MDDG10R08G

100V N-Channel Enhancement Mode MOSFET

1. Description

This N-Channel MV MOSFET is produced using MDD Semiconductor's advanced Power Trench process that incorporates Shielded Gate technology. This process has been optimized to minimize on-state resistance and yet maintain superior switching performance with best in class soft body diode.

2. Features

- Max RDS(on) = 8 mΩ at VGS = 10 V, ID = 35 A
- Extremely Low Reverse Recovery Charge, Qrr
- 100% UIS Tested
- RoHS Compliant

3. Application

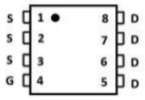
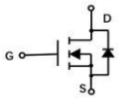
- Synchronous Rectification for AC / DC Quick Charger
- Motor Drives and Uninterruptible Power Supplies
- Micro Solar Inverter
- Battery management System

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Note 1)	I_D	75	A
Pulsed Drain Current (Note 2)	I_{DM}	240	A
Single Pulsed Avalanche Energy (Note 3)	E_{AS}	130	mJ
Thermal Resistance, steady-state	$R_{\theta JA}$	50	°C/W
Power Dissipation	P_D	69	W
Junction Temperature	T_J	-55~+150	°C
Storage Temperature	T_{stg}	-55~+150	°C

Note: 1)Calculated continuous current based on maximum allowable junction temperature.
2)Repetitive rating, pulse width limited by max. junction temperature.
3)E_{AS} condition：T_J=25°C, V_{DD}=50V, V_{GS}=10V, L= 0.5mH, R_g= 25Ω, I_{AS}=23A.

5. Pinning information

Pin	Symbol	Description	Simplified outline	Equivalent Circuit	Marking	Package
4	G	Gate			MDD G10R08G	PDFN5*6-8L
5-8	D	Drain				
1-3	S	Source				

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	100	—	—	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}=100V, V_{GS}=0V	—	—	1	μA
$V_{GS(TH)}$	Gate Threshold Voltage		V_{DS}=VGS, I_D=250μA	1.5	2.0	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance		V_{GS}=10V, I_D=35A	—	6.0	8	mΩ
			V_{GS}=4.5V, I_D=30A	—	7.7	11	mΩ

7. Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=50V f=1MHz	—	2000	—	pF
C_{oss}	Output Capacitance		—	638	—	pF
C_{rss}	Reverse Transfer Capacitance		—	21	—	pF
Q_g	Total Gate Charge	V_{GS}=10V V_{DS}=50V I_D=30A	—	41	—	nC
Q_{gs}	Gate Source Charge		—	10.3	—	nC
Q_{gd}	Gate Drain Charge		—	7.5	—	nC

8. Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$t_{d(on)}$	Turn on Delay Time	V_{GS}=10V V_{DD}=50V I_D=30A R_G=2.7Ω	—	11	—	ns
t_r	Turn on Rise Time		—	36	—	ns
$t_{d(off)}$	Turn Off Delay Time		—	33	—	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=30A, V_{GS}=0V	—	0.85	—	V
t_{rr}	Body Diode Reverse Recovery Time	IF=30A di/dt=100A/μs	—	50	—	ns
Q_{rr}	Body Diode Reverse Recovery Charge		—	71	—	nC

10.Test Circuits And Waveforms

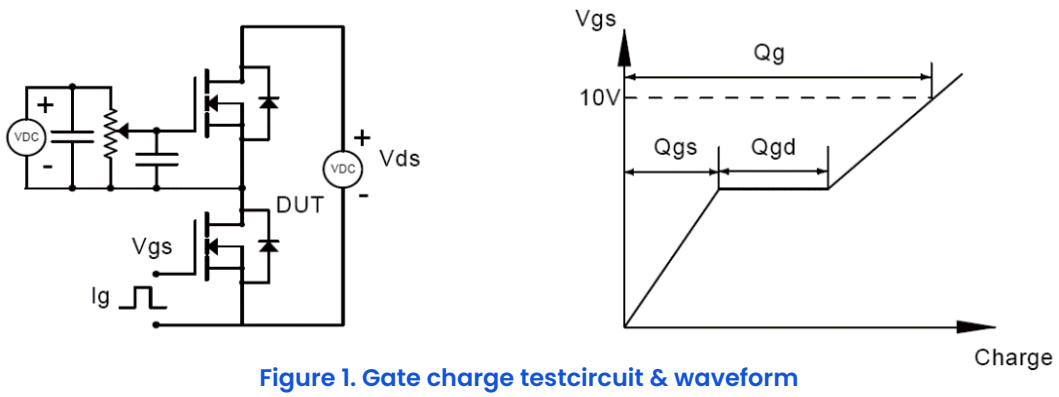


Figure 1. Gate charge testcircuit & waveform

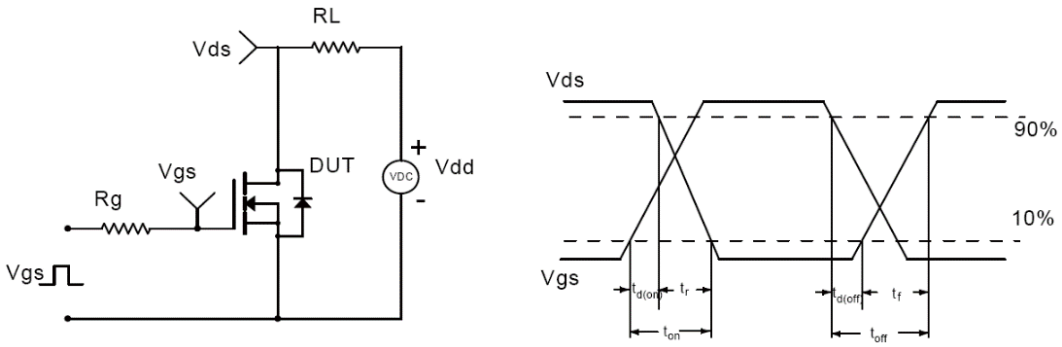


Figure 2.Switching time testcircuit & waveforms

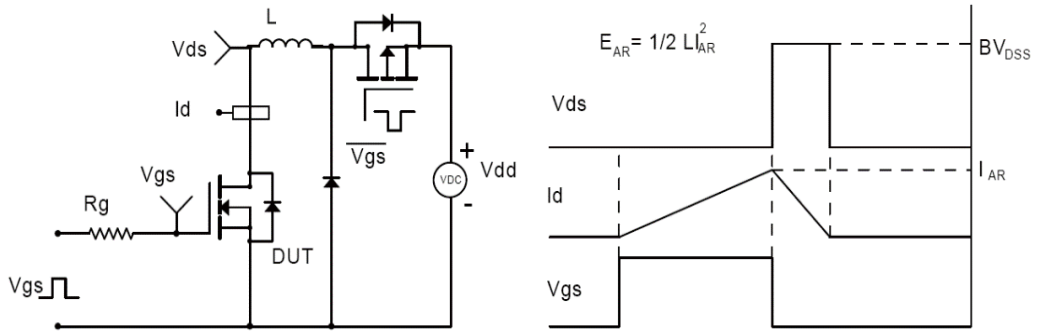


Figure 3.Unclamped inductive switching (UIS)test circuit & waveforms

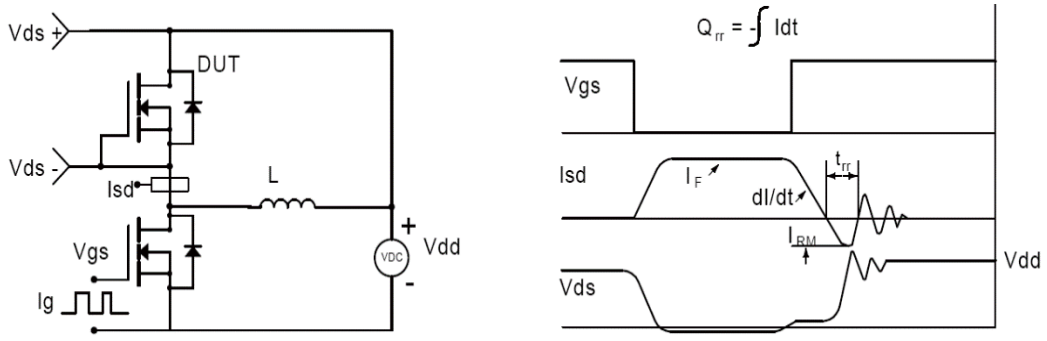


Figure 4. Diode reverse recoverytest circuit& waveforms

11.Electrical Characteristics Diagrams

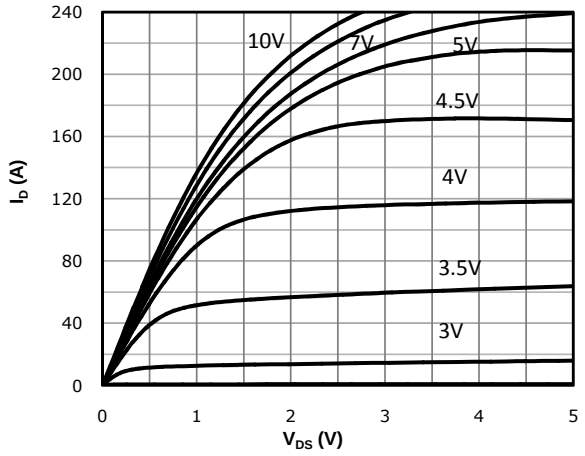


Figure 1. Typ. output characteristics

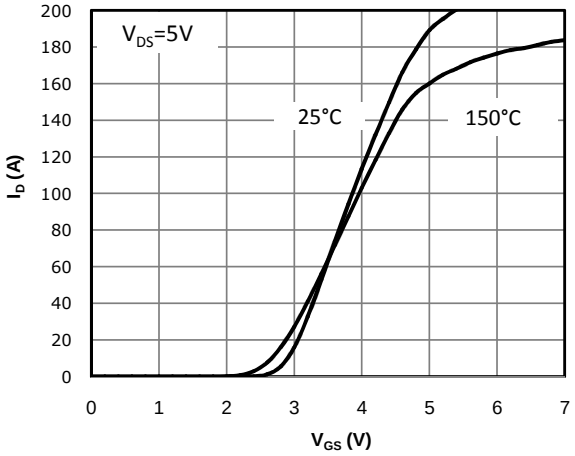


Figure 2. Typ. transfer characteristics

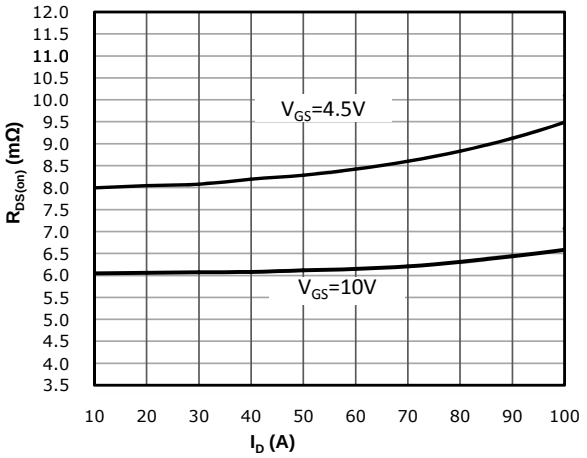


Figure 3. On-Resistance vs. Drain Current

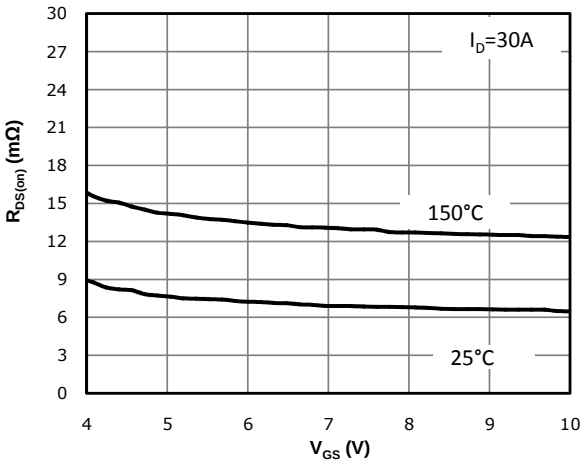


Figure 4. On-Resistance vs. Gate Voltage

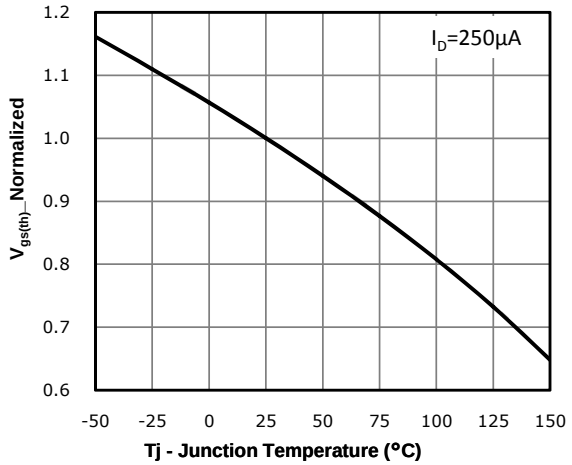


Figure 5. Normalized Threshold Voltage vs. Junction Temperature

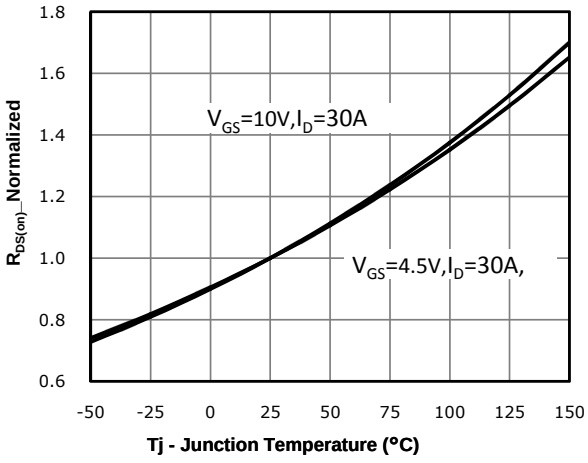
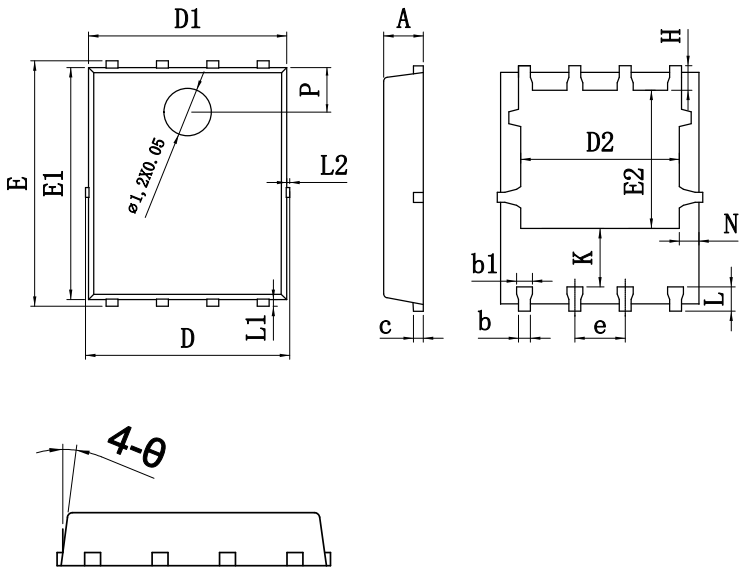


Figure 6. On-Resistance vs. Junction Temperature

12. Outline Drawing

PDFN5*6-8L Package Outline Dimensions



SYMBOL	mm		
	MIN	NOM	MAX
✻A	0.95	1.00	1.05
✻b	0.25	0.30	0.35
✻b1	0.30	0.40	0.50
✻c	0.20	0.25	0.30
D	5.15BSC		
✻D1	4.90	5.00	5.10
D2	3.90	4.01	4.20
✻e	1.17	1.27	1.37
E	6.15BSC		
✻E1	5.75	5.85	5.95
E2	3.35	3.50	3.65
H	0.51	0.61	0.71
K	1.10	1.35	1.50
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
L2	-	-	0.12
N	0.40	0.50	0.60
P	0.95	1.10	1.25
θ	9°	11°	13°

✻ is the key control dimension

13. Important Notice and Disclaimer

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