

METALLIZED POLYESTER FILM CAPACITOR
PRODUCT CODE: JSN

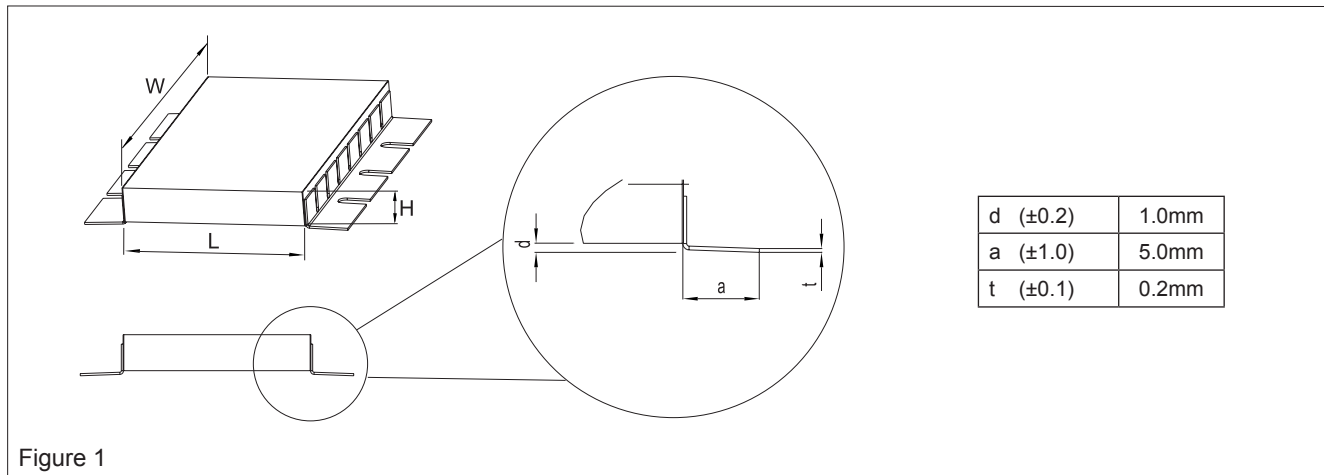


Figure 1

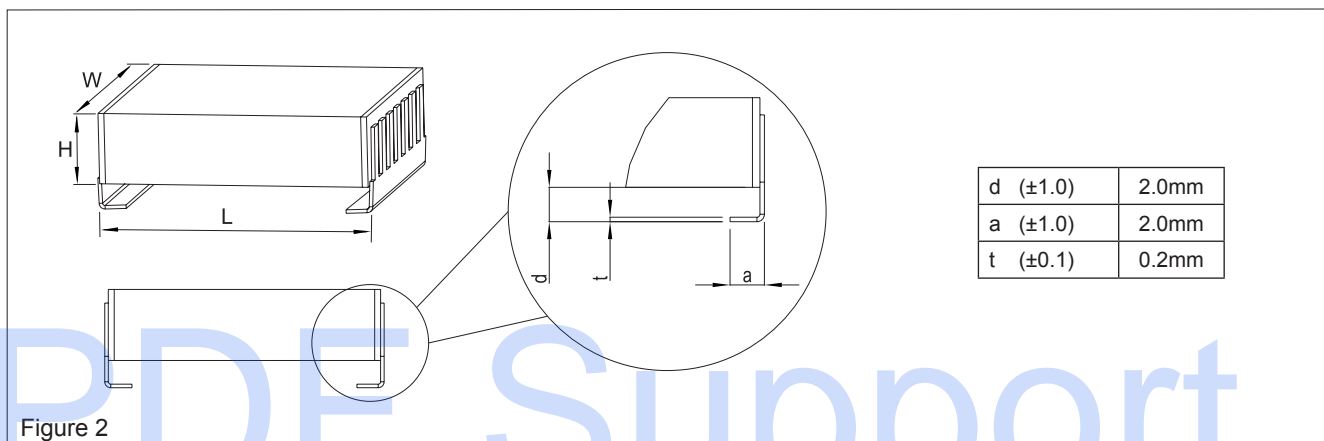


Figure 2

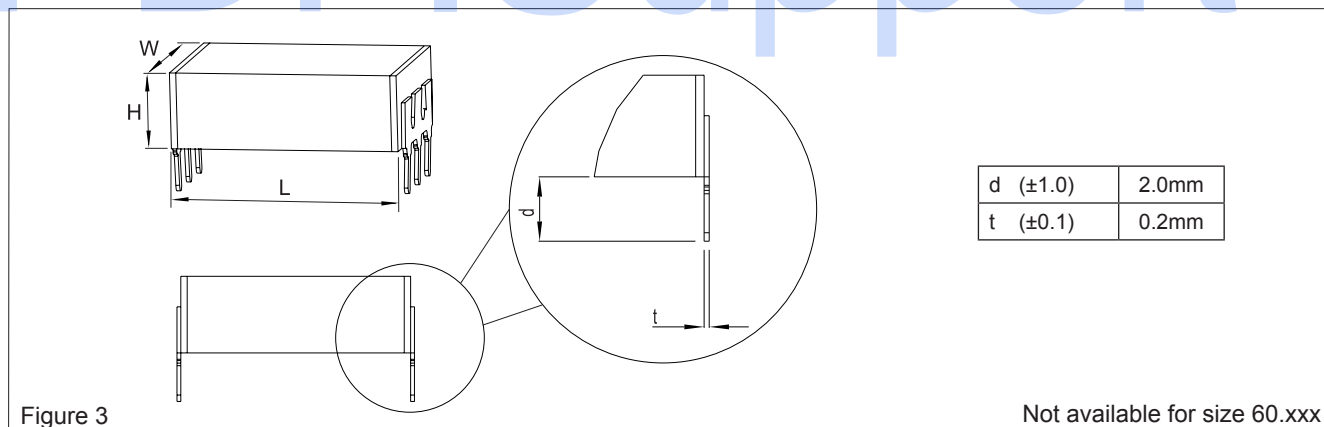


Figure 3

Not available for size 60.xxx

Market Applications

JSN series (Jumbo Stacked Naked) film capacitor has been designed especially for Automotive Power Electronics applications that require high reliability long life and severe working conditions (high operating temperature and very stressable mechanical and vibration requirements).

Some of the applications for both the 14V and 42V Powernet are the following:

Integrated Starter Alternator, Camless, Common rail, Electric Power steering, climate control, DC/DC and AC/DC converters.

JSN series could be used for the power electronics in electric/hybrid and fuel cell cars.

Moreover JSN series is suitable to be used for low power DC/DC and AC/DC converters for Telecom and Industrial applications like radio link, telecom central office, small welding machines ecc.

PRODUCT CODE SYSTEM

The part number, comprising 14 digits, is formed as follows:

1	2	3	4	5	6	7	8	9	10	11	12	13	14
J	S	N											-

- Digit 1 to 3 Series code.
- Digit 4 d.c. rated voltage
D = 63V; E = 100V; G = 160V; I = 250V
M = 400V
- Digit 5 Size code (see table 1):
- Digit 6 to 9 Digits 7-8-9 indicate the first three digits of Capacitance value and the 6th digit indicates the number of zeros that must be added to obtain the rated Capacitance in pF.
- Digit 10 Capacitance Tolerance:
J=±5%; K=±10%; M=±20%; X=special
- Digit 11 Dielectric: B=PET H.T.
- Digit 12 Version (see table1):
1 to 4 = Terminals Figure 1
6 to 9 = Terminals Figure 2
T to Z = Terminals Figure 3
A to P = special
- Digit 13 Packaging
M=bulk; S=taped (stick); N=taped (reel)
L=taped (tray)
- Digit 14 Internal use

MOUNTING & SOLDERING

The preferential method for mounting depends on the chosen terminals:

- JSN series with terminals according to figure 1 should be mounted using electrical welding or gluing.
- JSN series with terminals according to figure 2 should be mounted with reflow process (see thermal profile) or gluing.
- JSN series with terminals according to figure 3 should be wave soldered.

CAUTION

Hand assembly

In case of hand assembly with soldering iron the following recommendation must be taken :

- Maximum temperature on the soldering iron: 250°C for max 5s

Avoid contact between the soldering iron and the body of the capacitor

If PC Boards are assembled by hand, care must be taken to avoid mechanical damage. We recommend:

- use tweezers, the components should be gripped across two terminals
- the usage of a pen under vacuum of the capacitor is recommended

Table 1

Terminals Code digit 12	Size code (Digit 5)					
	60.80 (K) 90.80 (N) 100.80 (R)	60.115 (J) 90.115 (M) 100.115 (V)	90.145 (W) 100.145 (X)	60.160 (L) 90.160 (O) 100.160 (S)	90.210 (P) 100.210 (T)	90.230 (Q) 100.230 (U)
Figure 1 : $W_{terminal} = 16,0$ mm	1	*	*	*	*	*
Figure 1 : $W_{terminal} = 22,0$ mm		2	*	*	*	*
Figure 1 : $W_{terminal} = 33,0$ mm			3	3	*	*
Figure 1 : $W_{terminal} = 45,0$ mm					4	4
Figure 2 : $W_{terminal} = 20,0$ mm	6	6	*	*	*	*
Figure 2 : $W_{terminal} = 30,0$ mm			7	*	*	*
Figure 2 : $W_{terminal} = 40,0$ mm				8	8	*
Figure 2 : $W_{terminal} = 50,0$ mm						9
Figure 3 : $W_{terminal} = 16,0$ mm	T	*	*	*	*	*
Figure 3 : $W_{terminal} = 21,5$ mm		U	*	*	*	*
Figure 3 : $W_{terminal} = 34,5$ mm			V	V	*	*
Figure 3 : $W_{terminal} = 46,0$ mm					Z	Z

*also available upon special request.

METALLIZED POLYESTER FILM CAPACITOR
PRODUCT CODE: JSN

Rated Cap.	Size code	63Vdc / 40 Vac					Part number Terminal executions				
		W Max	H Max	L Max	Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	1	2	3		
15 μF	60.80	21.5	7.0	17.0	25.0	3.15 E3	JSNDK5150-B	1	6	**	- 0
22 μF	60.80	21.5	9.0	17.0	25.0	3.15 E3	JSNDK5220-B	1	6	**	- 0
33 μF	60.80	21.5	12.0	17.0	25.0	3.15 E3	JSNDK5330-B	1	6	**	- 0
47 μF	60.115	30.0	12.0	17.0	25.0	3.15 E3	JSNDJ5470-B	2	6	**	- 0
68 μF	60.160	42.9	12.0	17.0	25.0	3.15 E3	JSNDL5680-B	3	8	**	- 0
100 μF	60.160	42.9	18.0	17.0	25.0	3.15 E3	JSNDL6100-B	3	8	**	- 0
22 μF	90.80	21.5	7.0	22.5	20.0	2.52 E3	JSNDN5220-B	1	6	T	- 0
33 μF	90.115	30.0	7.0	22.5	20.0	2.52 E3	JSNDM5330-B	2	6	U	- 0
47 μF	90.145	36.6	8.0	22.5	20.0	2.52 E3	JSNDW5470-B	3	7	V	- 0
68 μF	90.210	50.0	8.0	22.5	20.0	2.52 E3	JSNDP5680-B	4	8	Z	- 0
100 μF	90.210	50.0	11.0	22.5	20.0	2.52 E3	JSNDP6100-B	3	7	V	- 0
150 μF	90.210	50.0	15.0	22.5	20.0	2.52 E3	JSNDP6150-B	3	7	V	- 0
220 μF	90.210	50.0	20.0	22.5	20.0	2.52 E3	JSNDP6220-B	4	8	Z	- 0
33 μF	100.80	21.5	8.0	27.5	15.0	1.9 E3	JSNDR5330-B	1	6	T	- 0
47 μF	100.115	30.0	8.0	27.5	15.0	1.9 E3	JSNDV5470-B	2	6	U	- 0
68 μF	100.160	42.9	8.0	27.5	15.0	1.9 E3	JSNDS5680-B	3	8	V	- 0
100 μF	100.160	42.9	10.0	27.5	15.0	1.9 E3	JSNDS6100-B	2	6	U	- 0
150 μF	100.160	42.9	14.0	27.5	15.0	1.9 E3	JSNDS6150-B	2	6	U	- 0
220 μF	100.160	42.9	19.0	27.5	15.0	1.9 E3	JSNDS6220-B	3	8	V	- 0
330 μF	100.230	60.0	20.0*	27.5	15.0	1.9 E3	JSNDU6330-B	4	9	Z	- 0

Tolerance: J (±5%); K (±10%); M (±20%)
Packaging
Internal use

Rated Cap.	Size code	100Vdc / 63Vac					Part number Terminal executions				
		W Max	H Max	L Max	Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	1	2	3		
10 μF	60.80	21.5	7.0	17.0	27.0	5.4 E3	JSNEK5100-B	1	6	**	- 0
15 μF	60.115	30.0	8.0	17.0	27.0	5.4 E3	JSNEJ5150-B	2	6	**	- 0
22 μF	60.80	21.5	14.0	17.0	27.0	5.4 E3	JSNEK5220-B	1	6	**	- 0
33 μF	60.115	30.0	15.0	17.0	27.0	5.4 E3	JSNEJ5330-B	2	6	**	- 0
47 μF	60.160	42.9	15.0	17.0	27.0	5.4 E3	JSNEL5470-B	3	8	**	- 0
68 μF	60.160	42.9	21.0	17.0	27.0	5.4 E3	JSNEL5680-B	3	8	**	- 0
10 μF	90.80	21.5	6.0	22.5	22.0	4.4 E3	JSNEN5100-B	1	6	T	- 0
15 μF	90.80	21.5	8.0	22.5	22.0	4.4 E3	JSNEN5150-B	1	6	T	- 0
22 μF	90.115	30.0	8.0	22.5	22.0	4.4 E3	JSNEM5220-B	2	6	U	- 0
33 μF	90.160	42.9	8.0	22.5	22.0	4.4 E3	JSNEO5330-B	3	8	V	- 0
47 μF	90.230	60.0	8.0	22.5	22.0	4.4 E3	JSNEQ5470-B	4	9	Z	- 0
68 μF	90.230	60.0	11.0	22.5	22.0	4.4 E3	JSNEQ5680-B	3	8	V	- 0
100 μF	90.230	60.0	14.0	22.5	22.0	4.4 E3	JSNEQ6100-B	4	9	Z	- 0
150 μF	90.230	60.0	20.0	22.5	22.0	4.4 E3	JSNEQ6150-B	4	9	Z	- 0
15 μF	100.80	21.5	7.0	27.5	17.0	3.4 E3	JSNER5150-B	1	6	T	- 0
22 μF	100.115	30.0	7.0	27.5	17.0	3.4 E3	JSNEV5220-B	2	6	U	- 0
33 μF	100.145	36.6	8.0	27.5	17.0	3.4 E3	JSNEX5330-B	3	7	V	- 0
47 μF	100.210	50.0	8.0	27.5	17.0	3.4 E3	JSNET5470-B	4	8	Z	- 0
68 μF	100.210	50.0	11.0	27.5	17.0	3.4 E3	JSNET5680-B	3	7	V	- 0
100 μF	100.230	60.0	12.0	27.5	17.0	3.4 E3	JSNEU6100-B	4	9	Z	- 0
150 μF	100.230	60.0	17.0	27.5	17.0	3.4 E3	JSNEU6150-B	4	9	Z	- 0
220 μF	100.230	60.0	23.0	27.5	17.0	3.4 E3	JSNEU6220-B	4	9	Z	- 0

Tolerance: J (±5%); K (±10%); M (±20%)
Packaging
Internal use

Note: * available only with 20% of tolerance
** not available

All dimensions are in mm

METALLIZED POLYESTER FILM CAPACITOR

PRODUCT CODE: JSN

Rated Cap.	Size code	160Vdc / 90Vac					Part number Terminal executions				
		W Max	H Max	L Max	Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	1	2	3		
10 μF	60.80	21.5	15.0	17.0	35.0	11.2 E3	JSNGK5100-B	1	6	**	- 0
15 μF	60.115	30.0	15.0	17.0	35.0	11.2 E3	JSNGJ5150-B	2	6	**	- 0
22 μF	60.115	30.0	23.0	17.0	35.0	11.2 E3	JSNGJ5220-B	2	6	**	- 0
33 μF	60.160	42.9	23.0	17.0	35.0	11.2 E3	JSNGL5330-B	3	8	**	- 0
10 μF	90.115	30.0	8.0	22.5	30.0	9.6 E3	JSNGM5100-B	2	6	U	- 0
15 μF	90.160	42.9	8.0	22.5	30.0	9.6 E3	JSNGO5150-B	3	8	V	- 0
22 μF	90.230	60.0	9.0	22.5	30.0	9.6 E3	JSNGQ5220-B	4	9	Z	- 0
33 μF	90.230	60.0	15.0	22.5	30.0	9.6 E3	JSNGQ5330-B	3	7	V	- 0
47 μF	90.230	60.0	15.0	22.5	30.0	9.6 E3	JSNGQ5470-B	3	8	V	- 0
10 μF	100.115	30.0	7.0	27.5	25.0	8.0 E3	JSNGV5100-B	2	6	U	- 0
15 μF	100.145	36.6	8.0	27.5	25.0	8.0 E3	JSNGX5150-B	3	7	V	- 0
22 μF	100.160	42.9	9.0	27.5	25.0	8.0 E3	JSNGS5220-B	4	9	Z	- 0
33 μF	100.230	60.0	10.0	27.5	25.0	8.0 E3	JSNGU5330-B	3	7	V	- 0
47 μF	100.230	60.0	13.0	27.5	25.0	8.0 E3	JSNGU5470-B	4	9	Z	- 0
68 μF	100.230	60.0	17.0	27.5	25.0	8.0 E3	JSNGU5680-B	4	9	Z	- 0
100 μF	100.230	60.0	24.0	27.5	25.0	8.0 E3	JSNGU6100-B	4	9	Z	- 0

Tolerance: J (±5%); K (±10%); M (±20%)

Packaging

Internal use

Rated Cap.	Size code	250Vdc / 160Vac					Part number Terminal executions				
		W Max	H Max	L Max	Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	1	2	3		
10 μF	60.115	30.0	20.0	17.0	40.0	20.0 E3	JSNIJ5100-B	2	6	**	- 0
15 μF	60.160	42.9	20.0	17.0	40.0	20.0 E3	JSNIL5150-B	3	8	**	- 0
10 μF	90.160	42.9	9.0	22.5	35.0	17.5 E3	JSNIO5100-B	4	8	Z	- 0
15 μF	90.210	50.0	11.0	22.5	35.0	17.5 E3	JSNIP5150-B	3	7	V	- 0
22 μF	90.230	60.0	13.0	22.5	35.0	17.5 E3	JSNIQ5220-B	4	9	Z	- 0
33 μF	90.230	60.0	19.0	22.5	35.0	17.5 E3	JSNIQ5330-B	4	9	Z	- 0
10 μF	100.160	42.9	8.0	27.5	30.0	15.0 E3	JSNIS5100-B	4	8	Z	- 0
15 μF	100.210	50.0	10.0	27.5	30.0	15.0 E3	JSNIT5150-B	4	9	Z	- 0
22 μF	100.230	60.0	11.0	27.5	30.0	15.0 E3	JSNIU5220-B	4	8	Z	- 0
33 μF	100.230	60.0	16.0	27.5	30.0	15.0 E3	JSNIU5330-B	4	8	Z	- 0
47 μF	100.230	60.0	21.0*	27.5	30.0	15.0 E3	JSNIU5470-B	4	9	Z	- 0

Tolerance: J (±5%); K (±10%); M (±20%)

Packaging

Internal use

Rated Cap.	Size code	400Vdc / 200Vac					Part number Terminal executions				
		W Max	H Max	L Max	Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	1	2	3		
5 μF	90.210	50.0	9.0	22.5	40.0	32.0E3	JSNMP4500-B	4	8	Z	- 0
10 μF	90.230	60.0	14.0	22.5	40.0	32.0 E3	JSNMQ5100-B	3	7	V	- 0
15 μF	90.230	60.0	19.0	22.5	40.0	32.0 E3	JSNMQ5150-B	4	9	Z	- 0
5 μF	100.210	50.0	8.0	27.5	35.0	28.0 E3	JSNMT4500-B	4	8	Z	- 0
10 μF	100.230	60.0	12.0	27.5	35.0	28.0 E3	JSNMT4500-B	4	8	Z	- 0
15 μF	100.230	60.0	16.0	27.5	35.0	28.0 E3	JSNMT4500-B	4	8	Z	- 0
22 μF	100.230	60.0	22.0	27.5	35.0	28.0 E3	JSNMT4500-B	4	8	Z	- 0

Tolerance: J (±5%); K (±10%); M (±20%)

Packaging

Internal use

Note: * available only with 20% of tolerance

** not available

All dimensions are in mm

METALLIZED POLYESTER FILM CAPACITOR

PRODUCT CODE: **JSN**

GENERAL TECHNICAL DATA

Dielectric: Metallized polyester film (PET H.T.).

Construction: Stacked Naked capacitor with special terminals.

Terminals: Copper tinned lead frame.
For dimensions see Figure 1,2,3.
Other types of terminals are available upon request.

Marking: Manufacturer's logo, series (JSN), capacitance, tolerance, D.C. rated voltage, manufacturing date code.

Operating temperature range -55°C up to 125°C

Climatic category: 55/125/56 IEC 60068-1

Storage conditions: Temperature range: 0°C up to +40°C
Humidity: 60% R.H. max.

ELECTRICAL CHARACTERISTICS

Rated voltage (V_R): 63Vdc, 100Vdc, 160Vdc, 250Vdc, 400Vdc.

Category Voltage (V_C): V_C=V_R up to 105°C.
For temperatures between +105 and +125°C a decreasing factor of 1.25% per degree °C has to be applied.

Rated temperature(T_R): +105°C.

Capacitance range: 5µF to 330µF.

Capacitance values: E6 series (IEC 60063 Norm).

Capacitance tolerance (measured at 1kHz):
±5% (J); ±10% (K); ±20% (M)
(Other tolerances are available upon request)

Dissipation Factor (tgδ): ≤ 0.01 at 1kHz – T=25°C±5°C

Insulation Resistance:

Test conditions

Temperature +25°C±5°C
Voltage charge time: 1 min
Voltage charge: 50Vdc for V_R = 63Vdc
100Vdc for V_R ≥ 100Vdc

Performance

≥ 100s for V_R = 63Vdc
≥ 250s for V_R = 100Vdc
≥ 400s for V_R = 160Vdc
≥ 800s for V_R = 250Vdc
≥ 1200s for V_R = 400Vdc

Test voltage between terminations:

1.4x V_R applied for 2s at +25°C±5

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

Test conditions

Temperature: +40°C±2°C
Relative humidity (RH): 93% ±2%
Test duration: 56 days

Performance

Capacitance change |ΔC/C|: ≤ 7%
DF change (Δtgδ): ≥ 50x10⁻⁴ at 1kHz
Insulation resistance: ≥ 50% of limit value

Endurance:

Test conditions

Temperature: 125°C ±2°C
Test duration: 2000 h
Voltage applied: 1.25xV_C

Performance

Capacitance change |ΔC/C|: ≤ 5%
DF change (Δtgδ): ≤ 50x10⁻⁴ at 1kHz
Insulation resistance: ≥ 50% of limit value

Rapid change of temperature:

Test conditions

Temperature: 1h at -55°C; 1h at +125°C
Number of cycles: 1000

Performance

Capacitance change |ΔC/C|: ≤ 3%
DF change (Δtgδ): ≤ 50x10⁻⁴ at 1kHz
Insulation resistance: ≥ limit value
No mechanical damage.

Long term stability (after two years):

Storage:

standard environmental conditions.

Performance

Capacitance change |ΔC/C|: ≤ 3%

Reliability (reference MIL HDB 217):

Failure rate:

≤ 1 FIT (40°C – 0.5x V_R)

Failure criteria:

Short or open circuit
Capacitance change: |ΔC/C|>10%
DF change: (Δtgδ.>2xinitial limit)
Insulation resistance: > 0.005 x initial value

Dimension of landing area:

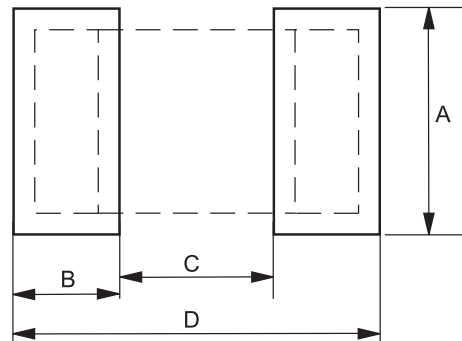
Figure 1

Size code	A	B	C	D
60.80	21.9	7.0	15.0	29.0
60.115	30.4	7.0	15.0	29.0
60.160	43.3	7.0	15.0	29.0
90.80	21.9	7.0	20.5	34.5
90.115	30.4	7.0	20.5	34.5
90.145	37.0	7.0	20.5	34.5
90.160	43.3	7.0	20.5	34.5
90.210	50.4	7.0	20.5	34.5
90.230	60.4	7.0	20.5	34.5
100.80	21.9	7.0	25.5	39.5
100.115	30.4	7.0	25.5	39.5
100.145	37.0	7.0	25.5	39.5
100.160	43.3	7.0	25.5	39.5
100.210	50.4	7.0	25.5	39.5
100.230	60.4	7.0	25.5	39.5

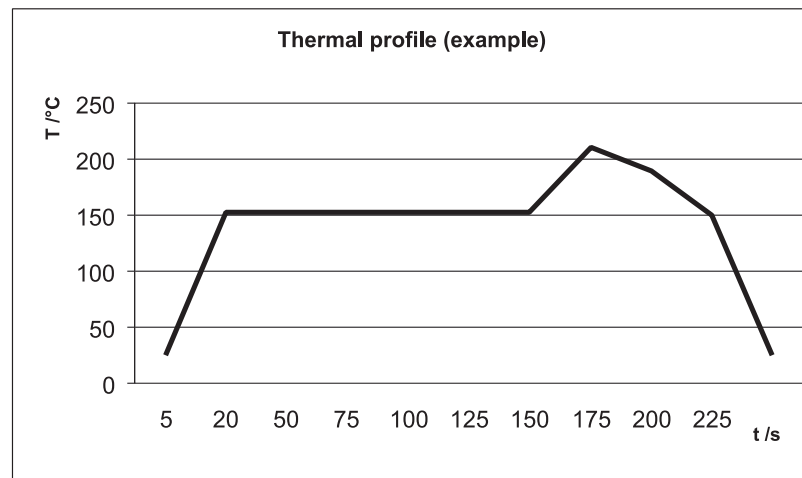
Figure 2

Size code	A	B	C	D
60.80	21.9	5.0	10.2	20.4
60.115	30.4	5.0	10.2	20.4
60.160	43.3	5.0	10.2	20.4
90.80	21.9	5.0	15.7	25.9
90.115	30.4	5.0	15.7	25.9
90.145	37.0	5.0	15.7	25.9
90.160	43.3	5.0	15.7	25.9
90.210	50.4	5.0	15.7	25.9
90.230	60.4	5.0	15.7	25.9
100.80	21.9	5.0	20.7	30.9
100.115	30.4	5.0	20.7	30.9
100.145	37.0	5.0	20.7	30.9
100.160	43.3	5.0	20.7	30.9
100.210	50.4	5.0	20.7	30.9
100.230	60.4	5.0	20.7	30.9

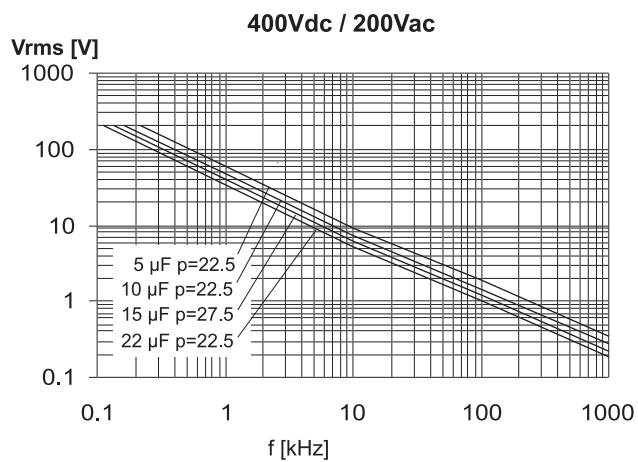
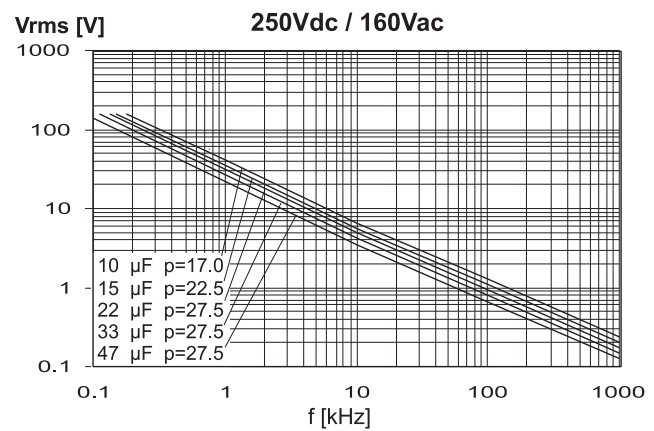
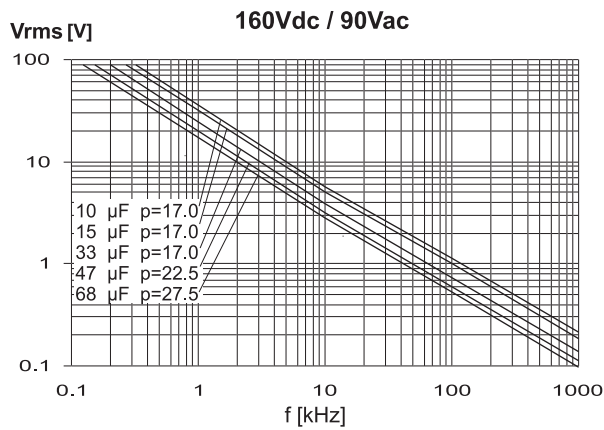
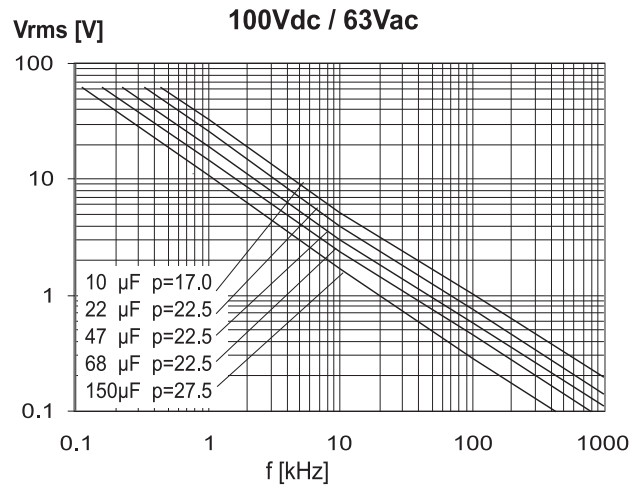
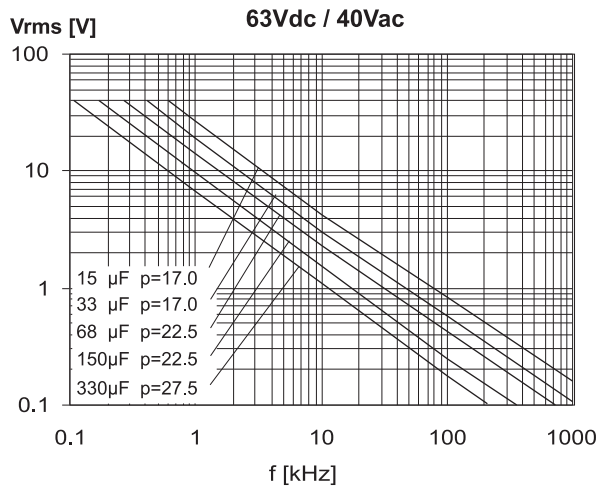
Example for land dimensions



Thermal profile for reflow process:



MAX. VOLTAGE (Vr.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / $T_h \leq 40^\circ\text{C}$)

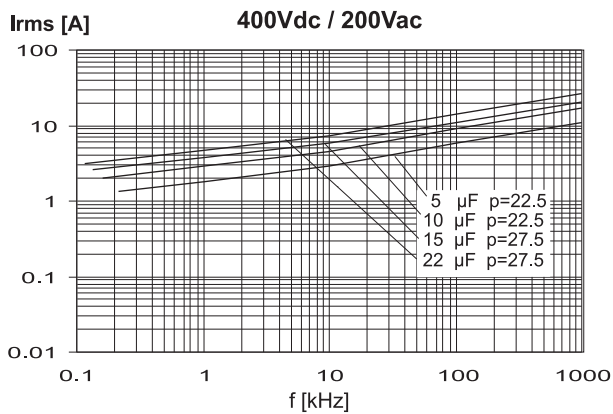
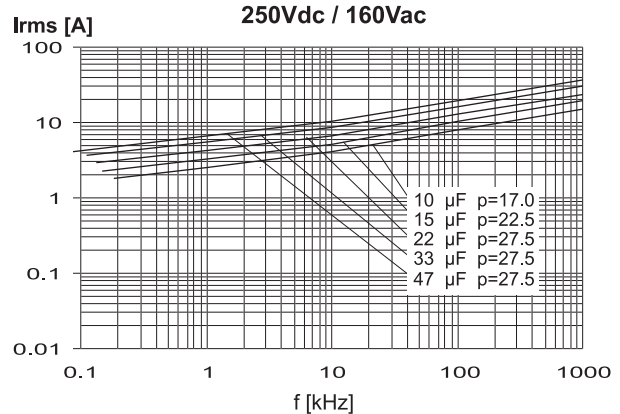
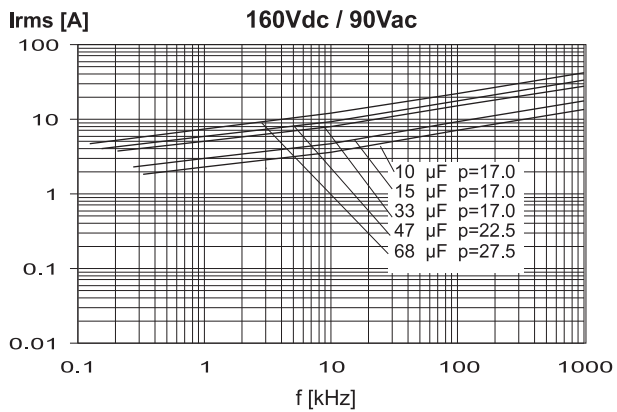
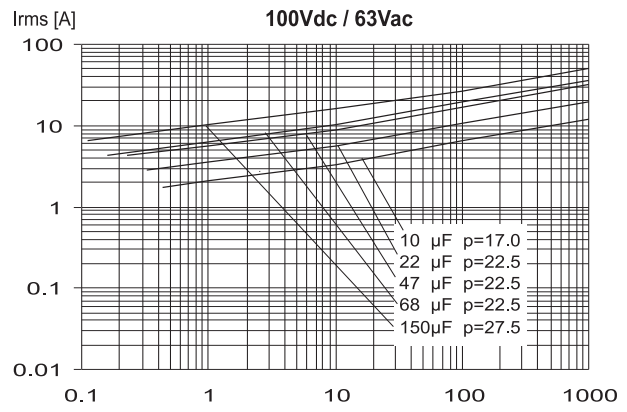
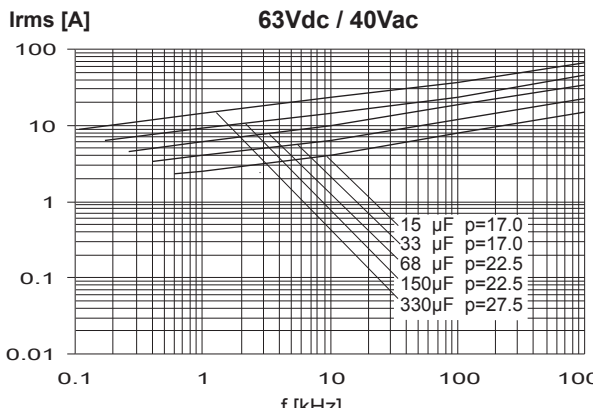


Note: * T_h = max. ambient temperature surrounding the capacitor or hottest contact point (i.e. tracks), whichever is higher, in the worst operation conditions in $^\circ\text{C}$

METALLIZED POLYESTER FILM CAPACITOR

PRODUCT CODE: JSN

MAX. CURRENT (I_{r.m.s.}) VERSUS FREQUENCY (sinusoidal wave-form / T_n ≤ 40°C)



Note: *Th= max. ambient temperature surrounding the capacitor or hottest contact point (i.e. tracks), whichever is higher, in the worst operation conditions in °C