

FMOSTHAC30P06-H

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FMOSTHAC30P06-H

-30A -60V P-Channel Trench Enhancement Mode Power MOSFET

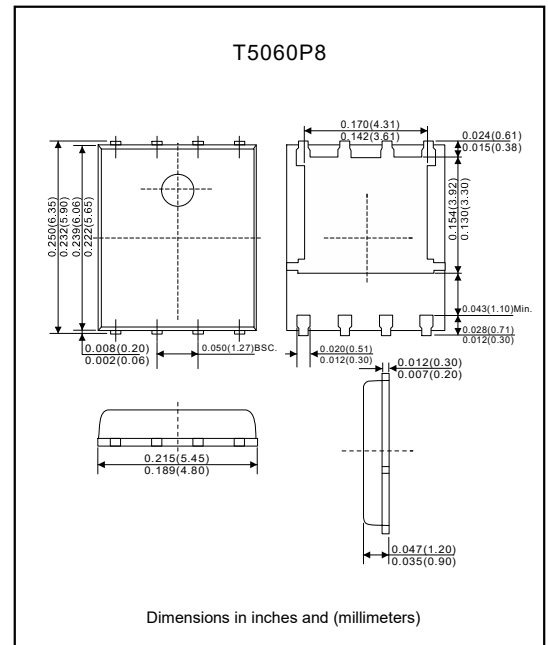
Features

- $-V_{DS}=60V$, $-I_D=30A$.
- $R_{DS(ON)} \leq 39m\Omega$, @ $-V_{GS}=10V$, $-I_D=10A$.
- $R_{DS(ON)} \leq 58m\Omega$, @ $-V_{GS}=4.5V$, $-I_D=5A$.
- Super high dense cell trench design for low on-resistance.
- Rugged and reliable.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

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	$-V_{DS}$	60	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current ($T_c=25^\circ C$) ($T_c=70^\circ C$)	$-I_D$	30	A
		21	
Pulsed drain current (Note1)	$-I_{DM}$	100	A
Avalanche current	$-I_{AS}$	18	A
Single pulse avalanche energy ($L=0.1mH$)	E_{AS}	27	mJ
Power dissipation (Note1) ($T_c=25^\circ C$) ($T_c=100^\circ C$)	P_D	52	W
		21	
Thermal resistance Junction to ambient (Note1)	$R_{\theta JA}$	48.5	$^\circ C/W$
Thermal resistance Junction to case (Note1)	$R_{\theta JC}$	2.6	$^\circ C/W$
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 $T_A=25^\circ\text{C}$ 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	$-I_{DSS}$	$-V_{DS}=48V$, $V_{GS}=0V$, $T_J=25^{\circ}C$			1	μA
		$-V_{DS}=48V$, $V_{GS}=0V$, $T_J=125^{\circ}C$			30	
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V$, $V_{DS}=0V$			± 100	nA
On characteristics						
Gate threshold voltage (Note 2)	$-V_{GS(TH)}$	$V_{GS}=V_{DS}$, $-I_D=250\mu A$	1	1.6	3	V
Static drain-source on-resistance (Note 2)	$R_{DS(ON)}$	$-V_{GS}=10V$, $-I_D=10A$		30	39	m Ω
		$-V_{GS}=4.5V$, $-I_D=5A$		42	58	
Forward transconductance	g_{FS}	$-V_{DS}=10V$, $-I_D=12A$		23		S
Dynamic parameters						
Input capacitance	C_{iss}	$V_{GS}=0V$, $-V_{DS}=48V$, $f=1.0MHz$		1328		pF
Out capacitance	C_{oss}			117		
Reverse transfer capacitance	C_{rss}			85		
Gate resistance	R_g	$V_{DS}=0V$, $V_{GS}=0V$, $f=1.0MHz$		3.8		Ω
Switching parameters (Note3)						
Total gate charge	Q_g	$-V_{GS}=4.5V$, $-V_{DS}=48V$, $-I_D=10A$		12.8		nC
Total gate charge				26.1		
Gate to source charge	Q_{gs}	$-V_{GS}=10V$, $-V_{DS}=48V$, $-I_D=10A$		5.3		
Gate to drain charge	Q_{gd}			5.7		
Turn-on delay time	$t_{d(on)}$	$-V_{DD}=48V$, $-V_{GS}=10V$, $R_G=6\Omega$, $-I_D=10A$		13		ns
Rise time	t_r			18		
Turn-off delay time	$t_{d(off)}$			41		
Fall time	t_f			9		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 2)	$-V_{SD}$	$I_S=I_F$, $V_{GS}=0V$		0.75	1.25	V
Continuous source current	$-I_S$				30	A

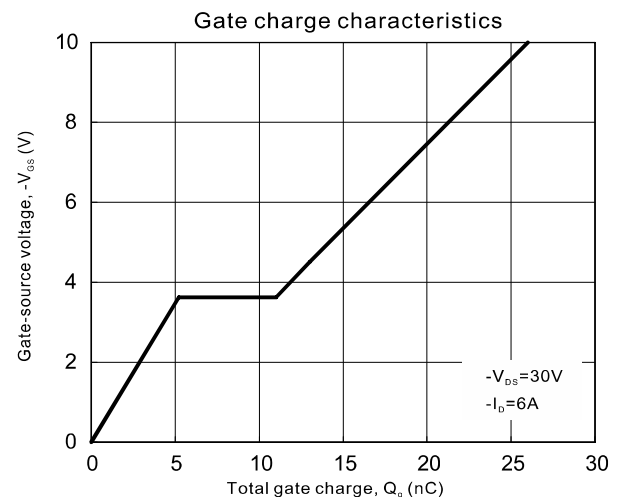
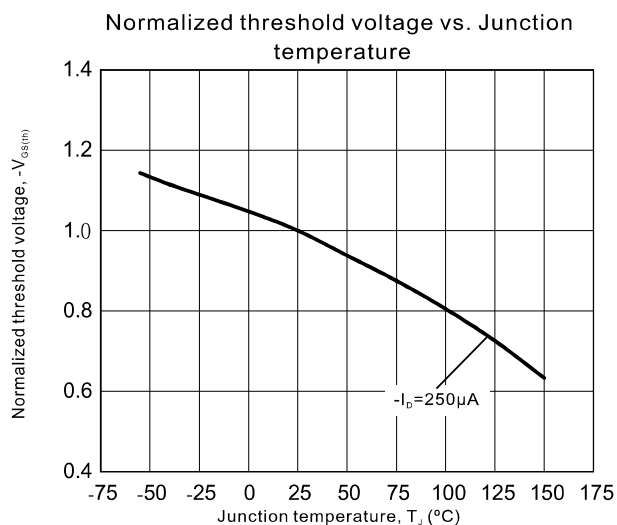
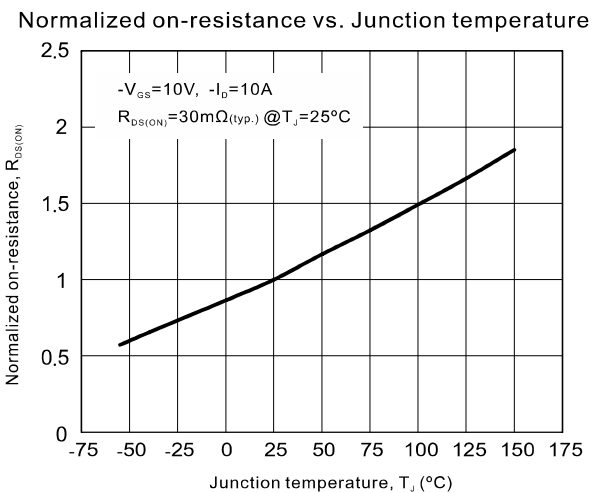
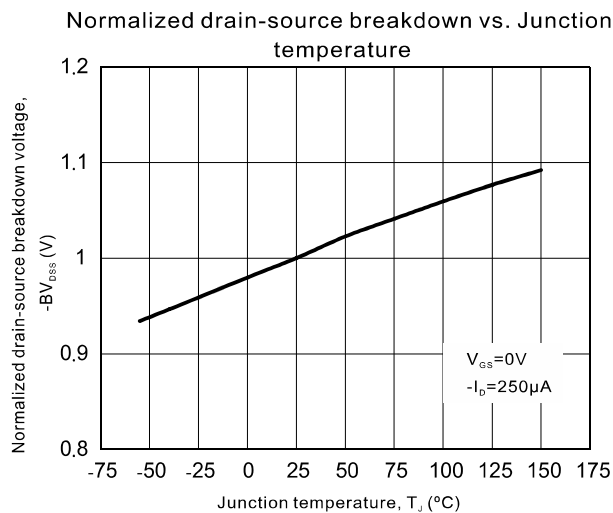
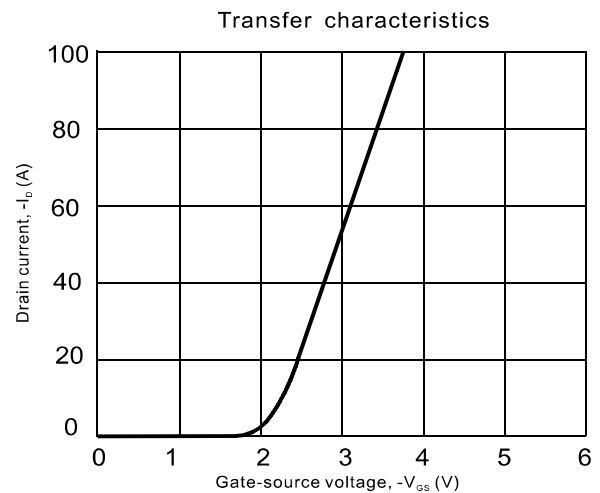
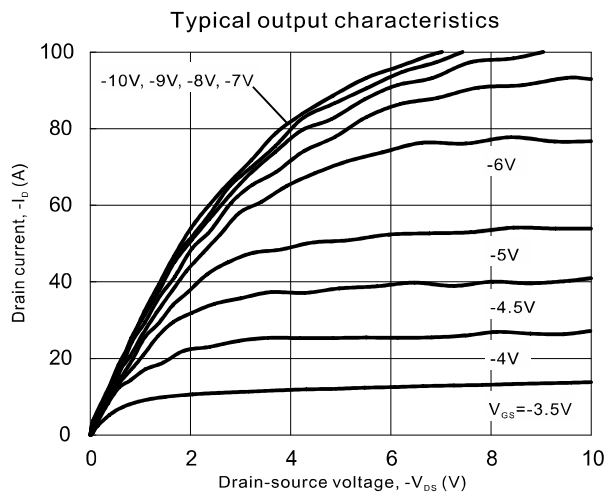
Note: 1. Pulse width limited by maximum junction temperature.

2. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

3. Independent of operating production testing.

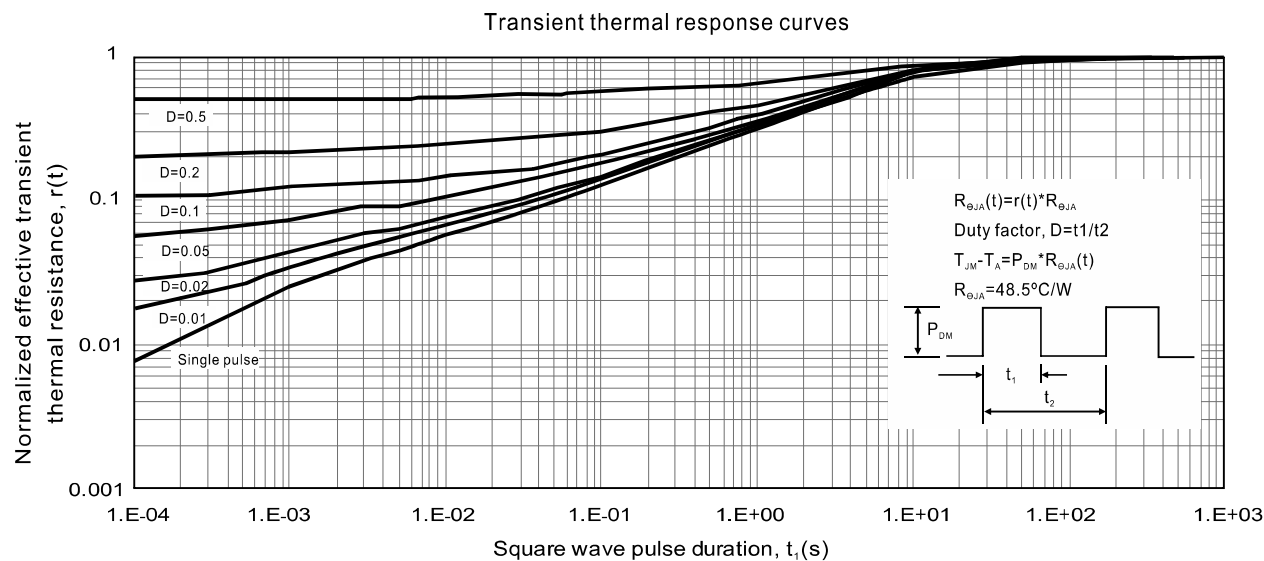
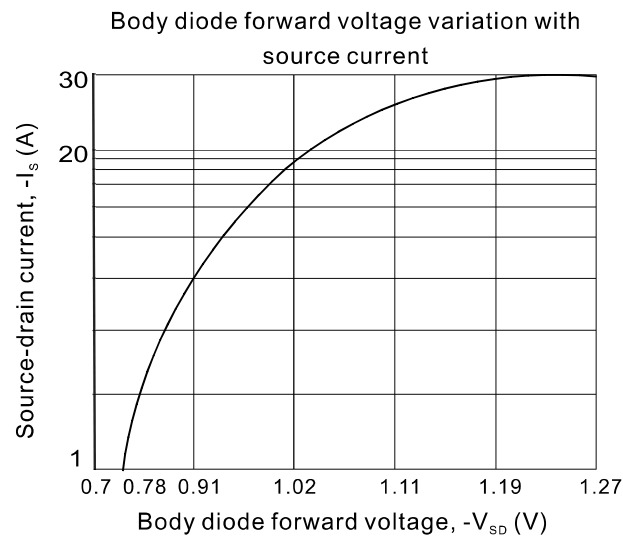
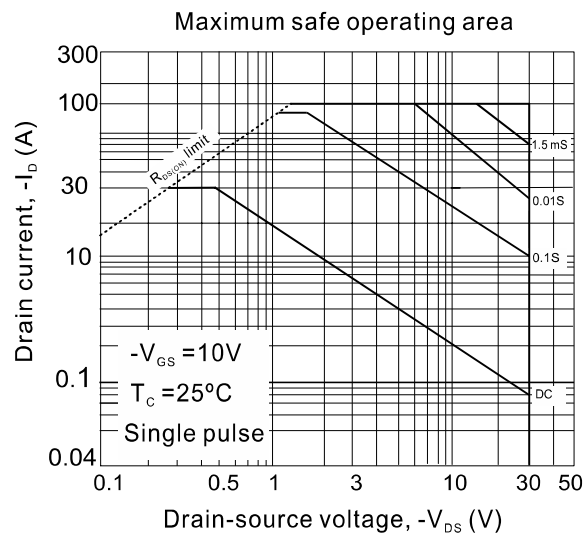
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Rating and characteristic curves



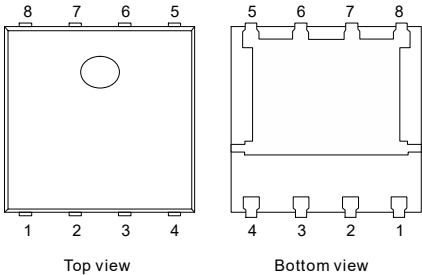
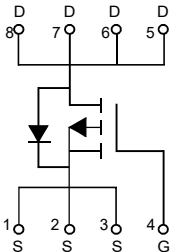
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Rating and characteristic curves



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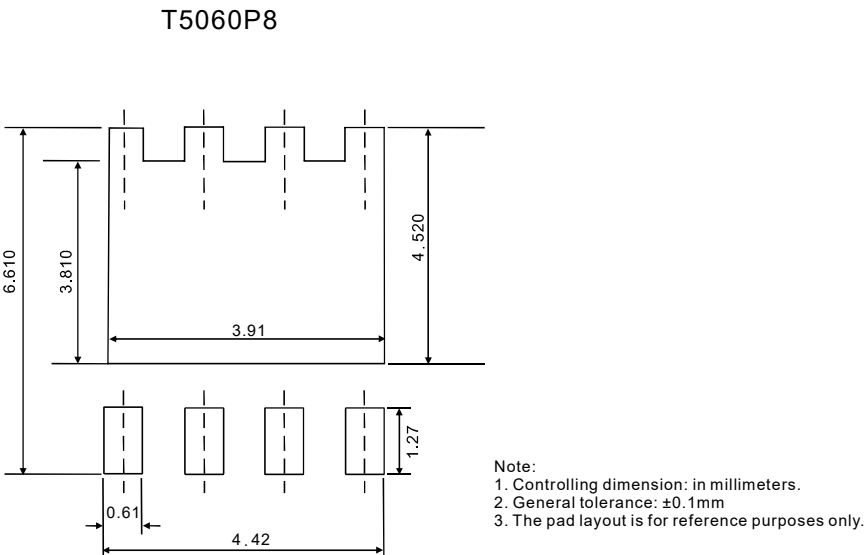
Pinning information

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

Marking

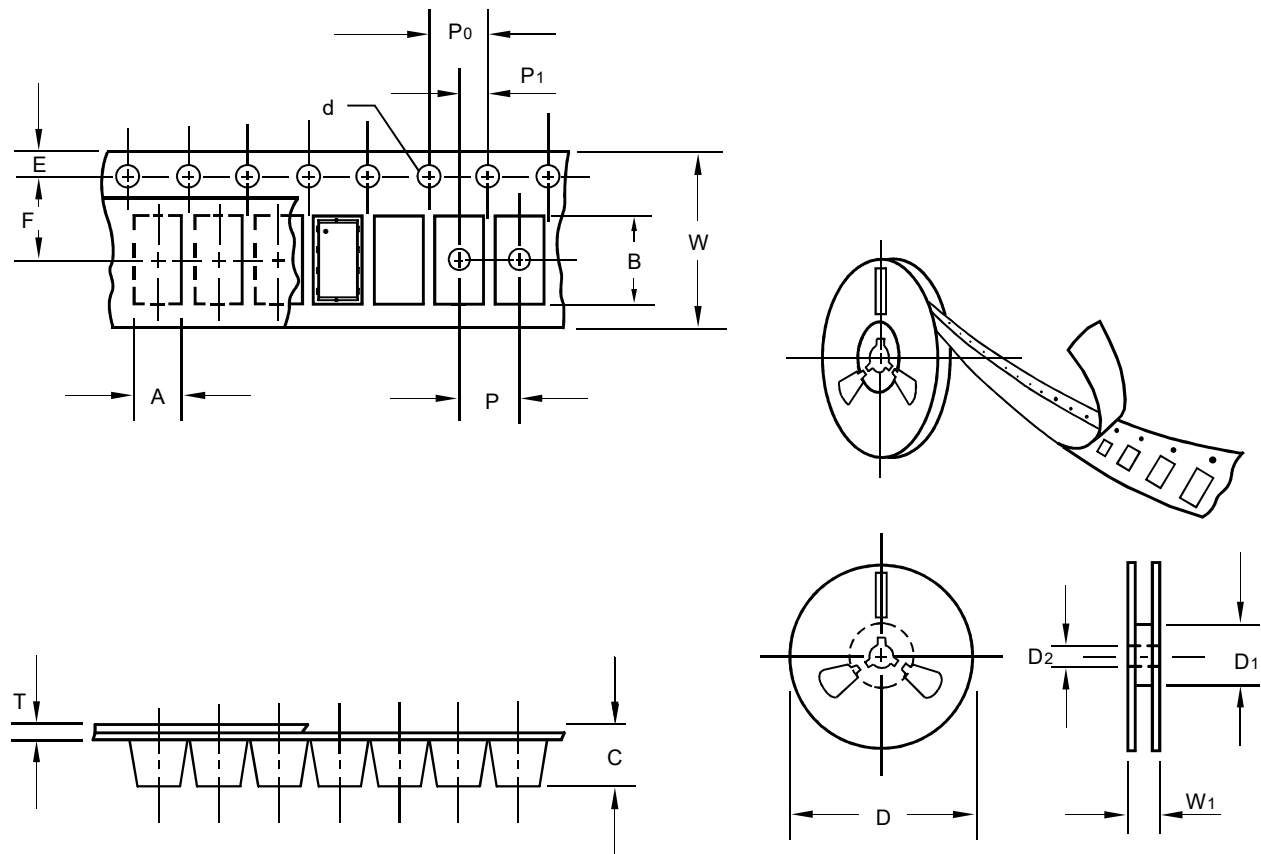
Type number	Marking code
FMOSTHAC30P06-H	AC30P06

Suggested solder pad layout



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Packing information



unit:mm

Item	Symbol	Tolerance	T5060P8
Carrier width	A	1.0	6.50
Carrier length	B	1.0	5.28
Carrier depth	C	1.0	1.40
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
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	3.0	17.60

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

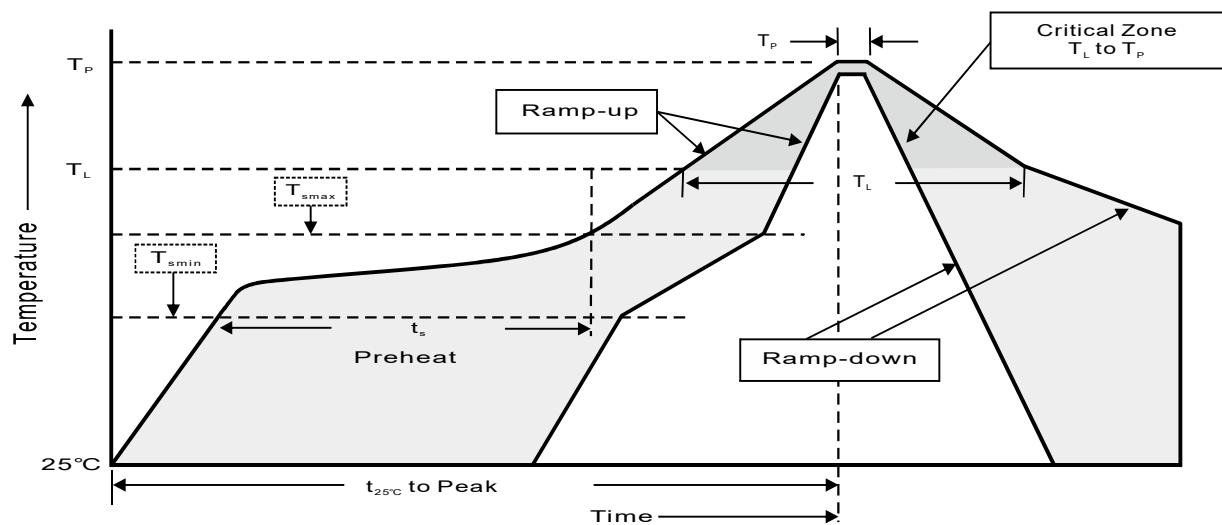
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Reel packing

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)
T5060P8	13"	5,000	4.0	10,000	335*335*38	330	350*350*360	80,000

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 ~ 120 sec
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 with 5°C of actual peak temperature (T_p)	10 ~30 sec
Ramp-down rate	< 6 °C/sec
Time 25°C to peak temperature	< 6 minutes