

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% ∇V_{DS} Tested

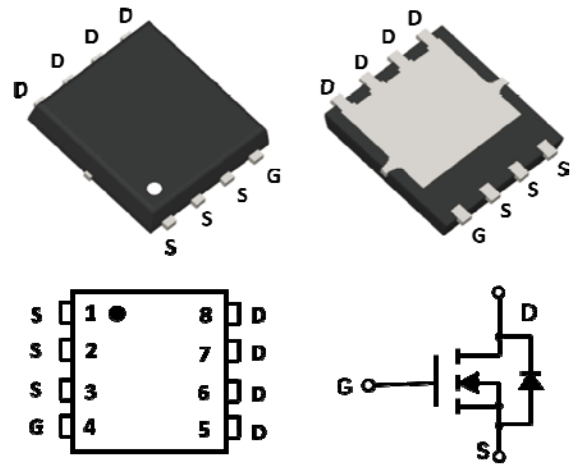
General Description

- 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}	± 20	V
Drain Current		I_D	130	A
Drain Current ^A	$T_C=25^{\circ}\text{C}$	I_D	85	A
	$T_C=100^{\circ}\text{C}$		54	
Pulsed Drain Current ^B		I_{DM}	390	A
Avalanche energy ^C		EAS	270	mJ
Total Power Dissipation ^D		P_D	105	W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	1.2	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-to-Ambient ^E		$R_{\theta JA}$	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°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	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	mΩ
		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
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHz		3350		pF
Output Capacitance	C _{oss}			1666		
Reverse Transfer Capacitance	C _{rss}			77.7		
Switching Parameters						
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 Chrage	Q _{rr}	I _F =25A, di/dt=100A/us		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} =2Ω		22.5		
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}=50 V, R_G=25 Ω, L=0.5 mH, starting T_J=25 °C.
- P_D is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{θJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 °C.

Typical Performance Characteristics

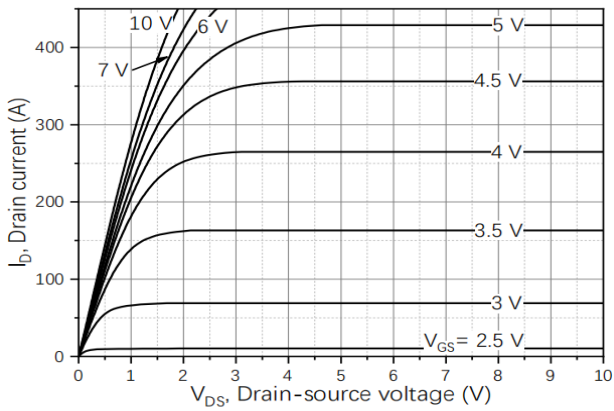


Figure1. Output Characteristics

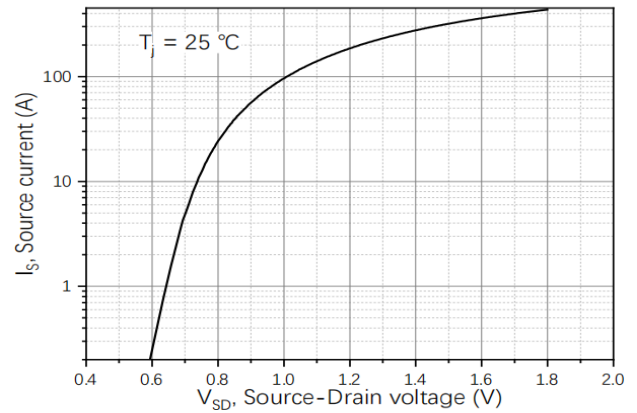


Figure2. Transfer Characteristics

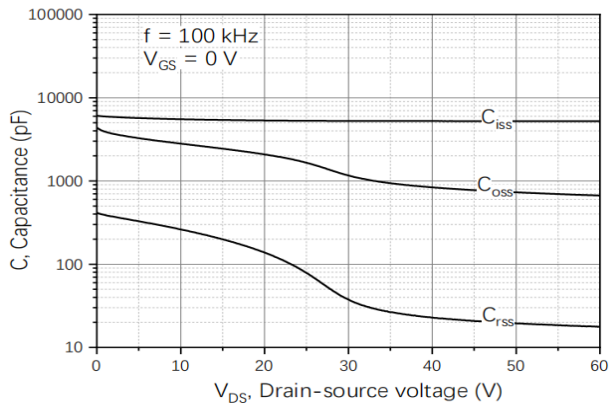


Figure3. Capacitance Characteristics

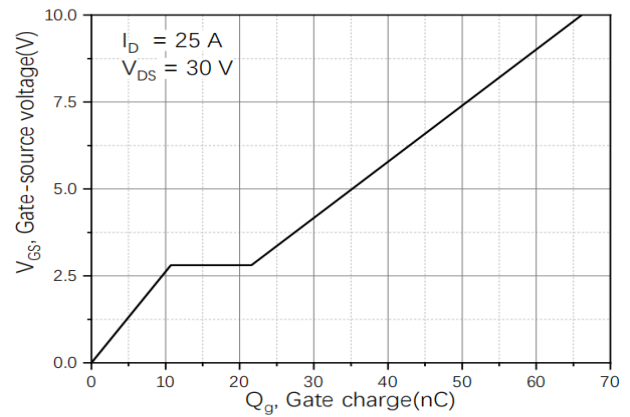


Figure4. Gate Charge

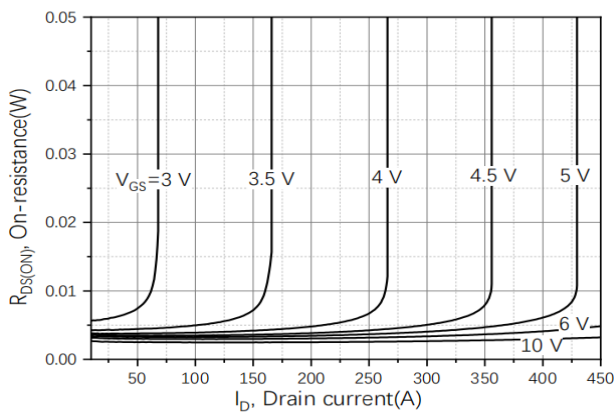


Figure5. Drain-Source on Resistance

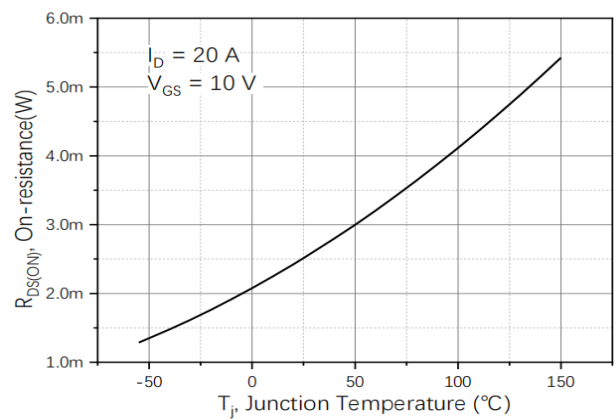


Figure6. Drain-Source on Resistance

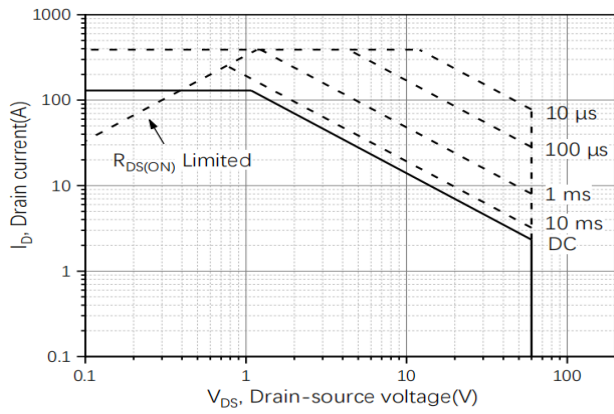


Figure7. Safe Operation Area

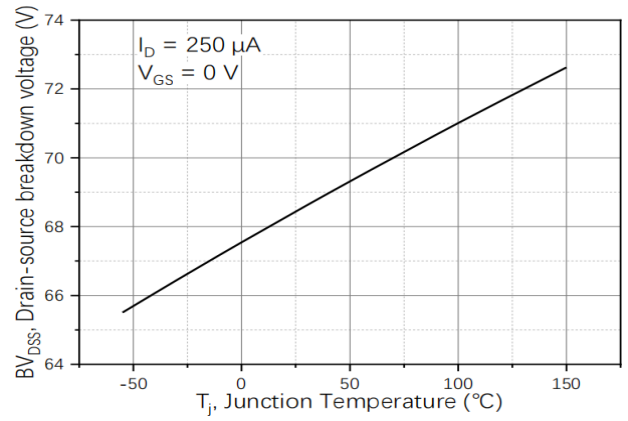


Figure8. Drain-source breakdown voltage

Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

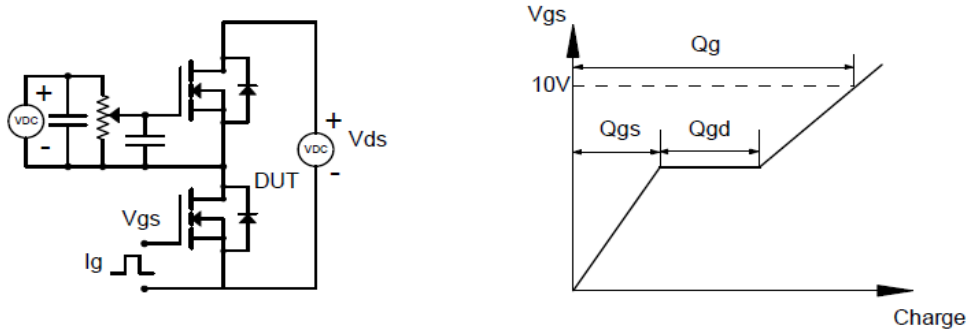


Figure B: Resistive Switching Test Circuit & Waveforms

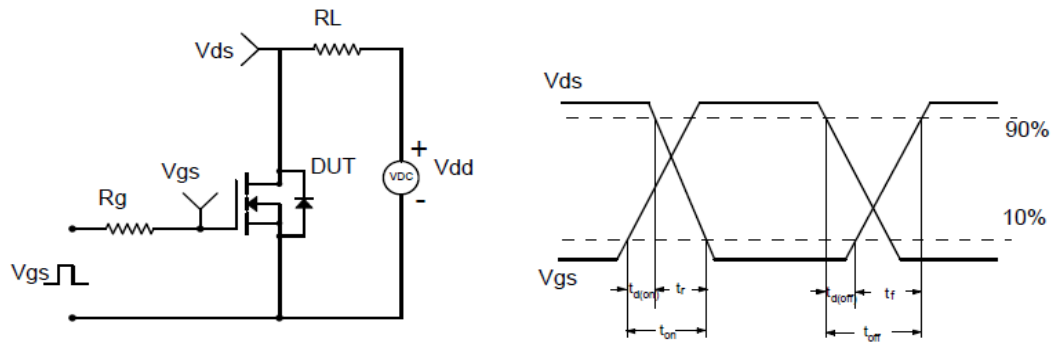


Figure C: Unclamped Inductive Switching (UIS) Test

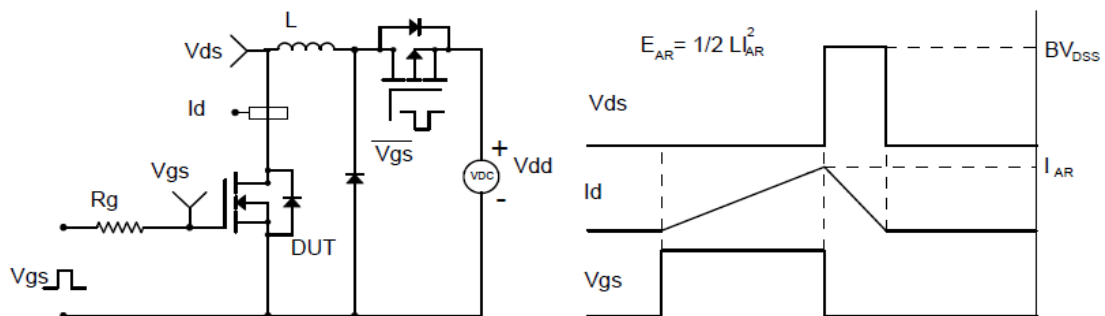
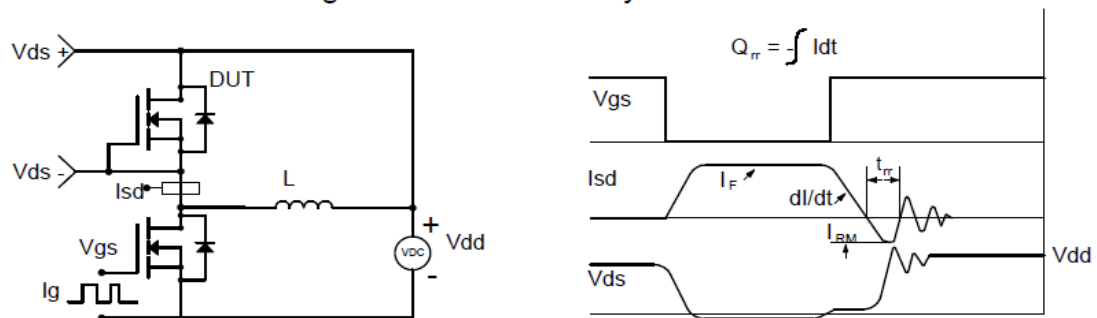


Figure D: Diode Recovery Test Circuit & Waveforms



PDFN5060-8L Package Information

