

FMOSAB10DN10

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FMOSAB10DN10

10A 100V N-Channel Power MOSFET

Features

- $V_{DS}=100V$, $I_D=10A$.
- $R_{DS(ON)} \leq 125m\Omega$ @ $V_{GS}=10V$, $I_D=2A$.
- $R_{DS(ON)} \leq 160m\Omega$ @ $V_{GS}=4.5V$, $I_D=1A$.
- Low $R_{DS(ON)}$.
- Low gate charge.
- 100% UIS and R_g tested.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOSAB10DN10-H.

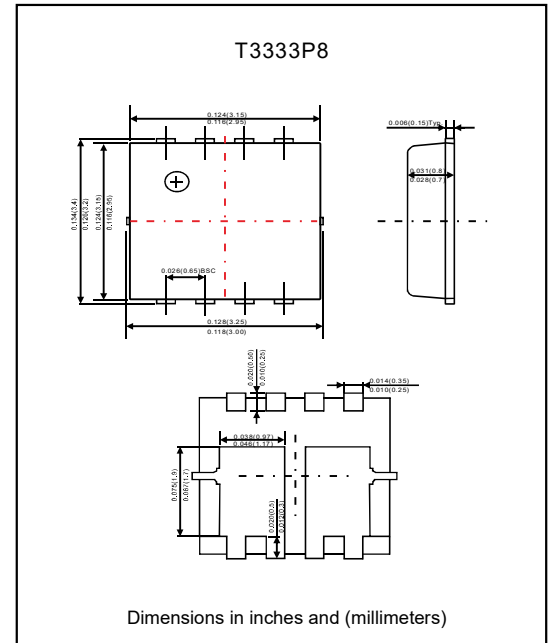
Application

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

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, T3333P8.
- Mounting Position : Any.

Package outline

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

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current (Note 1) ($T_C=25^\circ C$) ($T_C=100^\circ C$)	I_D	10.1	A
		6.4	
Pulsed drain current (Note 2)	I_{DM}	31	A
Avalanche current (Note 3)	I_{AS}	4.2	A
Avalanche energy (Note 3)	E_{AS}	0.9	mJ
Power dissipation (Note 4) ($T_C=25^\circ C$) ($T_C=100^\circ C$)	P_D	22	W
		8.9	
Thermal resistance, junction to ambient	$R_{\theta JA}$	60	$^\circ C/W$
Thermal resistance Junction to case	$R_{\theta JC}$	5.6	$^\circ C/W$
Operating Junction temperature	T_J	-55 to +150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

Note : 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 $T_{J_Max}=150^\circ C$.

3.This single-pulse measurement was taken under the following condition [$L=100\mu H$, $V_{GS}=10V$, $V_{DO}=50V$] while its value is limited by $T_{J_Max}=150^\circ C$.

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

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static parameters						
Drain-source breakdown voltage	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	BV_{DSS}	100			V
Drain-source leakage current	$V_{DS}=80\text{V}$, $V_{GS}=0\text{V}$	I_{DSS}			1.0	μA
Gate-source leakage current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$	I_{GSS}			± 100	nA
Gate threshold voltage	$V_{GS}=V_{DS}$, $I_D=250\mu\text{A}$	$V_{GS(TH)}$	1.2	1.7	2.5	V
Static drain-source on-resistance	$V_{GS}=10\text{V}$, $I_D=2\text{A}$	$R_{DS(ON)}$		100	125	m Ω
	$V_{GS}=4.5\text{V}$, $I_D=1\text{A}$			123	160	
Forward transconductance	$V_{DS}=5\text{V}$, $I_D=2\text{A}$	g_{FS}		6.8		S

Dynamic parameters (Note 5)

Input capacitance	$V_{GS}=0\text{V}$, $V_{DS}=50\text{V}$, $f=1.0\text{MHz}$	C_{iss}		103		pF
Out capacitance		C_{oss}		47		
Reverse transfer capacitance		C_{rss}		4.9		
Gate resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1.0\text{MHz}$	R_g		2.6		Ω

Switching parameters (Note 5)

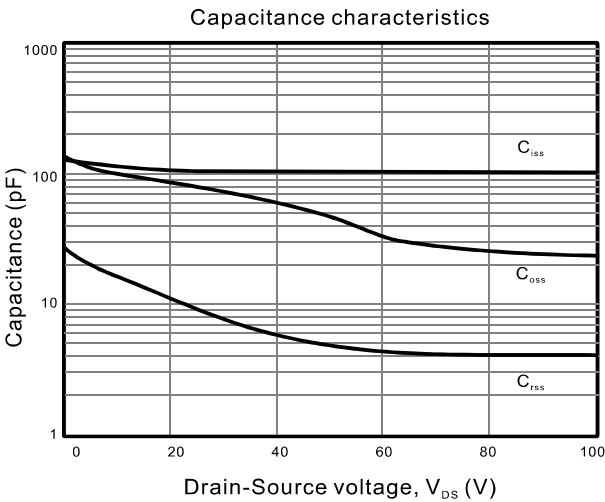
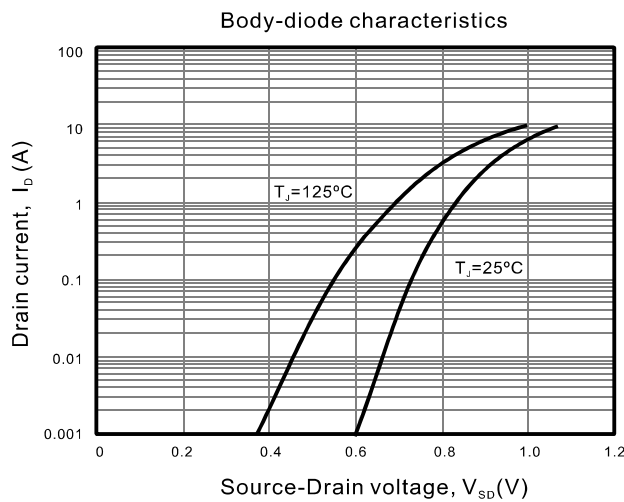
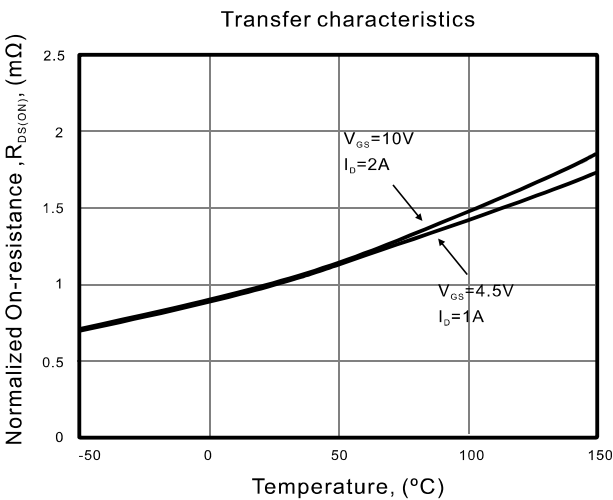
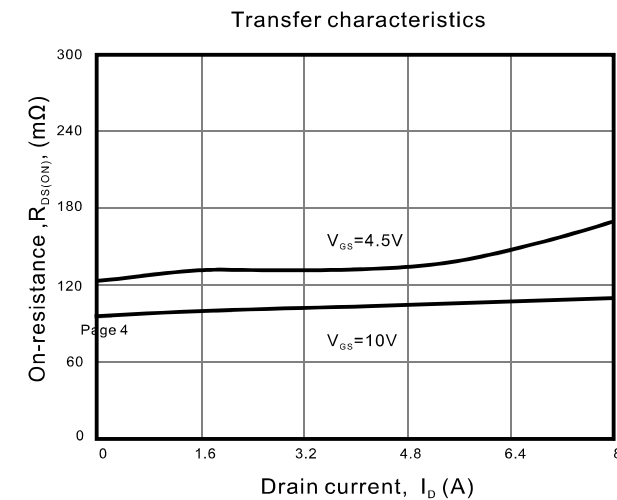
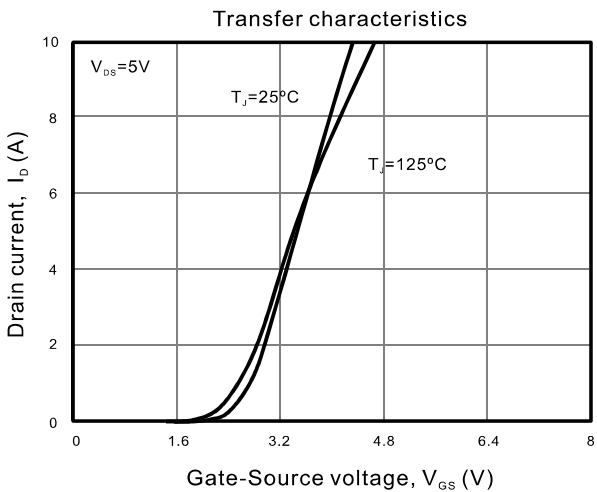
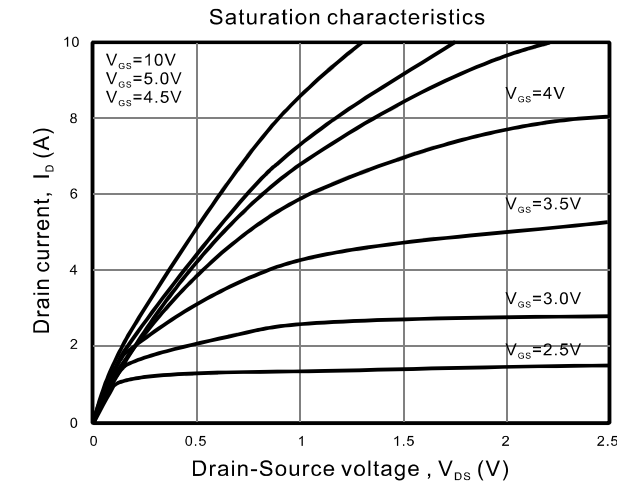
Total gate charge	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $I_D=2\text{A}$	Q_g		2.3		nC
Gate to source charge		Q_{gs}		0.3		
Gate to drain charge		Q_{gd}		0.7		
Turn-on delay time	$V_{DS}=50\text{V}$, $V_{GS}=10\text{V}$, $R_L=25\Omega$, $R_{GEN}=6\Omega$	$t_{d(on)}$		2.1		ns
Rise time		t_r		3.3		
Turn-off delay time		$t_{d(off)}$		7.5		
Fall time		t_f		3.2		
Body diode reverse recovery time	$I_F=2\text{A}$, $dI_F/dt=100\text{A}/\mu\text{s}$	t_{rr}		21		ns
Body diode reverse recovery charge	$I_F=2\text{A}$, $dI_F/dt=100\text{A}/\mu\text{s}$	Q_{rr}		8.0		nC

Source-drain diode ratings and characteristics

Maximum continuous drain to source diode forward current	$T_c=25^{\circ}\text{C}$	I_S			22	A
Drain-source diode forward voltage	$I_{SD}=1\text{A}$, $V_{GS}=0\text{V}$	V_{SD}		0.68	1.0	V

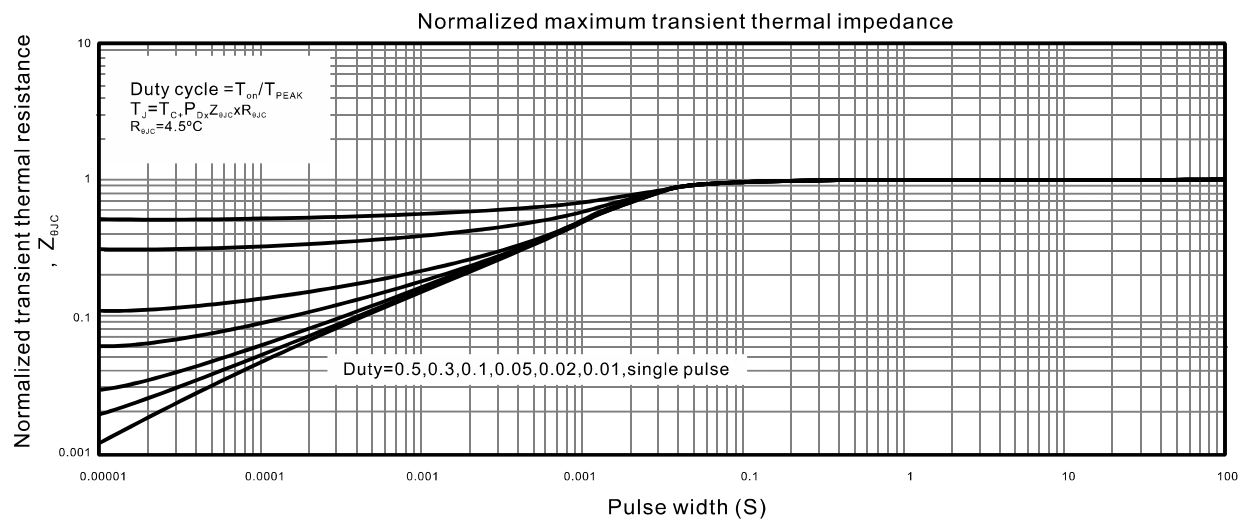
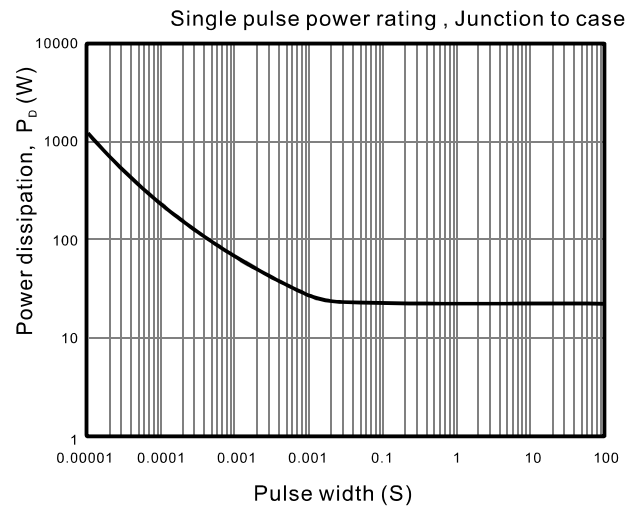
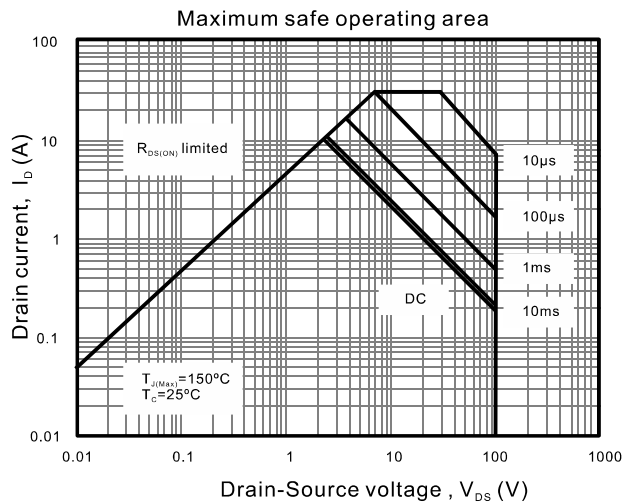
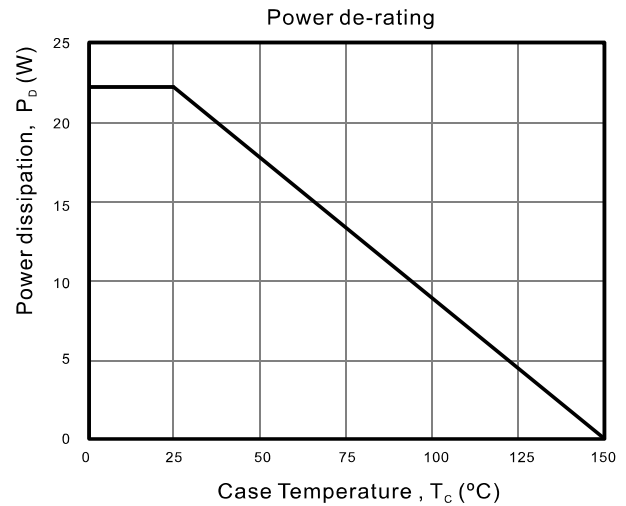
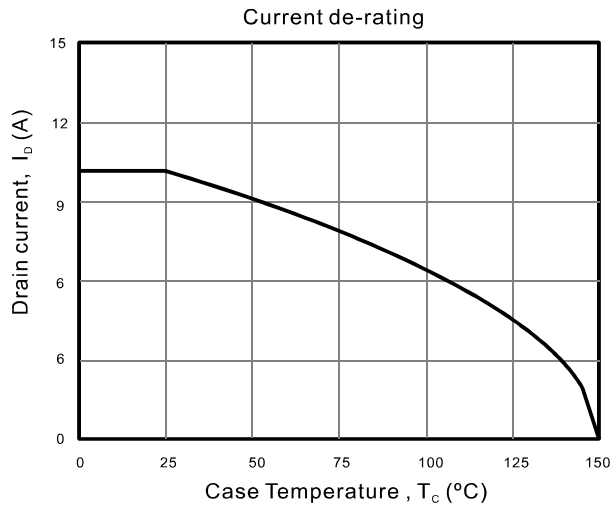
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Rating and characteristic curves



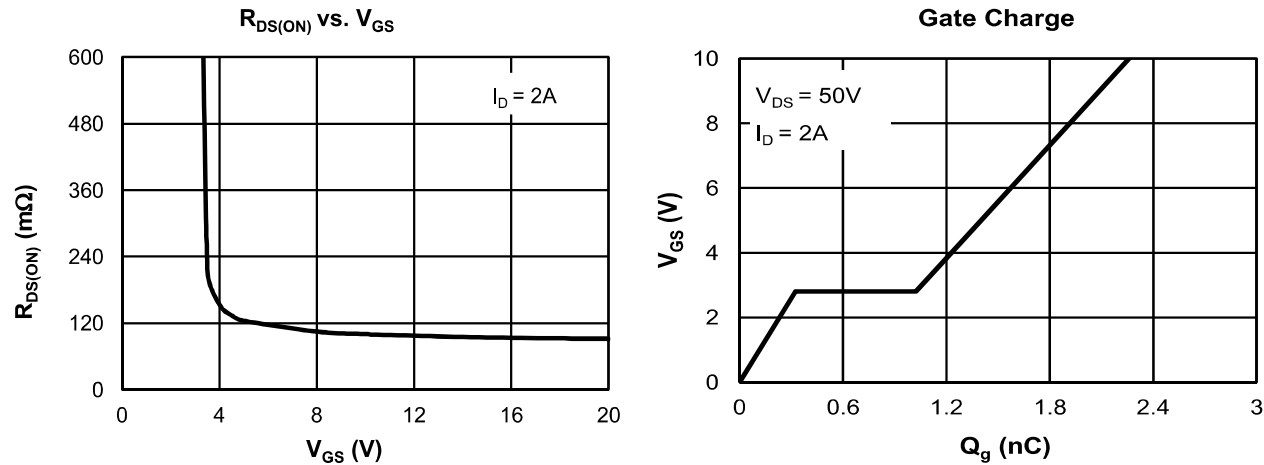
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Rating and characteristic curves



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Rating and characteristic curves



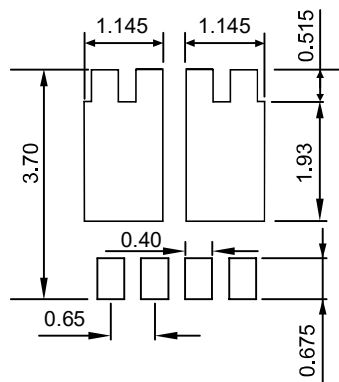
Pinning information

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

Marking

Type number	Marking Code
FMOSAB10DN10	L10130A

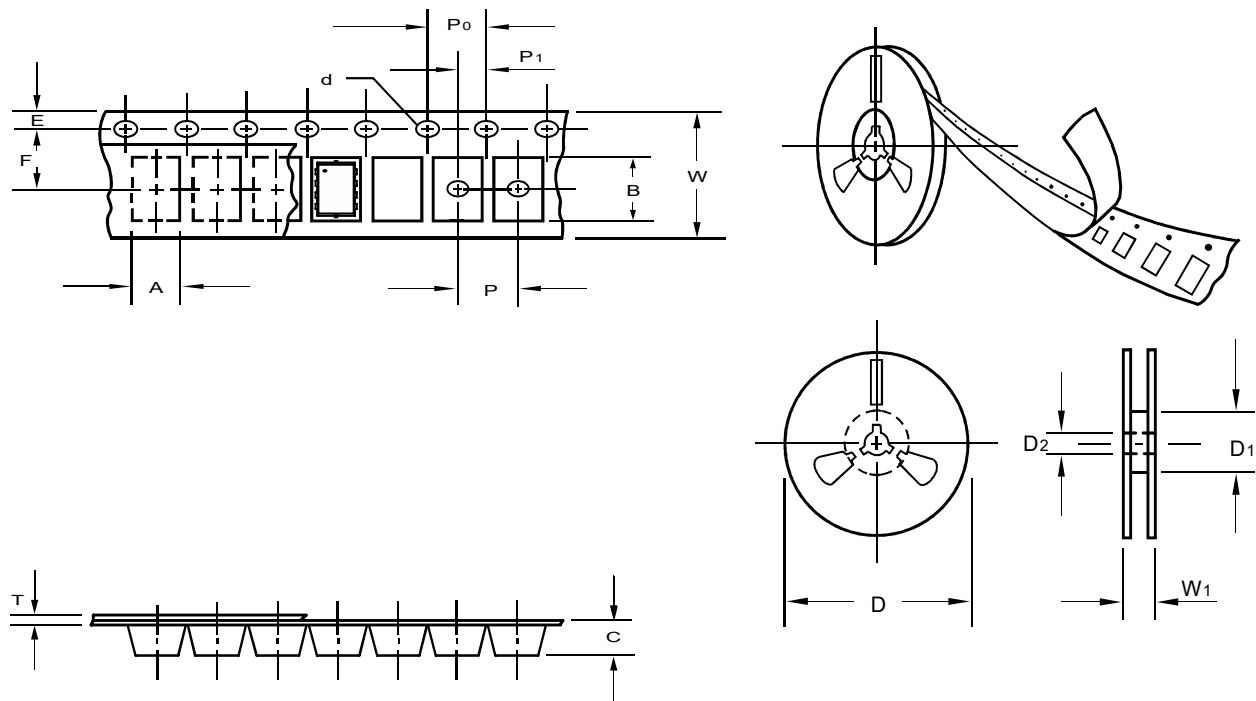
Suggested solder pad layout



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	0.1	3.55
Carrier length	B	0.1	3.55
Carrier depth	C	0.1	1.10
Sprocket hole	d	0.1	1.50
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	0.23
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.

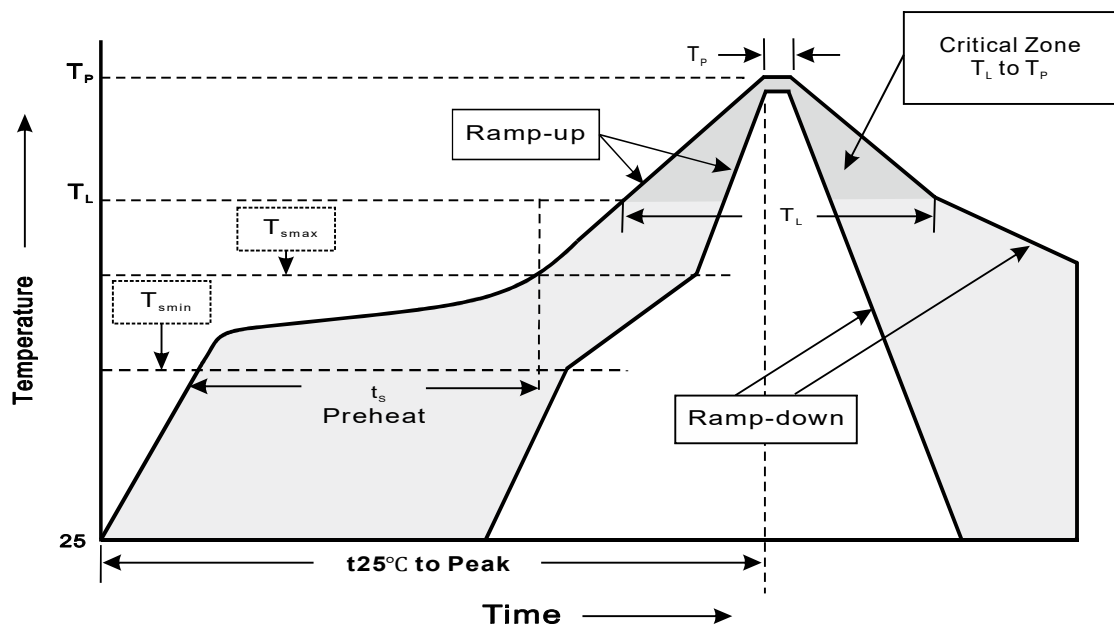
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Reel packing

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)
T3333P8	13"	5,000	8.0	10,000	355*335*38	330	350*330*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 ~ 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