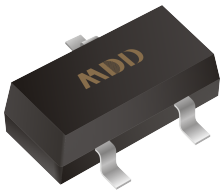


MDD3400

30V N-Channel Enhancement Mode MOSFET

1. Description

This 30V N-channel MOSFET is based on MDD's unique device design to achieve low $R_{DS(ON)}$, fast switching and excellent avalanche characteristics.

2. Features

- High dense cell design for extremely low RDS(ON)
- Exceptional on-resistance and maximum DC current capability

3. Description

- Load Switch for Portable Devices
- Switching voltage regulator
- DC-DC convertor

4. Absolute Maximum Ratings(T_A=25°C unless otherwise noted)

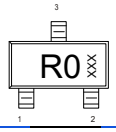
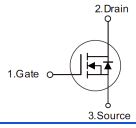
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current (Note 1)	I_D	5.8	A
Pulsed Drain Current (Note 1)	I_{DM}	23	A
Thermal Resistance, Junction-Ambient (Note 2)	$R_{\theta JA}$	100	°C/W
Power Dissipation	P_D	1.5	W
Junction Temperature	T_J	-50~+150	°C
Storage Temperature	T_{stg}	-50~+150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only.
Functional operation above the Recommended Operating Conditions is not implied.
Extended exposure to stresses above the recommended Operating Conditions may affect device reliability

Notes: 1.Pulse width limited by maximum allowable junction temperature
2.The value of PD&RθJAis measured with the device mounted on 1 in2 FR-4board with 2oz.Copper, double sided, in a still air environment with Ta=25.
3.Pulse test ; Pulse width300us, duty cycle2%

Microdiode Semiconductor

5. Pinning information

Pin	Symbol	Description	Simplified outline	Equivalent Circuit	Marking	Package
1	G	Gate			R0 XXX:Date Code	SOT-23
2	S	Source				
3	D	Drain				

6. T_A=25°C unless otherwise specified

Symbol	Parameter		Condition	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		V_{GS}=0V, I_D=250μA	30	—	—	V
I_{GSS}	Gate-Source Leakage Current	Forward	V_{GS}=20V	—	—	100	nA
		Reverse	V_{GS}=-20V	—	—	-100	nA
I_{DSS}	Drain-Source Leakage Current		V_{DS}=24V, V_{GS}=0V	—	—	1	μA
$V_{GS(TH)}$	Gate Threshold Voltage		V_{DS}=VGS, I_D=250μA	0.5	0.8	1.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance		V_{GS}=10V, I_D=10A	—	20	32	mΩ
			V_{GS}=4.5V, I_D=7A	—	22	35	mΩ
			V_{GS}=2.5V, I_D=7A	—	27	45	mΩ

7. Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=15V f=1MHz	—	635	—	pF
C_{oss}	Output Capacitance		—	135	—	pF
C_{rss}	Reverse Transfer Capacitance		—	40	—	pF
Q_g	Total Gate Charge	V_{GS}=4.5V V_{DS}=15V I_D=5A	—	10.5	—	nC
Q_{gs}	Gate Source Charge		—	1.6	—	nC
Q_{gd}	Gate Drain Charge		—	2.7	—	nC

8. Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$t_{d(on)}$	Turn on Delay Time	V_{GS}=4.5V V_{DS}=15V I_D=5A R_G=3.3Ω	—	7.5	—	ns
t_r	Turn on Rise Time		—	18	—	ns
$t_{d(off)}$	Turn Off Delay Time		—	36	—	ns
t_f	Turn Off Fall Time		—	5	—	ns

9. Source Drain Diode Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{SD}	Drain-Source Diode Forward Voltage	I_S=3A, V_{GS}=0V	—	0.82	1.2	V
I_{SD}	Source drain current(Body Diode)	T_A=25°C	—	—	1.5	A

10.Test Circuits And Waveforms

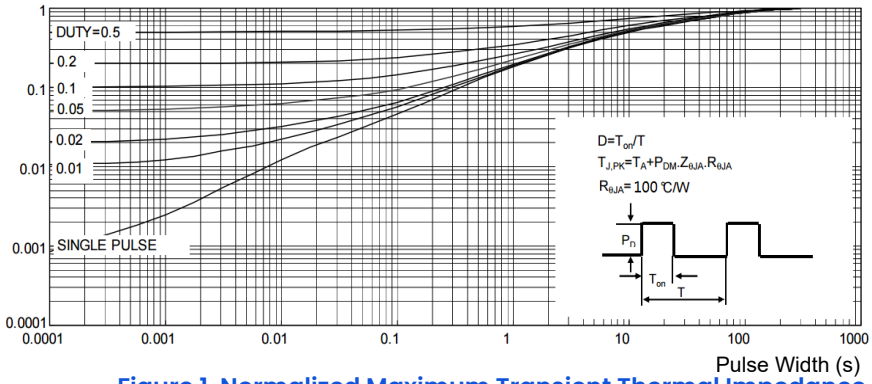


Figure 1. Normalized Maximum Transient Thermal Impedance

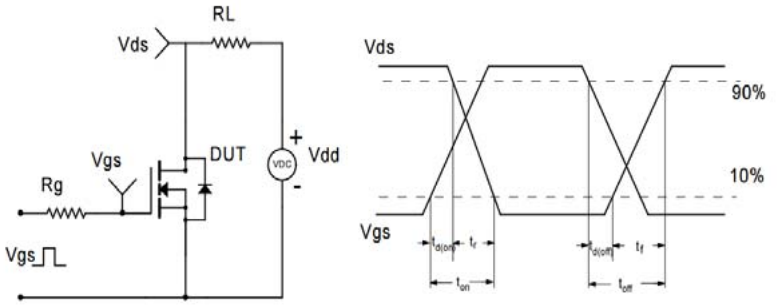


Figure 2.Switchingtime testcircuit & waveforms

The curve above is for reference only.

11.Electrical Characteristics Diagrams

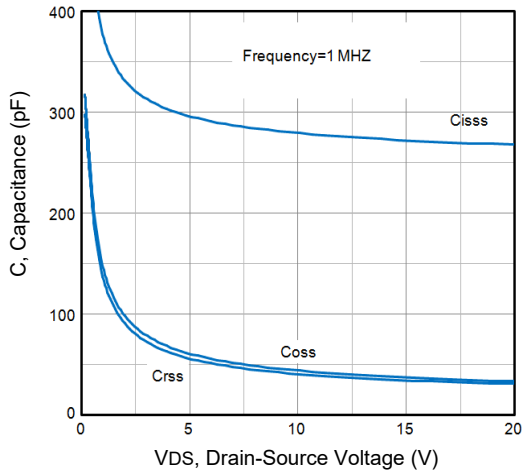


Fig 1. Typical Capacitance Vs. Drain-Source Voltage

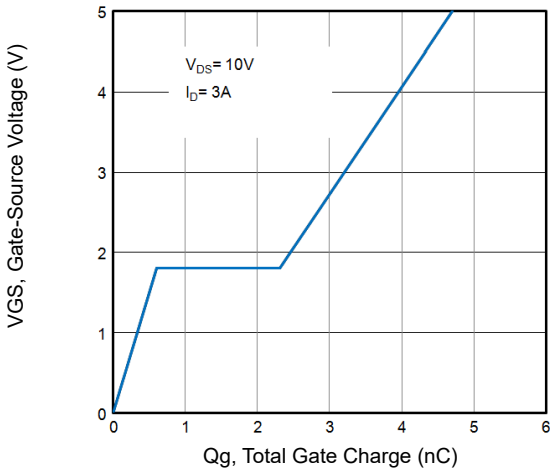


Fig 2. Typical Gate Charge Vs. Gate-Source Voltage

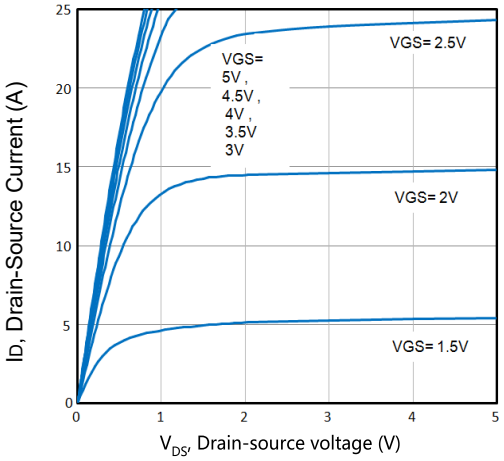


Figure 3. Typ. output characteristics

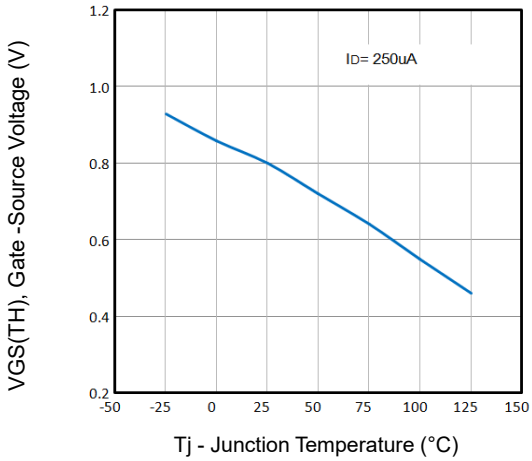


Fig 4. Normalized Threshold Voltage Vs. Temperature

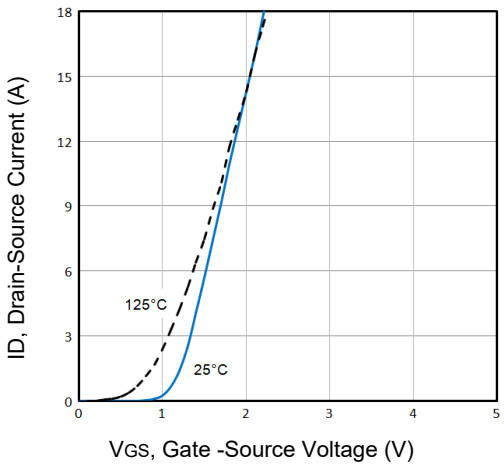


Fig 5. Typical Transfer Characteristics

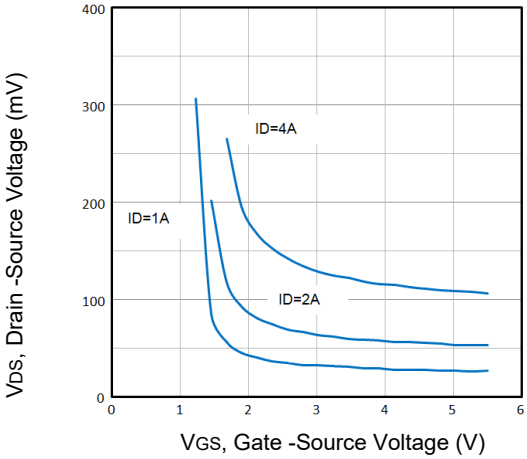


Fig 6. Drain -Source Voltage vs Gate -Source Voltage

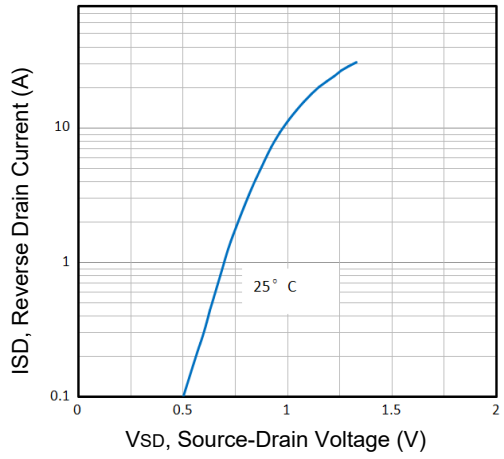


Fig 7. Typical Source-Drain Diode Forward Voltage

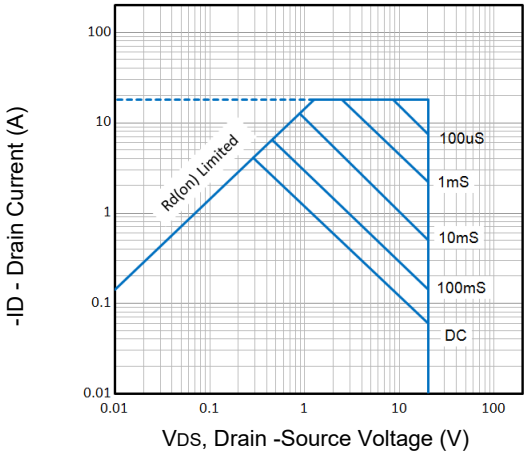
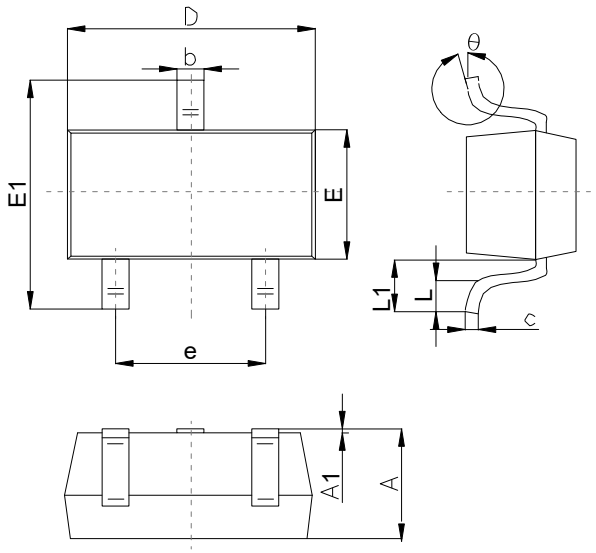


Fig 8. Maximum Safe Operating Area

The curve above is for reference only

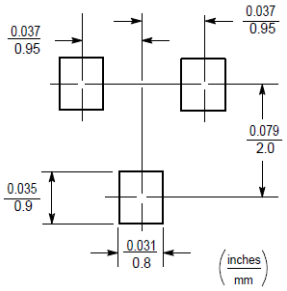
12. Outline Drawing

SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.65		1.40
A1	0.00		0.20
b	0.30		0.55
c	0.08		0.20
D	2.70		3.10
E	1.15		1.65
E1	2.10		2.80
e	1.70		2.10
L	0.15		0.50
L1	0.35		0.70
θ	0°		12°

13. Suggested Pad Layout



Note:

1.Controlling dimension:in/millimeters.

2.General tolerance: ±0.05mm.

3.The pad layout is for reference purposes only.

14. Important Notice and Disclaimer

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