Impregnated Metallized Paper EMI Suppression Capacitors SMP253, Class Y2, 310VAC, Surface Mount Device

Overview

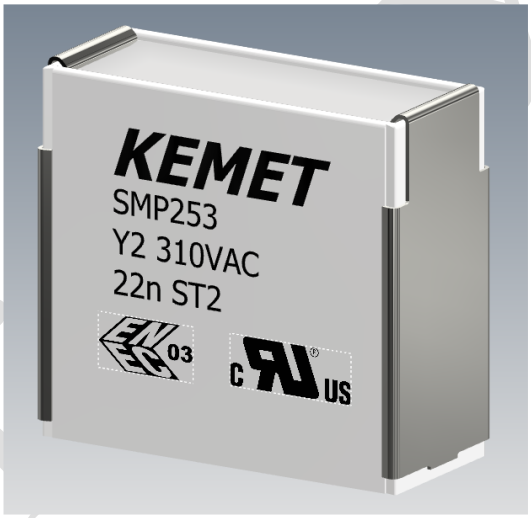
Multilayer, metallized paper, encapsulated and impregnated in self-extinguishing material that meets the requirements of UL 94 V-0.

Applications

For worldwide use as an electromagnetic interference suppressor in all Y2 applications, line-to earth.

Benefits

- High dv/dt capability
- Impregnated paper that ensures excellent stability and reliability properties, particularly in applications with continuous operation
- Approvals: ENEC, cULus
- Rated voltage: 310 VAC 50/60 Hz
- Maximum recommended DC voltage 1500 VDC
- Capacitance range: 0.001-0.068 µ
- Capacitance tolerance: ± 20%
- Size code: 5045 (12.7 mm), 6560 (16.5 mm), 7067 (17.8 mm)
- Climatic Category: 40/125/56/B, IEC 60068-1
- Tape and reel packaging in accordance with IEC 60286-3
- RoHS compliance and lead-free terminations
- Operating temperature range of -40 ˚C to +125 ˚C
- 100 % screening factory test at 3200 VDC
- Excellent self-healing properties ensure long life even when subjected to frequent over voltages
- Good resistance to ionization due to impregnated dielectric
- Automotive (AEC–Q200) grade



Customer Part Number System

SMP253	F	A	4100	M	B31	TR24
Series	Rated Voltage (VAC)		Capacitance code (pF)	Capacitance Tolerance	Chip Size	Packaging
Y2, Metallized Paper	F = 310 VAC	A = 12.7 B = 16.5 C = 17.8	Digits 2-4 (3) indicates the first three digits of the capacitance value. First digit indicates the total number of digits in the capacitance value.	M = ±20%	B31 = 12.7 C31 = 16.5 D32 = 17.8	See Ordering Options Table

KEMET Part Number System

P	101	YR	102	M	310	V
Capacitor Class	Series	Chip Size	Capacitance Code (pF)	Capacitance Tolerance	Rated Voltage (VAC)	Packing Code
P = Paper	Y2, Metallized paper	YR = B31 ZS = C31 FK = D32	First two digits indicate the two most significant digits of the capacitance value in picofarads. The third digit is the number of following zeros.	M = ±20%	310 = 310 VAC	See Ordering Options Table

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Ratings & Part Number Reference

Chip Capacitance [nF]	L -0/+0.4	W -0/+0.6	T -0/+0.4	dU/dt [V/µs]	Customer Part Number	KEMET Part Number
1.0	12.7	11.5	6.5	2000	SMP253FA4100MB31(1)	P101YR102M310(1)
1.5	12.7	11.5	6.5	2000	SMP253FA4150MB31(1)	P101YR152M310(1)
2.2	12.7	11.5	6.5	2000	SMP253FA4220MB31(1)	P101YR222M310(1)
2.5	12.7	11.5	6.5	2000	SMP253FA4250MB31(1)	P101YR252M310(1)
3.3	12.7	11.5	6.5	2000	SMP253FA4330MB31(1)	P101YR332M310(1)
3.9	12.7	11.5	6.5	2000	SMP253FA4390MB31(1)	P101YR392M310(1)
4.7	12.7	11.5	6.5	2000	SMP253FA4470MB31(1)	P101YR472M310(1)
5.6	12.7	11.5	6.5	2000	SMP253FA4560MB31(1)	P101YR562M310(1)
6.8	12.7	11.5	6.5	2000	SMP253FA4680MB31(1)	P101YR682M310(1)
8.2	12.7	11.5	6.5	2000	SMP253FA4820MB31(1)	P101YR822M310(1)
10	12.7	11.5	6.5	2000	SMP253FA5100MB31(1)	P101YR103M310(1)
12	16.5	15.0	7.0	1400	SMP253FB5120MC31(1)	P101ZS123M310(1)
15	16.5	15.0	7.0	1400	SMP253FB5150MC31(1)	P101ZS153M310(1)
18	16.5	15.0	7.0	1400	SMP253FB5180MC31(1)	P101ZS183M310(1)
22	16.5	15.0	7.0	1400	SMP253FB5220MC31(1)	P101ZS223M310(1)
27	16.5	15.0	7.0	1400	SMP253FB5270MC31(1)	P101ZS273M310(1)
33	17.8	17.0	10.2	1000	SMP253FC5330MD32(1)	P101FK333M310(1)
39	17.8	17.0	10.2	1000	SMP253FC5390MD32(1)	P101FK393M310(1)
47	17.8	17.0	10.2	1000	SMP253FC5470MD32(1)	P101FK473M310(1)
56	17.8	17.0	10.2	1000	SMP253FC5560MD32(1)	P101FK563M310(1)
68	17.8	17.0	10.2	1000	SMP253FC5680MD32(1)	P101FK683M310(1)

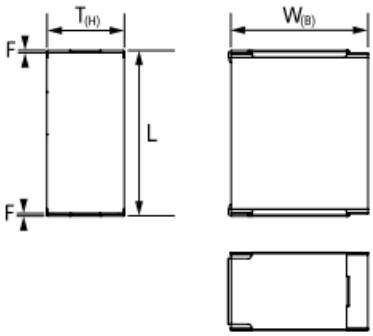
All dimensions are in mm

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

Ordering Options Table

Chip Size (EIA)	Packaging Type	KEMET Packaging Code	Legacy Packaging Code
5045, 6560, 7067	Bulk	A	BULK
5045	Tape&Reel (Horizontal)	V	TR24
5026	Tape&Reel (Vertical)	Y	TV24
6560	Tape&Reel (Horizontal)	V	TR24
6528	Tape&Reel (Vertical)	Y	TV44
7067	Tape&Reel (Horizontal)	V	TR32
7040	Tape&Reel (Vertical)	Y	TV32

Dimensions Millimeters



Chip Size	W		T		L		F	
EIA	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
5045	11.5	-0/+0.6	6.5	-0/+0.4	12.7	-0/+0.4	0.5	Nominal
5026	6.5	-0/+0.6	11.5	-0/+0.4	12.7	-0/+0.4	0.5	Nominal
6560	15.0	-0/+0.6	7.0	-0/+0.4	16.5	-0/+0.4	0.5	Nominal
6528	7.0	-0/+0.6	15.0	-0/+0.4	16.5	-0/+0.4	0.5	Nominal
7067	17.0	-0/+0.6	10.2	-0/+0.4	17.8	-0/+0.4	0.5	Nominal
7040	10.2	-0/+0.6	17.0	-0/+0.4	17.8	-0/+0.4	0.5	Nominal

General Technical Data

Execution: Wound technology
Dielectric: Metallized Paper
Winding: Non-inductive type
Leads: Tinned copper
Climatic Category: 40/125/56 B IEC 60068-1
Temperature Range: -40°C to 125°C
Category Voltage (Vc): Vc = V_R up to 125°C.

Electrical Characteristics

Rated Capacitance Range :	1nF - 68 nF
Rated Voltage (V_{RAC}):	310 Vrms
Recommended DC voltage:	≤1500 VDC
Capacitance Tolerance:	± 20% (@ room temperature)
D.F.(tgδ):	≤ 130 x10^{-4} @ 1kHz/25°C
Insulation Resistance:	≥ 12000 MΩ

Soldering Process

Reflow soldering temperature is measured on the top body surface of the component. Use the recommended soldering profiles for convection reflow ovens and IR reflow ovens. If a vapor phase reflow oven is used, consult KEMET. Exceeding the manufacturer's process recommendations may harm the component. KEMET is not liable for any defect caused by exceeding recommendations. According to international standards, the maximum temperature capability must be measured on the top surface of a component. The international standards do not define how the thermocouple should be fastened on the component. Our recommendation for attaching the thermocouple to the top surface of the component is to glue it with high temperature resistant glue or with thermo tape specified for reflow profiling. Compliant to lead-free reflow soldering process.

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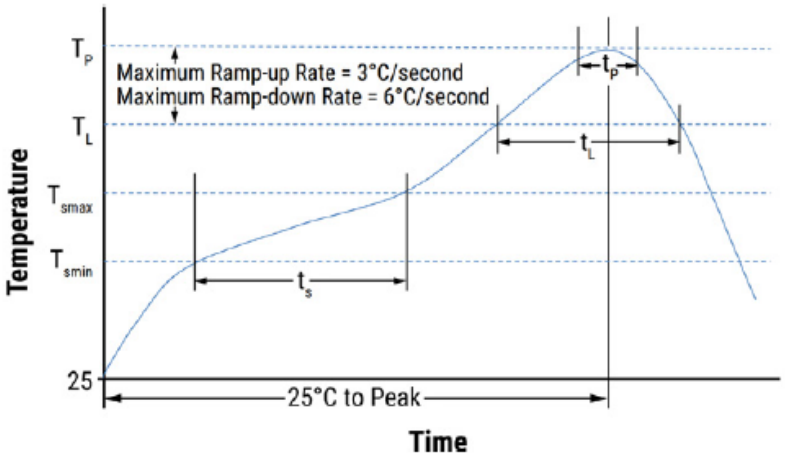
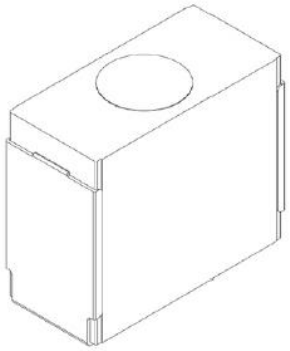
Profile Feature	Termination Finish
	100% Matte Sn
Preheat/Soak	
Temperature Minimum (T_{Smin})	150°C
Temperature Maximum (T_{Smax})	200°C
Time (t_s) from T_{Smin} to T_{Smax}	60 - 120 seconds
Ramp-Up Rate (T_L to T_P)	3°C/second maximum
Liquidous Temperature (T_L)	217°C
Time Above Liquidous (t_L)	60 - 150 seconds
Peak Temperature (T_P)	245°C
Time Within 5°C of Maximum Peak Temperature (t_P)	30 seconds maximum
Ramp-Down Rate (T_P to T_L)	6°C/second maximum
Time 25° to Peak Temperature	8 minutes maximum



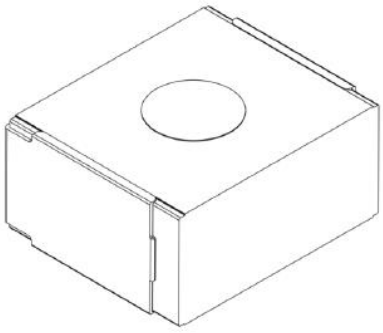
Note: All temperatures refer to the center of the package, measured on the capacitor body surface that is facing up during assembly reflow.

Temperature Sensor Position in Reflow Profiling

For vertical capacitors profiling



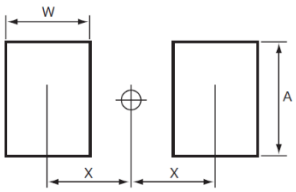
For horizontal capacitors profiling



Soldering Land Dimensions

L	Case size		W		Ah		Av		X	
mm	Horizontal	Vertical	mils	mm	mils	mm	mils	mm	mils	mm
12.7	5045	5026	100	2.5	455	11.6	260	6.6	276	7.0
16.5	6560	6528	120	3.0	590	15.0	280	7.1	355	9.0
17.8	7067	7040	140	3.5	670	17.0	405	10.3	374	9.5

Ah = horizontal mounting
Av = vertical mounting



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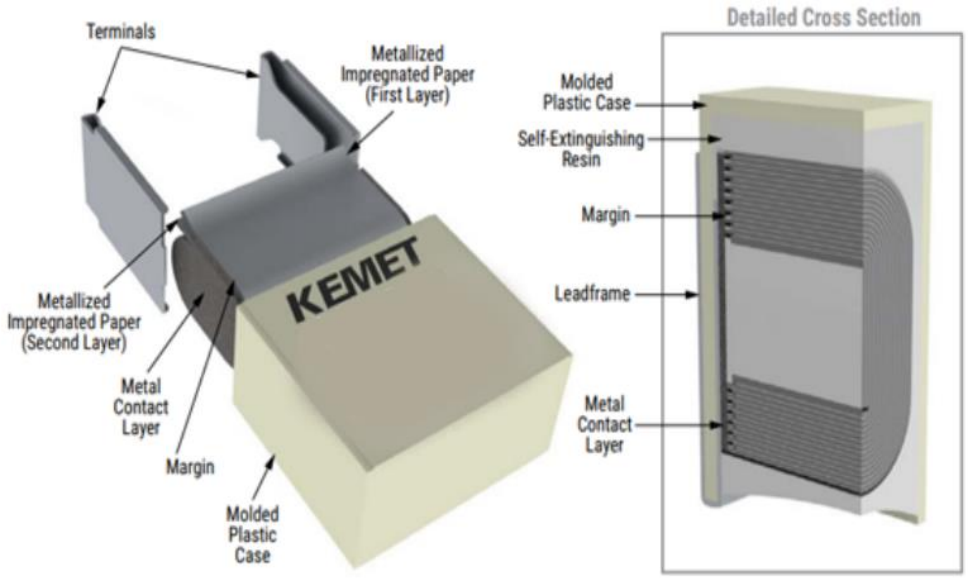
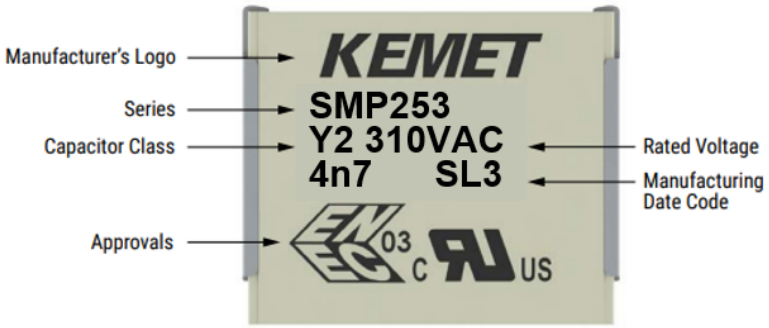
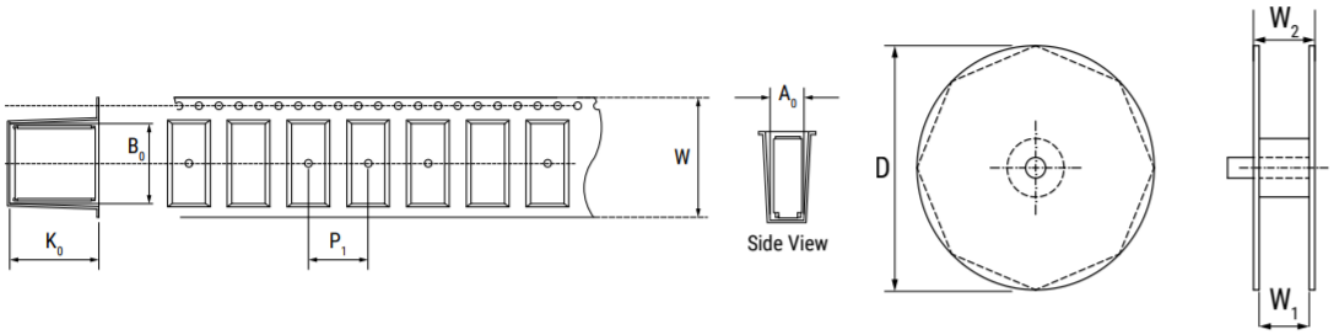
Construction



Marking



Vertical Taping Orientation



EIA Size Code Vertical Mounting	Dimensions in mm			Taping Specification							
	B*	H*	L	W	P_1	A_0	B_0	K_0	D	W_1	W_2
	Nominal	Nominal	Nominal	-0/+0.3	+/-0.1	Nominal	Nominal	Nominal	±2.0	-0/+2	Maximum
5026	6.5	11.5	12.7	24.0	16.0	6.9	13.1	11.8	330	24.4	30.0
6528	7.0	15.0	16.5	44.0	20.0	7.5	17.0	15.3	330	44.4	50.0
7040**	10.2	17.0	17.8	32.0	20.0	10.9	18.5	19.9	330	32.4	38.0

*Dimensions B and H in vertical mounting correspond H and B in the standard mounting and in the article tables.
**Double sprocket holes

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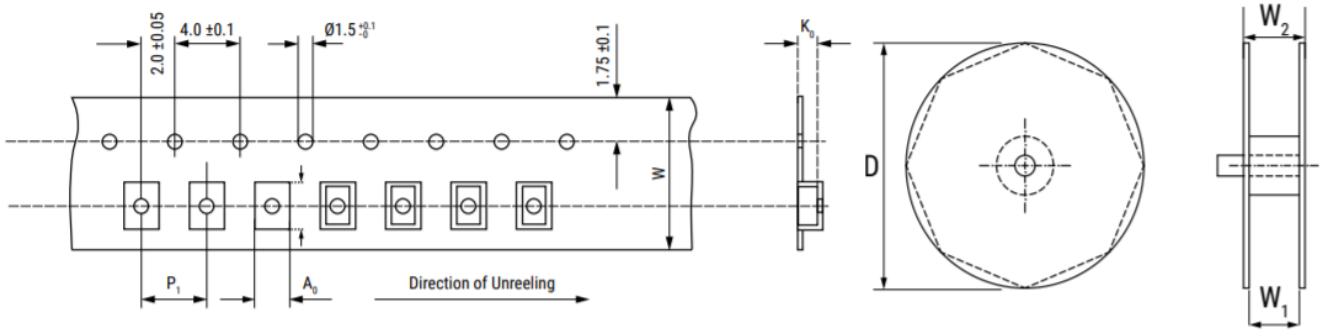
Horizontal Taping Orientation



EIA Size Code Horizontal Mounting	Dimensions in mm			Taping Specification							
	B	H	L	W	P_1	A_0	B_0	K_0	D	W_1	W_2
	Nominal	Nominal	Nominal	-0/+0.3	+/-0.1	Nominal	Nominal	Nominal	±2.0	-0/+2	Maximum
5045	11.5	6.5	12.7	24.0	16.0	11.9	13.1	6.8	330	24.4	30.0
6560	15.0	7.0	16.5	24.0	20.0	15.4	16.8	7.3	330	24.4	30.0
7067**	17.0	10.2	17.8	32.0	24.0	17.9	18.5	10.9	330	32.4	38.0

**Double sprocket holes

Packing Quantities

Chip Size EIA	Standard Reel (330 mm)	Thickness	Height	Length	Packing Quantity
5045	Horizontal	6.5	11.5	12.7	600
5026	Vertical	11.5	6.5	12.7	400
6560	Horizontal	7.0	15.0	16.5	500
6528	Vertical	15.0	7.0	16.5	200
7067	Horizontal	10.2	17.0	17.8	270
7040	Vertical	17.0	10.2	17.8	200

Approvals

Certification Body	Mark	Specification	File Number
IMQ S.p.A.		EN/IEC 60384–14	TBD
UL		UL 60384–14 and CAN/CSA–E60384–14	TBD

Prototype Sample Disclaimer

The Customer acknowledges the following limitations of the prototype samples: (1) prototype samples are manufactured from preliminary designs and manufacturing processes, may not represent final designs, have not been released for commercial use and are not subject to the same quality control procedures applicable to released products; (2) prototype samples are not qualified parts and are provided as-is by KEMET Electronics Corporation, which specifically disclaims any and all warranties and guarantees, express or implied, including without limitation the warranties of merchantability and fitness for a particular purpose or use; (3) prototype samples are not intended for commercial use, are provided for engineering evaluation only and are not recommended for use in the Customer's production line; and (4) the Customer assumes the risk of any and all uses that the Customer makes of the prototype samples.