

FMOSG01N03E-H

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FMOSG01N03E-H

1.0A 30V N-Channel High Density Trench MOSFET

Features

- $V_{DS}=30V$, $I_D=1A$.
- $R_{DS(ON)} \leq 280m\Omega$ @ $V_{GS}=4.5V$, $I_D=1.0A$.
- $R_{DS(ON)} \leq 550m\Omega$ @ $V_{GS}=1.8V$, $I_D=0.5A$.
- ESD Rating (HBM) : 2KV.
- Super high density cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

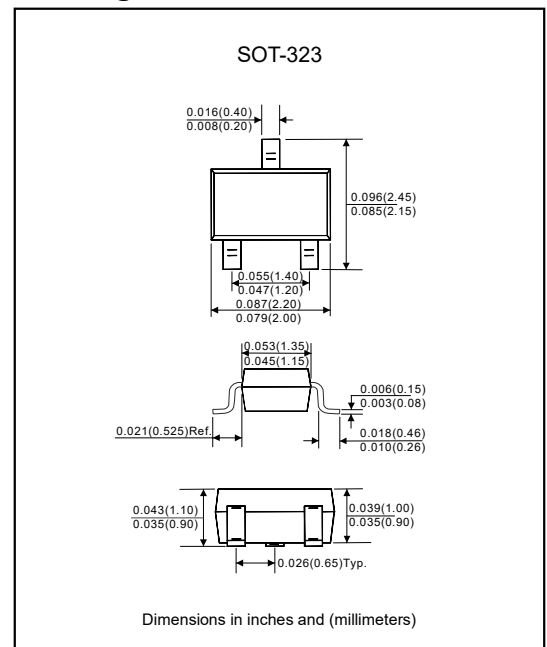
Applications

- Load switch for portable devices.
- DC/CD Converter.

Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-323.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Mounting Position : Any.
- Weight : Approximated 6mg.

Package outline



Maximum ratings (AT $T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	± 10	V
Continuous drain current (Note1)	I_D	1	A
Power dissipation (Note1)	P_D	350	mW
		200	
Pulse drain current (Note2)	I_{DM}	4	A
Drain to source diode forward current (Note1)	I_S	0.8	A
Thermal resistance, junction to ambient (Note1)	$R_{\theta JA}$	625	$^{\circ}C/W$
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 specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	BV_{DSS}	$I_D=250\mu A$, $V_{GS}=0V$	30			V
Drain-source leakage current	I_{DSS}	$V_{DS}=20V$, $V_{GS}=0V$			1	μA
Gate-source leakage current	I_{GSS}	$V_{DS}=0V$, $V_{GS}=\pm 10V$			± 10	μA
On characteristics						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	0.5	0.7	1.0	V
Static drain-source on-resistance	$R_{DS(ON)}$	$V_{GS}=4.5V$, $I_D=1.0A$		210	280	m Ω
		$V_{GS}=1.8V$, $I_D=0.5A$		360	550	
Forward transconductance	g_{FS}	$V_{DS}=5V$, $I_D=1A$		3.7		S
Dynamic parameters						
Input capacitance	C_{iss}	$V_{GS}=0V$, $V_{DS}=10V$, $f=1.0MHz$		60		pF
Out capacitance	C_{oss}			22		
Reverse transfer capacitance	C_{rss}			12		
Switching parameters						
Total gate charge	$Q_{g(tot)}$	$V_{GS}=4.5V$, $V_{DS}=10V$, $I_D=0.8A$		1		nC
Threshold gate charge	$Q_{g(th)}$			0.28		
Gate-source charge	Q_{gs}			0.15		
Gate-drain charge	Q_{gd}			0.21		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=10V$, $I_D=0.8A$, $V_{GS}=4.5V$, $R_L=6\Omega$, $R_G=6\Omega$		2		ns
Rise time	t_r			19		
Turn-off delay time	$t_{d(off)}$			10		
Fall time	t_f			23		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage	V_{SD}	$I_S=0.8A$, $V_{GS}=0V$			1.2	V

Note: 1. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.

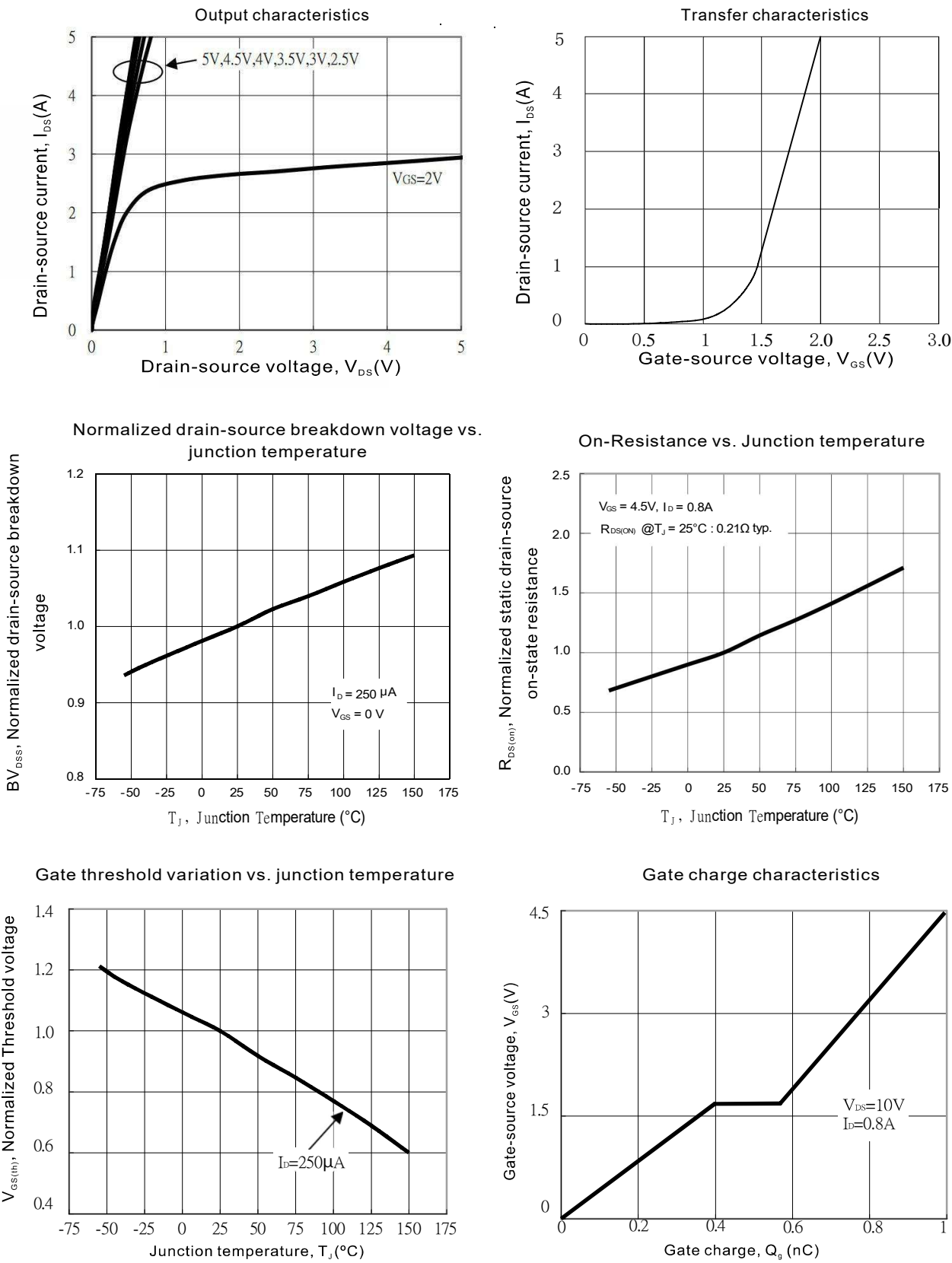
2. Pulse width limited by maximum junction temperature.

3. Pulse Test Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

4. Guaranteed by design, not subject to production testing.

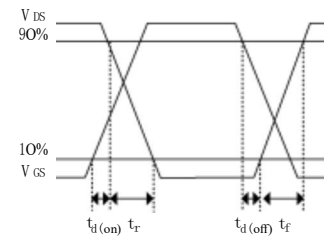
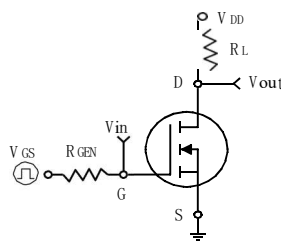
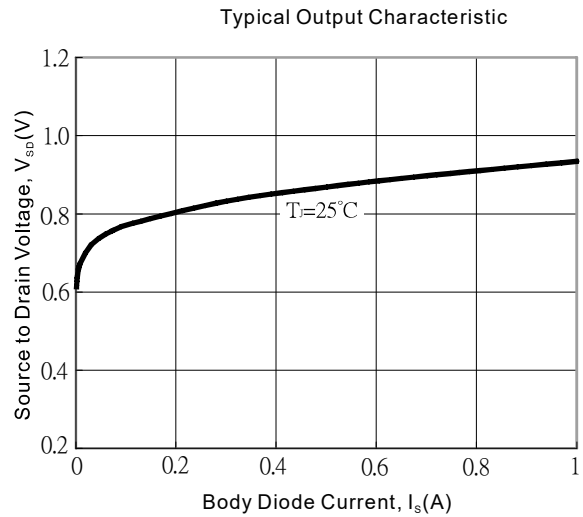
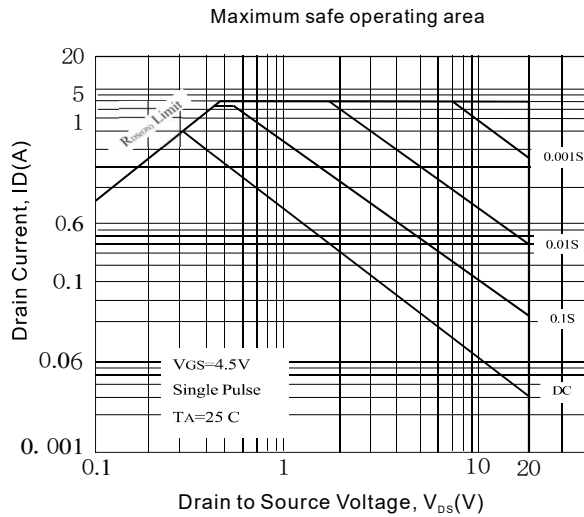
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Rating and characteristic curves

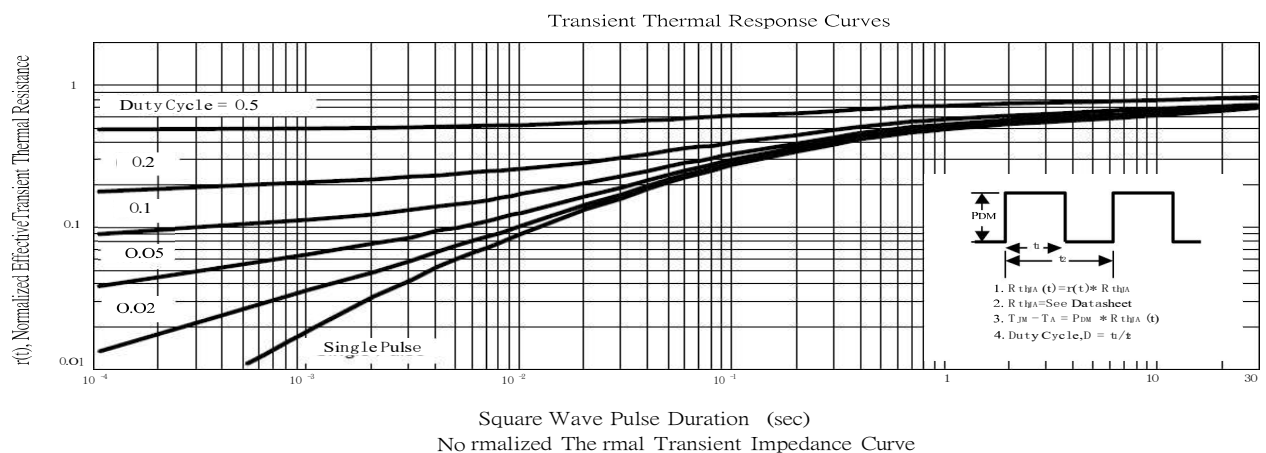


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Rating and characteristic curves

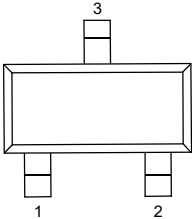
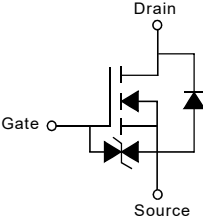


Switching test circuit and switching waveforms

Square Wave Pulse Duration (sec)
Normalised Thermal Transient Impedance Curve

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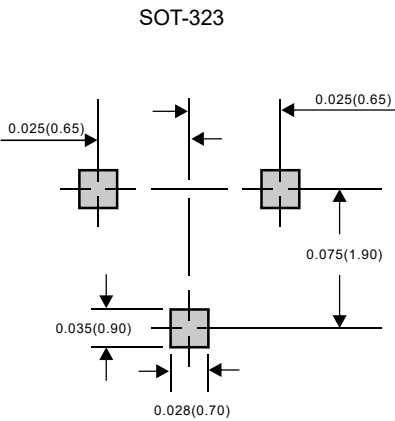
Pinning information

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

Marking

Type number	Marking code
FMOSG01N03E-H	3132

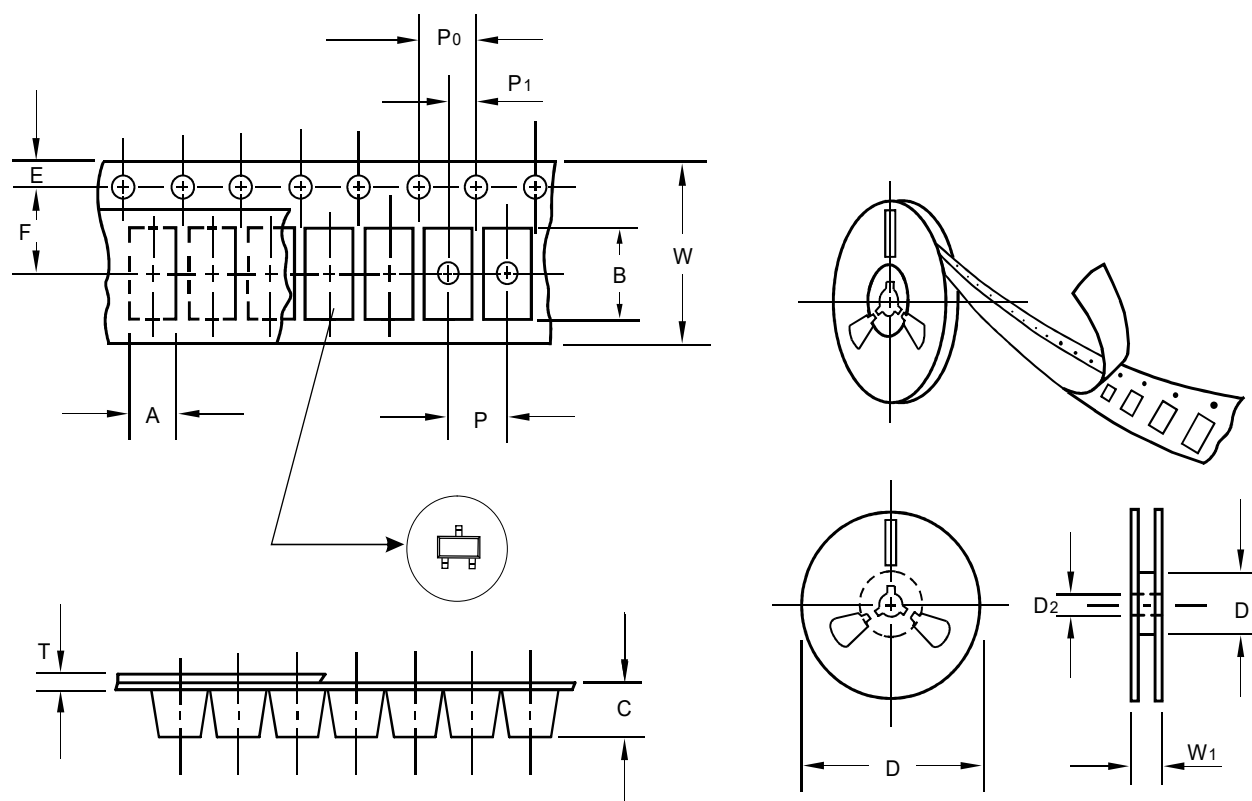
Suggested solder pad layout



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-323
Carrier width	A	0.1	2.36
Carrier length	B	0.1	2.40
Carrier depth	C	0.1	1.20
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	62.00
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 accordance with EIA standard RS-481-A and specifications listed above.

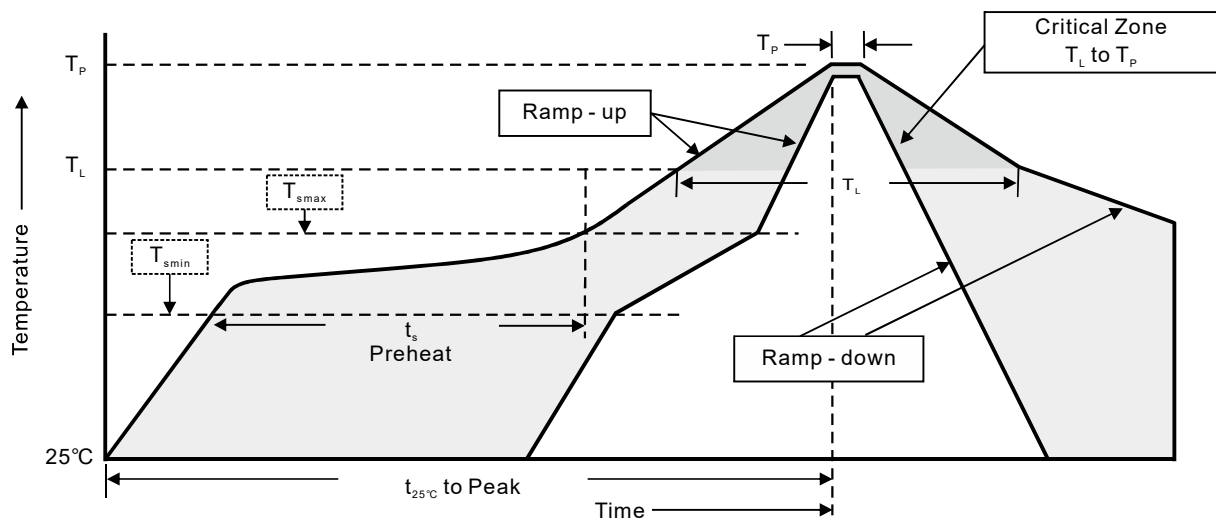
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Reel packing

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-323	7"	3,000	4.0	30,000	183*183*123	178	382*262*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_{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