

Features

- ★ Split Gate Trench MOS Technology
- ★ 100% EAS Guaranteed
- ★ Fast Switching Speed
- ★ Green Device Available

Applications

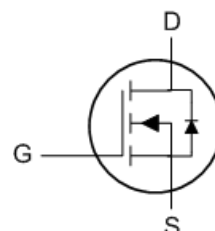
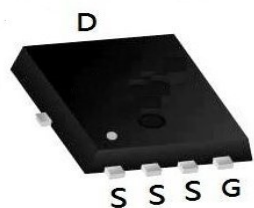
- ★ High Frequency Switching and Synchronous Rectification.
- ★ DC/DC Converter.

Product Summary



BVDSS	RDS(on)	ID
40V	1.65mΩ	140A

PDFN5060-8L Pin Configuration



■ Absolute Maximum Ratings ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	40	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current ^A $T_C=25^{\circ}\text{C}$	I_D	140	A
Pulsed Drain Current ^B	I_{DM}	560	A
Avalanche energy ^C	EAS	200	mJ
Total Power Dissipation ^D	P_D	83	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.5	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-to-Ambient ^E	$R_{\theta JA}$	20	
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^{\circ}\text{C}$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	-	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =20A	-	1.65	2.3	mΩ
		V _{GS} =4.5V, I _D =20A	-	2.45	3.2	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	3830	-	pF
C _{oss}	Output Capacitance		-	2794	-	pF
C _{rss}	Reverse Transfer Capacitance		-	474	-	pF
Q _g	Total Gate Charge	V _{DD} =32V, I _D =10A,	-	66	-	nC
Q _{gs}	Gate-Source Charge		-	13.6	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	12.6	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =20V, R _D =0.5Ω, R _G =10Ω	-	892.8	-	ns
t _r	Turn-on Rise Time		-	21.4	-	ns
t _{d(off)}	Turn-off Delay Time		-	72.28	-	ns
t _f	Turn-off Fall Time		-	34.52	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	140	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	560	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =20A	-	-	0.78	V
t _{rr}	Body Diode Reverse Recovery Time	T _J =25℃, I _F =I _S ,dI/dt=100A/μs	-	31	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	110	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25°C, V_D=32V, L=0.5mH

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

Figure 1: Output Characteristics

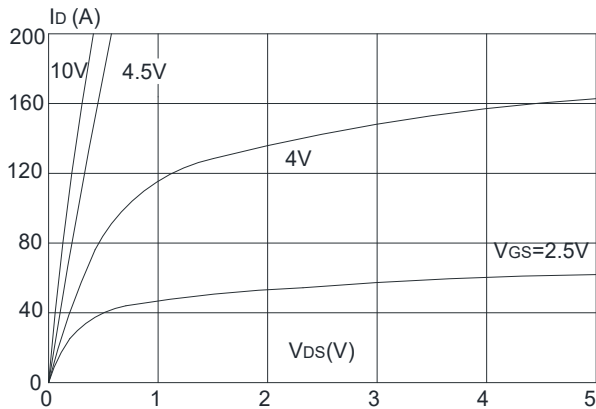


Figure 2: Typical Transfer Characteristics

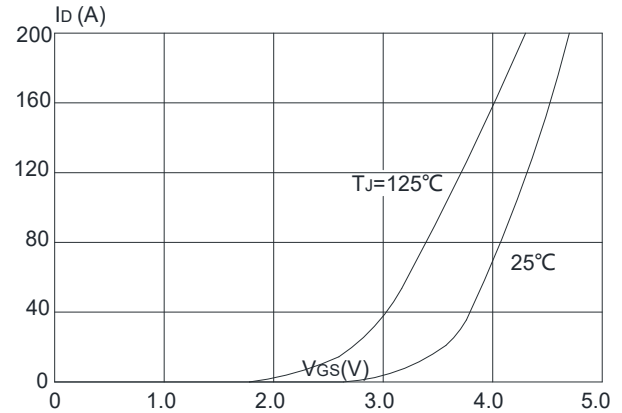


Figure 3: On-resistance vs. Drain Current

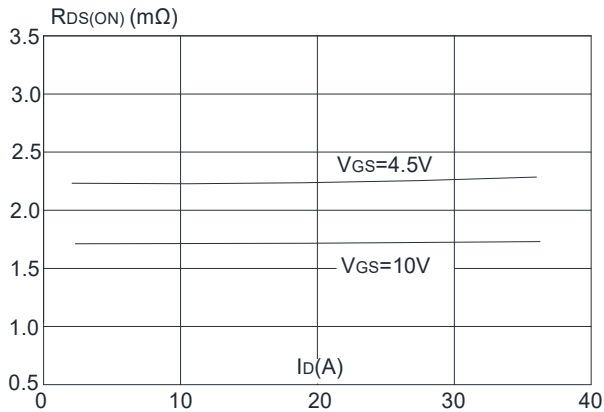


Figure 4: Body Diode Characteristics

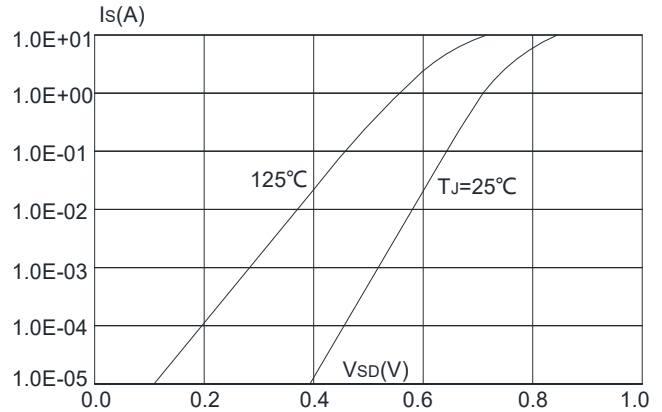


Figure 5: Gate Charge Characteristics

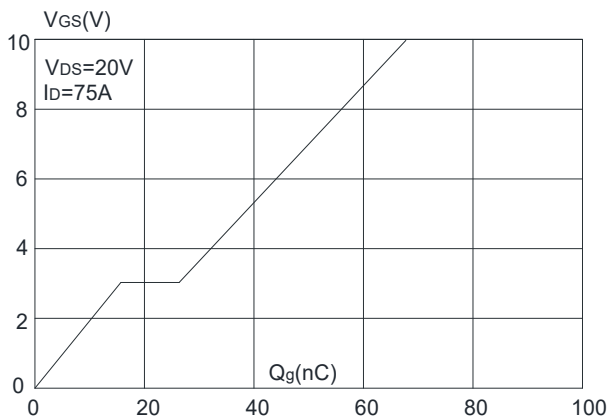


Figure 6: Capacitance Characteristics

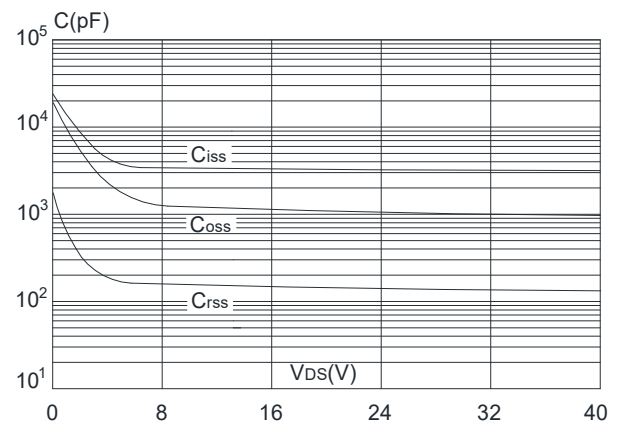


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

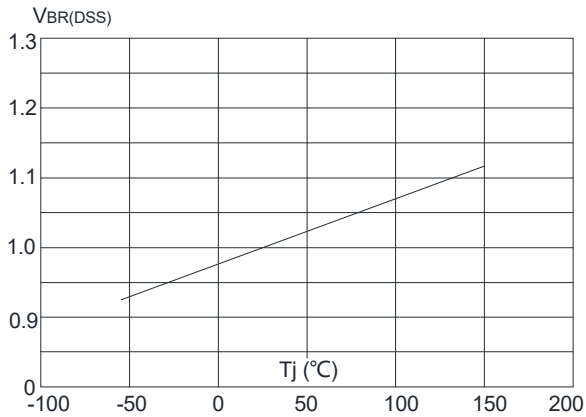


Figure 8: Normalized on Resistance vs. Junction Temperature

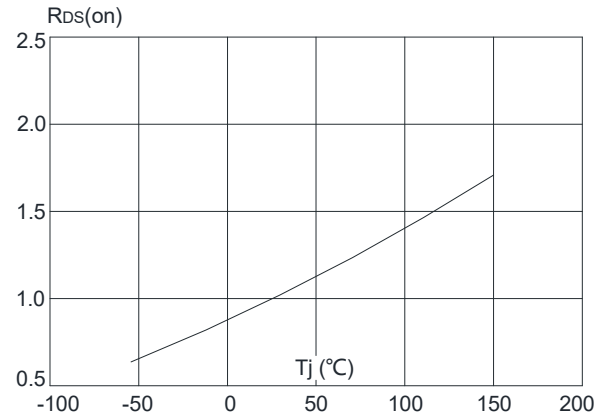


Figure 9: Maximum Safe Operating Area

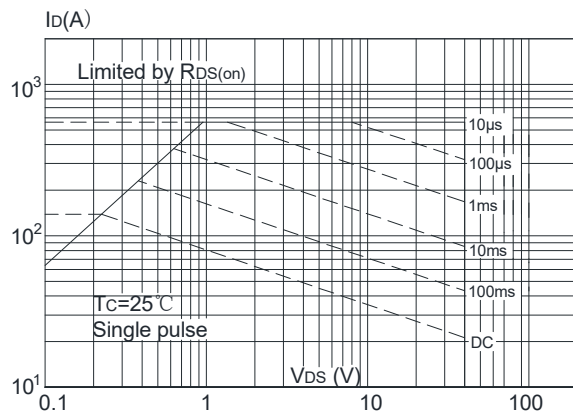


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

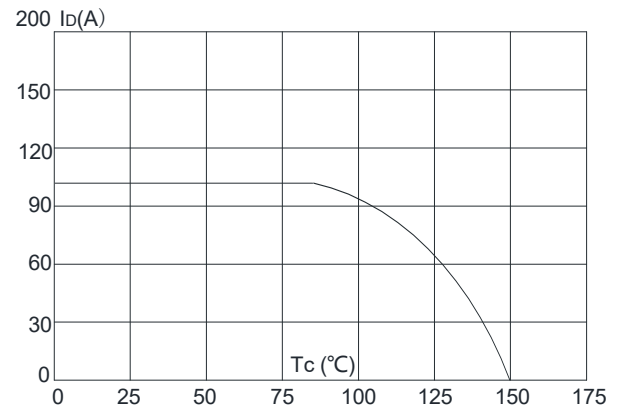
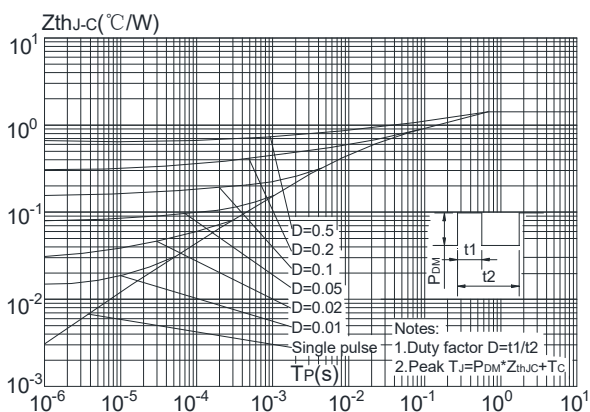


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case





Test Circuit

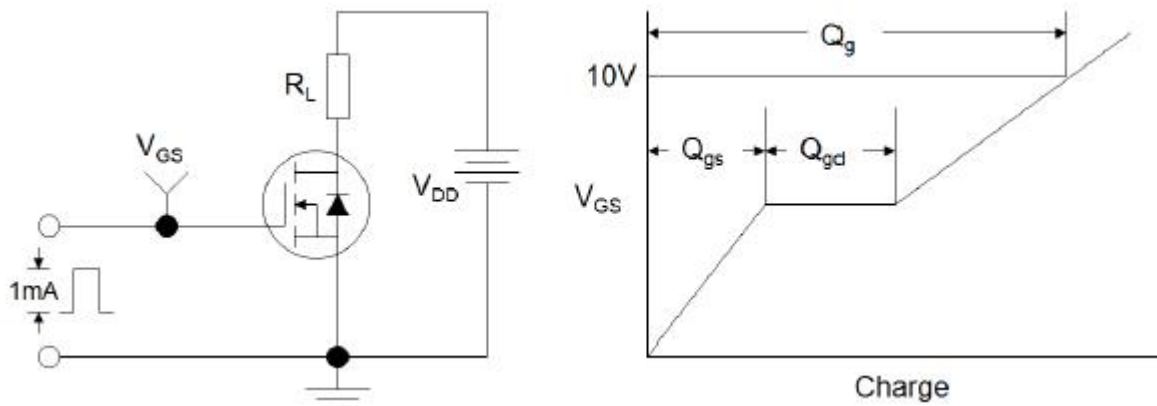


Figure1:Gate Charge Test Circuit & Waveform

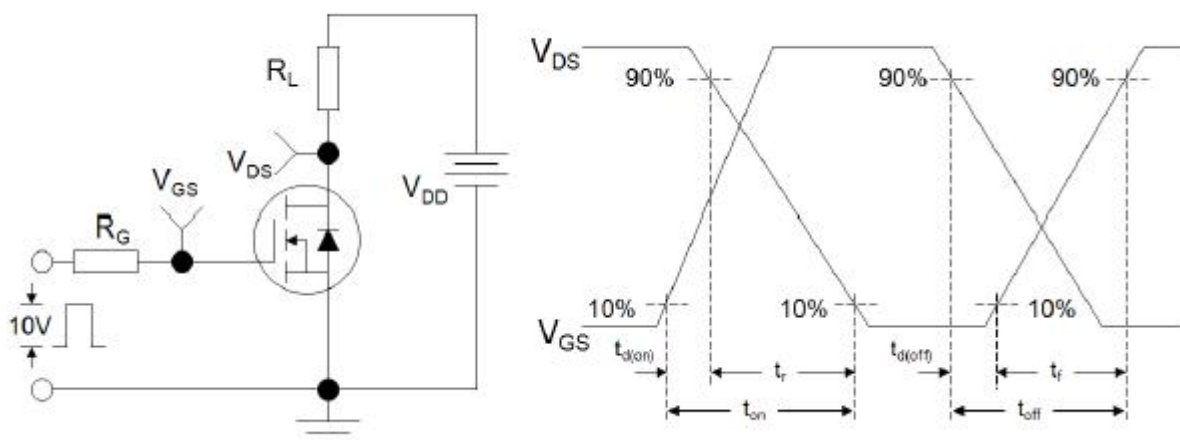


Figure 2: Resistive Switching Test Circuit & Waveforms

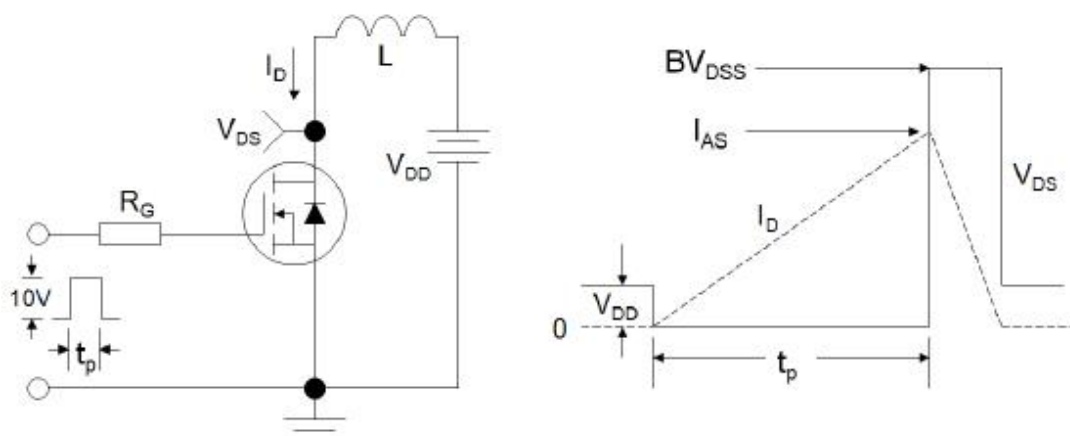
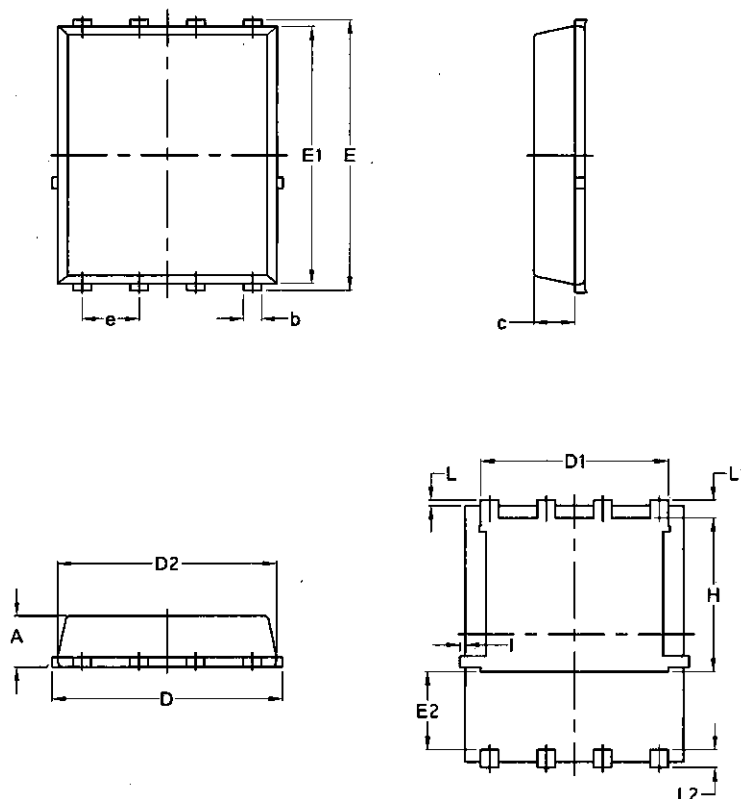


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Package Mechanical Data-PDFN5060-8L- Single



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070