

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Low $R_{DS(ON)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity or Invertors

Pin Description

Pin	Description
1,2,3	Source(S)
4	Gate(G)
5,6,7,8	Drain(D)

Applications

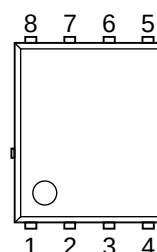
- Consumer electronic power supply Motor control
- Synchronous-rectification Isolated DC
- Synchronous-rectification applications

Quick reference

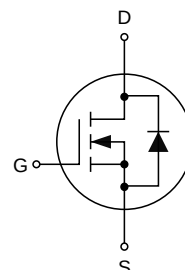
- $B_V \geq 60V$
- $I_D \leq 130A$
- $R_{DS(ON)} \leq 3.0m\Omega$ @ $V_{GS} = 10V$ (Type:2.5 $m\Omega$)

Simplified Outline

Symbol



Top View
PDFN5x6-8L



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ130N06G	PDFN5x6-8L	130N06 YWWXXX	YWW: Date Code	-	5000

2. Absolute Maximum Ratings ($T_J=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Min	Max	Unit
V_{DS}	Drain-Source Voltage	60	-	V
V_{GS}	Gate-Source Voltage	-	± 20	V
I_D^1	Drain Current	-	130	A
I_{DM}^2	Pulsed Drain Current	-	390	A
P_{tot}^3	Total Power Dissipation	-	140	W
T_{stg}	Storage Temperature	- 55	150	$^\circ C$
T_J	Junction Temperature	-	150	$^\circ C$
E_{AS}^5	Single Pulsed Avalanche Energy	-	320	mJ
$R_{\theta JC}$	Thermal Resistance- Junction to Case	-	0.89	$^\circ C/W$
$R_{\theta JA}^4$	Thermal Resistance- Junction to ambient	-	62	$^\circ C/W$

3. Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-source breakdown voltage	V _{GS} =0V, I _D =250μA	60			V
V _{GS(th)}	Gate threshold voltage	V _{DS} =V _{GS} , I _D =250μA	1.0		2.5	V
R _{DS(ON)}	Drain-source on-state resistance	V _{GS} =10V, I _D =20A		2.5	3.0	mΩ
R _{DS(ON)}	Drain-source on-state resistance	V _{GS} =4.5V, I _D =10A		3.5	4.5	mΩ
I _{GSS}	Gate-source leakage current	V _{GS} =±20V			±100	nA
I _{DSS}	Drain-source leakage current	V _{DS} =60V, V _{GS} =0V			1	μA
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=100kHz		5377		pF
C _{oss}	Output Capacitance			1666		pF
C _{rss}	Reverse Transfer Capacitance			77.7		pF
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =30V, R _G =2Ω, I _D =25A		22.5		ns
t _r	Turn-on Rise Time			6.7		ns
t _{d(off)}	Turn-off Delay Time			80.3		ns
t _f	Turn-off Fall Time			26.8		ns
Q _{gs}	Gate-source charge	I _D =25A, V _{DS} =30V, V _{GS} =10V		10.7		nC
Q _{gd}	Gate-drain charge			10.9		nC
V _{plateau}	Gate plateau voltage			2.9		V
I _S	Diode forward current	V _{GS} <V _{th} I _S =20A, V _{GS} =0V			130	A
I _{SP}	Pulsed source current				390	A
V _{SD}	Diode forward voltage				1.3	V
t _{rr}	Reverse Recovery Time	I _S =25A, di/dt=100A/μs		68.3		ns
Q _{rr}	Reverse Recovery Charge			73		nC
I _{rrm}	Peak reverse recovery current			1.9		A

Notes:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. P_D is based on max. junction temperature, using junction-case thermal resistance.
4. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_a=25°C.
5. V_{DD}=50V, R_G=25Ω, L=0.3mH, starting T_J=25°C.

4. Typical Characteristics

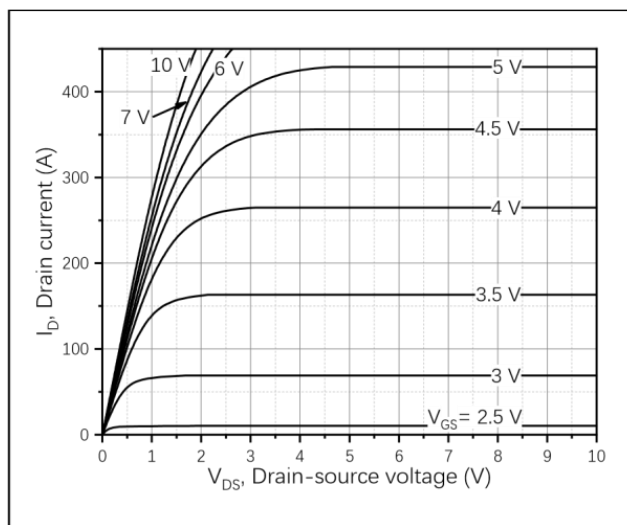


Figure 1, Typ. output characteristics

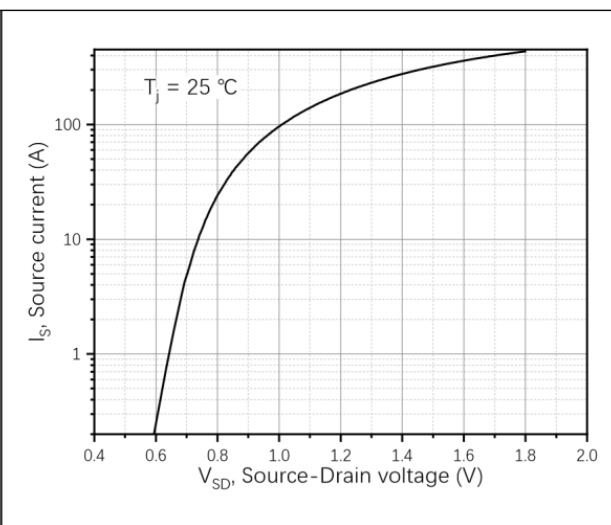


Figure 2, Typ. transfer characteristics

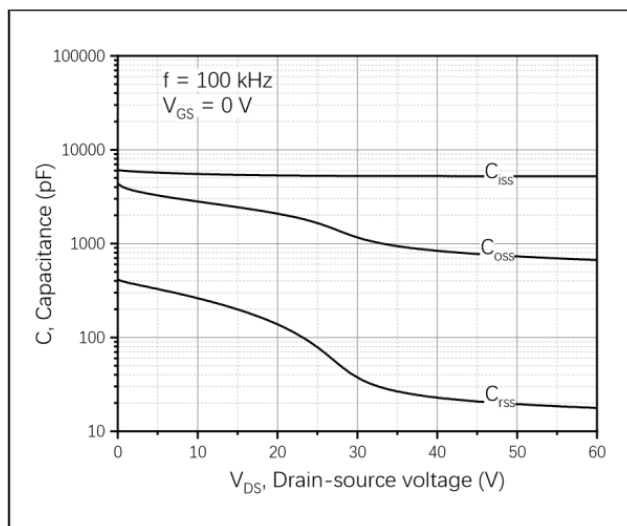


Figure 3, Typ. capacitances

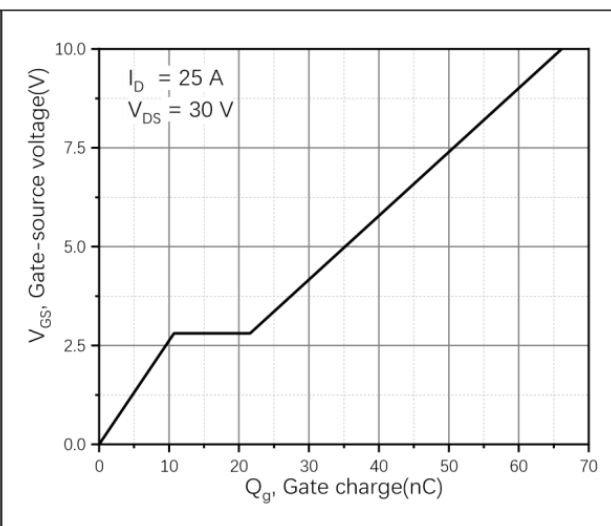


Figure 4, Typ. gate charge

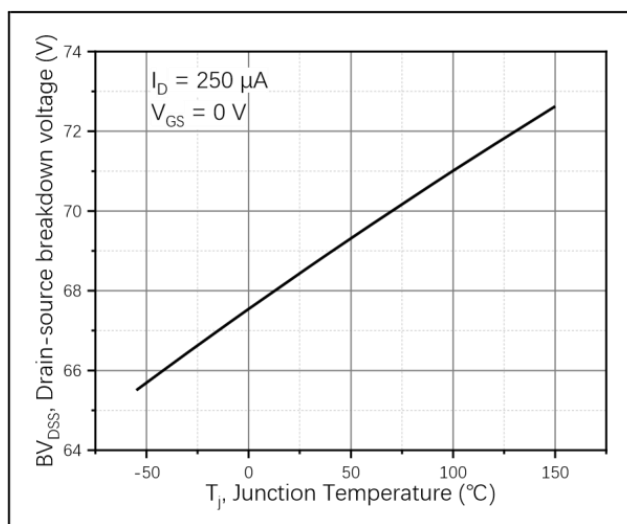


Figure 5, Drain-source breakdown voltage

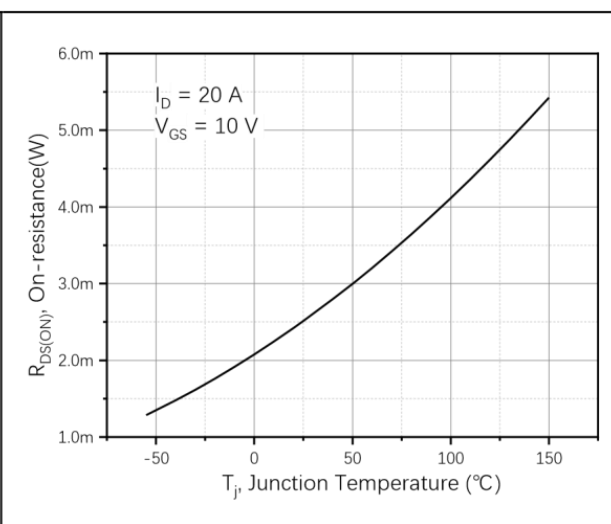


Figure 6, Drain-source on-state resistance

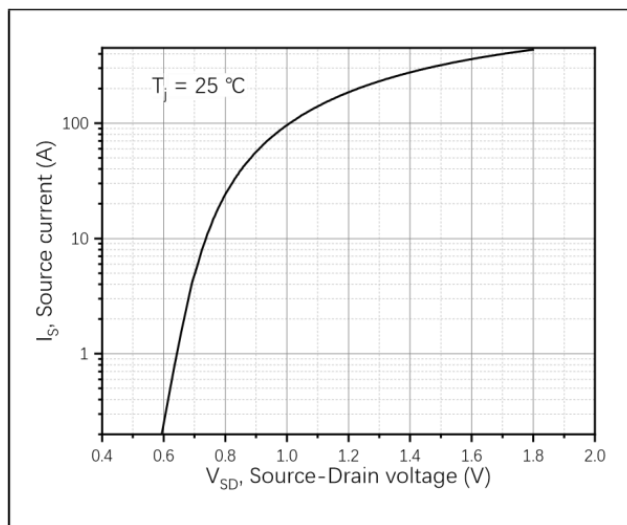


Figure 7, Forward characteristic of body diode

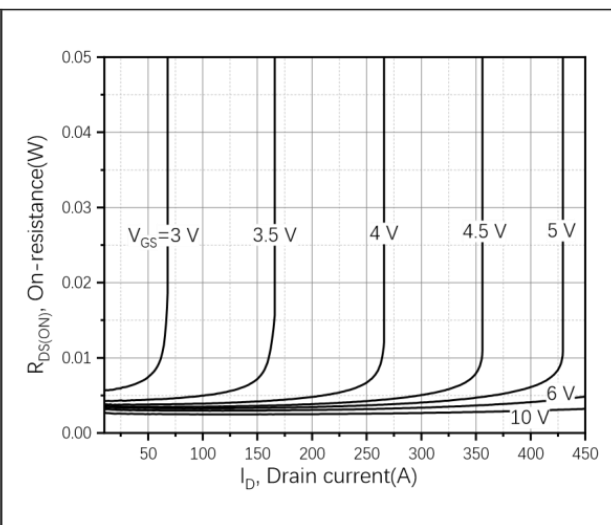


Figure 8, Drain-source on-state resistance

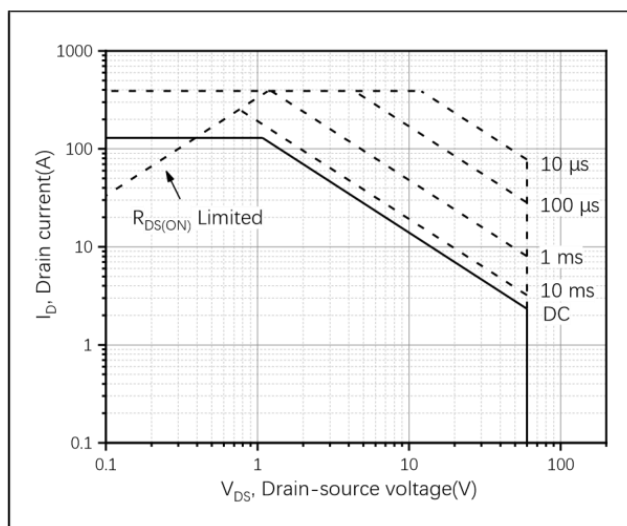


Figure 9, Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

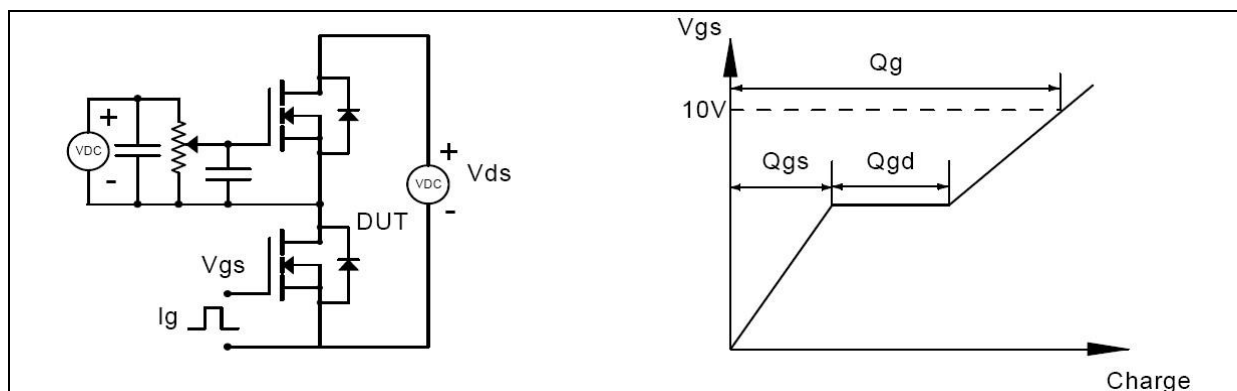


Figure 1, Gate charge test circuit & waveform

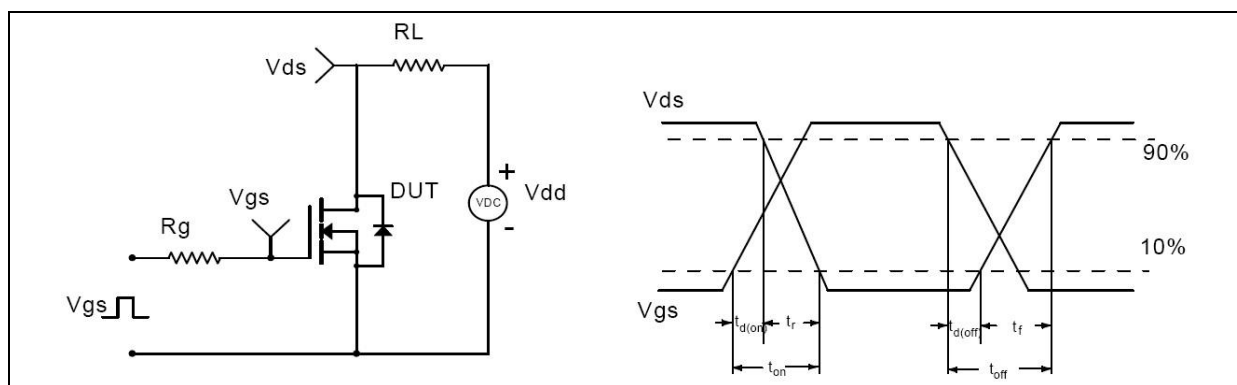


Figure 2, Switching time test circuit & waveforms

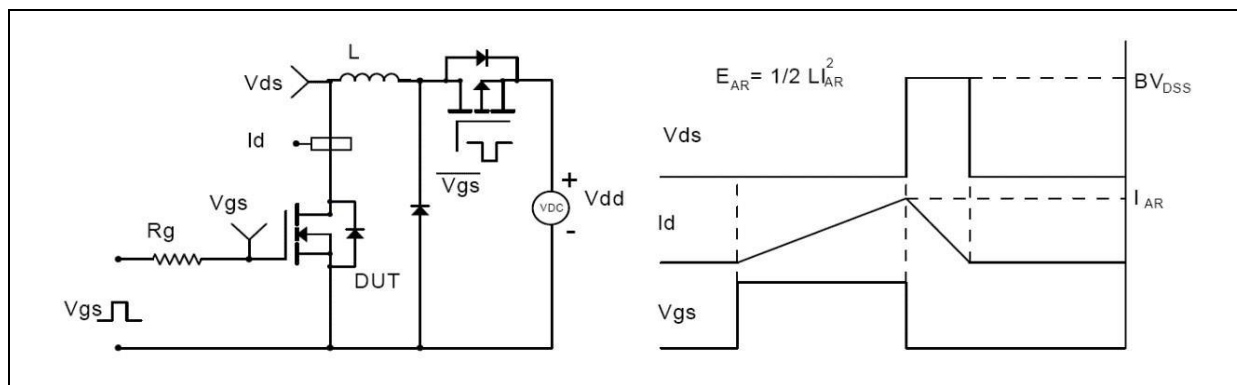


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

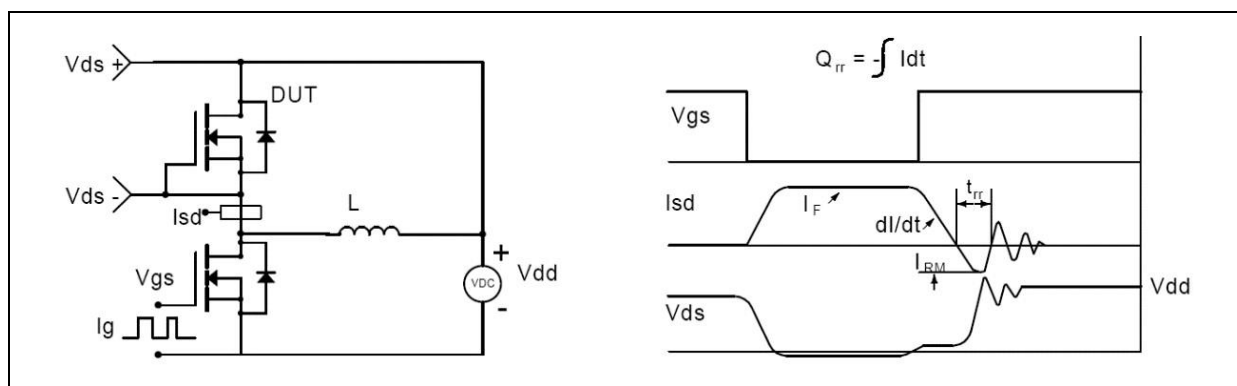
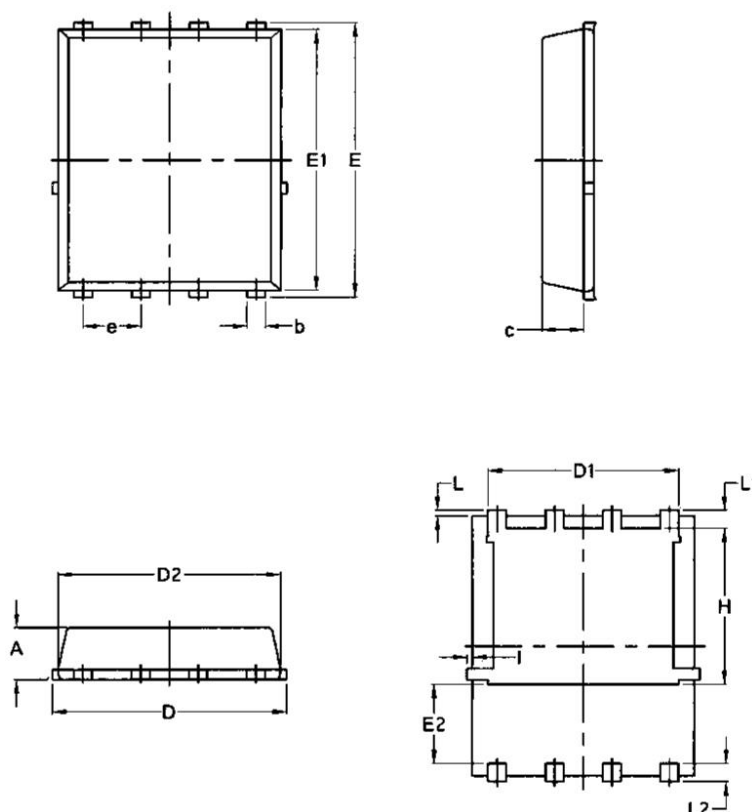


Figure 4, Diode reverse recovery test circuit & waveforms

5. Package Mechanical Data

PDFN5×6-8L Package



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	0.970	0.0324	0.0382
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