

FMOSAC25N06

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FMOSAC25N06

25A 60V N-Channel Power MOSFET

Features

- $V_{DS} = 60V$, $I_D = 25A$.
- $R_{DS(ON)} \leq 28m\Omega @ V_{GS} = 10V$, $I_D = 5A$.
 $R_{DS(ON)} \leq 37m\Omega @ V_{GS} = 4.5V$, $I_D = 3A$.
- Low on-resistance, $R_{DS(ON)}$.
- Low gate charge, Q_g .
- 100% UIS and Rg Tested.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOSAC25N06-H.

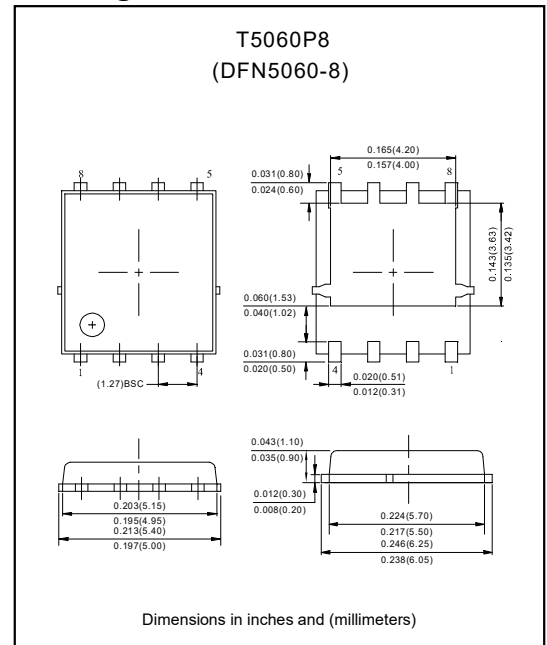
Applications

- Power management in telecom, Industrial automation, CE.
- Motor driving in power tool, E-vehicle, robotics.
- Current switching in DC/DC & AC/DC (SR) sub-systems.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, T5060P8 (DFN5060-8).
- 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}	60	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain Current (Note 1)	I_D	($T_c = 25^\circ C$) 25	A
		($T_c = 100^\circ C$) 16.4	
Pulsed drain current (Note 2)	I_{DM}	61	A
Single pulse avalanche energy (Note 3)	E_{AS}	13.5	mJ
Power dissipation (Note 4)	P_D	($T_c = 25^\circ C$) 35	W
		($T_c = 100^\circ C$) 14.2	
Operating Junction temperature	T_J	+150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$
Thermal resistance, Junction to ambient	$R_{\theta JA}$	63	$^\circ C/W$
Thermal resistance Junction to case	$R_{\theta JC}$	4.0	$^\circ C/W$

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

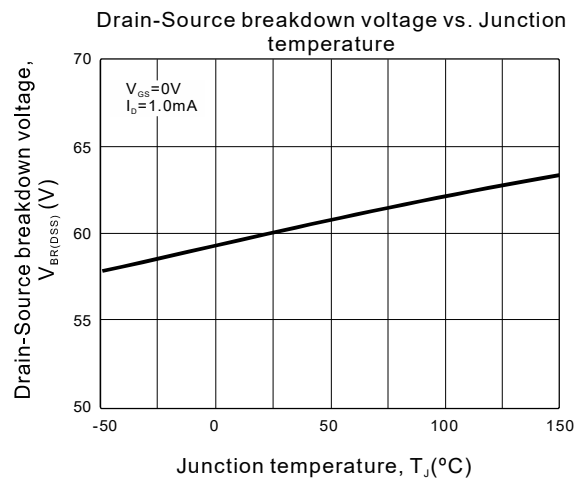
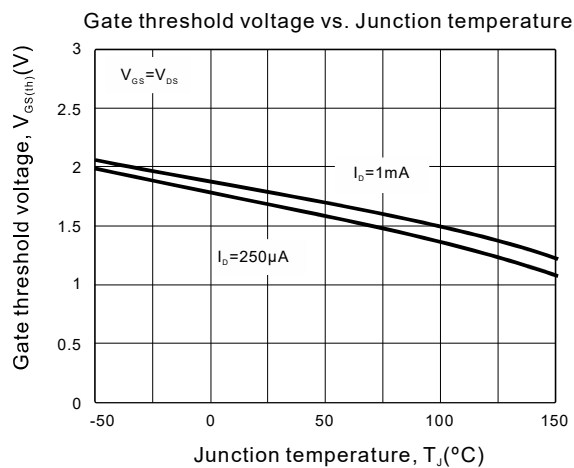
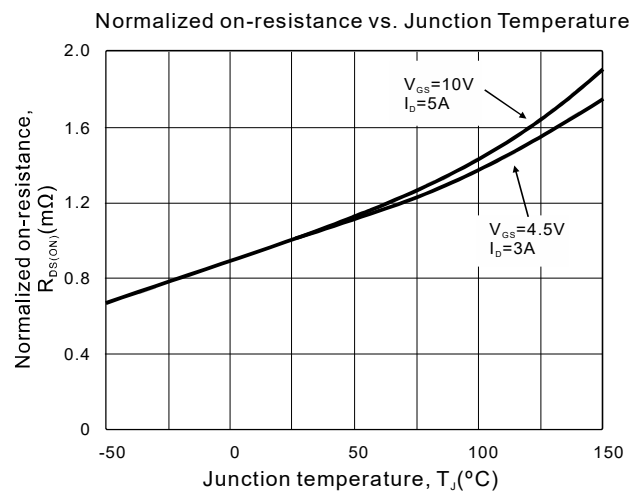
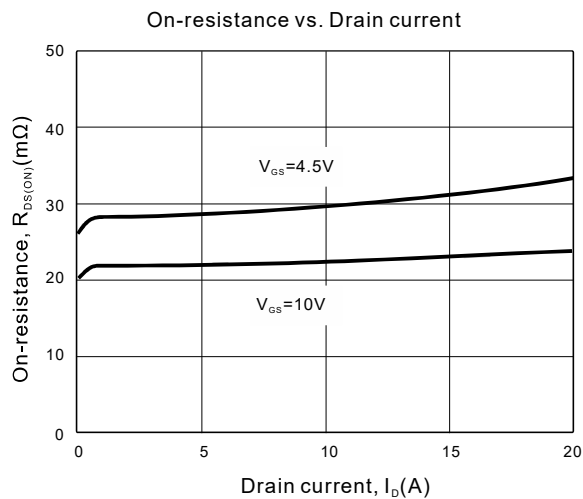
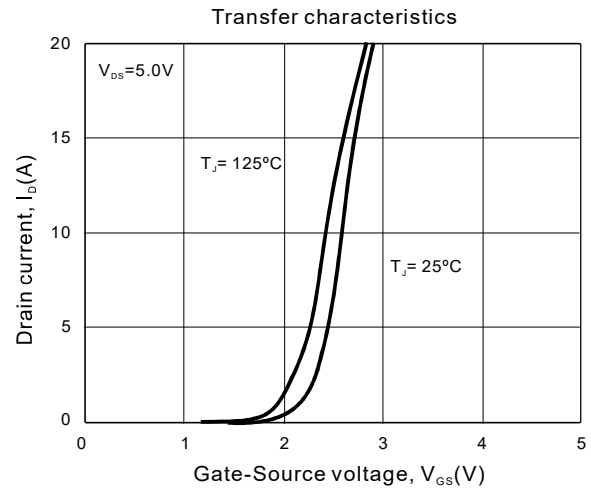
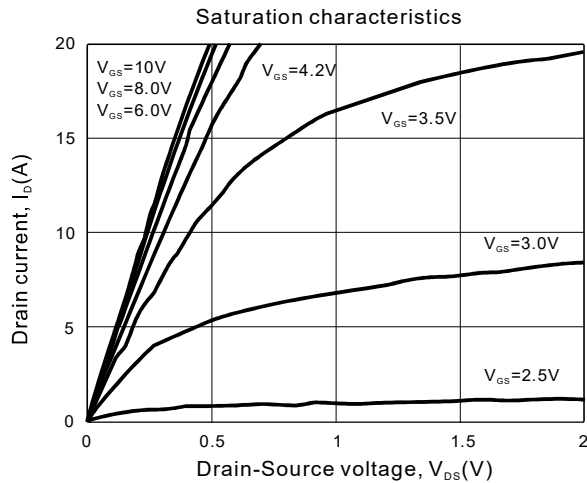
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	BV_{DSS}	$I_D=250\mu A$, $V_{GS}=0V$	60			V
Drain-source leakage current	I_{DSS}	$V_{DS}=48V$, $V_{GS}=0V$			1	μA
		$V_{DS}=48V$, $V_{GS}=0V$, $T_J=55^{\circ}C$			5	
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V$, $V_{DS}=0V$			± 100	nA
On characteristics						
Gate threshold voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	1.7	2.5	V
Static drain-source on-resistance	$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=5A$		22	28	m Ω
		$V_{GS}=4.5V$, $I_D=3A$		28	37	
Forward transconductance	g_{FS}	$V_{DS}=5V$, $I_D=5A$		17		S
Dynamic parameters (Note 5)						
Input capacitance	C_{iss}	$V_{GS}=0V$, $V_{DS}=30V$, $f=1.0MHz$		288		pF
Out capacitance	C_{oss}			92		
Reverse transfer capacitance	C_{rss}			22		
Gate resistance	R_g	$V_{GS}=0V$, $V_{DS}=0V$, $f=1.0MHz$		5		Ω
Switching parameters (Note 5)						
Total gate charge	Q_g	$V_{GS}=0$ to $10V$, $V_{DS}=30V$, $I_D=5A$		5.8		nC
Gate to source charge	Q_{gs}			1.4		
Gate to drain charge	Q_{gd}			1.2		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=30V$, $V_{GS}=10V$, $R_L=6\Omega$, $R_G=6\Omega$		6		ns
Rise time	t_r			62		
Turn-off delay time	$t_{d(off)}$			18.5		
Fall time	t_f			97		
Source-drain diode ratings and characteristics						
Maximum body-diode continuous current	I_s	$T_C=25^{\circ}C$			25	A
Drain-source diode forward voltage	V_{SD}	$I_s=1A$, $V_{GS}=0V$		0.75	1	V
Body diode reverse recovery time	t_{rr}	$I_F=5A$, $dI_F/dt=100A/\mu s$		13		ns
Body diode reverse recovery charge	Q_{rr}			6		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 $T_{J_Max} = 150^\circ\text{C}$
3. E_{AS} of 13.5 mJ is based on starting $T_J = 25^\circ\text{C}$, $L=3.0\text{mH}$, $I_{AS}=3.0\text{A}$, $V_{GS}=10\text{V}$, $V_{DD}=30\text{V}$; 100% test at $L=0.1\text{mH}$, $I_{AS}=12\text{A}$, $T_{J_Max} = 150^\circ\text{C}$.
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.

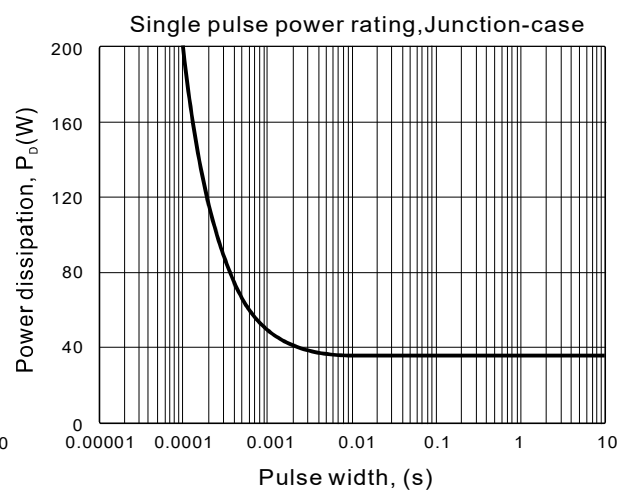
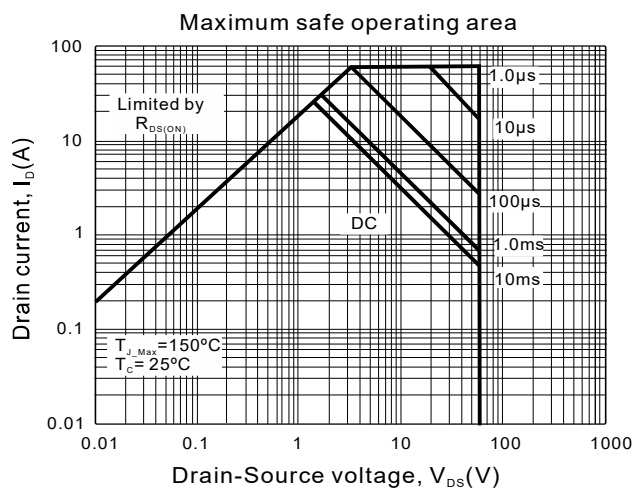
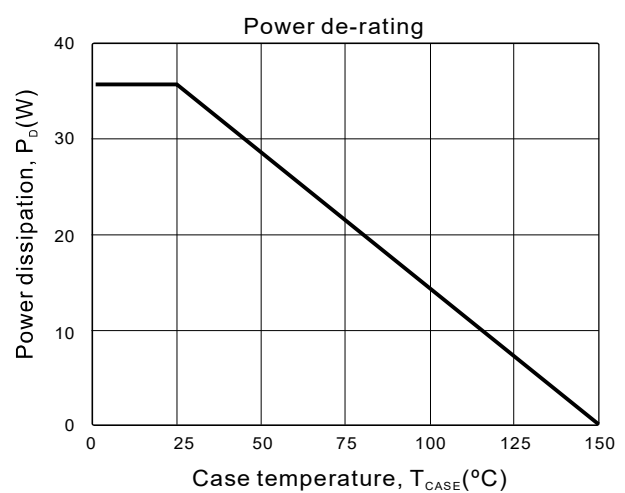
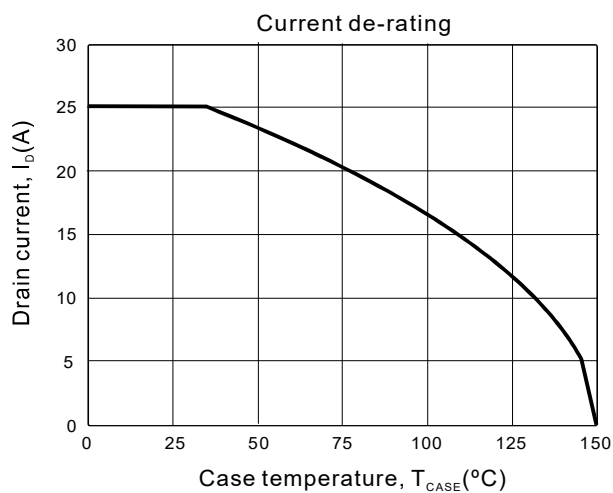
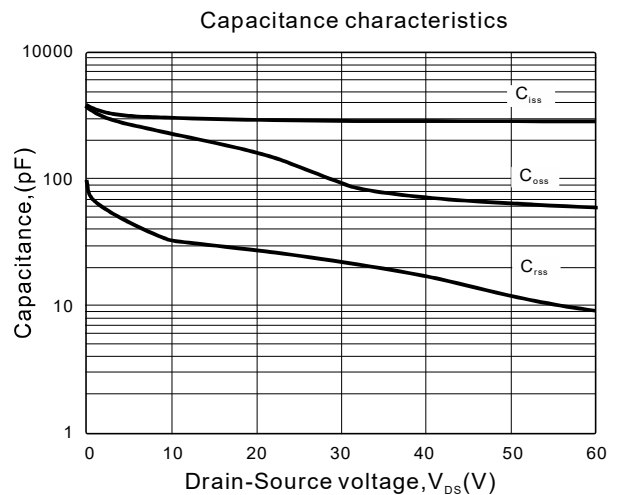
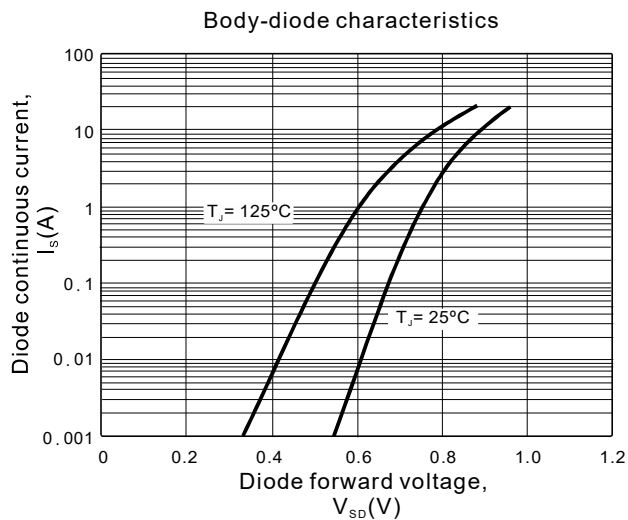
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Rating and characteristic curves



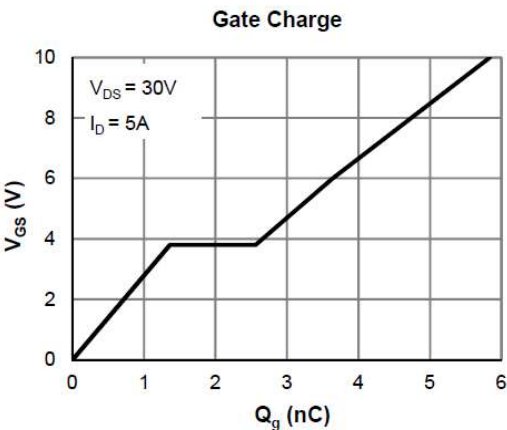
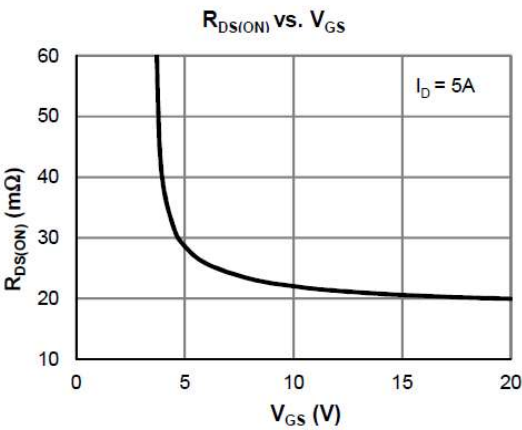
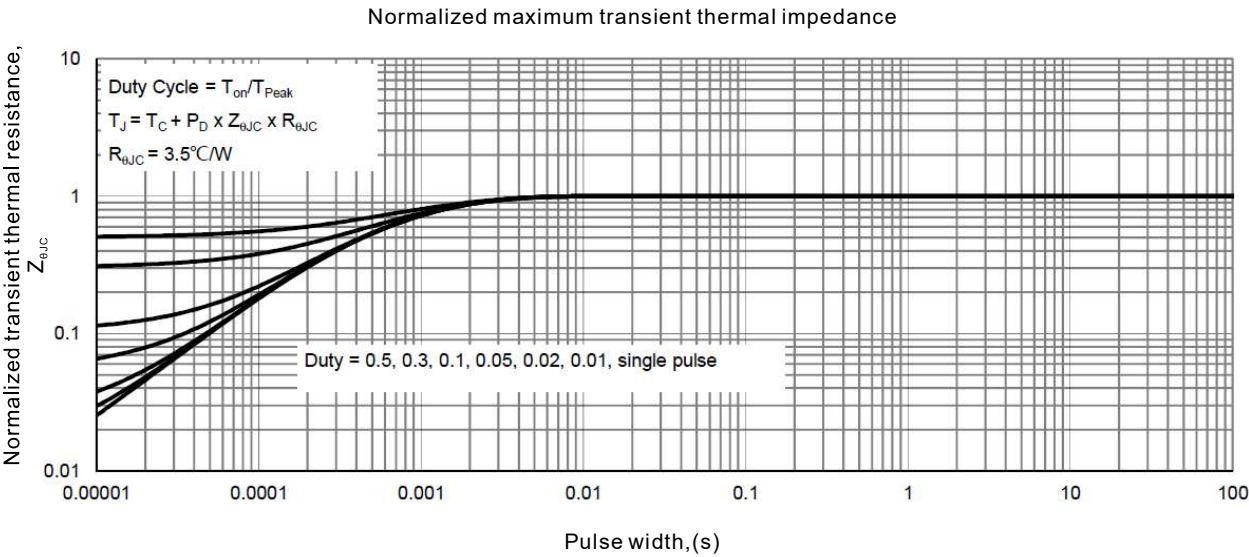
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Rating and characteristic curves



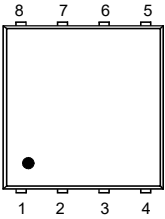
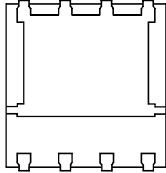
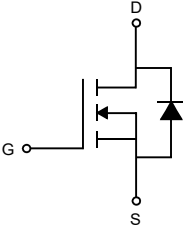
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Rating and characteristic curves



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Pinning information

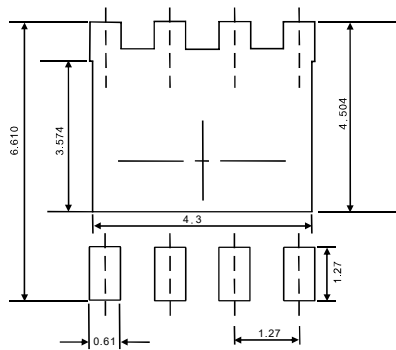
Pin	Simplified outline	Symbol
Pin 1, 2, 3 Source Pin 4 Gate Pin 5, 6, 7, 8 Drain	 	

Marking

Type number	Marking code
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Suggested solder pad layout

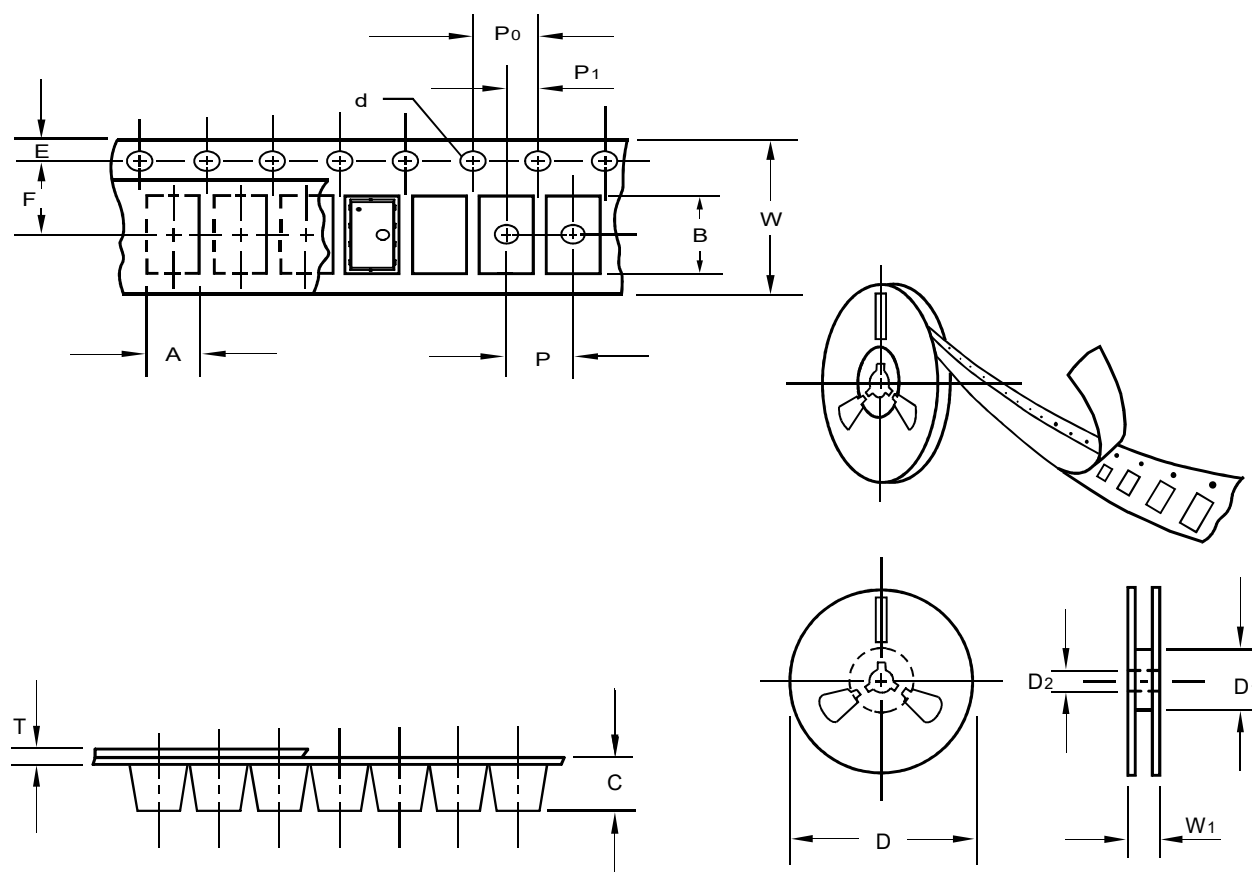
T5060P8



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 (DFN5060-8)
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.

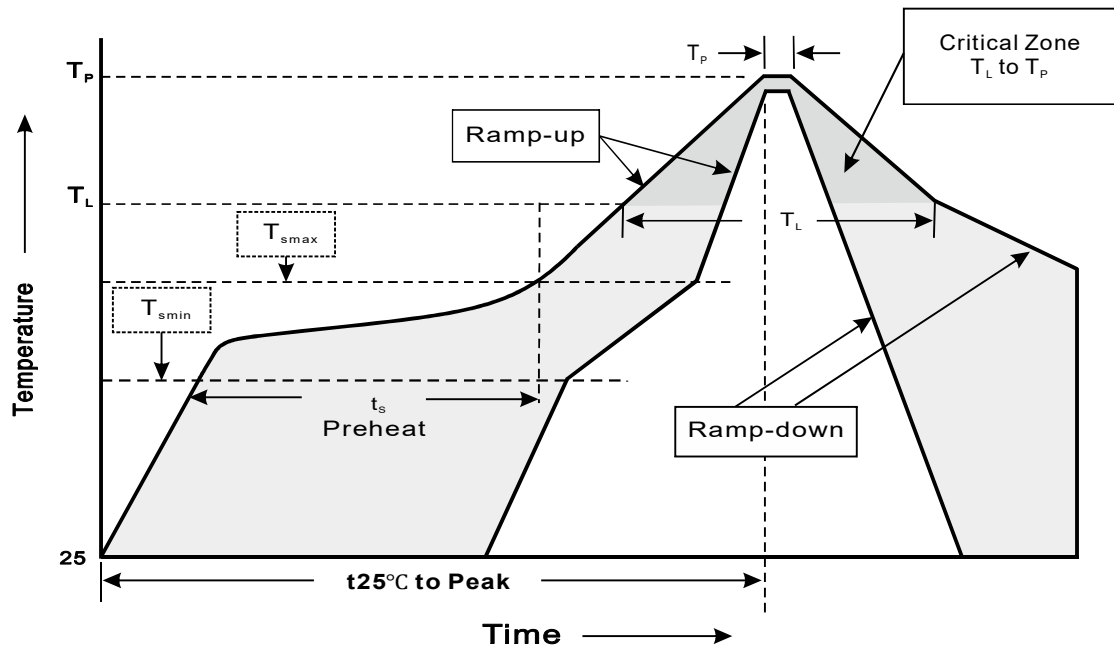
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Reel packing

Device	Outline	Device Package	Reel Size	Reel (pcs)
FMOSAC25N06	Taping	T5060P8	13 inch	5000

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