



**MF303#, MF304#, MF306#, MF308# Series**



**DESCRIPTION**

The MF303#, MF304#, MF306# and MF308# series of devices consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon detector performing the function of a zero voltage crossing bilateral triac driver. They are designed for use with a discrete power triac in the interface of logic systems to equipment powered from 110 to 240 VAC lines.

**FEATURES**

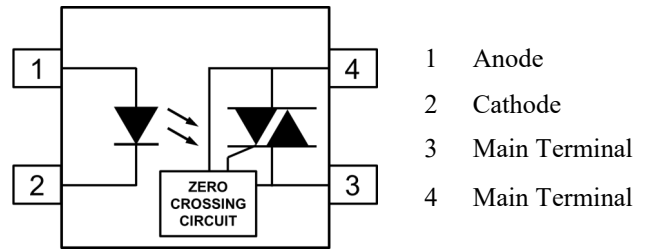
- Zero Voltage Crossing
- $V_{DRM}$ 
  - MF303# Series 250V
  - MF304# Series 400V
  - MF306# Series 600V
  - MF308# Series 800V
- Mini Flat Package
- Isolation Voltage  $3750V_{RMS}$
- Wide Operating Temperature Range  $-40^{\circ}C$  to  $110^{\circ}C$
- RoHS Compliant
- UL File E91231 designated as MF304# and MF306# where # is any number 0-9
- Safety Approval Pending for MF303# and MF308# Series

**APPLICATIONS**

- Solenoid / Valve Controls
- Light Controls
- AC Motor Drivers
- Temperature Controls
- AC Motor Starters
- Solid State Relays

**ORDER INFORMATION**

- Available in Tape & Reel



**ABSOLUTE MAXIMUM RATINGS**

**Input**

Forward Current	60mA
Peak Forward Current (1 $\mu$ s pulse 300pps)	1A
Reverse Voltage	6V
Power Dissipation	100mW

**Output**

Off-State Output Terminal Voltage	
MF303# Series	250V
MF304# Series	400V
MF306# Series	600V
MF308# Series	800V
On-state RMS Current	$70mA_{RMS}$
Power Dissipation	300mW

**Total Package**

Isolation Voltage	$3750V_{RMS}$
Operating Temperature	$-40$ to $110^{\circ}C$
Storage Temperature	$-55$ to $150^{\circ}C$
Lead Soldering Temperature (10s)	$260^{\circ}C$

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**ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise specified)**

**INPUT**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	$V_F$	$I_F = 30\text{mA}$			1.5	V
Reverse Current	$I_R$	$V_R = 6\text{V}$			10	$\mu\text{A}$

**OUTPUT**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak Off-State Current	$I_{\text{DRM}}$	$V_{\text{DRM}} = \text{Rated } V_{\text{DRM}}$ $I_F = 0\text{mA}$  Note 1			100	nA
On-State Voltage	$V_{\text{TM}}$	$I_{\text{TM}} = 100\text{mA (peak)}$			3	V
Critical Rate of Rise of Off-State Voltage	dv/dt		1000			V/ $\mu\text{s}$

**COUPLED**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input Trigger Current	$I_{\text{FT}}$	$V_{\text{TM}} = 3\text{V}$  MF3030 / MF3040 MF3060 / MF3080  MF3031 / MF3041 MF3061 / MF3081  MF3032 / MF3042 MF3062 / MF3082  MF3033 / MF3043 MF3063 / MF3083  MF306#  Note 2			30  15  10  5  3	mA
Holding Current (either direction)	$I_H$			280		$\mu\text{A}$

Note 1 : Test Voltage must be applied within dv/dt rating.

Note 2 : Guaranteed to trigger at an  $I_F$  value less than or equal to max  $I_{\text{FT}}$ , recommended  $I_F$  lies between Rated  $I_{\text{FT}}$  to Absolute Max  $I_F$ .



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**ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise specified)**

**ZERO CROSSING CHARACTERISTICS**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Inhibit Voltage	$V_{INH}$	$I_F = \text{Rated } I_{FT}$ MT1-MT2 Voltage above which device will not trigger			20	V
Leakage Current in Inhibit State	$I_{DRM2}$	$I_F = \text{Rated } I_{FT}$ $V_{DRM} = \text{Rated } V_{DRM}$ Off-state			1000	$\mu\text{A}$

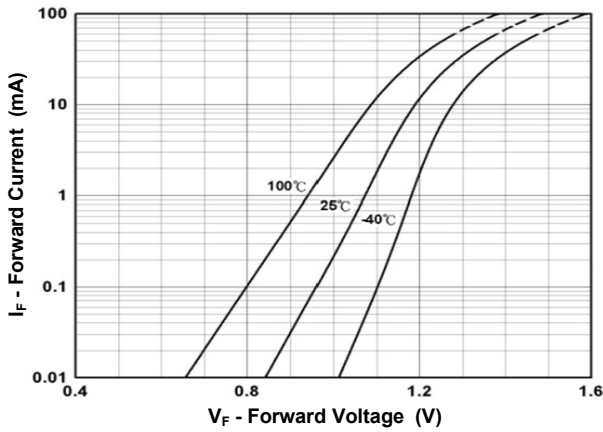
**ISOLATION**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	$V_{ISO}$	R.H. = 40% to 60% $t = 1 \text{ min}$	3750			$V_{RMS}$

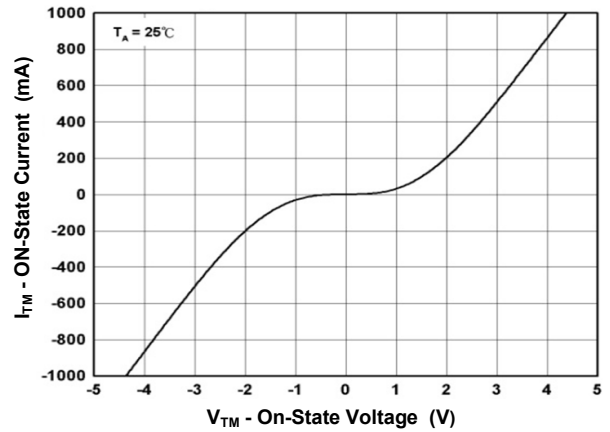
Measured with input leads shorted together and output leads shorted together.



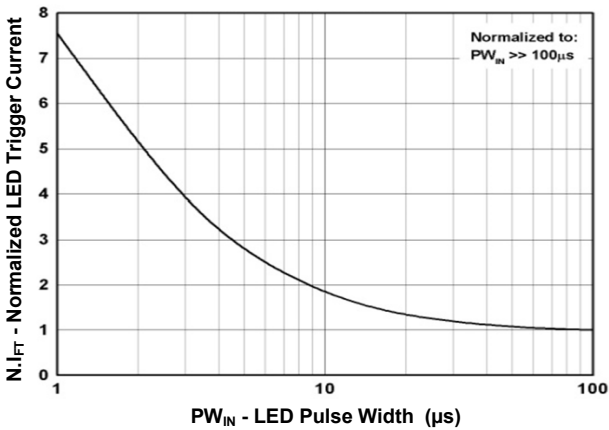
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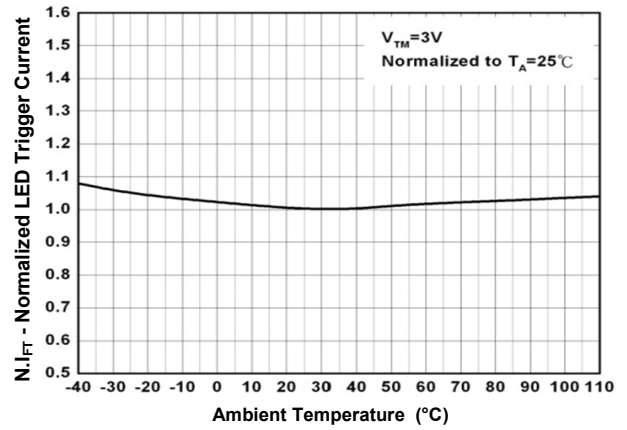
**Fig 1 Forward Current vs Forward Voltage**



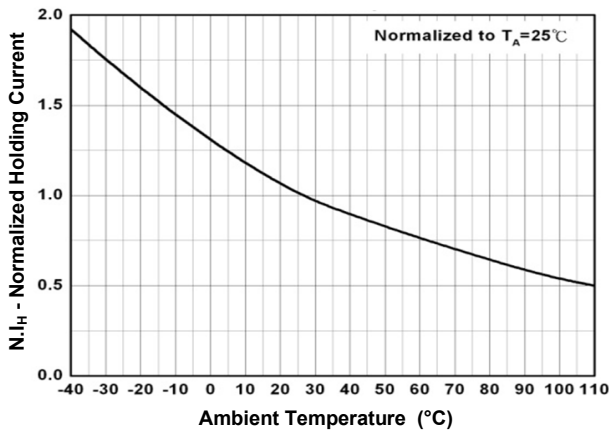
**Fig 2 On-State Characteristics**



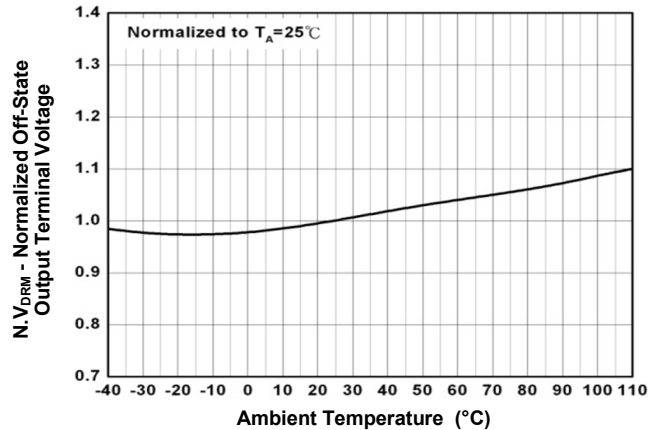
**Fig 3 Normalized LED Trigger Current vs LED Pulse Width**



**Fig 4 Normalized LED Trigger Current vs Ambient Temperature**



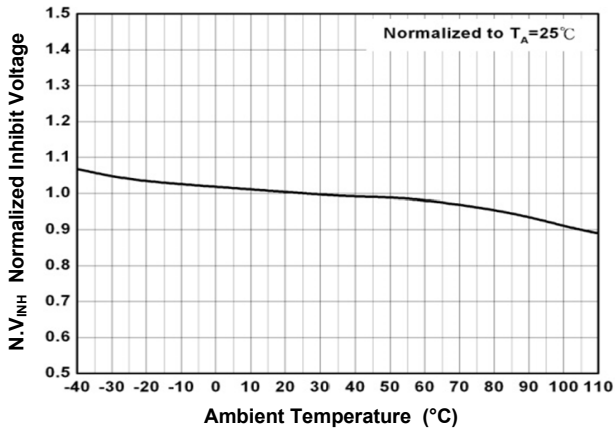
**Fig 5 Holding Current vs Ambient Temperature**



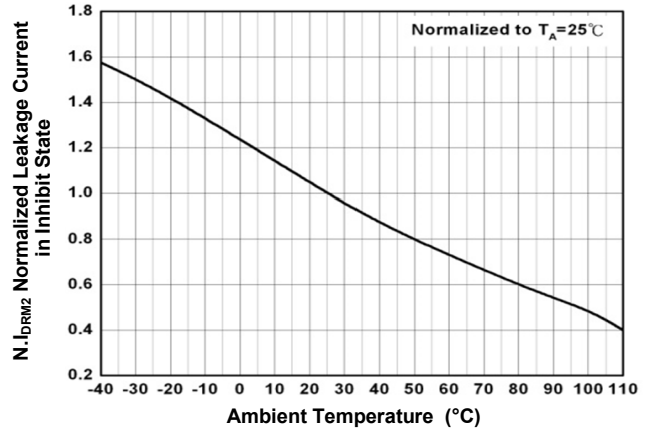
**Fig 6 Off-State Output Terminal Voltage vs Ambient Temperature**



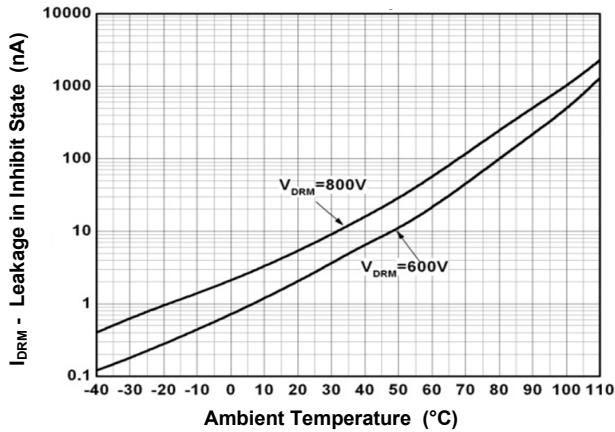
**MF303#, MF304#, MF306#, MF308# Series**



**Fig 7 Normalized Inhibit Voltage vs Ambient Temperature**



**Fig 8 Normalized Leakage Current in Inhibit State vs Ambient Temperature**



**Fig 9 Leakage Current vs Ambient Temperature**

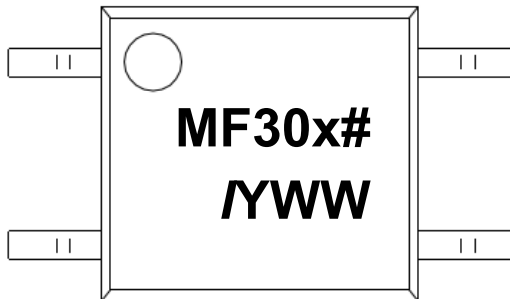


**MF303#, MF304#, MF306#, MF308# Series**

**ORDER INFORMATION**

MF303#, MF304#, MF306#, MF308# Series			
After PN	PN	Description	Packing quantity
None	MF3030, MF3031, MF3032 MF3033  MF3040, MF3041, MF3042 MF3043  MF3060, MF3061, MF3062 MF3063, MF306#  MF3080, MF3081, MF3082 MF3083	Surface Mount Tape & Reel	3000 pcs per reel
<p><b>NOTE : MF3033 may be supported when ordering MF3030, MF3031, MF3032</b>  <b>MF3043 may be supported when ordering MF3040, MF3041, MF3042</b>  <b>MF3063, MF306# may be supported when ordering MF3060, MF3061, MF3062</b>  <b>MF3083 may be supported when ordering MF3080, MF3081, MF3082</b></p>			

**DEVICE MARKING**

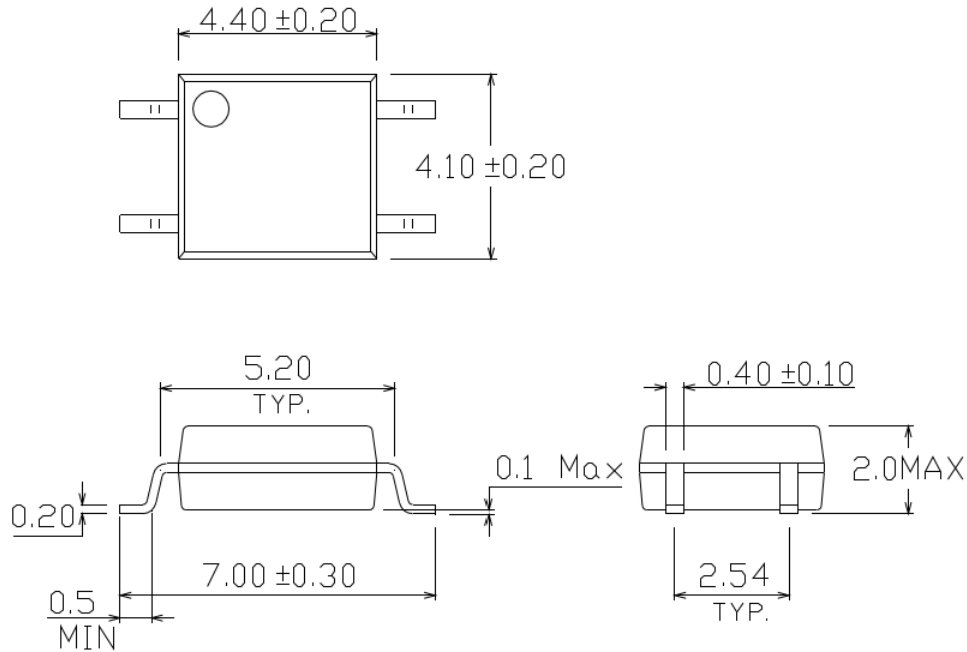


- x                    x = 3, 4, 6, 8
- #                    # = 0, 1, 2, 3, #
- I                    Isocom
- Y                    Year Code (A = 2010, B = 2011, etc.)
- WW                2 digit Week Code

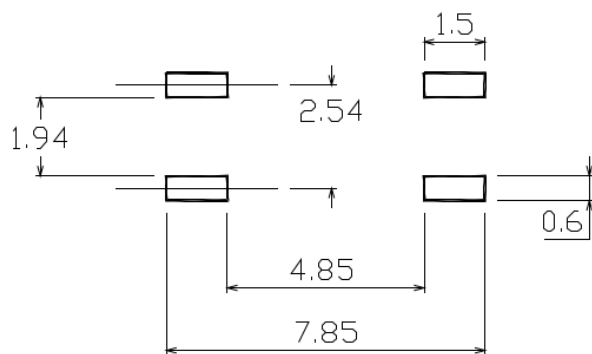
<b>Note :</b>	<b>Device</b>	<b>Optional Marking</b>
	MF3033	MF303#
	MF3043	MF304#
	MF3063	MF3064
	MF3083	MF308#

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**PACKAGE DIMENSIONS (mm)**



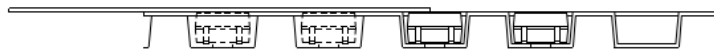
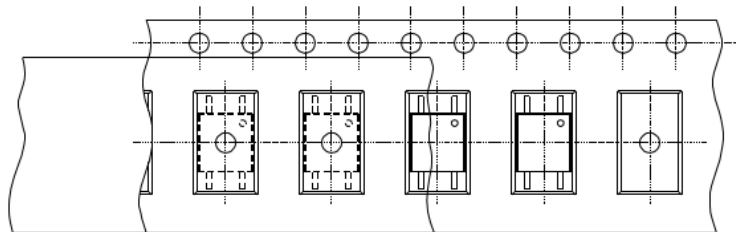
**RECOMMENDED PAD LAYOUT (mm)**



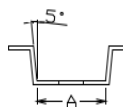
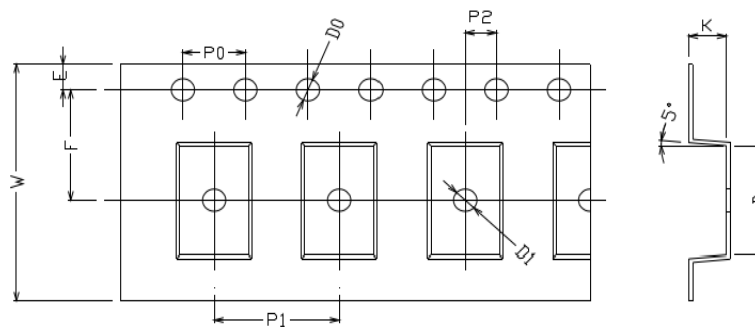
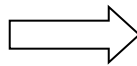


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**TAPE AND REEL PACKAGING (mm)**



Direction of feed from reel



Dimension No.	<b>A</b>	<b>B</b>	<b>Do</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension( mm)	4.4±0.1	7.4±0.1	1.5±0.1/-0	1.5±0.1	1.75±0.1	7.5±0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K</b>
Dimension (mm)	4.0±0.15	8.0±0.1	2.0±0.1	0.25±0.03	16.0±0.2	2.4±0.1

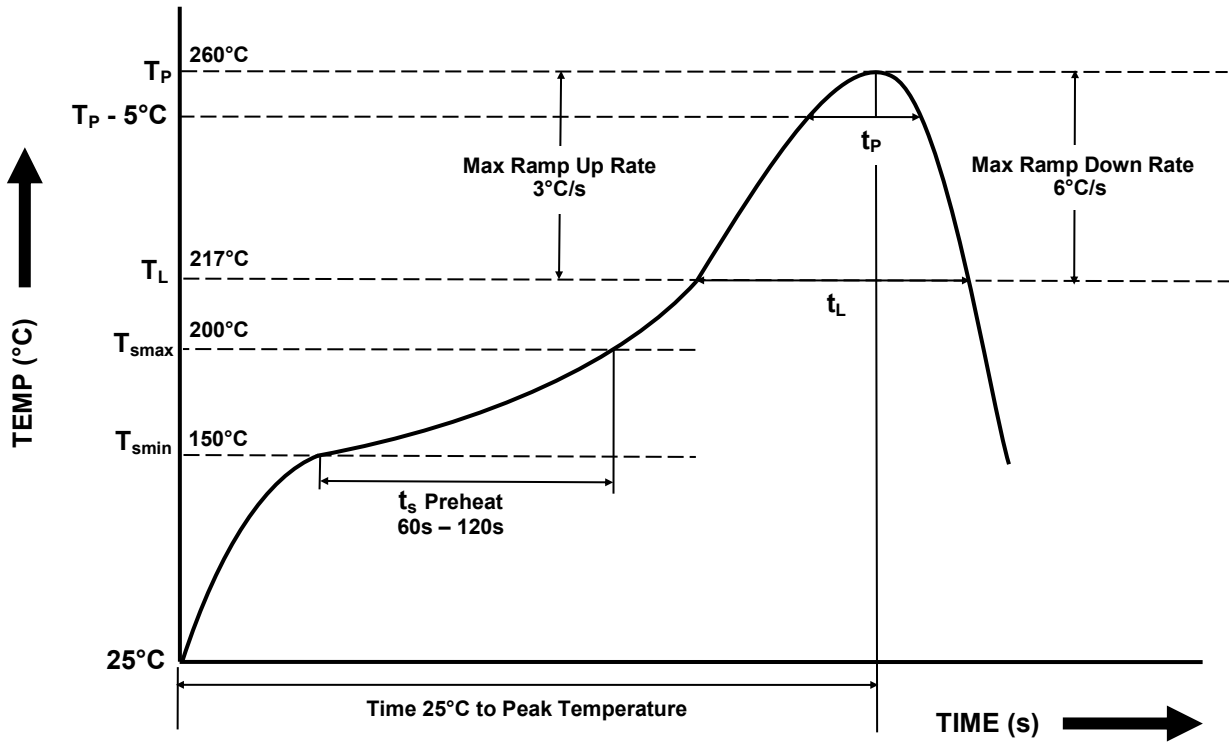




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**IR REFLOW SOLDERING TEMPERATURE PROFILE**

(One Time Reflow Soldering is Recommended)



Profile Details	Conditions
<b>Preheat</b> - Min Temperature ( $T_{SMIN}$ ) - Max Temperature ( $T_{SMAX}$ ) - Time $T_{SMIN}$ to $T_{SMAX}$ ( $t_s$ )	150°C 200°C 60s – 120s
<b>Soldering Zone</b> - Peak Temperature ( $T_P$ ) - Liquidous Temperature ( $T_L$ ) - Time within 5°C of Actual Peak Temperature ( $T_P - 5^\circ C$ ) - 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 217°C 30s 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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