

MDD06P03C

30V P-Channel Enhancement Mode MOSFET

1. Description

This 30V 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

- High dense cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

3. Application

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

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

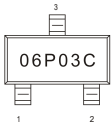
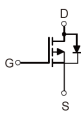
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 25	V
Continuous Drain Current (Note 1)	I_D	-6.0	A
Pulsed Drain Current (Note 1)	I_{DM}	-24.0	A
Thermal Resistance, Junction-Ambient (Note 2)	$R_{\theta JA}$	100	$^{\circ}\text{C}/\text{W}$
Power Dissipation	P_D	1.25	W
Junction Temperature	T_J	-55~+150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55~+150	$^{\circ}\text{C}$

- 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.

5. Pinning information

Pin	Symbol	Description	Simplified outline	Equivalent Circuit	Marking	Package
1	G	Gate			06P03C	SOT-23-3L
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		$V_{GS}=0V, I_D=-250\mu A$	-30	—	—	V
I _{ess}	Gate-Source Leakage Current	Forward	$V_{GS}=-20V$	—	—	-100	nA
		Reverse	$V_{GS}=20V$	—	—	100	nA
I _{DSS}	Drain-Source Leakage Current		$V_{DS}=-30V, V_{GS}=0V$	—	—	-1	μA
$V_{GS(TH)}$	Gate Threshold Voltage		$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.5	-2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance		$V_{GS}=-10V, I_D=-6A$	—	—	27	m Ω
			$V_{GS}=-4.5V, I_D=-4A$	—	—	37	m Ω

7. Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C _{iss}	Input Capacitance	$V_{GS}=0V$ $V_{DS}=-15V$ $f=1.0MHz$	—	890	—	pF
C _{oss}	Output Capacitance		—	111	—	pF
C _{rss}	Reverse Transfer Capacitance		—	90	—	pF
Q _g	Total Gate Charge	$V_{GS}=-10V$ $V_{DS}=-15V$ $I_D=-6A$	—	25	—	nC
Q _{gs}	Gate Source Charge		—	4.8	—	nC
Q _{gd}	Gate Drain Charge		—	3.9	—	nC

8. Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
t _{d(on)}	Turn on Delay Time	$V_{GS}=-10V$ $V_{DS}=-15V$ $I_D=-6A$ $R_G=3.3\Omega$	—	13	—	ns
t _r	Turn on Rise Time		—	35	—	ns
t _{d(off)}	Turn Off Delay Time		—	22	—	ns
t _f	Turn Off Fall Time		—	12	—	ns

9. Source Drain Diode Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V _{SD}	Drain-Source Diode Forward Voltage	$I_S=-6A, V_{GS}=0V$	—	-0.8	-1.2	V
I _{SD}	Source drain current(Body Diode)	$T_A=25^{\circ}\text{C}$	—	—	-2.0	A

10. Test Circuits And Waveforms

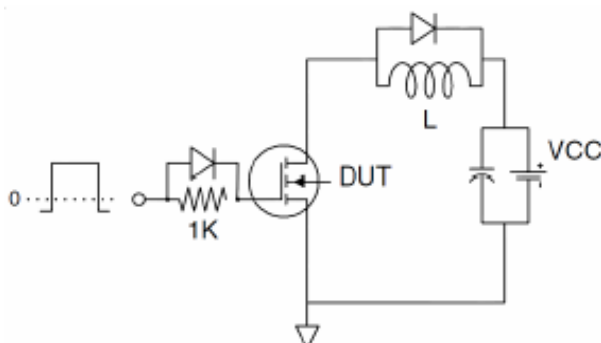


Figure 1. Gate Charge test Circuit

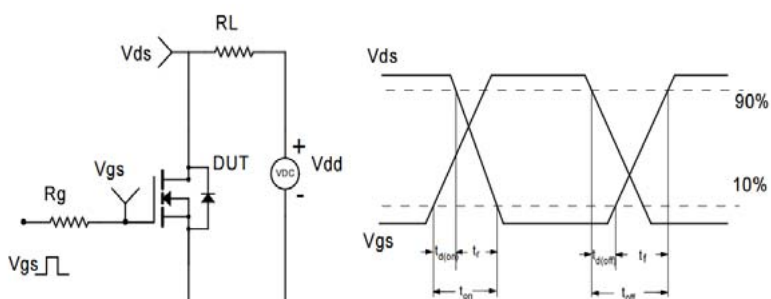


Figure 2. Switching time test circuit & waveforms

The curve above is for reference only.

11. Electrical Characteristics Diagrams

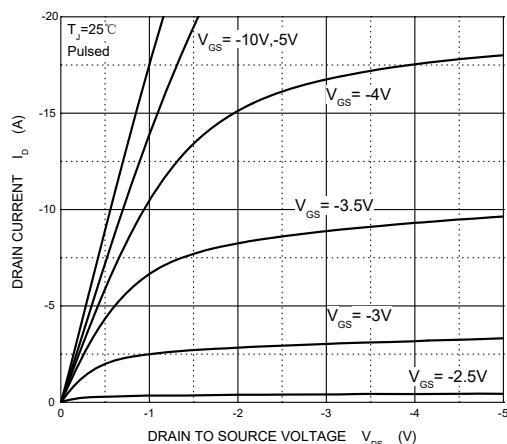


Figure 1. Typ. output characteristics

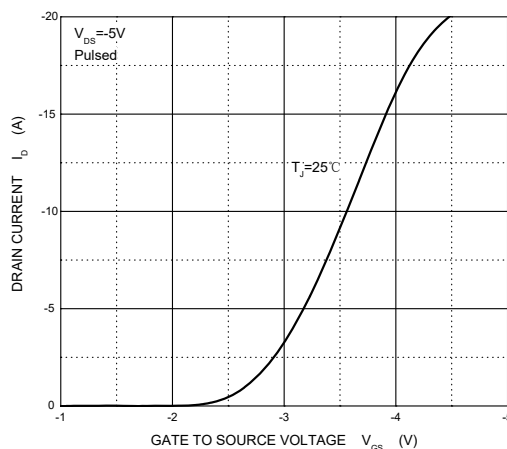


Fig 2. Transfer Charhacteristics

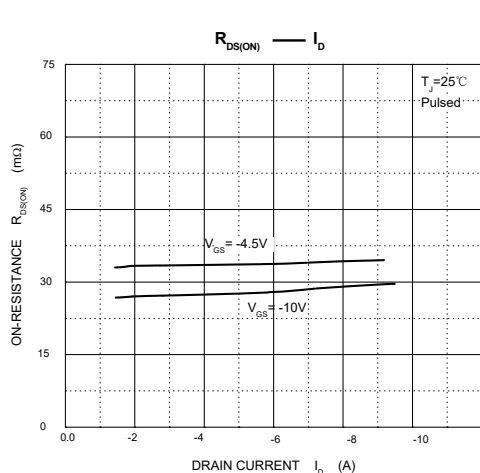


Fig 3. RDson vs I_D Characteristics

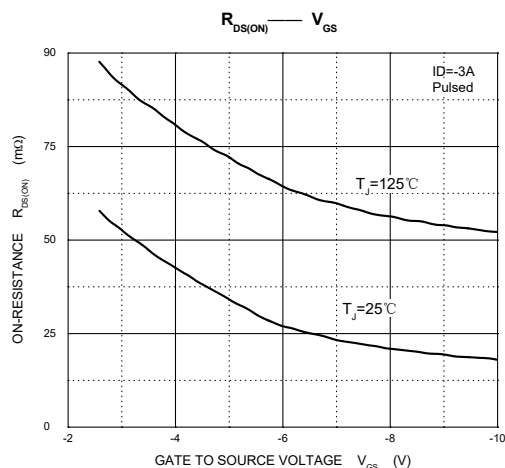


Fig 4. RDson vs V_{GS} Characteristics

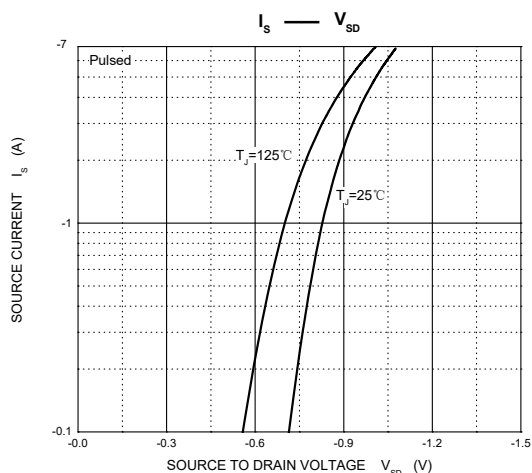


Fig 5. Source current Characteristics

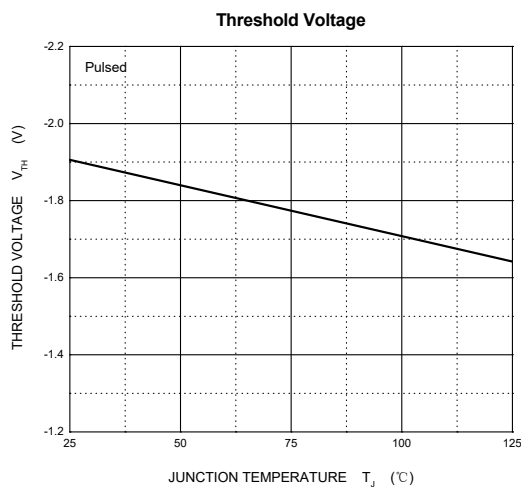
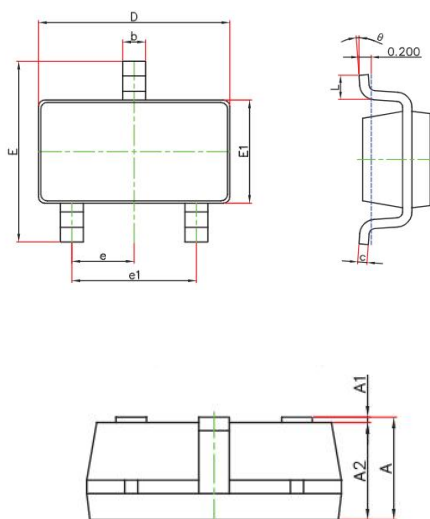


Fig 6. Typ. Threshold Voltage Characteristics

The curve above is for reference only

12. Outline Drawing

SOT-23-3L Package Outline Dimensions



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

13. Important Notice and Disclaimer

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