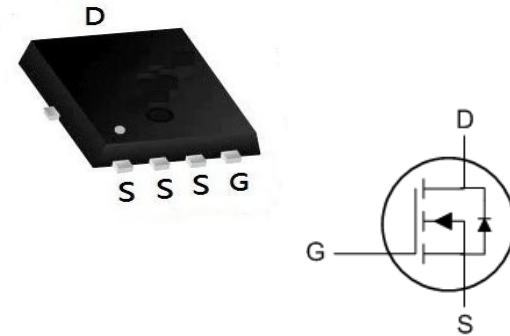**N-Ch 40V Fast Switching MOSFETs**

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
40V	5.5mΩ	65A

PDFN5060-8L Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current[1]	65	A
I_D@T_C=100℃	Continuous Drain Current[1]	35	A
I_{DM}	Pulsed Drain Current[2]	130	A
EAS	Single Pulse Avalanche Energy[3]	48	mJ
I_{AS}	Avalanche Current	35	A
P_D@T_C=25℃	Total Power Dissipation[4]	39	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 (Steady State)[1]	---	60	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	3.2	℃/W

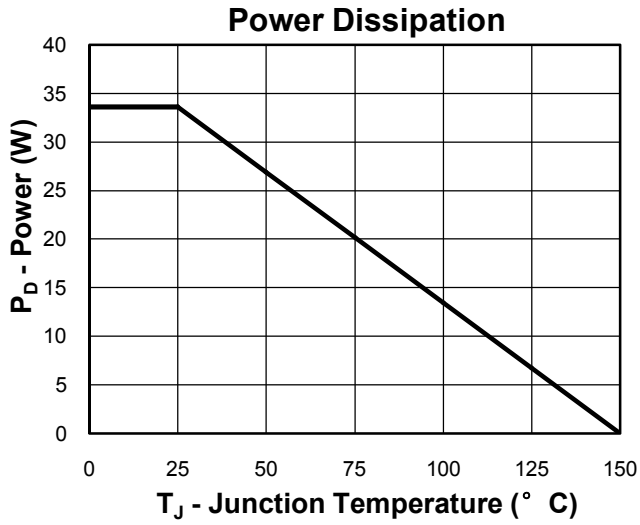## Electrical Characteristics (T$_J$=25 ℃, unless otherwise noted)

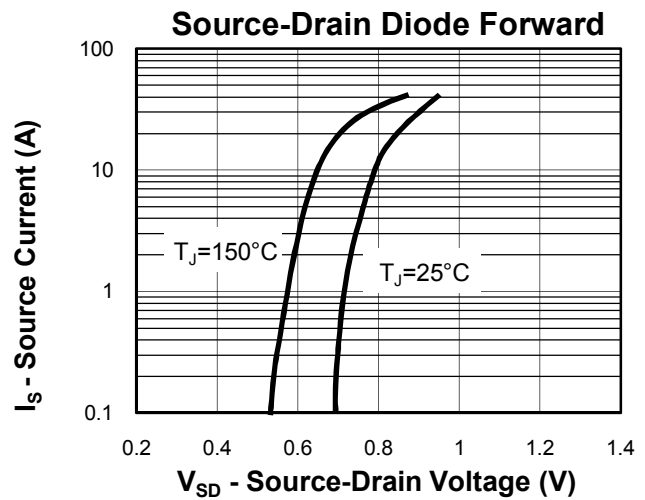| Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V , I$_D$=250uA	40	---	---	V
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=10V , I$_D$=12A	---	5.5	7.5	mΩ
		V$_{GS}$=4.5V , I$_D$=10A	---	8	13	
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	1.35	---	3	V
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=32V , V$_{GS}$=0V , T$_J$=25℃	---	---	1	uA
		V$_{DS}$=32V , V$_{GS}$=0V , T$_J$=55℃	---	---	5	
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±20V , V$_{DS}$=0V	---	---	±100	nA
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	1.7	---	Ω
Q$_g$	Total Gate Charge (4.5V)	V$_{DS}$=20V , V$_{GS}$=4.5V , I$_D$=12A	---	28	---	nC
Q$_{gs}$	Gate-Source Charge		---	4	---	
Q$_{gd}$	Gate-Drain Charge		---	6	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=15V , V$_{GS}$=10V , R$_G$=3.3Ω I$_D$=1A	---	14.3	---	ns
T$_r$	Rise Time		---	5.6	---	
T$_{d(off)}$	Turn-Off Delay Time		---	20	---	
T$_f$	Fall Time		---	11	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	1048	---	pF
C$_{oss}$	Output Capacitance		---	187	---	
C$_{rss}$	Reverse Transfer Capacitance		---	178	---	

Diode Characteristics

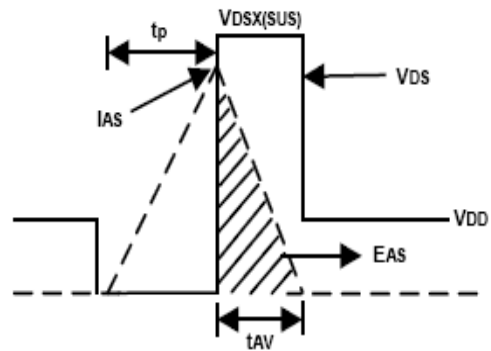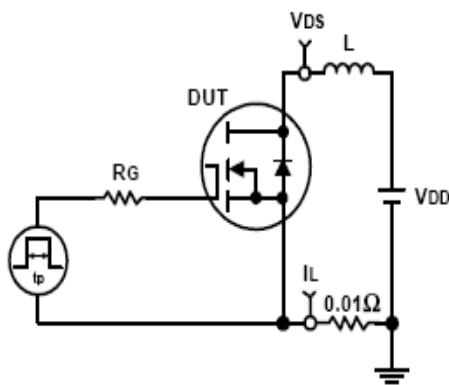| Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current[1,5]	V$_G$=V$_D$=0V , Force Current	---	---	65	A
V$_{SD}$	Diode Forward Voltage[2]	V$_{GS}$=0V , I$_S$=1A , T$_J$=25℃	---	---	1	V

Note :

1.The data tested by surface mounted on a 1 inch[2] 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 V$_{DD}$=25V,V$_{GS}$=10V,L=0.1mH,I$_{AS}$=31A

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.
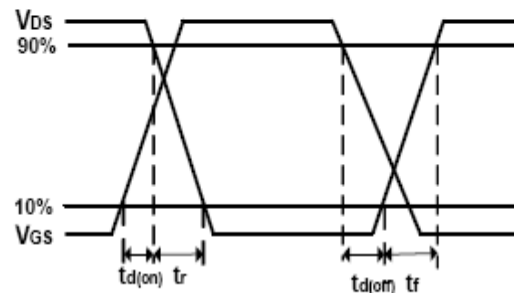
N-Ch 40V Fast Switching MOSFETs

Typical Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Drain Current
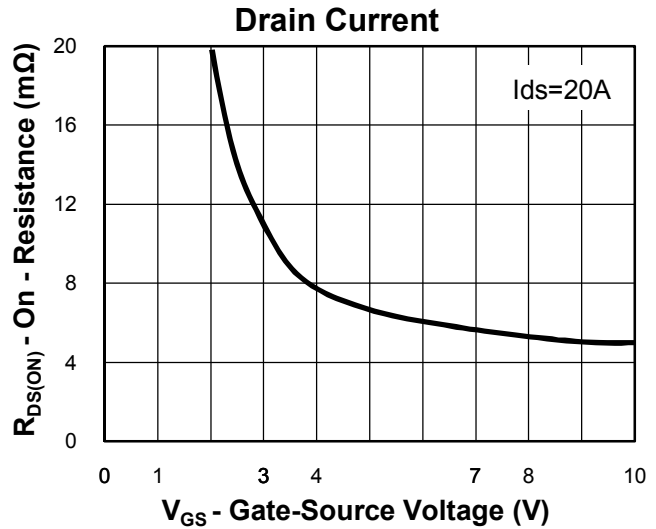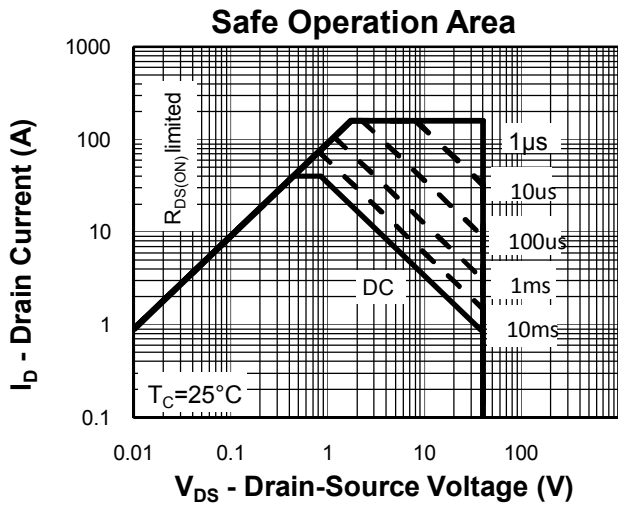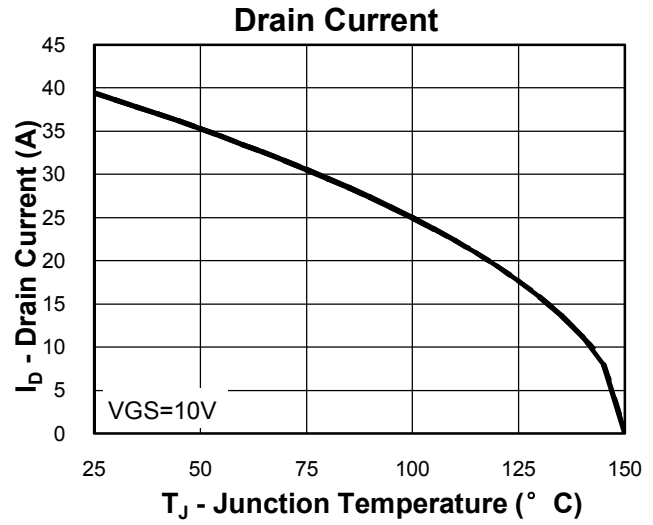
Thermal Transient Impedance

Typical Characteristics

Output Characteristics

Drain-Source On Resistance

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

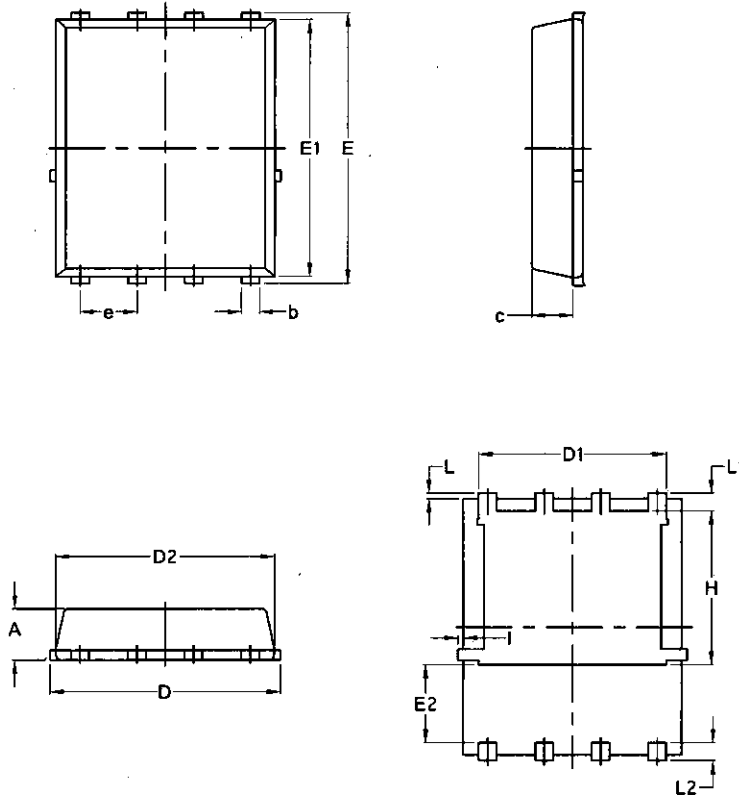### Gate Charge
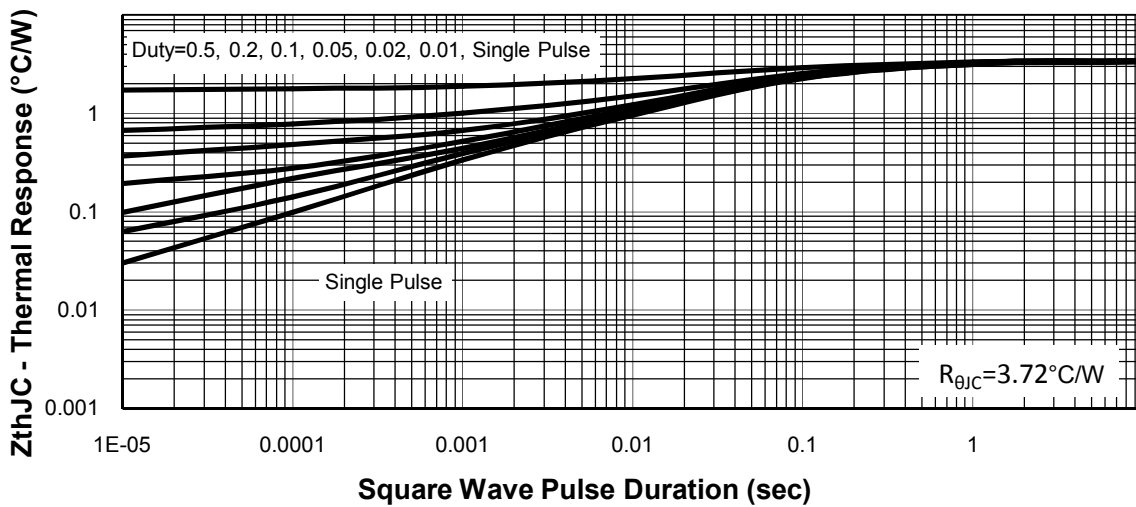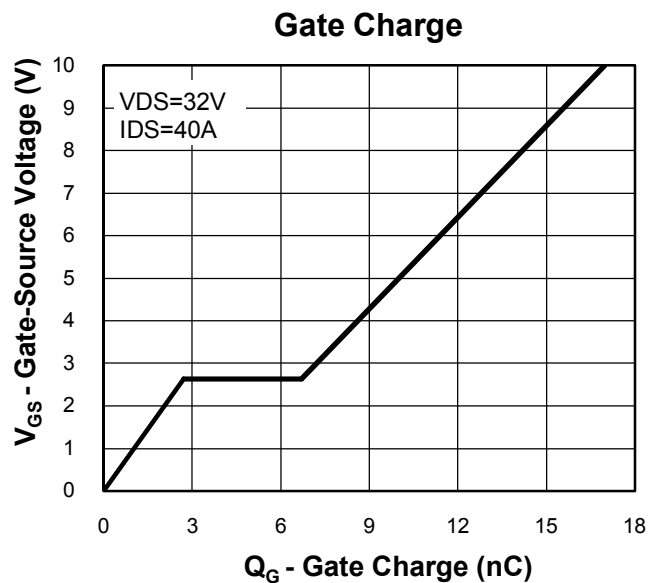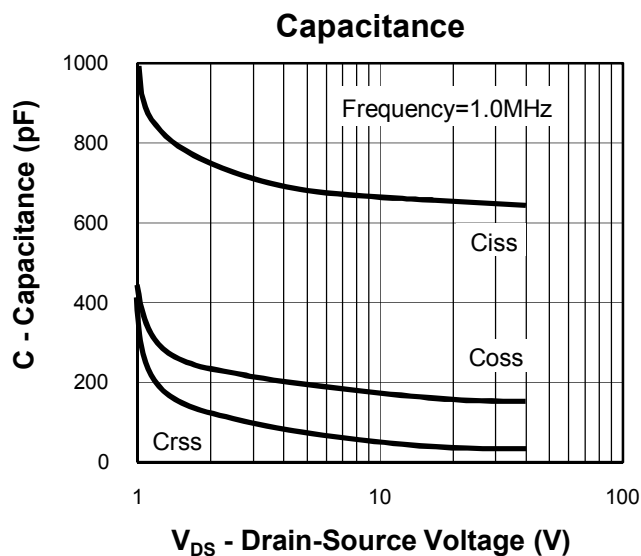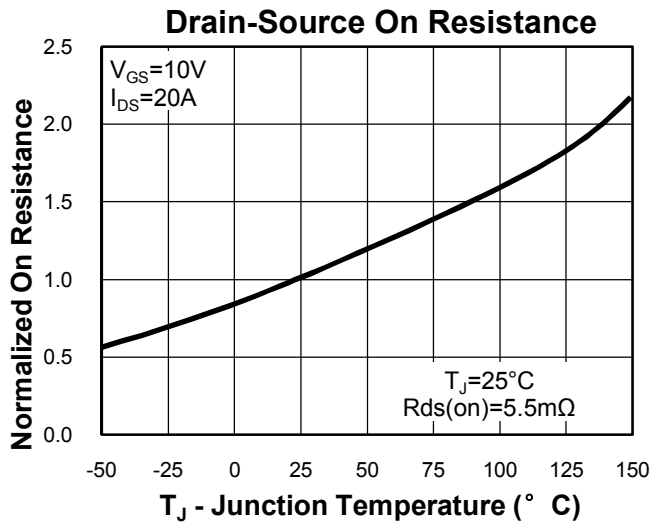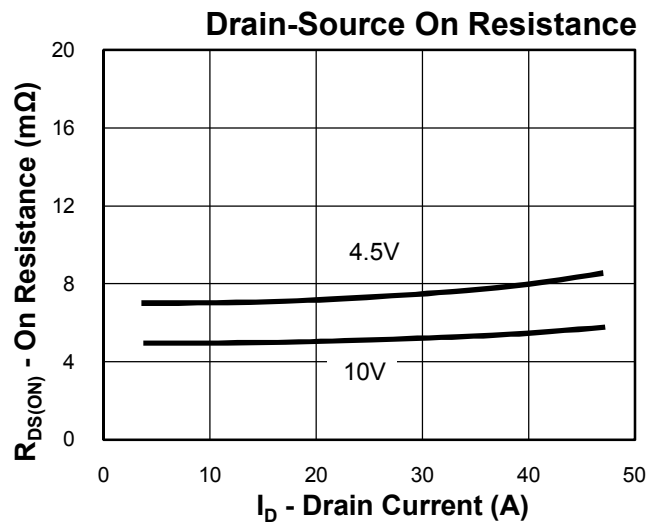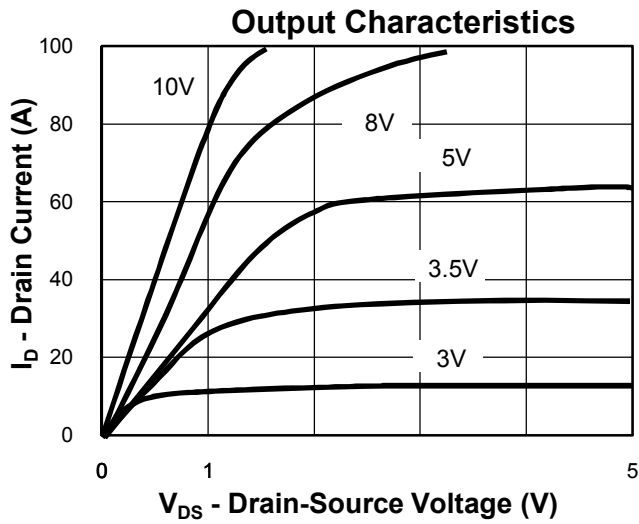
Avalanche Test Circuit and Waveforms

Switching Time Test Circuit and Waveforms
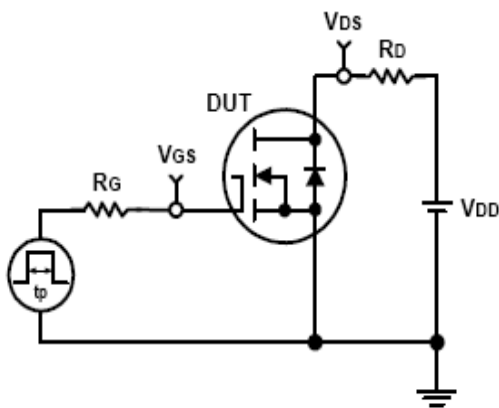
Package Mechanical Data-PDFN5060-8L- Single

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