

MDD8205

Dual 20V N-Channel Enhancement Mode MOSFET

1. Description

This 20V N-channel MOSFET is a dual die type based on MDD's unique device design to achieve low $R_{DS(on)}$ and fast switching 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)

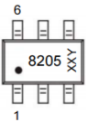
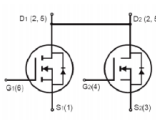
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current (Note 1)	I_D	5.0	A
Pulsed Drain Current (Note 1)	I_{DM}	25	A
Thermal Resistance, Junction-Ambient (Note 2)	$R_{\theta JA}$	80	$^{\circ}\text{C}/\text{W}$
Power Dissipation	P_D	1.5	W
Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +150$	$^{\circ}\text{C}$

- 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
4,6	G	Gate			8205 XXY:Date Code	SOT-23-6L
1,3	S	Source				
2,5	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		$V_{GS}=0V, I_D=250\mu A$	20	—	—	V
I _{ess}	Gate-Source Leakage Current	Forward	$V_{GS}=12V$	—	—	100	nA
		Reverse	$V_{GS}=-12V$	—	—	-100	nA
I _{DSS}	Drain-Source Leakage Current		$V_{DS}=20V, V_{GS}=0V$	—	—	1	μA
$V_{GS(TH)}$	Gate Threshold Voltage		$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.65	1	V
R _{DS(ON)}	Drain-Source On-State Resistance		$V_{GS}=4.5V, I_D=3A$	—	23	30	m Ω
			$V_{GS}=2.5V, I_D=2.5A$	—	30	39	m Ω

7. Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C _{iss}	Input Capacitance	$V_{GS}=0V$ $V_{DS}=10V$ $f=1.0MHz$	—	500	—	pF
C _{oss}	Output Capacitance		—	70	—	pF
C _{rss}	Reverse Transfer Capacitance		—	65	—	pF
Q _g	Total Gate Charge	$V_{GS}=4.5V$ $V_{DS}=10V$ $I_D=5A$	—	5	—	nC
Q _{gs}	Gate Source Charge		—	0.9	—	nC
Q _{gd}	Gate Drain Charge		—	1.4	—	nC

8. Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
t _{d(on)}	Turn on Delay Time	$V_{GS}=4.5V$ $V_{DS}=10V$ $I_D=1A$ $R_{\theta}=6\Omega$	—	16	—	ns
t _r	Turn on Rise Time		—	17	—	ns
t _{d(off)}	Turn Off Delay Time		—	30	—	ns
t _f	Turn Off Fall Time		—	10	—	ns

9. Source Drain Diode Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V _{SD}	Drain-Source Diode Forward Voltage	$I_S=5A, V_{GS}=0V$	—	0.8	1.2	V

10. Test Circuits And Waveforms

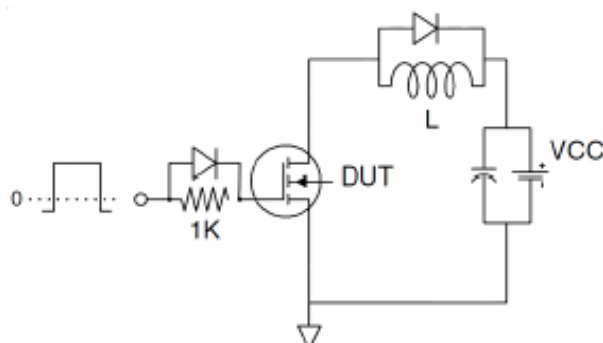


Figure 1. Gate Charge test Circuit

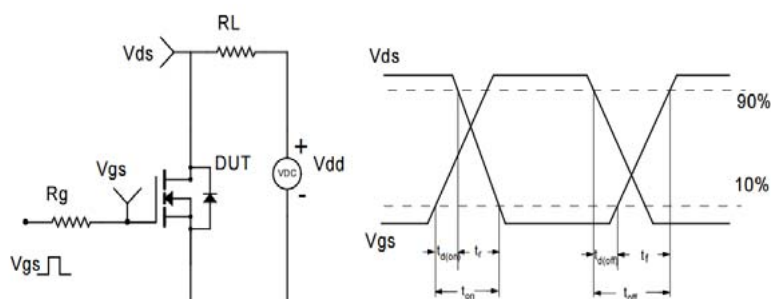


Figure 2. Switching time test circuit & waveforms

The curve above is for reference only.

11. Electrical Characteristics Diagrams

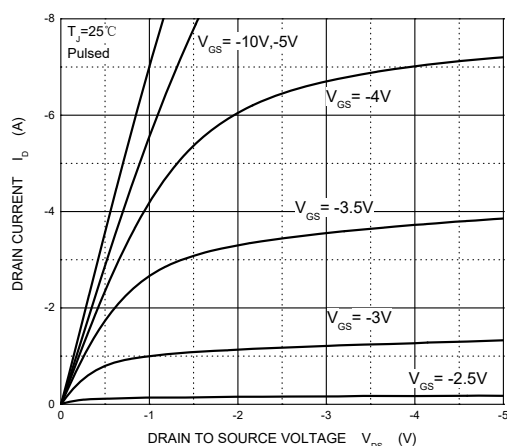


Figure 1. Typ. output characteristics

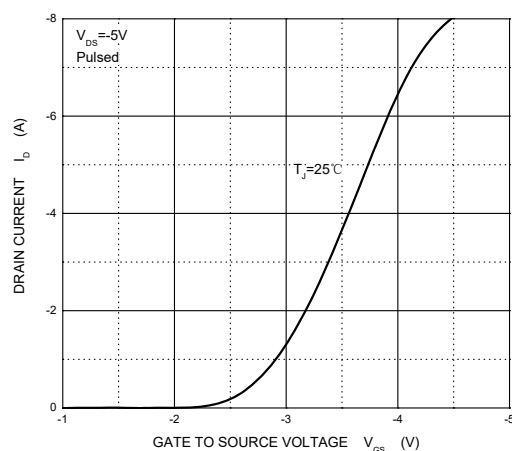


Fig 2. Transfer Charhacteristics

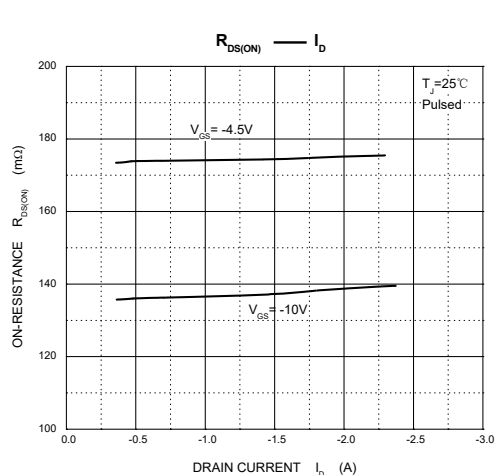
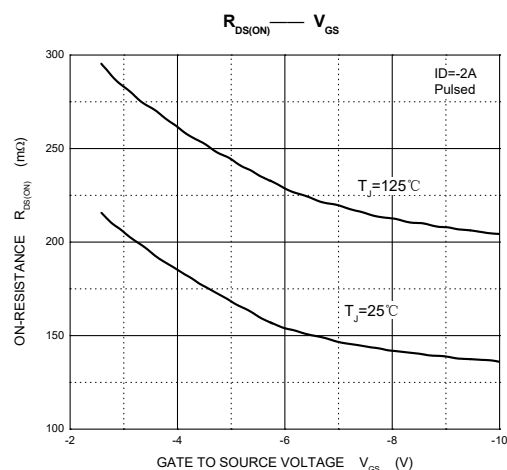
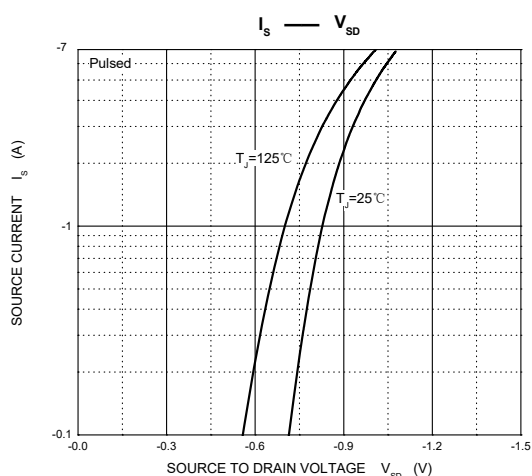
Fig 3. RDson vs I_D CharacteristicsFig 4. RDson vs V_{GS} Characteristics

Fig 5. Source current Characteristics

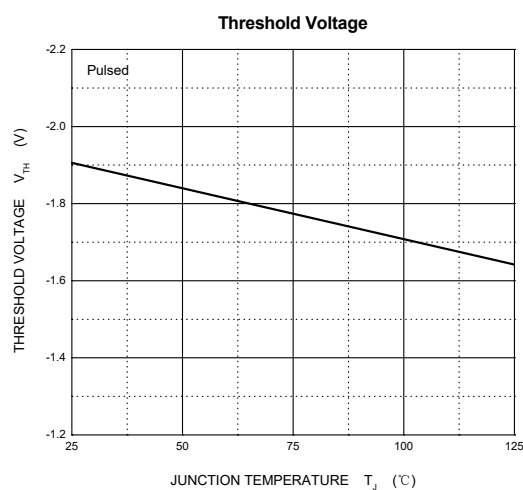
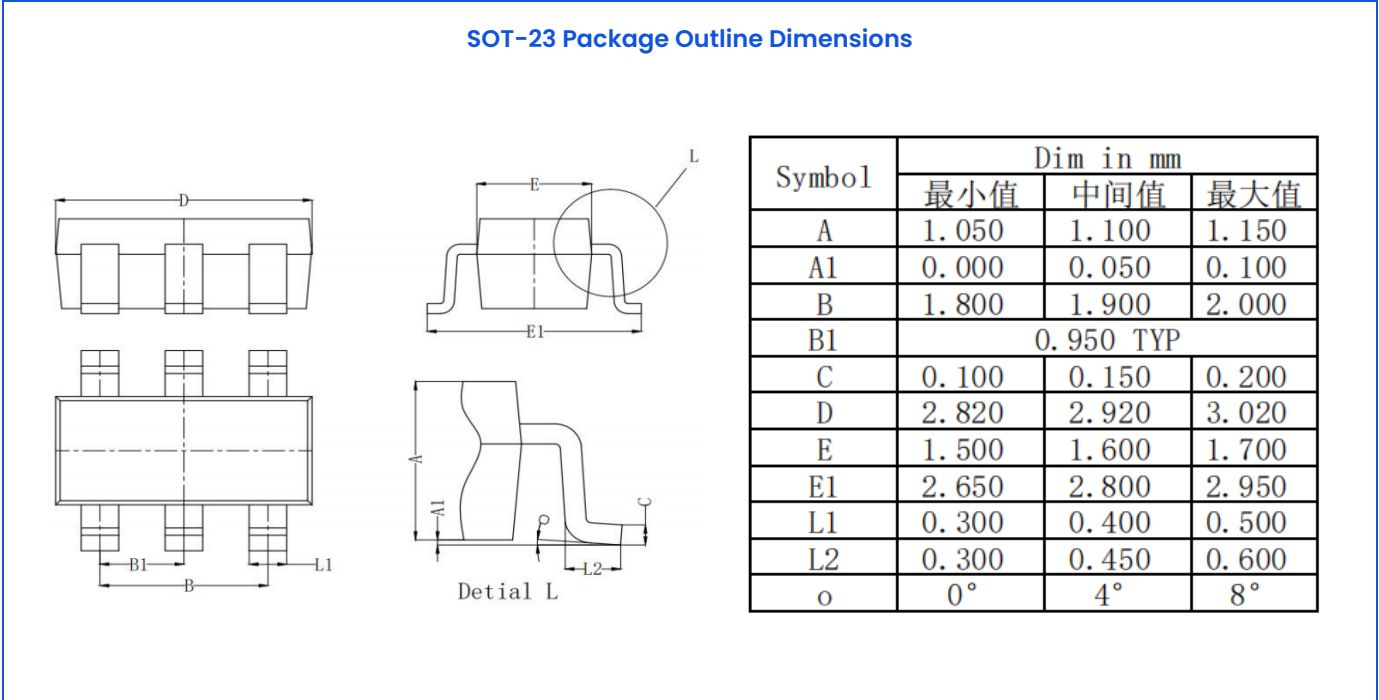


Fig 6. Typ. Threshold Voltage Characteristics

The curve above is for reference only

12. Outline Drawing



13. Important Notice and Disclaimer

Microdiode Electronics (Shenzhen) reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design,purchase or use.

Microdiode Electronics (Shenzhen) makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, not does Microdiode Electronics (Shenzhen) assume any liability for application assistance or customer product design. Microdiode Electronics (Shenzhen) does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of Microdiode Electronics (Shenzhen).

Microdiode Electronics (Shenzhen) products are not authorized for use as critical components in life support devices or systems without express written approval of Microdiode Electronics (Shenzhen).