FMNPBSS84-H

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-0.13A -50V P-Channel Enhancement Mode MOSFET

Features

- $-V_{DS}$ = 50V, $-I_D$ = 0.13A.
- $R_{DS(ON)}$ ≤ 10Ω, @$-V_{GS}$ = 5V, $-I_D$ = 0.1A.
- $R_{DS(ON)}$ ≤ 8Ω, @$-V_{GS}$ = 10V, $-I_D$ = 0.1A.
- Energy efficient.
- Low threshold voltage.
- High-speed switching.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

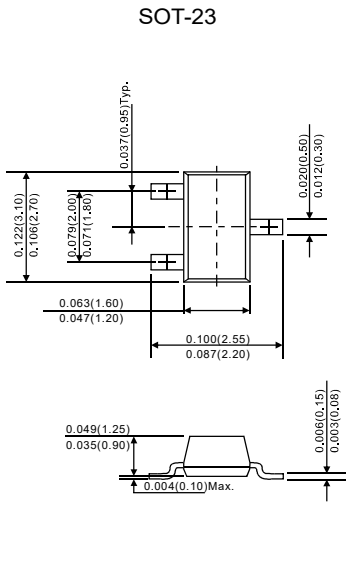
Applications

- DC-DC converters and load switching.
- Power management in portable.
- Battery-powered products such as computers, printers, cellular and cordless telephones.

Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Weight : Approximated 8mg.

Package outline



Dimensions in inches and (millimeters)

Maximum ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-source voltage	$-V_{DS}$	50	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current	$-I_D$	0.13	A
Pulsed drain current (Note1) (t_p<10 μs)	$-I_{DM}$	0.52	A
Power dissipation	P_D	225	mW
Thermal resistance, junction to ambient (Note2)	$R_{\theta JA}$	556	℃/W
Lead temperature for soldering purposes, duration for 5 seconds	T_L	260	℃
Operating junction temperature	T_J	+150	℃
Storage temperature range	T_{STG}	-55 to +150	℃

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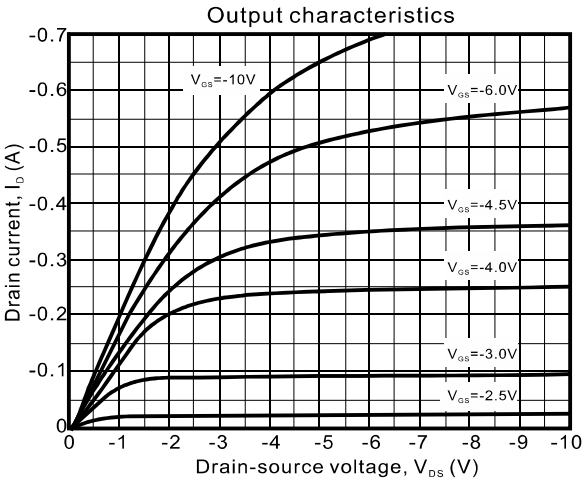
Electrical characteristics (At T_A=25°C unless otherwise specified)

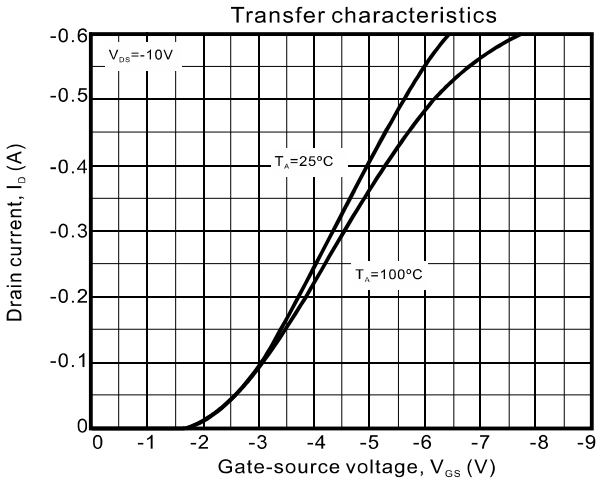
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$-BV_{DSS}$	$-I_D$ = 250μA, V_{GS} = 0V	50			V
Drain-source leakage current	$-I_{DSS}$	$-V_{DS}$ = 50V, V_{GS} = 0V			15	μA
		$-V_{DS}$ = 25V, V_{GS} = 0V			0.1	
Gate-source leakage current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±5	μA
On characteristics						
Gate threshold voltage (Note 3)	$-V_{GS(TH)}$	V_{DS} = V_{GS}, $-I_D$ = 250μA	0.9	1.6	2.0	V
Static drain-source on-resistance (Note 3)	$R_{DS(ON)}$	$-V_{GS}$=5V, $-I_D$=0.1A		5.8	10	Ω
		$-V_{GS}$=10V, $-I_D$=0.1A		4.5	8	
Forward transconductance (Note 1)	g_{FS}	$-V_{GS}$=25V, $-I_D$=100mA	50			mS
Dynamic parameters (Note 4)						
Input capacitance	C_{iss}	V_{GS}=0V, $-V_{DS}$=5V, f=1.0MHZ		30		pF
Output capacitance	C_{oss}			10		
Reverse transfer capacitance	C_{rss}			5		
Switching parameters (Note 4)						
Turn-on delay time	$t_{D(ON)}$	$-V_{DD}$=15V, R_L=50Ω, $-I_D$=2.5A		2.5		ns
Rise time	t_r			1		
Turn-off delay time	$t_{D(OFF)}$			16		
Fall time	t_f			8		
Source-drain diode ratings and characteristics						
Drain - source diode forward voltage (Note 3)	$-V_{SD}$	$-I_S$=0.13A, V_{GS}=0V			2.2	V
Continuous drain to source diode forward current	$-I_S$				0.13	A
Pulsed drain to source diode forward current	$-I_{SM}$				0.52	A

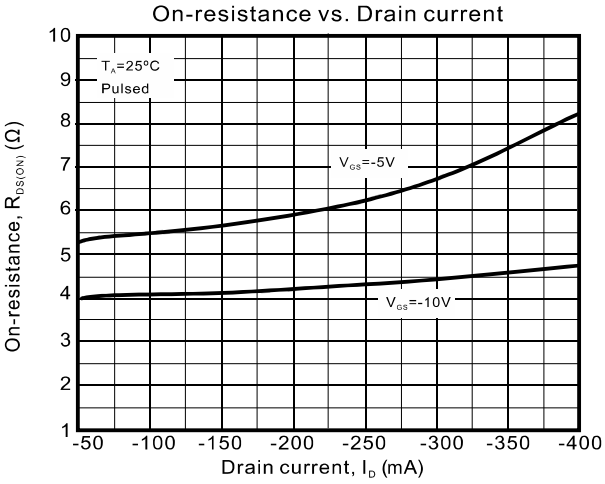
Note :1.Repetitive rating: pulse width limited by junction temperature.
2. Surface mounted on FR4 board, t ≤ 10s.
3. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to producting.

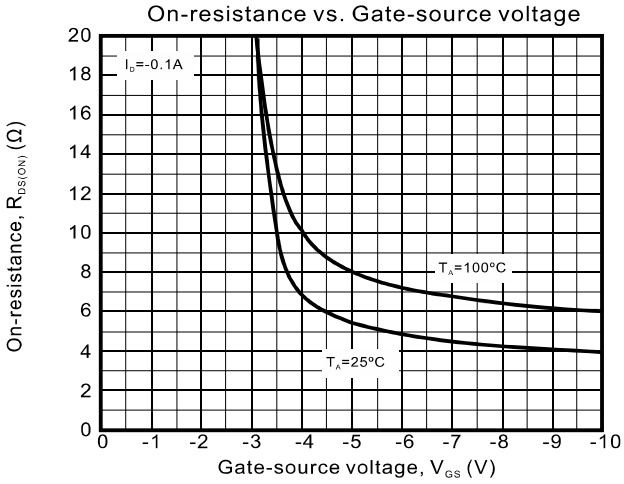
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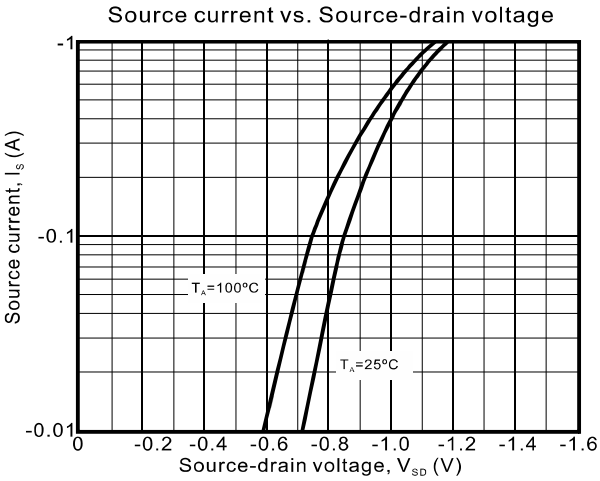
Rating and characteristic curves

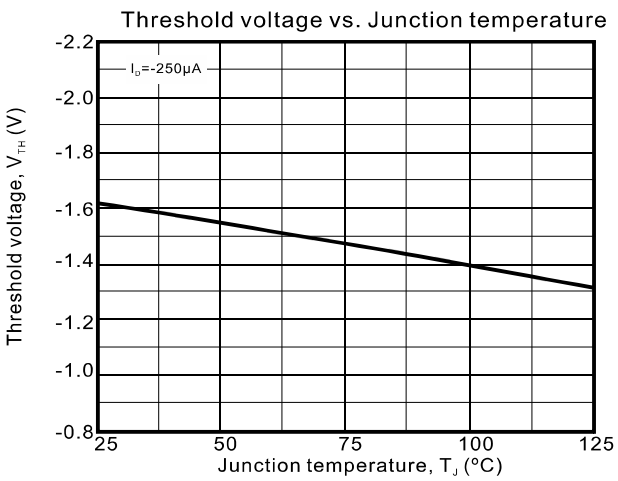






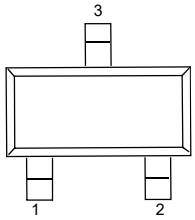
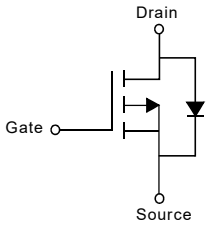




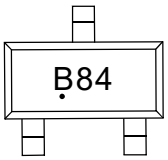


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Pinning information

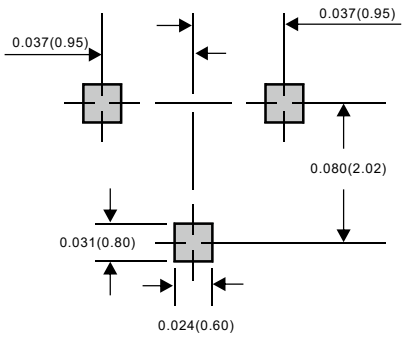
Pin	Simplified outline	Symbol
Pin 1 Gate Pin 2 Source Pin 3 Drain		

Marking

Type number	Marking code
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Suggested solder pad layout

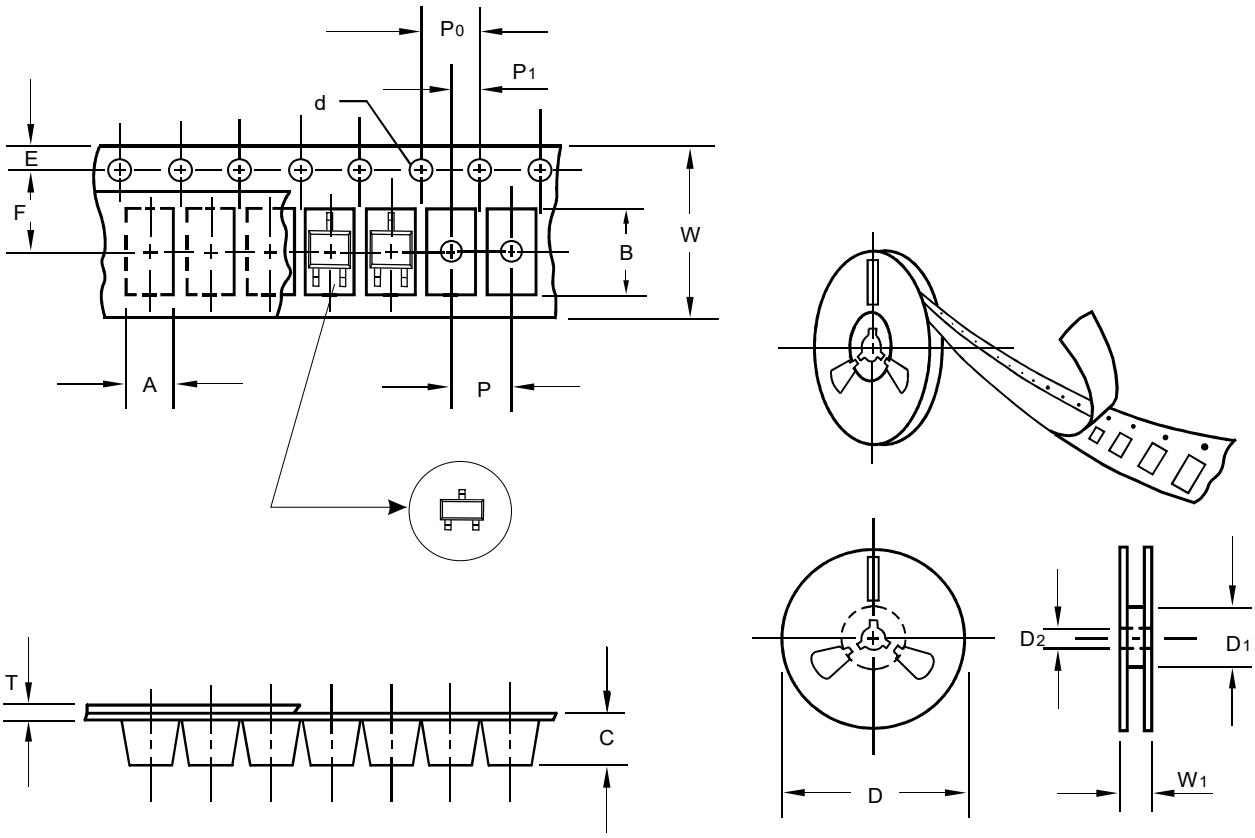
SOT-23



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.5	3.15
Carrier length	B	0.5	2.77
Carrier depth	C	0.5	1.22
Sprocket hole	d	0.5	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	0.5	0.23
Tape width	W	0.5	8.00
Reel width	W_1	5.0	12.30

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

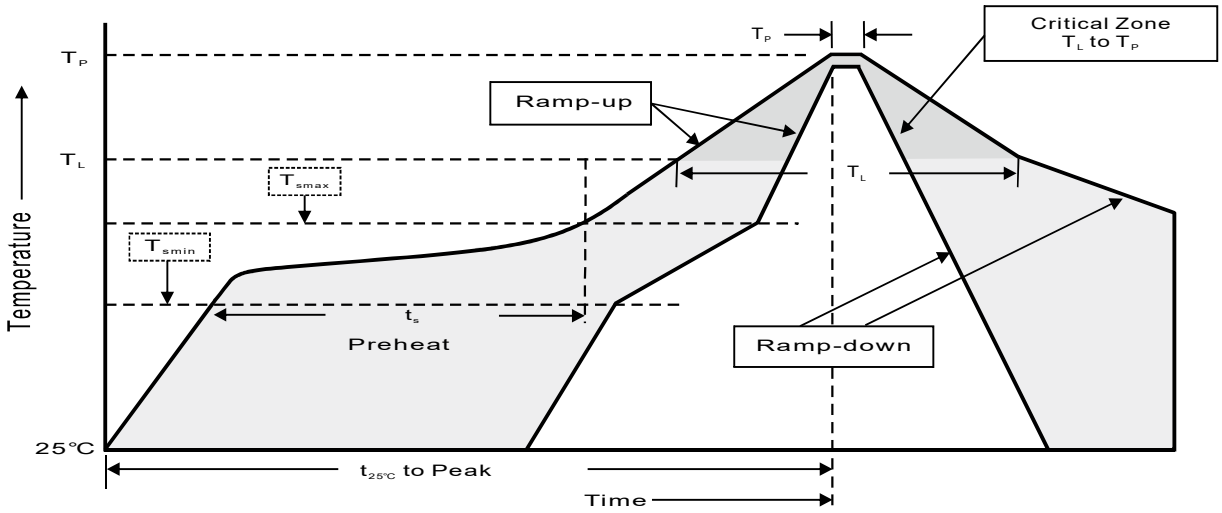
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Reel packing

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°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 ℃/sec
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (Min to Max) (t_s)	 150℃ 200℃ 60 ~ 120 sec
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 with 5℃ of actual peak temperature (T_P)	10 ~30 sec
Ramp-down rate	< 6 ℃/sec
Time 25℃ to peak temperature	< 6 minutes