

Metallized Polypropylene Film AC Filtering Capacitors

FAG Series - 160 ~ 450VAC for Harsh Environmental Conditions



Overview

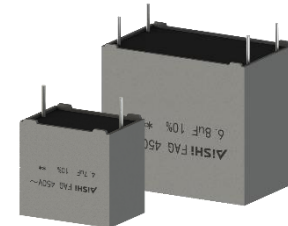
The FAG capacitor is constructed of metallized polypropylene film encapsulated with epoxy resin in a plastic box, with 2 or 4 tinned copper wire. These FAG series are suitable for harsh environment conditions and compliant to THB Grade IIIB.

Applications

Widely used in Clamping, AC and Harmonic Filtering, UPS Systems, Solar Inverter with LCL Filter and Motor Drive.

Features

- High ripple current
- Self-healing and low loss
- Optimized AC voltage performance
- Suitable for high frequency applications
- Suitable for harsh environment conditions.
- THB Grade IIIB.
- Passed 85°C 85%RH 1.0Un for 1000 hours.

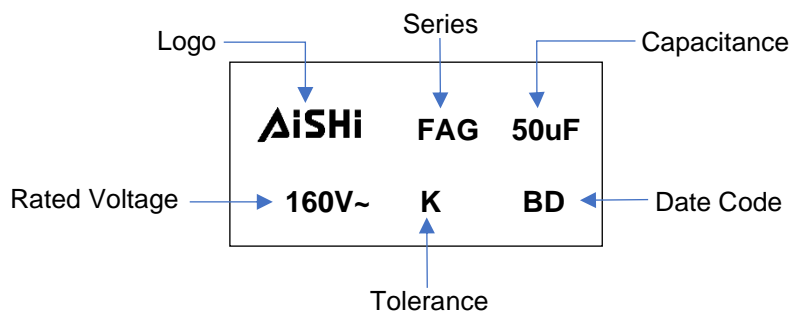


Approvals

Marking	Specification	File Number
	UL 810	E500537



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

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Part Number System

F	AG	16	K	506	M20	4MD	5
Capacitor Type	Series	Voltage (VAC)	Tolerance	Capacitance (pF)	Size Code	Terminal Code	Lead Length Code
F = Film	AC Filtering, THB Type, Metallized PP Film	160=16 250=25 275=27 350=35 400=40 450=45	J = ±5% K = ±10%	First two digits = significant figures. Third digit = Number of zeros.	Refer to Size Code Table	Refer to Terminal Code Table	Refer to Lead Length Code Table

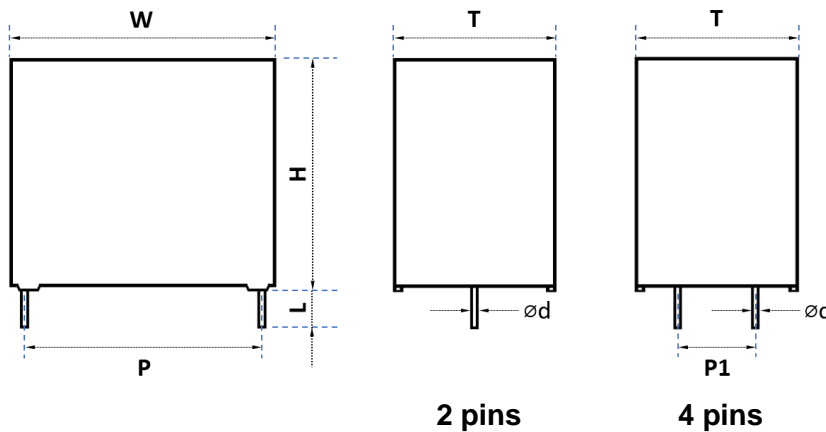
Terminal Code

Digit One (Lead/Terminal Type)		Digit Two (Lead Space)		Digit Three (Lead Ipsilateral)	
2 leads for long	L	27.5mm	G	10.2mm	B
2 leads for straight cut	2	37.5mm	K	12.7mm	G
2 leads for forming cut	E	57.5mm	M	20.3mm	D
4 leads for straight cut	4	N/A	N	N/A	L
6 leads for straight cut	6				

Lead Length Code

Lead Length	
3.0mm	3
4.0mm	4
5.0mm	5
7.0mm	7
20.0mm min	L

Dimension (mm)



Size Code Table (mm)

Size Code	Dimension						Pitch				Ød		
	W	Tolerance	H	Tolerance	T	Tolerance	P	Tolerance	P1	Tolerance	4 Leads	2 Leads	Tolerance
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
G26	32.0	0.8	28.0	0.8	14.0	0.8	27.5	0.5	/	/	/	0.8	0.05
G34	32.0	0.8	33.0	0.8	18.0	0.8	27.5	0.5	/	/	/	0.8	0.05
G40	32.0	0.8	37.0	0.8	22.0	0.8	27.5	0.5	/	/	/	0.8	0.05
K24	42.5	0.8	40.0	0.8	20.0	0.8	37.5	0.5	10.2	0.5	1.2	1.0	0.05
K27	42.5	0.8	37.0	0.8	22.0	0.8	37.5	0.5	10.2	0.5	1.2	1.0	0.05
K37	42.5	0.8	37.0	0.8	28.0	0.8	37.5	0.5	10.2	0.5	1.2	1.0	0.05
K42	42.5	0.8	45.0	0.8	30.0	0.8	37.5	0.5	20.3	0.5	1.2	1.0	0.05
M16	57.5	1.0	45.0	1.0	30.0	1.0	52.5	0.5	20.3	0.5	1.2	1.2	0.05
M20	57.5	1.0	50.0	1.0	35.0	1.0	52.5	0.5	20.3	0.5	1.2	1.2	0.05

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Rating and Part Number

Vdc	Cap Value µF	Dimensions					Irms 10KHz 70°C A	Peak Current A	Surge Current A	ESR 10KHz mΩ	ESL nH	Thermal Res °C/W	dv/dt V/us	Lead Wire mm	Part Number
		W	H	T	P	P1									
		mm	mm	mm	mm	mm									
160	2.2	32.0	20.0	11.0	27.5	\	7	70	211	15.3	24	20.0	32	0.8	FAG16K225G182GL5
160	3.3	32.0	22.0	13.0	27.5	\	7	106	317	11.3	24	27.1	32	0.8	FAG16K335G212GL5
160	5	32.0	28.0	14.0	27.5	\	7	160	480	8.8	26	34.8	32	0.8	FAG16K505G262GL5
160	10	32.0	33.0	18.0	27.5	\	7	320	960	6.8	26	45.0	32	0.8	FAG16K106G342GL5
160	10	42.5	37.0	28.0	37.5	10.2	12	220	660	7.2	30	14.5	22	1.2	FAG16K106K374KB5
160	20	42.5	37.0	28.0	37.5	10.2	12	440	1320	6.9	30	15.1	22	1.2	FAG16K206K374KB5
160	30	42.5	45.0	30.0	37.5	20.3	12	660	1980	7.4	30	14.1	22	1.2	FAG16K306K424KD5
160	40	57.5	45.0	30.0	52.5	20.3	12	640	1920	7.6	35	13.7	16	1.2	FAG16K406M164MD5
160	50	57.5	50.0	35.0	52.5	20.3	12	800	2400	7.5	35	13.9	16	1.2	FAG16K506M204MD5
250	1	32.0	20.0	11.0	27.5	\	8	40	120	14.0	24	16.7	40	0.8	FAG25K105G182GL5
250	1.5	32.0	20.0	11.0	27.5	\	8	60	180	10.0	24	23.4	40	0.8	FAG25K155G182GL5
250	2	32.0	22.0	13.0	27.5	\	9	80	240	8.2	24	22.6	40	0.8	FAG25K205G212GL5
250	3.3	32.0	28.0	14.0	27.5	\	9	132	396	6.2	26	29.9	40	0.8	FAG25K335G262GL5
250	4	32.0	33.0	18.0	27.5	\	9	160	480	5.9	26	31.4	40	0.8	FAG25K405G342GL5
250	5	32.0	33.0	18.0	27.5	\	9	200	600	5.2	26	35.6	40	0.8	FAG25K505G342GL5
250	6.8	32.0	37.0	22.0	27.5	\	9	272	816	4.9	28	15.6	40	0.8	FAG25K685G402GL5
250	10	42.5	40.0	20.0	37.5	10.2	14	300	900	5.6	30	13.7	30	1.2	FAG25K106K244KB5
250	15	42.5	37.0	28.0	37.5	10.2	14	450	1350	5.2	30	14.7	30	1.2	FAG25K156K374KB5
250	20	42.5	45.0	30.0	37.5	20.3	14	600	1800	4.8	30	15.9	30	1.2	FAG25K206K424KD5
250	25	57.5	45.0	30.0	52.5	20.3	14	625	1875	5.7	35	13.4	25	1.2	FAG25K256M164MD5
250	30	57.5	45.0	30.0	52.5	20.3	14	750	2250	5.3	35	14.4	25	1.2	FAG25K306M164MD5
250	35	57.5	50.0	35.0	52.5	20.3	14	875	2625	5.5	35	13.9	25	1.2	FAG25K356M204MD5
250	40	57.5	50.0	35.0	52.5	20.3	14	1000	3000	5.2	35	14.7	25	1.2	FAG25K406M204MD5
275	1	32.0	20.0	11.0	27.5	\	8	40	120	13.0	24	18.0	40	0.8	FAG27K105G182GL5
275	3.3	32.0	33.0	18.0	27.5	\	9	132	396	6.2	26	29.9	40	0.8	FAG27K335G342GL5
275	6.8	32.0	37.0	22.0	27.5	\	9	272	816	4.7	28	39.4	40	0.8	FAG27K685G402GL5
275	10	42.5	40.0	20.0	37.5	10.2	14	300	900	5.9	30	13.0	30	1.2	FAG27K106K244KB5
275	15	42.5	45.0	30.0	37.5	20.3	14	450	1350	5.1	30	15.0	30	1.2	FAG27K156K424KD5
275	20	57.5	45.0	30.0	52.5	20.3	14	500	1500	6.0	35	12.8	25	1.2	FAG27K206M164MD5
275	30	57.5	50.0	35.0	52.5	20.3	14	750	2250	5.3	35	14.4	25	1.2	FAG27K306M204MD5
350	0.68	32.0	20.0	11.0	27.5	\	8	31	92	15.0	24	15.6	45	0.8	FAG35K684G182GL5
350	2	32.0	33.0	18.0	27.5	\	9	90	270	7.3	26	25.4	45	0.8	FAG35K205G342GL5
350	2.2	32.0	33.0	18.0	27.5	\	9	99	297	6.9	26	26.8	45	0.8	FAG35K225G342GL5
350	3.3	32.0	37.0	22.0	27.5	\	9	149	446	5.7	28	32.5	45	0.8	FAG35K335G402GL5
350	4.7	42.5	40.0	20.0	37.5	10.2	14	160	479	6.9	30	11.1	34	1.2	FAG35K475K244KB5
350	5	42.5	40.0	20.0	37.5	10.2	14	170	510	6.8	30	11.3	34	1.2	FAG35K505K244KB5
350	6.8	42.5	37.0	28.0	37.5	10.2	14	231	694	6.2	30	12.3	34	1.2	FAG35K685K374KB5
350	10	42.5	45.0	30.0	37.5	20.3	14	340	1020	5.3	30	14.4	34	1.2	FAG35K106K424KD5
350	12	57.5	45.0	30.0	52.5	20.3	14	336	1008	6.8	35	11.3	28	1.2	FAG35K126M164MD5
350	20	57.5	50.0	35.0	52.5	20.3	14	560	1680	5.9	35	13.0	28	1.2	FAG35K206M204MD5
400	0.47	32.0	20.0	11.0	27.5	\	7	24	71	18.6	24	16.5	50	0.8	FAG40K474G182GL5
400	1	32.0	28.0	14.0	27.5	\	9	50	150	10.3	26	18.0	50	0.8	FAG40K105G262GL5
400	1.5	32.0	33.0	18.0	27.5	\	9	75	225	8.1	26	22.9	50	0.8	FAG40K155G342GL5
400	2.2	32.0	33.0	18.0	27.5	\	9	110	330	6.4	26	28.9	50	0.8	FAG40K225G342GL5
400	3	32.0	37.0	22.0	27.5	\	9	150	450	5.7	28	32.5	50	0.8	FAG40K305G402GL5
400	5	42.5	37.0	28.0	37.5	10.2	14	200	600	6.2	30	12.3	40	1.2	FAG40K505K374KB5
400	10	57.5	45.0	30.0	52.5	20.3	14	350	1050	6.9	35	11.1	35	1.2	FAG40K106M164MD5
400	15	57.5	50.0	35.0	52.5	20.3	14	525	1575	6.1	35	12.5	35	1.2	FAG40K156M204MD5

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Vdc	Cap Value μF	Dimensions					Irms 10KHz 70°C A	Peak Current A	Surge Current A	ESR 10KHz mΩ	ESL nH	Thermal Res °C/W	dv/dt V/us	Lead Wire mm	Part Number
		W mm	H mm	T mm	P mm	P1 mm									
450	0.47	32.0	22.0	13.0	27.5	\	8	26	78	15.7	24	14.9	55	0.8	FAG45K474G212GL5
450	1	32.0	33.0	18.0	27.5	\	8	55	165	9.2	26	25.5	55	0.8	FAG45K105G342GL5
450	1.5	32.0	37.0	22.0	27.5	\	8	83	248	7.3	28	32.1	55	0.8	FAG45K155G402GL5
450	3.3	42.5	37.0	28.0	37.5	10.2	14	149	446	7.4	30	10.3	45	1.2	FAG45K335K374KB5
450	4.7	42.5	45	30	37.5	20.3	14	212	635	6.2	30	12.3	45	1.2	FAG45K475K424KD5
450	6.8	57.5	45	30	52.5	20.3	14	258	775	7.5	35	10.2	38	1.2	FAG45K685M164MD5
450	10	57.5	50	35	52.5	20.3	14	380	1140	6.6	35	11.6	38	1.2	FAG45K106M204MD5

General Technical Data

Applications	AC Filtering
Dielectric	Metallized Polypropylene Film
Reference Standard	IEC 61071/EN 61071
Climatic Category	55/105/56 IEC 60068-1
Operating Temperature Range	-55°C ~ +105°C (85°C ~105°C, decreasing factor 1.25% per °C for Urms)
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.

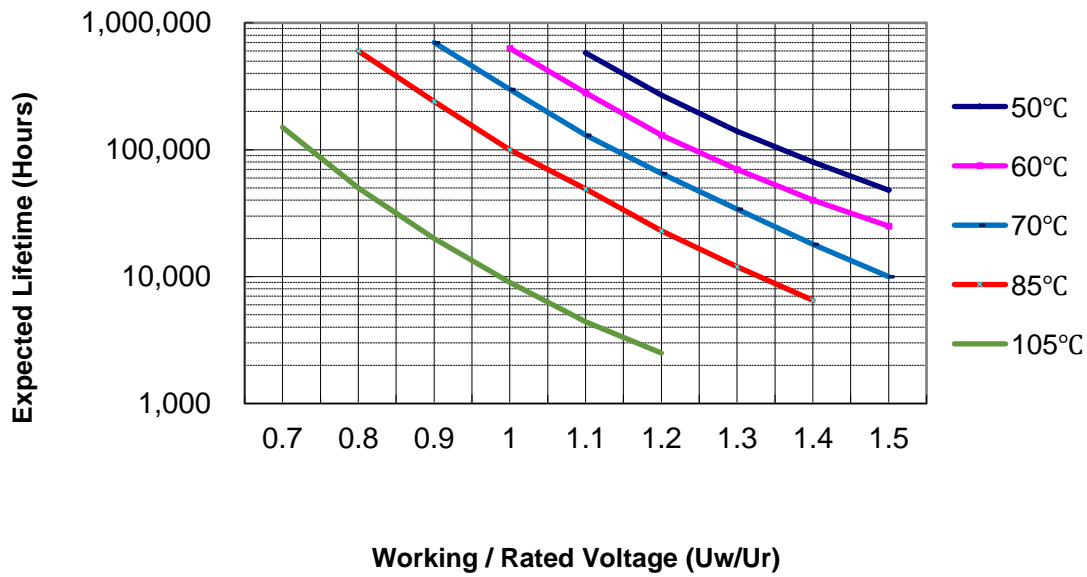
Construction

Metallized Film	OPP & Al/Zn	
Metal Sprayed	Sn/Zn Alloy	
Connection Electrode	Tinned copper wires	
Case	Plastic Case (UL94V-0)	
Filling	Epoxy Resin (UL94V-0)	
Film Construction	<p>Mono Structure</p> 	<p>Internal Series Connection</p> 

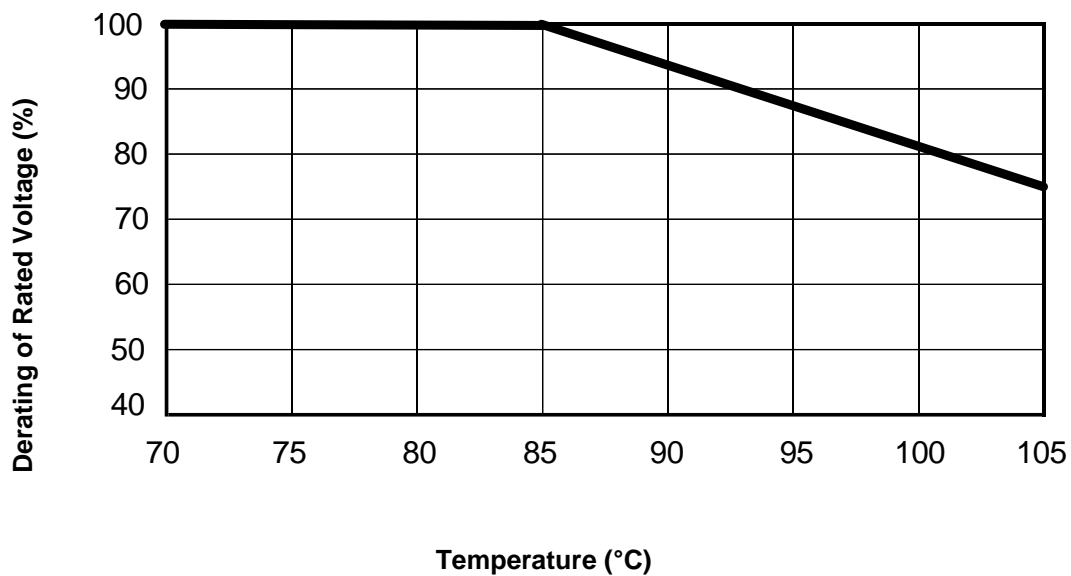
Electrical Characteristics

Voltage Range	160Vac ~ 450Vac
Capacitance Range	0.47uF ~50uF
Capacitance Tolerance	±5% or ±10% at +25°C
Capacitance	Measuring Frequency at 1kHz Measuring Voltage:1±0.2V
Standard Atmospheric Conditions for Static Test	<p>Ambient temperature 15°C to 35°C (If there is any doubt on the results, the measurements shall be made at +20 +/- 5°C)</p> <p>Relative humidity 45% to 75% (If there is any doubt on the results, the measurements shall be made at 60% to 70 %.)</p> <p>Air pressure 86 kPa to 106 kPa.</p>
Voltage Between Terminals U _{TT}	1.5 x V _R Vac for 10 seconds (between terminations) @ +25°C ±5°C
Voltage Between Terminals and Case U _{TC}	3000V _{AC} , 50/60Hz 60s (at+25+/-5°C)
Dielectric Dissipation Factor Tgδ 0	≤2×10 ⁻⁴
Dissipation factor	≤ 0.002 (0.20%) at 1 KHz. C≤20uF at +25°C ≤ 0.003 (0.30%) at 1 KHz. C>20uF at +25°C
Insulation Resistance	RC between leads, IR xC≥30,000 s at 100vdc 1minute at +25°C
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

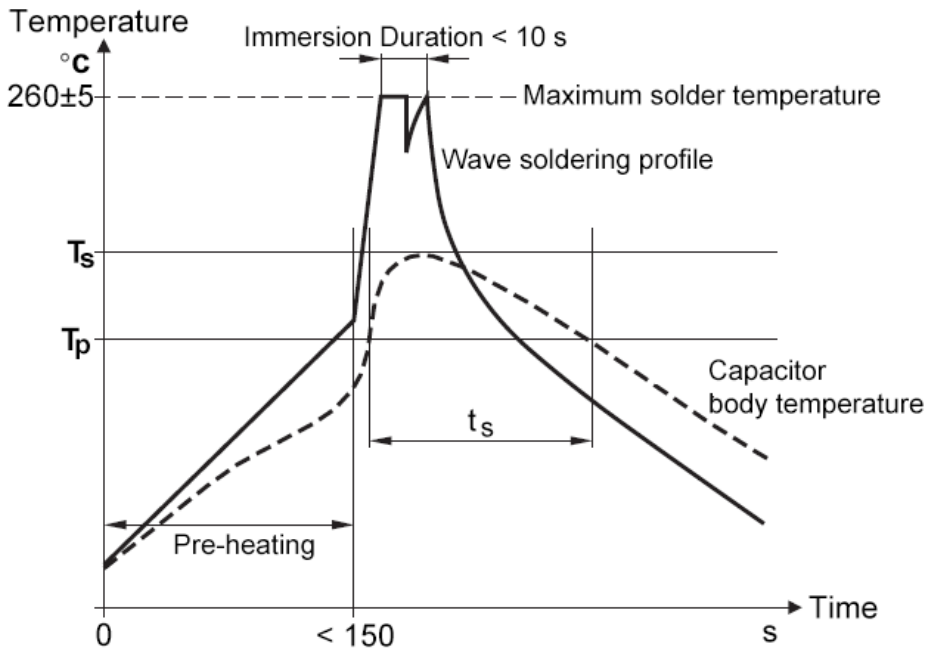
Expected Life Curve



Derating of Rated Voltage Vs Temperature



Wave Soldering Recommendations

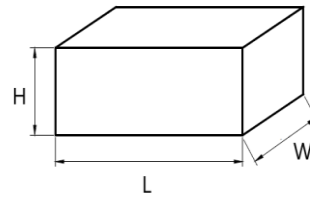


Ts: Capacitor body maximum temperature at wave soldering
 Tp: Capacitor body maximum temperature at pre-heating

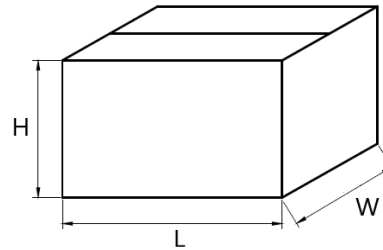
Polypropylene Capacitors	Polyester Capacitors
During pre-heating: $T_p \leq 110^\circ\text{C}$ During soldering: $T_s \leq 120^\circ\text{C}$, $t_s \leq 60$	During pre-heating: $T_p \leq 130^\circ\text{C}$ During soldering: $T_s \leq 160^\circ\text{C}$, $t_s \leq 60\text{s}$

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
27.5	G18	32	20	11	200	252
	G21	32	22	13	200	207
	G26	32	28	14	200	198
	G34	32	33	18	100	153
	G40	32	37	22	100	126
37.5	K24	42.5	40	20	-	105
	K27	42.5	37	22	-	98
	K37	42.5	37	28	-	77
	K42	42.5	45	30	-	70
52.5	M16	57.5	45	30	-	50
	M20	57.5	50	35	-	45

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

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