Type 0685P

Surface Mount Fast Acting Chip Fuse

HF Pb 0685P Series – 1206 Size RoHS Compliant

Features

- Fast Acting, with improved surge withstand performance
- Small size, 1206 SMD
- Current rating from 2A to 50A, fuse marked with ampere code
- Wide operating temperature range from -55℃ to 125℃
- Tape and Reel for automatic SMD placement
- Compatible with 260℃ IR Pb-free and wave soldering process
- Full compliance with EU Directive 2011/65/EU and amending directive 2015/863 (MSL = 1)
- Halogen Free and Lead Free
- AEC-Q Compliant
- Meets Bel automotive qualification*

  * - Largely based on internal AEC-Q test plan

Applications

- Automotive Navigation System
- Thin film transistor LCD flat-panel display screen
- Notebook
- PC computer
- Office electronic equipment
- Industrial equipment
- Medical equipment
- POE, POE+
- LCD / LED monitor
- Power supply
- LCD / LED TV
- DC-DC Converter

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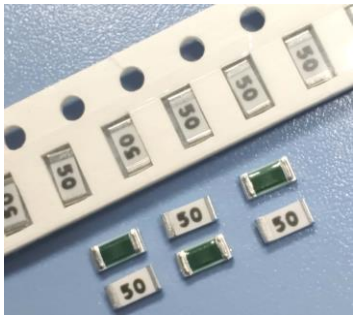
LEAD FREE = Pb
HALOGEN FREE HF



UK CA c UL us CE

AEC-Q Compliant

Typical Part Marking

Fuse body (ceramic white side) marked with marking code.

Example:

Current Rating	Marking Code	Current Rating	Marking Code
2A	2	10A	10
2.5A	T	12A	12
3A	3	15A	15
3.5A	Z	20A	20
4A	4	25A	25
5A	5	30A	30
6A	6	40A	40
7A	7	50A	50
8A	8		

Electrical Characteristics (UL STD. 248-14)

Amp Rating	Testing Current	Blow Time	
		Minimum	Maximum
2A-50A	100%	4 Hrs.	N/A
2A-8A	250%	N/A	5 Sec
10A-50A	350%	N/A	5 Sec

Safety Agency Approvals

Safety Agency	Safety Agency Certificate	Ampere Rating / Voltage Rating	Ampere Range / Volt @ I.R. ability*
c UL us	E506667	2A–8A/50V AC /63V DC >8A-30A/50V DC >30A-50A/32V DC	2A–8A/50A@50VAC /100A@63V DC >8A-25A/150A@50V DC >25A-30A/250A @50V DC >30A-50A/200A@32V DC
*I.R.= Interrupting Rating = Short Circuit Rating(Amps)			

Physical Specifications

Materials	Body : Ceramic Substrate
	Terminations : Ag / Ni / Sn (100% Lead-free)
	Element Cover Coating : Lead-free Glass
Marking	On Fuse :
	Marking Code
	On Label :
	"bel", "0685P", "Current Rating", "Voltage Rating", "Interrupting Rating", "Appropriate Safety Logos" and " RoHS ", " e "(China RoHS compliant).

Specifications subject to change without notice

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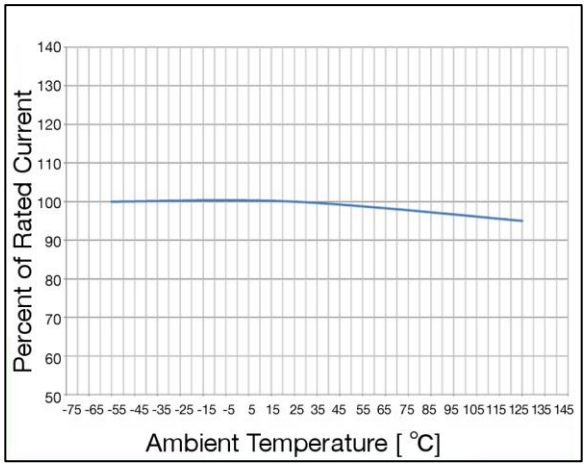
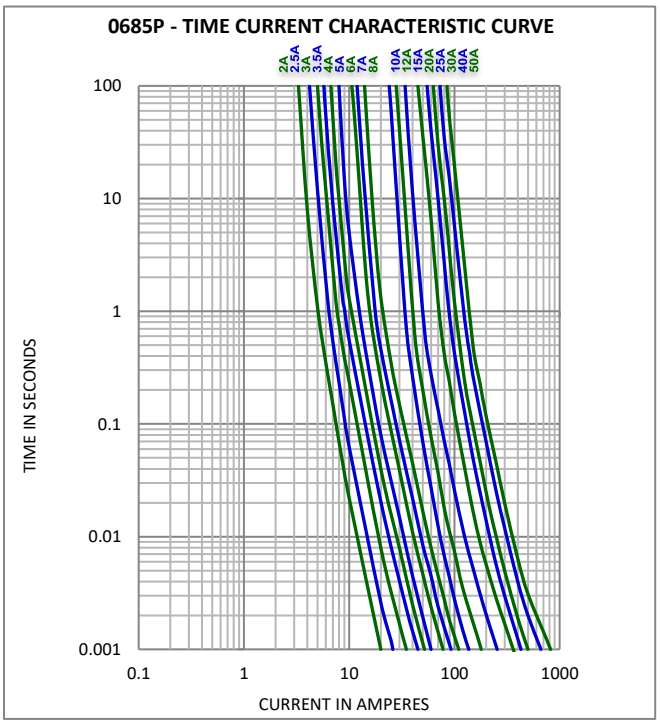
Temperature Derating Curve



Average Time Current Curve



Electrical Specifications

Part Number	Ampere Rating (A)	Marking Code	Nominal Cold Resistance (mohms)	Maximum Volt-drop @100% In (Volt) max.	Voltage and Interrupting Ratings	Nominal Melting I²T @10 In (A² Sec)	Maximum Power Dissipation @100% In (W)	Agency Approvals
0685P2000-01	2	2	115.0	0.370	See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings	0.2	0.74	Y
0685P2500-01	2.5	T	82.0	0.305		0.6	0.76	Y
0685P3000-01	3	3	60.0	0.270		1.3	0.81	Y
0685P3500-01	3.5	Z	50.0	0.240		2.6	0.84	Y
0685P4000-01	4	4	40.0	0.210		4.0	0.84	Y
0685P5000-01	5	5	26.0	0.205		4.1	1.03	Y
0685P6000-01	6	6	20.0	0.166		8.0	1.00	Y
0685P7000-01	7	7	16.0	0.159		12.5	1.11	Y
0685P8000-01	8	8	12.0	0.128		19	1.02	Y
0685P9100-01	10	10	5.70	0.065		25	0.65	Y
0685P9120-01	12	12	4.60	0.065		48	0.78	Y
0685P9150-01	15	15	3.40	0.065		80	0.98	Y
0685P9200-01	20	20	2.20	0.050		100	1.00	Y
0685P9250-01	25	25	1.60	0.050		225	1.25	Y
0685P9300-01	30	30	1.30	0.050		255	1.50	Y
0685P9400-01	40	40	1.05	0.054		320	2.16	Y
0685P9500-01	50	50	0.80	0.072		500	3.60	Y

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Consult manufacturer for other ratings

NOTES: Test Conditions

All test were conducted with the fuses soldered to a PCB with a nominal thickness of 1.6mm with copper traces measuring 100mm overall length. Copper trace/width as described below.

Device designed to be mounted with marking facing up.

Device designed to carry rated current for 4 hours minimum. It is recommended that device be operated continuously at no more than 80% of rated current when in a +25°C ambient, with further derating at elevated ambient temperatures.

Fuse Rating	Test Board Trace Dimension
2A – 5.0 A	1 oz. copper, 5.0 mm wide
>5.0 A – 8.0 A	2 oz. copper, 7.5 mm wide
>8.0 A – 30.0 A	3 oz. copper, 10.0mm wide
>30.0 A – 40.0 A	3 oz. copper, 15.0 mm wide
>40.0 A – 50.0 A	3 oz. copper, 25.0 mm wide

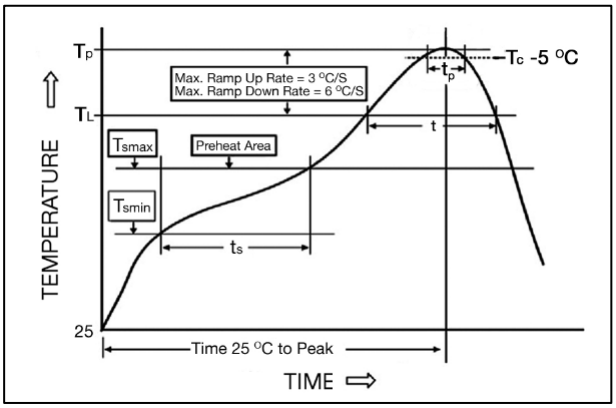
Environmental Specifications

Shock Resistance	MIL-STD-202G, Method 213B, Test Condition 1 (100 G's peak for 6 milliseconds; Sawtooth waveform)
Vibration Resistance	MIL-STD-202G, Method 201A (10-55 Hz, 0.06 inch, total excursion).
Salt Spray Resistance	MIL-STD-202G, Method 101E, Test Condition B (48 hrs.).
Insulation Resistance	MIL-STD-202G, Method 302, Test Condition A (After Opening) 10,000 ohms minimum.
Solderability	MIL-STD-202G, Method 208H
Resistance to solder Heat	MIL-STD-202G, Method 210F, Test Condition C. Top Side(260℃,20 sec) MIL-STD-202G, Method 210F, Test Condition D. Bottom Side(260℃,10 sec)
Thermal Shock	MIL-STD-202G, Method 107G, Test Condition B (-65℃ to +125℃).
Operating Temperature	-55℃ to +125℃
Moisture Sensitivity Level	1 (According to IPC J-Std-020)

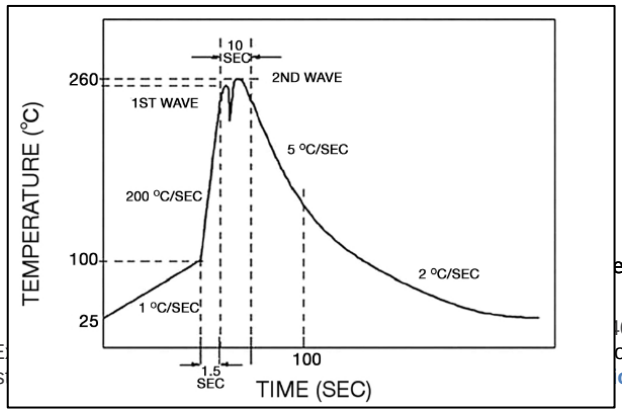
High temperature storage	MIL-STD-202 Method 108
Temperature cycling	JESD22 Method JA-104,Test Condition B
Biased humidity	MIL-STD-202 Method 103, 85C/85% RH with 10% operating power for 1000 hrs.
Operational life	MIL-STD-202 Method 108, Test Condition D
Resistance to solvents	MIL-STD-202 Method 215
Mechanical shock	MIL-STD-202 Method 213,Test Condition C
Vibration	MIL-STD-202 Method 204
Resistance to soldering heat	MIL-STD-202 Method 210,Test condition B
Thermal shock	MIL-STD-202 Method 107
Solderability	J-STD-002
Board flex(SMD)	AEC-Q200-005
Terminal strength	AEC-Q200-006
Electrical characterization	3 temperature electrical

Soldering Parameters

IR Reflow Profile (IPC/JEDEC J-STD-020D)	
Preheat & Soak Temperature min (T_{smin}) Temperature max (T_{smax}) Time (T_{smin} to T_{smax}) (t_s)	 150℃ 200℃ 60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3℃/second max.
Liquidous temperature (T_L) Time at liquidous (t_L)	217℃ 60-150 seconds
Peak temperature (T_p)	260℃ max
Time (tp) within 5℃ of the specified classification temperature (Tc)	30 seconds
Average ramp-down rate (T_p to T_{smax})	6℃/second max.
Time 25℃ to peak temperature	8 minutes max.



Lead-free Wave Soldering Profile	
Wave Soldering Parameter	
Average ramp-up rate	200℃ / second
Heating rate during preheat	typical 1 - 2℃ / second Max 4℃ / second



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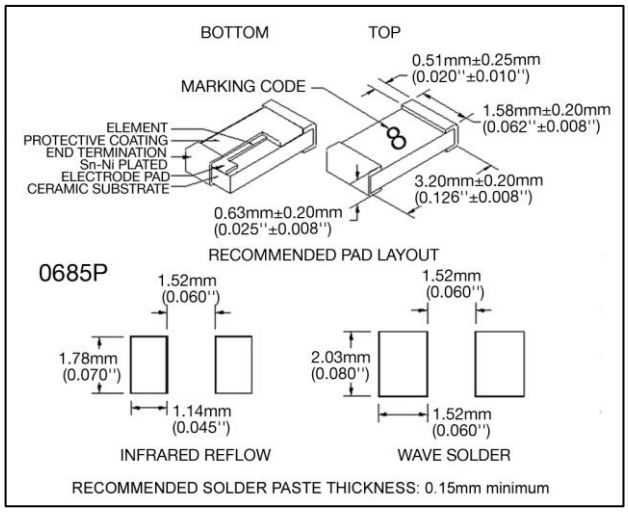
Final preheat temperature	within 125℃ of soldering temperature
Peak temperature Tp	260℃
Time within +0℃ / -5℃ of actual peak temperature	10 seconds
Ramp-down rate	5℃ / second max.

Fuse FGNO Explanation
0685 P [XXXX] -XX
0685P=0685P; [XXXX]=Ampere Rating; XX=See Ordering Information as below

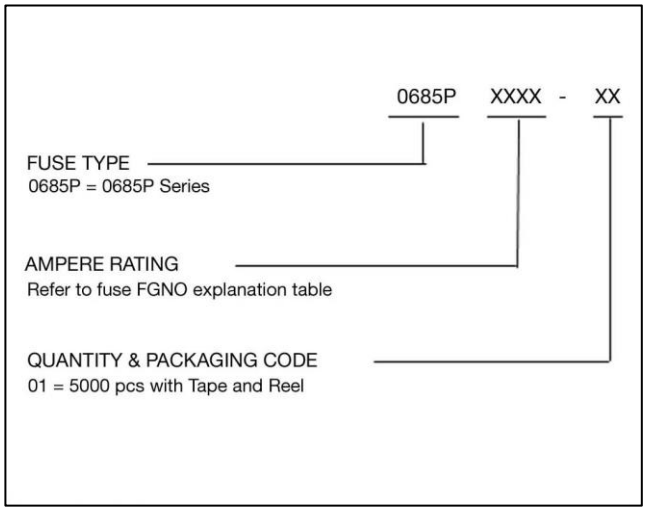
Amps	Bel FGNO[XXXX]
2	2000
2.5	2500
3	3000
3.5	3500
4	4000
5	5000
6	6000
7	7000
8	8000

Amps	Bel FGNO[XXXX]
10	9100
12	9120
15	9150
20	9200
25	9250
30	9300
40	9400
50	9500

Mechanical Dimensions



Ordering Information



Packaging

Packaging Tape & Reel	Packaging Specification	Quantity	Quantity & Packaging Code

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8 mm wide tape with 7 inches Diameter reel	EIA Standard 481-E	5000	0685PXXXX-01

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