

FMOSL8205B

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FMOSL8205B

4.6A 20V Dual N-Channel Enhancement Mode Power MOSFET

Features

- $V_{DS}=20V$, $I_D=4.6A$.
- $R_{DS(ON)}<27m\Omega$, @ $V_{GS}=4V$, $I_D=4.6A$.
- $R_{DS(ON)}<34m\Omega$, @ $V_{GS}=2.5V$, $I_D=3.5A$.
- Super high dense cell trench design for low on-resistance.
- Rugged and reliable.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates halogen free part, ex.FMOSL8205B-H.

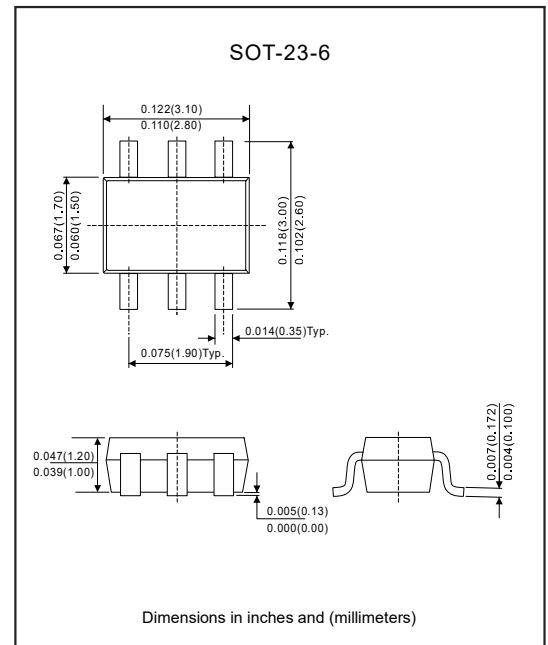
Application

- Load switch.
- PWM Application.
- Power management.

Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23-6.
- Terminals : Solder plated, solderable per MIL-STD750, Method 2026.
- Mounting Position : Any.

Package outline



Maximum Ratings (At $T_A=25^{\circ}C$ Unless otherwise noted)

Parameter	Symbols	Ratings	Unit
Drain to source voltage	V_{DS}	20	V
Gate to source voltage	V_{GS}	± 12	V
Drain current continuous (Note 1) ($T_A=25^{\circ}C$)	I_D	4.6	A
Pulsed drain current (Note 2)	I_{DM}	22.5	A
Drain-source diode forward current (Note 1)	I_S	1.7	A
Power dissipation (Note 1)	P_D	1.25	W
		0.75	
Thermal resistance, junction to ambient (Note 1) ($T_A=25^{\circ}C$)	$R_{\theta JA}$	100	$^{\circ}C/W$
Operating junction temperature	T_J	+150	$^{\circ}C$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}C$

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Electrical Characteristics (At $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Off characteristics						
Drain to source breakdown voltage	$V_{GS}=0, I_D=250\mu\text{A}$	BV_{DSS}	20			V
Drain to source leakage current	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$	I_{DSS}			1	μA
Gate to source leakage current	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$	I_{GSS}			± 100	nA

On characteristics (Note3)

Gate threshold voltage	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	$V_{GS(th)}$	0.5	0.7	1.5	V
Static drain to source on-resistance	$V_{GS}=4\text{V}, I_D=4.6\text{A}$	$R_{DS(on)}$		22	27	m Ω
	$V_{GS}=2.5\text{V}, I_D=3.5\text{A}$			29	34	

Dynamic parameters (Note4)

Input capacitance	$V_{DS}=8\text{V}, V_{GS}=0\text{V}, f=1.0\text{MHz}$	C_{iss}		550		pF
Output capacitance		C_{oss}		164		
Reverse transfer capacitance		C_{rss}		138		

Switching parameters (Note4)

Total gate charge	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V}, I_D=3\text{A}$	Q_g		6.2		nC
Gate to source charge		Q_{gs}		1.8		
Gate to drain charge		Q_{gd}		1.5		
Turn to on delay charge	$V_{DD}=10\text{V}, V_{GEN}=4.5\text{V}, I_D=1\text{A}, R_G=6\Omega, R_L=10\Omega$	$t_{d(on)}$		10		ns
Rise time		t_r		8.2		
Turn - off delay time		$t_{d(off)}$		25		
Fall time		t_f		6.7		

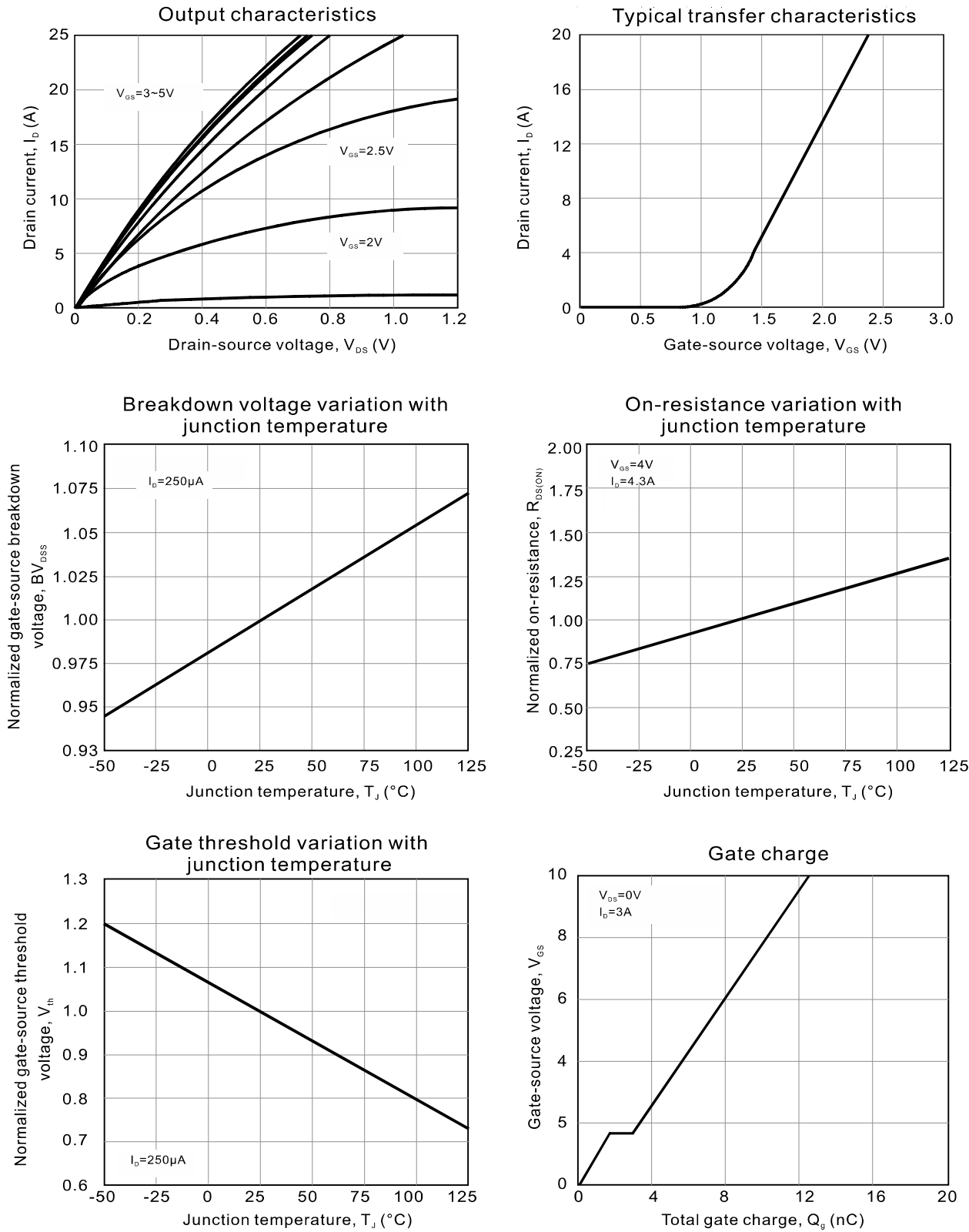
Source - drain diode ratings and characteristics (Note3)

Diode forward voltage	$I_S=1.7\text{A}, V_{GS}=0\text{V}$	V_{SD}			1.2	V
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Note: 1. Surface mounted on FR4 board, $t \leq 10$ seconds.
2. Pulse width limited by maximum junction temperature.
3. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

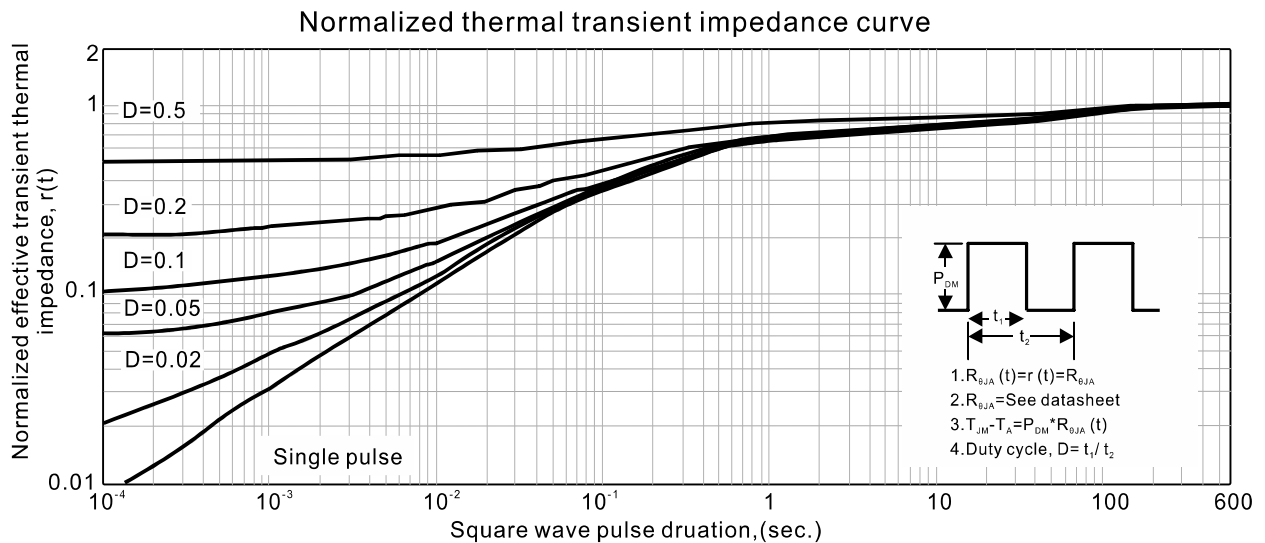
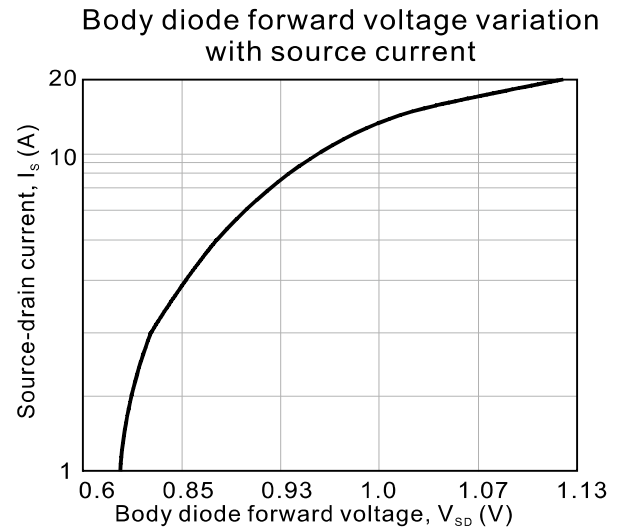
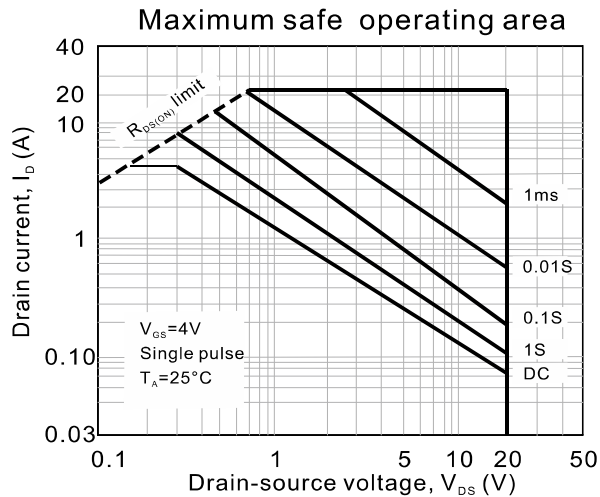
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Rating and Characteristic Curves



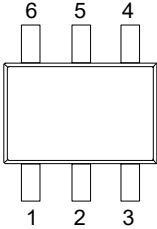
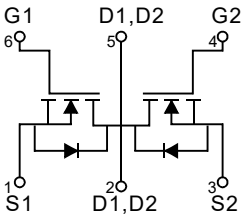
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Rating and Characteristic Curves



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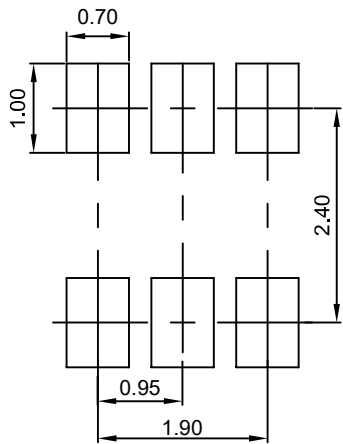
Pinning information

Pin	Simplified outline	Symbol
Pin 1 Source 1 Pin 2 Drain 1, 2 Pin 3 Source 2 Pin 4 Gate 2 Pin 5 Drain 1, 2 Pin 6 Gate 1		

Marking

Type number	Marking code
FMOSL8205B	8205

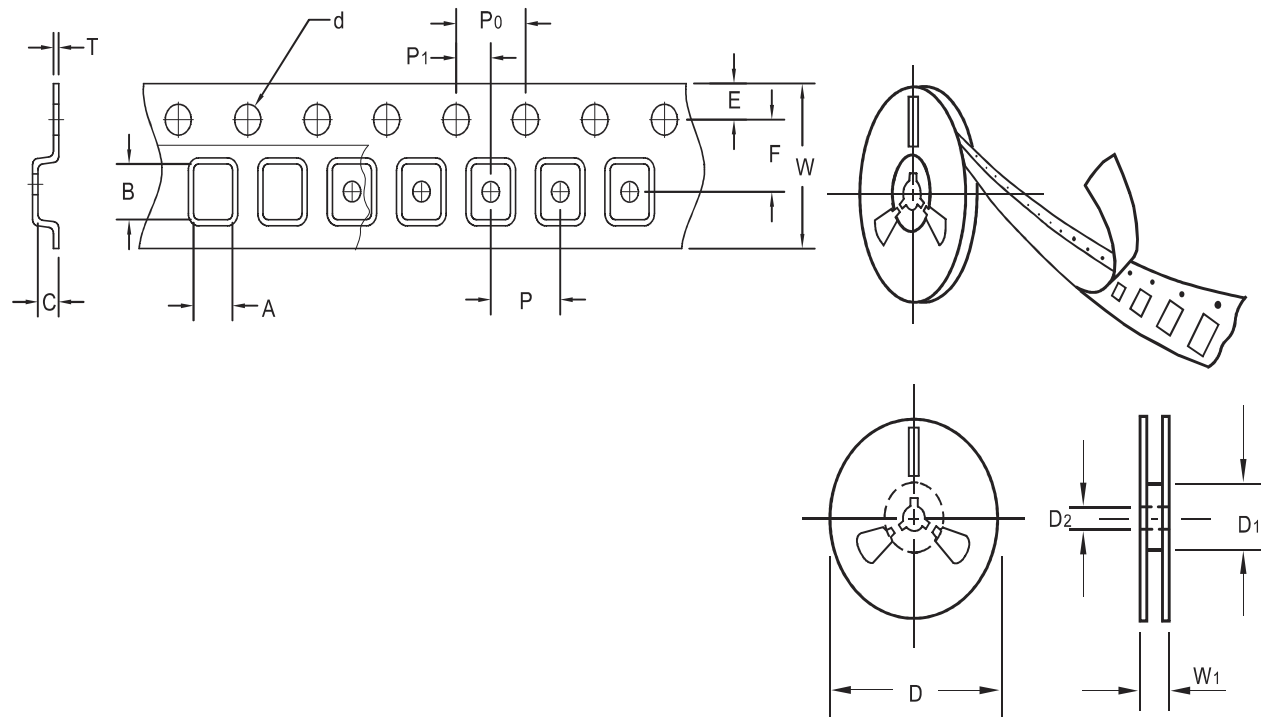
Suggested solder pad layout



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23-6
Carrier width	A	0.2	3.10
Carrier length	B	0.2	2.70
Carrier depth	C	0.1	1.20
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	62.00
Feed hole diameter	D2	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	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Tape width	W	0.3	8.00
Reel width	W1	1.0	14.40

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

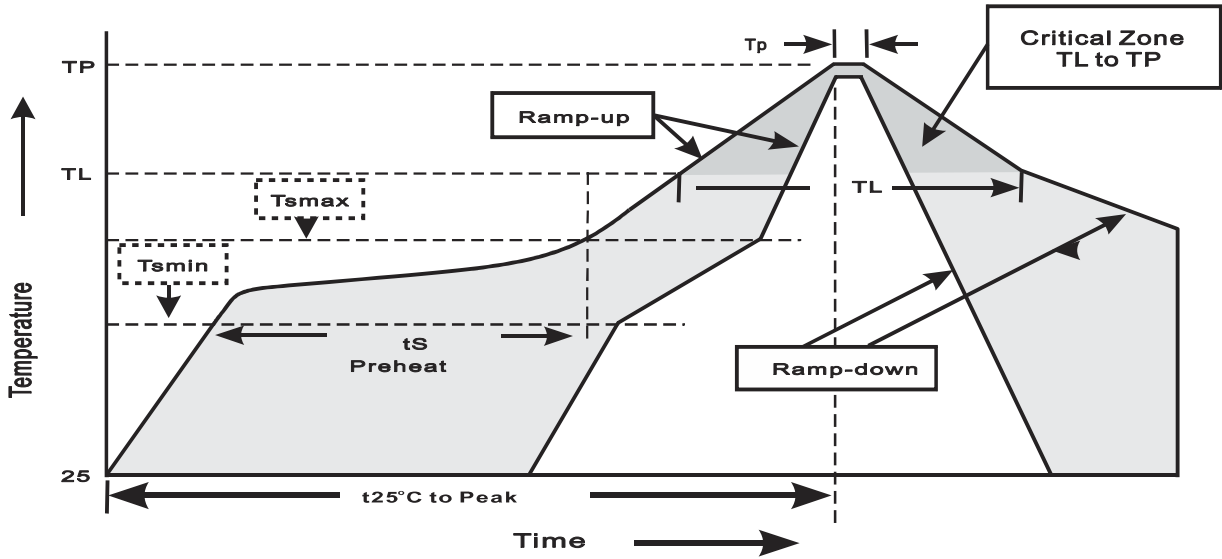
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Reel packing

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-23-6	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°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(TL to TP)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(ts)	150°C 200°C 60~120sec
Tsmax to TL -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(TL) -Time(tL)	217°C 60~260sec
Peak Temperature(TP)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tp)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes