

FMBSS84

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FMBSS84

50V P-Channel Enhancement
Mode Power MOSFET

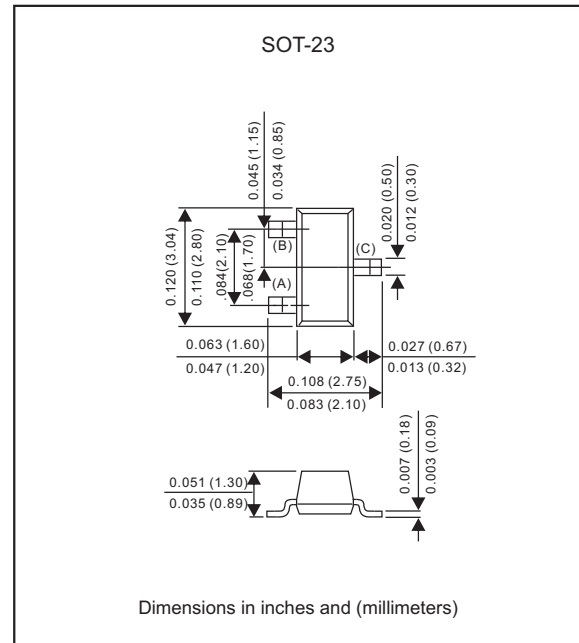
Package outline

Features

- Low on-resistance $R_{DS(ON)} = 10\Omega$
- Low input capacitance : 30pF
- Fast switching speed : 2.5ns
- Low output capacitance : 10pF
- Low threshold : 2.0V
- In compliance with EU RoHS 2002/95/EC directives
- Suffix "-H" indicates Halogen-free part, ex.FMBSS84-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram



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

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Drain-source voltage		V_{DSS}			50	V
Drain current-continue	$T_A = 25^\circ\text{C}$	I_D			130	mA
		I_{DM}			520	
Gate- source voltage-continue		V_{GS}			± 20	V
Total power dissipation (Derate above 25°C)		P_D			225	mW
Junction to ambient thermal resistance		$R_{\theta JA}$			556	$^\circ\text{C/W}$
Operation junction temperature		T_J	-55		+150	$^\circ\text{C}$
Storage temperature		T_{STG}	-65		+150	$^\circ\text{C}$

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

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
OFF CHARACTERISTICS						
Drain-source breakdown voltage	$V_{GS} = 0V, I_D = -250\mu A$	BV_{DSS}	50			V
Zero gate voltage drain current	$V_{DS} = 25V, V_{GS} = 0V$ $V_{DS} = 50V, V_{GS} = 0V$	I_{DSS}			0.1 15	μA
Gate-body leakage current-forward	$V_{GS} = 20V, V_{DS} = 0$	I_{GSSF}			60	μA
Gate-body leakage current-reverse	$V_{GS} = -20V, V_{DS} = 0$	I_{GSSR}			-60	μA
ON CHARACTERISTICS (Note 1)						
Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 1.0mA$	$V_{GS(th)}$	0.8		2.0	V
Static drain-source on-resistance	$V_{GS} = 5.0V, I_D = 100mA$	$R_{DS(ON)}$		5.0	10	Ω
Source-drain current		I_S			0.130	A
Source-drain current (pulse), Note 2		I_{SM}			0.520	A
Forward transconductance, Note 1	$V_{DS} = 25V, I_D = 100mA, f = 1kHz^*$	g_{FS}	50			ms
Forward on voltage, Note 1		V_{SD}		2.5		V
DYNAMIC CHARACTERISTICS						
Input capacitance	$V_{DS} = 5V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}		30		μF
Output capacitance		C_{oss}		10		
Reverse transfer capacitance		C_{rss}		5.0		
Gate charge		Q_T		6000		μC
Turn-On Delay Time	$V_{DD} = -15V, R_L = 50\Omega, I_D = -2.5A$	$t_{d(ON)}$		25		ns
		t_r		1.0		
Turn-Off Delay Time		$t_{d(OFF)}$		16		
		t_f		8		

Note 1. Pulse duration $\geq 300\mu s$, duty cycle 2.0%

2. Pulse width limited by Max. junction temperature

3. Surface mounted on 1 inch square copper pad of FR4 board; 270°C/W when mounted on min. copper pad.

Rating and characteristic curves (FMBSS84)

FIG.1 TRANSFER CHARACTERISTICS

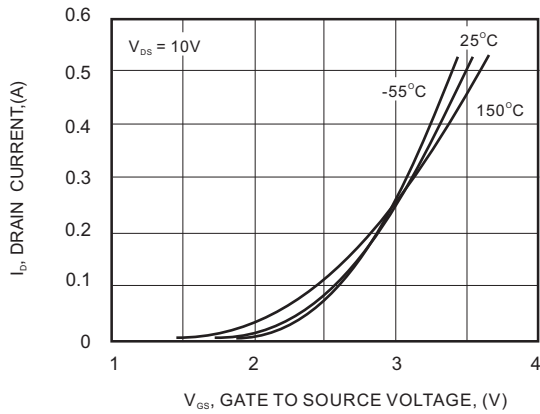


FIG.2 ON-REGION CHARACTERISTICS

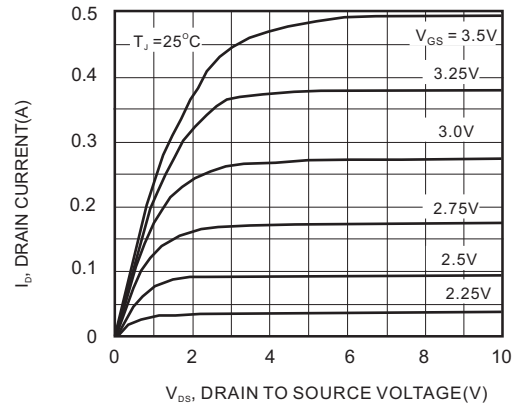


FIG.3 ON-RESISTANCE VS DRAIN CURRENT

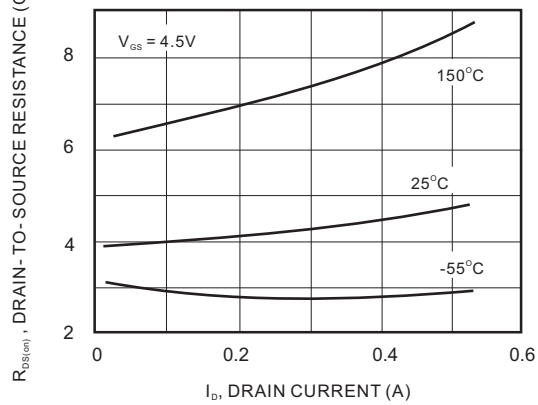
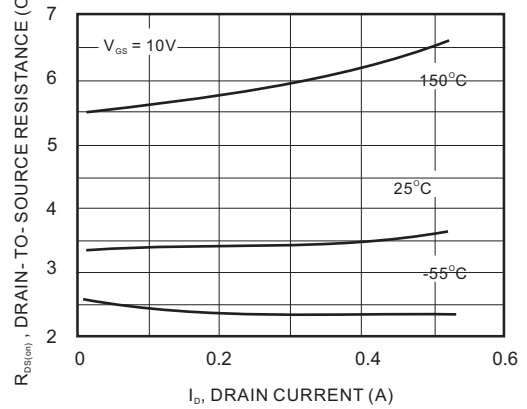


FIG.4 ON-RESISTANCE VS DRAIN CURRENT



Rating and characteristic curves (FMBSS84)

FIG.5 ON-RESISTANCE VARIATION WITH TEMPERATURE

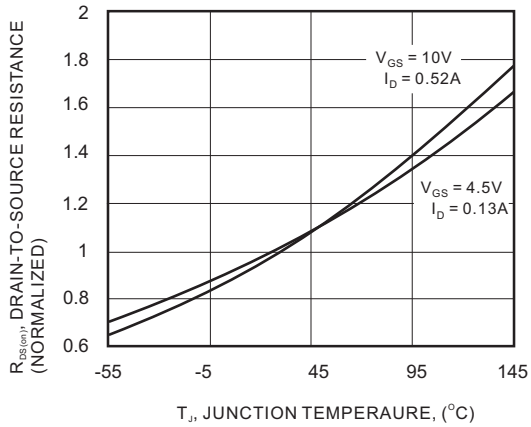


FIG.6 GATE CHARGE

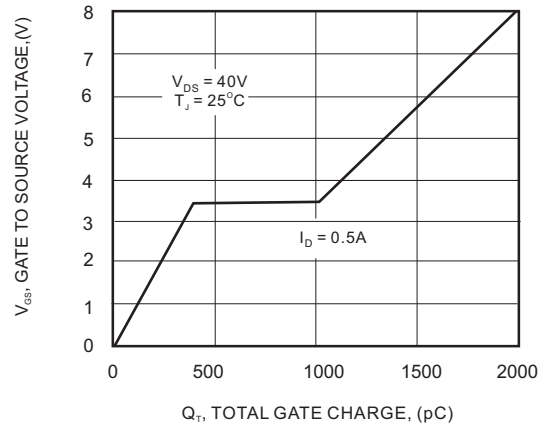
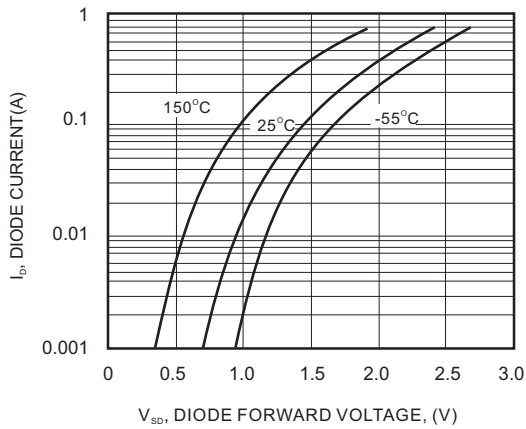
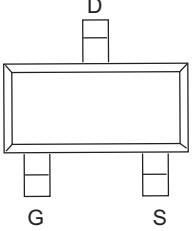
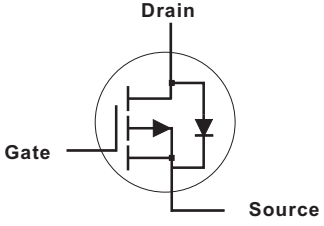


FIG.7 BODY DIODE FORWARD VOLTAGE



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Pinning information

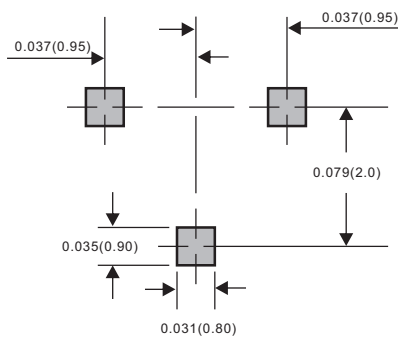
Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source		

Marking

Type number	Marking code
FMBSS84	PD

Suggested solder pad layout

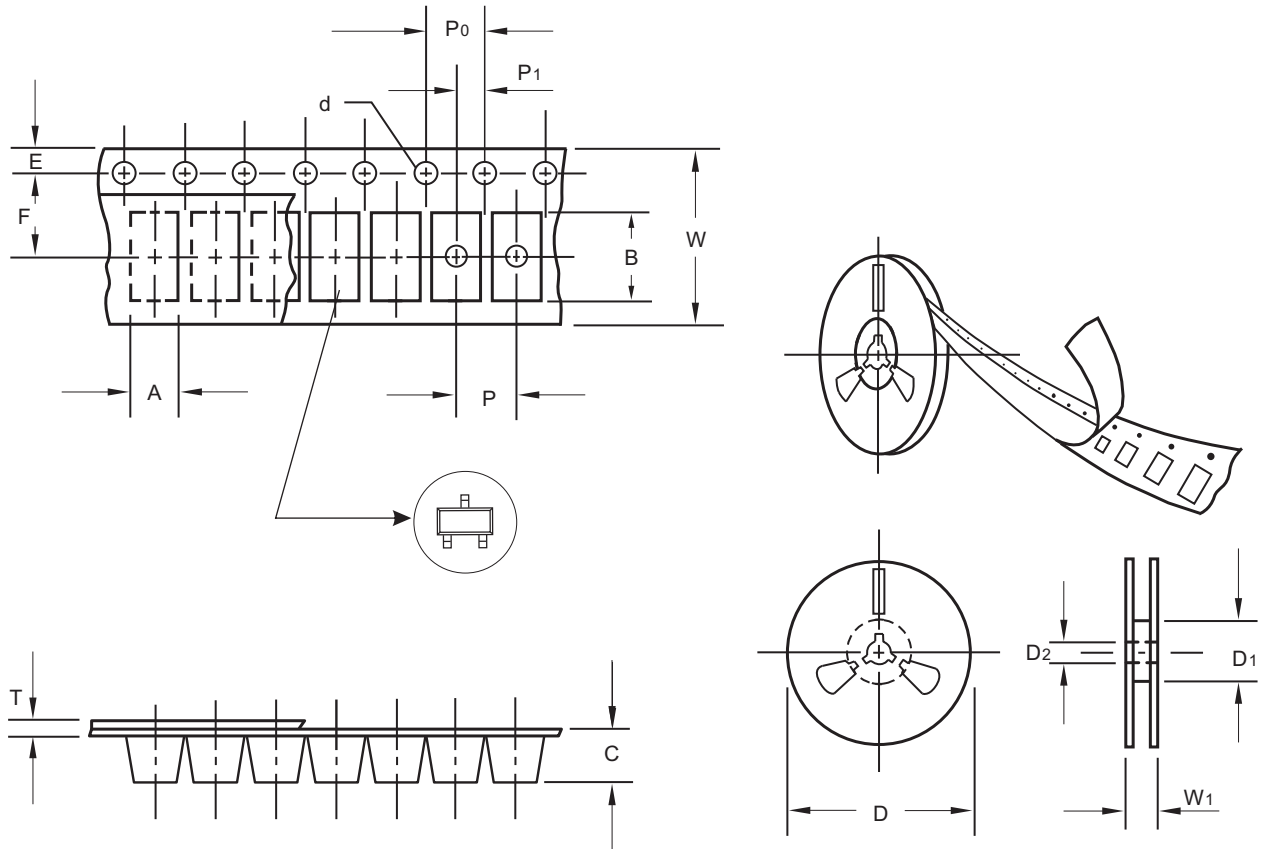
SOT-23



Dimensions in inches and (millimeters)

FMBSS84

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	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	55.00
Feed hole diameter	D2	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	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	8.00
Reel width	W1	1.0	12.0

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

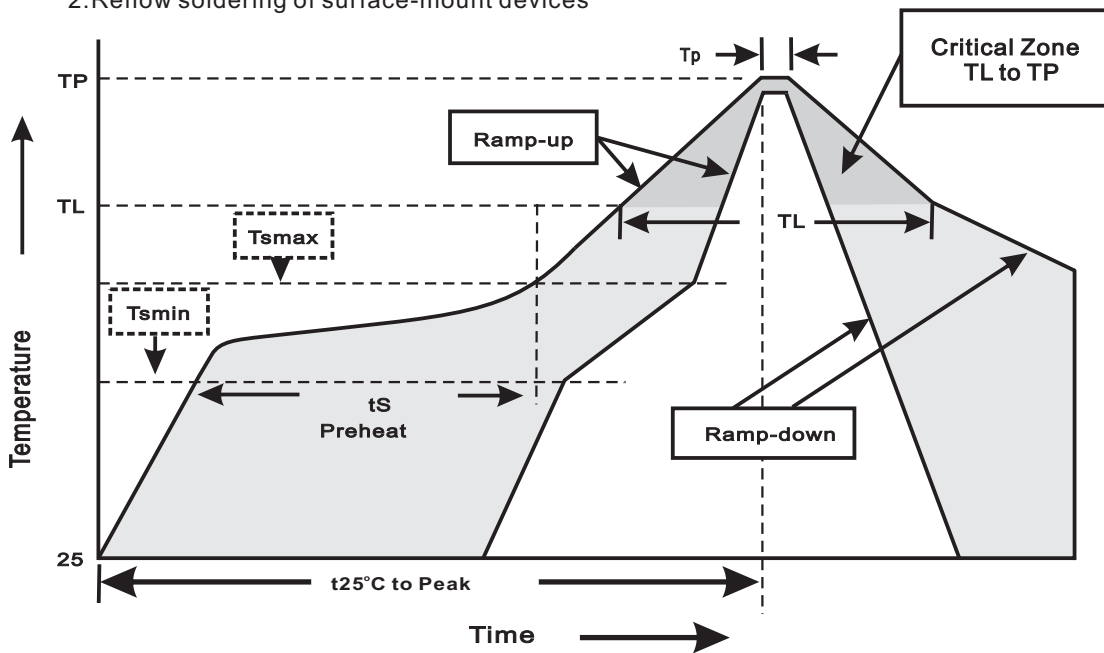
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Reel packing

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)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3000	4.0	30,000	183*183*123	178	383*262*387	240,000	11.6

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_{min}) -Temperature Max(T_{max}) -Time(min to max)(t_s)	150°C 200°C 60~120sec
T_{max} 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