FMOSN0P64P02E-H

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-0.64A -20V P-Channel General Small Signal Enhancement Mode MOSFET ESD Protection

Features

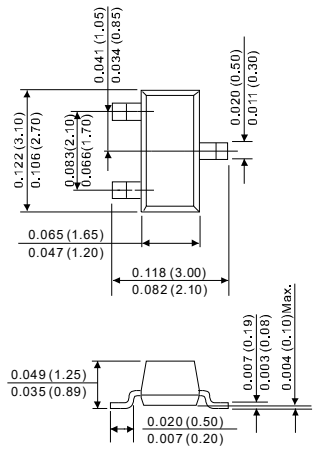
- $-V_{DS}$ = 20V, $-I_D$ = 0.64A.
- $R_{DS(ON)} \leq 580m\Omega$, @ $-V_{GS}$ = 4.5V, $-I_D$ = 0.55A.
- $R_{DS(ON)} \leq 850m\Omega$, @ $-V_{GS}$ = 2.5V, $-I_D$ = 0.45A.
- Super high dense cell trench design for low on-resistance.
- Rugged and reliable.
- ESD protected: 2.0KV (HBM).
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC 61249-2-21).

Mechanical data

- Epoxy : UL94-V0 rated flame ratardant.
- Case : Molded plastic, SOT-23.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Weight : Approximated 8mg.

Package outline

SOT-23



Dimensions in inches and (millimeters)

Maximum ratings (At T_A=25°C Unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain source voltage	$-V_{DS}$	20	V
Gate source voltage	V_{GS}	±12	V
Continuous drain current (Note 1)	$-I_D$	0.64	A
Pulsed drain current (Note 2)	$-I_{DM}$	2.6	A
Power dissipation (Note 1) (T_A=25°C)	P_D	0.35	W
Power dissipation (Note 1) (T_A=70°C)	P_D	0.22	W
Drain-source diode forward current (Note 1)	$-I_S$	0.3	A
Thermal resistance, junction to ambient (Note 1)	$R_{\theta JA}$	350	°C/W
Operating junction temperature	T_J	+150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

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Electrical characteristics (At T_A=25°C unless otherwise specified)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V_{GS}=0V, -I_D=250μA	-BV_{DSS}	20			V
Drain-source leakage current	V_{GS}=0V, -V_{DS}=20V	-I_{DSS}			1	μA
Gate-source leakage current	V_{DS}=0V, V_{GS}=±12V	I_{GSS}			±10	μA
On characteristics (Note3)						
Gate threshold voltage	V_{DS}=V_{GS}, -I_D=250μA	$V_{GS(TH)}$	0.5	0.7	1.0	V
Static drain-source on-state resistance	-V_{GS}=4.5V, -I_D=0.55A	$R_{DS(ON)}$		450	580	mΩ
	-V_{GS}=2.5V, -I_D=0.45A			630	850	
Forward transconductance	-V_{DS}=5V, -I_D=0.55A	g_{FS}		1		S
Dynamic parameters (Note4)						
Input capacitance	V_{GS}=0V, V_{DS}=10V, f=1.0MHz	C_{iss}		58		pF
Out capacitance		C_{oss}		5.7		
Reverse transfer capacitance		C_{rss}		4.4		
Switching parameters (Note4)						
Total gate charge	-V_{GS}=4.5V, -V_{DS}=10V, -I_D=0.55A	Q_g		1		nC
Gate to source charge		Q_{gs}		0.17		
Gate to drain charge		Q_{gd}		0.18		
Turn-on delay time	-V_{DD}=10V, -V_{GEN}=4.5V, -I_D=0.55A, R_{GEN}=3Ω	$t_{d(on)}$		0.40		nS
Rise time		t_r		0.03		
Turn-off delay time		$t_{d(off)}$		0.04		
Fall time		t_f		1.10		
Source-drain diode ratings and characteristics (Note3)						
Drain-source diode forward voltage	-I_S=0.55A, V_{GS}= 0V	-V_{SD}		0.75	1.10	V

Notes : 1. Surface mounted on FR-4 board, t ≤ 10 seconds.

2. Pulse width limited by maximum junction temperature.

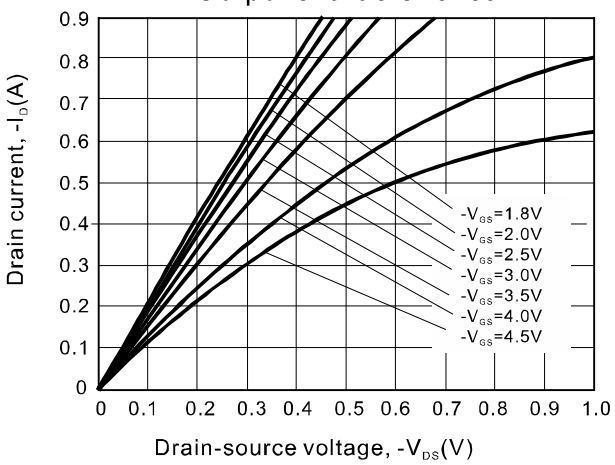
3. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.

4. Guaranteed by design, not subject to production testing.

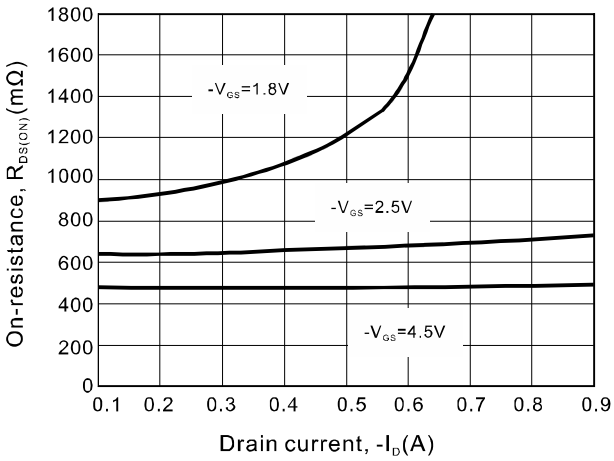
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Rating and characteristic curves

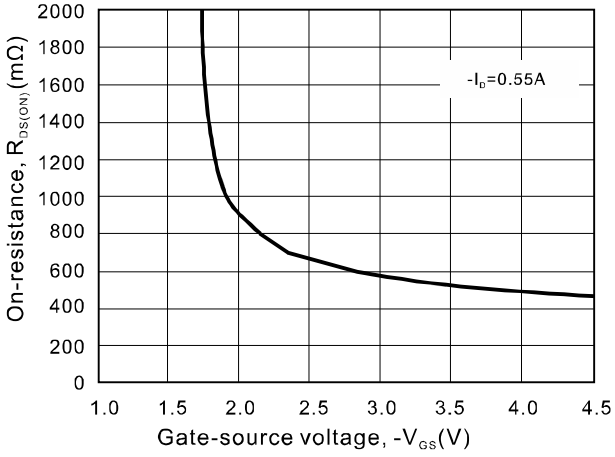
Output characteristics



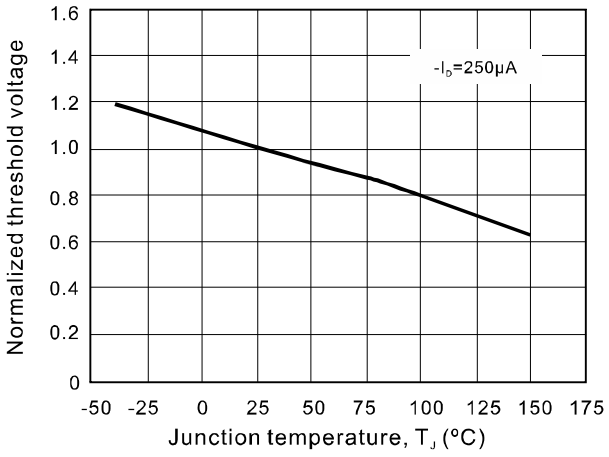
On-resistance vs. Drain current



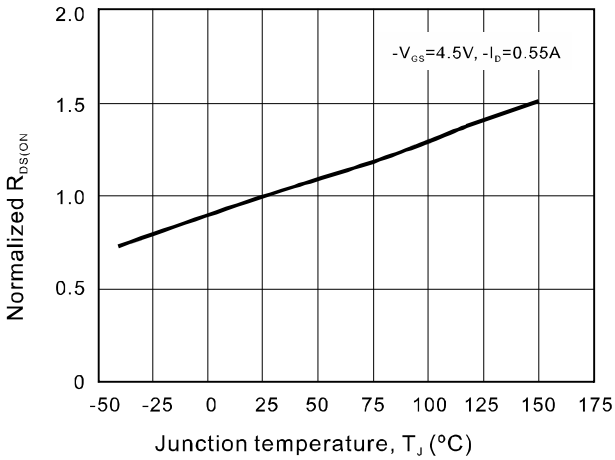
On-resistance vs. Gate-source voltage



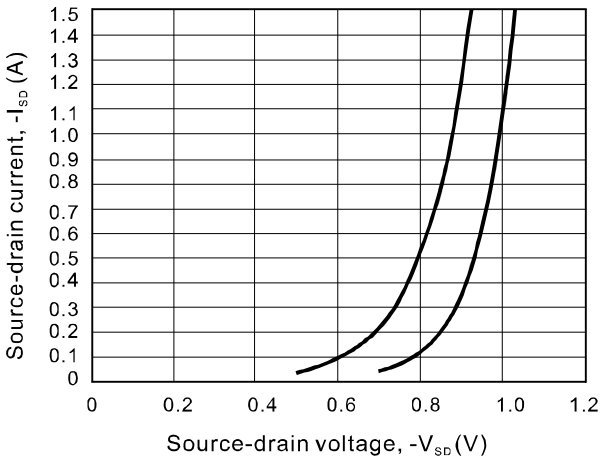
Gate threshold voltage



Drain-source on-resistance



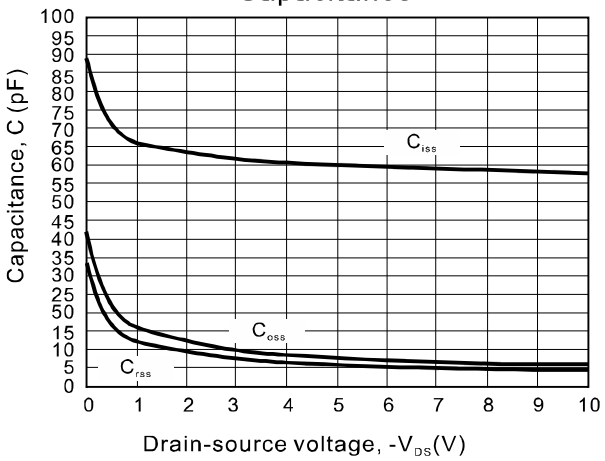
Source-drain diode forward



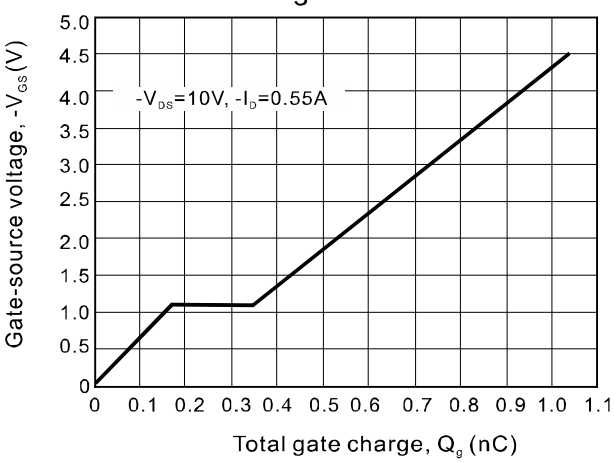
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Rating and characteristic curves

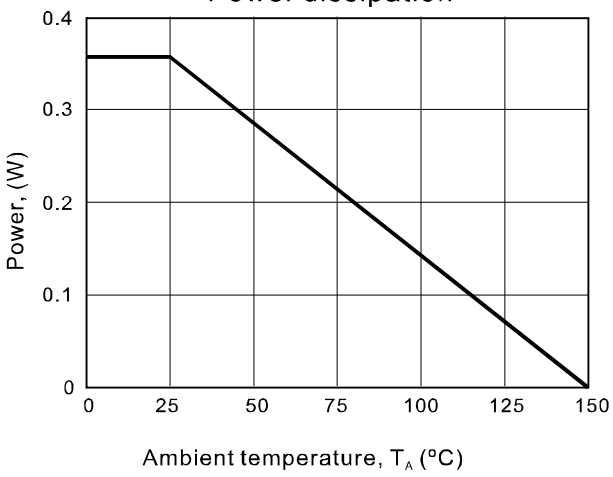
Capacitance



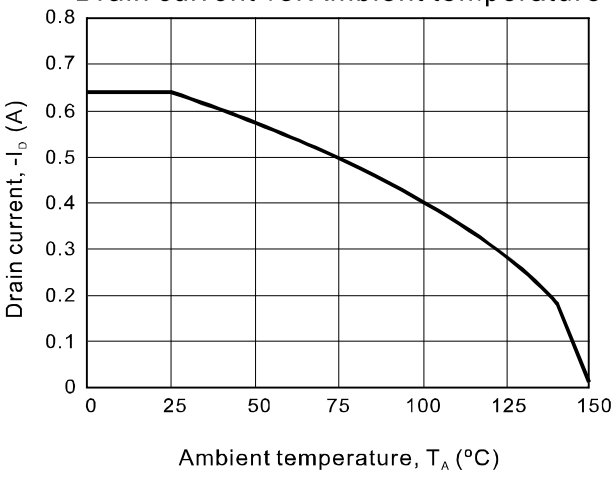
Gatet charge characteristics



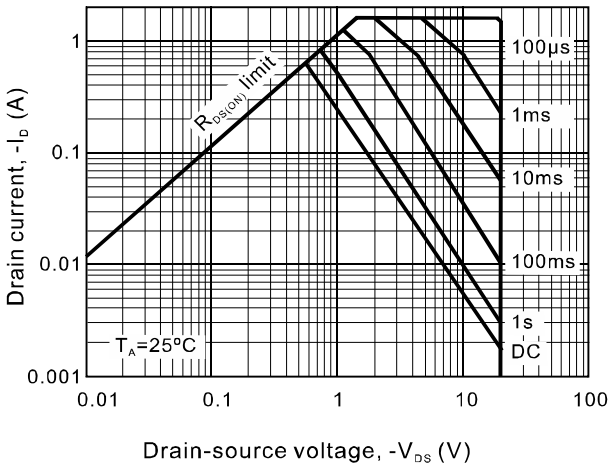
Power dissipation



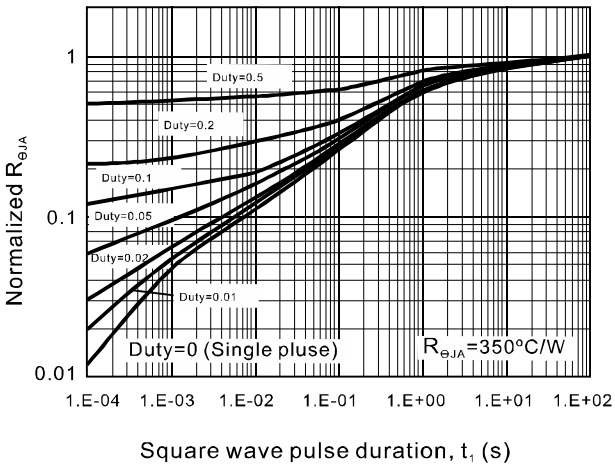
Drain current vs. Ambient temperature



Safe operating area

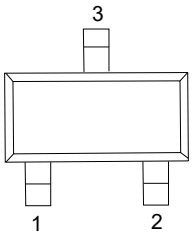
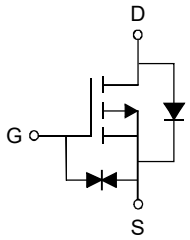


$R_{\theta JA}$ Transient thermal impedance



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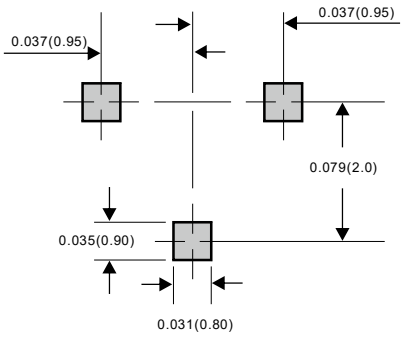
Pinning information

Pin	Simplified outline	Symbol
Pin 1 Gate Pin 2 Source Pin 3 Drain		

Marking

Type Number	Marking code
FMOSN0P64P02E-H	111M1

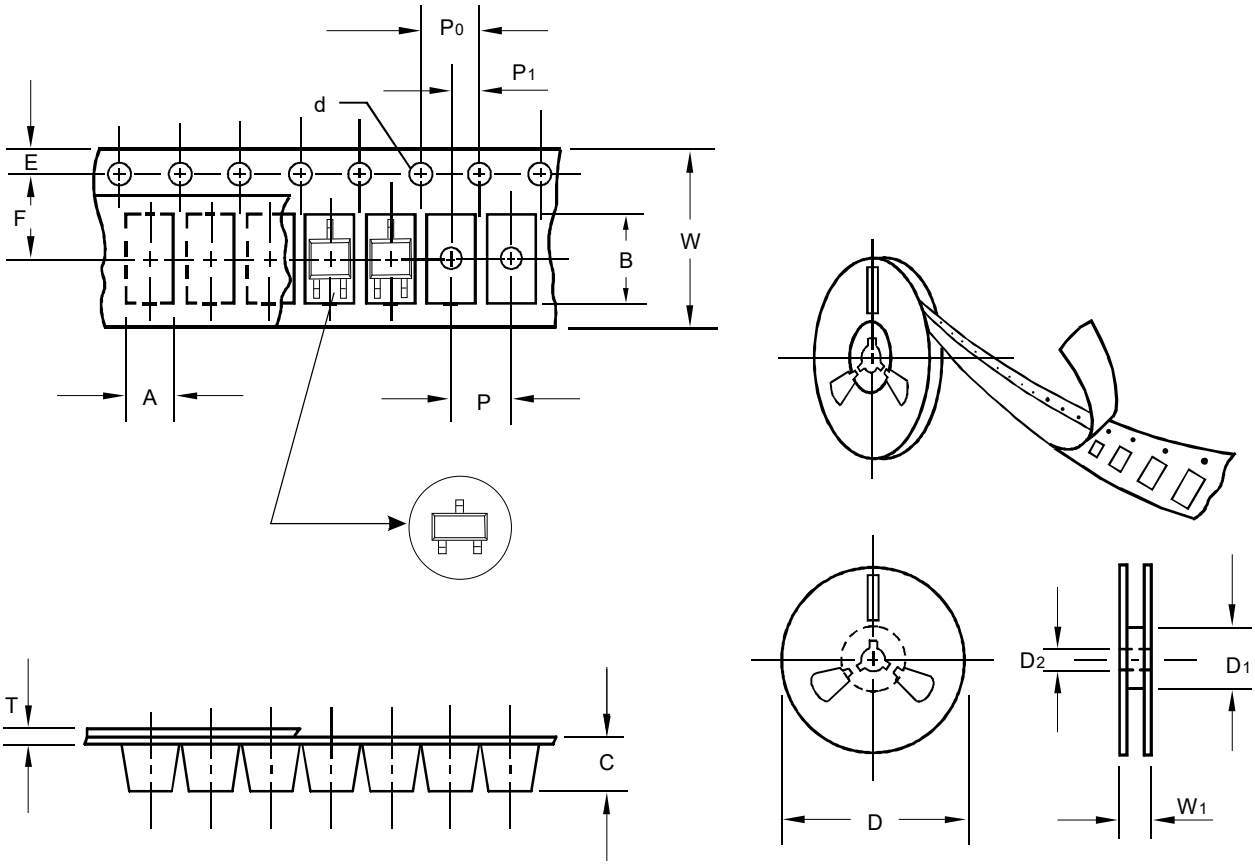
Suggested solder pad layout



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.5	3.15
Carrier length	B	0.5	2.77
Carrier depth	C	0.5	1.22
Sprocket hole	d	0.5	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	54.40
Feed hole diameter	D_2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.5	0.20
Tape width	W	0.5	8.00
Reel width	W_1	5.0	12.3

Note:Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

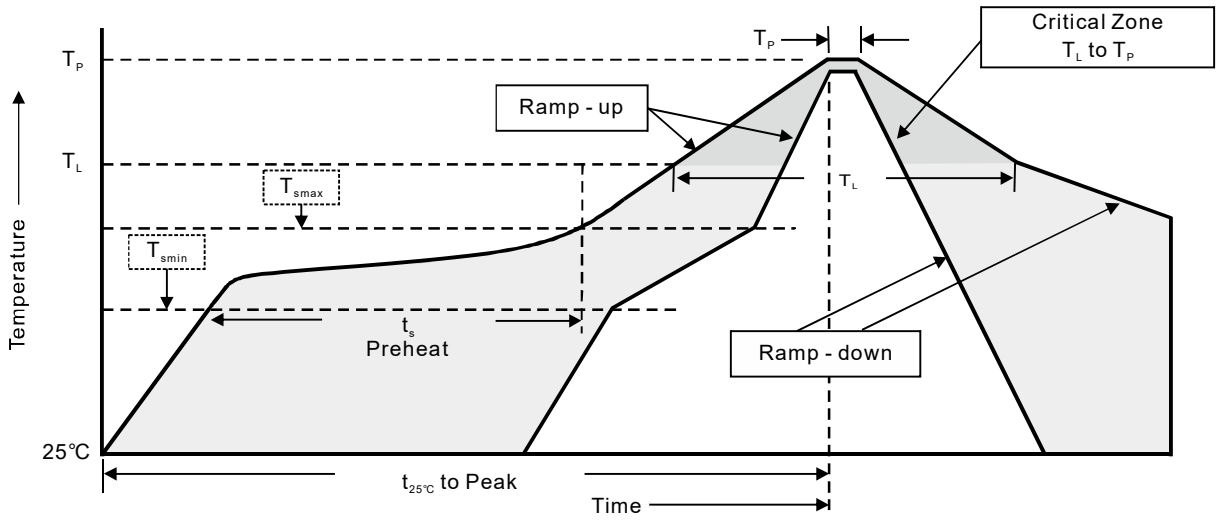
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000

Suggested thermal profiles for soldering processes

1. Storage environment : Temperature = 5℃ ~ 40℃, Humidity = 55%, ±25%.
2. Reflow soldering of surface - Mount devices.



3.Reflow soldering

Profile feature	Soldering condition
Average ramp-up rate (T_L to T_P)	< 3 ℃/sec
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (Min to Max) (t_s)	 150℃ 200℃ 60 ~ 120 sec
T_{smax} to T_L - Ramp-up rate	 < 3 ℃ / sec
Time maintained above : - Temperature (T_L) - Time (T_L)	 217℃ 60 ~ 260 sec
Peak temperature (T_P)	255 ℃ -0 / +5℃
Time with 5℃ of actual peak temperature (T_P)	10 ~ 30 sec
Ramp-down rate	< 6℃ / sec
Time 25℃ to peak temperature	< 6 minutes