

## N-Channel Enhancement Mode Field Effect Transistor

### Product Summary

- $V_{DS}$  60V
- $I_D$  130A
- $I_D$  (Package limited) 85A
- $R_{DS(ON)}$ ( at  $V_{GS}=10V$ ) <3.0 mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=4.5V$ ) <4.5 mohm
- 100% UIS Tested
- 100%  $\nabla V_{bs}$  Tested

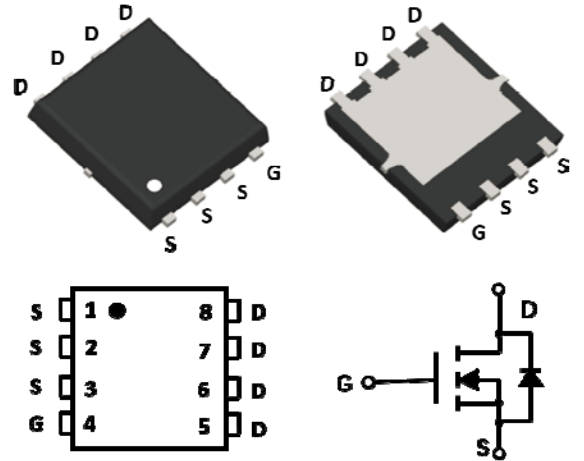
### General Description

- 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



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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		$V_{DS}$	60	V
Gate-source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current		$I_D$	130	A
Drain Current <sup>A</sup>	$T_C=25^\circ\text{C}$	$I_D$	85	A
	$T_C=100^\circ\text{C}$		54	
Pulsed Drain Current <sup>B</sup>		$I_{DM}$	390	A
Avalanche energy <sup>C</sup>		EAS	270	mJ
Total Power Dissipation <sup>D</sup>		$P_D$	105	W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	1.2	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-to-Ambient <sup>E</sup>		$R_{\theta JA}$	55	
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SKG85G06A	F1	SKG85G06A	5000	10000	50000	13" reel

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.8	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		2.5	3.0	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$		3.5	4.5	
Diode Forward Voltage	$V_{SD}$	$I_S=20A, V_{GS}=0V$			1.2	V
Maximum Body-Diode Continuous Current	$I_S$				85	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, f=1\text{MHz}$		3350		pF
Output Capacitance	$C_{oss}$			1666		
Reverse Transfer Capacitance	$C_{rss}$			77.7		
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=10V, V_{DS}=30V, I_D=25A$		66.1		nC
Gate-Source Charge	$Q_{gs}$			10.7		
Gate-Drain Charge	$Q_{gd}$			10.9		
Reverse Recovery Charge	$Q_{rr}$	$I_F=25A, di/dt=100A/\mu s$		73		ns
Reverse Recovery Time	$t_{rr}$			68		
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=30V, I_D=25A$ $R_{GEN}=2\Omega$		22.5		ns
Turn-on Rise Time	$t_r$			6.7		
Turn-off Delay Time	$t_{d(off)}$			80.3		
Turn-off fall Time	$t_f$			26.9		

**Note:**

- The maximum current rating is package limited.
- Repetitive rating; pulse width limited by max. junction temperature.
- $V_{DD}=50V, R_G=25\Omega, L=0.5mH$ , starting  $T_J=25^{\circ}\text{C}$ .
- $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_a=25^{\circ}\text{C}$ .

## Typical Performance Characteristics

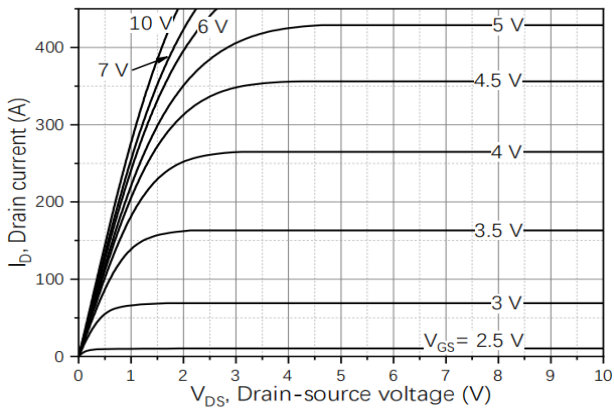


Figure1. Output Characteristics

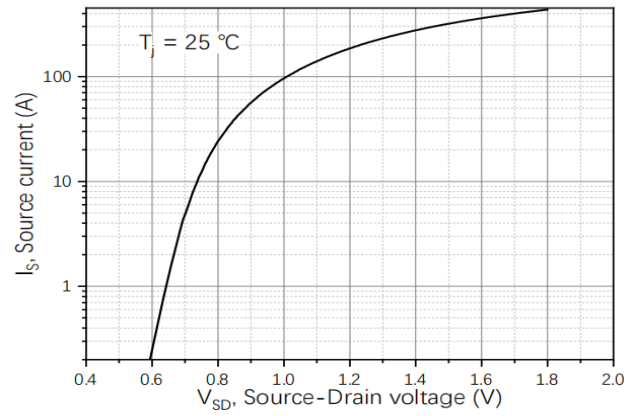


Figure2. Transfer Characteristics

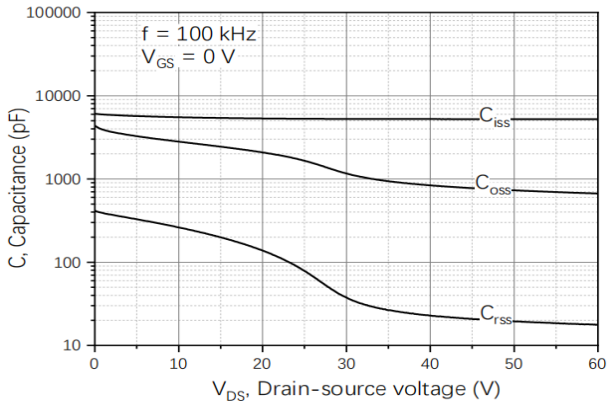


Figure3. Capacitance Characteristics

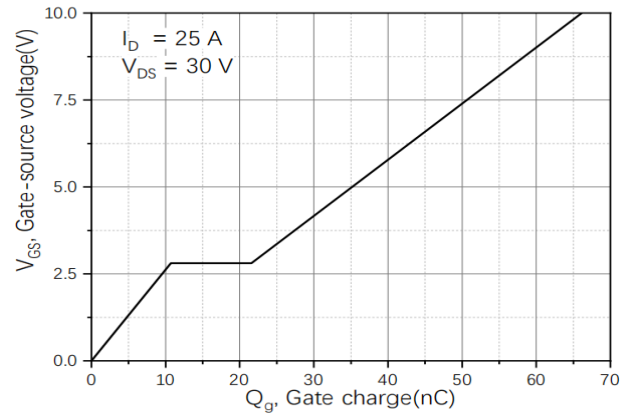


Figure4. Gate Charge

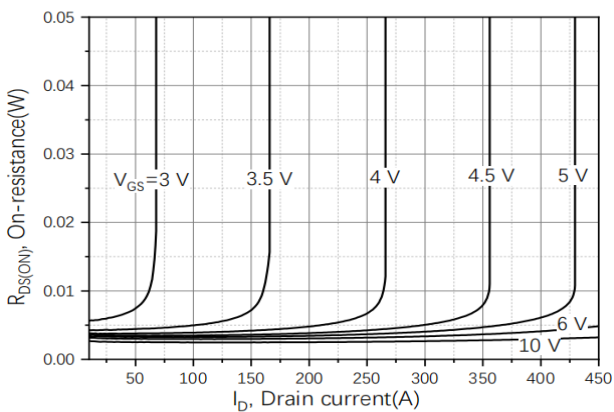


Figure5. Drain-Source on Resistance

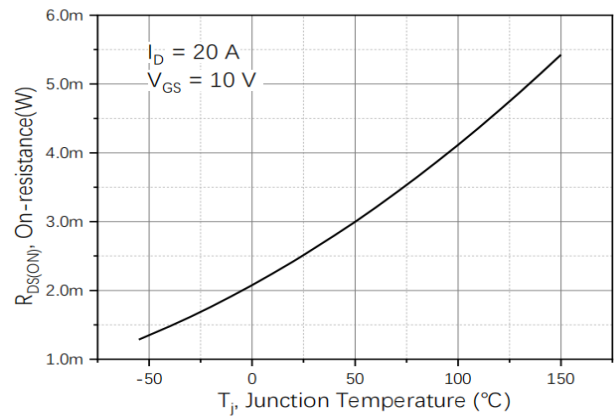


Figure6. Drain-Source on Resistance

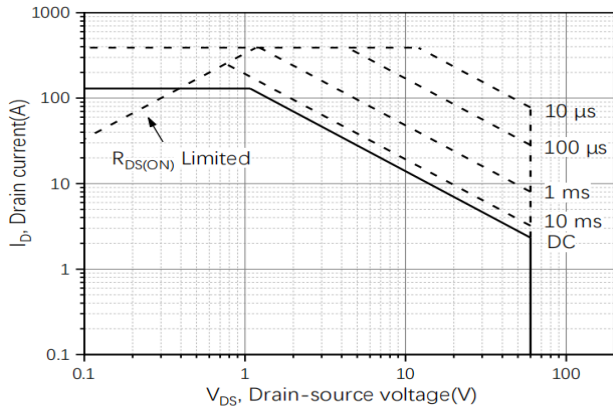


Figure7. Safe Operation Area

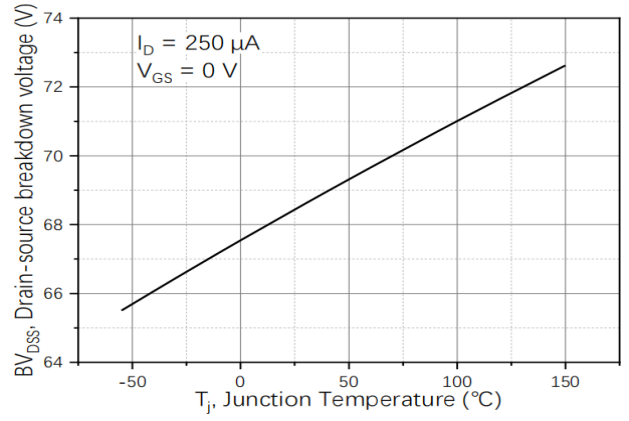


Figure8. Drain-source breakdown voltage

## Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

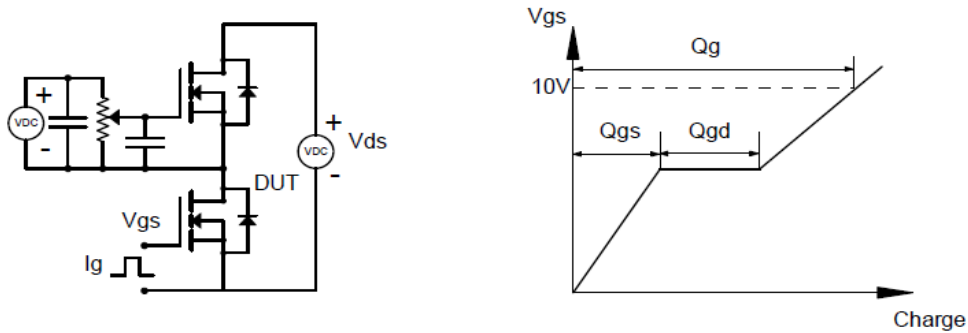


Figure B: Resistive Switching Test Circuit & Waveforms

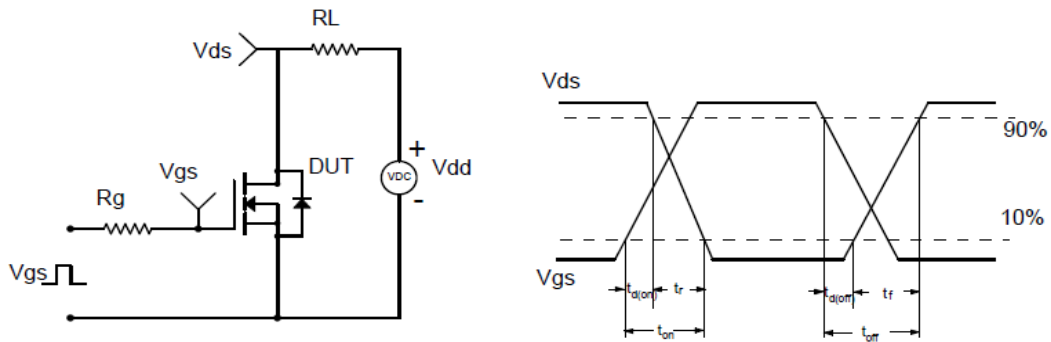


Figure C: Unclamped Inductive Switching (UIS) Test

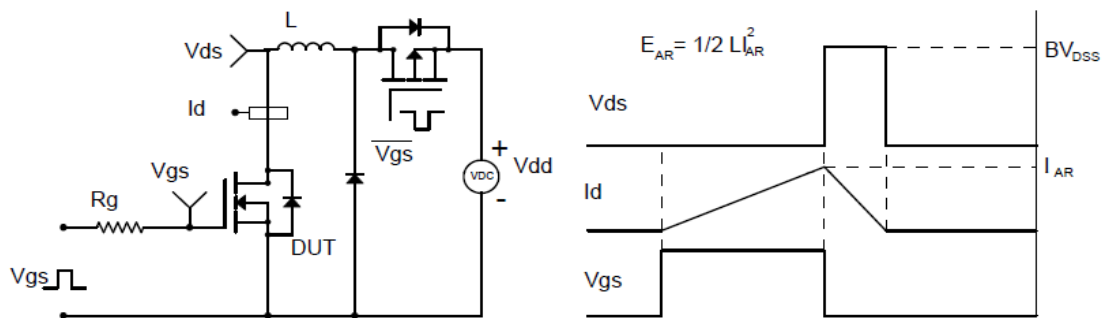
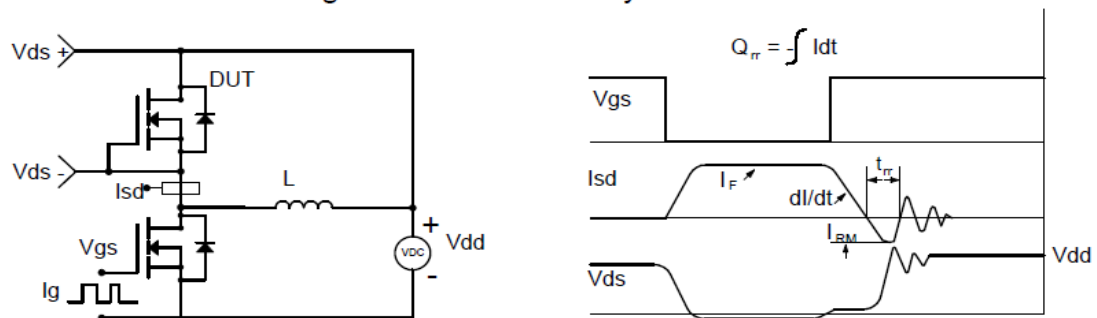


Figure D: Diode Recovery Test Circuit & Waveforms



## PDFN5060-8L Package Information

