FMNN3400-H

List

FMNN3400-H

5.2A 30V N-Channel Enhancement Mode Power MOSFET

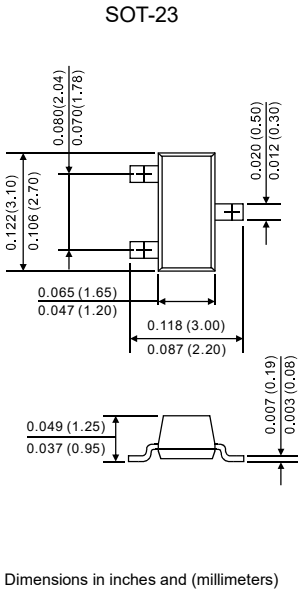
Features

- V_{DS}=30V, I_D=5.2A.
- $R_{DS(ON)}$≤ 32 mΩ, @V_{GS}=10V, I_D=5.2A.
- $R_{DS(ON)}$≤ 38 mΩ, @V_{GS}=4.5V, I_D=3.6A.
- $R_{DS(ON)}$≤ 43 mΩ, @V_{GS}=2.5V, I_D=2.4A.
- Super high dense cell trench design for low on-resistance.
- Rugged and reliable.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

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 11mg

Package outline



Dimensions in inches and (millimeters)

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

Parameter	Symbol	Ratings	Units
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	±12	V
Continuous drain current (Note 1) (T_A=25°C)	I_D	5.2	A
Pulsed drain current (Note 2)	I_{DM}	22	A
Drain-sourec diode forward current (Note 1)	I_S	2.5	A
Power dissipation (Note 1) (T_A=25°C)	P_D	1.25	W
Power dissipation (Note 1) (T_A=75°C)	P_D	0.75	W
Thermal resistance, junction to ambient (Note 1)	$R_{\theta JA}$	100	°C/W
Operation junction temperature	T_J	+150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

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

Parameter	Condition	Symbol	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	V_{GS}=0V, I_D=250A	BV_{DSS}	30			V
Zero gate voltage drain current	V_{DS}=24V, V_{GS}=0V	I_{DSS}			1	μA
Gate-body leakage current	V_{GS}=±12V,V_{DS}=0V	I_{GSS}			±100	nA
On characteristics (Note3)						
Gate threshold voltage	V_{DS}=V_{GS}, I_D=250μA	$V_{GS(th)}$	0.6	0.9	1.4	V
Drain-source on-state resistance	V_{GS}=10V , I_D=5.2A	$R_{DS(on)}$		24	32	mΩ
	V_{GS}=4.5V , I_D=3.6A			26	38	
	V_{GS}=2.5V , I_D=2.4A			32	43	
Forward transconductance	V_{GS}=5V , I_D=5A	g_{FS}		12		S
Dynamic parameters (Note4)						
Intput capacitance	V_{GS}=0V, V_{DS}=15V, f=1.0MHz	C_{iss}		681		pF
Output capacitance		C_{oss}		62		
Reverse transfer capacitance		C_{rss}		39		
Switching parameters (Note4)						
Total gate charge	V_{GS}=10V, V_{DS}=15V, I_D=3A	Q_g		14.5		nC
Gate-source charge		Q_{gs}		3.1		
Gate-drain charge		Q_{gd}		2.2		
Turn-on delay time	V_{DD}=15V, I_D=1A, V_{GEN}=10V, R_L=15Ω, R_{GEN}=6Ω	$t_{d(on)}$		7.2		ns
Turn-on rise time		t_r		3.0		
Turn-off delay time		$t_{d(off)}$		27.5		
Turn-off fall time		t_f		4.1		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 3)	I_S=1A, V_{GS}=0V	V_{SD}			1.2	V

Note: 1. Surface mounted on FR4 board, t ≤ 10 seconds.
2. Pulse width limited by maximum junction temperature.
2. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.
3. Guaranteed by design, not subject to production testing.

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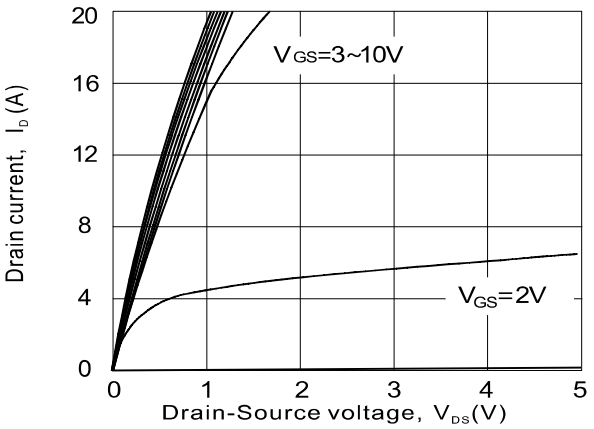
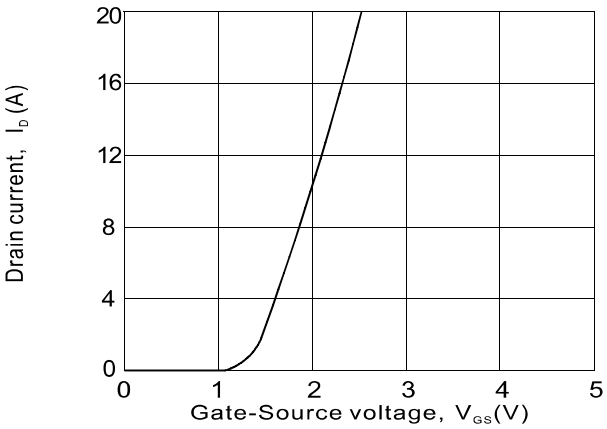
Rating and characteristic curves

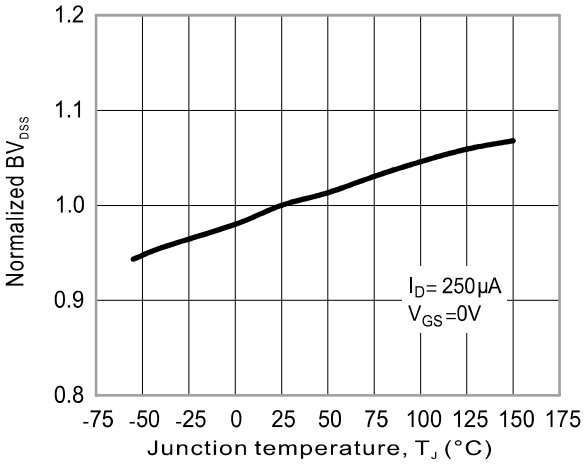
Output characteristics



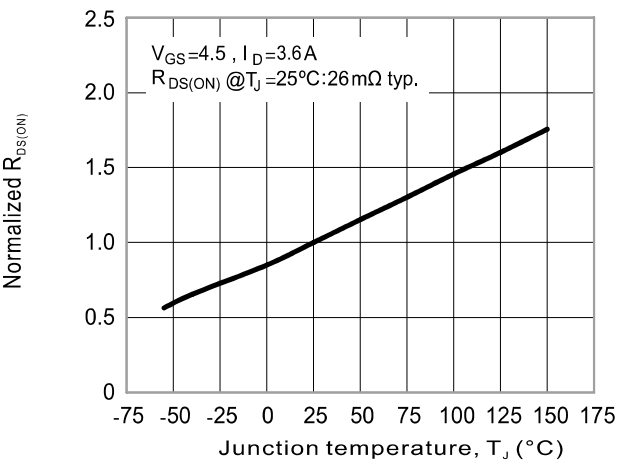
Transfer characteristics



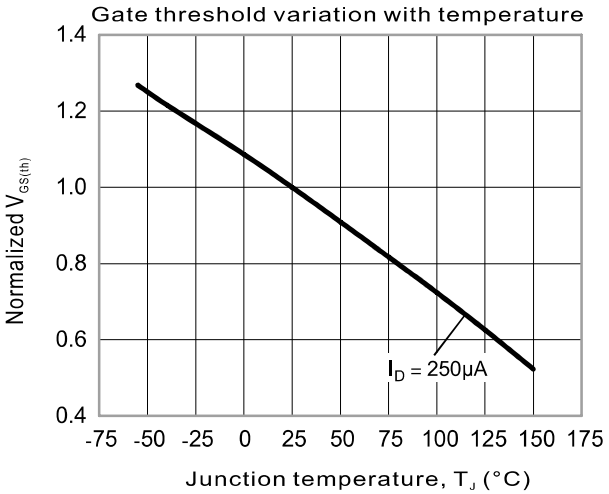
Breakdown voltage variation with temperature



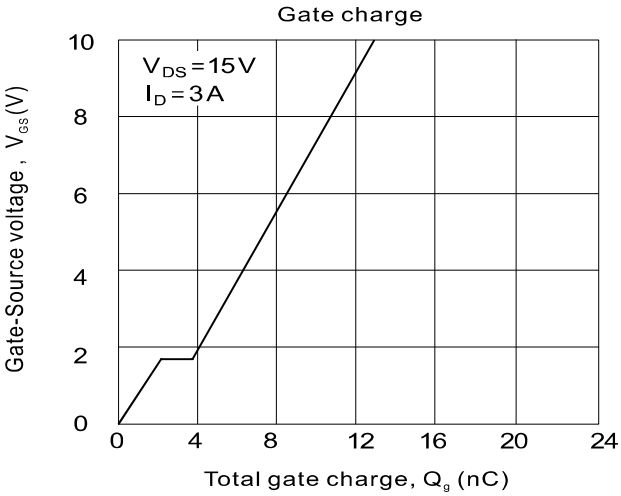
On-resistance variation with temperature



Gate threshold variation with temperature



Gate charge



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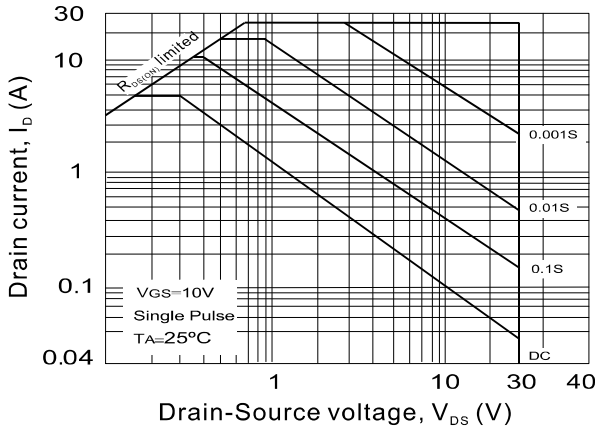
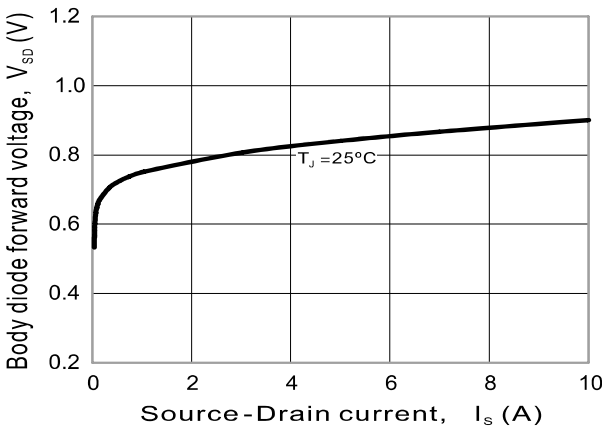
Rating and characteristic curves

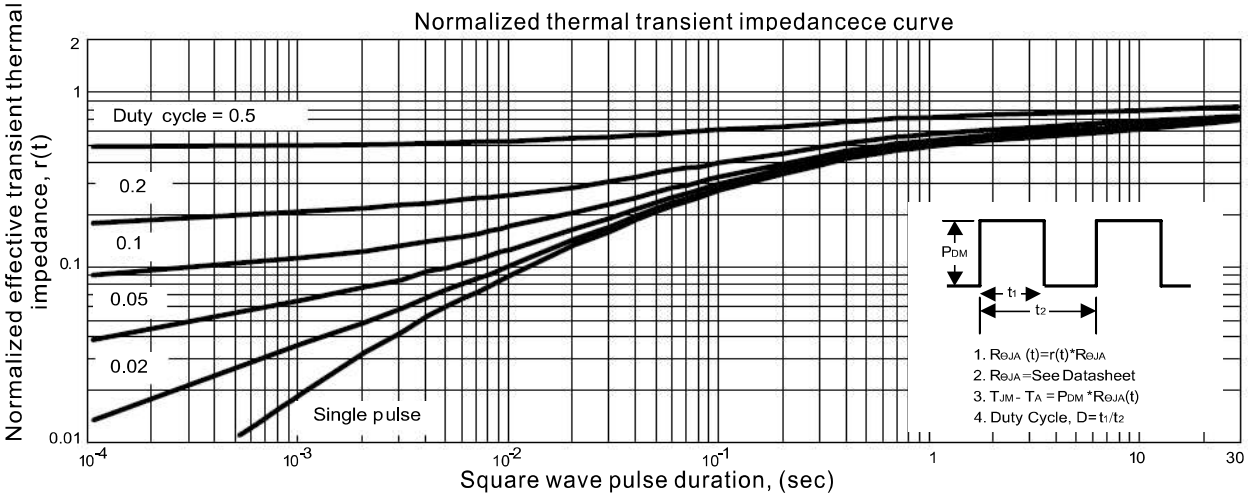
Maximum safe operating area



Body diode forward voltage variation with source current



Normalized thermal transient impedancece curve



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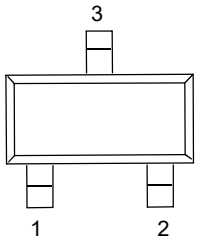
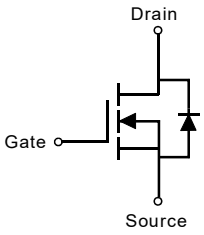
Pinning information

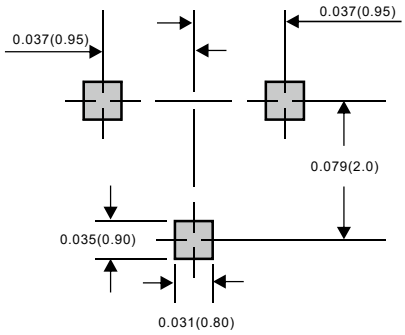
Pin	Simplified outline	Symbol
Pin 1 Gate Pin 2 Source Pin 3 Drain		

Marking

Type number	Marking code
FMNN3400-H	3400C

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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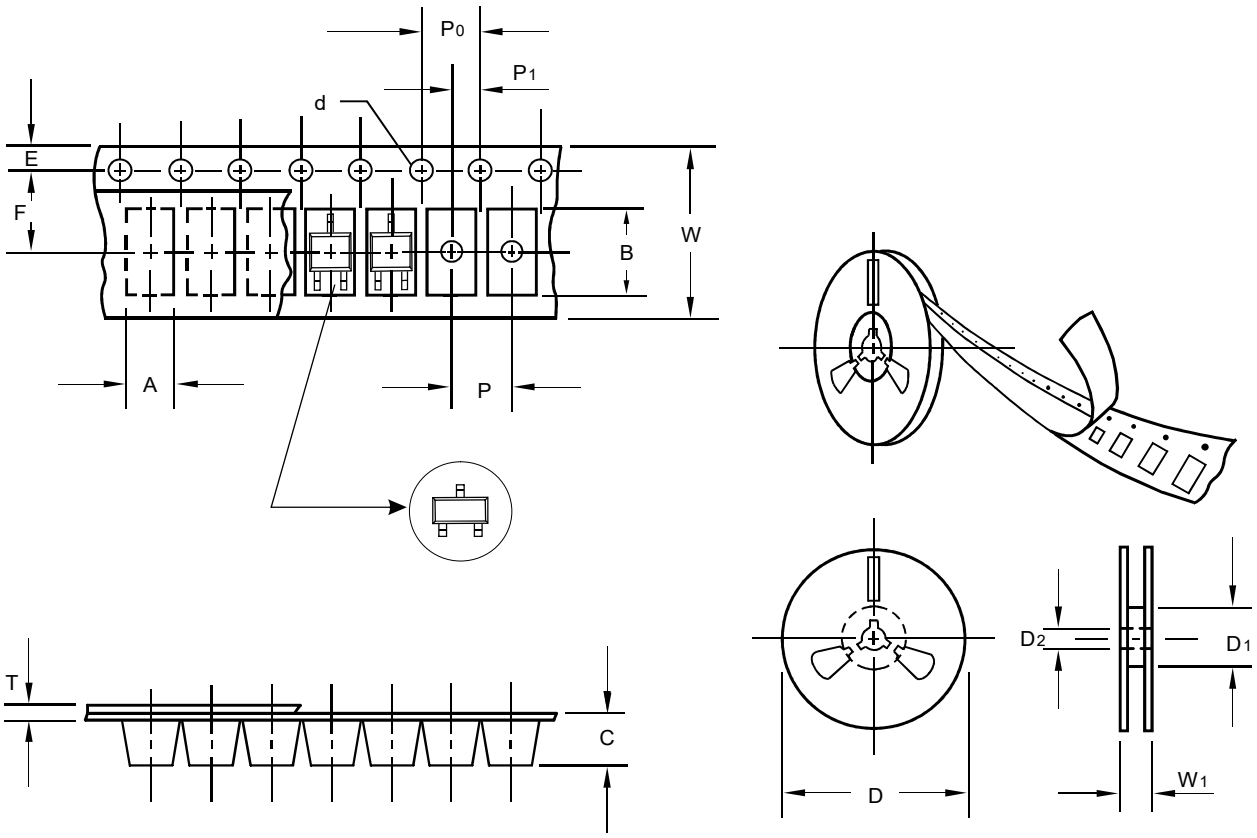
Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.3	3.15
Carrier length	B	0.3	2.77
Carrier depth	C	0.3	1.22
Sprocket hole	d	0.3	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	0.3	0.23
Tape width	W	0.3	8.00
Reel width	W_1	3.0	12.3

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

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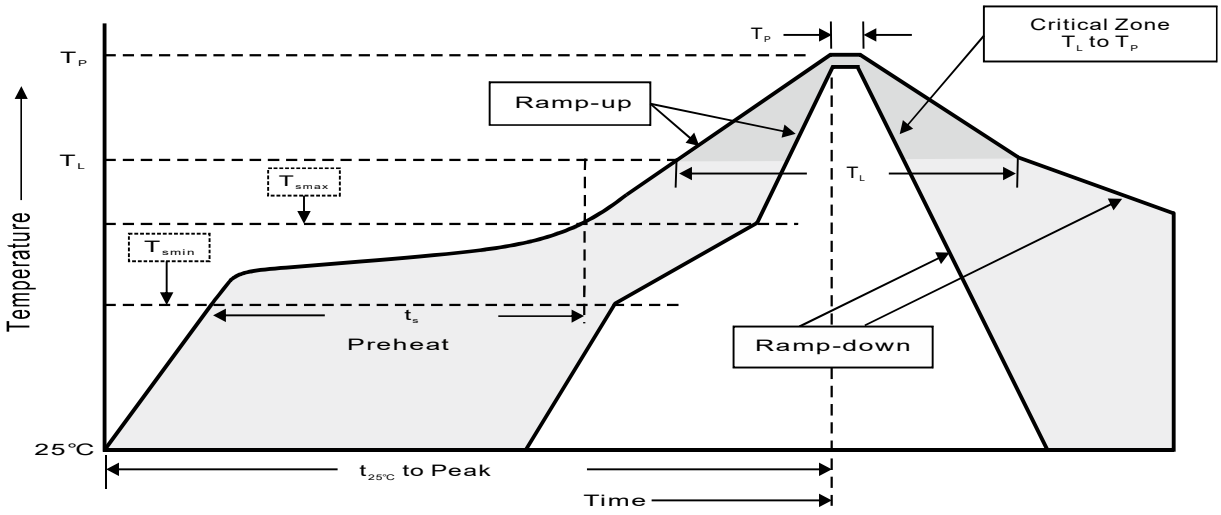
Reel packing

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