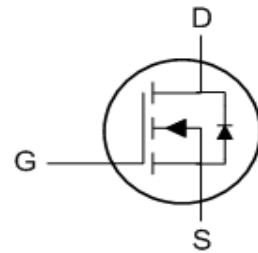




Features

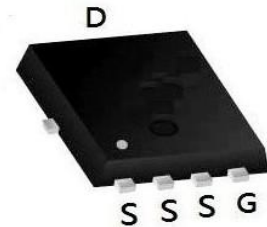
- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$



Applications

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

PDFN5060-8L Pin Configuration



Product Summary

BVDSS	R _{DS(ON)}	ID
85V	4.3mΩ	100A

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	I_D	$T_C=25^\circ\text{C}$	100
		$T_C=100^\circ\text{C}$	63.3
Pulsed Drain Current ¹	I_{DM}	400	A
Single Pulse Avalanche Energy ²	EAS	273.8	mJ
Total Power Dissipation	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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	85	-	-	V
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	$T_J=25^\circ\text{C}$	$V_{DS} = 85V, V_{GS} = 0V$	-	-	1	μA
	$T_J=100^\circ\text{C}$		-	-	100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-Source on-Resistance ⁴	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	4.3	5.6	m Ω
Forward Transconductance ⁴	g_{fs}	$V_{DS} = 5V, I_D = 20A$	-	57.8	-	S
Dynamic Characteristics⁵						
Input Capacitance	C_{iss}	$V_{DS} = 40V, V_{GS} = 0V, f = 1MHz$	-	4645	-	μF
Output Capacitance	C_{oss}		-	673	-	
Reverse Transfer Capacitance	C_{rss}		-	41	-	
Gate Resistance	R_g	$f = 1MHz$	-	2.0	-	Ω
Switching Characteristics⁵						
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	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 40V, R_G = 3\Omega, I_D = 20A$	-	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}	$I_F = 20A, di/dt = 100A/\mu S$	-	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	$T_C=25^\circ\text{C}$	I_S	-	-	100	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_J(MAX)=150^\circ\text{C}$
2. The EAS data shows Max. rating . The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.4mH, I_{AS}=37A$
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

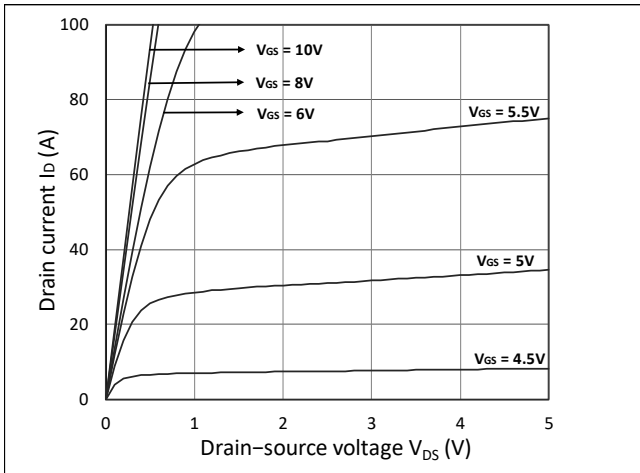


Figure 1. Output Characteristics

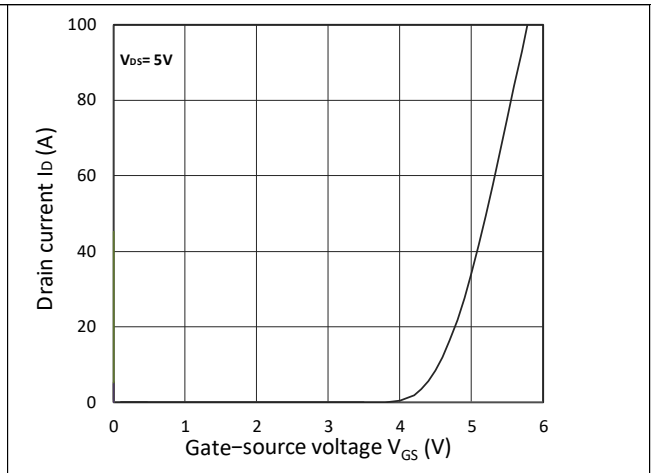


Figure 2. Transfer Characteristics

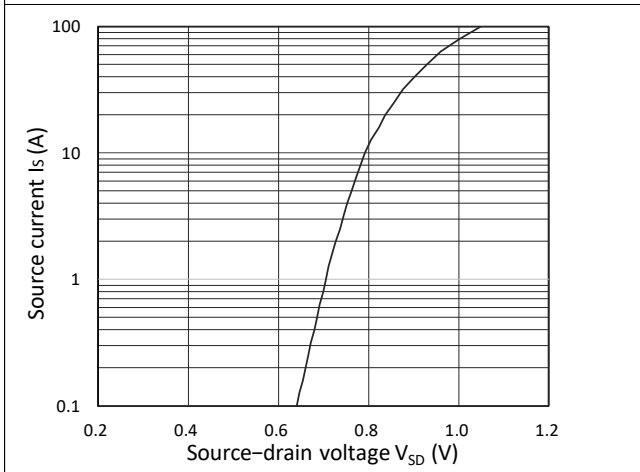


Figure 3. Forward Characteristics of Reverse

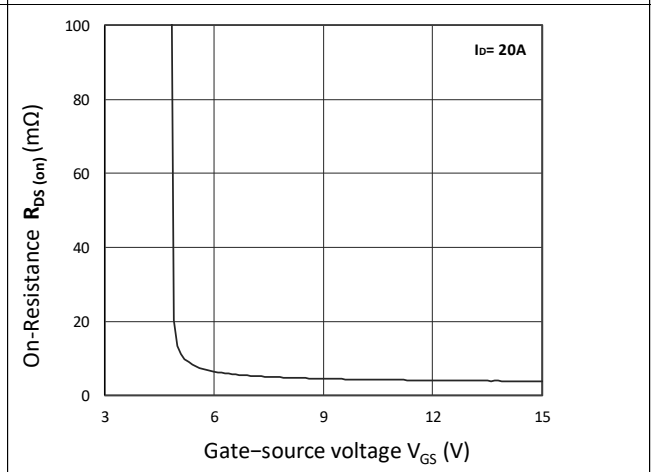


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

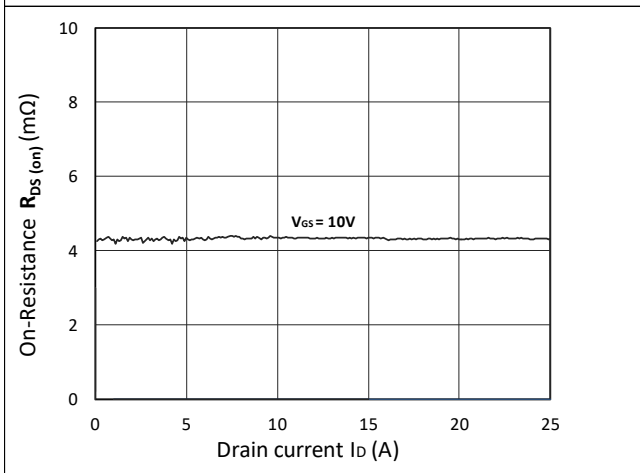


Figure 5. $R_{DS(ON)}$ vs. I_D

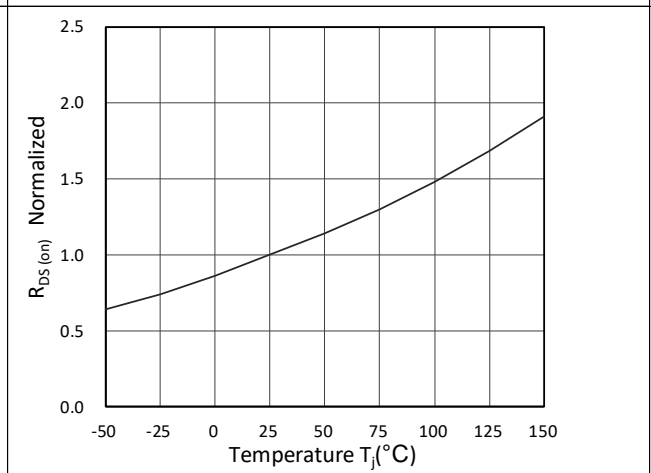


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

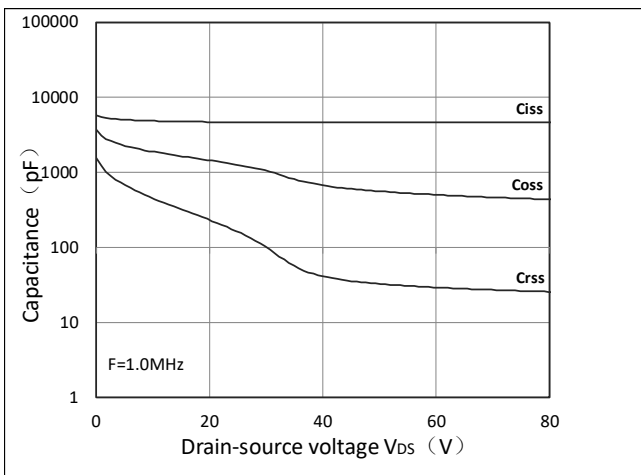


Figure 7. Capacitance Characteristics

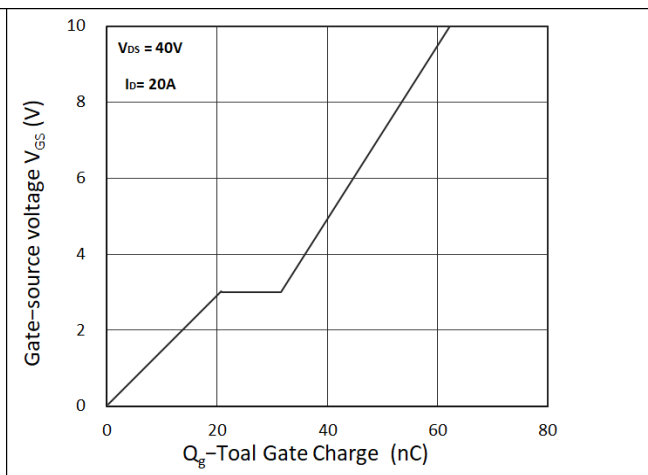


Figure 8. Gate Charge Characteristics

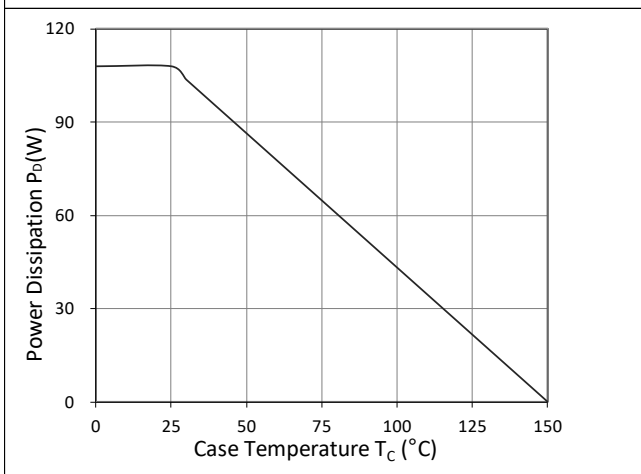


Figure 9. Power Dissipation

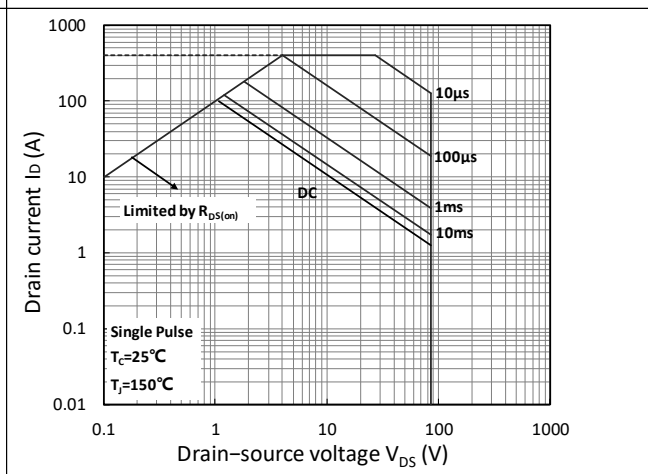


Figure 10. Safe Operating Area

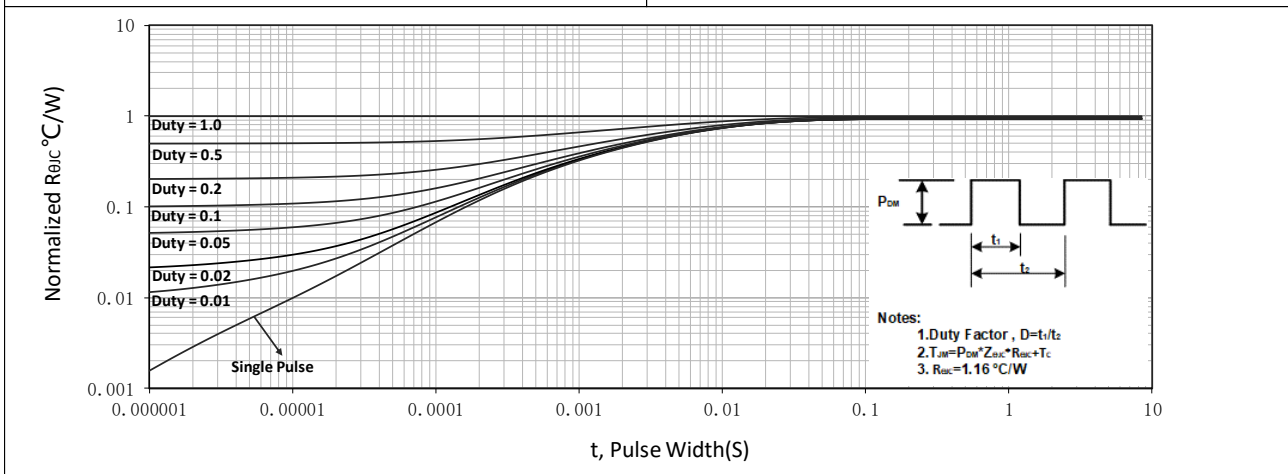
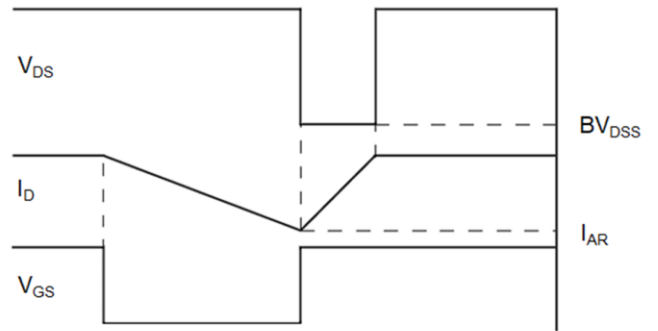
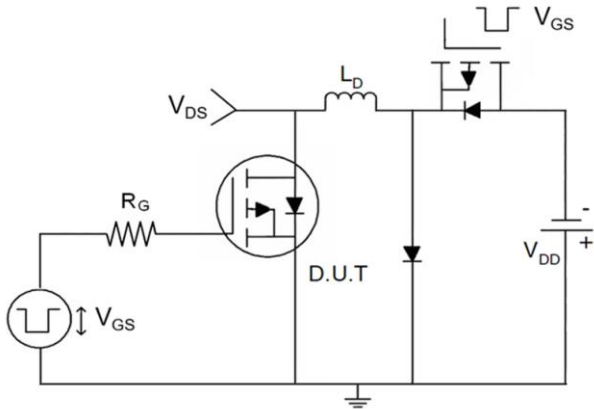


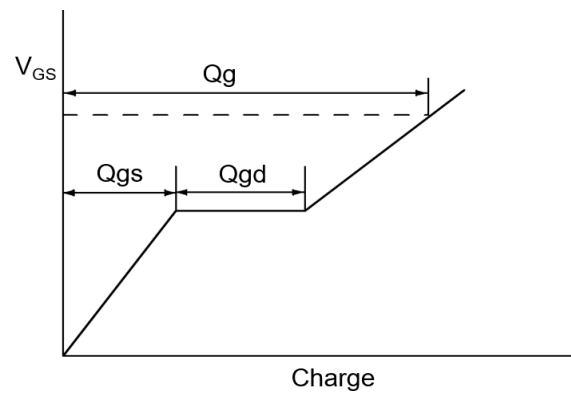
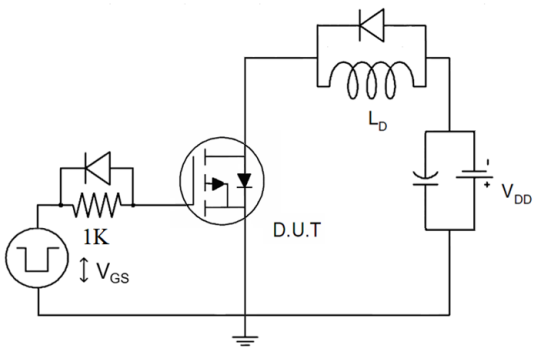
Figure 11. Normalized Maximum Transient Thermal Impedance



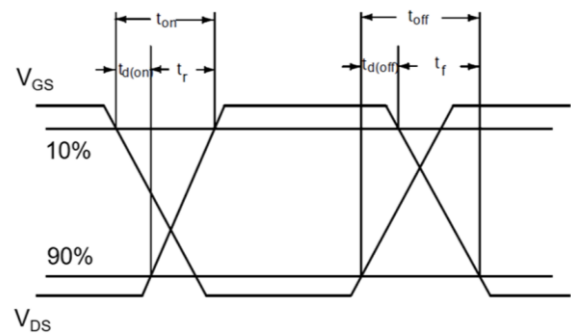
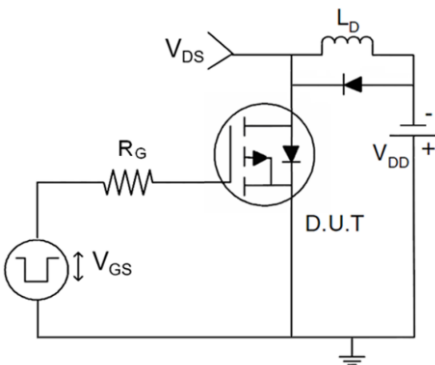
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit

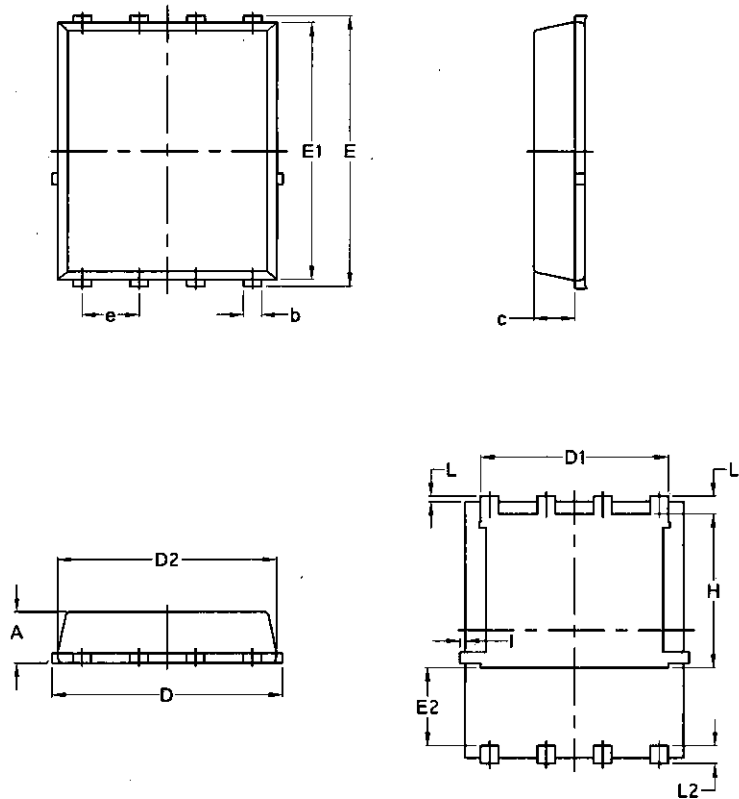


3) Switch Time Test Circuit





Package Mechanical Data-PDFN5060-8L -Single



Symbol	Common			
	mm		Inch	
	Min	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



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