SFH618A-2, SFH618A-3, SFH618A-4

DESCRIPTION

The SFH618A-2, SFH618A-3 and SFH618A-4 optically coupled isolators each consists of an infrared light emitting diode and an NPN silicon photo transistor in a space efficient Dual In Line Plastic Package.

FEATURES

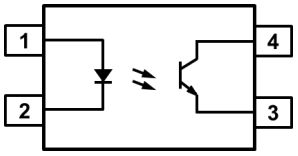
- AC Isolation Voltage 5000V_{RMS}
- Wide Operating Temperature Range -55°C to +110°C
- Lead Free and RoHS Compliant
- UL File E91231 Package Code “EE”
- VDE Approval Certificate No. 40028086

APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measuring Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

ORDER INFORMATION

- Add X after PN for VDE Approval
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel



1 Anode
2 Cathode
3 Emitter
4 Collector

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device.
Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

Forward Current	50mA
Peak Forward Current (100µs, 100Hz)	1A
Reverse Voltage	6V
Power dissipation	70mW

Output

Collector to Emitter Voltage V_{CEO}	55V
Emitter to Collector Voltage V_{ECO}	6V
Collector Current	50mA
Power Dissipation	150mW

Total Package

Isolation Voltage	5000V_{RMS}
Total Power Dissipation	200mW
Operating Temperature	-55 to 110 °C
Junction Temperature	125 °C
Storage Temperature	-55 to 125 °C
Lead Soldering Temperature (10s)	260°C

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ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	I_F = 20mA		1.2	1.4	V
Reverse Leakage	I_R	V_R = 4V			10	µA
Terminal Capacitance	C_t	V = 0V, f = 1KHz		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector−Emitter Breakdown Voltage	BV_{CEO}	I_C = 0.1mA, I_F = 0mA	55			V
Emitter−Collector Breakdown Voltage	BV_{ECO}	I_E = 10µA, I_F = 0mA	6			V
Collector−Emitter Dark Current	I_{CEO}	V_{CE} = 20V, I_F = 0mA			100	nA

ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	SFH618A-2 I_F = 1mA, V_{CE} = 0.5V I_F = 0.5mA, V_{CE} = 1.5V SFH618A-3 I_F = 1mA, V_{CE} = 0.5V I_F = 0.5mA, V_{CE} = 1.5V SFH618A-4 I_F = 1mA, V_{CE} = 0.5V I_F = 0.5mA, V_{CE} = 1.5V	 63 32 100 50 160 80		 125 200 320	%
Collector−Emitter Saturation Voltage	$V_{CE(sat)}$	SFH618A-2 I_F = 1mA, I_{CE} = 0.32mA SFH618A-3 I_F = 1mA, I_{CE} = 0.5mA SFH618A-4 I_F = 1mA, I_{CE} = 0.8mA			0.4 0.4 0.4	V
Floating Capacitance	C_f	V = 0V, f = 1MHz		0.6	1	pF
Cut-Off Frequency	fc	V_{CE} = 5V, I_C = 2mA, R_L = 100Ω, -3dB		80		kHz
Output Rise Time	t_r	V_{CE} = 2V, Ic = 2mA, R_L = 100Ω		4	18	µs
Output Fall Time	t_f			3	18	

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input to Output Isolation Voltage	V_{ISO}	AC 1 minute, RH = 40% to 60% Note 1	5000			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	V_{IO}= 500V, RH = 40% to 60% Note 1	$5x10^{10}$	$1x10^{11}$		Ω

Note 1 : Measure with input leads shorted together and output leads shorted together.

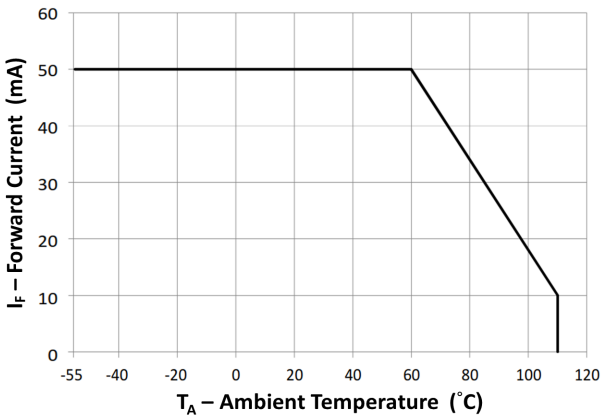


Fig 1 Forward Current vs Ambient Temperature

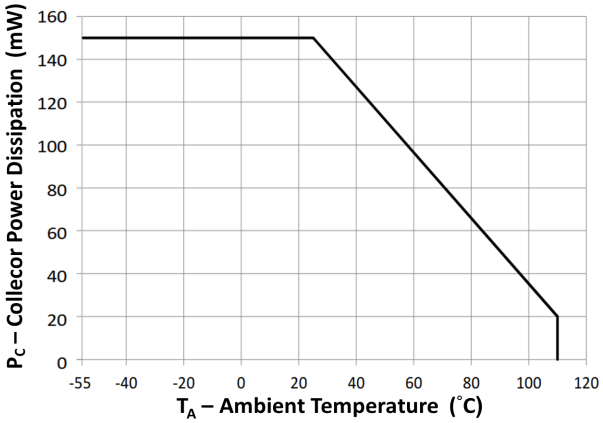


Fig 2 Collector Power Dissipation vs Ambient Temperature

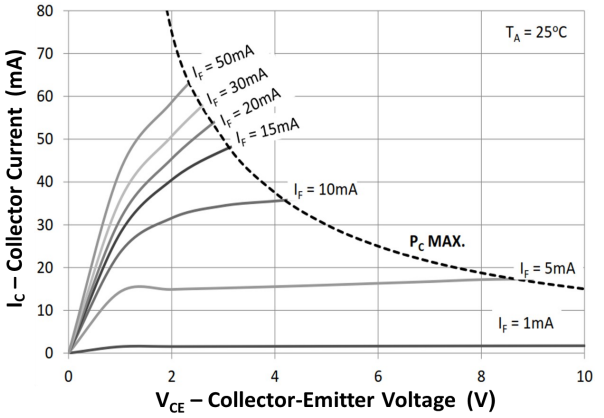


Fig 3 Collector Current vs Collector-Emitter Voltage

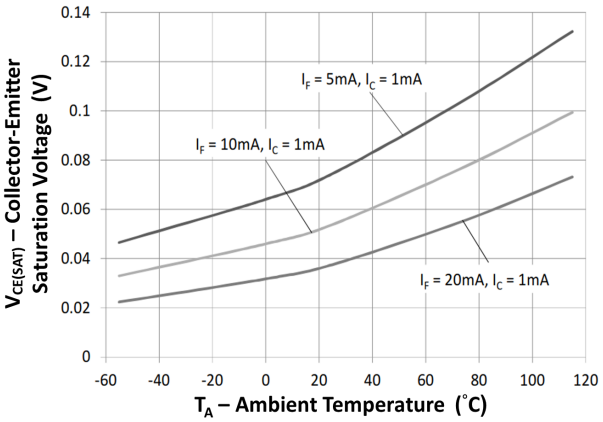


Fig 4 Collector-Emitter Saturation Voltage vs Ambient Temperature

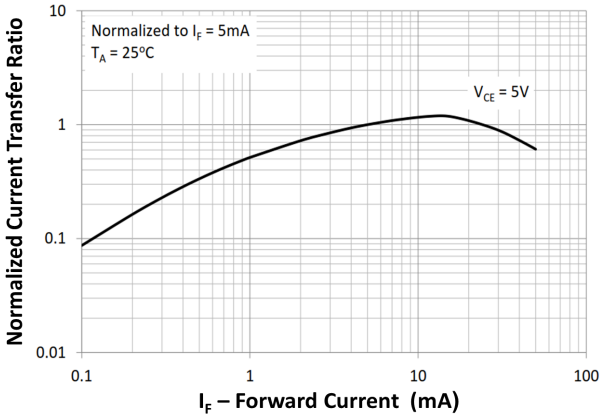


Fig 5 Normalized Current Transfer Ratio vs Forward Current

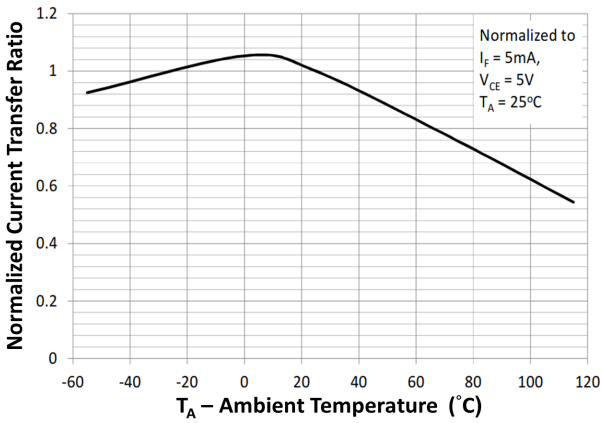


Fig 6 Normalized Current Transfer Ratio vs Ambient Temperature

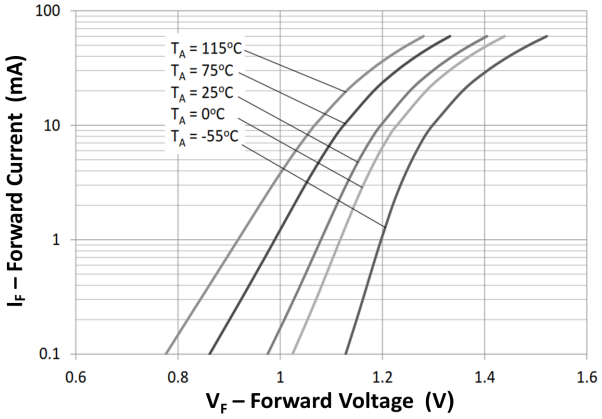


Fig 7 Forward Current vs Forward Voltage

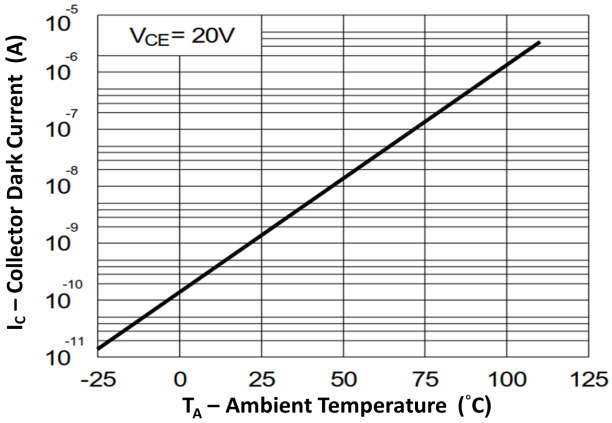


Fig 8 Collector Dark Current vs Ambient Temperature

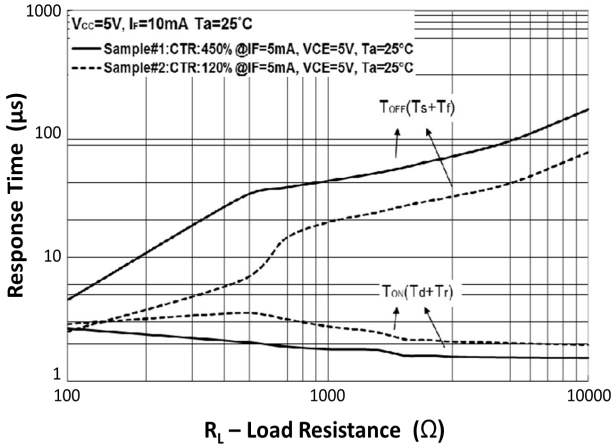


Fig 9 Response Time vs Load Resistance

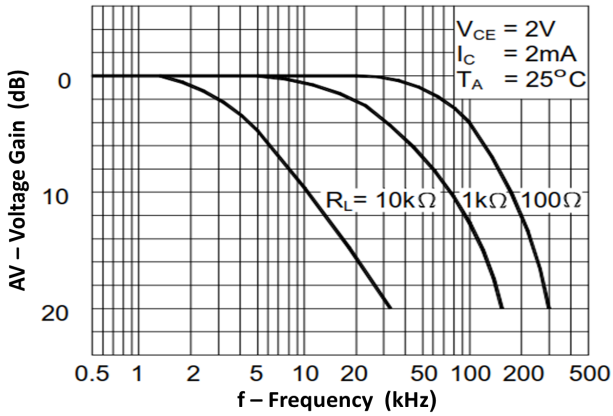
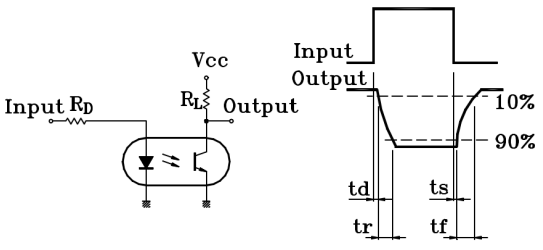
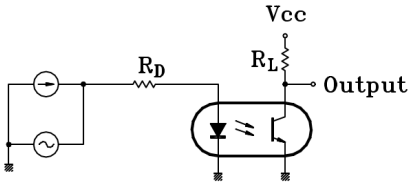


Fig 10 Frequency Response



Response Time Test Circuit



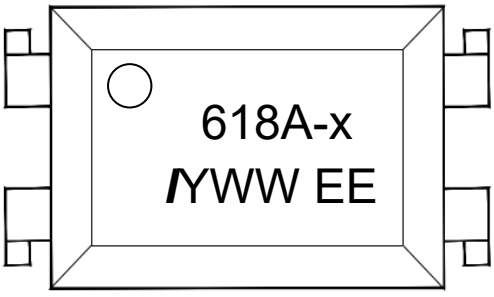
Frequency Response Test Circuit

ORDER INFORMATION

SFH618A-2, SFH618A-3, SFH618A-4 (UL Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	SFH618A-2, SFH618A-3, SFH618A-4	Standard DIP4	100 pcs per tube
G	SFH618A-2G, SFH618A-3G, SFH618A-4G	10mm Lead Spacing	100 pcs per tube
SM	SFH618A-2SM, SFH618A-3SM SFH618A-4SM	Surface Mount	100 pcs per tube
SMT&R	SFH618A-2SMT&R, SFH618A-3SMT&R SFH618A-4SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

SFH618A-2, SFH618A-3, SFH618A-4 (UL and VDE Approvals)			
After PN	**PN**	**Description**	**Packing quantity**
None	SFH618A-2X, SFH618A-3X, SFH618A-4X	Standard DIP4	100 pcs per tube
G	SFH618A-2XG, SFH618A-3XG SFH618A-4XG	10mm Lead Spacing	100 pcs per tube
SM	SFH618A-2XSM, SFH618A-3XSM SFH618A-4XSM	Surface Mount	100 pcs per tube
SMT&R	SFH618A-2XSMT&R SFH618A-3XSMT&R SFH618A-4XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

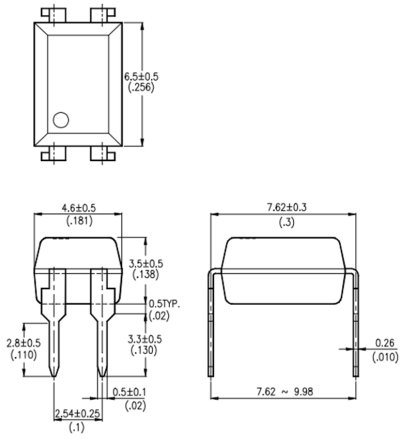
DEVICE MARKING



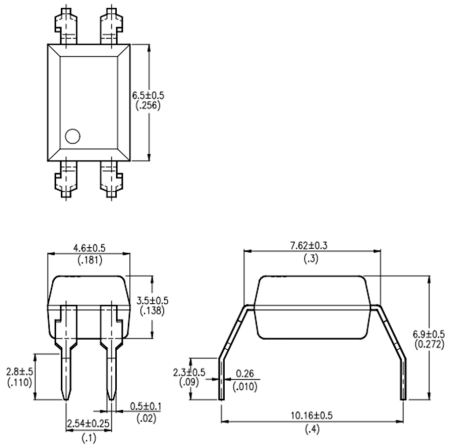
618A-x	denotes Device Part Number where “x” denotes CTR Grade
I	denotes Isocom
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
EE	UL Package Designation

PACKAGE DIMENSIONS in mm (inch)

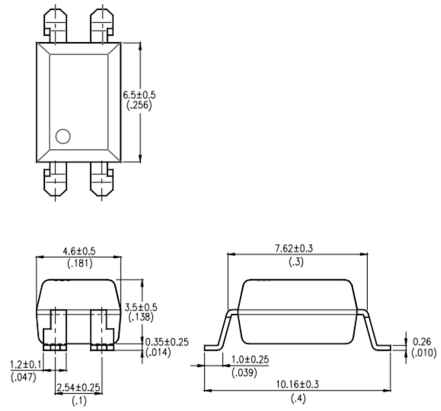
DIP



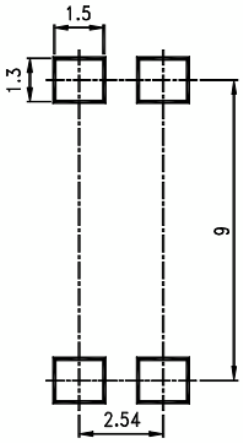
G Form



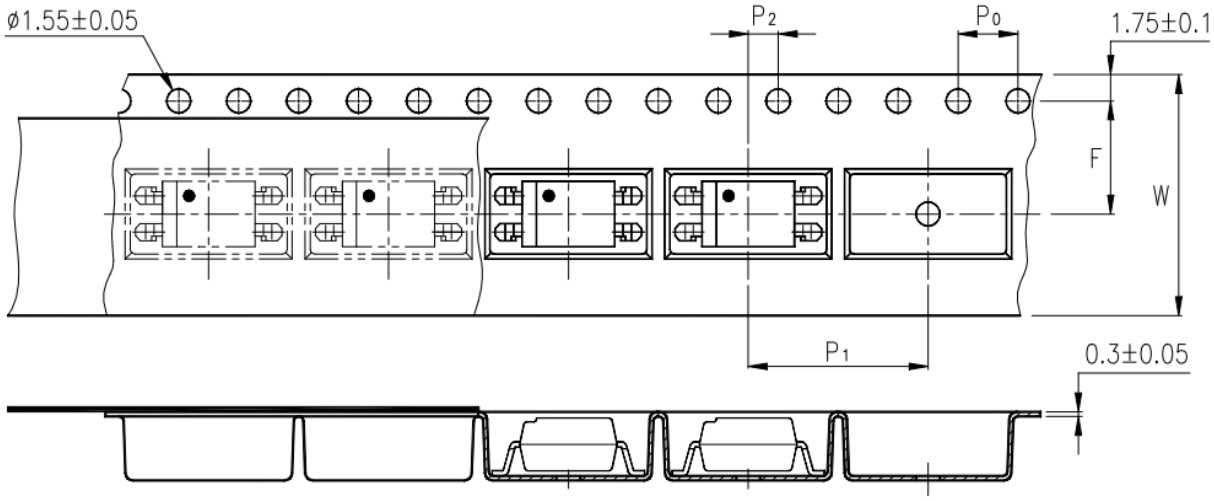
SMD



RECOMMENDED PAD LAYOUT FOR SMD (mm)

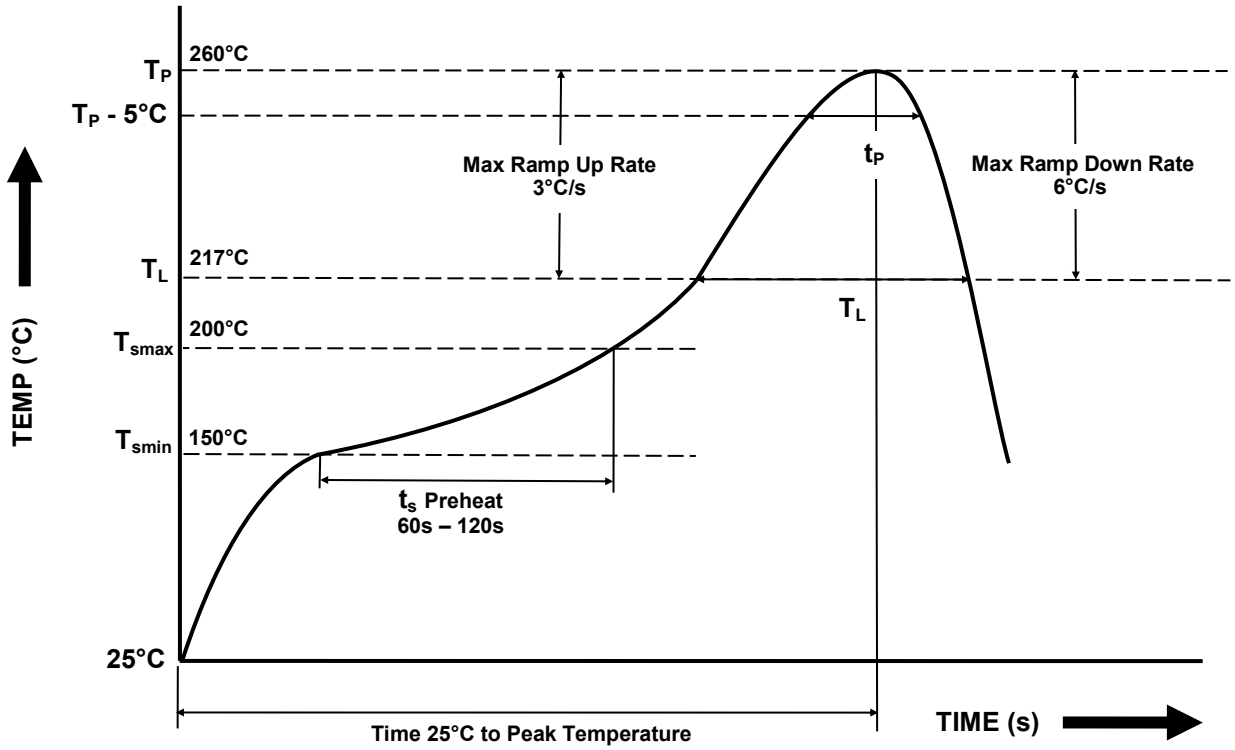


TAPE AND REEL PACKAGING



Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P_0	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P_2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P_1	12 ± 0.1 (0.472)

IR REFLOW SOLDERING TEMPERATURE PROFILE FOR SMD
One Time Reflow Soldering is Recommended.
Do not immerse device body in solder paste.



Profile Details	Conditions
Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s)	 150°C 200°C 60s - 120s
Soldering Zone - Peak Temperature (T_P) - Time at Peak Temperature - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature (T_P – 5°C) - Time maintained above T_L (t_L) - Ramp Up Rate (T_L to T_P) - Ramp Down Rate (T_P to T_L)	 260°C 10s max 217°C 30s max 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T_{smax} to T_P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max

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