

FMOSTHAB45P03-H

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FMOSTHAB45P03-H

-45A -30V P-Channel Trench
Enhancement Mode Power MOSFET

Features

- $-V_{DS} = 30V$, $-I_D = 45A$.
- $R_{DS(ON)} \leq 7.4m\Omega$, @ $-V_{GS} = 10V$, $-I_D = 15A$.
- $R_{DS(ON)} \leq 12.6m\Omega$, @ $-V_{GS} = 4.5V$, $-I_D = 10V$.
- Advanced trench technology.
- Excellent on-resistance and low gate charge.
- 100% UIS and ΔV_{DS} tested.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

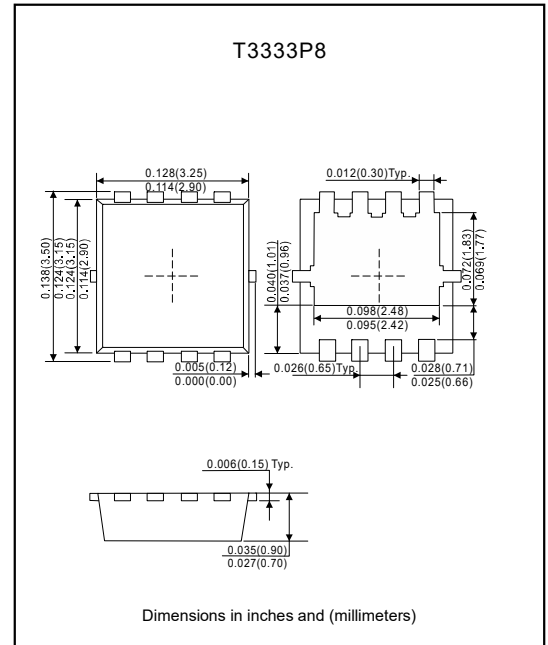
Applications

- PWM application.
- Load switch.
- Power management.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, T3333P8 (DFN3333-8).
- Weight : Approximated 20mg.

Package outline

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

Parameter	Symbol	Ratings	Units
Drain-source voltage	$-V_{DS}$	30	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current	$-I_D$	45	A
		27	
Pulsed drain current (Note1)	$-I_{DM}$	180	A
Single pulsed avalanche energy (Note2)	E_{AS}	110	mJ
Power dissipation	P_D	26	W
Thermal resistance, junction to case	$R_{\theta JC}$	4.8	$^\circ C/W$
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	$-BV_{DSS}$	$-I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Drain-Source leakage current	$-I_{DSS}$	$-V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-Source leakage current	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			± 100	nA

On characteristics

Gate threshold voltage	$-V_{GS(th)}$	$V_{DS}=V_{GS}$, $-I_D=250\mu\text{A}$	1.0	1.6	2.2	V
Static drain-source on-resistance (Note3)	$R_{DS(on)}$	$-V_{GS}=10\text{V}$, $-I_D=15\text{A}$		5.7	7.4	m Ω
		$-V_{GS}=4.5\text{V}$, $-I_D=10\text{A}$		9.7	12.6	

Dynamic characteristics

Input capacitance	C_{iss}	$-V_{DS}=15\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		2127		pF
Output capacitance	C_{oss}			396		
Reverse transfer capacitance	C_{rss}			329		

Switching characteristics

Total gate charge	Q_g	$-V_{GS}=0$ to 10V , $-V_{DS}=15\text{V}$, $-I_D=5\text{A}$		58		nC
Gate-Source charge	Q_{gs}			10		
Gate-Drain Charge	Q_{gd}			11		
Turn-on delay time	$t_{d(on)}$	$-V_{DS}=15\text{V}$, $-V_{GS}=10\text{V}$, $R_{GEN}=5\Omega$, $-I_D=10\text{A}$		10		ns
Turn-on rise time	t_r			60		
Turn-off delay time	$t_{d(off)}$			65		
Turn-off fall time	t_f			50		

Drain-Source diode characteristics and maximum ratings

Drain-Source diode forward voltage	$-V_{SD}$	$-I_S=10\text{A}$, $V_{GS}=0\text{V}$			1.2	V
Maximum continuous drain to source diode forward current	$-I_S$				45	A
Maximum pulsed drain to source diode forward current	$-I_{SM}$				180	A
Body diode reverse recovery time	t_{rr}	$-I_F=10\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		17		ns
Body diode reverse recovery charge	Q_{rr}			8		nC

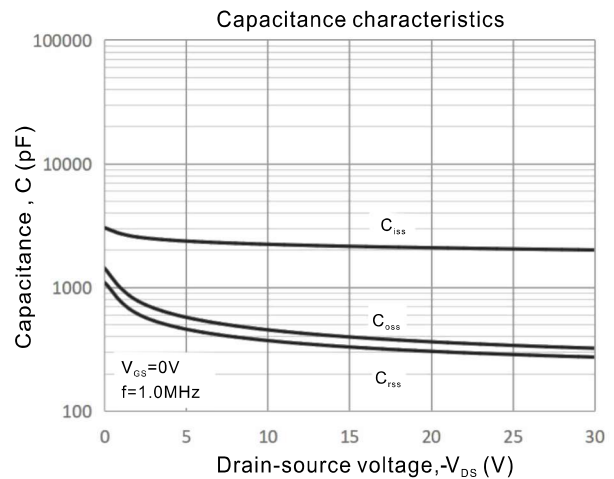
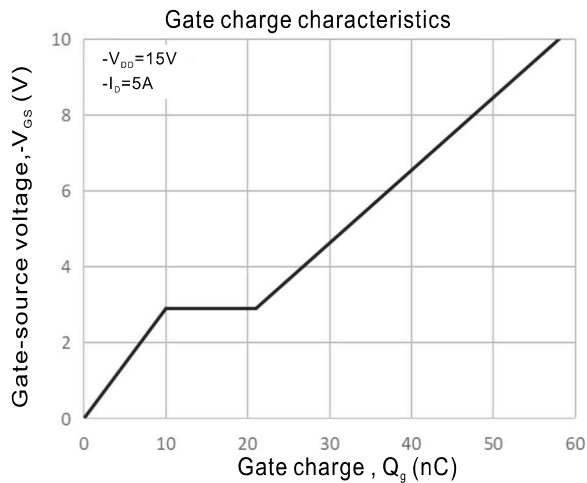
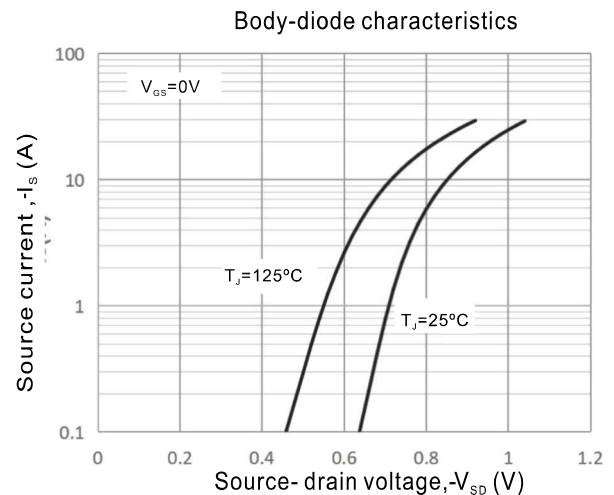
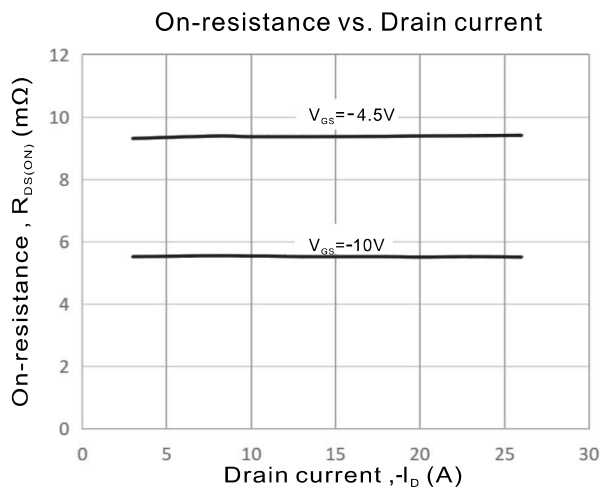
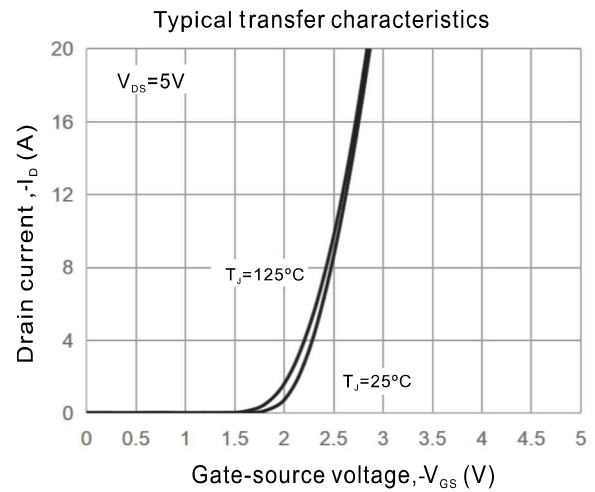
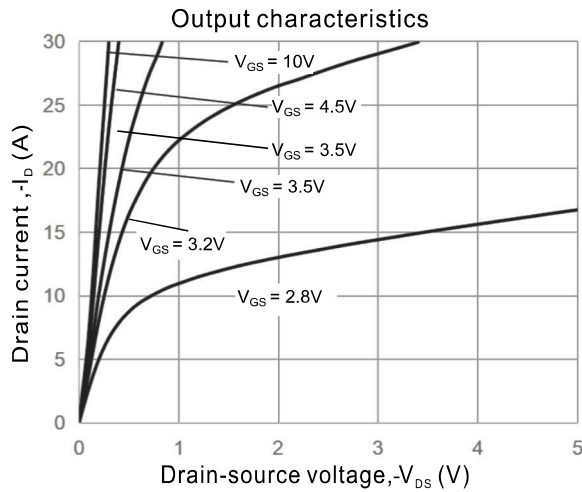
Note : 1. Repetitive rating: pulse width limited by maximum junction temperature.

2. E_{AS} condition: starting $T_J=25^{\circ}\text{C}$, $-V_{DS}=15\text{V}$, $-V_G=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$, $-I_{AS}=21\text{A}$.

3. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 0.5\%$.

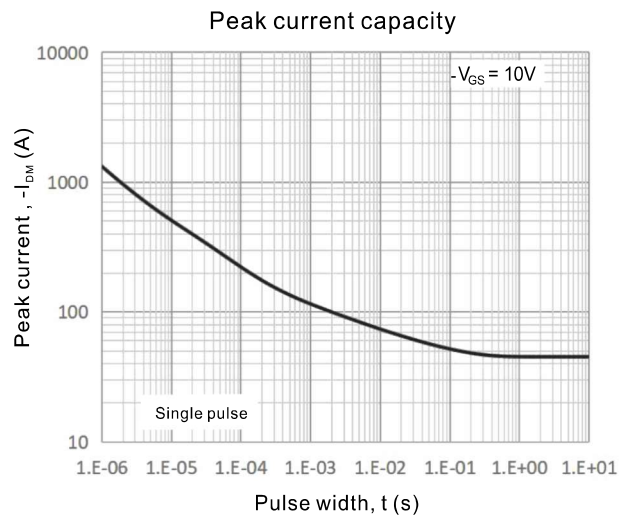
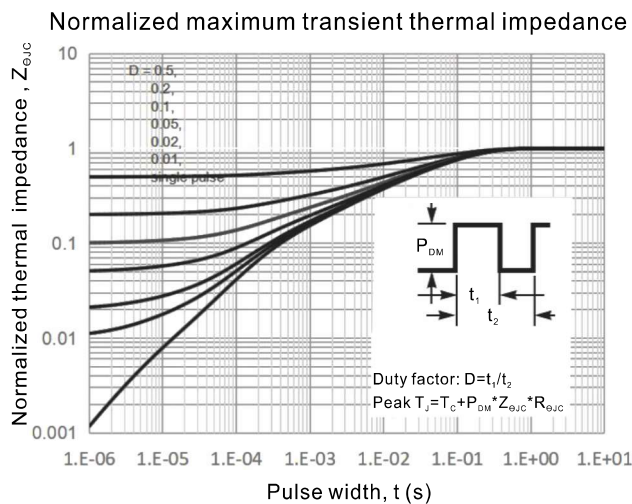
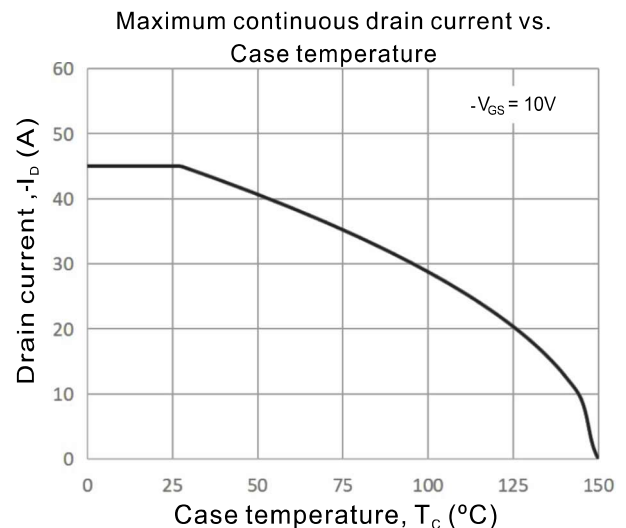
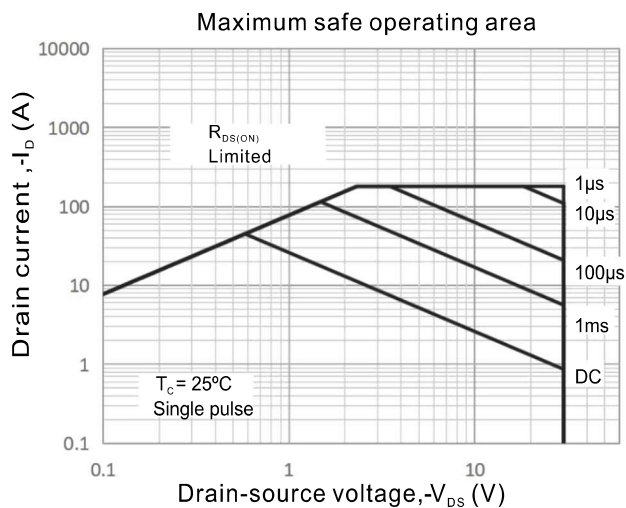
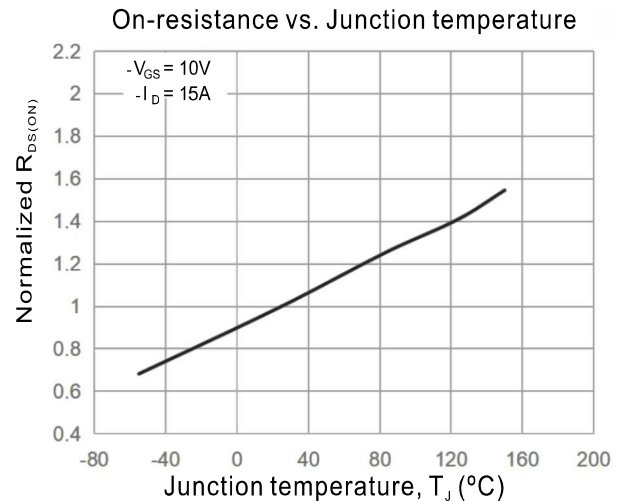
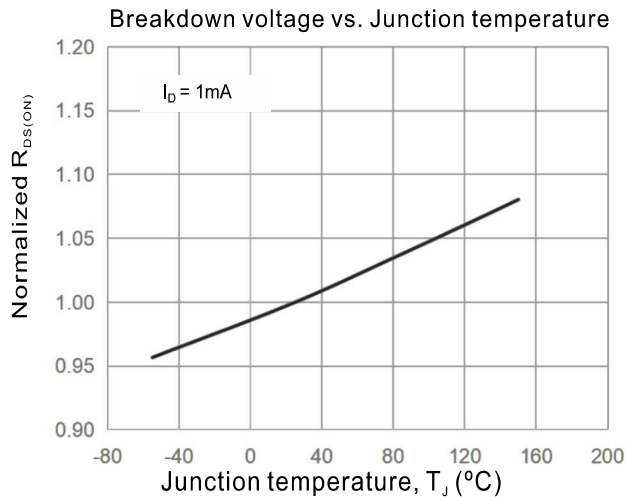
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Rating and characteristic curves



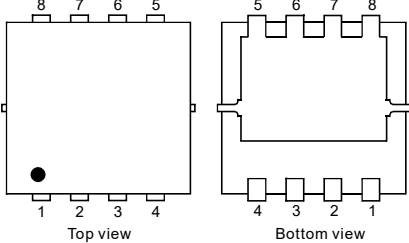
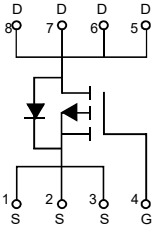
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Rating and characteristic curves



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Pinning information

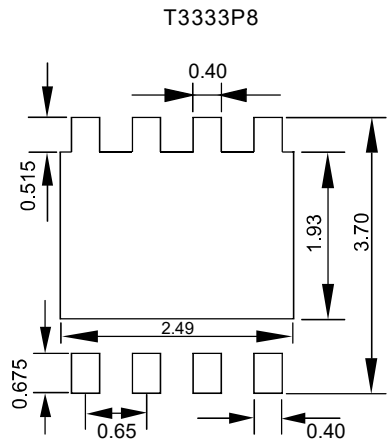
Pin	Simplified outline	Symbol
Pin 1, 2, 3 Source Pin 4 Gate Pin 5, 6, 7, 8 Drain	 Top view Bottom view	

Marking

Type number	Marking code
FMOSTHAB45P03-H	CRM QBL0309A YWW XXXKK

*YWW:Wafer lot code
XX:Assy. code
KKK: Lot run traceability code

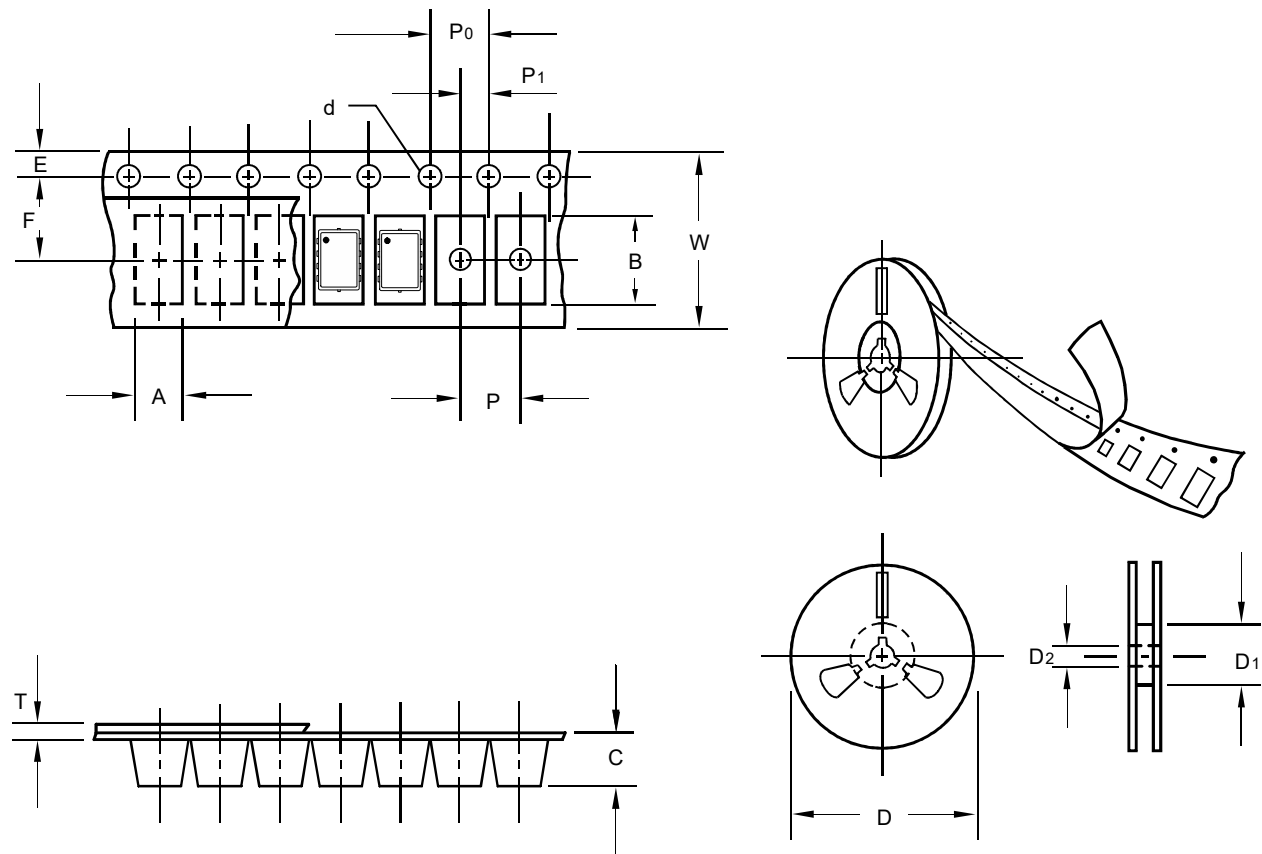
Suggested solder pad layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

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Packing information



unit:mm

Item	Symbol	Tolerance	T3333P8
Carrier width	A	0.5	3.55
Carrier length	B	0.5	3.55
Carrier depth	C	0.5	1.10
Sprocket hole	d	0.3	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	99.00
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	0.5	0.23
Tape width	W	0.3	12.00

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

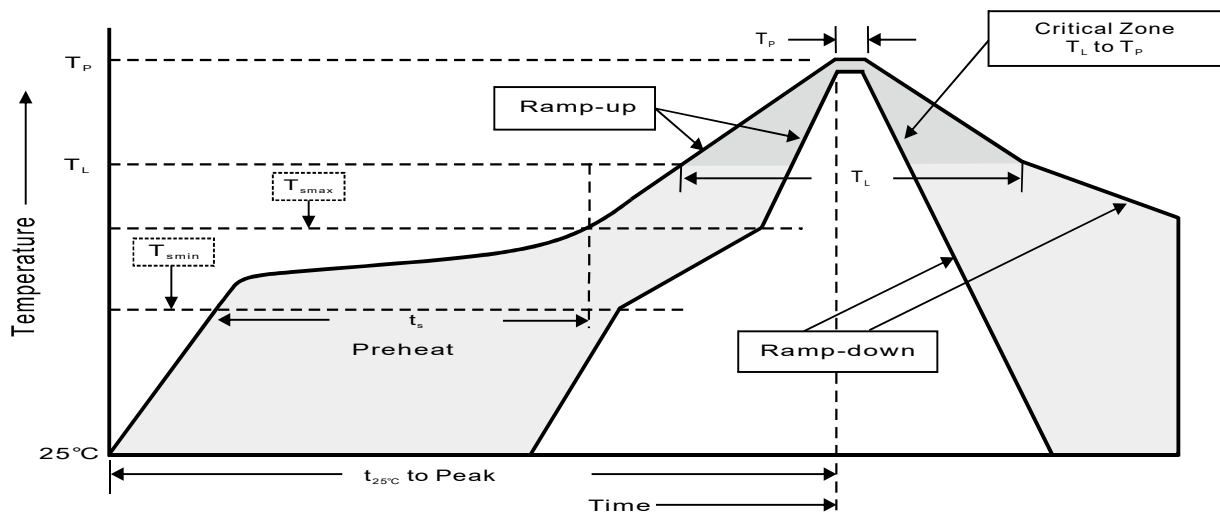
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	REEL DIA, (m/m)
T3333P8	13"	5,000	8.0	330

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_{min}) - Temperature Max (T_{max}) - 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