

## MF303x, MF304x, MF306x, MF308x



### DESCRIPTION

The MF303x, MF304x, MF306x and MF308x 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

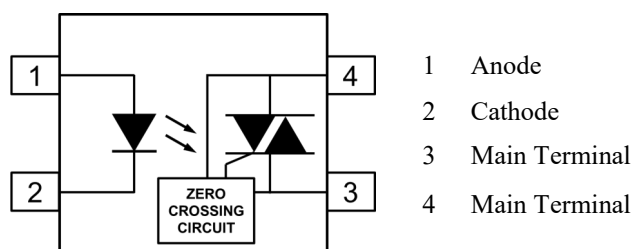
- Zero Voltage Crossing
- $V_{DRM}$ 
  - MF303x 250V
  - MF304x 400V
  - MF306x 600V
  - MF308x 800V
- Mini Flat Package
- Isolation Voltage 3750V<sub>RMS</sub>
- Wide Operating Temperature Range -40°C to 110°C
- Pb Free and RoHS Compliant
- UL File E91231 for MF304x, MF306x
- Safety Approval Pending for MF303x, MF308x

### 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 (1μs pulse 300pps)	1A
Reverse Voltage	6V
Power Dissipation	100mW

#### Output

Off-State Output Terminal Voltage	
MF303x	250V
MF304x	400V
MF306x	600V
MF308x	800V
On-state RMS Current	70mA <sub>RMS</sub>
Power Dissipation	300mW

#### Total Package

Isolation Voltage	3750V <sub>RMS</sub>
Operating Temperature	-40 to 110°C
Storage Temperature	-55 to 150°C
Lead Soldering Temperature (10s)	260°C

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## MF303x, MF304x, MF306x, MF308x

### 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			$\text{V}/\mu\text{s}$

#### 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  Note 2			30  15  10  5	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	$\mu\text{A}$

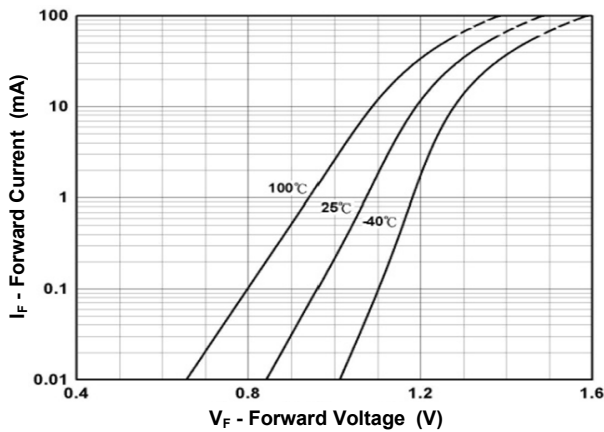
#### ISOLATION

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

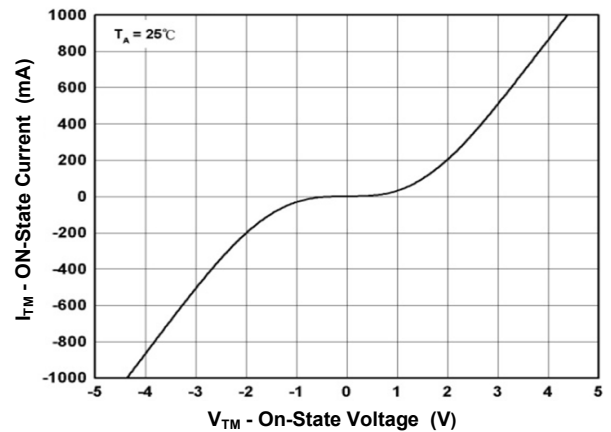
Measured with input leads shorted together and output leads shorted together.



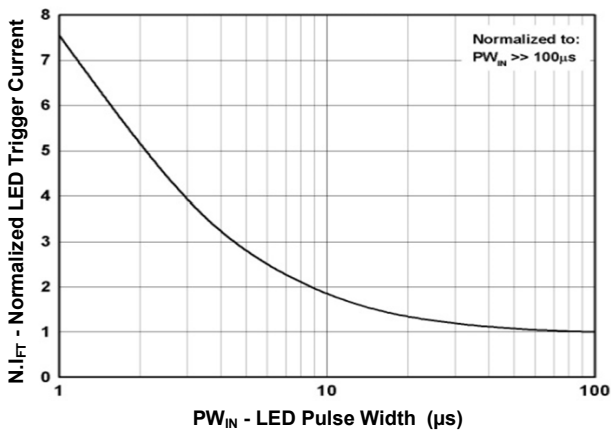
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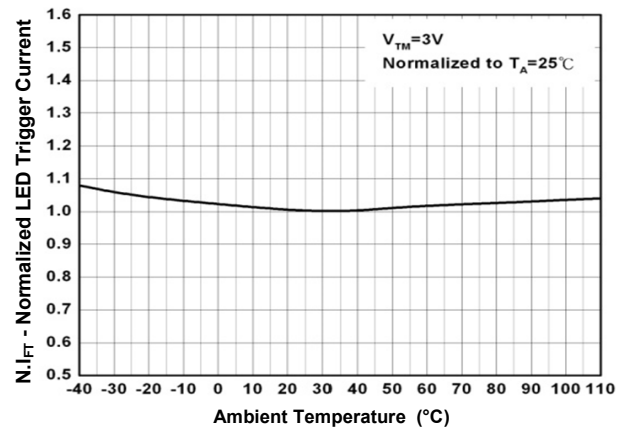
**Fig 1 Forward Current vs Forward Voltage**



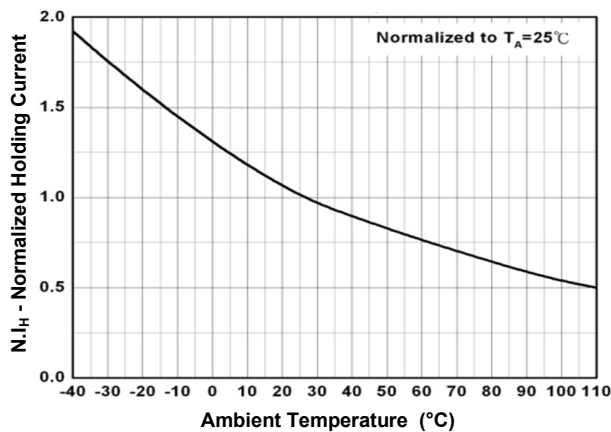
**Fig 2 On-State Characteristics**



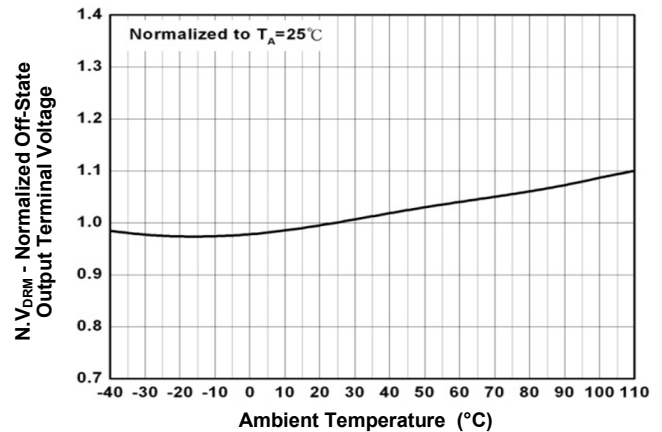
**Fig 3 Normalized LED Trigger Current vs LED Pulse Width**



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



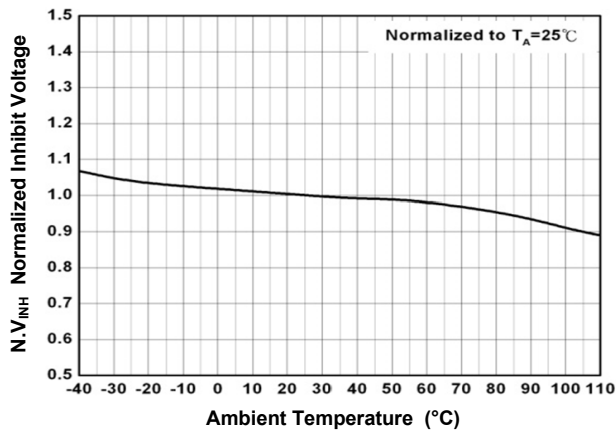
**Fig 5 Holding Current vs Ambient Temperature**



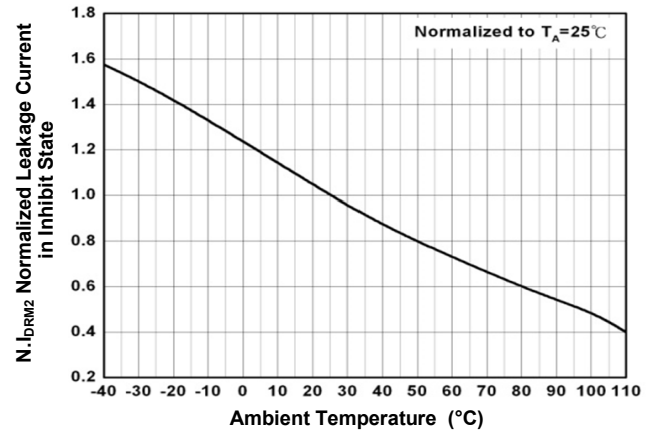
**Fig 6 Off-State Output Terminal Voltage vs Ambient Temperature**



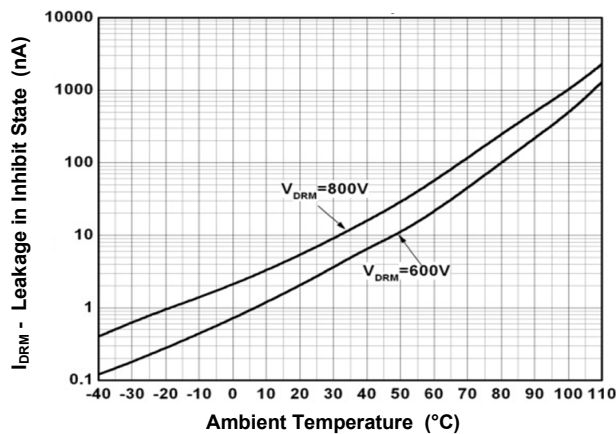
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**Fig 7 Normalized Inhibit Voltage vs Ambient Temperature**



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



**Fig 9 Leakage Current vs Ambient Temperature**

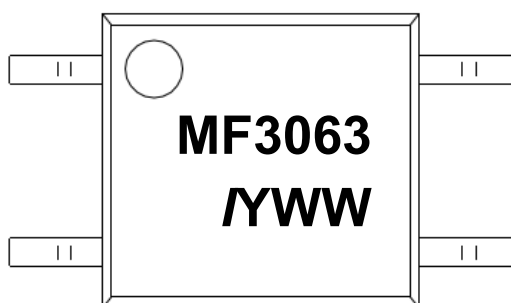
## MF303x, MF304x, MF306x, MF308x

### ORDER INFORMATION

MF303x, MF304x, MF306x, MF308x			
After PN	PN	Description	Packing quantity
None	MF3030, MF3031, MF3032, MF3033 MF3040, MF3041, MF3042, MF3043 MF3060, MF3061, MF3062, MF3063 MF3080, MF3081, MF3082, MF3083	Surface Mount Tape & Reel	3000 pcs per reel
<b>NOTE :</b> MF3033 may be supported when ordering MF3030, MF3031, MF3032 MF3043 may be supported when ordering MF3040, MF3041, MF3042 MF3063 may be supported when ordering MF3060, MF3061, MF3062 MF3083 may be supported when ordering MF3080, MF3081, MF3082			

### DEVICE MARKING

**Note :** MF3063 is used as example



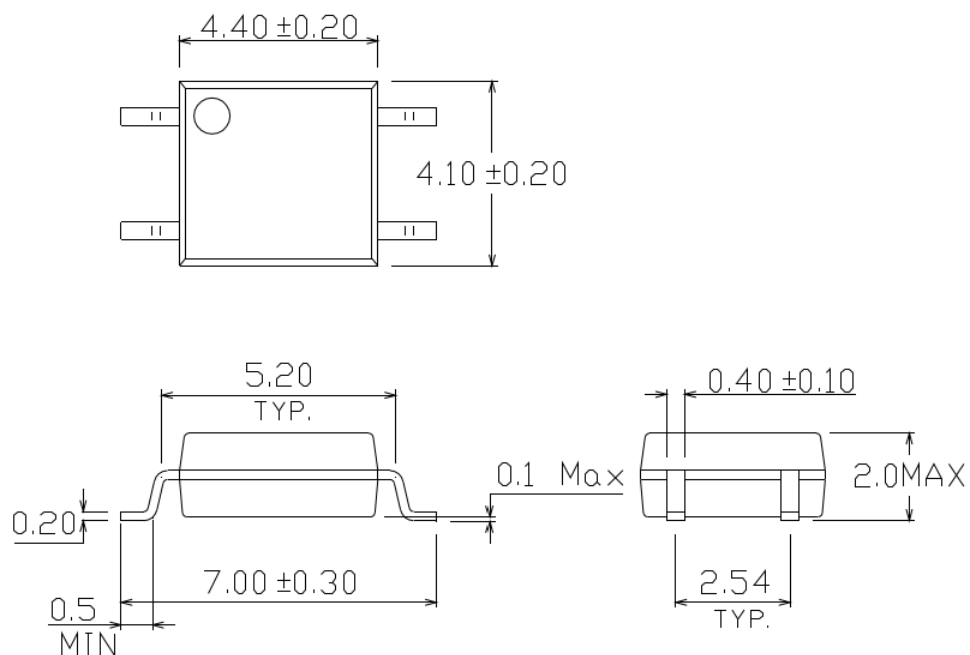
MF3063	Device Part Number	
I	Isocom	
Y	Year Code (A = 2010, B = 2011, etc.)	
WW	2 digit Week Code	
<b>Note :</b>	<b>Device</b>	<b>Optional Marking</b>
	MF3033	MF303#
	MF3043	MF304#
	MF3063	MF306# / MF3064
	MF3083	MF308#



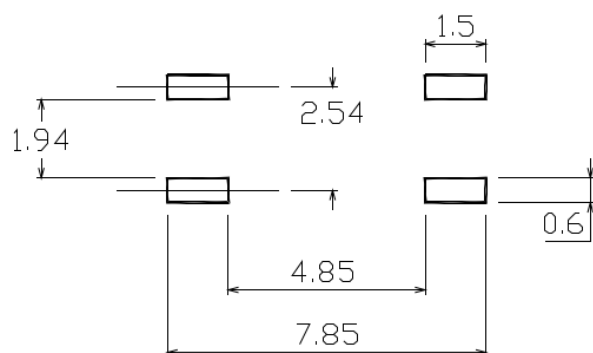
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### PACKAGE DIMENSIONS (mm)



### RECOMMENDED PAD LAYOUT (mm)

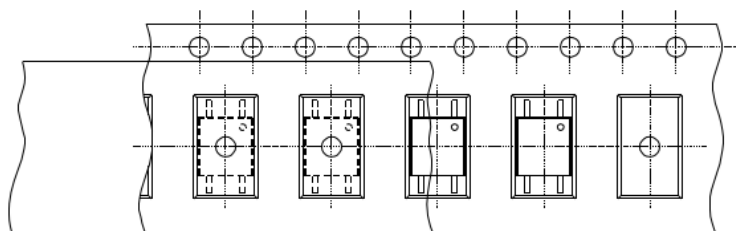




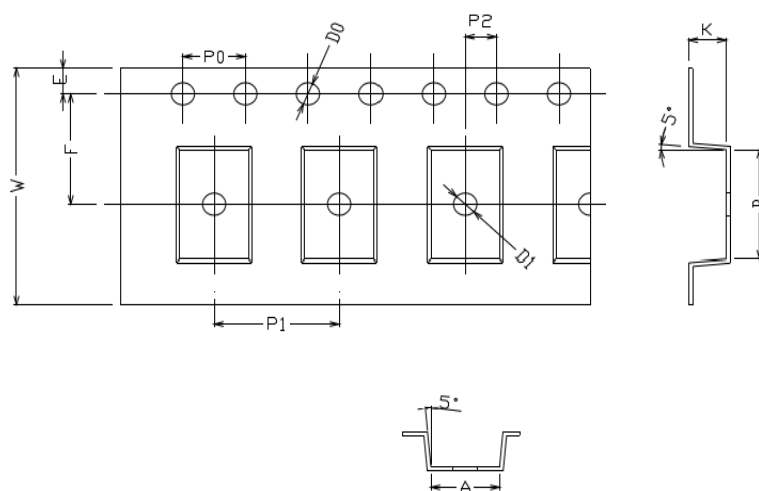
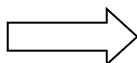
**ISOCOM**  
COMPONENTS

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### TAPE AND REEL PACKAGING (mm)



Direction of feed from reel



Dimension No.	A	B	Do	D1	E	F
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.	Po	P1	P2	t	W	K
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

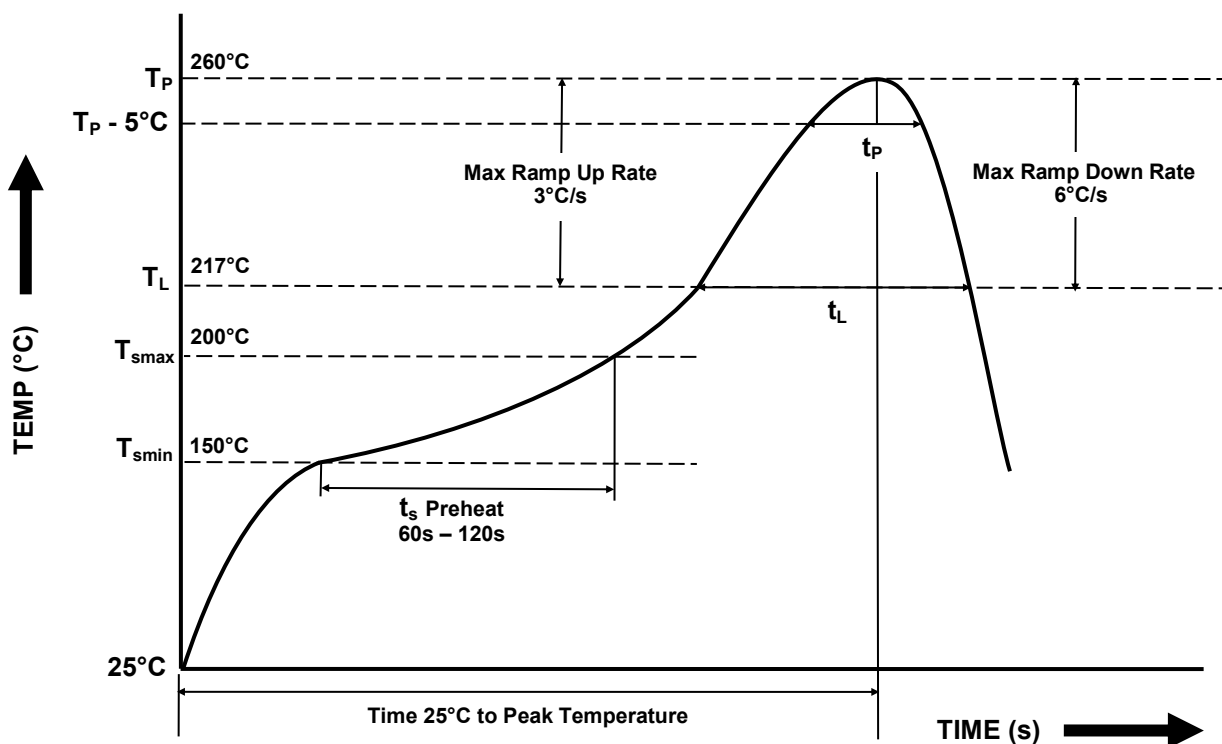




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**IR REFLOW SOLDERING TEMPERATURE PROFILE**

**(One Time Reflow Soldering is Recommended)**



Profile Details	Conditions
<b>Preheat</b> <ul style="list-style-type: none"><li>- Min Temperature (<math>T_{SMIN}</math>)</li><li>- Max Temperature (<math>T_{SMAX}</math>)</li><li>- Time <math>T_{SMIN}</math> to <math>T_{SMAX}</math> (<math>t_s</math>)</li></ul>	150°C 200°C 60s – 120s
<b>Soldering Zone</b> <ul style="list-style-type: none"><li>- Peak Temperature (<math>T_P</math>)</li><li>- Liquidous Temperature (<math>T_L</math>)</li><li>- Time within 5°C of Actual Peak Temperature (<math>T_P - 5^\circ\text{C}</math>)</li><li>- Time maintained above <math>T_L</math> (<math>t_L</math>)</li><li>- Ramp Up Rate (<math>T_L</math> to <math>T_P</math>)</li><li>- Ramp Down Rate (<math>T_P</math> to <math>T_L</math>)</li></ul>	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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