

MDD2333

18V P-Channel Enhancement Mode MOSFET

1. Description

This 18V P-channel MOSFET is based on MDD's unique device design to achieve low $R_{DS(ON)}$, fast switching and excellent avalanche characteristics.

2. Features

- $V_{DS} = -18V$, $I_D = -7A$, $R_{DS(on)}$ typ = $18m\Omega$ @ $V_{GS} = 4.5V$
- Exceptional on-resistance and maximum DC current capability
- High dense cell design for extremely low $R_{DS(ON)}$

3. Application

- Load Switch for Portable Devices
- Battery Powered System
- DC-DC converter
- LCD Display inverter
- Portable Equipment

4. Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-18	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current (Note 1)	I_D	-7.0	A
Pulsed Drain Current (Note 1)	I_{DM}	-28.0	A
Thermal Resistance, Junction-Ambient (Note 2)	$R_{\theta JA}$	65	$^\circ C/W$
Power Dissipation	P_D	2.0	W
Junction Temperature	T_J	-55~+150	$^\circ C$
Storage Temperature	T_{stg}	-55~+150	$^\circ C$

- 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.Surface Mounted on FR4 Board, $t < 10$ sec.

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5. Pinning information

Pin	Symbol	Description	Simplified outline	Equivalent Circuit	Marking	Package
1	G	Gate			2333 XXYY:Date Code	SOT-23
2	S	Source				
3	D	Drain				

6. $T_A=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Condition	Min	Typ	Max	Unit	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-18	—	—	V	
I_{GSS}	Gate-Source Leakage Current	Forward	$V_{GS}=-12V$	—	—	-100	nA
		Reverse	$V_{GS}=12V$	—	—	100	nA
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-18V, V_{GS}=0V$	—	—	-1	μA	
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.3	-0.7	-1.5	V	
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-4.5V, I_D=-5A$	—	18	25	m Ω	
		$V_{GS}=-2.5V, I_D=-3A$	—	21.5	30	m Ω	

7. Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS}=0V$ $V_{DS}=-10V$ $f=1.0MHz$	—	1210	—	pF
C_{oss}	Output Capacitance		—	310	—	pF
C_{rss}	Reverse Transfer Capacitance		—	290	—	pF
Q_g	Total Gate Charge	$V_{GS}=-4.5V$ $V_{DS}=-10V$ $I_D=-1A$	—	9	—	nC
Q_{gs}	Gate Source Charge		—	1.6	—	nC
Q_{gd}	Gate Drain Charge		—	3	—	nC

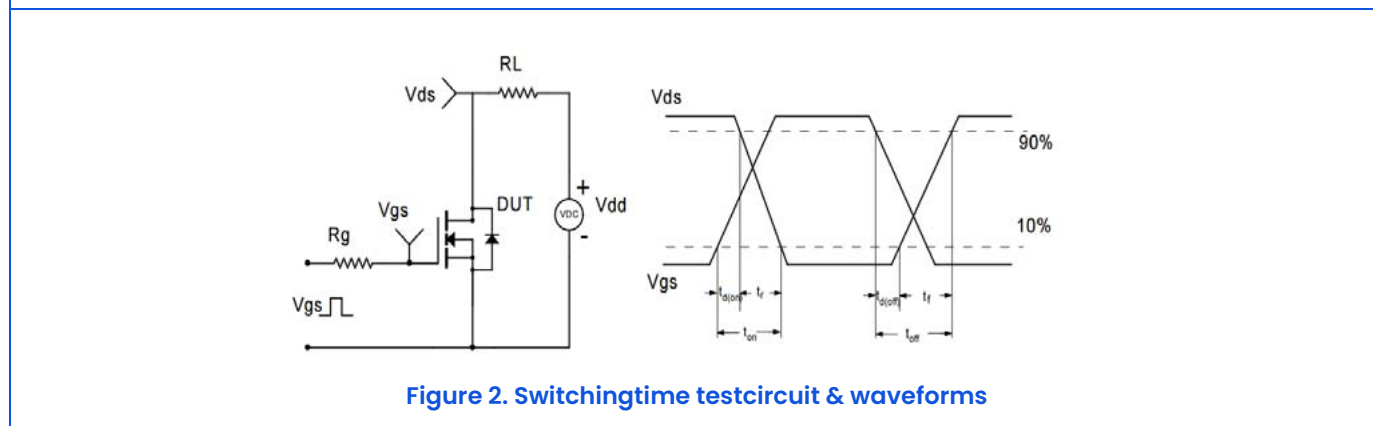
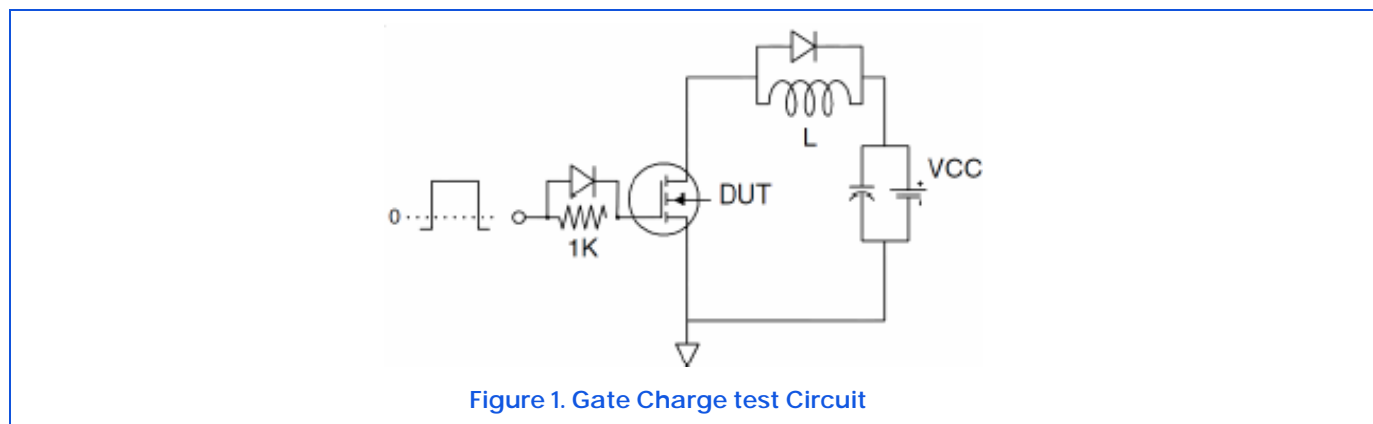
8. Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$t_{d(on)}$	Turn on Delay Time	$V_{GS}=-4.5V$ $V_{DS}=-10V$ $I_D=-1A$ $R_{\theta}=6\Omega$	—	30	—	ns
t_r	Turn on Rise Time		—	25	—	ns
$t_{d(off)}$	Turn Off Delay Time		—	70	—	ns
t_f	Turn Off Fall Time		—	50	—	ns

9. Source Drain Diode Characteristics

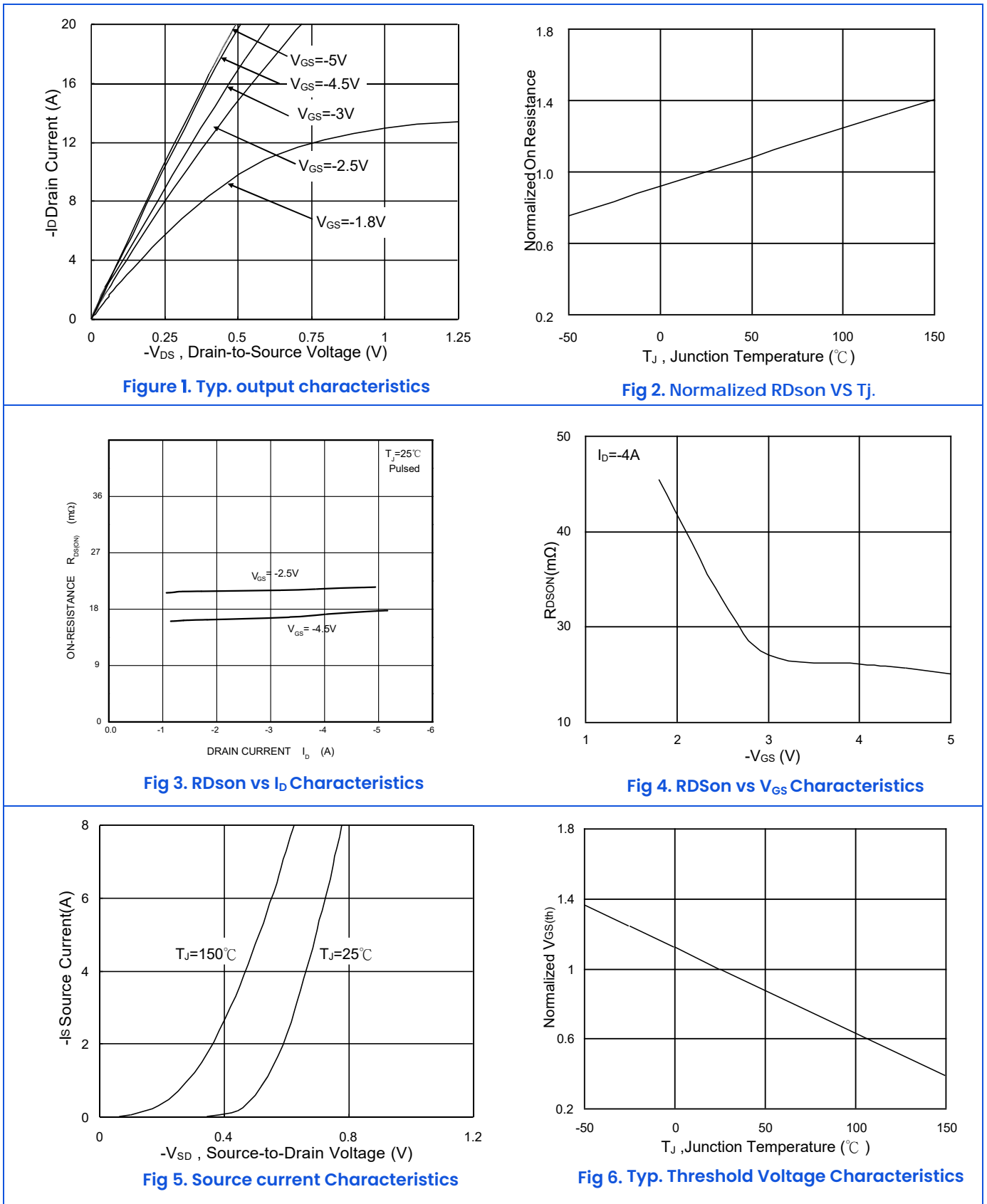
Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{SD}	Drain-Source Diode Forward Voltage	$I_S=-1A, V_{GS}=0V$	—	-0.8	-1.2	V
I_{SD}	Source drain current(Body Diode)	$T_A=25^\circ\text{C}$	—	—	-7.0	A

10. Test Circuits And Waveforms



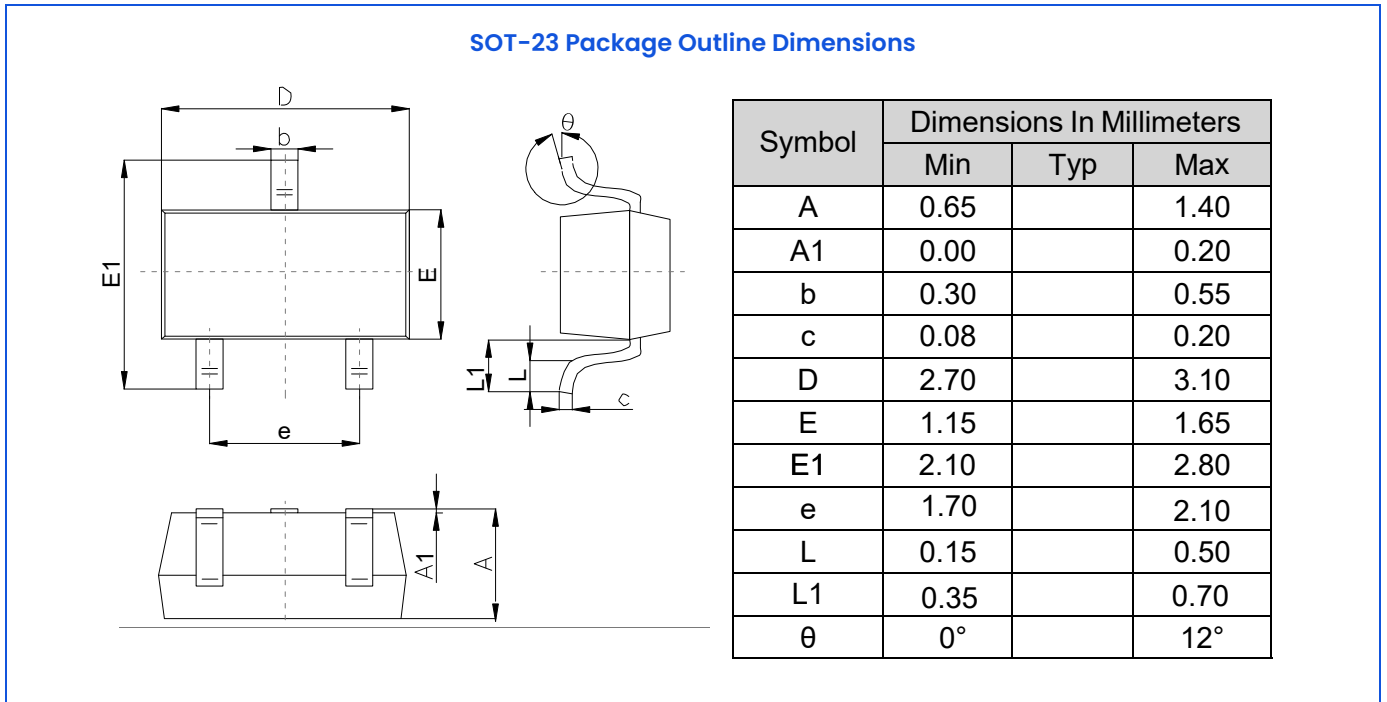
The curve above is for reference only.

II. Electrical Characteristics Diagrams

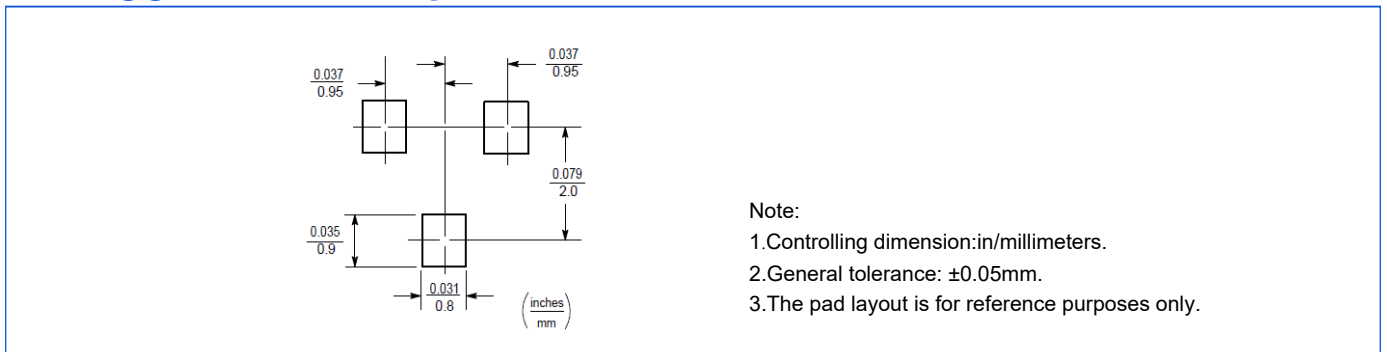


The curves above are for reference only.

12. Outline Drawing



13. Suggested Pad Layout



14. Important Notice and Disclaimer

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