

FMOS2SK3019ET

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FMOS2SK3019ET

0.2A 30V N-Channel Enhancement Mode MOSFET ESD Protection

Features

- $V_{DS}=30V$, $I_D=0.2A$.
- $R_{DS(on)} < 2.8\Omega$ @ $V_{GS}=10V$, $I_D=250mA$.
- $R_{DS(on)} < 4.2\Omega$ @ $V_{GS}=4.5V$, $I_D=250mA$.
- $R_{DS(on)} < 13\Omega$ @ $V_{GS}=2.5V$, $I_D=10mA$.
- Low threshold voltage.
- Fast switching speed.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex. FMOS2SK3019ET-H.

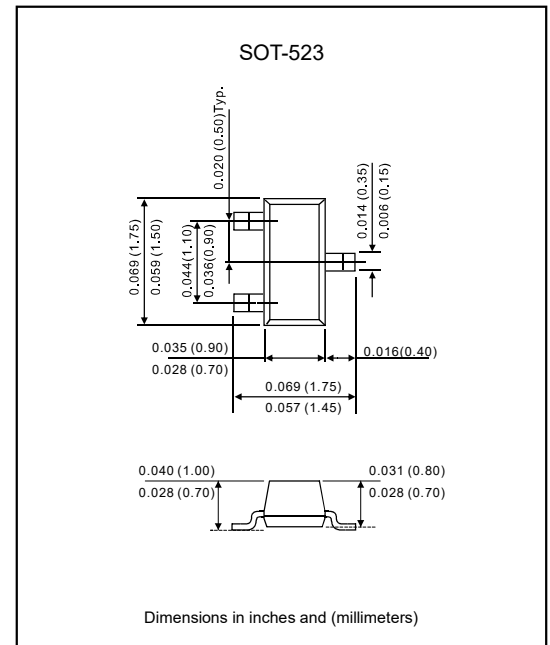
Applications

- Load switch for portable devices.
- Voltage controlled small signal switch.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-523.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



Maximum Ratings (At $T_A=25^\circ C$ Unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain source voltage	V_{DS}	30	V
Gate source voltage	V_{GS}	± 20	V
Drain current continuous (Note 1)	I_D	0.2	A
Pulsed drain current (Note 1)	I_{DM}	1.2	A
Power dissipation (Note 1)	P_D	0.27	W
Thermal resistance, junction to ambient (Note 1)	$R_{\theta JA}$	450	$^\circ C/W$
Operating junction temperature range	T_J	+150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

Note: 1. Device mounted on 1 inch² FR-4 PCB with high coverage 2oz. copper, single sided.

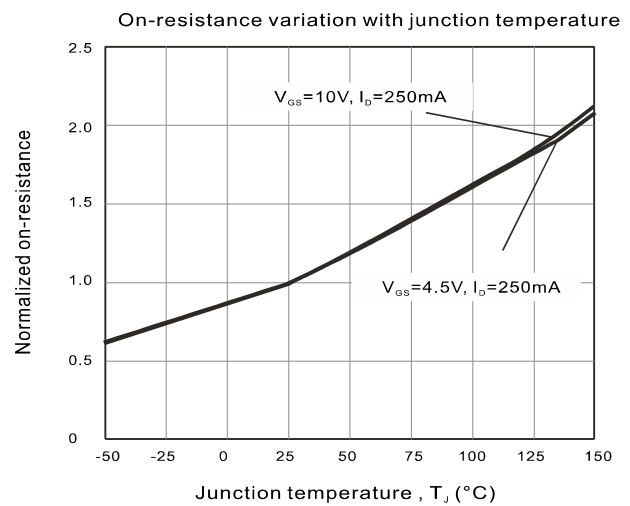
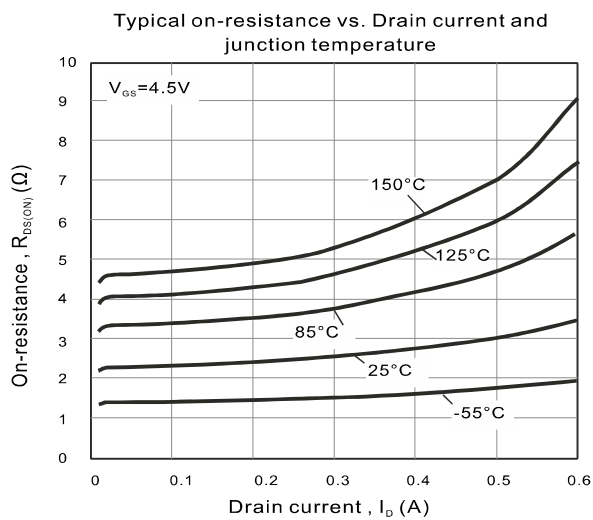
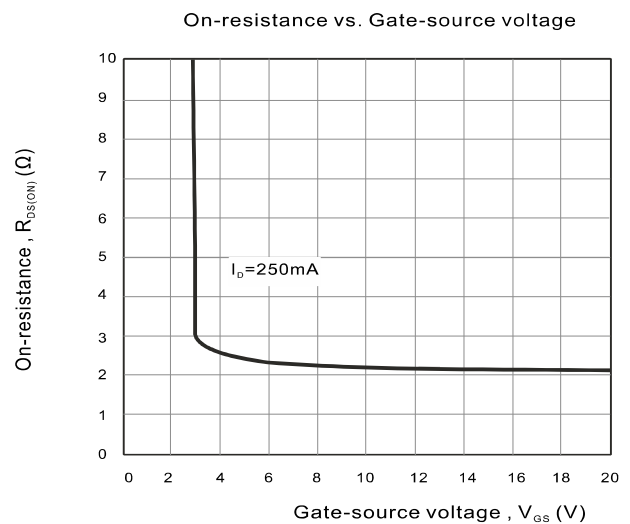
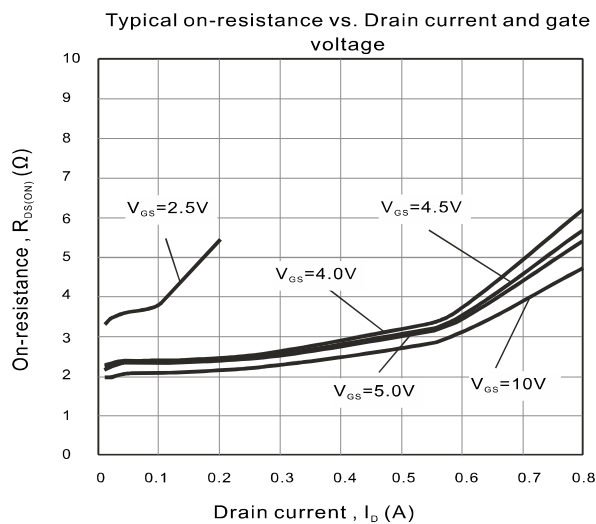
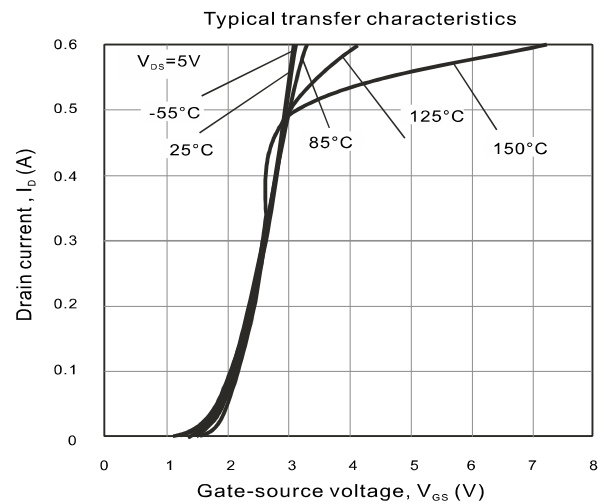
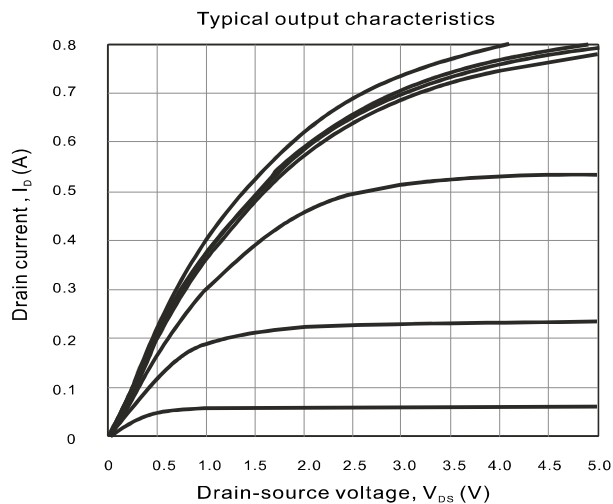
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Electrical characteristics (At $T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static parameters						
Drain-source breakdown voltage	$I_D=250\mu A, V_{GS}=0V$	BV_{DSS}	30			V
Drain-source leakage current	$V_{DS}=30V, V_{GS}=0V$	I_{DSS}			1	μA
Gate-source leakage current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}			± 10	μA
Gate threshold voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(TH)}$	1	1.7	2.2	V
Static drain-source on-state resistance	$V_{GS}=10V, I_D=250mA$	$R_{DS(ON)}$			2.8	Ω
	$V_{GS}=4.5V, I_D=250mA$			1.1	4.2	
	$V_{GS}=2.5V, I_D=10mA$			1.5	13	
Forward transconductance	$V_{DS}=10V, I_D=0.115A$	g_{FS}	80			mS
Dynamic parameters						
Input capacitance	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$	C_{iss}		23.2		pF
Out capacitance		C_{oss}		3		
Reverse transfer capacitance		C_{rss}		2.2		
Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0MHz$	R_G		79.9		Ω
Switching parameters						
Total gate charge	$V_{GS}=10V, V_{DS}=30V, I_D=0.15A$	Q_g		0.9		nC
	$V_{GS}=4.5V, V_{DS}=30V, I_D=0.15A$			0.4		
Gate to source charge	$V_{GS}=10V, V_{DS}=30V, I_D=0.15A$	Q_{gs}		0.1		
Gate to drain charge		Q_{gd}		0.2		
Turn-on delay time	$V_{DS}=30V, V_G=10V, R_G=25\Omega, I_D=0.115A$	$t_{d(on)}$		2.3		nS
Rise time		t_r		3.9		
Turn-off delay time		$t_{d(off)}$		11.4		
Fall time		t_f		16.7		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage	$I_{SD}=0.115A, V_{GS}=0V$	V_{SD}			1.2	V

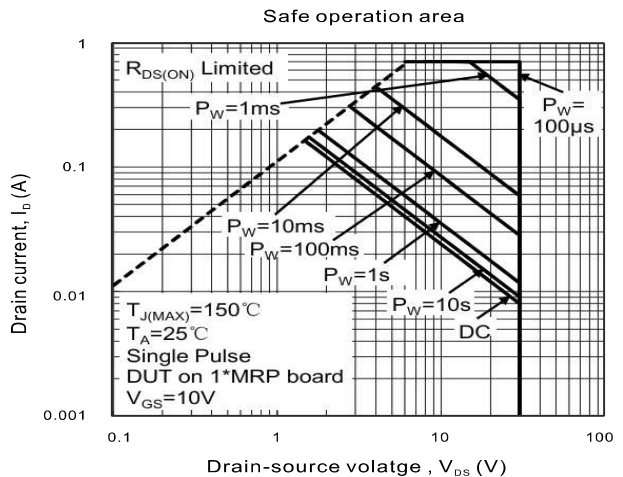
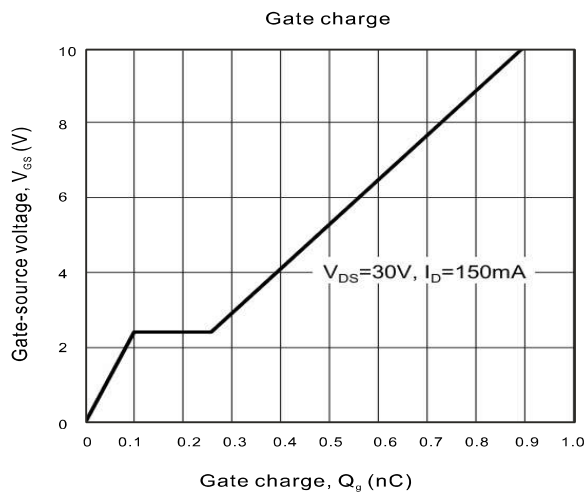
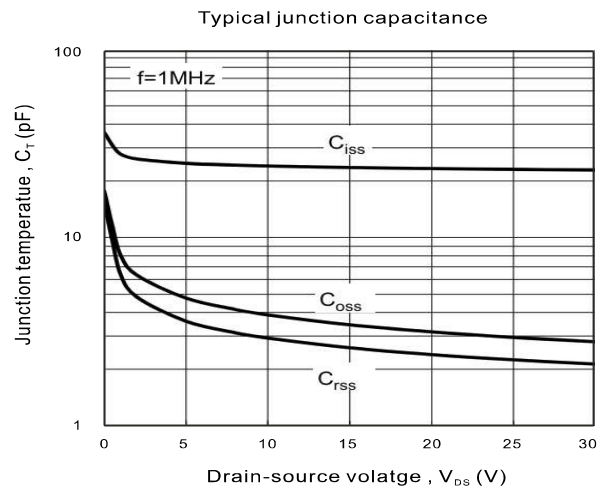
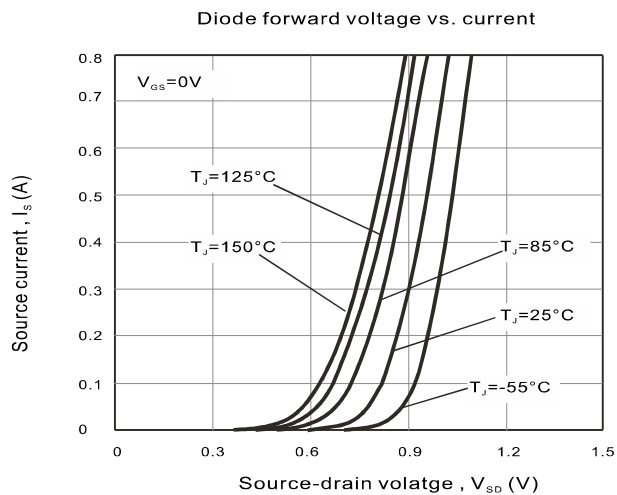
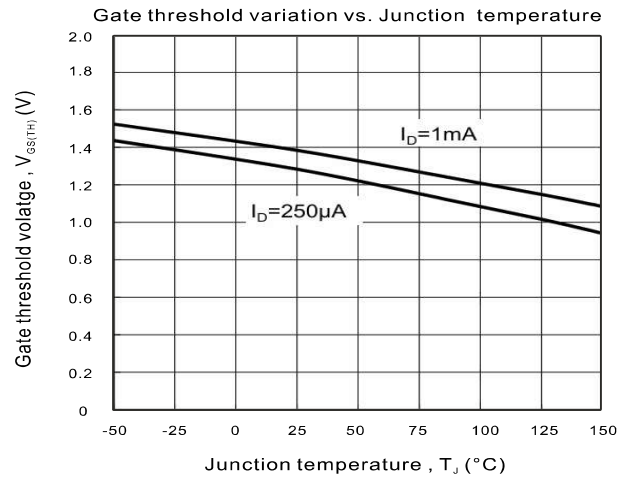
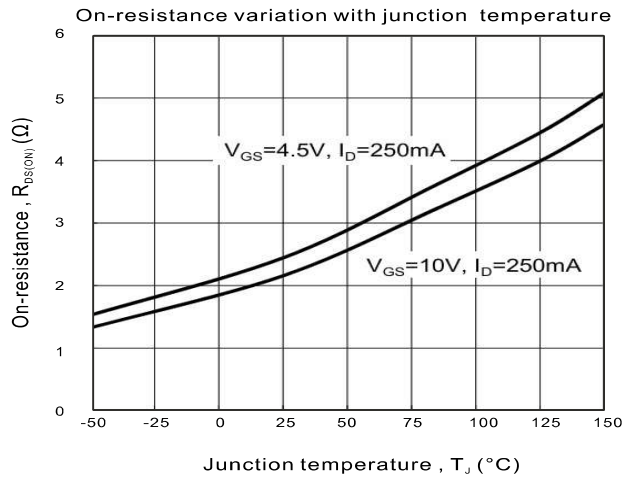
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Rating and characteristic curves



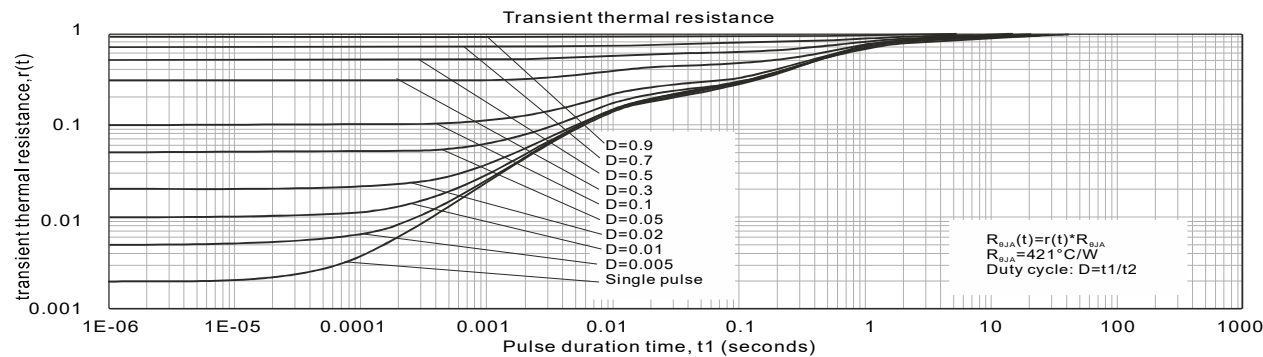
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Rating and characteristic curves

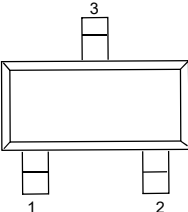
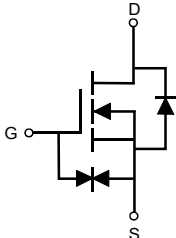


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Rating and characteristic curves



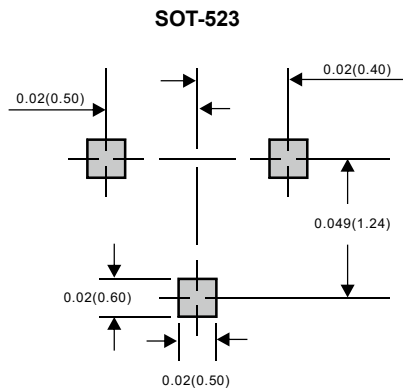
Pinning information

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

Marking

Type number	Marking code
FMOS2SK3019ET	KN

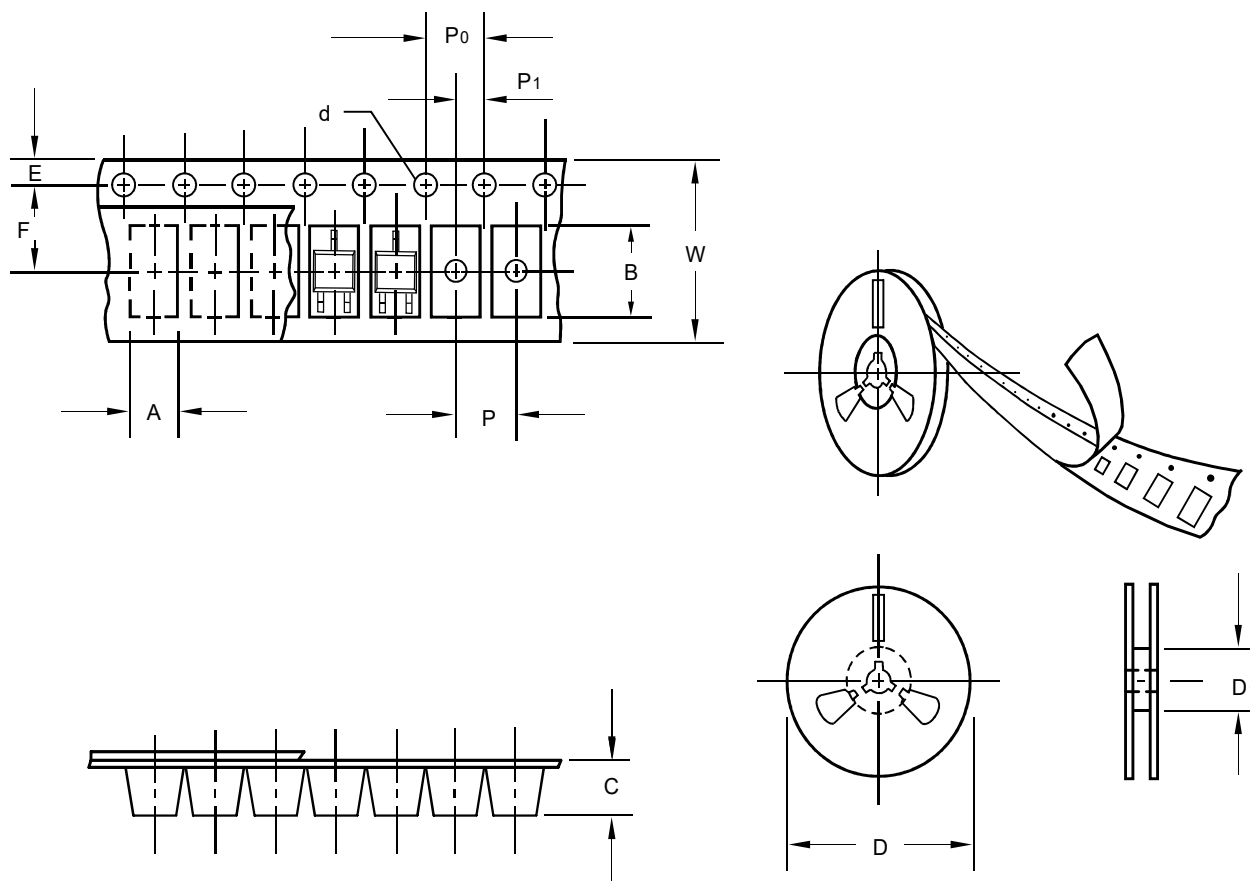
Suggested solder pad layout



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-523
Carrier width	A	0.5	0.95
Carrier length	B	0.5	1.85
Carrier depth	C	0.5	0.70
Sprocket hole	d	0.1	1.55
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	54.00
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	P0	0.1	2.00
Embossment center	P1	0.1	2.00
Tape width	W	0.3	8.00

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

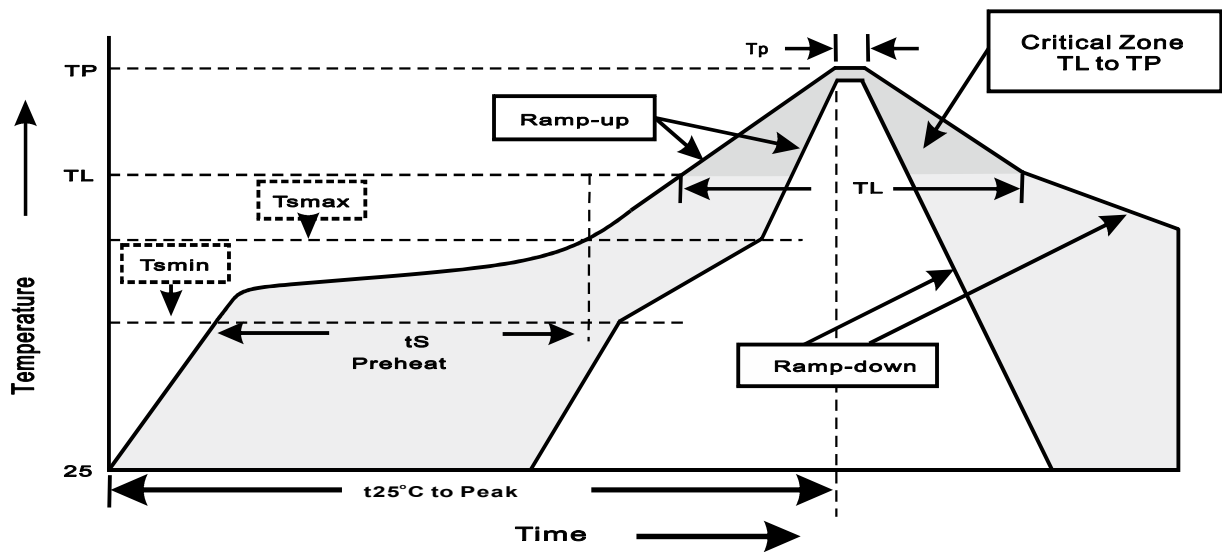
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
SOT-523	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°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 _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
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	<6minutes