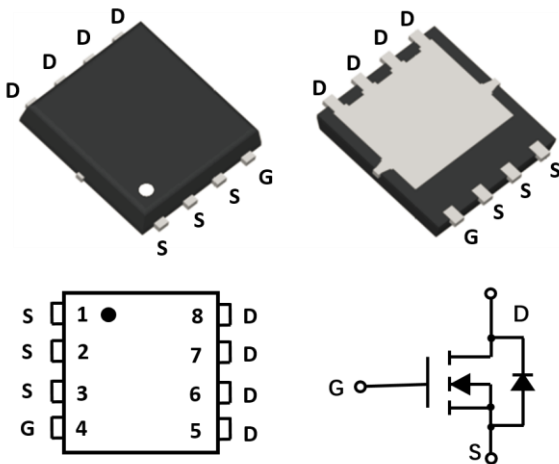


## N-Channel Enhancement Mode Field Effect Transistor

### PDFN5060-8L



### 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%  $\nabla V_{DS}$  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

### ■ Absolute Maximum Ratings ( $T_A=25^\circ C$ 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>	$I_D$	$T_C=25^\circ C$	85
		$T_C=100^\circ C$	54
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	390	A
Avalanche energy <sup>C</sup>	$E_{AS}$	270	mJ
Total Power Dissipation <sup>D</sup>	$P_D$	105	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.2	$^\circ C/W$
Thermal Resistance Junction-to-Ambient <sup>E</sup>	$R_{\theta JA}$	55	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ C$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJG85G06A	F1	YJG85G06A	5000	10000	50000	13" reel



# YJG85G06A

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.8	2.5	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =20A		2.5	3.0	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> =10A		3.5	4.5	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =20A, V <sub>GS</sub> =0V			1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				85	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHZ		5377		pF
Output Capacitance	C <sub>oss</sub>			1666		
Reverse Transfer Capacitance	C <sub>rss</sub>			77.7		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, I <sub>D</sub> =25A		66.1		nC
Gate-Source Charge	Q <sub>gs</sub>			10.7		
Gate-Drain Charge	Q <sub>gd</sub>			10.9		
Reverse Recovery Chrage	Q <sub>rr</sub>	I <sub>F</sub> =25A, di/dt=100A/us		73		
Reverse Recovery Time	t <sub>rr</sub>			68		
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =30V, I <sub>D</sub> =25A R <sub>GEN</sub> =2Ω		22.5		ns
Turn-on Rise Time	t <sub>r</sub>			6.7		
Turn-off Delay Time	t <sub>d(off)</sub>			80.3		
Turn-off fall Time	t <sub>f</sub>			26.9		

### Note:

- The maximum current rating is package limited.
- Repetitive rating; pulse width limited by max. junction temperature.
- V<sub>DD</sub>=50 V, R<sub>G</sub>=25 Ω, L=0.5 mH, starting T<sub>J</sub>=25 °C.
- P<sub>D</sub> is based on max. junction temperature, using junction-case thermal resistance.
- The value of R<sub>θJA</sub> is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T<sub>a</sub>=25 °C.



## ■ Typical Performance Characteristics

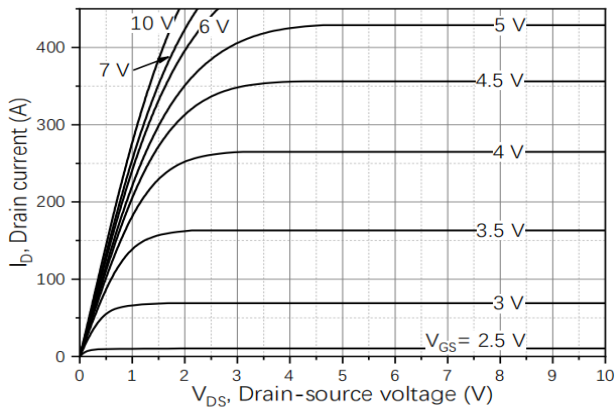


Figure1. Output Characteristics

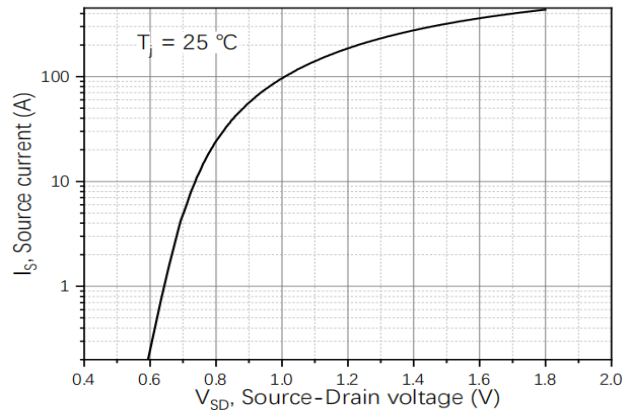


Figure2. Transfer Characteristics

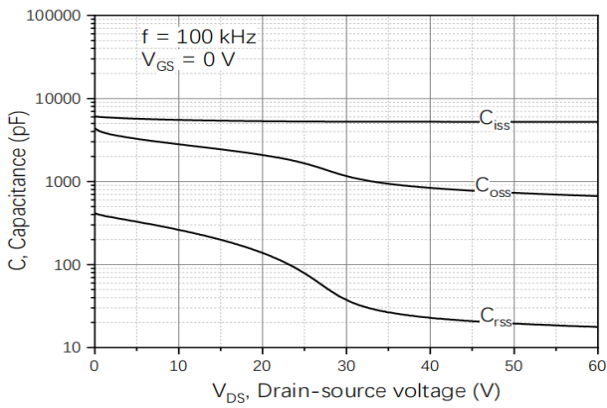


Figure3. Capacitance Characteristics

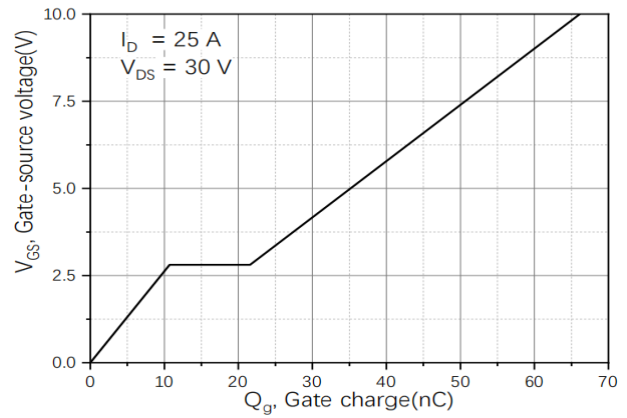


Figure4. Gate Charge

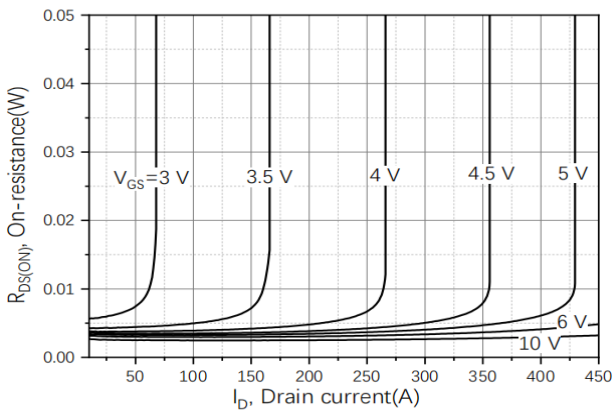


Figure5. Drain-Source on Resistance

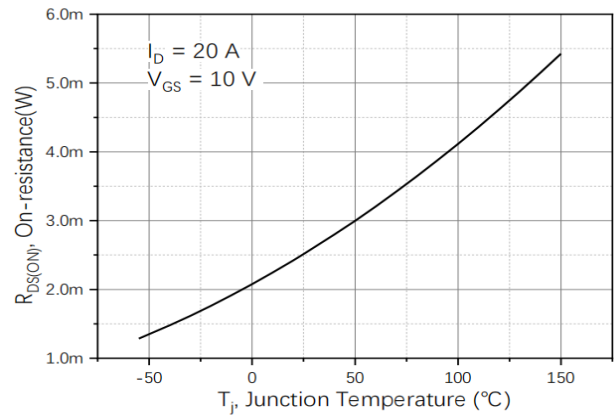


Figure6. Drain-Source on Resistance



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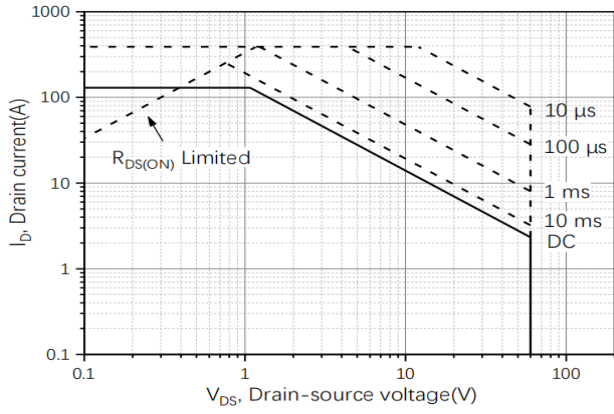


Figure7. Safe Operation Area

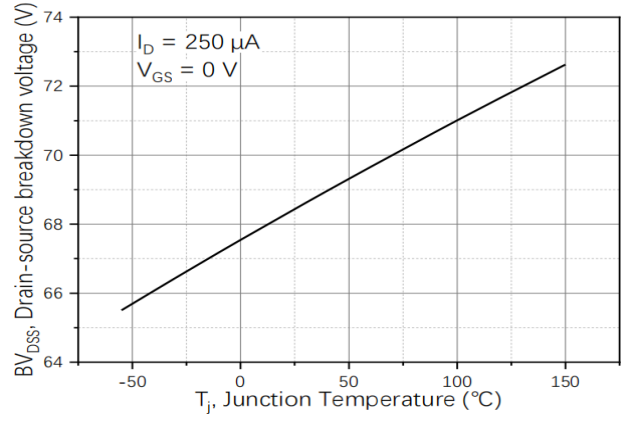


Figure8. Drain-source breakdown voltage

## ■ Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

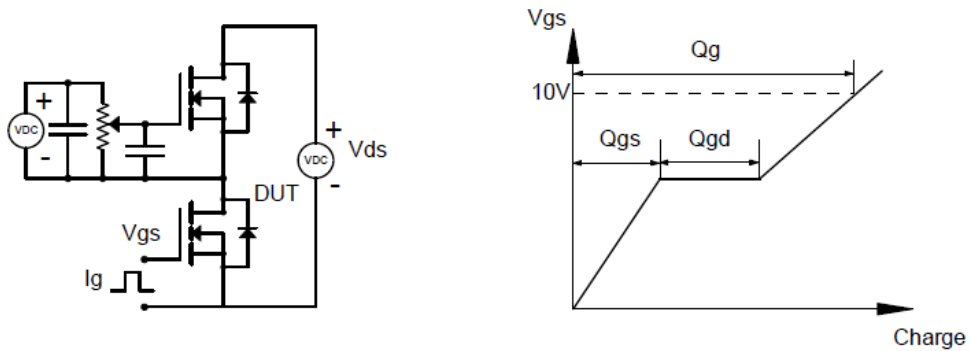


Figure B: Resistive Switching Test Circuit & Waveforms

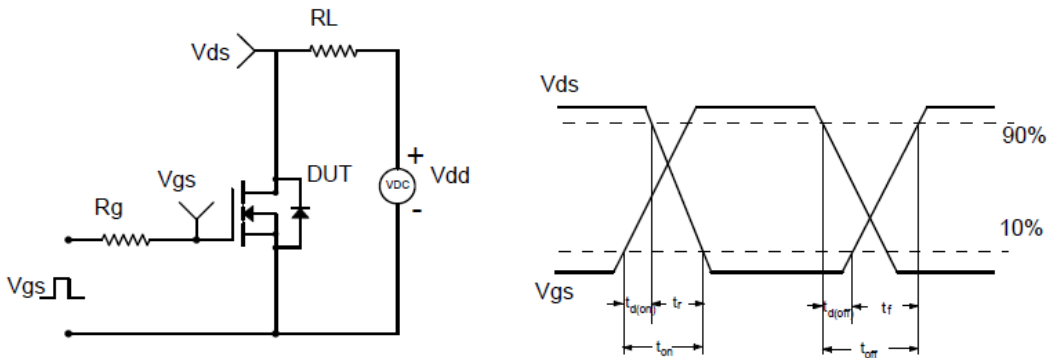


Figure C: Unclamped Inductive Switching (UIS) Test

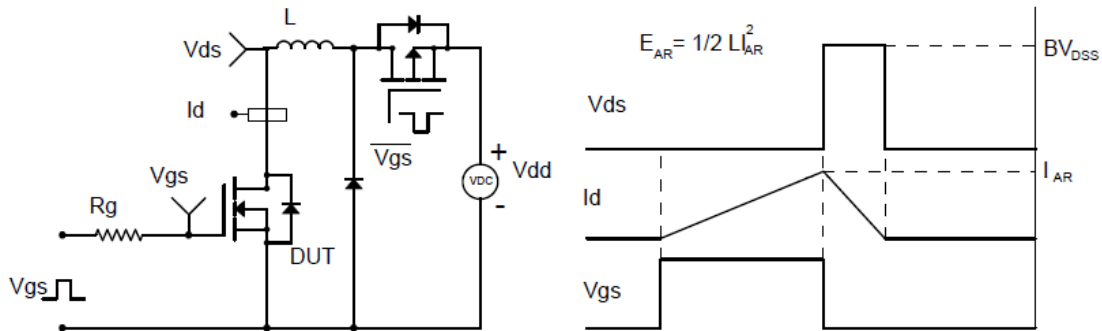
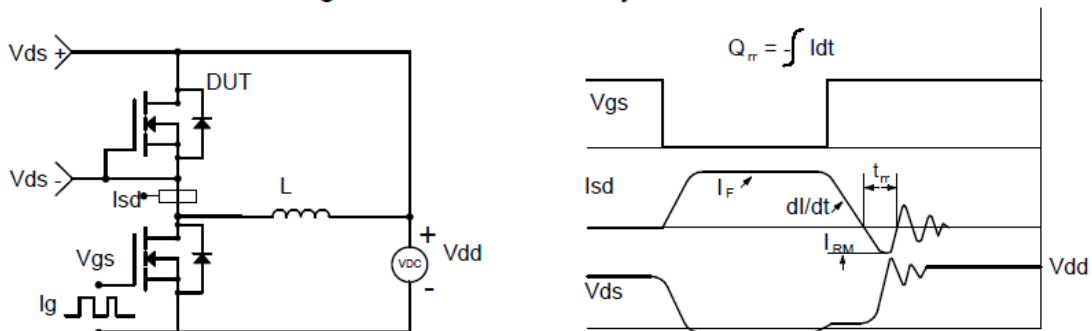


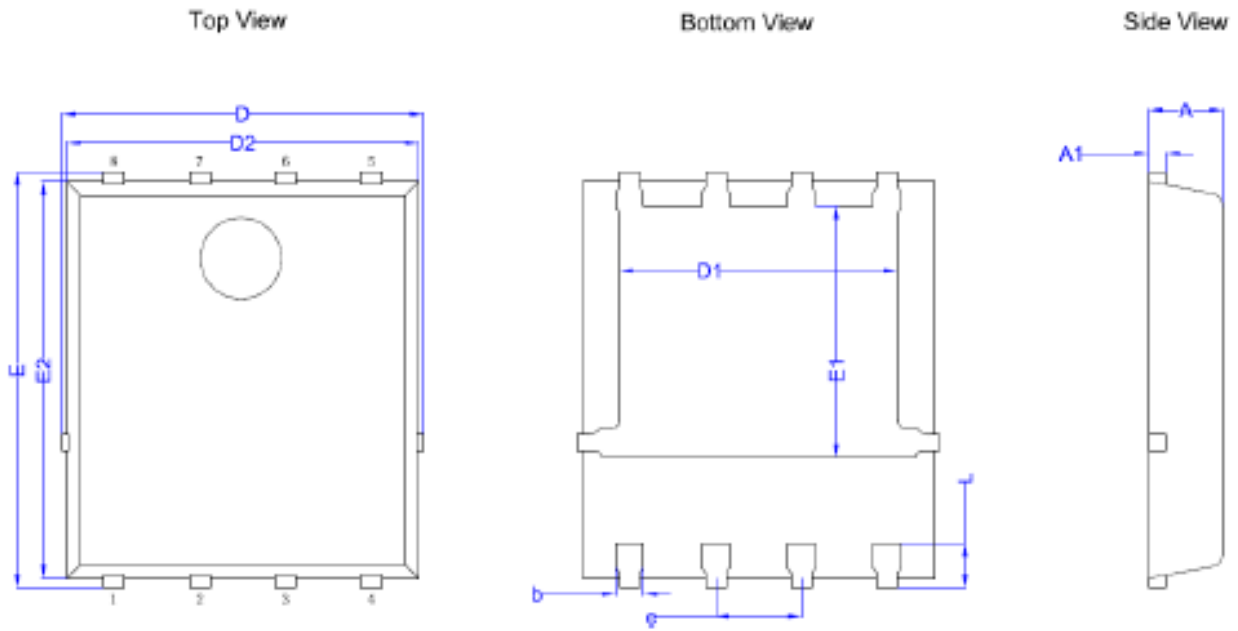
Figure D: Diode Recovery Test Circuit & Waveforms





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## ■ PDFN5060-8L Package information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.00	1.10	1.20
A1	0.254 BSC		
D	5.15	5.35	5.55
E	5.95	6.15	6.35
D1	3.92	4.12	4.32
E1	3.52	3.72	3.92
D2	5.00	5.20	5.40
E2	5.66	5.86	6.06
e	1.27BSC		
b	0.31	0.41	0.51
L	0.56	0.66	0.76



## YJG85G06A

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