

FMOSAC25P10

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FMOSAC25P10

-27A -100V P-Channel Enhancement Mode Power MOSFET

Features

- $-V_{DS}=100V$, $-I_D=27A$.
- $R_{DS(ON)} \leq 50m\Omega$, @ $-V_{GS}=10V$, $-I_D=15A$.
- $R_{DS(ON)} \leq 65m\Omega$, @ $-V_{GS}=4.5V$, $-I_D=10A$.
- Low on-resistance.
- Excellent gate charge on-resistance product (FOM.).
- 100% UIS and R_g tested.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOSAC25P10-H.

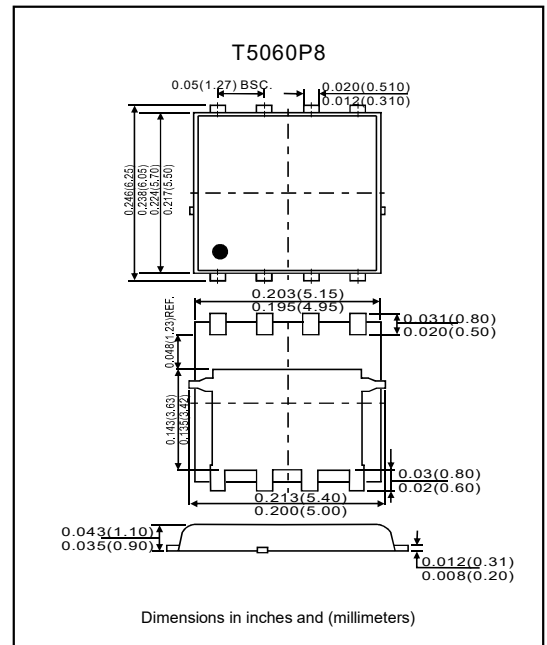
Application

- Battery management.
- DC/DC in telecoms and industrial.
- 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 $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Ratings	Units
Drain-source voltage	$-V_{DS}$	100	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current (Note1)	$-I_D$	27	A
		17	
Pulsed drain current (Note2)	$-I_{DM}$	82	A
Avalanche current (Note3)	$-I_{AS}$	27	A
Avalanche energy (Note3)	E_{AS}	109	mJ
Power dissipation (Note4)	P_D	78	W
		31	
Thermal resistance junction to ambient	$R_{\theta JA}$	55	$^\circ C/W$
Thermal resistance junction to case	$R_{\theta JC}$	1.6	$^\circ C/W$
Operation 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	Condition	Symbol	Min.	Typ.	Max.	Units
Off characteristics						
Drain-source breakdown voltage	$V_{GS} = 0V, -I_D = 250\mu A$	$-V_{(BR)DSS}$	100			V
Gate- source leakage current	$-V_{DS} = 80V, V_{GS} = 0V$	$-I_{DSS}$			1	μA
	$-V_{DS} = 80V, V_{GS} = 0V, T_J=55^{\circ}C$				5	
Gate-body leakage current	$V_{DS} = 0V, V_{GS} = \pm 20V$	I_{GSS}			± 100	nA
On characteristics						
Gate threshold voltage	$V_{GS} = V_{DS}, -I_D = 250\mu A$	$-V_{GS(th)}$	1	2	3	V
Drain-source on-resistance	$-V_{GS} = 10V, -I_D = 15A$	$R_{DS(on)}$		36	50	m Ω
	$-V_{GS} = 4.5V, -I_D = 10A$			48	65	
Forward transconductance	$-V_{DS} = 5V, -I_D = 15A$	g_{FS}		30		S
Dynamic characteristics (Note5)						
Intput capacitance	$-V_{DS} = 50V, V_{GS} = 0V, f = 1.0MHz$	C_{iss}		1412		pF
Output capacitance		C_{oss}		222		
Reverse transfer capacitance		C_{rss}		2.6		
Gate resistance	$-V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	R_g		10.2		Ω
Switching characteristics (Note5)						
Total gate charge	$-V_{GS} = 10V, -V_{DS} = 50V, -I_D = 15A$	Q_g		20		nC
	$-V_{GS} = 6V, -V_{DS} = 50V, -I_D = 15A$			12.6		
Gate-source charge	$-V_{GS} = 0 \text{ to } 10V, -V_{DS} = 50V, -I_D = 15A$	Q_{gs}		6.4		
Gate-drain charge		Q_{gd}		3.3		
Turn-on delay time	$-V_{DS} = 50V, -V_{GS} = 10V, R_G = 6\Omega, R_L = 3.3\Omega$	$t_{d(on)}$		10.7		nS
Turn-on rise time		t_r		56		
Turn-off delay time		$t_{d(off)}$		45		
Turn-off fall time		t_f		81		
Drain-source diode characteristics						
Drain-source diode forward voltage	$-I_S = 1A, V_{GS} = 0V$	$-V_{SD}$		0.7	1	V
Continuous drain-source diode forward current	$T_C=25^{\circ}C$	$-I_S$			78	A
Body diode reverse recovery time	$-I_F = 15A, dI_F/dt=-100A/\mu s$	t_{rr}		51		nS
Body diode reverse recovery charge		Q_{rr}		130		nC

Notes: 1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.

2. This single-pulse measurement was taken under $T_J=150^{\circ}\text{C}$.

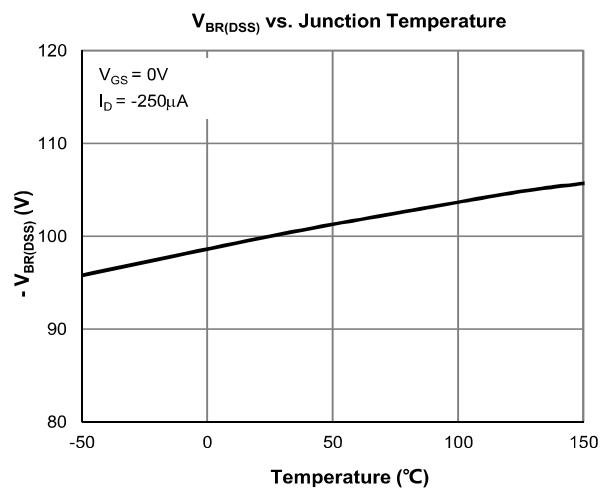
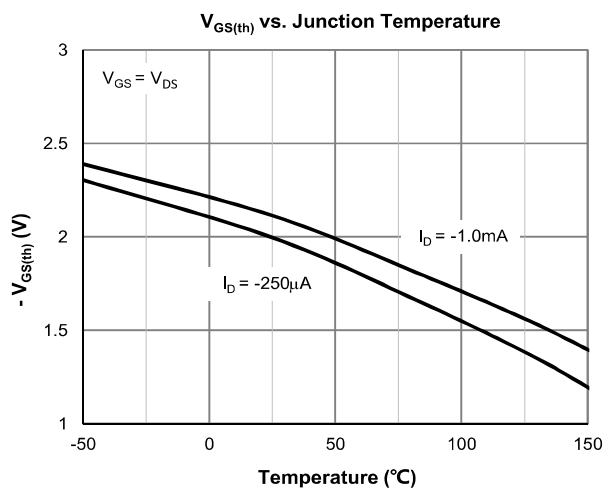
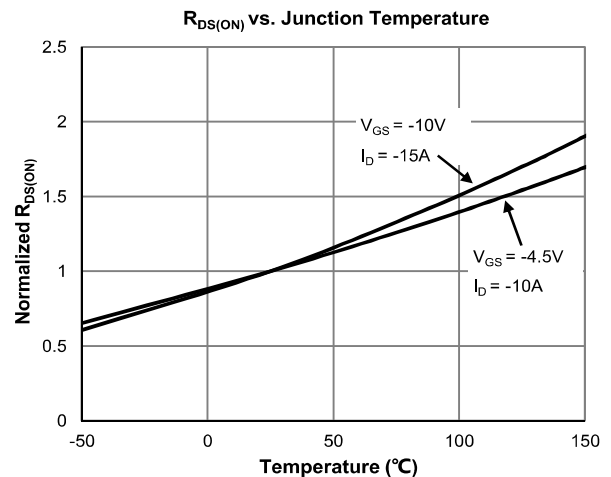
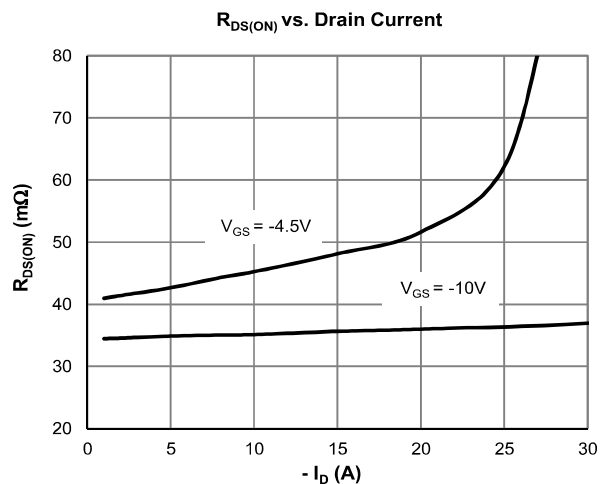
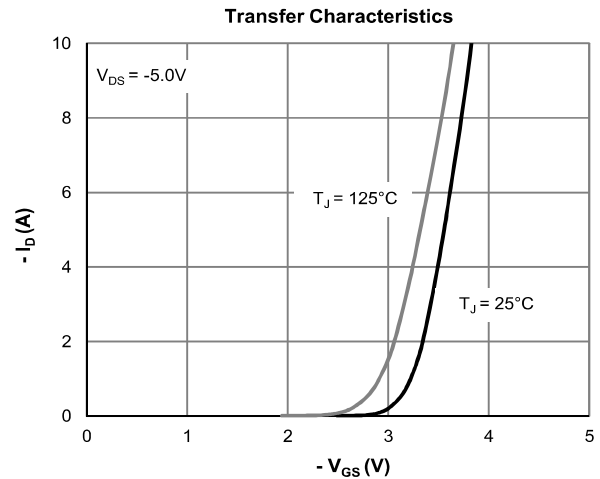
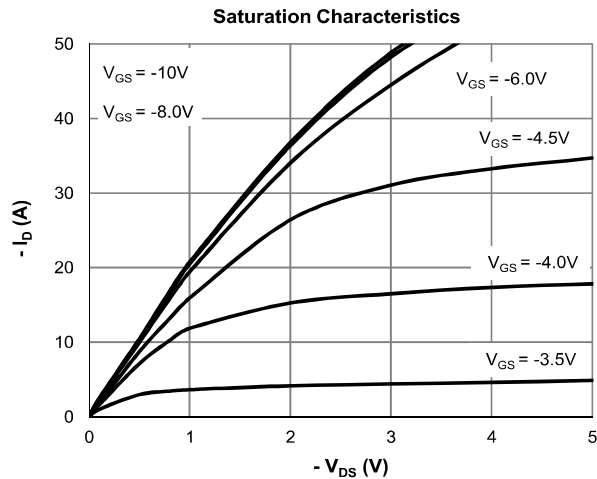
3. This single-pulse measurement was taken under the following condition [$L=300\mu\text{H}, V_{GS}=-10\text{V}, V_{DD}=-50\text{V}$] while its value is limited by $T_J=150^{\circ}\text{C}$.

4. The power dissipation P_D is based on $T_{J_Max}=150^{\circ}\text{C}$.

5. This value is guaranteed by design hence it is not included in the production test.

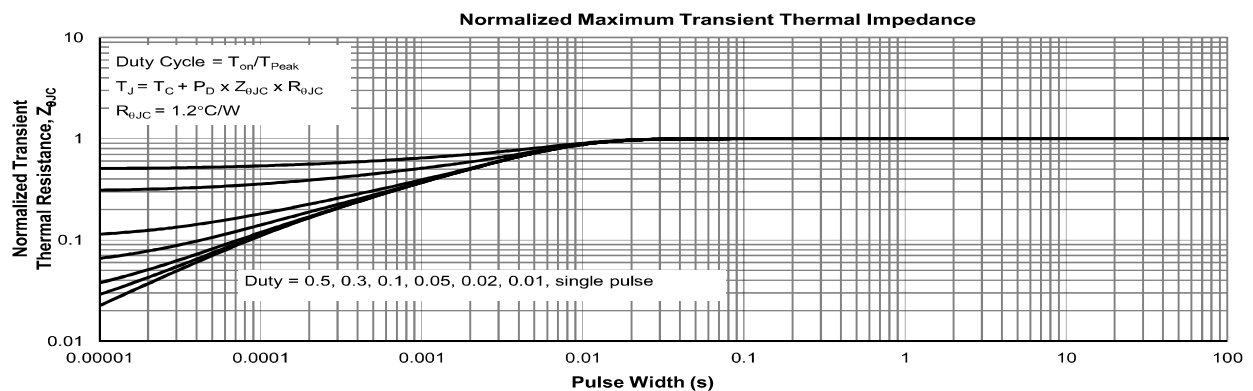
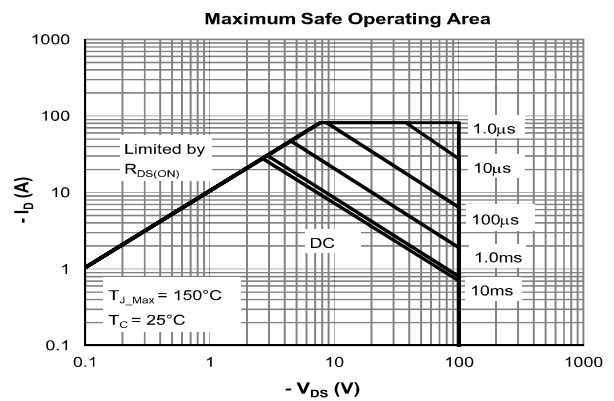
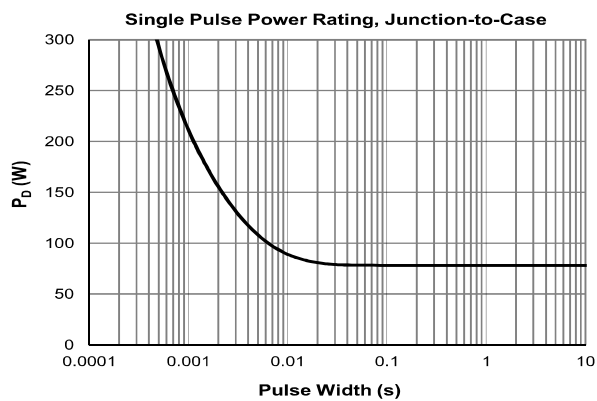
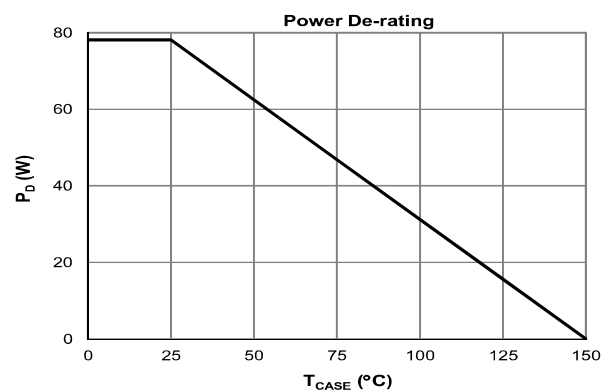
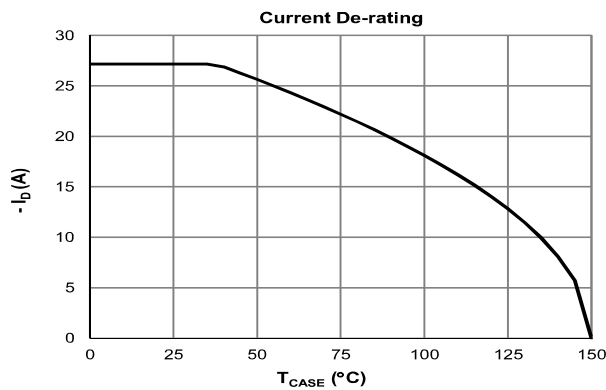
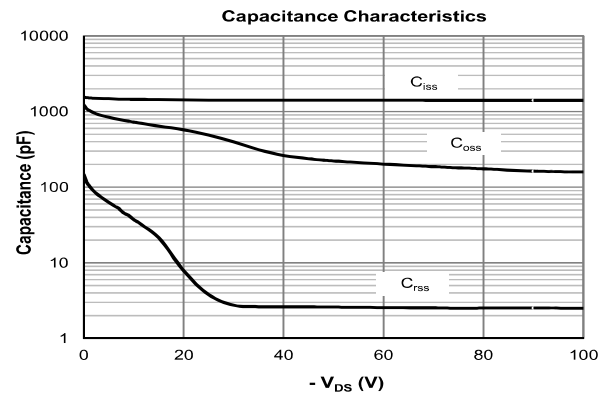
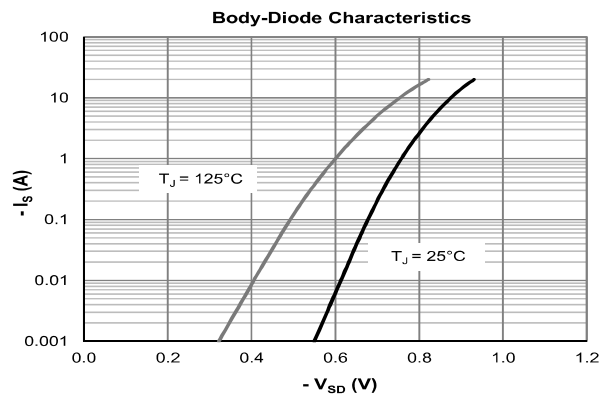
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Rating and characteristic curves



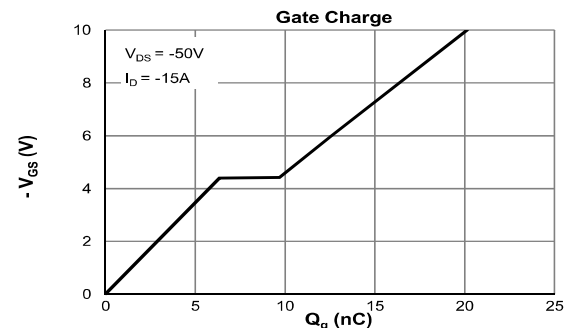
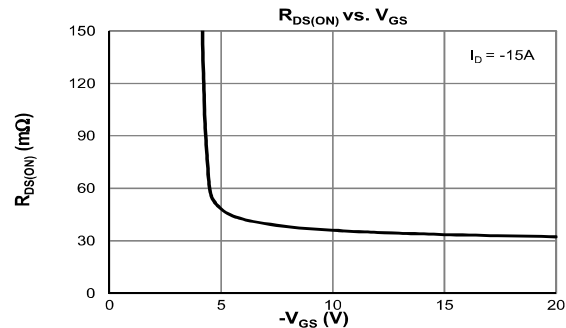
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Rating and characteristic curves



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Rating and characteristic curves



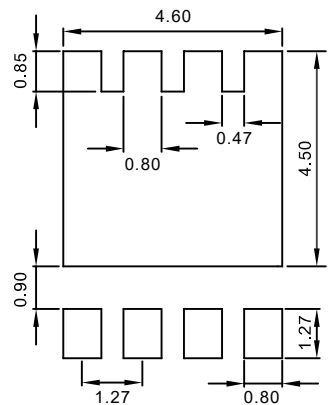
Pinning information

Pin	Simplified outline	Symbol
Pin1 Source Pin2 Source Pin3 Source Pin4 Gate Pin5 Drain Pin6 Drain Pin7 Drain Pin8 Drain		

Marking

Type number	Marking code
FMOSAC25P10	PL1050A

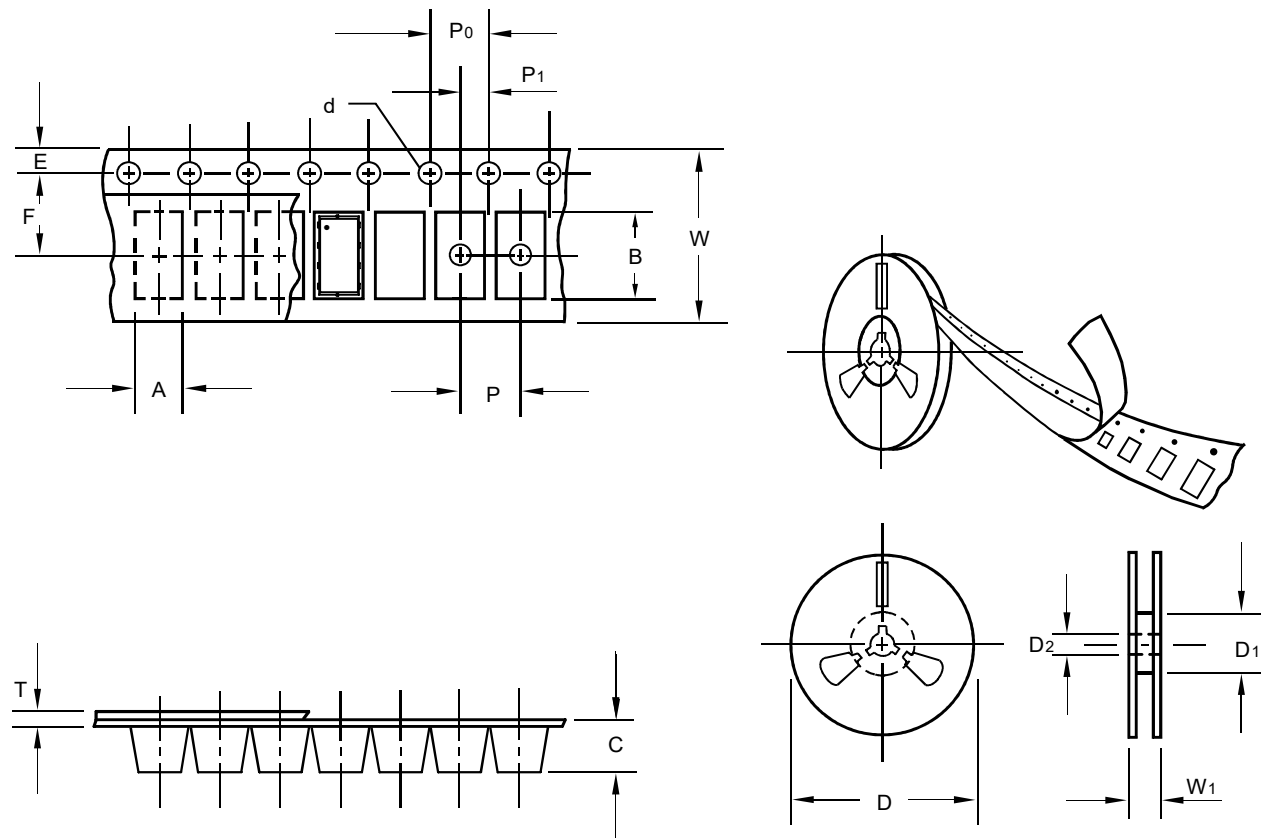
Suggested solder pad layout



- Note:
- Controlling dimension: in millimeters.
 - General tolerance: $\pm 0.05mm$
 - 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	6.40
Carrier length	B	0.1	5.40
Carrier depth	C	0.1	1.25
Sprocket hole	d	0.1	1.55
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	100.00
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	17.60

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

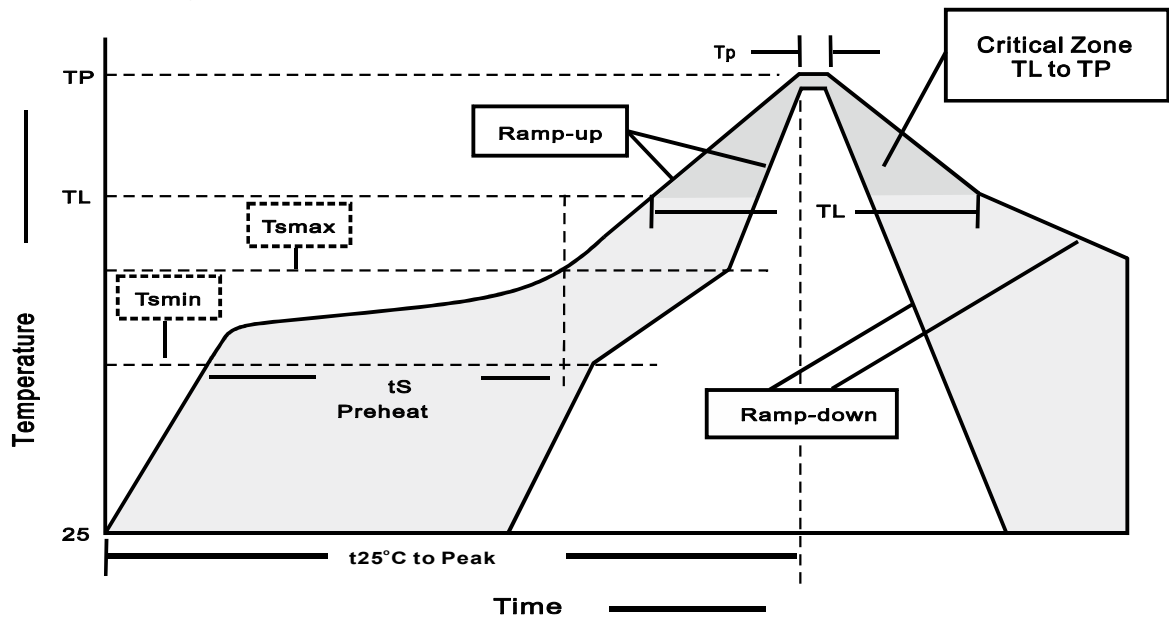
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Reel packing

Device	Outline	Package	Reel Size	Reel (PCS)
FMOSAC25P10	TAPING	T5060P8	13inch	5,000

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 _{smín}) -Temperature Max(T _{smáx}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smáx} 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	<3°C/sec
Time 25°C to Peak Temperature	<6minutes