

FMOS2303B

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FMOS2303B

-2.5A -30V P-Channel Enhancement Mode Power MOSFET

Features

- $V_{DS} = -30V$, $I_D = -2.5A$.
- $R_{DS(ON)} < 80m\Omega$, $V_{GS} = -10V$, $I_D = -2.5A$.
- $R_{DS(ON)} < 120m\Omega$, $V_{GS} = -4.5V$, $I_D = -1A$.
- Very low on-resistance and low reverse transfer capacitance.
- Fast switching.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" for Halogen-free part, ex. FMOS2303B-H.

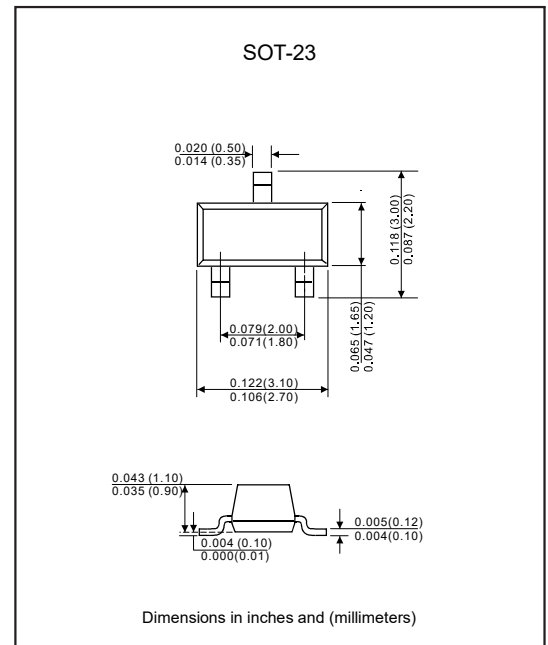
Applications

- Load switch.
- PWM application.
- Power management.
- Video monitor.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.
- Mounting Position : Any.

Package outline



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

Parameter	Symbol	Rating	Unit
Drain source voltage	$-V_{DS}$	30	V
Gate source voltage	V_{GS}	± 20	V
Drain current continuous	$-I_D$	2.5	A
		1.6	
Pulsed drain current (Note 1)	$-I_{DM}$	10	A
Power dissipation	P_D	0.64	W
Thermal resistance, junction to ambient	$R_{\theta JA}$	195	$^\circ C/W$
Lead temperature for soldering purposes 1/8" from case for 5 seconds (Note2)	T_L	300	$^\circ C$
Operating junction temperature range	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 specified)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static parameters						
Drain-source breakdown voltage	$-I_D=250\mu A, V_{GS}=0V$	$-BV_{DSS}$	30			V
Drain-source leakage current	$-V_{DS}=30V, V_{GS}=0V$	$-I_{DSS}$			1	μA
Gate-source leakage current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}			± 100	nA
Gate threshold voltage	$V_{DS}=V_{GS}, -I_D=250\mu A$	$-V_{GS(TH)}$	1	1.5	2.2	V
Static drain-source on-state resistance	$-V_{GS}=10V, -I_D=2.5A$	$R_{DS(ON)}$		64	80	m Ω
	$-V_{GS}=4.5V, -I_D=1A$			95	120	
Dynamic parameters						
Input capacitance	$V_{GS}=0V, -V_{DS}=15V, f=1.0MHz$	C_{iss}		326		pF
Out capacitance		C_{oss}		44		
Reverse transfer capacitance		C_{rss}		39		
Switching parameters						
Total gate charge	$-V_{GS}=10V, -V_{DS}=15V, -I_D=2.5A$ (Note3)	Q_g		7.2		nC
Gate to source charge		Q_{gs}		1.5		
Gate to drain charge		Q_{gd}		1.7		
Turn-on delay time	$-V_{DS}=15V, -V_{GS}=10V, R_G=10\Omega, -I_D=1A$ (Note3)	$t_{d(on)}$		9		ns
Rise time		t_r		11		
Turn-off delay time		$t_{d(off)}$		13		
Fall time		t_f		9		
Source-drain diode ratings and characteristics						
Diode continuous current		$-I_S$			2.5	A
Pulsed drain-source diode forward current		$-I_{SM}$			10	A
Drain-source diode forward voltage	$-I_{SD}=2A, V_{GS}=0V, T_J=25^{\circ}C$	$-V_{SD}$			1.2	V

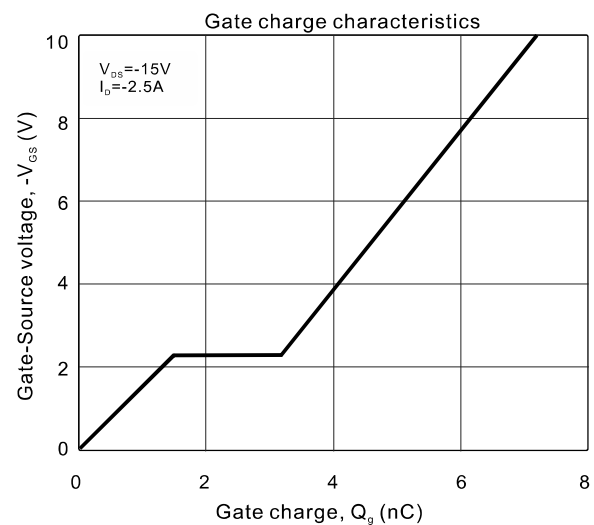
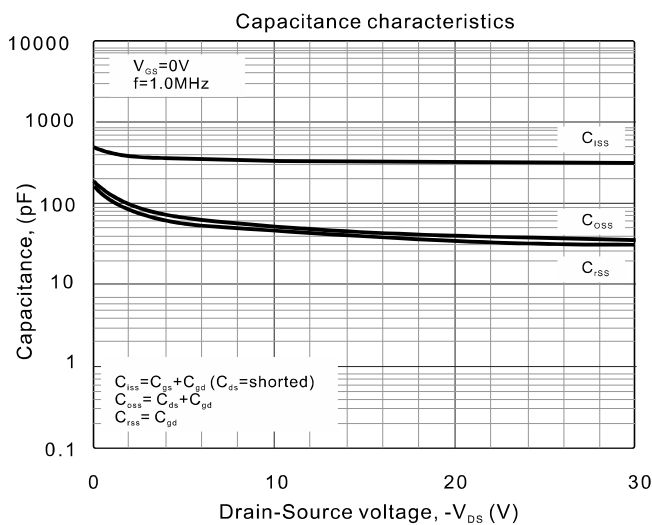
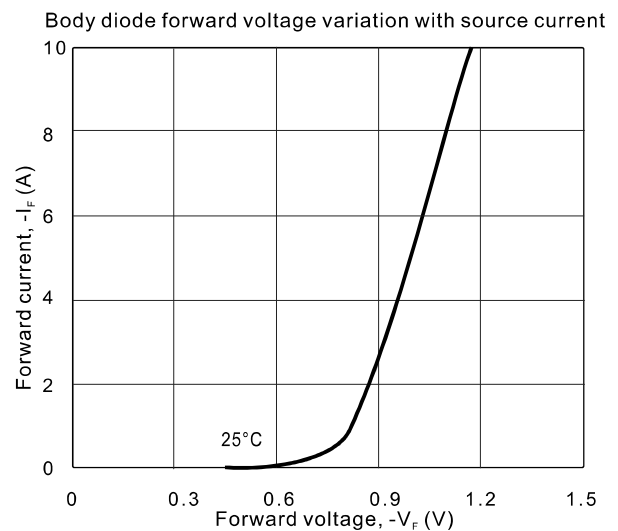
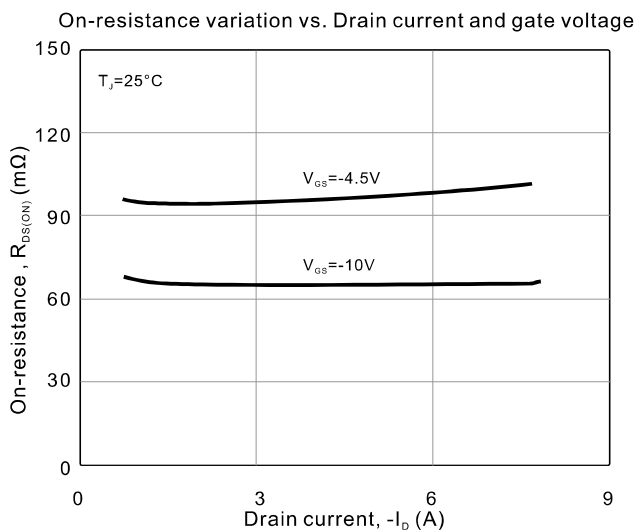
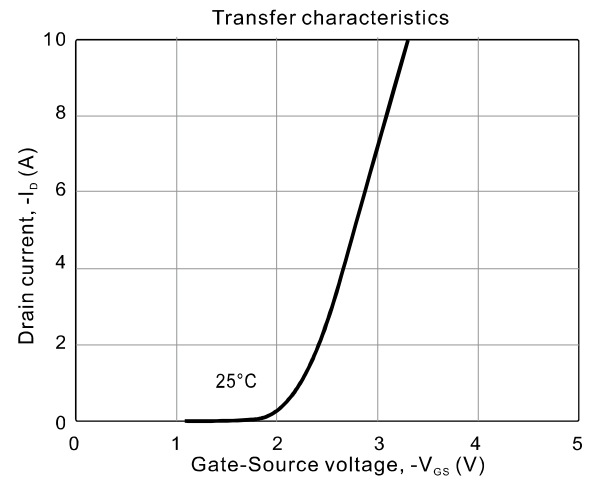
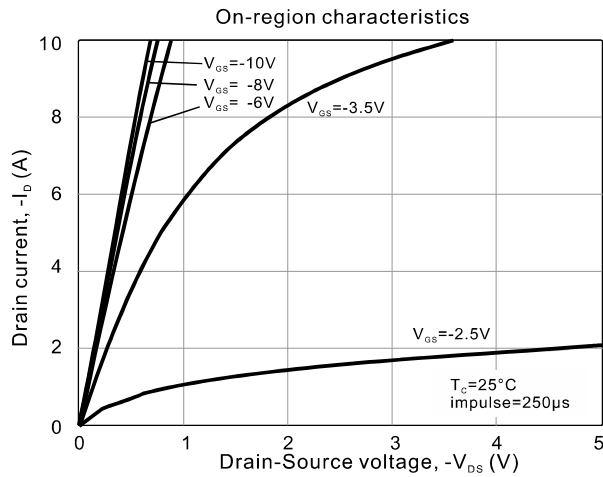
Note: 1.Repetitive rating: pulse width limited by maximum junction temperature.

2.Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

3.Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 0.5\%$.

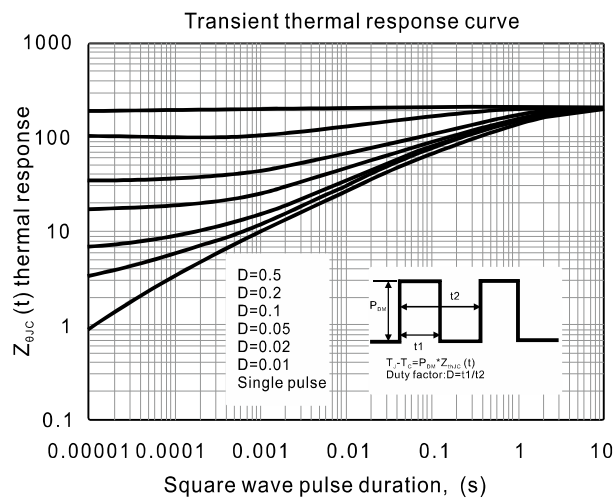
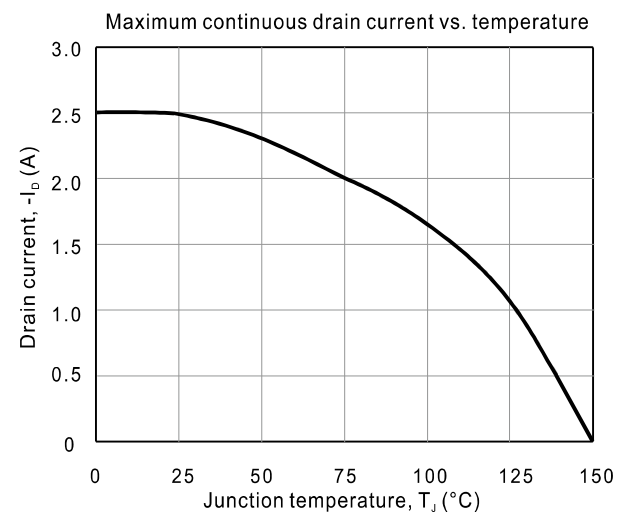
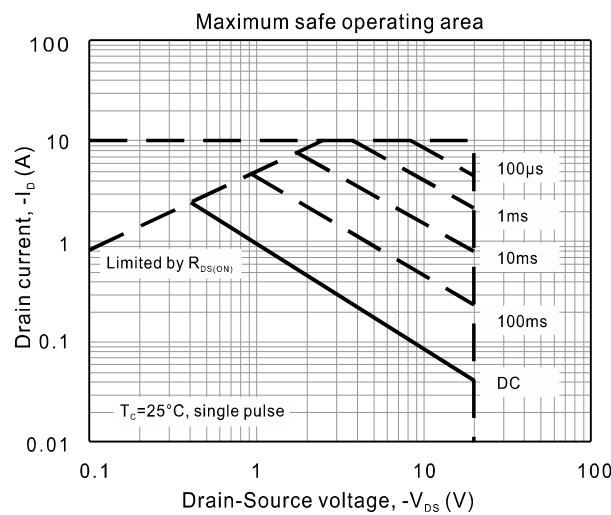
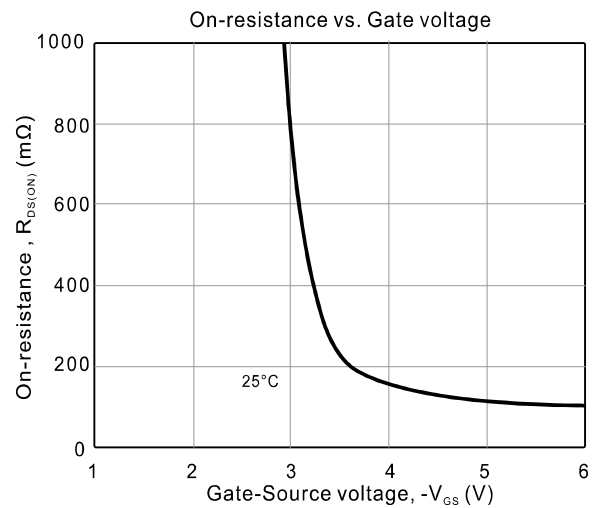
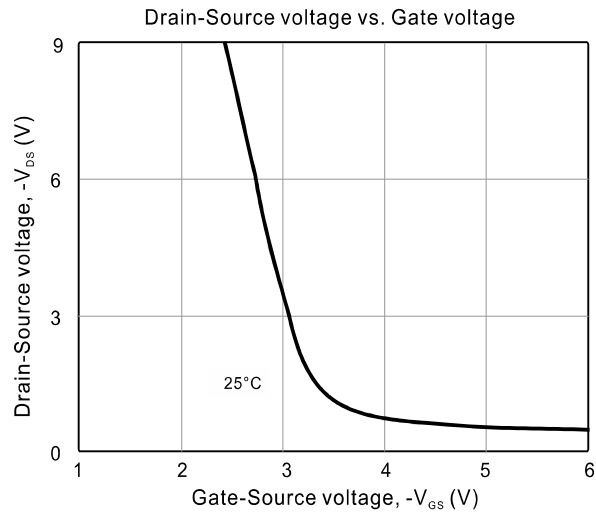
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Rating and Characteristic Curves



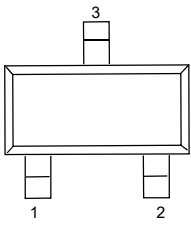
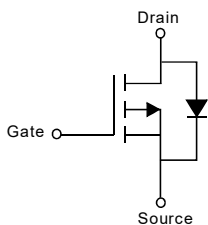
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Rating and Characteristic Curves



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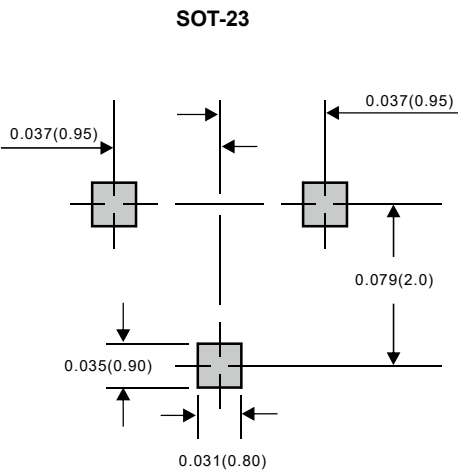
Pinning information

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

Marking

Type number	Marking code
FMOS2303B	2303A

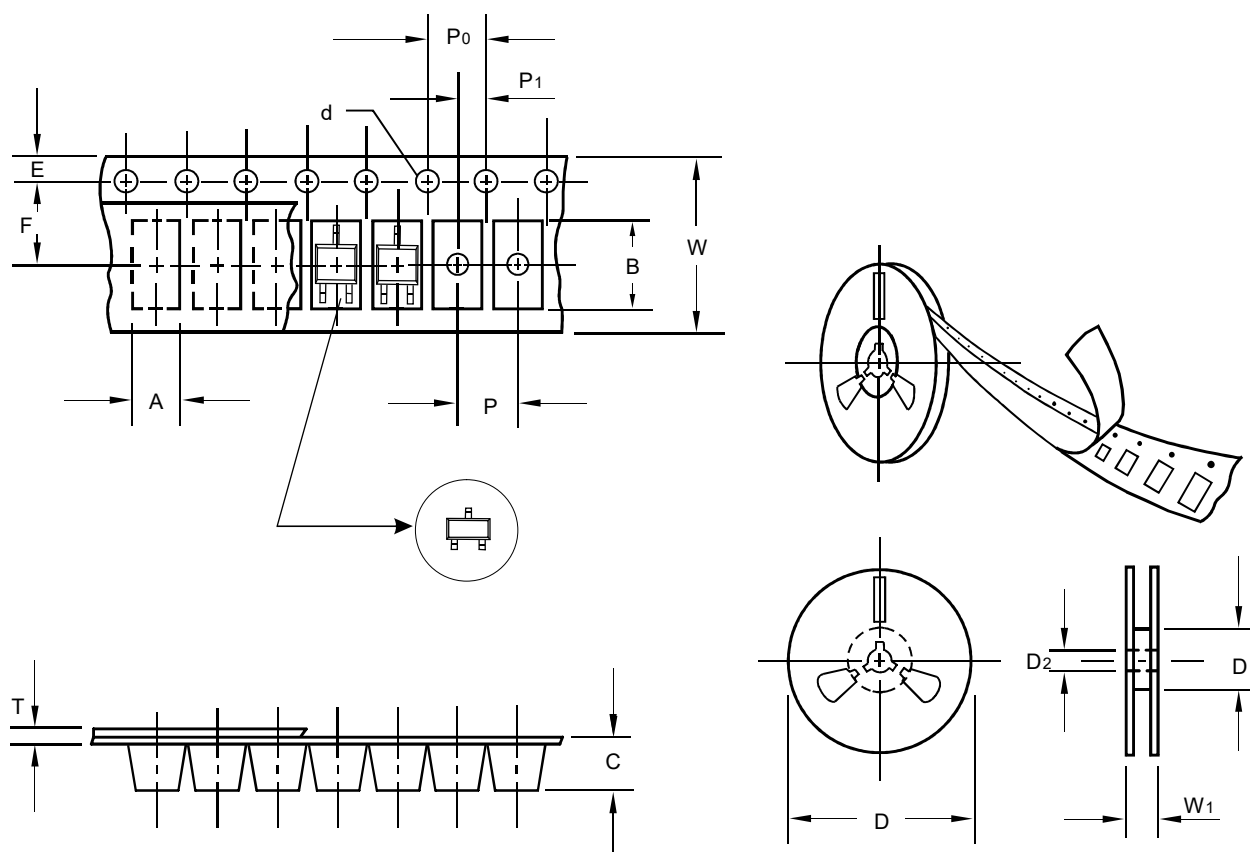
Suggested solder pad layout



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
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	55.00
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
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	12.0

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

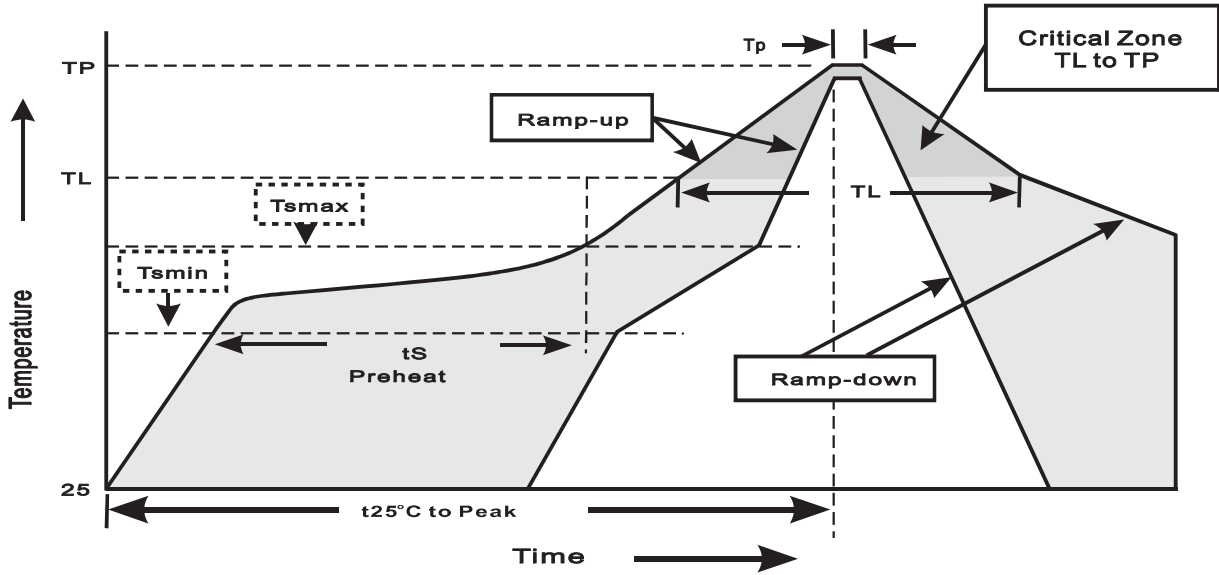
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Reel packing

DEVICE	OUTLINE	REEL (PCS)	TAPE & REEL
FMOS2303B	TAPING	3,000	7inch

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