N-Ch 60V Fast Switching MOSFETs

Features

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

Product Summary

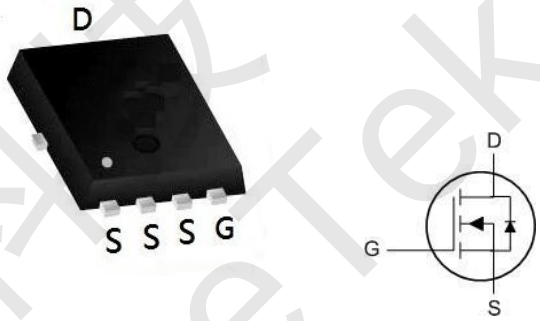
Green

BVDSS	RDSON	ID
60V	6.5mΩ	65A

Applications

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

PDFN5060-8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	65	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	40	A
I_{DM}	Pulsed Drain Current[2]	260	A
EAS	Single Pulse Avalanche Energy[3]	57.8	mJ
I_{AS}	Avalanche Current	17	A
P_D@T_C=25℃	Total Power Dissipation[4]	31.25	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	52	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	4	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	60	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	---	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	6.5	9	mΩ
		V_{GS}=4.5V , I_D=10A	---	8.7	13	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.3	1.7	2.2	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=60V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=60V, V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=20A	---	56	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.5	---	Ω
Q_g	Total Gate Charge	V_{DS}=30V , V_{GS}=10V , I_D=20A	---	21.7	---	nC
Q_{gs}	Gate-Source Charge		---	3.9	---	
Q_{gd}	Gate-Drain Charge		---	4.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=2.5Ω, I_D=20A	---	7.3	---	ns
T_r	Rise Time		---	8.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	19.6	---	
T_f	Fall Time		---	5.6	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , f=1MHz	---	1210	---	pF
C_{oss}	Output Capacitance		---	355	---	
C_{rss}	Reverse Transfer Capacitance		---	17	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	65	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V

Note :
1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is TJ = 25ÁC,VDD=50V,VGS=10V,L=0.4mH， IAS=17A.
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

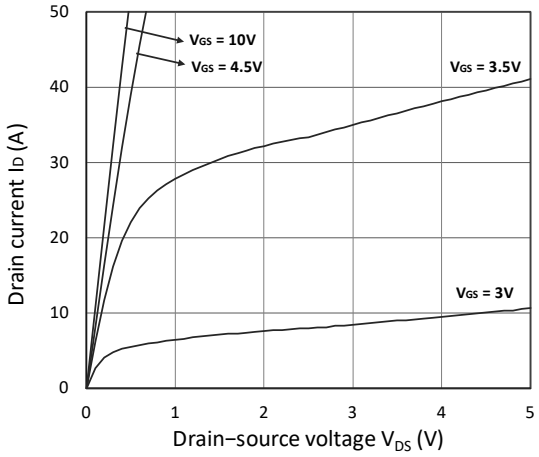


Figure 1. Output Characteristics

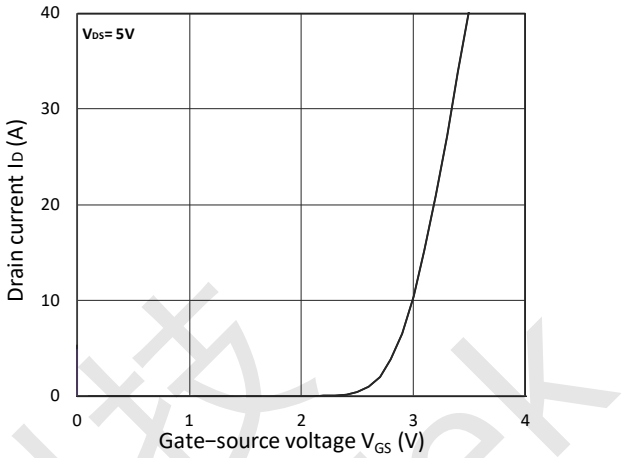


Figure 2. Transfer Characteristics

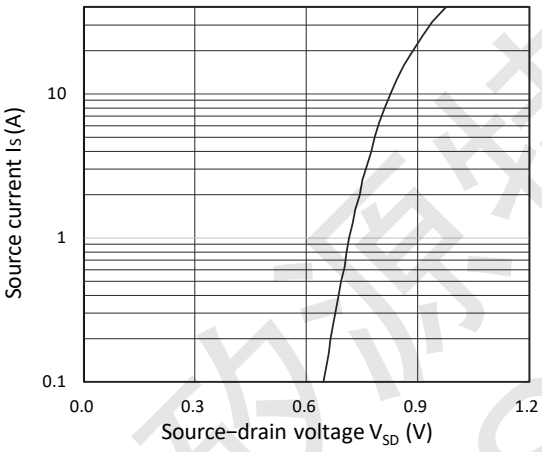


Figure 3. Forward Characteristics of Reverse

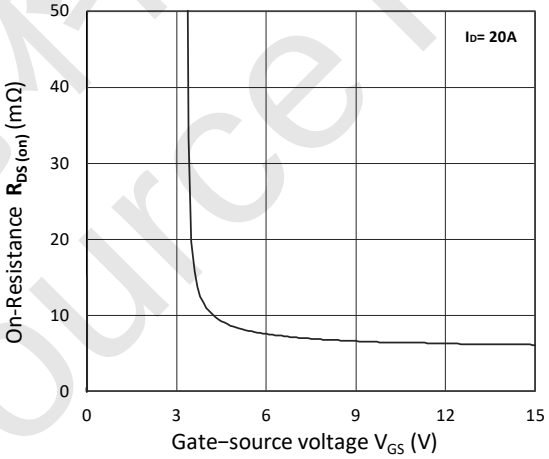


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

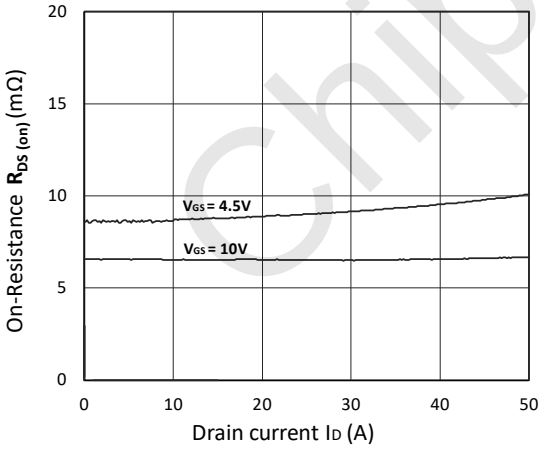


Figure 5. $R_{DS(ON)}$ vs. I_D

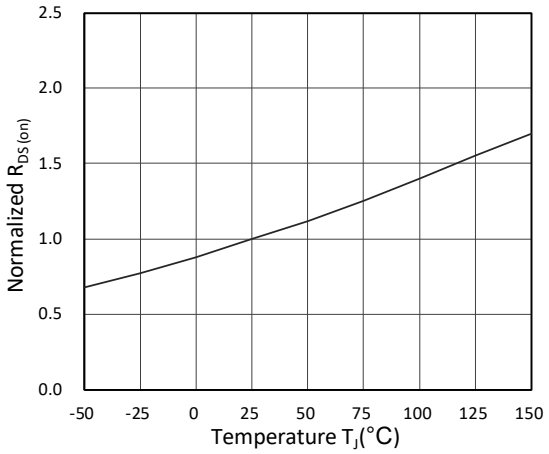


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

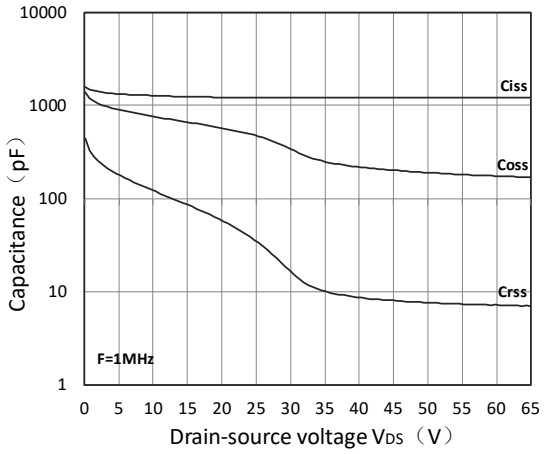


Figure 7. Capacitance Characteristics

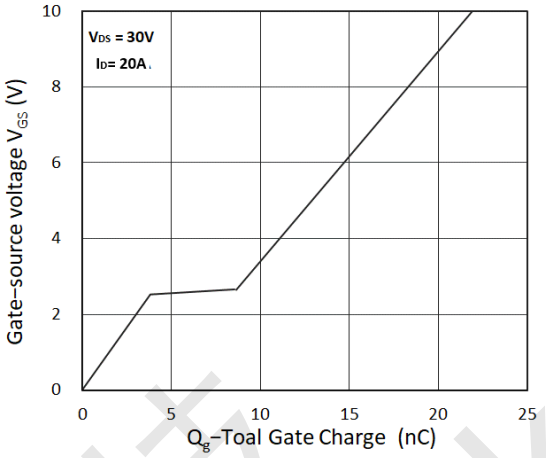


Figure 8. Gate Charge Characteristics

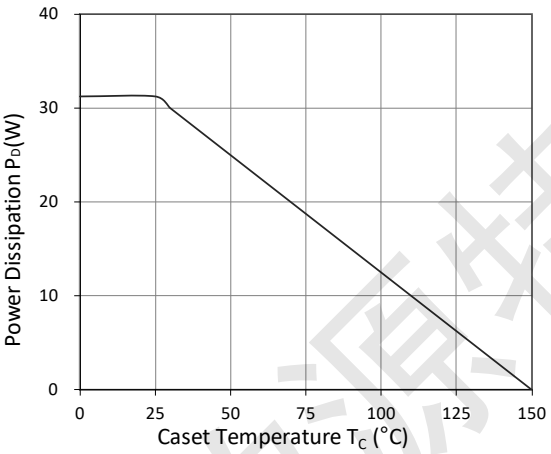


Figure 9. Power Dissipation

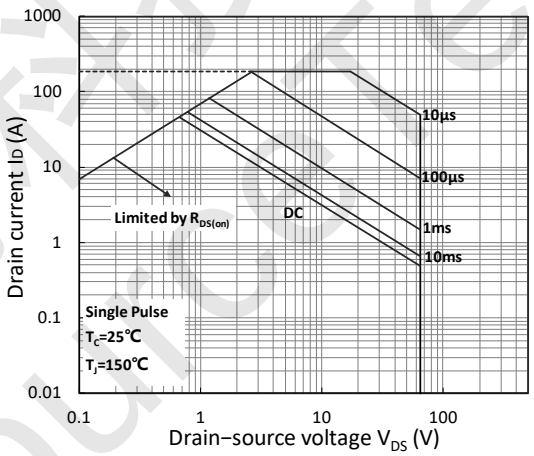


Figure10. Safe Operating Area

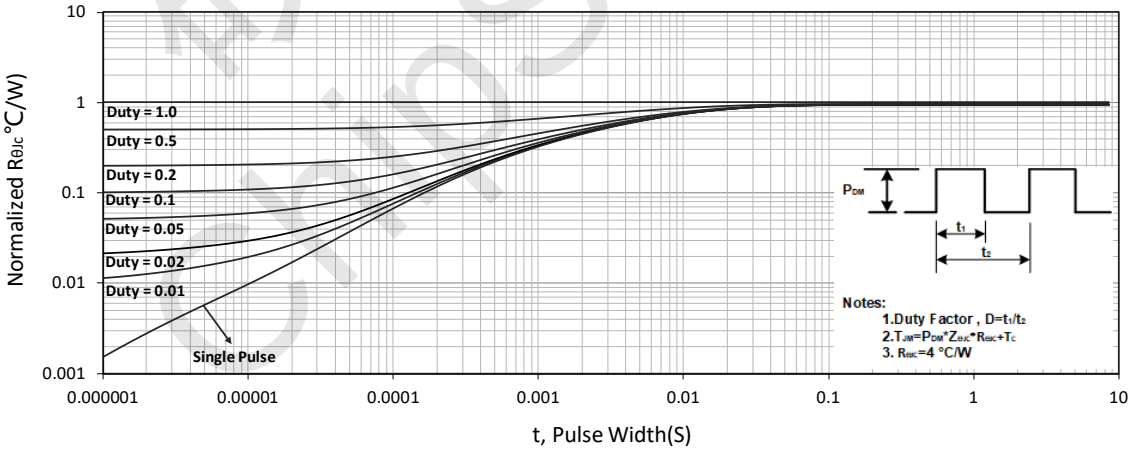
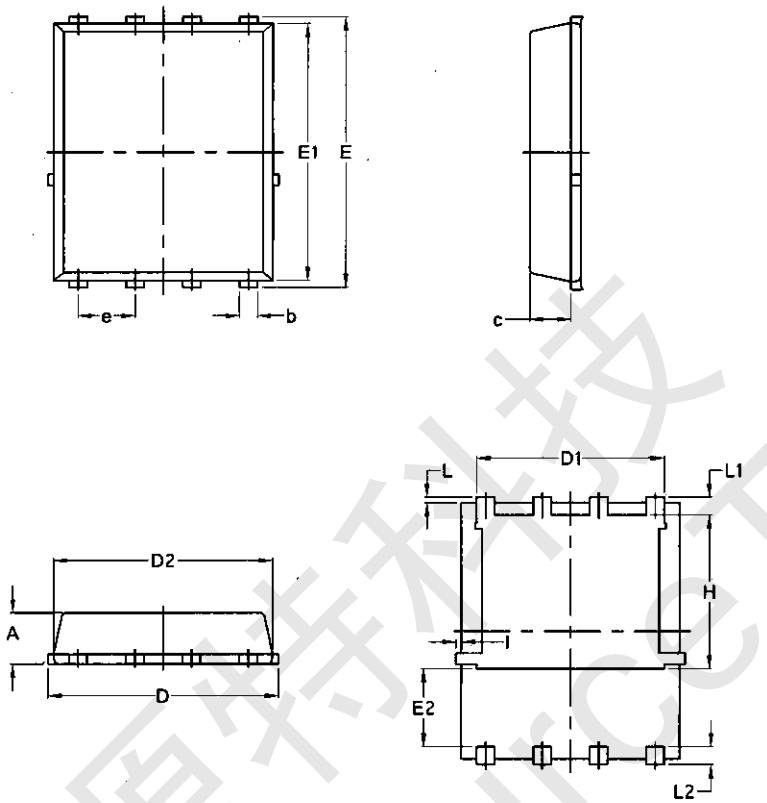


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN5060-8L-JQ 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