

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

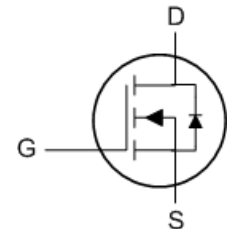
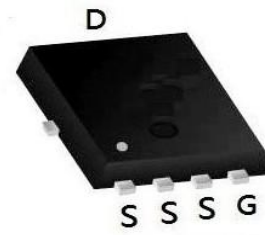
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

Product Summary



BVDSS	RDSON	ID
85V	4.3mΩ	100A

PDFN5060-8L Pin Configuration



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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	85	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	100	A
	$T_C = 100^\circ\text{C}$		63.3	
Pulsed Drain Current ¹		I_{DM}	400	A
Single Pulse Avalanche Energy ²		E_{AS}	273.8	mJ
Total Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	107.8	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	1.16	$^\circ\text{C/W}$

Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	85	-	-	V
Gate-body Leakage current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = 85V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-Source on-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	4.3	5.6	mΩ
Forward Transconductance ⁴		g _{fs}	V _{DS} = 5V, I _D =20A	-	57.8	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C _{iss}	V _{DS} = 40V, V _{GS} =0V, f =1MHz	-	4645	-	pF
Output Capacitance		C _{oss}		-	673	-	
Reverse Transfer Capacitance		C _{rss}		-	41	-	
Gate Resistance		R _g	f=1MHz	-	2.0	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 40V, I _D = 20A	-	61.3	-	nC
Gate-Source Charge		Q _{gs}		-	21	-	
Gate-Drain Charge		Q _{gd}		-	11	-	
Turn-on Delay Time		t _{d(on)}	V _{GS} =10V, V _{DD} = 40V, R _G = 3Ω, I _D = 20A	-	16.5	-	ns
Rise Time		t _r		-	51.8	-	
Turn-off Delay Time		t _{d(off)}		-	37.1	-	
Fall Time		t _f		-	8.2	-	
Body Diode Reverse Recovery Time		t _{rr}	I _F =20A, di/dt = 100A/μS	-	69	-	ns
Body Diode Reverse Recovery Charge		Q _{rr}		-	141	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C =25°C	I _S	-	-	-	100	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_J(\text{MAX}) = 150^\circ\text{C}$
2. The EAS data shows Max. rating . The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.4\text{mH}, I_{AS} = 37A$
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

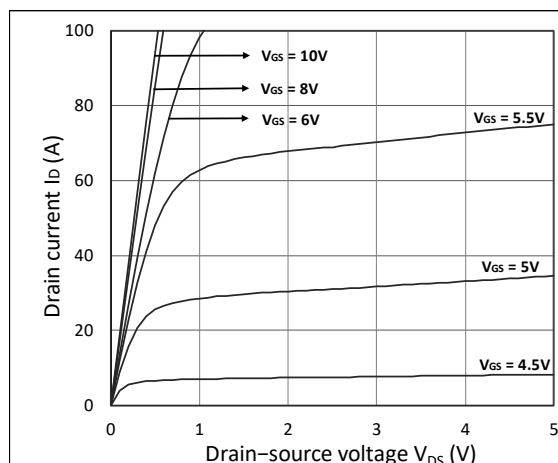


Figure 1. Output Characteristics

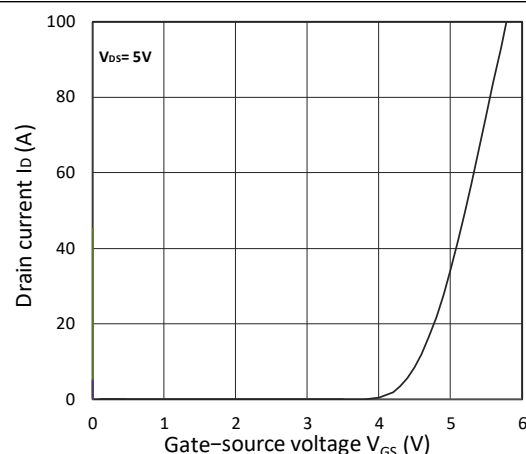


Figure 2. Transfer Characteristics

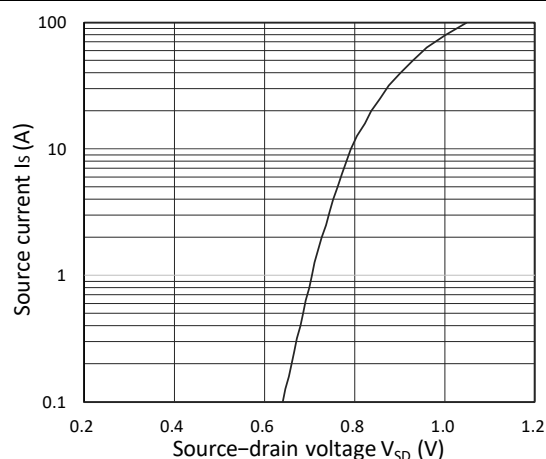


Figure 3. Forward Characteristics of Reverse

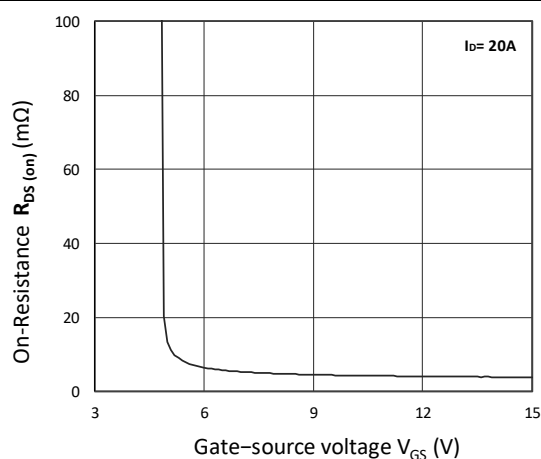


Figure 4. $R_{DS(on)}$ vs. V_{GS}

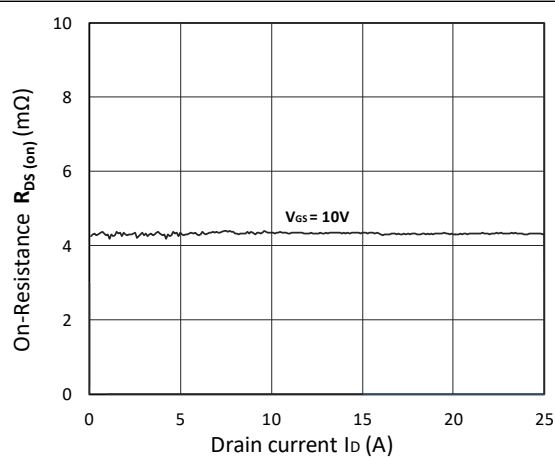


Figure 5. $R_{DS(on)}$ vs. I_D

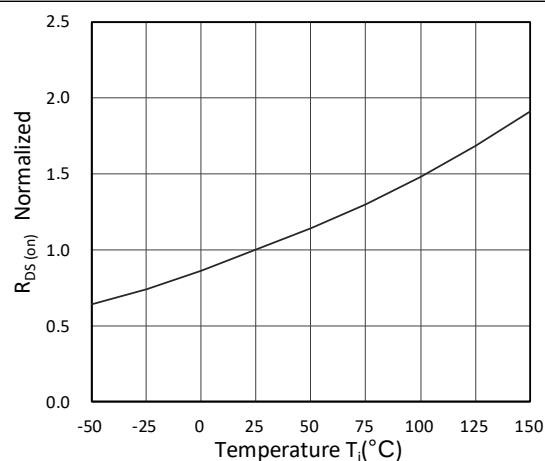


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

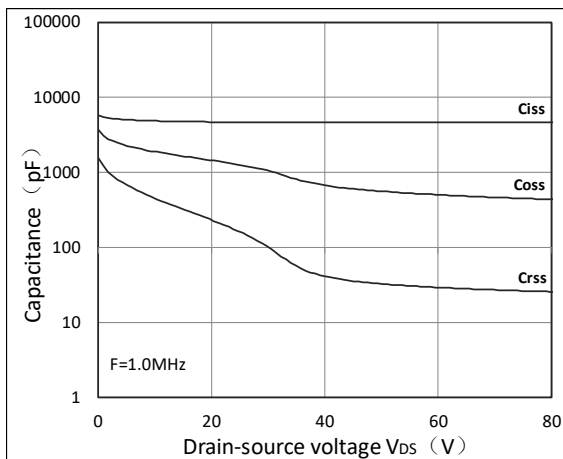


Figure 7. Capacitance Characteristics

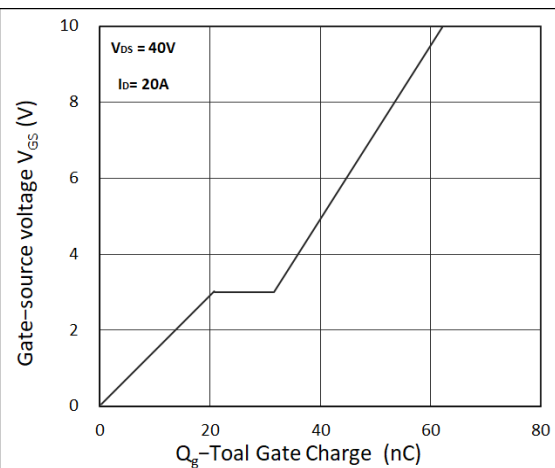


Figure 8. Gate Charge Characteristics

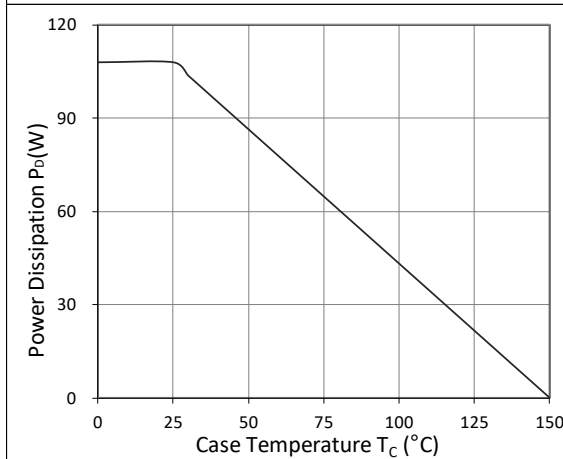


Figure 9. Power Dissipation

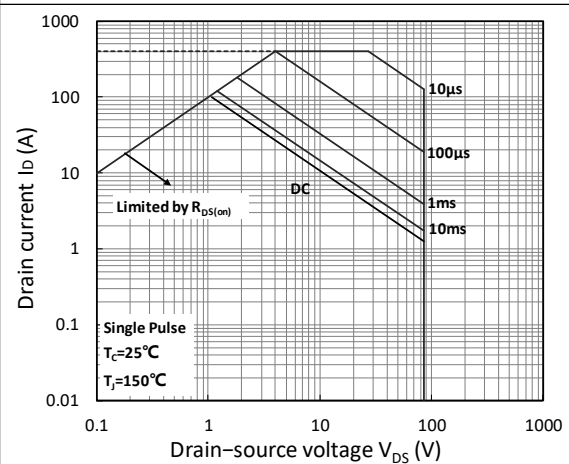


Figure 10. Safe Operating Area

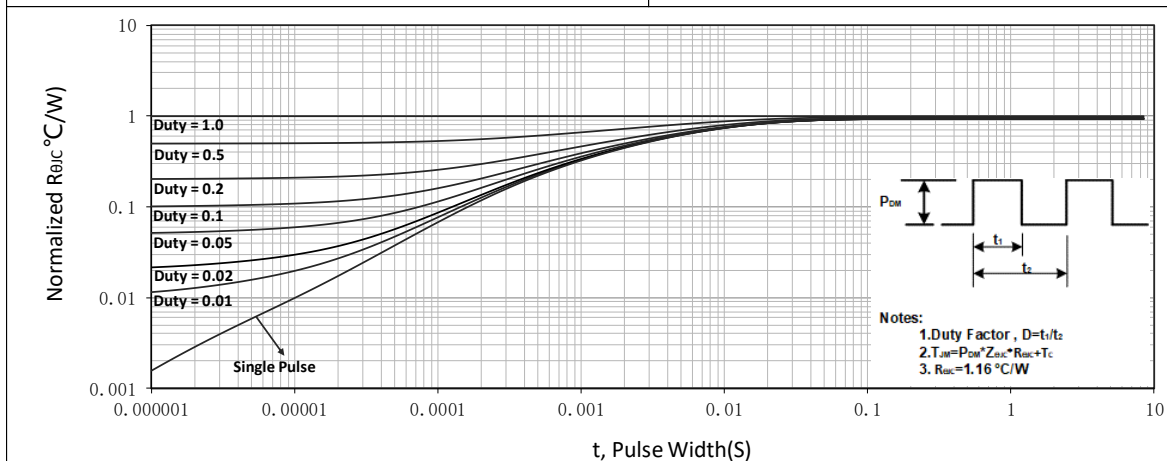
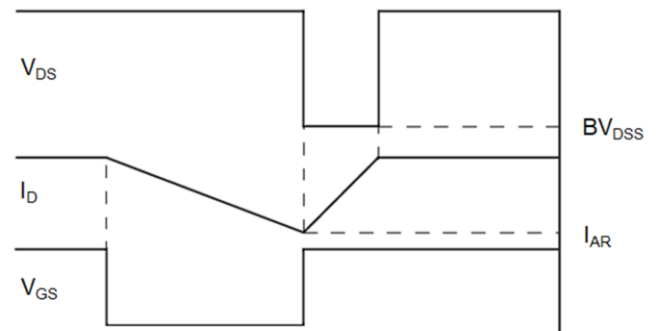
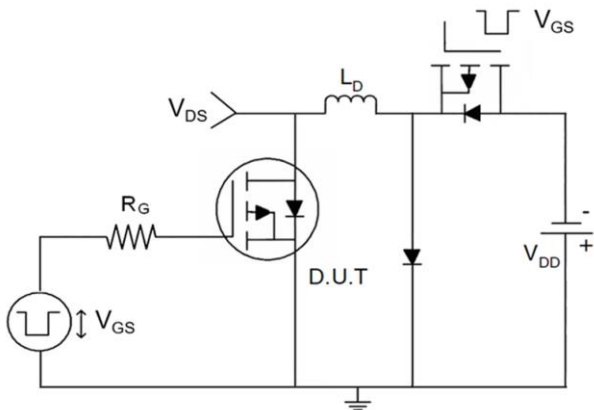
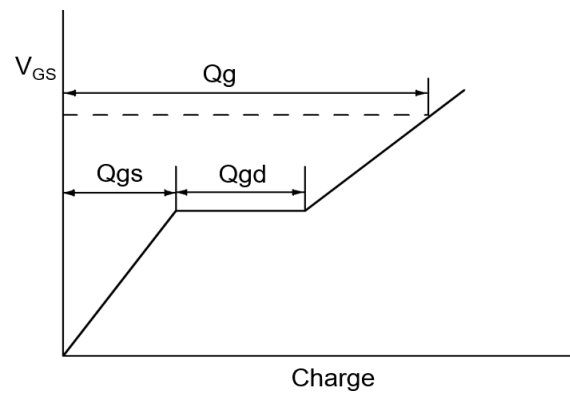
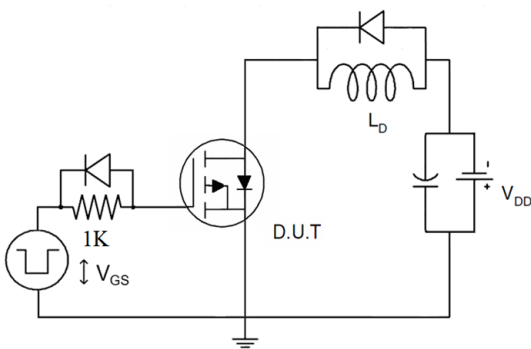


Figure 11. Normalized Maximum Transient Thermal Impedance

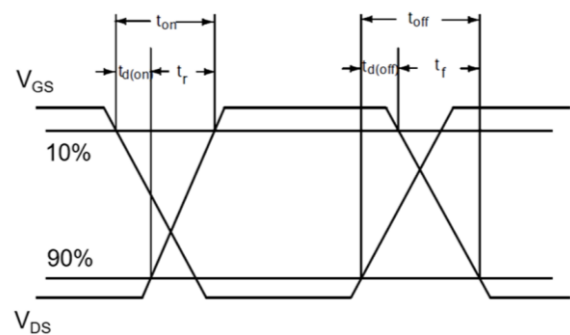
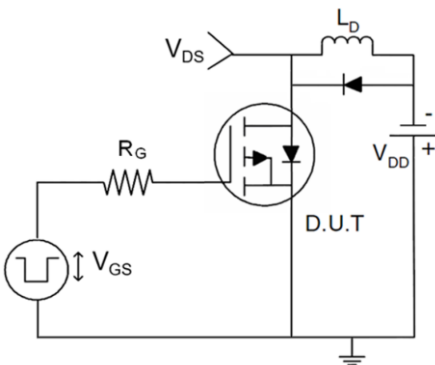
1) E_{AS} Test Circuits



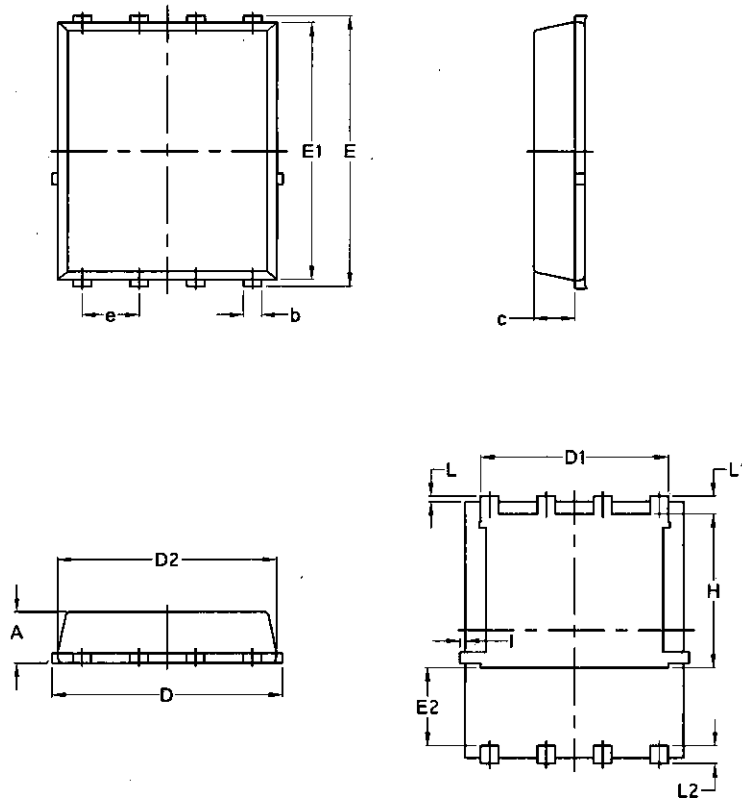
2) Gate Charge Test Circuit



3) Switch Time Test Circuit



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