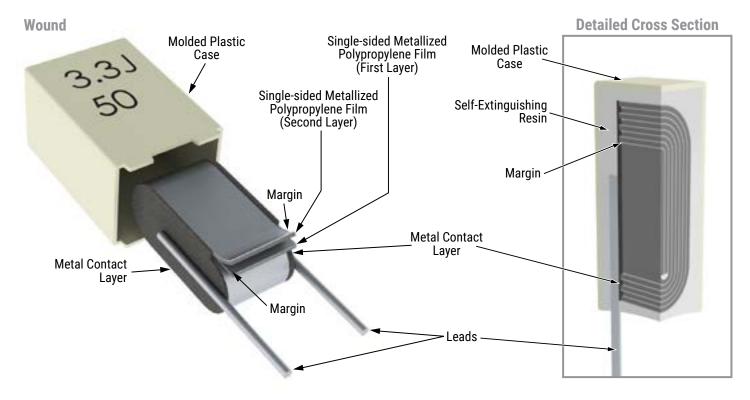
#### **Selective Soldering Recommendations**

Selective dip soldering is a variation of reflow soldering. In this method, the printed circuit board with through-hole components to be soldered is preheated and transported over the solder bath as in normal flow soldering without touching the solder. When the board is over the bath, it is stopped and pre-designed solder pots are lifted from the bath with molten solder only at the places of the selected components, and pressed against the lower surface of the board to solder the components.

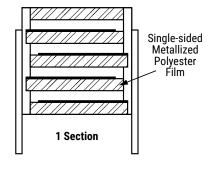
The temperature profile for selective soldering is similar to the double wave flow soldering outlined in this document, **however, instead of two baths, there is only one bath with a time from 3 to 10 seconds.** In selective soldering, the risk of overheating is greater than in double wave flow soldering, and great care must be taken so that the parts are not overheated.



## Construction

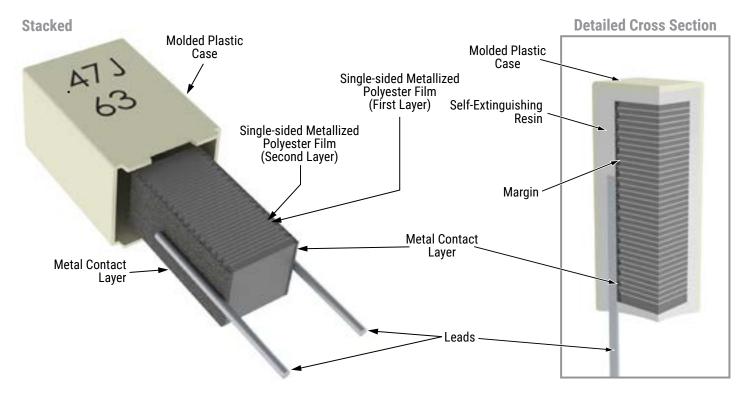


Winding Scheme



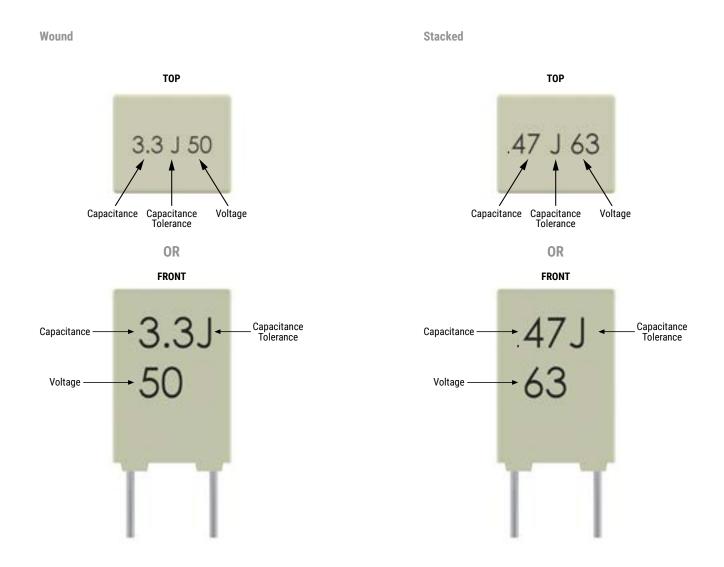


#### **Construction cont.**





#### Marking



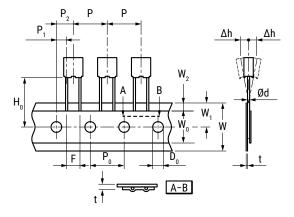
### **Packaging Quantities**

Lead Spacing	Thickness (mm)	Height (mm)	Length (mm)	Bulk Short Leads	Bulk Long Leads	Standard Reel 355 mm	Ammo Taped
	2.5	6.5	7.2	3,000	4,000	2,500	3,500
	3.5	7.5	7.2	2,000	3,000	1,800	2,500
F	4.5	9.5	7.2	1,500	2,000	1,400	1,900
5	5.0	10.0	7.2	1,000	1,500	1,200	1,700
	6.0	11.0	7.2	2,000	1,000	1,000	1,400
	7.2	13.0	7.2	1,500	750	800	1,150



## Lead Taping & Packaging (IEC 60286-2)

Figure 1 – Lead Spacing 5 & 7.5 mm



		Dimensio	ons (mm)
Description	Symbol	Lead Spacing	
	-,	5	Tolerance
		Figure 1	
Lead wire diameter	d	0.5 - 0.6	±0.05
Taping lead space	Р	12.7	±1
Feed hole lead space	Po	12.7	±0.2*
Centering of the lead wire	P ₁	3.85	±0.7
Centering of the body	P ₂	6.35	±1.3
Lead spacing	F	5	+0.6/-0.1
Component alignment	Δh	0	±2
Height of component from tape center	H ₀ **	18.5	±0.5
Carrier tape width	W	18	+1/-0.5
Hold down tape width	W _o	6	Minimum
Hole position	W ₁	9	±0.5
Hold down tape position	W ₂	3	Maximum
Feed hole diameter	D ₀	4	±0.2
Tape thickness	t	0.7	±0.2

*Maximum 1 mm on 20 lead spaces.

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

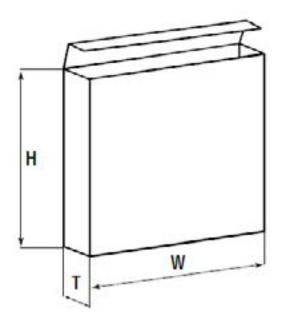
For orders of capacitors with lead space = 7.5 mm, please specify the requested version (Figure 1 or Figure 2).



# **Ammo Specifications**

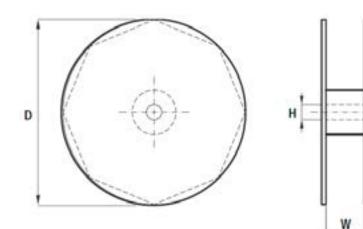
Dimensions in mm			
Н	W	Т	
360 *	340	59	

* Lower dimension available upon request (maximum 295 mm)



## **Reel Specifications**

Dimensions in mm			
D	Н	W	
355	30	55 maximum	





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