FMOS10130A-Q1

List

FMOS10130A-Q1

3A 100V N-Channel Advanced Mode Power MOSFET

Features

- V_{DS} = 100V, I_D = 3A.
- $R_{DS(ON)}$ ≤ 130mΩ, @V_{GS}=10V, I_D=3A.
- $R_{DS(ON)}$ ≤ 190mΩ, @V_{GS}=4.5V, I_D=1A.
- Advanced split gate trench technology.
- Excellent $R_{DS(ON)}$ and low gate charge.
- Qualified to AEC-Q101 standards for high reliability.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOS10130A-Q1-H.

Applications

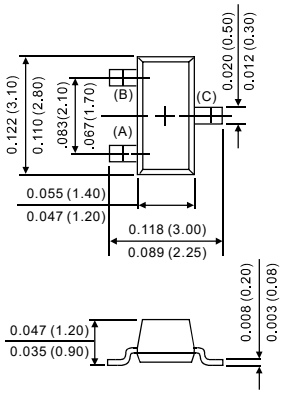
- DC/DC converter.
- LED backlighting.
- Motor control.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.

Package outline

SOT-23



Dimensions in inches and (millimeters)

Maximum ratings (T_C=25°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 (T_c=25°C)	I_D	3	A
Continuous drain current (T_c=100°C)		2.2	
Pulsed drain current (Note 1)	I_{DM}	12	A
Single pulsed avanlanche energy (Note 2)	E_{AS}	7.2	mJ
Power dissipation	P_D	3.1	W
Thermal resistance form junction to ambient (Note 3)	$R_{\theta JA}$	40.3	°C/W
Operating Junction temperature	T_j	+150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

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Electrical characteristics (At T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	100			V
Drain-source leakage current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
On characteristics						
Gate threshold voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.65	2.5	V
Static drain-source on-resistance (Note 4)	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A		95	130	mΩ
		V_{GS}=4.5V, I_D=1A		135	190	
Dynamic Parameters						
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1.0MHZ		200		pF
Output capacitance	C_{oss}			30		
Reverse transfer capacitance	C_{rss}			3		
Total gate charge	Q_g	V_{GS}=0 to 10V, V_{DS}=50V, I_D=3A		4		nC
Gate to source charge	Q_{gs}			0.9		
Gate to Drain charge	Q_{gs}			1.1		
Switching parameters						
Turn-on delay time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=50V, I_D=3A, R_G=3Ω		13		ns
Turn-on rise time	t_r			19		
Turn-off delay time	$t_{d(off)}$			20		
Turn-off fall time	t_f			28		
Source-drain diode ratings and characteristics						
Maximum continuous Drain- Source diode forward current	I_S				3	A
Maximum pulsed Drain- Source diode forward current	I_{SM}				12	
Drain - source diode forward voltage	V_{SD}	V_{GS}=0V, I_S=3A			1.2	V

Note : 1. Repetitive rating : pulse width limited by maximum junction temperature.
2. $R_{\theta JA}$ is measured with the device mounted on a 1 $inch^2$ pad of 2oz copper FR4 PCB.
3. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 0.5%.

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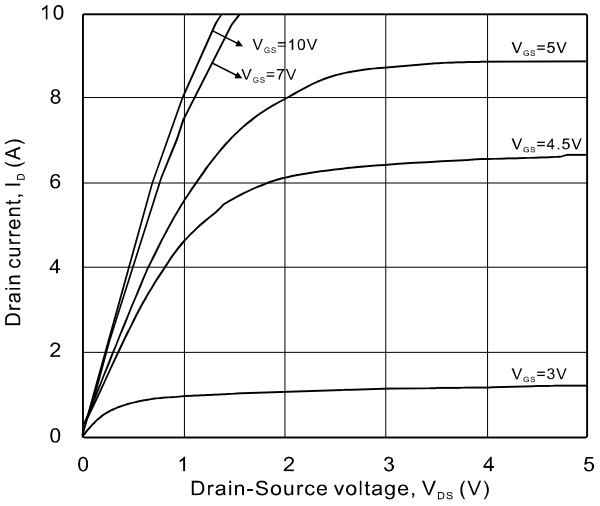
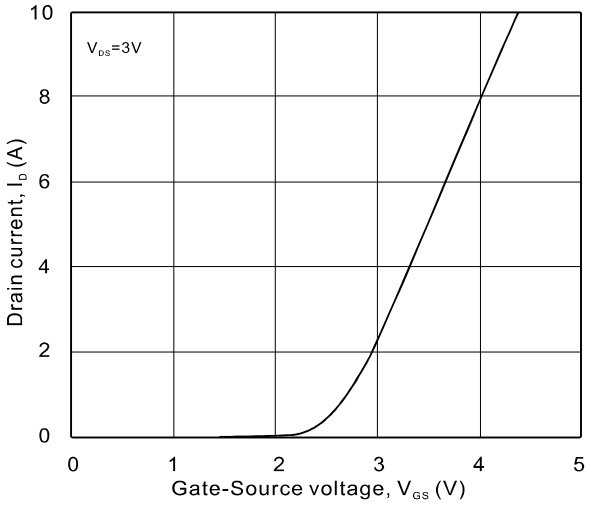
Rating and characteristic curves

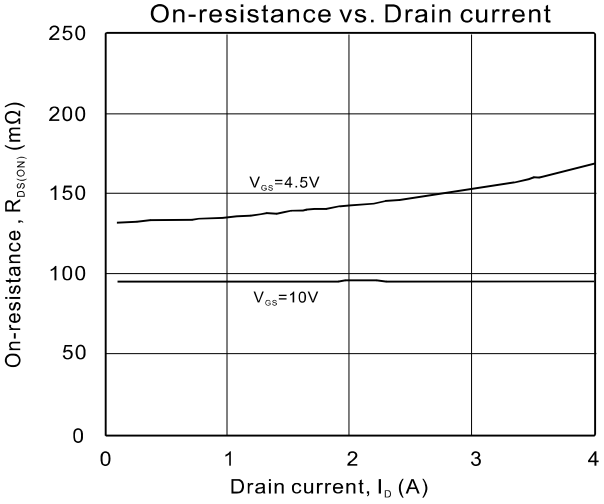
Output characteristics



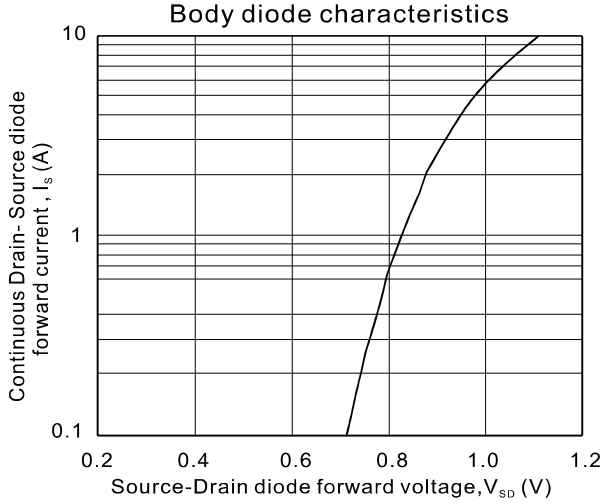
Typical transfer characteristics



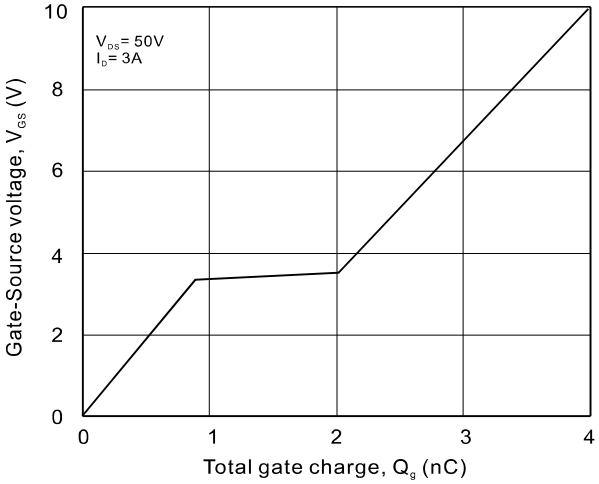
On-resistance vs. Drain current



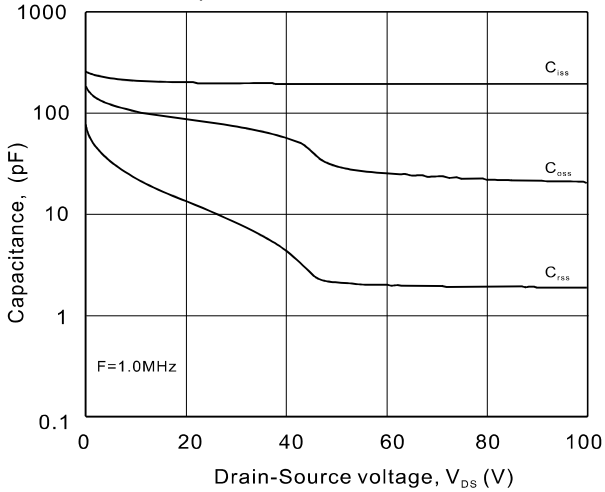
Body diode characteristics



Gate charge characteristics



Capacitance characteristics



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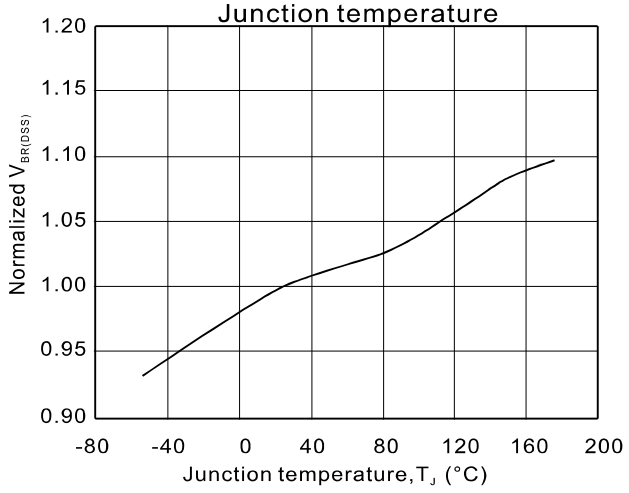
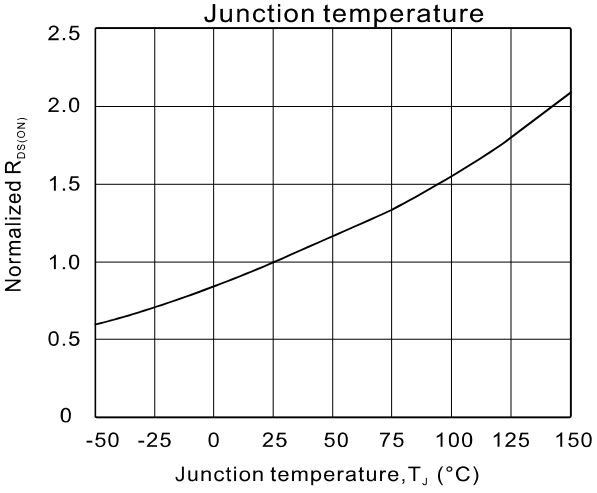
Rating and characteristic curves

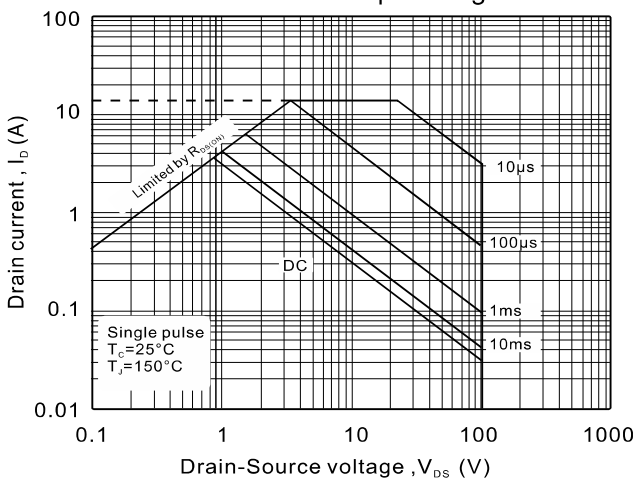
Normalized breakdown voltage vs. Junction temperature



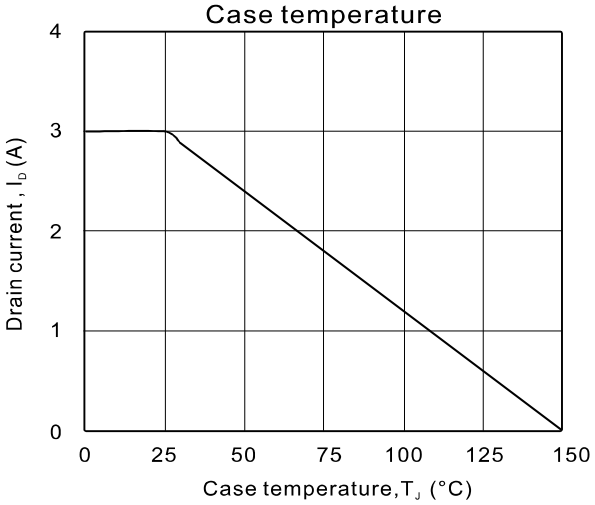
Normalized on-resistance vs. Junction temperature



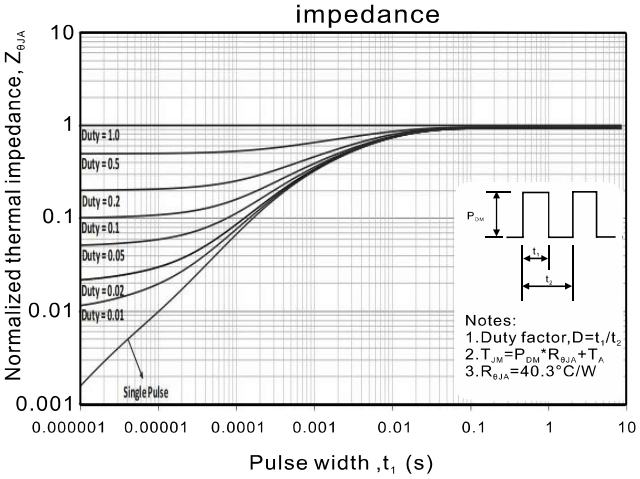
Maximum safe operating area



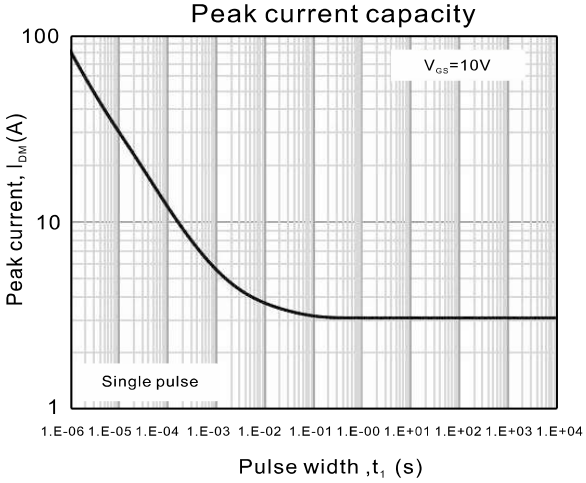
Maximum continuous drain current vs. Case temperature



Normalized maximum transient thermal impedance



Peak current capacity



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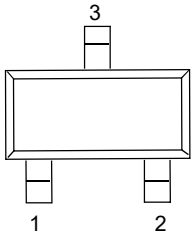
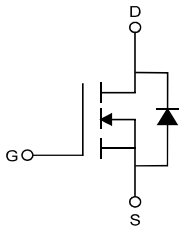
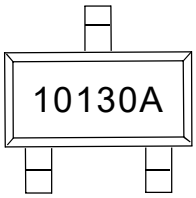
Pinning information

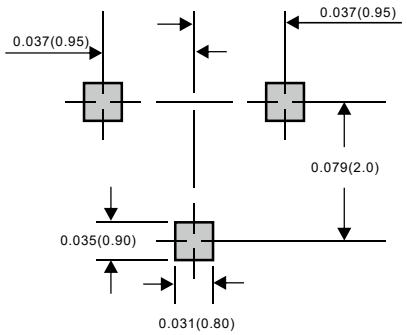
Pin	Simplified outline	Symbol
Pin 1 Gate Pin 2 Source Pin 3 Drain		

Marking

Type number	Marking code
FMOS10130A-Q1	

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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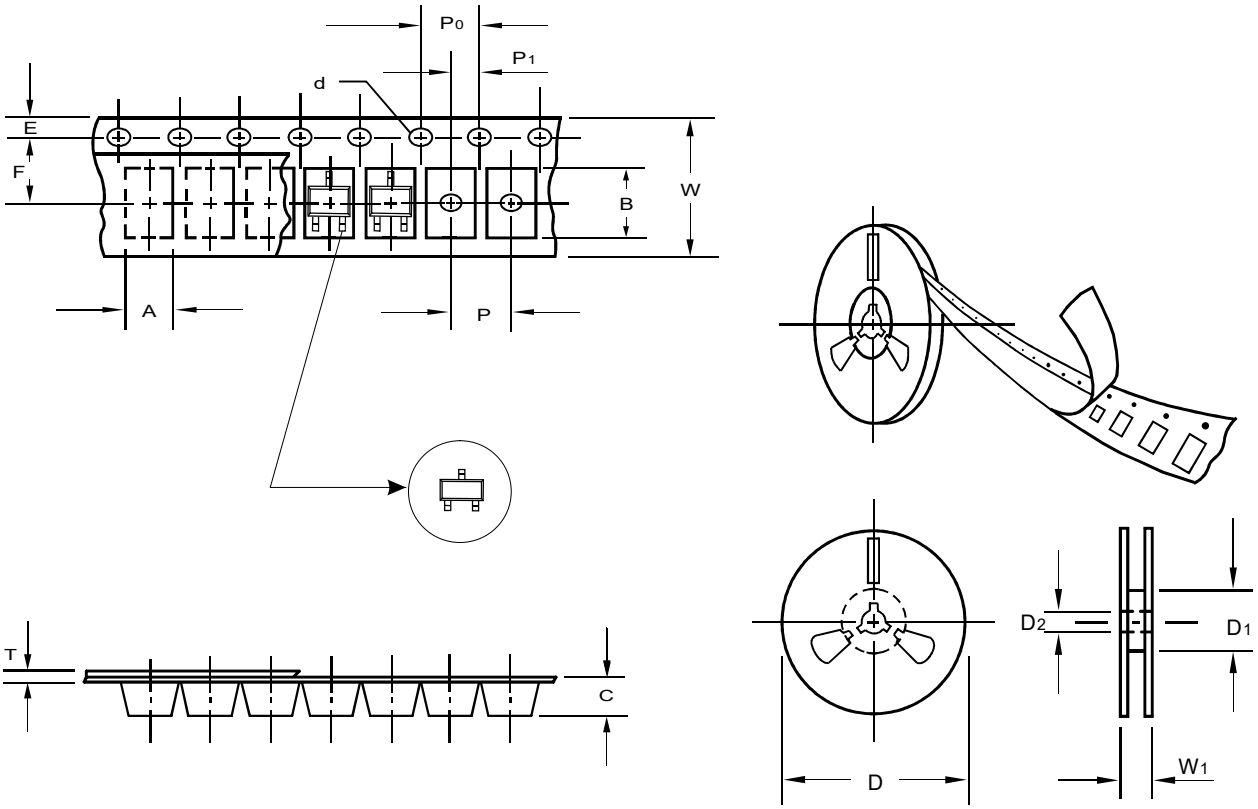
Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	54.40
Feed hole diameter	D_2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	11.40

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

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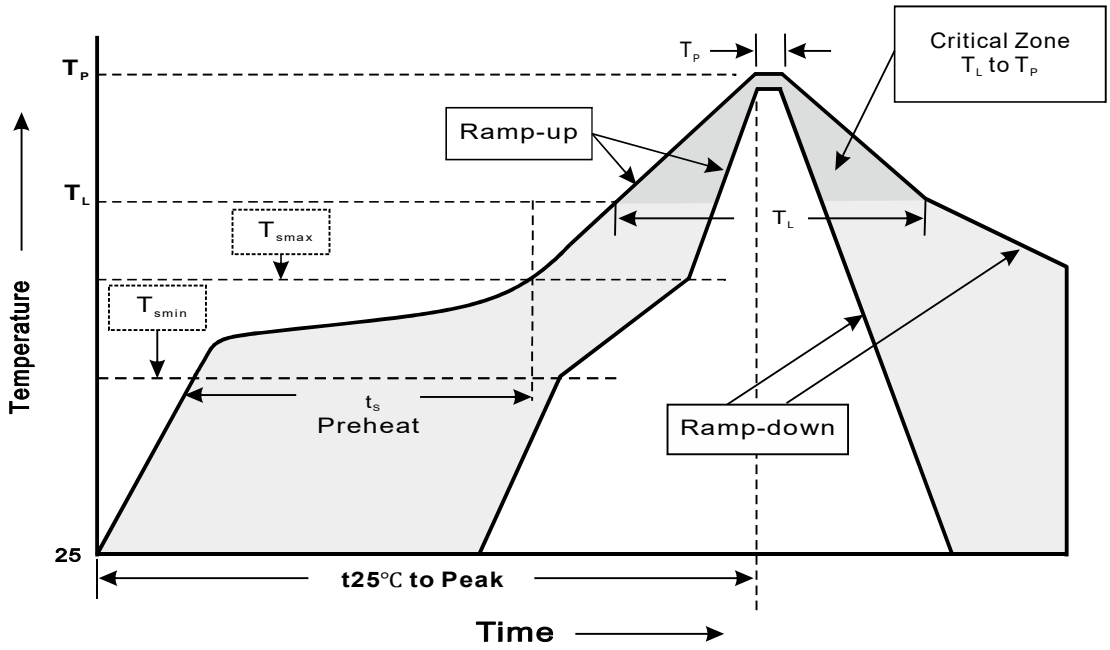
Reel packing

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)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000

Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=5℃~40℃ 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℃/sec
Prehaeat -Temperature Min (T_{smin}) -Temperature Max (T_{smax}) -Time (min to max) (t_S)	 150℃ 200℃ 60 ~120sec
T_{smax} to T_L -Ramp-up rate	< 3℃/sec
Time maintained above: -Temperature (T_L) -Time(T_L)	 217℃ 60 ~ 260 sec
Peak Temperature(T_P)	255℃ -0/+5℃
Time within 5℃ of actual peak Temperature(T_P)	10 ~ 30sec
Ramp-down rate	< 6℃/sec
Time 25℃ to peak temperature	< 6 minutes