R75 Series Single Metallized Polypropylene Film, Radial, DC and Pulse Applications (Automotive Grade)

Overview

The R75 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 in a self-extinguishing solvent resistant plastic case with thermosetting resin material meeting the UL 94V–0 requirements. Two different winding constructions are used depending on voltage parameters and lead spacing. Please see the Performance Characteristics for more information.

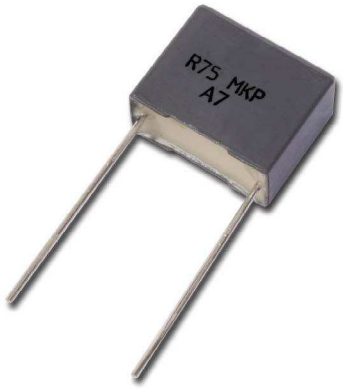
Automotive grade devices are available (up to lead spacing 22.5 mm) and meet the demanding Automotive Electronics Council's AEC–Q200 qualification requirements.

Applications

Typical applications include deflection circuits in televisions (S-correction), resonant capacitor in electronic ballast and compact lamp, power factor correction and coupling capacitor in switched mode power supply (SMPS), timing and oscillator circuits. Not suitable for across-the-line application (see Suppressor Capacitors).

Benefits

- Voltage range: 160 – 2,000 VDC
- Capacitance range: 220 pF – 33 µF
- Lead Spacing: 7.5 – 37.5 mm
- Capacitance tolerance: ±5%, ±10%, ±20%
- Climatic category: 55/105/56 IEC 60068-1
- Operating temperature range of -55˚C to +105˚C
- RoHS compliance and lead-free terminations
- Tape and reel packaging in accordance with IEC 60286–2
- Self-healing
- Automotive (AEC–Q200) grades available up to lead spacing 22.5mm



Part Number System

R75	P	N	2820	AA	30	K
Series	Rated Voltage (VDC)	Lead Spacing (mm)	Capacitance Code (pF)	Lead and Packaging Code	Internal Use	Capacitance Tolerance
Metallized Polypropylene	G = 160 I = 250 M = 400 P = 630 Q = 1,000 R = 1,250 T = 1,600 U = 2,000	D = 7.5 F = 10 I = 15 N = 22.5 R = 27.5 W = 37.5	Digits 2 – 4 indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	See Ordering Options Table	00 10 30 40 50 60 70 80	J = ±5% K = ±10% M = ±20%

Ordering Options Table

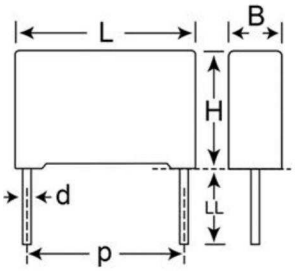
Lead Spacing Nominal (mm)	Type of Leads and Packaging	Lead Length (mm)	Lead and Packaging Code
7.5	**Standard Lead and Packaging Options**		
	Bulk (Bag) – Short Leads	4 +2/-0	AA
	Ammo Pack	H_0= 18.5 +/-0.5	DQ
	Other Lead and Packaging Options		
	Tape & Reel (Standard Reel)	H_0=18.5 +/- 0.5	CK
	Bulk (Bag)–Short Leads	2.7 +0.5/-0	JA
	Bulk (Bag)–Short Leads	3.5 +0.5/-0	JB
	Bulk (Bag)–Short Leads	10 +/- 1	JC
	Bulk (Bag)–Short Leads	4.0 +0.5/-0	JE
	Bulk (Bag)–Short Leads	3.2 +0.3/-0.2	JH
	Bulk (Bag)–Long Leads	18 +1/-1	JM
	Bulk (Bag)–Long Leads	17 +1/-2	Z3
	Bulk (Bag)–Long Leads	30 +5/-0	40
	Bulk (Bag)–Long Leads	25 +2/-1	50
10 15 22.5	**Standard Lead and Packaging Options**		
	Bulk (Bag) – Short Leads	4 +2/-0	AA
	Ammo Pack	H_0= 18.5 +/-0.5	DQ
	Other Lead and Packaging Options		
	Tape & Reel (Standard Reel)	H_0=18.5 +/- 0.5	GY
	Tape & Reel (Large Reel)	H_0=18.5 +/- 0.5	CK
	Bulk (Bag)–Short Leads	2.7 +0.5/-0	JA
	Bulk (Bag)–Short Leads	3.5 +0.5/-0	JB
	Bulk (Bag)–Short Leads	10 +/- 1	JC
	Bulk (Bag)–Short Leads	4.0 +0.5/-0	JE
	Bulk (Bag)–Short Leads	3.2 +0.3/-0.2	JH
	Bulk (Bag)–Long Leads	18 +1/-1	JM
	Bulk (Bag)–Long Leads	30 +5/-0	40
	Bulk (Bag)–Long Leads	25 +2/-1	50
27.5	**Standard Lead and Packaging Options**		
	Bulk (Bag)–Short Leads	4 +2/-0	AA
	Other Lead and Packaging Options		
	Tape & Reel (Large Reel)	H_0=18.5 +/-0.5	CK
	Bulk (Bag)–Short Leads	3.5 +0.5/-0	JB
	Bulk (Bag)–Short Leads	4.0 +0.5/-0	JE
	Bulk (Bag)–Short Leads	3.2 +0.3/-0.2	JH
	Bulk (Bag)–Long Leads	30 +5/-0	40
	Bulk (Bag) – Long Leads	25 +2/-1	50

Ordering Options Table cont'd

Lead Spacing Nominal (mm)	Type of Leads and Packaging	Lead Length (mm)	Lead and Packaging Code
37.5	**Standard Lead and Packaging Options**		
	Bulk (Tray) – Straight Leads	4 +2/-0	AA
	Other Lead and Packaging Options		
	Bulk (Bag)–Short Leads	3.5 +0.5/-0	JB
	Bulk (Bag)–Short Leads	4.0 +0.5/-0	JE
	Bulk (Bag)–Short Leads	3.2 +0.3/-0.2	JH
	Bulk (Bag)–Long Leads	30 +5/-0	40
	Bulk (Bag) – Long Leads	25 +2/-1	50

Dimensions – Millimeters

Loose



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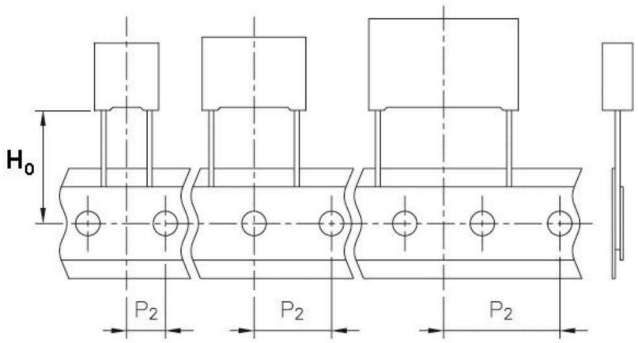
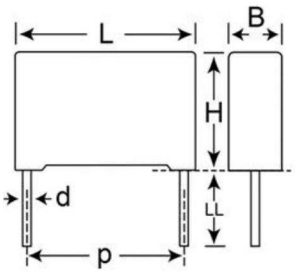


p		B		H		L		d	
Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
7.5	+/- 0.4	4.0	+0.1	9.0	+0.1	10.0	+0.2	0.5	+/- 0.05
7.5	+/- 0.4	5.0	+0.1	10.5	+0.1	10.0	+0.2	0.5	+/- 0.05
7.5	+/-0.4	6.0	+0.1	12.0	+0.1	10.0	+0.2	0.5	+/- 0.05
10.0	+/- 0.4	4.0	+0.2	9.0	+0.1	13.0	+0.2	0.6	+/- 0.05
10.0	+/- 0.4	5.0	+0.2	11.0	+0.1	13.0	+0.2	0.6	+/- 0.05
10.0	+/-0.4	6.0	+0.2	12.0	+0.1	13.0	+0.2	0.6	+/- 0.05
15.0	+/- 0.4	4.0	+0.2	10.0	+0.1	18.0	+0.3	0.8	+/- 0.05
15.0	+/- 0.4	5.0	+0.2	11.0	+0.1	18.0	+0.3	0.8	+/- 0.05
15.0	+/- 0.4	6.0	+0.2	12.0	+0.1	18.0	+0.3	0.8	+/- 0.05
15.0	+/- 0.4	7.5	+0.2	13.5	+0.1	18.0	+0.5	0.8	+/- 0.05
15.0	+/- 0.4	8.5	+0.2	14.5	+0.1	18.0	+0.5	0.8	+/- 0.05
15.0	+/- 0.4	9.0	+0.2	12.5	+0.1	18.0	+0.5	0.8	+/- 0.05

Note: See Ordering Options Table for lead length (LL/Ho) options.

Dimensions – Millimeters

Loose



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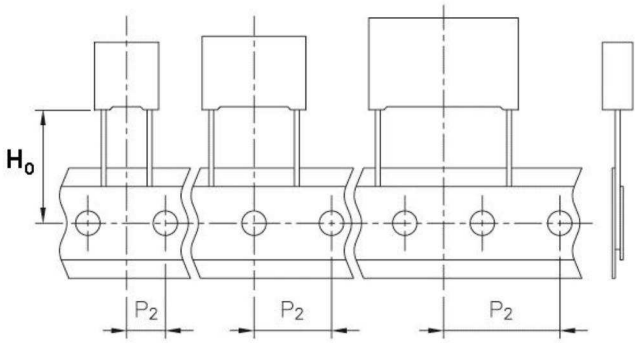

p		B		H		L		d	
Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
15.0	+/- 0.4	10.0	+0.2	16.0	+0.1	18.0	+0.5	0.8	+/- 0.05
15.0	+/- 0.4	11.0	+0.2	19.0	+0.1	18.0	+0.5	0.8	+/- 0.05
15.0	+/- 0.4	13.0	+0.2	12.0	+0.1	18.0	+0.5	0.8	+/- 0.05
22.5	+/- 0.4	6.0	+0.2	15.0	+0.1	26.5	+0.3	0.8	+/- 0.05
22.5	+/- 0.4	7.0	+0.2	16.0	+0.1	26.5	+0.3	0.8	+/- 0.05
22.5	+/- 0.4	8.5	+0.2	17.0	+0.1	26.5	+0.3	0.8	+/- 0.05
22.5	+/- 0.4	10.0	+0.2	18.5	+0.1	26.5	+0.3	0.8	+/- 0.05
22.5	+/- 0.4	11.0	+0.2	20.0	+0.1	26.5	+0.3	0.8	+/- 0.05
22.5	+/- 0.4	13.0	+0.2	22.0	+0.1	26.5	+0.3	0.8	+/- 0.05
27.5	+/- 0.4	9.0	+0.2	17.0	+0.1	32.0	+0.3	0.8	+/- 0.05
27.5	+/- 0.4	11.0	+0.2	20.0	+0.1	32.0	+0.3	0.8	+/- 0.05
27.5	+/- 0.4	13.0	+0.2	22.0	+0.1	32.0	+0.3	0.8	+/- 0.05
27.5	+/- 0.4	13.0	+0.2	25.0	+0.1	32.0	+0.3	0.8	+/- 0.05
27.5	+/- 0.4	14.0	+0.2	28.0	+0.1	32.0	+0.3	0.8	+/- 0.05
27.5	+/- 0.4	18.0	+0.2	33.0	+0.1	32.0	+0.3	0.8	+/- 0.05
27.5	+/- 0.4	22.0	+0.2	37.0	+0.1	32.0	+0.3	0.8	+/- 0.05
37.5	+/- 0.4	11.0	+0.3	22.0	+0.1	41.5	+0.3	1.0	+/- 0.05
37.5	+/- 0.4	13.0	+0.3	24.0	+0.1	41.5	+0.3	1.0	+/- 0.05
37.5	+/- 0.4	16.0	+0.3	28.5	+0.1	41.5	+0.3	1.0	+/- 0.05
37.5	+/- 0.4	19.0	+0.3	32.0	+0.1	41.5	+0.3	1.0	+/- 0.05
37.5	+/- 0.4	20.0	+0.3	40.0	+0.1	41.5	+0.3	1.0	+/- 0.05
37.5	+/- 0.4	24.0	+0.3	44.0	+0.1	41.5	+0.3	1.0	+/- 0.05
37.5	+/- 0.4	30.0	+0.3	45.0	+0.1	41.5	+0.3	1.0	+/- 0.05

Note: See Ordering Options Table for lead length (LL/Ho) options.

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												
Sections	1									3			
Rated Voltage V_R (VDC)	160	160	250	250	400	400	630	630	1000	1000	1250	1600	2000
Rated Voltage V_R (VAC)	70	90	140	160	200	220	220	250	250	400	600	650	700
Capacitance Range (µF)	0.1 – 0.33	0.068 – 33	0.068 – 0.22	0.027 – 33	0.027 – 0.068	0.01 – 15	0.01 – 0.027	0.001 – 8.2	0.012 – 3.9	0.00022 – 0.0082	0.0082 – 2.2	0.0039 – 1.5	0.001 – 1
Capacitance Values	E12 series (IEC 60063) measured @ 1 kHz and +20 ±1°C												
Capacitance Tolerance	±5%, ±10%, ±20%												
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												
	Average relative humidity ≤ 75%												
	RH = 95% for 30 days per year												
	RH = 85% for further days limited by average value per year												
Test Voltage	1.6 x V_R VDC for 2 seconds (between terminations) @ +25°C ±5°C												
Capacitance Drift	Maximum 0.5% after a 2 year storage period at a temperature of +10°C to +40°C and a relative humidity of 40% to 60%												
Maximum Pulse Steepness	dV/dt according to Table 1. For peak to peak voltages lower than rated voltage (Vpp <V_R), the specified dv/dt can be multiplied by the factor V_R/Vpp												
Temperature Coefficient	-(200 ±100) ppm/°C at 1 kHz												
Self Inductance (Lead Length ~ 2 mm)	Lead Spacing (mm)	7.5	10	15	22.5	27.5	37.5						
	L (nH) ≈	8	9	10	18	18	20						
	Maximum 1 nH per 1 mm lead and capacitor length.												
Dissipation Factor tanδ	Maximum Values @ 25°C ±5°C												
	Frequency	C ≤ 0.1 µF	0.1 µF < C ≤ 1.0 µF	1.0 µF < C ≤ 4.7 µF	C > 4.7 µF								
	1 kHz	0.04%	0.05%	0.06%	0.10%								
	10 kHz	0.06%	0.08%	-	-								
	100 kHz	0.25%	-	-	-								

Performance Characteristics cont'd

Insulation Resistance	Measured @ +25°C ±5°C, 100 VDC 60 seconds	
	Minimum Values Between Terminals	
	C ≤ 0.33 µF	C > 0.33 µF
	≥ 100,000 MΩ (≥ 500,000 MΩ) *	≥ 30,000 MΩ • µF (≥ 150,000 MΩ • µF) *

* typical value

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.

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| ≤ 2%, 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 for C ≤ 1µF Δ tanδ ≤ 0.001 @ 1 kHz for C > 1µF 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| ≤ 1%, Δ tanδ ≤ 0.001 @10 kHz for C ≤ 1µF Δ tanδ ≤ 0.001 @ 1 kHz for C > 1µF IR after test ≥ initial limit

Environmental Compliance

All KEMET pulse capacitors are RoHS Compliant.

RoHS Compliant

Table 1 – Ratings & Part Number Reference cont'd

VDC	VAC	Capacitance Value (µF)	Dimensions in mm			Lead Spacing (p)	dV/dt (V/µs)	Max K_0 (V^2/µs)	New KEMET Part Number	Legacy Part Number
			B	H	L					
630	250	0.0056	4.0	9.0	10.0	7.5	2,400	3,024,000	75PD1560(1)40(2)	R75PD1560(1)40(2)
630	250	0.0068	4.0	9.0	10.0	7.5	2,400	3,024,000	75PD1680(1)40(2)	R75PD1680(1)40(2)
630	250	0.0082	4.0	9.0	10.0	7.5	2,400	3,024,000	75PD1820(1)40(2)	R75PD1820(1)40(2)
630	250	0.010	5.0	10.5	10.0	7.5	2,400	3,024,000	75PD2100(1)40(2)	R75PD2100(1)40(2)
630	250	0.012	5.0	10.5	10.0	7.5	2,400	3,024,000	75PD2120(1)40(2)	R75PD2120(1)40(2)
630	250	0.015	6.0	12.0	10.5	7.5	2,400	3,024,000	75PD2150(1)30(2)	R75PD2150(1)30(2)
630	250	0.018	6.0	12.0	10.5	7.5	2,400	3,024,000	75PD2180(1)30(2)	R75PD2180(1)30(2)
630	250	0.0010	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1100(1)00(2)	R75PF1100(1)00(2)
630	250	0.0012	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1120(1)00(2)	R75PF1120(1)00(2)
630	250	0.0015	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1150(1)00(2)	R75PF1150(1)00(2)
630	250	0.0018	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1180(1)00(2)	R75PF1180(1)00(2)
630	250	0.0022	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1220(1)00(2)	R75PF1220(1)00(2)
630	250	0.0027	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1270(1)00(2)	R75PF1270(1)00(2)
630	250	0.0033	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1330(1)00(2)	R75PF1330(1)00(2)
630	250	0.0039	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1390(1)00(2)	R75PF1390(1)00(2)
630	250	0.0047	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1470(1)00(2)	R75PF1470(1)00(2)
630	250	0.0056	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1560(1)00(2)	R75PF1560(1)00(2)
630	250	0.0068	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1680(1)00(2)	R75PF1680(1)00(2)
630	250	0.0082	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF1820(1)00(2)	R75PF1820(1)00(2)
630	250	0.010	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF2100(1)30(2)	R75PF2100(1)30(2)
630	250	0.012	4.0	9.0	13.0	10.0	2,000	2,520,000	75PF2120(1)30(2)	R75PF2120(1)30(2)
630	250	0.015	5.0	11.0	13.0	10.0	2,000	2,520,000	75PF2150(1)30(2)	R75PF2150(1)30(2)
630	250	0.018	5.0	11.0	13.0	10.0	2,000	2,520,000	75PF2180(1)30(2)	R75PF2180(1)30(2)
630	250	0.022	6.0	12.0	13.0	10.0	2,000	2,520,000	75PF2220(1)30(2)	R75PF2220(1)30(2)
630	250	0.027	5.0	11.0	18.0	15.0	1,000	1,260,000	75PI2270(1)00(2)	R75PI2270(1)00(2)
630	250	0.033	5.0	11.0	18.0	15.0	1,000	1,260,000	75PI2330(1)00(2)	R75PI2330(1)00(2)
630	250	0.039	5.0	11.0	18.0	15.0	1,000	1,260,000	75PI2390(1)30(2)	R75PI2390(1)30(2)
630	250	0.047	5.0	11.0	18.0	15.0	1,000	1,260,000	75PI2470(1)30(2)	R75PI2470(1)30(2)
630	250	0.056	5.0	11.0	18.0	15.0	1,000	1,260,000	75PI2560(1)30(2)	R75PI2560(1)30(2)
630	250	0.068	6.0	12.0	18.0	15.0	1,000	1,260,000	75PI2680(1)30(2)	R75PI2680(1)30(2)
630	250	0.082	6.0	12.0	18.0	15.0	1,000	1,260,000	75PI2820(1)30(2)	R75PI2820(1)30(2)
630	250	0.10	7.5	13.5	18.0	15.0	1,000	1,260,000	75PI3100(1)30(2)	R75PI3100(1)30(2)
630	250	0.10	9.0	12.5	18.0	15.0	1,000	1,260,000	75PI3100(1)70(2)	R75PI3100(1)70(2)
630	250	0.12	7.5	13.5	18.0	15.0	1,000	1,260,000	75PI3120(1)30(2)	R75PI3120(1)30(2)
630	250	0.12	9.0	12.5	18.0	15.0	1,000	1,260,000	75PI3120(1)70(2)	R75PI3120(1)70(2)
630	250	0.15	8.5	14.5	18.0	15.0	1,000	1,260,000	75PI3150(1)30(2)	R75PI3150(1)30(2)
630	250	0.15	13.0	12.0	18.0	15.0	1,000	1,260,000	75PI3150(1)70(2)	R75PI3150(1)70(2)
630	250	0.18	10.0	16.0	18.0	15.0	1,000	1,260,000	75PI3180(1)30(2)	R75PI3180(1)30(2)
630	250	0.18	13.0	12.0	18.0	15.0	1,000	1,260,000	75PI3180(1)70(2)	R75PI3180(1)70(2)
630	250	0.22	10.0	16.0	18.0	15.0	1,000	1,260,000	75PI3220(1)30(2)	R75PI3220(1)30(2)
630	250	0.27	11.0	19.0	18.0	15.0	1,000	1,260,000	75PI3270(1)30(2)	R75PI3270(1)30(2)
630	250	0.33	11.0	19.0	18.0	15.0	1,000	1,260,000	75PI3330(1)30(2)	R75PI3330(1)30(2)
630	250	0.082	6.0	15.0	26.5	22.5	400	504,000	75PN2820(1)30(2)	R75PN2820(1)30(2)
630	250	0.10	6.0	15.0	26.5	22.5	400	504,000	75PN3100(1)30(2)	R75PN3100(1)30(2)
630	250	0.12	6.0	15.0	26.5	22.5	400	504,000	75PN3120(1)30(2)	R75PN3120(1)30(2)
630	250	0.15	6.0	15.0	26.5	22.5	400	504,000	75PN3150(1)30(2)	R75PN3150(1)30(2)
630	250	0.18	7.0	16.0	26.5	22.5	400	504,000	75PN3180(1)30(2)	R75PN3180(1)30(2)
630	250	0.22	7.0	16.0	26.5	22.5	400	504,000	75PN3220(1)30(2)	R75PN3220(1)30(2)
630	250	0.27	8.5	17.0	26.5	22.5	400	504,000	75PN3270(1)30(2)	R75PN3270(1)30(2)
630	250	0.33	10.0	18.5	26.5	22.5	400	504,000	75PN3330(1)30(2)	R75PN3330(1)30(2)
630	250	0.39	10.0	18.5	26.5	22.5	400	504,000	75PN3390(1)30(2)	R75PN3390(1)30(2)
630	250	0.47	11.0	20.0	26.5	22.5	400	504,000	75PN3470(1)30(2)	R75PN3470(1)30(2)
630	250	0.56	11.0	20.0	26.5	22.5	400	504,000	75PN3560(1)30(2)	R75PN3560(1)30(2)
630	250	0.68	13.0	22.0	26.5	22.5	400	504,000	75PN3680(1)30(2)	R75PN3680(1)30(2)
630	250	0.39	9.0	17.0	32.0	27.5	180	226,800	75PR3390(1)30(2)	R75PR3390(1)30(2)
630	250	0.47	9.0	17.0	32.0	27.5	180	226,800	75PR3470(1)40(2)	R75PR3470(1)40(2)
630	250	0.56	11.0	20.0	32.0	27.5	180	226,800	75PR3560(1)30(2)	R75PR3560(1)30(2)
630	250	0.68	11.0	20.0	32.0	27.5	180	226,800	75PR3680(1)30(2)	R75PR3680(1)30(2)
630	250	0.82	13.0	22.0	32.0	27.5	180	226,800	75PR3820(1)30(2)	R75PR3820(1)30(2)
630	250	1.0	13.0	22.0	32.0	27.5	180	226,800	75PR4100(1)30(2)	R75PR4100(1)30(2)
VDC	VAC	Capacitance Value (µF)	B (mm)	H (mm)	L (mm)	Lead Spacing (p)	dV/dt (V/µs)	Max K_0 (V^2/µs)	New 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%