

FMOSAC3117

List

List.....1

Package outline.....2

Features.....2

Applications.....2

Mechanical data.....2

Maximum ratings2

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

FMOSAC3117

-100A -30V P-Channel Enhancement Mode Power MOSFET

Features

- $-V_{DS}=30V$, $-I_D=100A$.
- $R_{DS(ON)} \leq 3.3m\Omega$, @ $-V_{GS}=10V$, $-I_D=30A$.
- $R_{DS(ON)} \leq 5.4m\Omega$, @ $-V_{GS}=4.5V$, $-I_D=20A$.
- 100% E_{AS} guaranteed.
- Reliable and rugged.
- Advanced trench MOS technology.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOSAC3117-H.

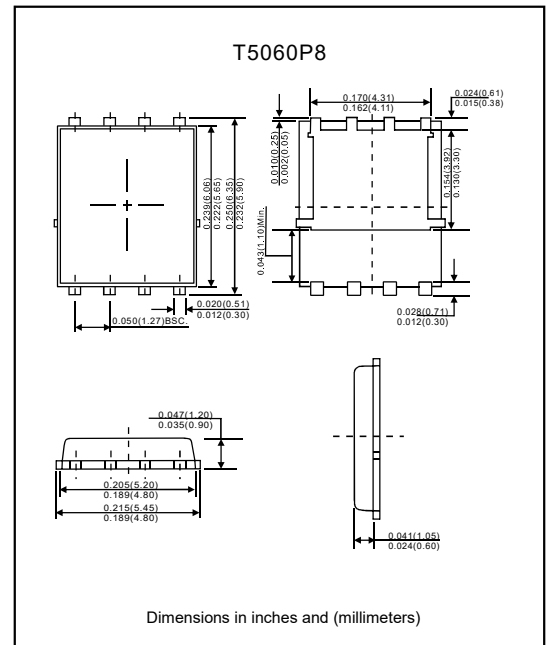
Applications

- Power management in notebook computer.
- Portable equipment.
- Battery powered systems.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic,T5060P8.
- Mounting Position : Any.

Package outline



Maximum ratings (At $T_c=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-source voltage	$-V_{DS}$	30	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current (Note1,6)	$-I_D$	100	A
		64	
Pulsed drain current (Note2)	$-I_{DM}$	400	A
Avalanche current	$-I_{AS}$	79	A
Single pulse avalanche energy (Note3)	E_{AS}	312	mJ
Power dissipation (Note4)	P_D	138	W
Thermal resistance Junction to ambient (Note1)	$R_{\theta JA}$	62	$^\circ C/W$
Thermal resistance Junction to case (Note1)	$R_{\theta JC}$	0.9	$^\circ C/W$
Operating Junction temperature	T_J	+150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

FMOSAC3117

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	$-BV_{\text{DSS}}$	$-I_{\text{D}}=250\mu\text{A}$, $V_{\text{GS}}=0\text{V}$	30			V
Drain-source leakage current	$-I_{\text{DSS}}$	$-V_{\text{DS}}=24\text{V}$, $V_{\text{GS}}=0\text{V}$, $T_{\text{J}}=25^{\circ}\text{C}$			1	μA
		$-V_{\text{DS}}=24\text{V}$, $V_{\text{GS}}=0\text{V}$, $T_{\text{J}}=55^{\circ}\text{C}$			5	
Gate-source leakage current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}$, $V_{\text{DS}}=0\text{V}$			± 10	μA
On characteristics						
Gate threshold voltage	$-V_{\text{GS(TH)}}$	$V_{\text{GS}}=V_{\text{DS}}$, $-I_{\text{D}}=250\mu\text{A}$	1.1	1.7	2.5	V
Static drain-source on-resistance (Note 2)	$R_{\text{DS(ON)}}$	$-V_{\text{GS}}=10\text{V}$, $-I_{\text{D}}=30\text{A}$		2.6	3.3	$\text{m}\Omega$
		$-V_{\text{GS}}=4.5\text{V}$, $-I_{\text{D}}=20\text{A}$		4.2	5.4	
Forward transconductance	g_{FS}	$-V_{\text{DS}}=5\text{V}$, $-I_{\text{D}}=20\text{A}$		25		S
Dynamic parameters						
Input capacitance	C_{iss}	$V_{\text{GS}}=0\text{V}$, $-V_{\text{DS}}=15\text{V}$, $f=1.0\text{MHz}$		7600		pF
Out capacitance	C_{oss}			1050		
Reverse transfer capacitance	C_{rss}			930		
Switching parameters						
Total gate charge	Q_{g}	$-V_{\text{GS}}=10\text{V}$, $-V_{\text{DS}}=15\text{V}$, $-I_{\text{D}}=30\text{A}$		140		nC
Gate to source charge	Q_{gs}			22		
Gate to drain charge	Q_{gd}			31		
Turn-on delay time	$t_{\text{d(on)}}$	$-V_{\text{DD}}=15\text{V}$, $-V_{\text{GS}}=10\text{V}$, $R_{\text{G}}=3.3\Omega$, $-I_{\text{D}}=20\text{A}$		24		ns
Rise time	t_{r}			31		
Turn-off delay time	$t_{\text{d(off)}}$			120		
Fall time	t_{f}			45		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 2)	$-V_{\text{SD}}$	$-I_{\text{S}}=1\text{A}$, $V_{\text{GS}}=0\text{V}$, $T_{\text{J}}=25^{\circ}\text{C}$			1	V
Continuous source current (Note 1, 5)	$-I_{\text{S}}$	$V_{\text{G}}=V_{\text{D}}=0\text{V}$, Force current			100	A
Reverse recovery time	t_{rr}	$-I_{\text{F}}=20\text{A}$, $di/dt=100\text{A}/\mu\text{A}$, $T_{\text{J}}=25^{\circ}\text{C}$		50		nS
Reverse recovery charge	Q_{rr}			54		nC

Note: 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

3.The E_{AS} data shows maximum rating . The test condition is $-V_{\text{DD}}=25\text{V}$, $-V_{\text{GS}}=10\text{V}$, $L=0.1\text{mH}$, $-I_{\text{AS}}=79\text{A}$.

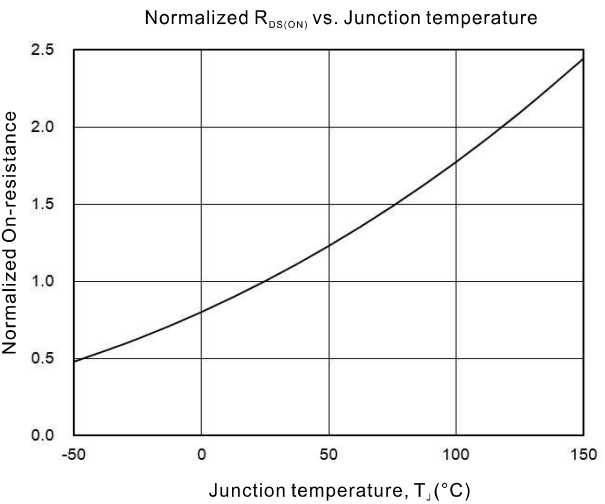
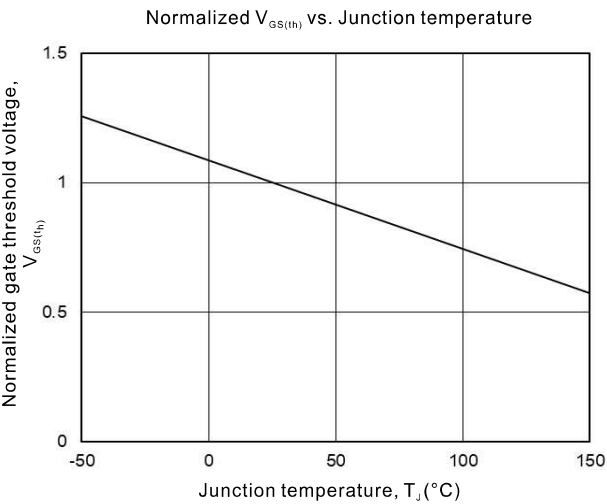
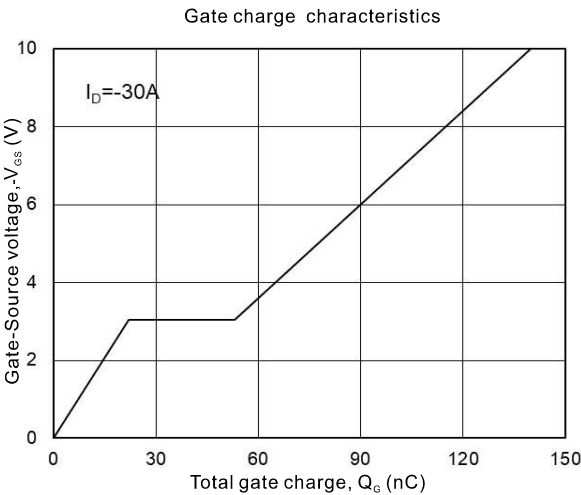
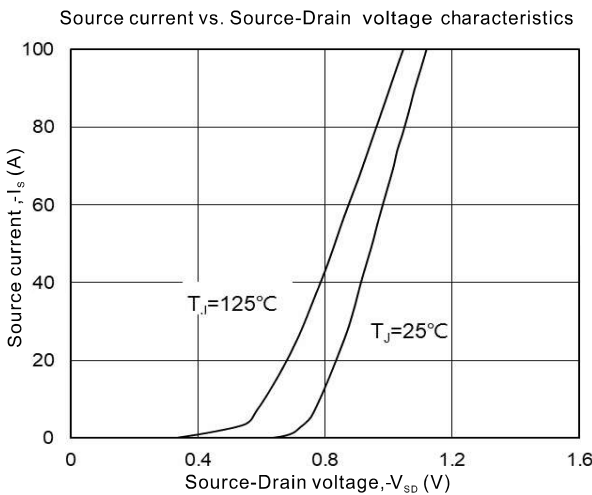
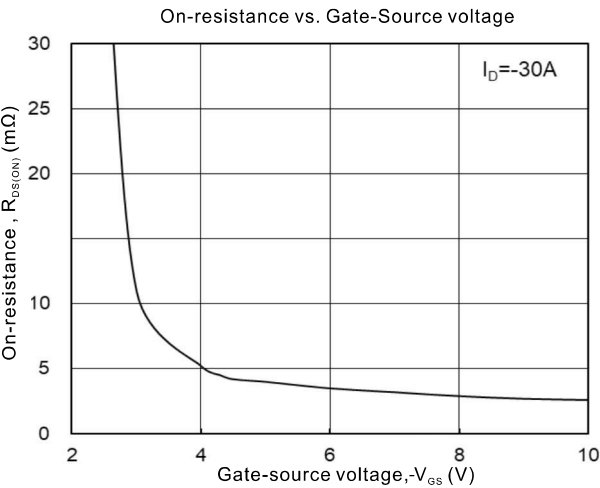
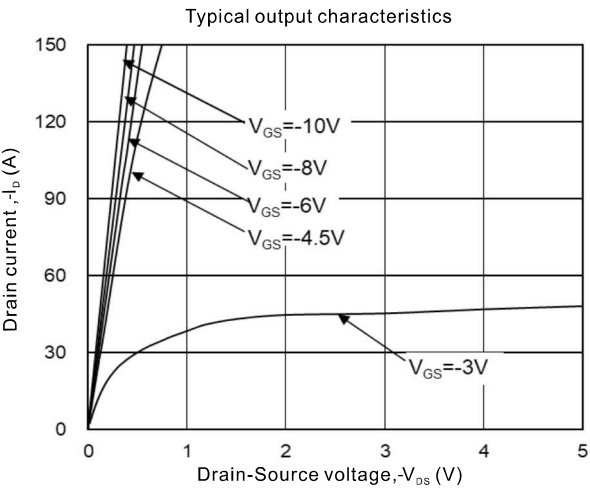
4.The power dissipation is limited by 150°C junction temperature.

5.The data is theoretically the same as I_D , in real applications , should be limited by total power dissipation.

6.The maximum current rating is package limited.

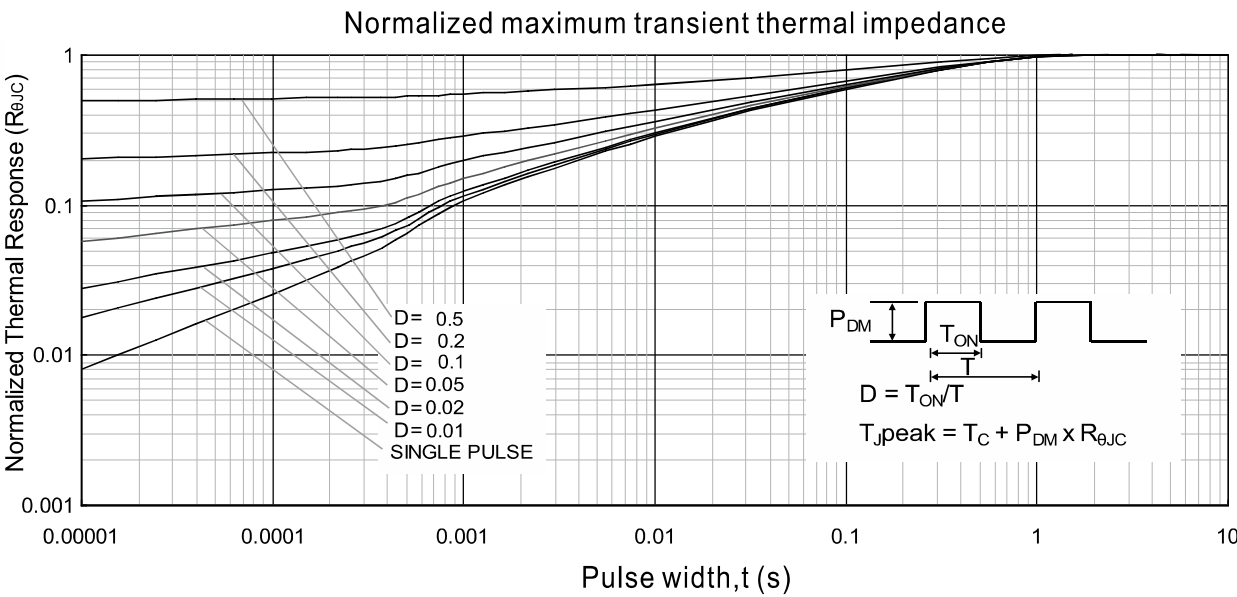
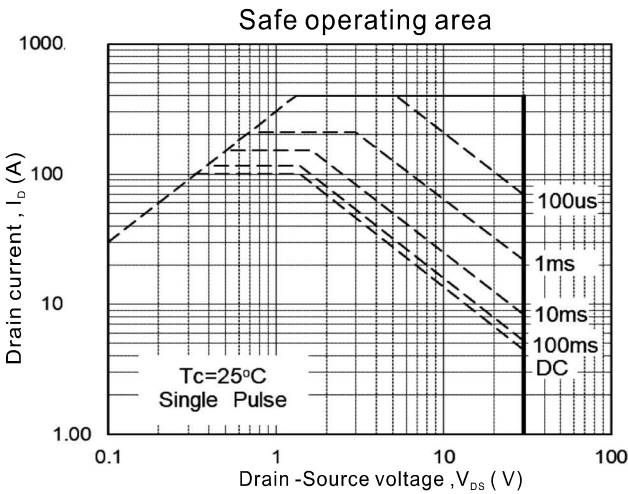
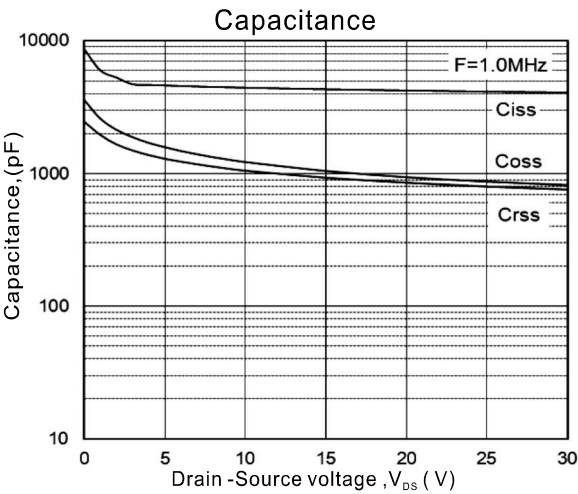
FMOSAC3117

Rating and characteristic curves



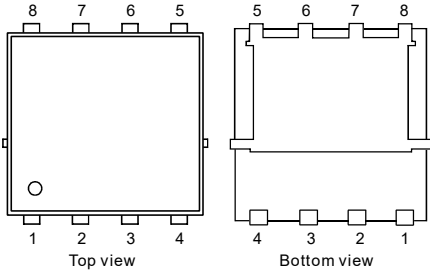
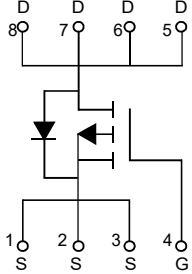
FMOSAC3117

Rating and characteristic curves



FMOSAC3117

Pinning information

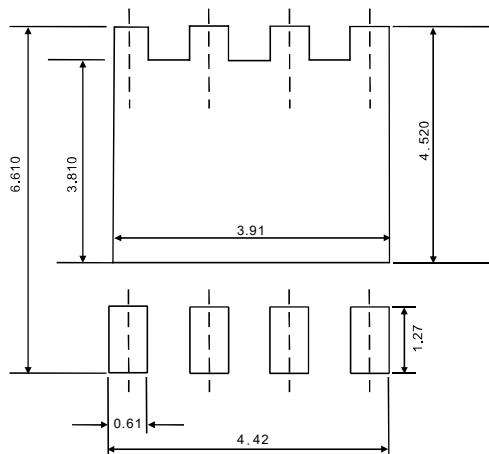
Pin	Simplified outline	Symbol
Pin 1, 2, 3, Source Pin 4 Gate Pin 5, 6, 7, 8 Drain	 Top view Bottom view	

Marking

Type number	Marking code
FMOSAC3117	AC3117

Suggested solder pad layout

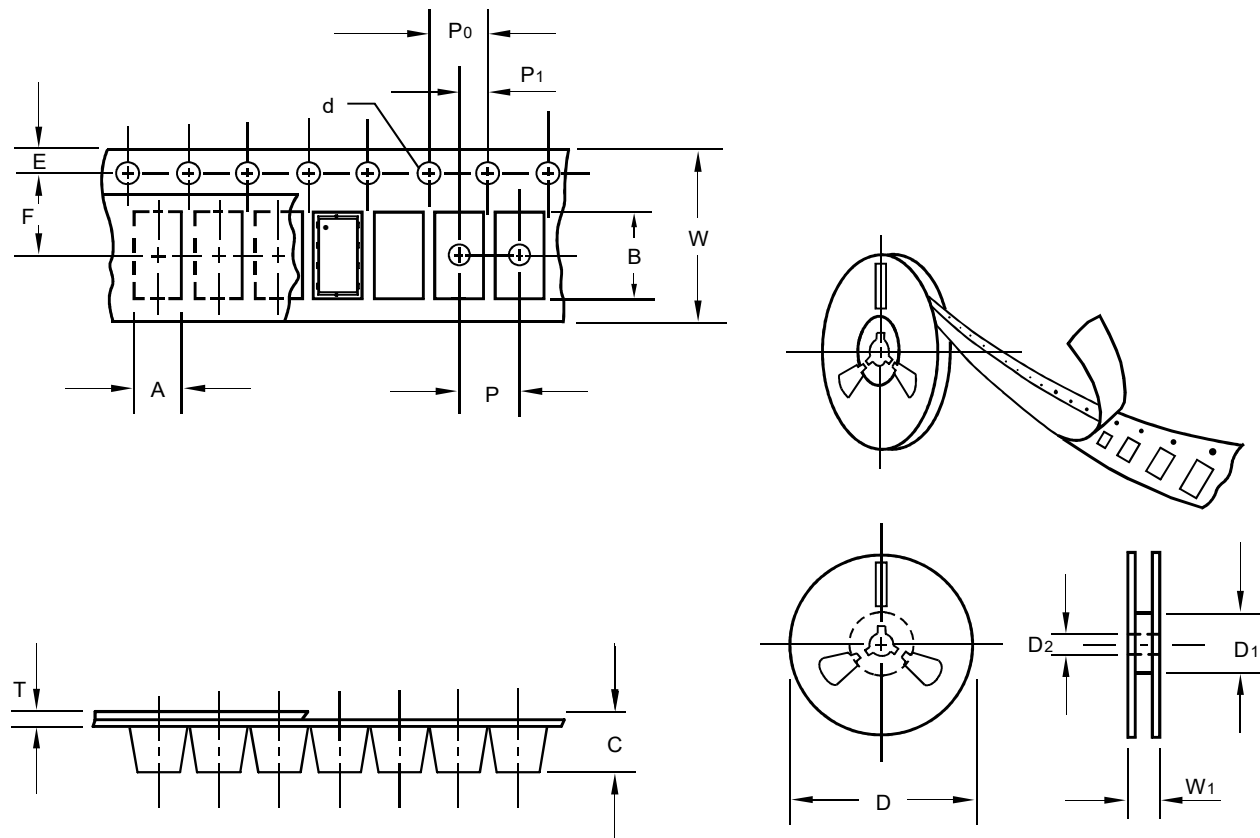
T5060P8



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.1\text{mm}$
3. The pad layout is for reference purposes only.

FMOSAC3117

Packing information



unit:mm

Item	Symbol	Tolerance	T5060P8
Carrier width	A	0.1	6.50
Carrier length	B	0.1	5.30
Carrier depth	C	0.1	1.40
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	176.00
7" Reel outside diameter	D	2.0	-
7" Reel inner diameter	D1	min	-
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.30
Tape width	W	0.3	12.00
Reel width	W1	1.0	18.40

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

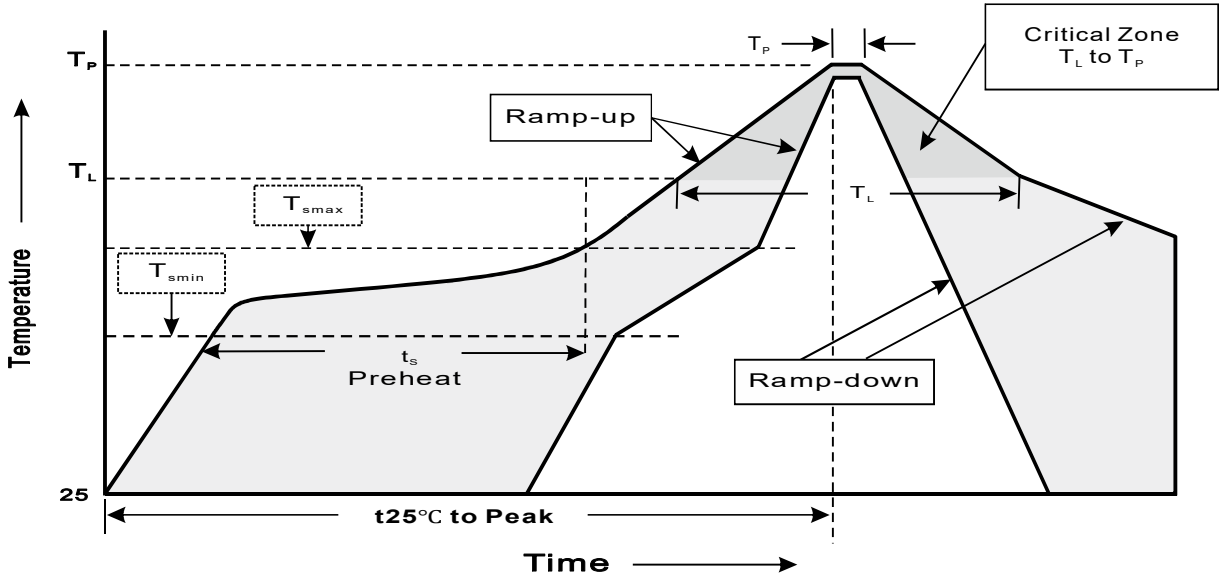
FMOSAC3117

Reel packing

Device	Outline	Device Package	Reel Size	Reel (pcs)
FMOSAC3117	Taping	T5060P8	13 inch	3,000

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-up rate	< 3°C/sec
Time maintained above: -Temperature (T_L) -Time(T_L)	217°C 60 ~ 260 sec
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	< 6 minutes