

FMOS3404A

List

List.....	1
Package outline.....	2
Features.....	2
Applications.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical characteristics.....	3
Rating and characteristic curves.....	4~5
Pinning information.....	6
Marking.....	6
Suggested solder pad layout.....	6
Packing Information.....	7
Reel Packing.....	8
Suggested thermal profiles for soldering processes.....	8

FMOS3404A

5.8A 30V N-Channel Enhancement Mode Power MOSFET

Features

- $V_{DS} = 30V$, $I_D = 5.8A$.
- $R_{DS(ON)} \leq 24m\Omega$, $V_{GS} = 10V$, $I_D = 5.5A$.
- $R_{DS(ON)} \leq 33m\Omega$, $V_{GS} = 4.5V$, $I_D = 4.5A$.
- Advanced trench technology.
- Excellent on-resistance and low gate charge.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates halogen-free part, ex. FMOS3404A-H.

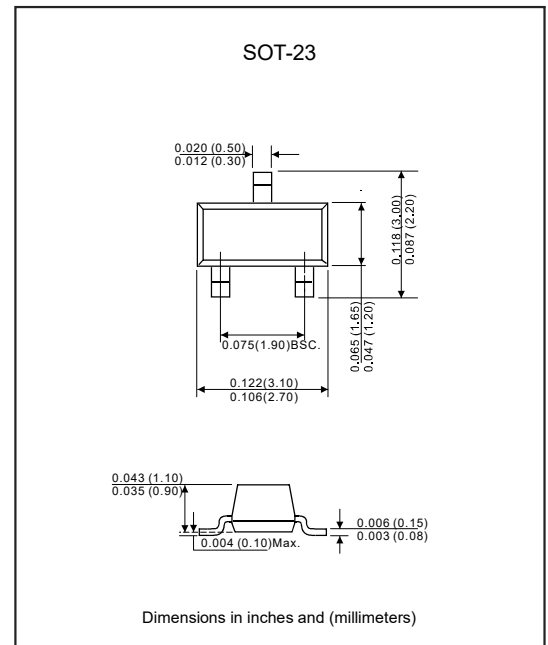
Application

- PWM applications.
- Load switch.
- Power management.

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	5.8	A
		4	
Pulsed drain current (Note 1)	I_{DM}	23	A
Power dissipation	P_D	1.1	W
Thermal resistance, junction to ambient (Note3)	$R_{\theta JA}$	113	$^\circ C/W$
Operating junction temperature	T_J	+150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

FMOS3404A

Electrical characteristics (At $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain-Source breakdown voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Drain-Source leakage current	I_{DSS}	$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-Source leakage current	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			± 100	nA

On characteristics

Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.2	1.7	2.2	V
Static drain-source on-resistance (Note4)	$R_{DS(on)}$	$V_{GS}=10\text{V}$, $I_D=5.5\text{A}$		18.4	24	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=4.5\text{A}$		25.5	33	

Dynamic characteristics

Input capacitance	C_{iss}	$V_{DS}=15\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		485		pF
Output capacitance	C_{oss}			69		
Reverse transfer capacitance	C_{rss}			53		

Switching characteristics

Total gate charge	Q_g	$V_{GS}=0$ to 10V , $V_{DS}=15\text{V}$, $I_D=5\text{A}$		10		nC
Gate-Source charge	Q_{gs}			2		
Gate-Drain Charge	Q_{gd}			2		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=15\text{V}$, $V_{GS}=10\text{V}$, $R_G=3\Omega$, $I_D=5\text{A}$		4		ns
Turn-on rise time	t_r			11		
Turn-off delay time	$t_{d(off)}$			14		
Turn-off fall time	t_f			2		

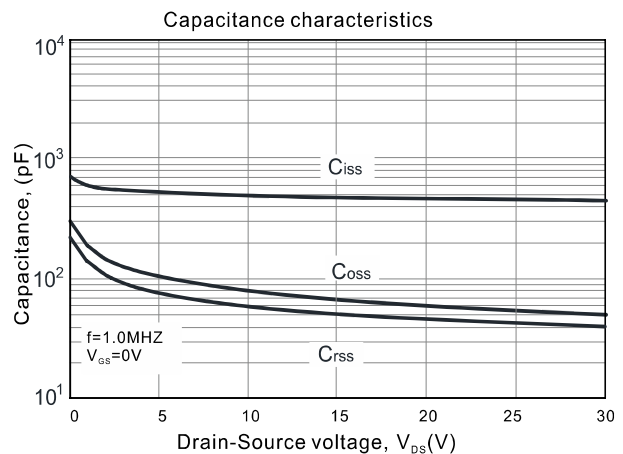
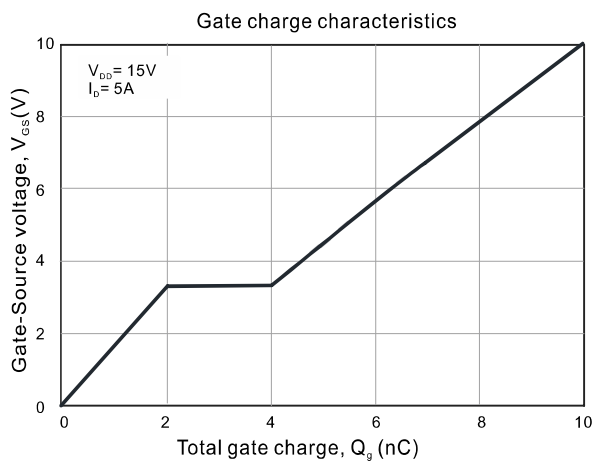
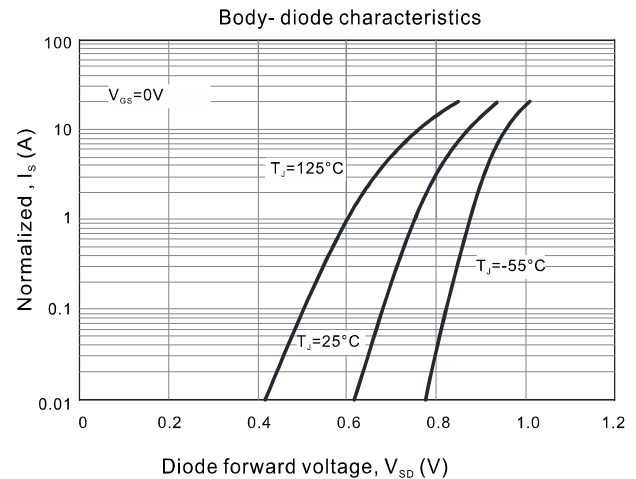
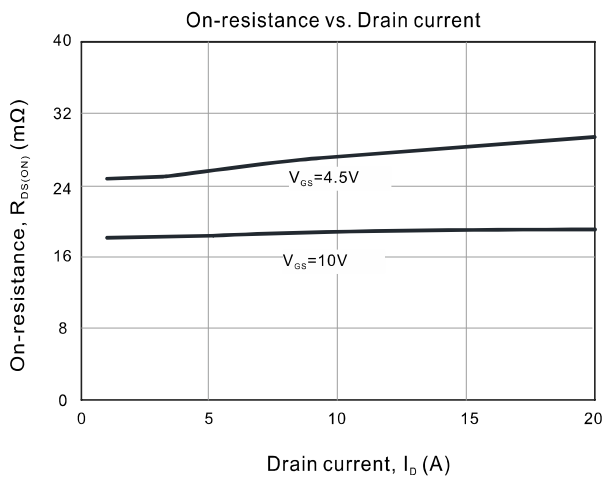
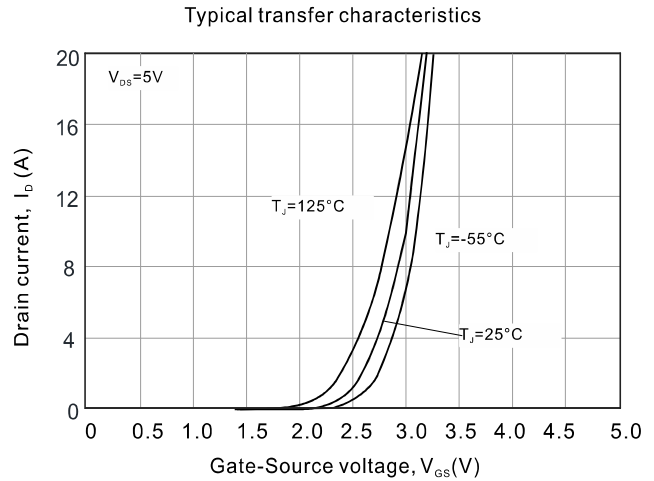
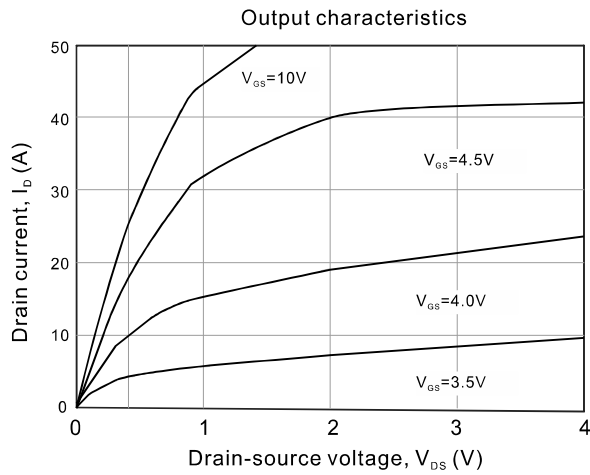
Drain-Source diode characteristics and maximum ratings

Drain-Source diode forward voltage	V_{SD}	$V_{GS}=0\text{V}$, $I_S=5.8\text{A}$			1.2	V
Maximum continuous drain-source forward current	I_S				5.8	A
Maximum pulsed drain-source forward current	I_{SM}				23	A
Body diode reverse recovery time	t_{rr}	$I_F=5\text{A}$, $di/dt=100\text{A}/\mu\text{s}$		7.5		ns
Body diode reverse recovery charge	Q_{rr}			2		nC

- Notes : 1. Repetitive rating; pulse width limited by maximum junction temperature.
 2. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB.
 3. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 0.5\%$.

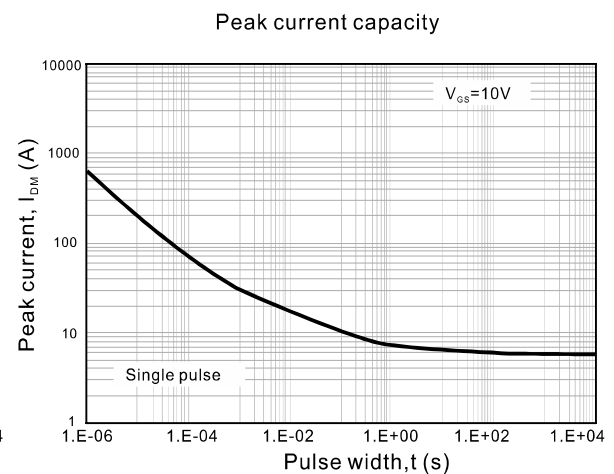
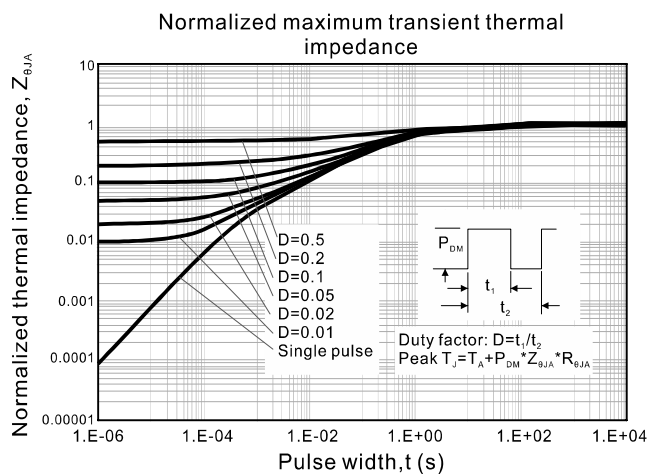
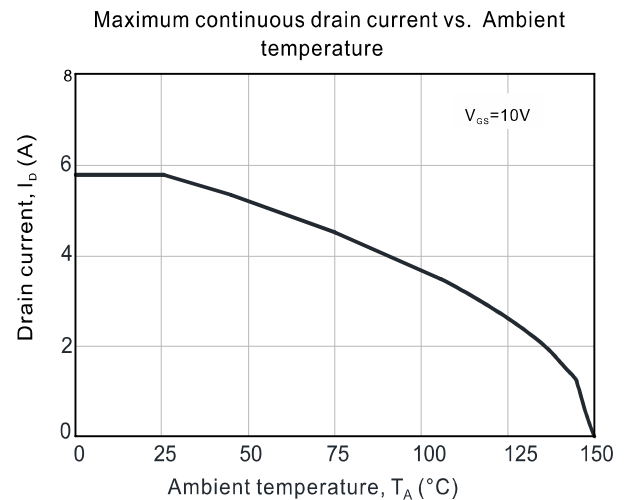
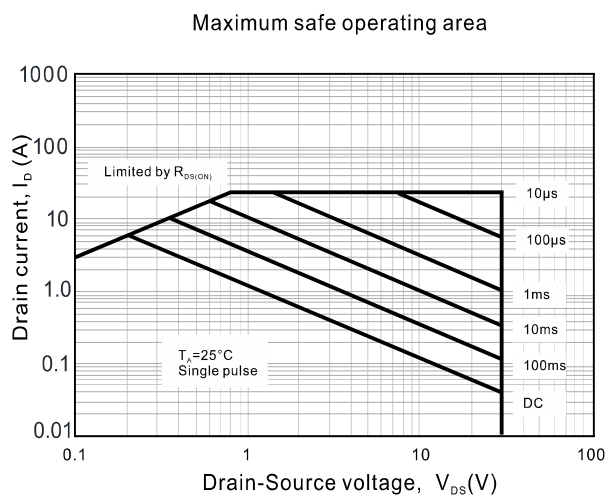
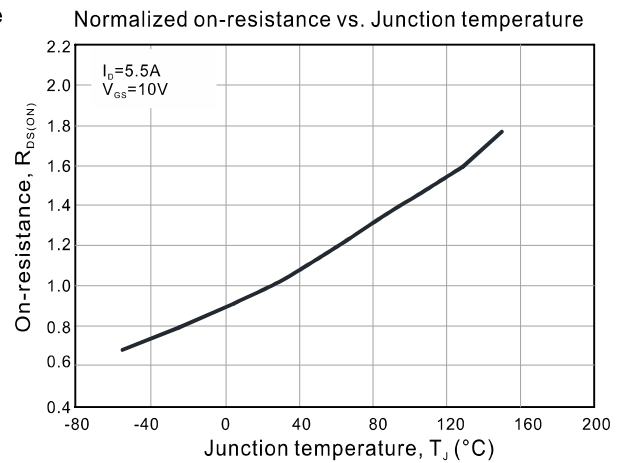
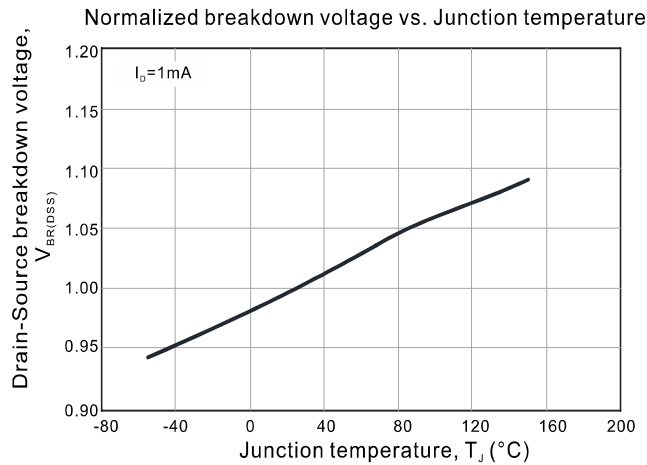
FMOS3404A

Rating and Characteristic Curves



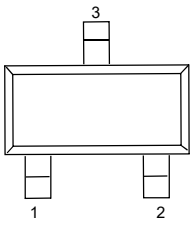
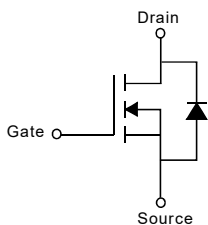
FMOS3404A

Rating and Characteristic Curves



FMOS3404A

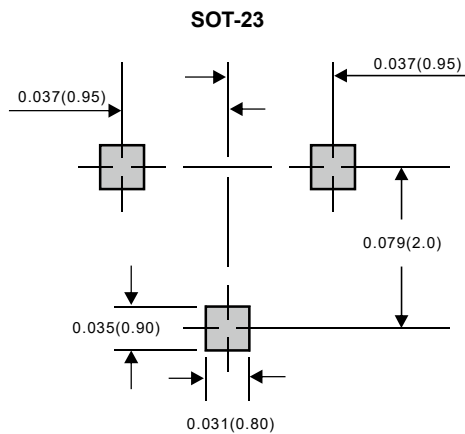
Pinning information

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

Marking

Type number	Marking code
FMOS3404A	3404

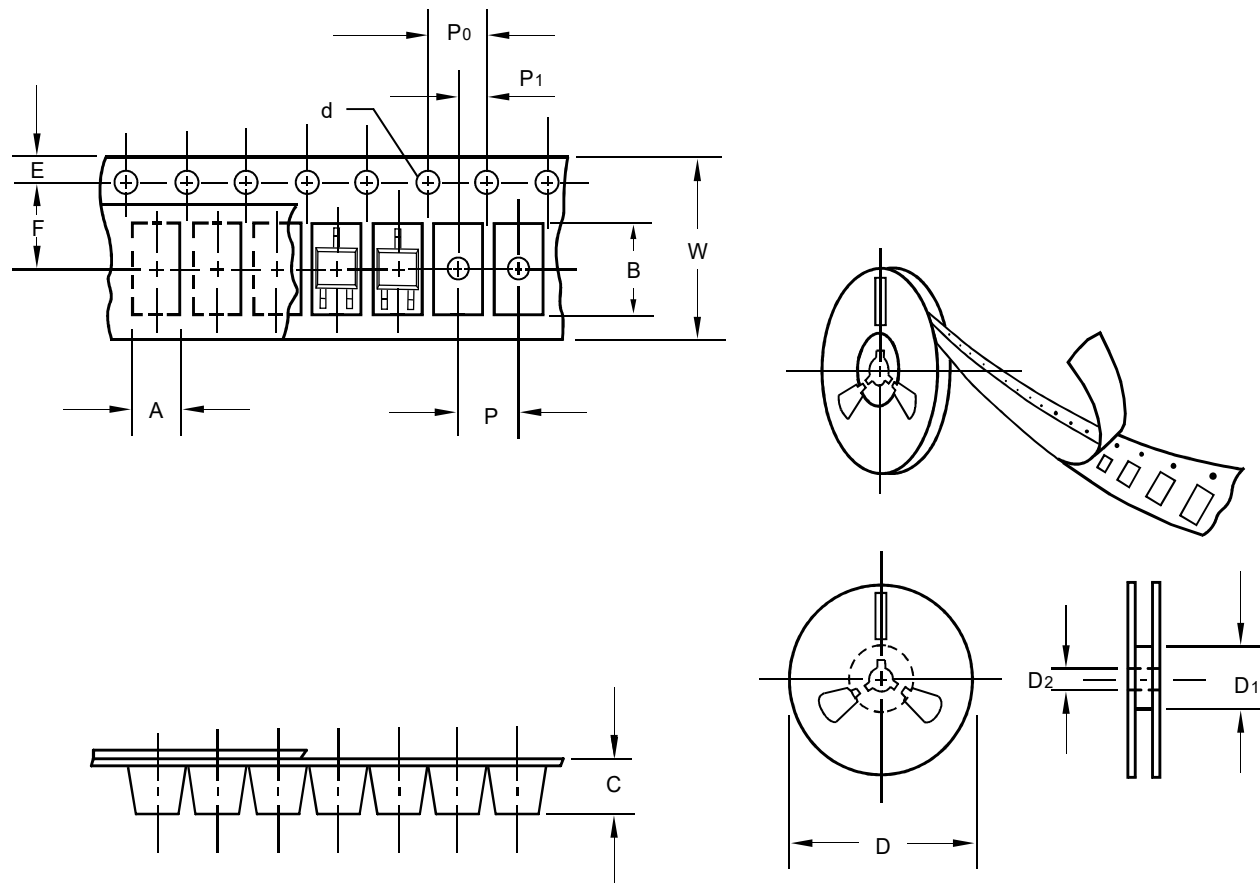
Suggested solder pad layout



Dimensions in inches and (millimeters)

FMOS3404A

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	50.00
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

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

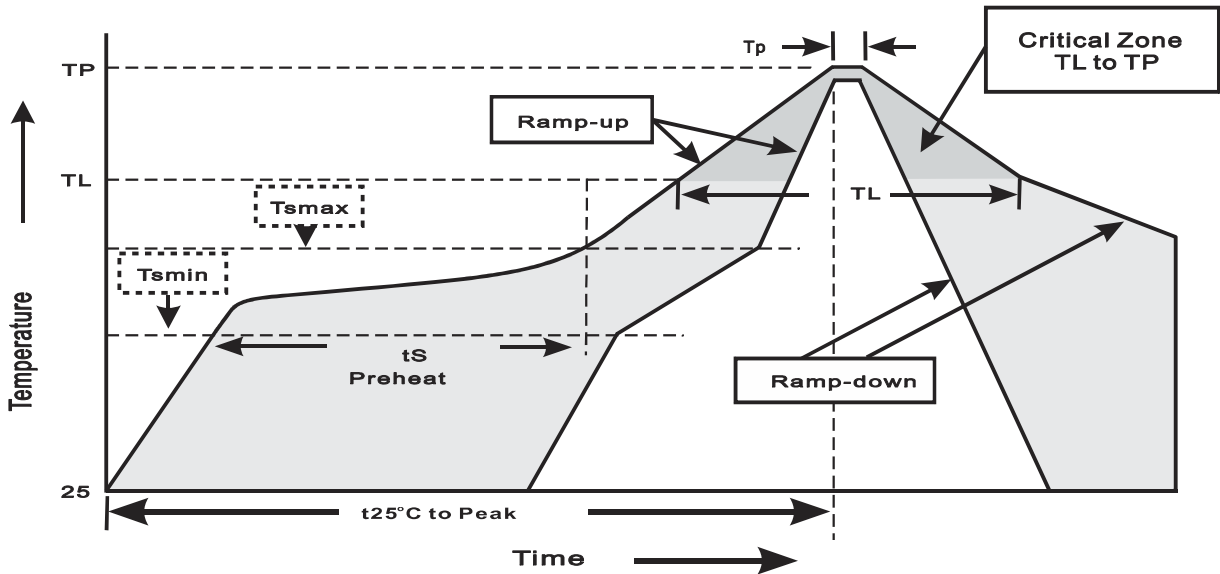
FMOS3404A

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°C~40°C 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°C/sec
Preheat -Temperature Min(T _{smin}) -Temperature Max(T _{smax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes