

FMOSAC0056

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FMOSAC0056

32A 100V N-Channel Enhancement
Mode Power MOSFET

Features

- $V_{DS}=100V$, $I_D=32A$.
- $R_{DS(ON)} \leq 20m\Omega$, @ $V_{GS}=10V$, $I_D=10A$.
- $R_{DS(ON)} \leq 30m\Omega$, @ $V_{GS}=4.5V$, $I_D=10A$.
- 100% E_{AS} guaranteed.
- Fast switching speed.
- Advanced trench MOS technology.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOSAC0056-H.

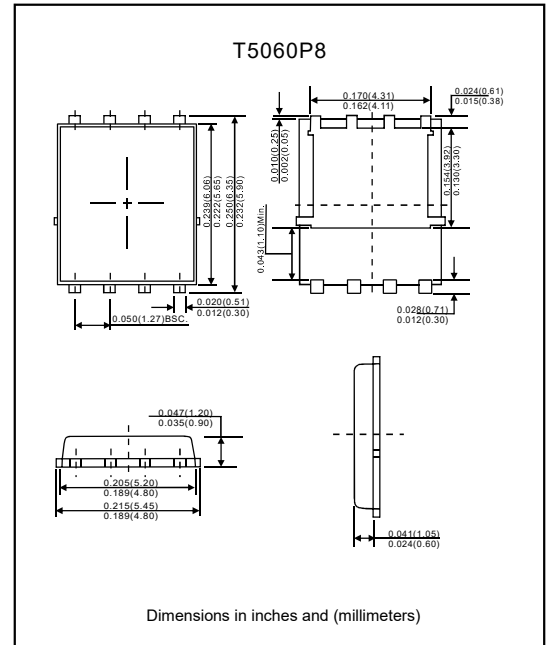
Applications

- Portable equipment.
- Battery powered systems.
- Hard switching and high-speed circuit.

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}	100	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current, $V_{GS}@10V$ (Note1)	I_D	32	A
($T_c=25^\circ C$) ($T_c=100^\circ C$)		20.2	
Pulsed drain current (Note2)	I_{DM}	90	A
Avalanche current	I_{AS}	30	A
Single pulse avalanche energy (Note3)	E_{AS}	45	mJ
Power dissipation (Note4)	P_D	37.9	W
Thermal resistance Junction to ambient (Note1)	$R_{\theta JA}$	55	$^\circ C/W$
Thermal resistance Junction to case (Note1)	$R_{\theta JC}$	3.3	$^\circ C/W$
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 $T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Drain-source leakage current	I _{DSS}	V _{DS} =80V, V _{GS} =0V			1	μA
		V _{DS} =80V, V _{GS} =0V, T _J =55°C			5	
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
On characteristics						
Gate threshold voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250μA	1.2	1.8	2.2	V
Static drain-source on-resistance (Note 2)	R _{DS(ON)}	V _{GS} =10V, I _D =10A		15.5	20	mΩ
		V _{GS} =4.5V, I _D =10A		21	30	
Dynamic parameters						
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=1.0MHz		849		pF
Out capacitance	C _{oss}			185		
Reverse transfer capacitance	C _{rss}			8		
Gate resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1.0MHz		1		Ω
Switching parameters						
Total gate charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =10A		17.9		nC
Gate to source charge	Q _{gs}			2.8		
Gate to drain charge	Q _{gd}			5.2		
Turn-on delay time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _G =6Ω, I _D =1A		13		ns
Rise time	t _r			6		
Turn-off delay time	t _{d(off)}			30		
Fall time	t _f			29		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 2)	V _{SD}	I _s =1A, V _{GS} =0V, T _J =25°C			1.2	V
Continuous source current (Note 1, 6)	I _s	V _G =V _D =0V, Force current			32	A

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 cycles $\leq 2\%$.

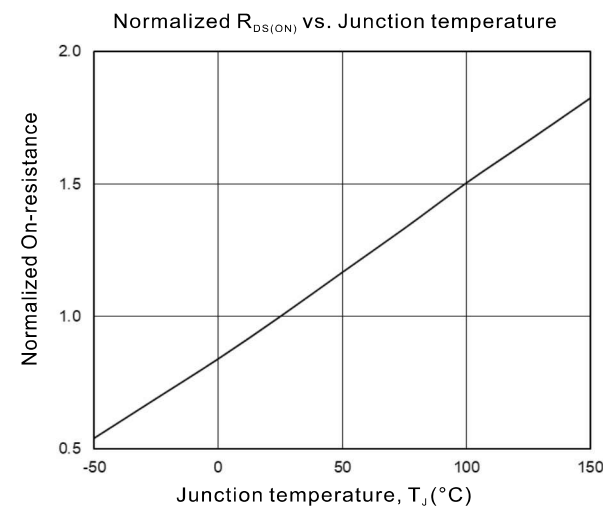
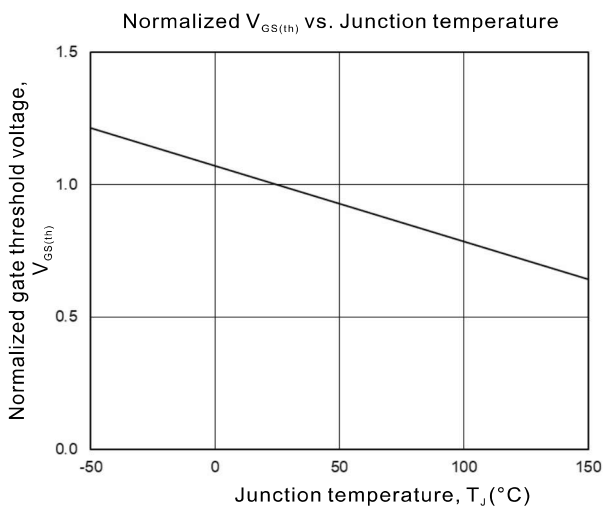
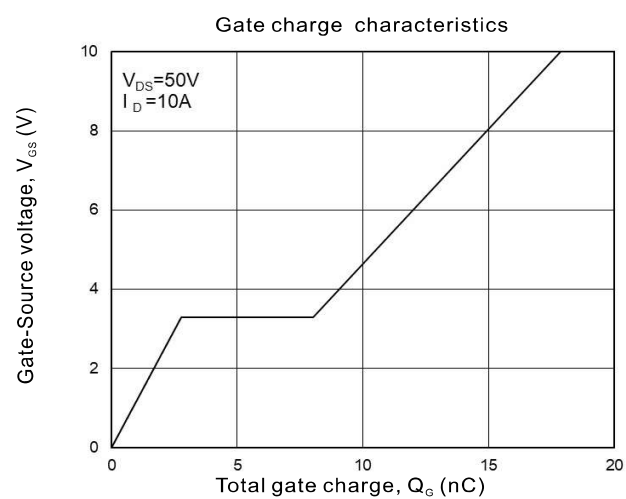
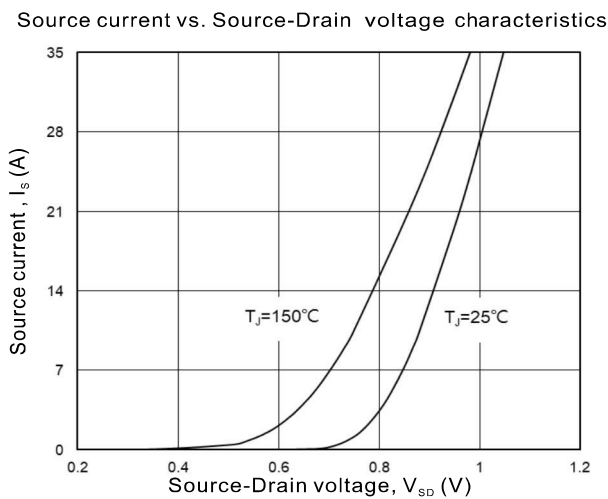
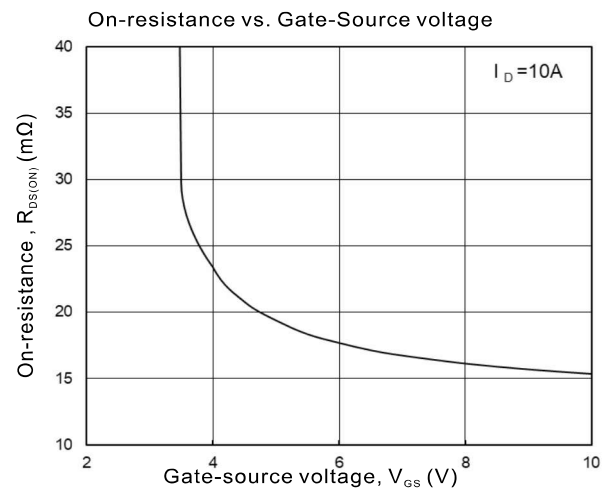
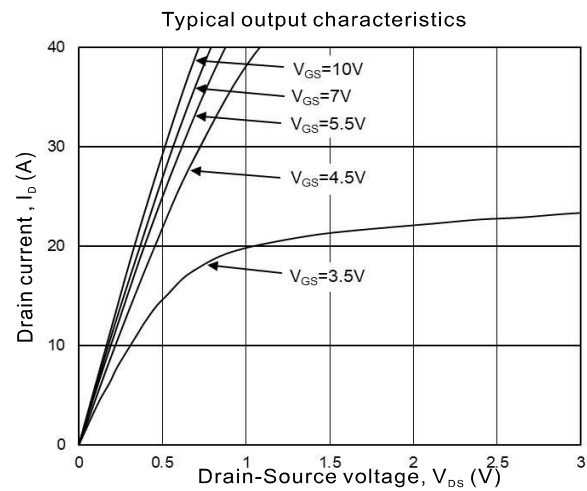
3. The E_{AS} data shows maximum rating. the test condition is $V_{DD}=25\text{V}$, $V_{GS}=10\text{V}$, $L=0.1\text{mH}$, $I_{AS}=30\text{A}$.

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

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

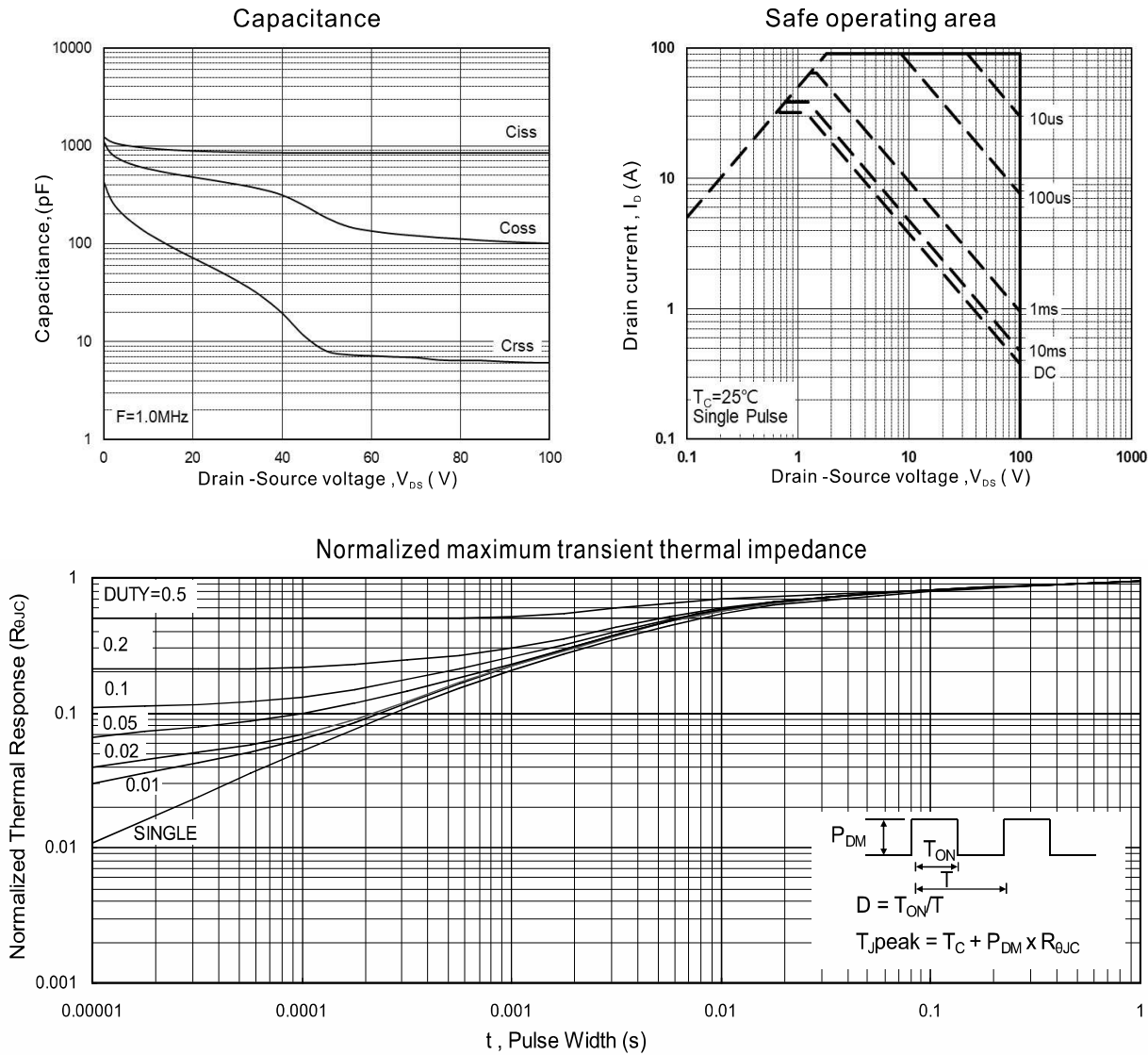
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Rating and characteristic curves



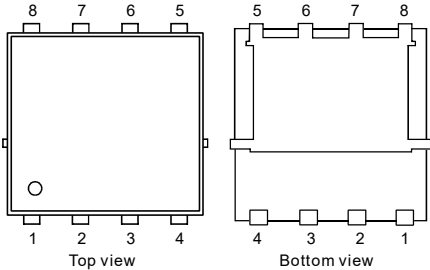
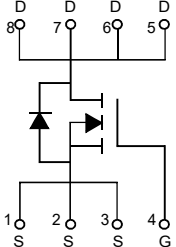
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Rating and characteristic curves



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Pinning information

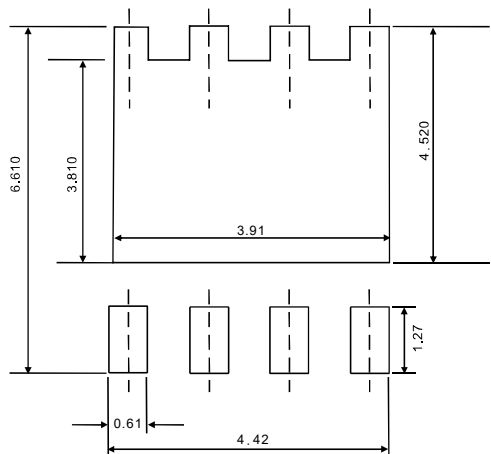
Pin	Simplified outline	Symbol
Pin 1, 2, 3, Source Pin 4 Gate Pin 5, 6, 7, 8 Drain	 Top view Bottom view	

Marking

Type number	Marking code
FMOSAC0056	AC0056

Suggested solder pad layout

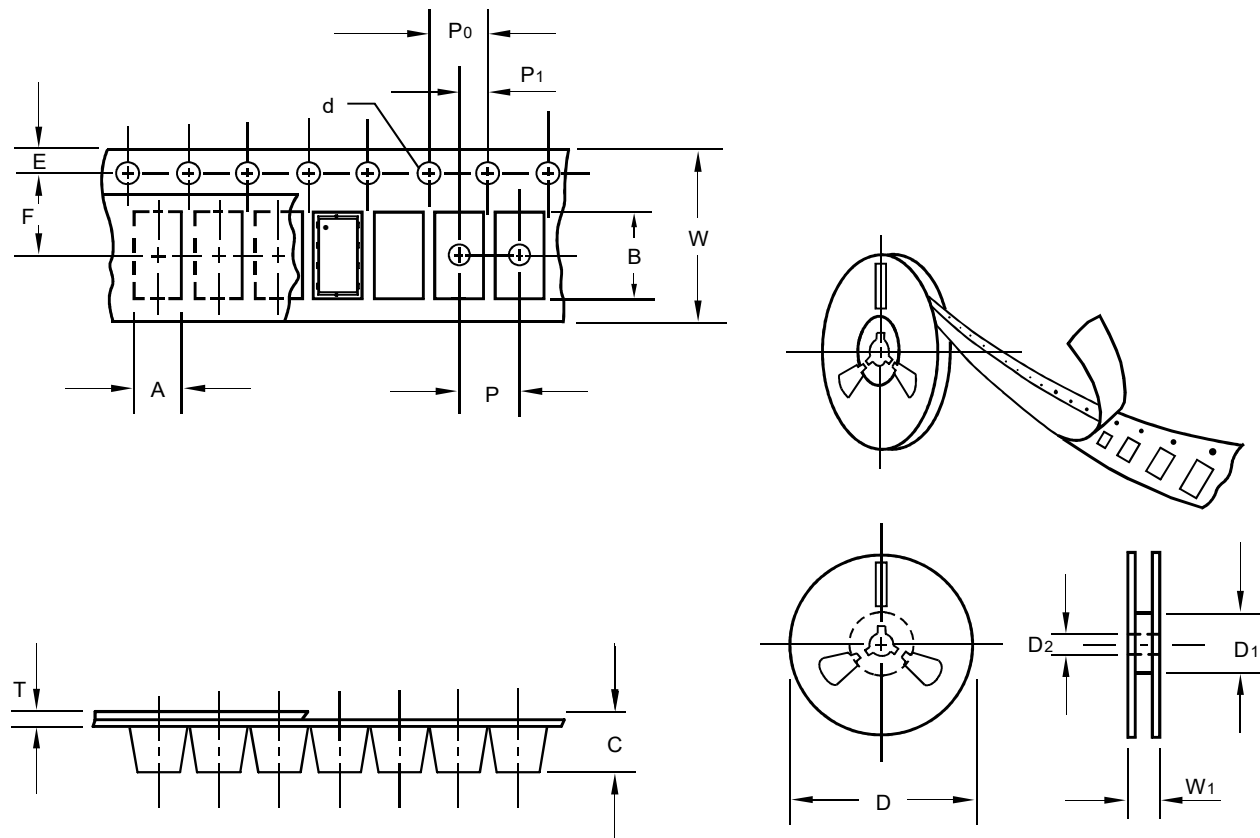
T5060P8



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

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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.

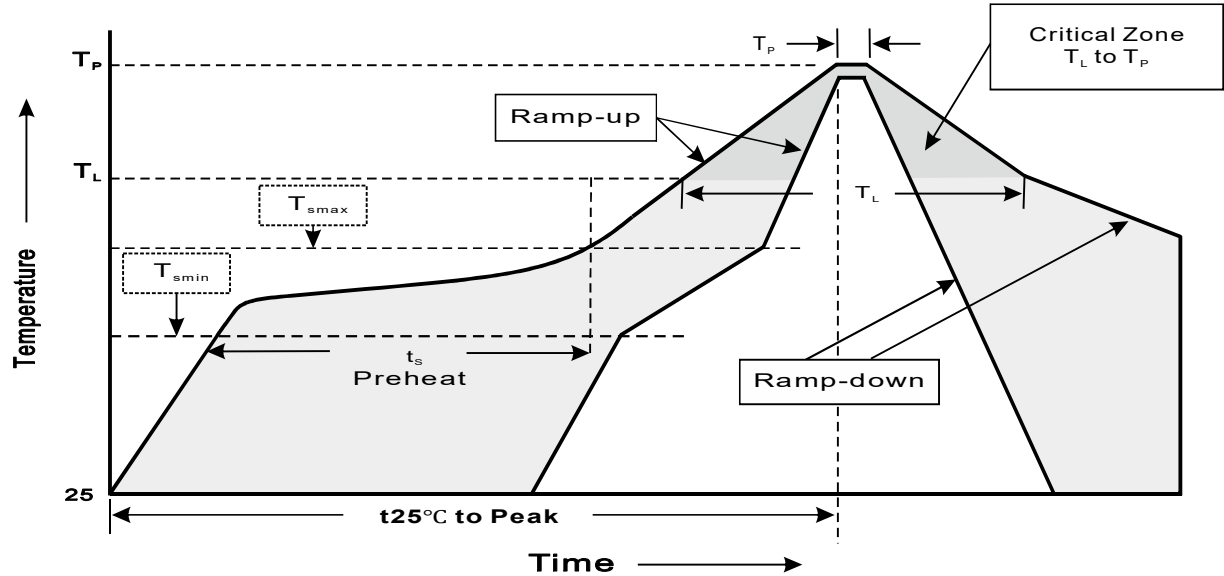
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Reel packing

Device	Outline	Device Package	Reel Size	Reel (pcs)
FMOSAC0056	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