

Metallized Polypropylene Film/Foil Capacitors

FGD Series - 1000 ~ 2000VDC (Pulse and High Frequency Applications)



Overview

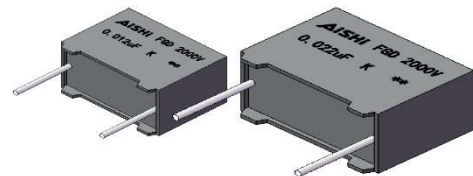
The FGD series is non-inductively wound with metallized polypropylene film in series with aluminum foil, polypropylene film, encapsulated in plastic case and sealed with epoxy resin.

Applications

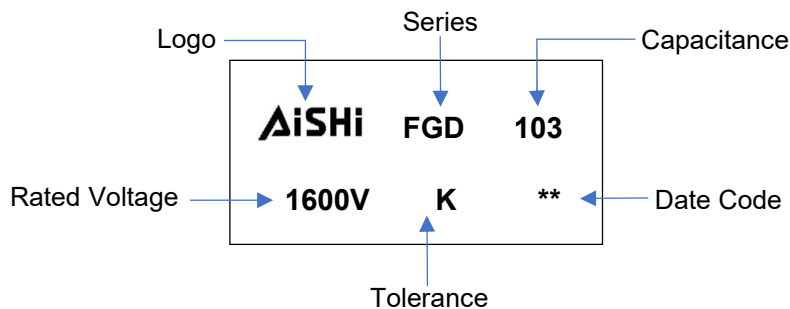
Widely used in monitors (S-correction and flyback tuning), ballasts and compact lamps, snubber and silicon-controlled rectifier.

Features

- High ripple current
- Low losses
- High dv/dt
- High contact reliability
- Suitable for high frequency applications



Marking



Manufacturing Date Code

Year	Code	Month	Code
2018	A	Jan	1
2019	B	Feb	2
2020	C	Mar	3
2021	D	Apr	4
2022	E	May	5
2023	F	Jun	6

Year	Code	Month	Code
2024	G	Jul	7
2025	H	Aug	8
2026	J	Sep	9
2027	K	Oct	A
2028	L	Nov	N
2029	M	Dec	D

Part Number System

F	GD	3W	K	104	F17	2FL	5
Capacitor Type	Series	Voltage (VDC)	Tolerance	Capacitance (pF)	Size Code	Terminal Code	Lead Length Code
F = Film	DC Film, Metallized PP Film	100=1K 250=2E 400=2G 630=2L	J = ±5% K = ±10%	First two digits = significant figures. Third digit = Number of zeros.	Refer to Dimension Table	Refer to Terminal Code Table	Refer to Lead Length Code Table

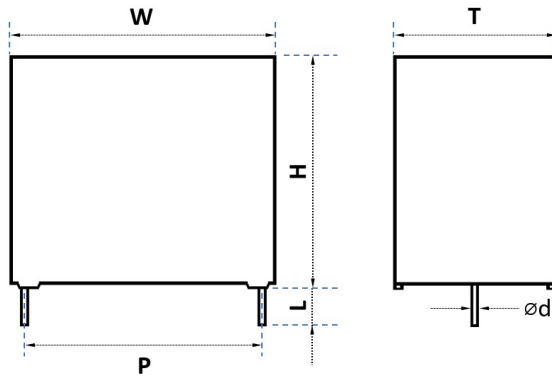
Terminal Code

Digit One (Lead/Terminal Type)	Digit Two (Lead Space)	Digit Three (Lead Ipsilateral)
2 leads for long	L	15.0mm E
2 leads for straight cut	2	22.5mm F
2 leads for forming cut	E	27.5mm G
2 leads for taping forming	T	
2 leads for taping straight	V	

Lead Length Code

Lead Length	Code
20mm min	L
35mm min	B
3.2mm	1
3.5mm	2
3.0mm	3
4.0mm	4
5.0mm	5
7.0mm	7
Taping	T
N/A	N

Dimension (mm)



2 pins

Dimension (mm)

Size Code	Dimension						Pitch		Ød	
	W	Tolerance	H	Tolerance	T	Tolerance	P	Tolerance	2 Leads	Tolerance
E14	18.0	0.5	11.0	0.5	5.0	0.5	15.0	0.5	0.6	0.05
E17	18.0	0.5	12.0	0.5	6.0	0.5	15.0	0.5	0.6	0.05
E29	18.0	0.5	13.5	0.5	7.5	0.5	15.0	0.5	0.8	0.05
E34	18.0	0.5	14.5	0.5	8.5	0.5	15.0	0.5	0.8	0.05
E43	18.0	0.5	16.0	0.5	10.0	0.5	15.0	0.5	0.8	0.05
F17	26.0	0.5	16.5	0.5	7.0	0.5	22.5	0.5	0.8	0.05
F20	26.0	0.5	17.0	0.5	8.5	0.5	22.5	0.5	0.8	0.05
F24	26.0	0.5	19.0	0.5	10.0	0.5	22.5	0.5	0.8	0.05
F26	26.0	0.5	20.0	0.5	11.0	0.5	22.5	0.5	0.8	0.05
G15	32.0	0.8	18.0	0.8	9.0	0.8	27.5	0.5	0.8	0.05
G18	32.0	0.8	20.0	0.8	11.0	0.8	27.5	0.5	0.8	0.05
G21	32.0	0.8	22.0	0.8	13.0	0.8	27.5	0.5	0.8	0.05
G22	32.0	0.8	24.5	0.8	13.0	0.8	27.5	0.5	0.8	0.05

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Rating and Part Number

Vdc	Vac	Cap Value μF	Dimensions				Peak Current A	dv/dt V/us	Lead Wire mm	Part Number
			W mm	H mm	T mm	P mm				
1000	400	0.0033	18.0	11.0	5.0	15.0	92.4	28000	0.6	FGD3KK332E142EL5
1000	400	0.0039	18.0	11.0	5.0	15.0	109.2	28000	0.6	FGD3KK392E142EL5
1000	400	0.0047	18.0	11.0	5.0	15.0	131.6	28000	0.6	FGD3KK472E142EL5
1000	400	0.0056	18.0	11.0	5.0	15.0	156.8	28000	0.6	FGD3KK562E142EL5
1000	400	0.0068	18.0	11.0	5.0	15.0	190.4	28000	0.6	FGD3KK682E142EL5
1000	400	0.0082	18.0	11.0	5.0	15.0	229.6	28000	0.6	FGD3KK822E142EL5
1000	400	0.01	18.0	12.0	6.0	15.0	280.0	28000	0.6	FGD3KK103E172EL5
1000	400	0.012	18.0	12.0	6.0	15.0	336.0	28000	0.6	FGD3KK123E172EL5
1000	400	0.015	18.0	13.5	7.5	15.0	420.0	28000	0.8	FGD3KK153E292EL5
1000	400	0.018	18.0	14.5	8.5	15.0	504.0	28000	0.8	FGD3KK183E342EL5
1000	400	0.022	18.0	14.5	8.5	15.0	616.0	28000	0.8	FGD3KK223E342EL5
1000	400	0.027	18.0	16.0	10.0	15.0	756.0	28000	0.8	FGD3KK273E432EL5
1000	400	0.033	26.0	16.5	7.0	22.5	363.0	11000	0.8	FGD3KK333F172FL5
1000	400	0.039	26.0	17.0	8.5	22.5	429.0	11000	0.8	FGD3KK393F202FL5
1000	400	0.047	26.0	19.0	10.0	22.5	517.0	11000	0.8	FGD3KK473F242FL5
1000	400	0.056	26.0	19.0	10.0	22.5	616.0	11000	0.8	FGD3KK563F242FL5
1000	400	0.068	26.0	20.0	11.0	22.5	748.0	11000	0.8	FGD3KK683F262FL5
1250	450	0.0022	18.0	11.0	5.0	15.0	66.0	30000	0.6	FGD3RK222E142EL5
1250	450	0.0027	18.0	11.0	5.0	15.0	81.0	30000	0.6	FGD3RK272E142EL5
1250	450	0.0032	18.0	12.0	6.0	15.0	96.0	30000	0.6	FGD3RK332E172EL5
1250	450	0.0039	18.0	12.0	6.0	15.0	117.0	30000	0.6	FGD3RK392E172EL5
1250	450	0.0047	18.0	13.5	7.5	15.0	141.0	30000	0.8	FGD3RK472E292EL5
1250	450	0.0056	18.0	13.5	7.5	15.0	168.0	30000	0.8	FGD3RK562E292EL5
1250	450	0.0068	18.0	14.5	8.5	15.0	204.0	30000	0.8	FGD3RK682E342EL5
1250	450	0.0082	18.0	16.0	10.0	15.0	246.0	30000	0.8	FGD3RK822E432EL5
1250	450	0.01	26.0	16.5	7.0	22.5	110.0	11000	0.8	FGD3RK103F172FL5
1250	450	0.012	26.0	16.5	7.0	22.5	132.0	11000	0.8	FGD3RK123F172FL5
1250	450	0.015	26.0	16.5	7.0	22.5	165.0	11000	0.8	FGD3RK153F172FL5
1250	450	0.018	26.0	16.5	7.0	22.5	198.0	11000	0.8	FGD3RK183F172FL5
1250	450	0.022	26.0	17.0	8.5	22.5	242.0	11000	0.8	FGD3RK223F202FL5
1250	450	0.027	26.0	19.0	10.0	22.5	297.0	11000	0.8	FGD3RK273F242FL5
1250	450	0.033	26.0	19.0	10.0	22.5	363.0	11000	0.8	FGD3RK333F242FL5
1250	450	0.039	32.0	18.0	9.0	27.5	429.0	11000	0.8	FGD3RK393G152GL5
1250	450	0.047	32.0	20.0	11.0	27.5	517.0	11000	0.8	FGD3RK473G182GL5
1250	450	0.056	32.0	20.0	11.0	27.5	616.0	11000	0.8	FGD3RK563G182GL5
1250	450	0.068	32.0	22.0	13.0	27.5	748.0	11000	0.8	FGD3RK683G212GL5
1250	450	0.082	32.0	24.5	13.0	27.5	902.0	11000	0.8	FGD3RK823G222GL5
1600	500	0.001	18.0	11.0	5.0	15.0	34.0	34000	0.6	FGD3WKJ10E142EL5
1600	500	0.0012	18.0	11.0	5.0	15.0	40.8	34000	0.6	FGD3WKJ12E142EL5
1600	500	0.0015	18.0	11.0	5.0	15.0	51.0	34000	0.6	FGD3WKJ15E142EL5
1600	500	0.0018	18.0	11.0	5.0	15.0	61.2	34000	0.6	FGD3WKJ18E142EL5
1600	500	0.0022	18.0	12.0	6.0	15.0	74.8	34000	0.6	FGD3WKJ22E172EL5
1600	500	0.0027	18.0	12.0	6.0	15.0	91.8	34000	0.6	FGD3WK272E172EL5
1600	500	0.0033	18.0	13.5	7.5	15.0	112.2	34000	0.8	FGD3WKJ33E292EL5
1600	500	0.0039	18.0	13.5	7.5	15.0	132.6	34000	0.8	FGD3WKJ39E292EL5
1600	500	0.0047	18.0	14.5	8.5	15.0	159.8	34000	0.8	FGD3WK472E342EL5
1600	500	0.0056	18.0	16.0	10.0	15.0	190.4	34000	0.8	FGD3WKJ56E432EL5
1600	500	0.0068	18.0	16.0	10.0	15.0	231.2	34000	0.8	FGD3WKJ68E432EL5

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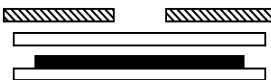
Rating and Part Number

Vdc	Vac	Cap Value μF	Dimensions				Peak Current A	dv/dt V/us	Lead Wire mm	Part Number
			W mm	H mm	T mm	P mm				
1600	500	0.0082	26.0	16.5	7.0	22.5	90.2	11000	0.8	FGD3WK822F172FL5
1600	500	0.01	26.0	16.5	7.0	22.5	110.0	11000	0.8	FGD3WKJ10F172FL5
1600	500	0.012	26.0	16.5	7.0	22.5	132.0	11000	0.8	FGD3WKJ12F172FL5
1600	500	0.015	26.0	17.0	8.5	22.5	165.0	11000	0.8	FGD3WKJ15F202FL5
1600	500	0.018	26.0	17.0	8.5	22.5	198.0	11000	0.8	FGD3WKJ18F202FL5
1600	500	0.022	26.0	19.0	10.0	22.5	242.0	11000	0.8	FGD3WK223F242FL5
1600	500	0.027	32.0	18.0	9.0	27.5	297.0	11000	0.8	FGD3WKJ27G152GL5
1600	500	0.033	32.0	20.0	11.0	27.5	363.0	11000	0.8	FGD3WK333G182GL5
1600	500	0.039	32.0	20.0	11.0	27.5	429.0	11000	0.8	FGD3WKJ39G182GL5
1600	500	0.047	32.0	22.0	13.0	27.5	517.0	11000	0.8	FGD3WK473G212GL5
1600	500	0.056	32.0	22.0	13.0	27.5	616.0	11000	0.8	FGD3WK563G212GL5
2000	550	0.00015	18.0	11.0	5.0	15.0	8.1	54000	0.6	FGD3DK151E142EL5
2000	550	0.00022	18.0	11.0	5.0	15.0	11.9	54000	0.6	FGD3DK221E142EL5
2000	550	0.00033	18.0	11.0	5.0	15.0	17.8	54000	0.6	FGD3DK331E142EL5
2000	550	0.00047	18.0	11.0	5.0	15.0	25.4	54000	0.6	FGD3DK471E142EL5
2000	550	0.00068	18.0	11.0	5.0	15.0	36.7	54000	0.6	FGD3DK681E142EL5
2000	550	0.001	18.0	12.0	6.0	15.0	54.0	54000	0.6	FGD3DK102E172EL5
2000	550	0.0012	18.0	12.0	6.0	15.0	64.8	54000	0.6	FGD3DK122E172EL5
2000	550	0.0015	18.0	13.5	7.5	15.0	81.0	54000	0.8	FGD3DK152E292EL5
2000	550	0.0018	18.0	13.5	7.5	15.0	97.2	54000	0.8	FGD3DK182E292EL5
2000	550	0.0022	18.0	14.5	8.5	15.0	118.8	54000	0.8	FGD3DK222E342EL5
2000	550	0.0027	18.0	16.0	10.0	15.0	145.8	54000	0.8	FGD3DK272E432EL5
2000	550	0.0033	26.0	16.5	7.0	22.5	36.3	11000	0.8	FGD3DK332F172FL5
2000	550	0.0039	26.0	16.5	7.0	22.5	42.9	11000	0.8	FGD3DK392F172FL5
2000	550	0.0047	26.0	16.5	7.0	22.5	51.7	11000	0.8	FGD3DK472F172FL5
2000	550	0.0056	26.0	16.5	7.0	22.5	61.6	11000	0.8	FGD3DK562F172FL5
2000	550	0.0068	26.0	17.0	8.5	22.5	74.8	11000	0.8	FGD3DK682F202FL5
2000	550	0.0082	26.0	17.0	8.5	22.5	90.2	11000	0.8	FGD3DK822F202FL5
2000	550	0.01	26.0	19.0	10.0	22.5	110.0	11000	0.8	FGD3DK103F242FL5
2000	550	0.012	26.0	20.0	11.0	22.5	132.0	11000	0.8	FGD3DK123F262FL5
2000	550	0.015	32.0	20.0	11.0	27.5	165.0	11000	0.8	FGD3DK153G182GL5
2000	550	0.018	32.0	22.0	13.0	27.5	198.0	11000	0.8	FGD3DK183G212GL5
2000	550	0.022	32.0	22.0	13.0	27.5	242.0	11000	0.8	FGD3DK223G212GL5

General Technical Data

Applications	DC / Pulse and High Frequency Applications
Dielectric	Polypropylene Metallized Film/Foil
Reference Standard	IEC 60384-17
Climatic Category	40/105/56 IEC 60068-1
Operating Temperature Range	-40°C ~ +105°C (85°C ~105°C, decreasing factor 1.25% per °C for Rated Voltage)
Protection	Solvent resistant plastic case UL94 V-0 Thermosetting resin sealing UL 94 V-0 compliant
Installation	Any position
Packaging	Packed in cardboard boxes with protection for the terminals
Storage Conditions	Storage time: ≤24months from the date marked on the label package Average relative humidity per year ≤70% RH≤85% for 30 days randomly distributed throughout the year Dew is absent Temperature: -40°C ~ +85°C
Storage Life	Product that passed less than 2 years from production, No need reconfirmation
RoHS Compliance	Compliant with the restricted substance requirement of Directive 2011/65/EU
Flame Retardant Grade	Flame retardant performance accords with horizontal combustion grade HB and vertical combustion grade V-0.

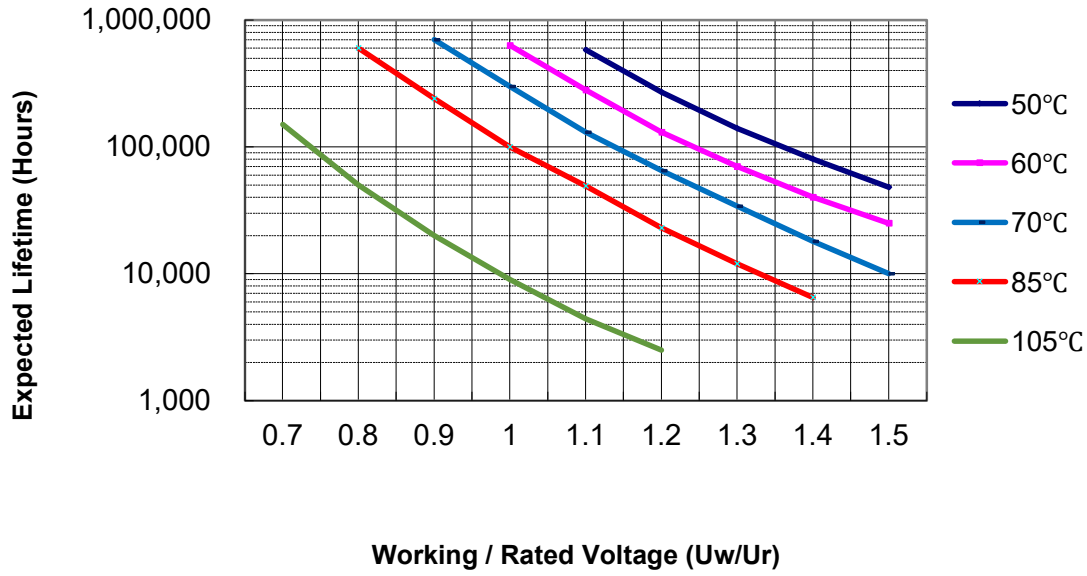
Construction

Metallized Film	OPP & Al
Electrode	Aluminum Foil
Dielectric	Polypropylene Film
Metal Sprayed	Sn/Zn Alloy
Connection Electrode	Tin-plated Copper Wire
Plastic Case	Plastic Case (UL94V-0)
Filling	Epoxy Resin (UL94V-0)
Film Construction	Internal Series Construction 

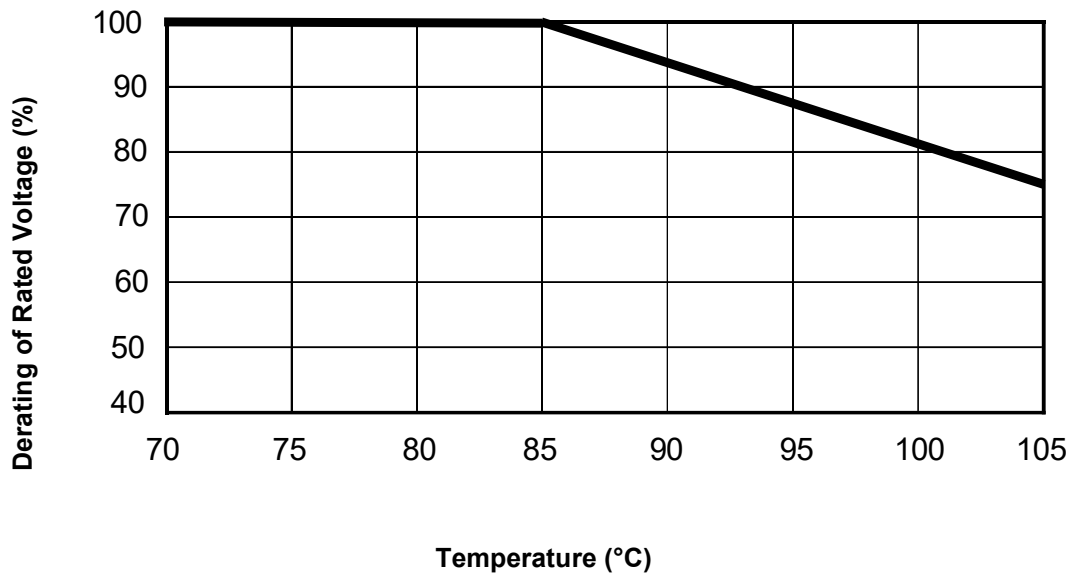
Electrical Characteristics

Voltage Range	1000Vdc ~ 2000Vdc
Capacitance Range	0.00015uF ~ 0.082uF
Capacitance Tolerance	±5% or ±10% at +25°C
Capacitance	Measuring Frequency at 1kHz Measuring Voltage: 1±0.2V
Standard Atmospheric Conditions for Static Test	Ambient temperature 15°C to 35°C (If there is any doubt on the results, the measurements shall be made at +20 +/- 5°C) Relative humidity 45% to 75% (If there is any doubt on the results, the measurements shall be made at 60% to 70 %.) Air pressure 86 kPa to 106 kPa.
Voltage Between Terminals U _{TT}	1.5 x V _R VDC for 10 seconds (between terminations) @ +25°C ±5°C
Voltage Between Terminals and Case U _{TC}	2000VAC, 60s (at+25+/-2°C)
Dielectric Dissipation Factor Tgδ 0	≤2×10 ⁻⁴
Dissipation factor	0.0010 (25°C, 1KHz)
Insulation Resistance	R between leads, for C ≤ 0.33 μF at 100 V; 1 min > 100 000 MΩ RC between leads, for C > 0.33 μF at 100 V; 1 min > 30 000 MΩ*uF
Self-Inductance	<1nH per mm of lead spacing
Hot-Spot	≤85°C
Life Expectancy	100,000 hours (UR, Θhotspot=85°C)
Failure Rate	100 Fit
Max. Altitude	2000 m
Overvoltage	Maximum duration within one day
Apply 110% of rated voltage	30% of on-load duration
Apply 115% of rated voltage	30 mins
Apply 120% of rated voltage	5 mins
Apply 130% of rated voltage	1 min

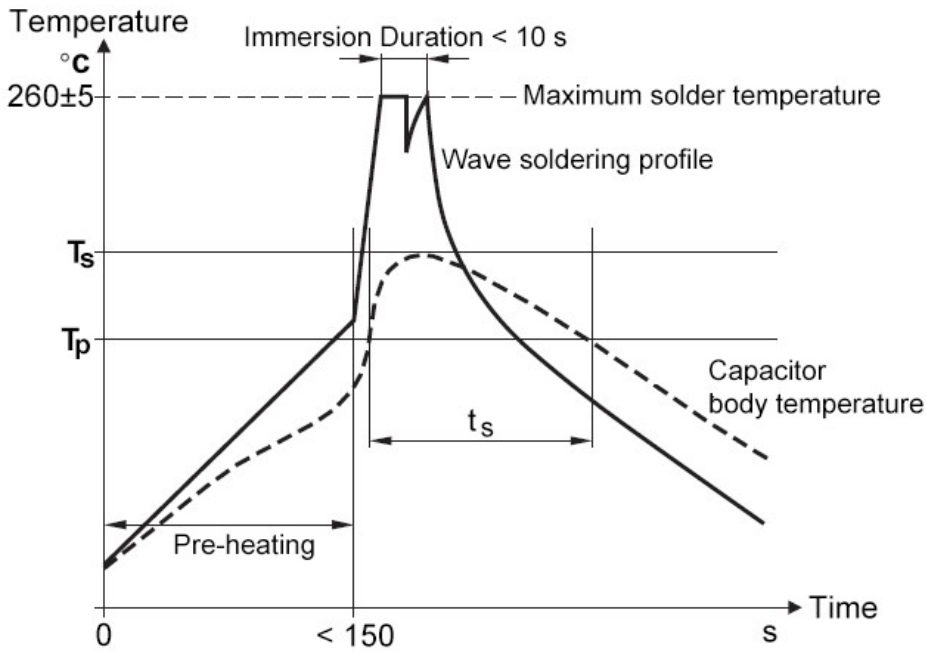
Expected Life Curve



Derating of Rated Voltage Vs Temperature



Wave Soldering Recommendations

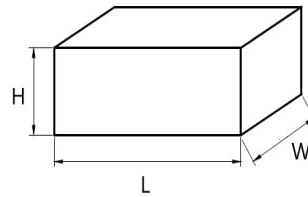


Ts: Capacitor body maximum temperature at wave soldering
 Tp: Capacitor body maximum temperature at pre-heating

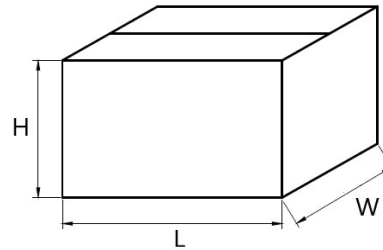
Polypropylene Capacitors	Polyester Capacitors
During pre-heating: $T_p \leq 110^\circ\text{C}$ During soldering: $T_s \leq 120^\circ\text{C}$, $t_s \leq 60$	During pre-heating: $T_p \leq 130^\circ\text{C}$ During soldering: $T_s \leq 160^\circ\text{C}$, $t_s \leq 60\text{s}$

Packaging Information

Inner Box Specifications (Dimensions)			
Box #	L ±3mm	W±3mm	H ±3mm
# 1	331	331	25
# 2	331	331	35
# 3	331	331	50
# 4	331	331	80
# 5	350	170	35
# 6	350	170	50
# 7	350	170	80



Outer Box Specifications (Dimensions)			
Box #	L ±5mm	W±5mm	H ±5mm
# 1	350	340	265
# 2	370	360	350



Packaging Quantity

P	Code	W	H	T	Long Leads	Short Leads
15	E14	18.0	11.0	5.0	800	1054
	E17	18.0	12.0	6.0	800	867
	E29	18.0	13.5	7.5	800	697
	E34	18.0	14.5	8.5	600	612
	E43	18.0	16.0	10.0	600	527
22.5	F17	26.0	16.5	7.0	600	528
	F20	26.0	17.0	8.5	600	432
	F24	26.0	19.0	10.0	400	372
	F26	26.0	20.0	11.0	400	336
27.5	G15	32.0	18.0	9.0	200	306
	G18	32.0	20.0	11.0	200	252
	G21	32.0	22.0	13.0	200	207
	G22	32.0	24.5	13.0	200	207

Cautions and Warnings

- Don't exceed the upper category temperature.
- For longtime storage, maximum relative humidity 80%, no dew allowed on the capacitor.
- Do not use or store capacitor in corrosive atmosphere, in the dusty environment's regular maintenance and cleaning especially of the terminals is required to avoid conductive path between terminal / or terminal and ground.
- Don't apply any mechanical stress to the capacitor terminals, and avoid any compressive, tensile or flexural stress.
- Don't move the capacitor after fixed to the PC board, and don't pick up the PC board by the fixed capacitor.
- Don't place the capacitor on a PC board whose holes pitch differs from the specified space.
- Avoid overload of the capacitors
- Do not have unlimited service life expectancy, the max service life expectancy may vary depending on the application the capacitor is used in.

Disclaimer

All product, product specifications and data in this datasheet are subject to change without notice to improve reliability, function or design or otherwise. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

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