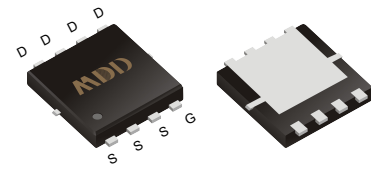


V_{DS}	40V
$I_D(T_c=25^\circ C)$	150A
$R_{DS(on),max}$	2.8m Ω @ $V_{GS}=10V$
$Q_{g,typ}$	40nC

PDFN5*6



Features

- N-channel, optimized for high speed smooth switching
- Excellent Gate charge $\times R_{DS(on)}$ (FOM)
- Very low on-resistance $R_{DS(on)}$
- 100% UIS Tested

Application

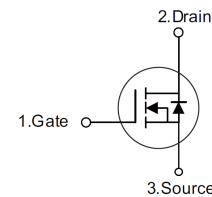
- DC-DC conversion
- Hard switching and high speed circuit

Marking



XXX: Date Code

Equivalent Circuit



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	150	A
Pulsed Drain Current (Note 1)	$I_{D,pulse}$	500	A
Continuous Diode Forward Current	I_S	150	A
Diode Pulsed Current	$I_{S,pulse}$	400	A
Thermal Resistance, Junction-Case	$R_{\theta JC}$	1.4	$^\circ C/W$
Avalanche Energy Single Pulsed (Note 2)	E_{AS}	320	mJ
Power Dissipation	P_D	89	W
Junction Temperature	T_J	-55 ~ +150	$^\circ C$
Storage Temperature	T_{stg}	-55 ~ +150	$^\circ C$

Ta = 25°C unless otherwise specified

Symbol	Parameter	Condition	Min	Typ	Max	Unit	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	--	--	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	$V_{DS}=40V, V_{GS}=0V$	--	--	1	μA	
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V	
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=30A$	--	2.3	2.8	m Ω	
	Drain-Source On-State Resistance	$V_{GS}=4.5V, I_D=20A$	--	3.0	3.6	m Ω	

Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS}=0V$	--	3000	--	pF
C_{oss}	Output Capacitance	$V_{DS}=20V$	--	895	--	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0MHz$	--	37	--	pF
Q_g	Total Gate Charge	$V_{GS}=10V,$ $V_{DS}=20V,$ $I_D=75A$	--	40	--	nC
Q_{gs}	Gate Source Charge	(Note 3,4)	--	8.0	--	nC
Q_{gd}	Gate Drain Charge		--	7.0	--	nC

Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$t_{d(on)}$	Turn on Delay Time	$V_{GS}=10V,$	--	13	--	ns
t_r	Turn on Rise Time	$V_{DS}=20V,$ $I_D=75A,$	--	3.0	--	ns
$t_{d(off)}$	Turn Off Delay Time	$R_G=1.6\Omega$	--	52	--	ns
t_f	Turn Off Fall Time	(Note 3,4)	--	24	--	ns

Source Drain Diode Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{SD}	Drain-Source Diode Forward Voltage	$I_S=75A, V_{GS}=0V$	--	--	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F=50A,$	--	35	--	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$di/dt=100A/\mu s$	--	31	--	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J=25^\circ C, V_{DD}=20V, V_G=10V, R_G=50\Omega, L=0.5mH, I_{AS}=50A$
3. $I_{SD} \leq 100A, di/dt = 100A/\mu s, V_{DD} \leq BV_{DSS},$ Starting $T_J=25^\circ C$
4. Pulse Test : Pulse width $\leq 300\mu s,$ Duty cycle $\leq 2\%$
5. Essentially independent of operating temperature

Electrical Characteristics Diagrams

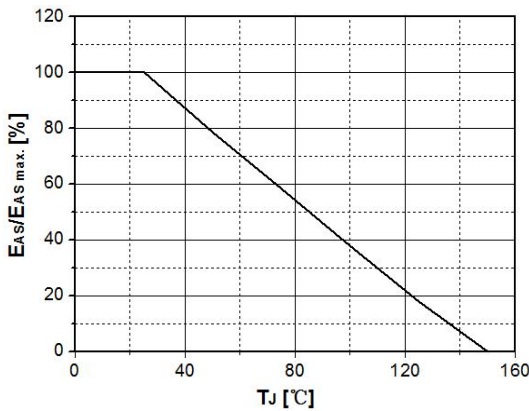


Figure 1. Avalanche Energy Derating Curve vs. Junction Temperature

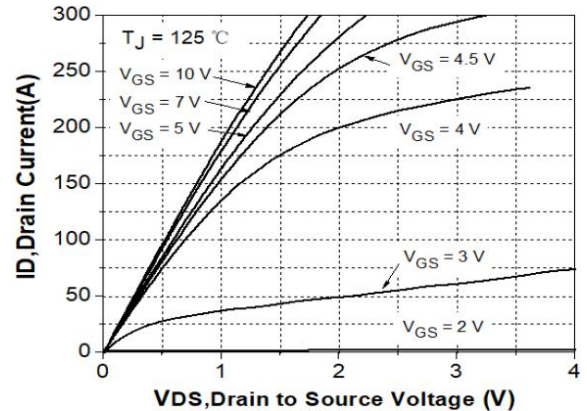


Figure 2. Typical Transfer Characteristics

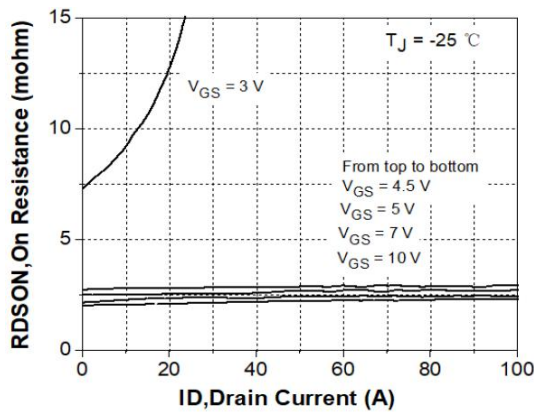


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

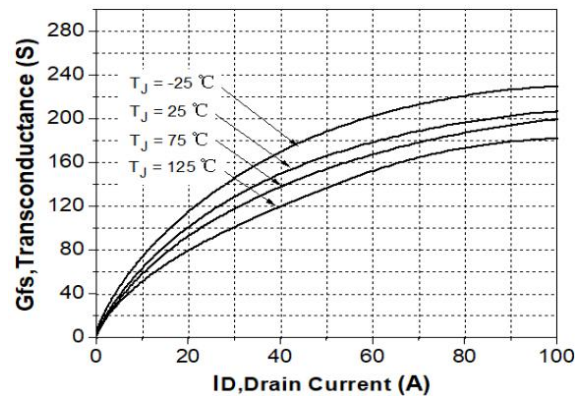


Figure 4. Transconductance vs. Drain Current

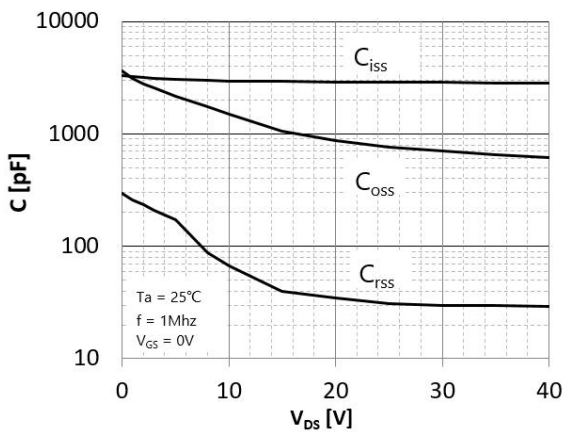


Figure 5. Capacitance Characteristics

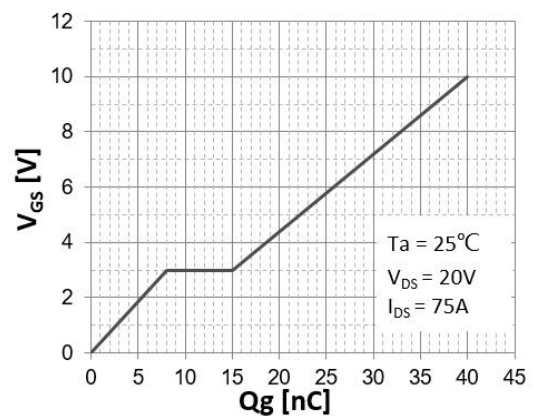


Figure 6. Gate Charge Characteristics

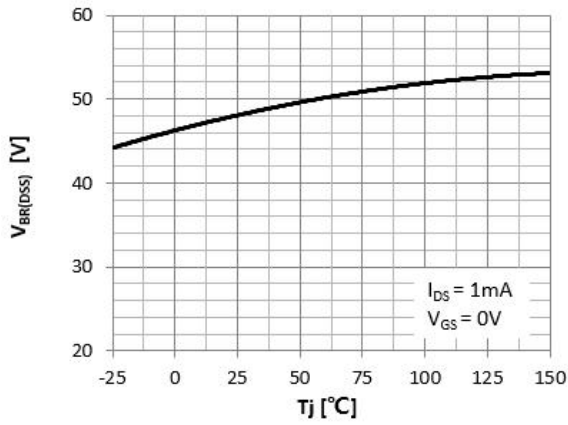


Figure 7. Breakdown Voltage Variation vs Temperature

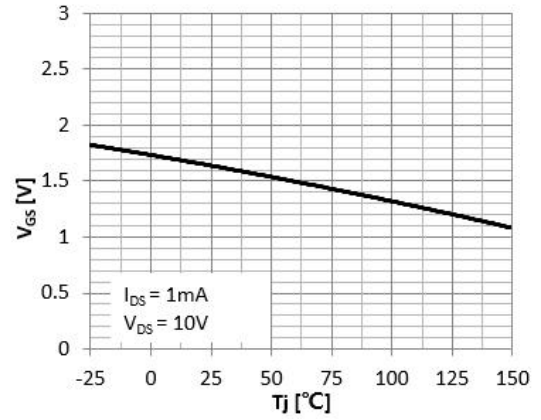


Figure 8. Gate Threshold Voltage vs. Junction Temperature

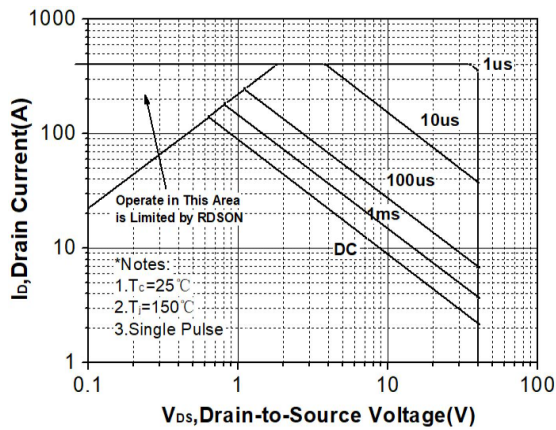


Figure 9. Maximum Safe Operating Area

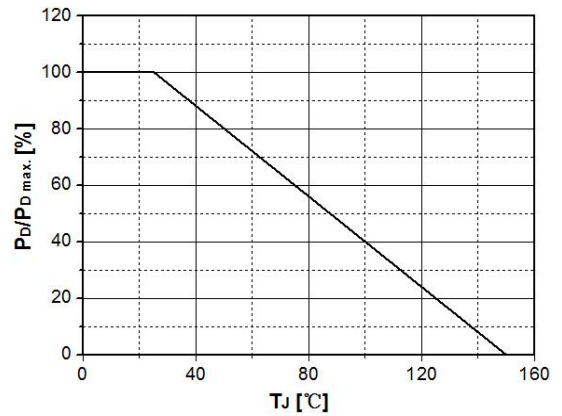


Figure 10. Power Dissipation Derating Curve

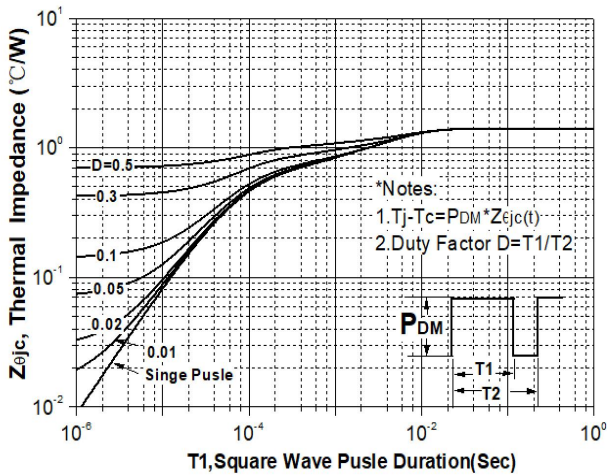


Figure 11. Transient Thermal Response Curve

■ TEST CIRCUITS AND WAVEFORMS

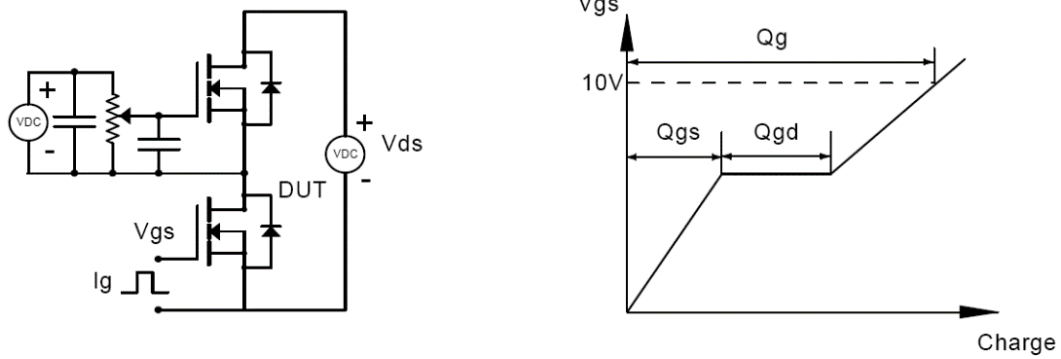


Figure 1. Gate charge test circuit & waveform

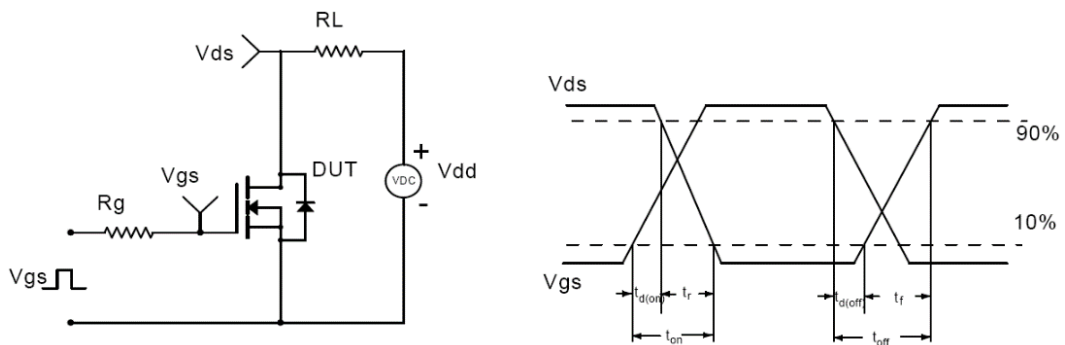


Figure 2. Switching time test circuit & waveforms

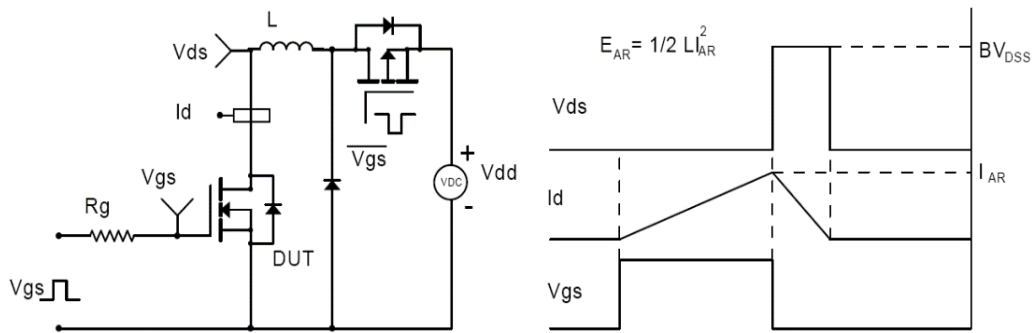


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

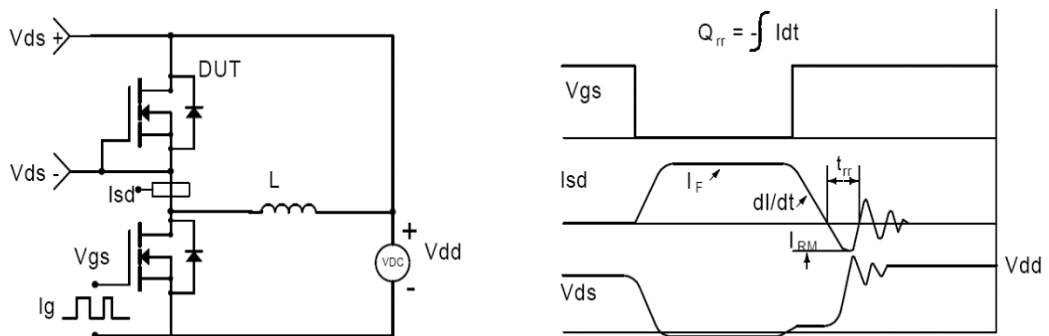
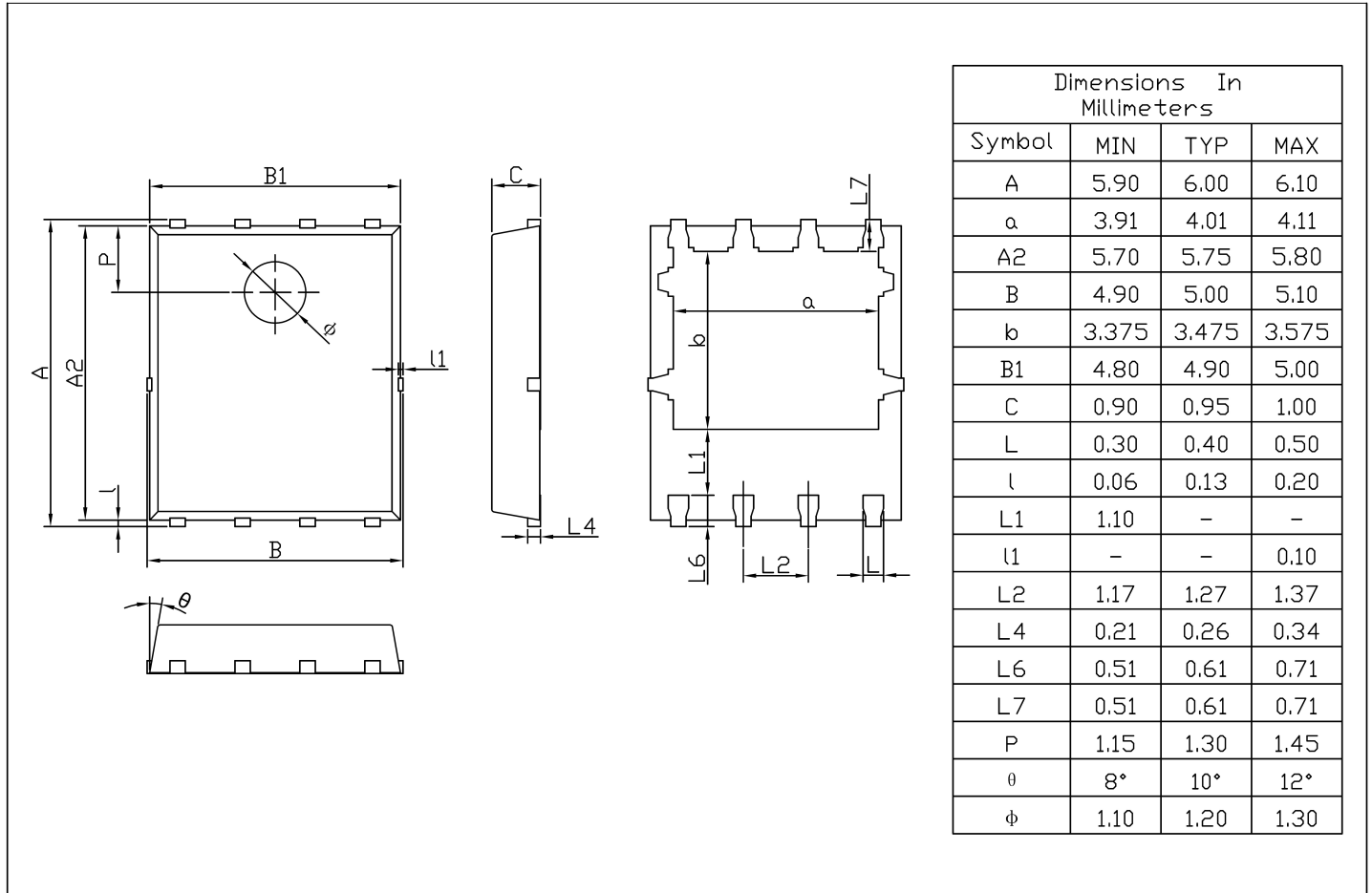


Figure 4. Diode reverse recovery test circuit & waveforms

The curve above is or reference only.

Outline Drawing

MOSFET PDFN5*6 Package Outline Dimensions



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