

### Features

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

### Description

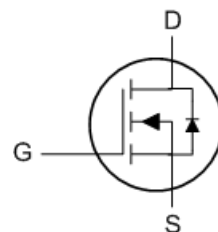
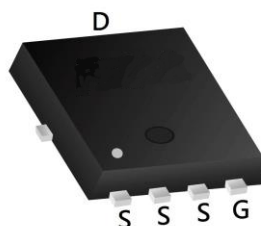
The JHG6006 is the high cell density trenched N-ch MOSFETs, which provide excellent R<sub>DS(on)</sub> and gate charge for most of the synchronous buck converter applications.

The JHG6006 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

### Product Summary

BVDSS	R <sub>DS(on)</sub>	I <sub>D</sub>
60V	16mΩ	40A

### DFN5X6 Pin Configuration



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	60	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	40	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	25	A
I <sub>D</sub> @T <sub>A</sub> =25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	7.4	A
I <sub>D</sub> @T <sub>A</sub> =70°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	6	A
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	80	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	39.2	mJ
I <sub>AS</sub>	Avalanche Current	28	A
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation <sup>4</sup>	59	W
P <sub>D</sub> @T <sub>A</sub> =25°C	Total Power Dissipation <sup>4</sup>	2	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-Ambient <sup>1</sup>	---	62	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>	---	2.1	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	60	---	---	V
△BV <sub>DSS</sub> /△T <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25℃ , I <sub>D</sub> =1mA	---	0.057	---	V/℃
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V , I <sub>D</sub> =20A	---	---	16	mΩ
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =10A	---	---	20	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.2	---	2.5	V
△V <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	-5.68	---	mV/℃
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =48V , V <sub>GS</sub> =0V , T <sub>J</sub> =25℃	---	---	1	uA
		V <sub>DS</sub> =48V , V <sub>GS</sub> =0V , T <sub>J</sub> =55℃	---	---	5	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =± 20V , V <sub>DS</sub> =0V	---	---	± 100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V , I <sub>D</sub> =20A	---	35.2	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz	---	1.7	---	Ω
Q <sub>g</sub>	Total Gate Charge (4.5V)	V <sub>DS</sub> =48V , V <sub>GS</sub> =4.5V , I <sub>D</sub> =15A	---	19.3	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	7.1	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	7.6	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =30V , V <sub>GS</sub> =10V , R <sub>G</sub> =3.3Ω, I <sub>D</sub> =15A	---	7.2	---	ns
T <sub>r</sub>	Rise Time		---	50	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	36.4	---	
T <sub>f</sub>	Fall Time		---	7.6	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V , V <sub>GS</sub> =0V , f=1MHz	---	2423	---	pF
C <sub>oss</sub>	Output Capacitance		---	145	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	97	---	
Diode Characteristics						
I <sub>S</sub>	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	40	A
I <sub>SM</sub>	Pulsed Source Current <sup>2,5</sup>		---	---	80	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V , I <sub>S</sub> =A , T <sub>J</sub> =25℃	---	---	1	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =15A , dI/dt=100A/μs , T <sub>J</sub> =25℃	---	16.3	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge		---	11	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is  $V_{DD}=25V$ ,  $V_{GS}=10V$ ,  $L=0.1mH$ ,  $I_{AS}=28A$
- 4.The power dissipation is limited by  $150^\circ\text{C}$  junction temperature
- 5.The data is theoretically the same as  $I_D$  and  $I_S$  , in real applications , should be limited by total power dissipation.

## Typical Characteristics

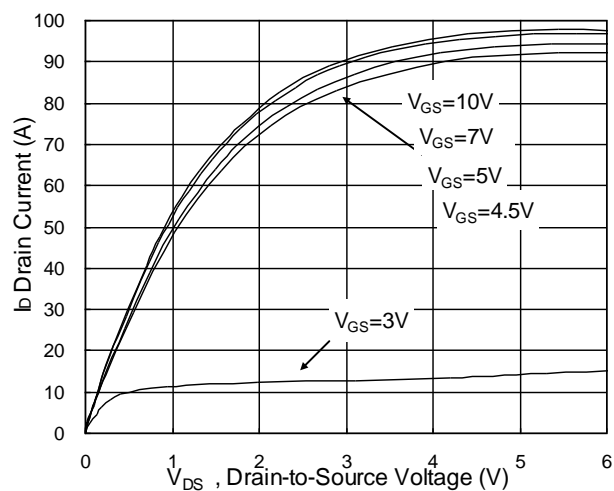


Fig.1 Typical Output Characteristics

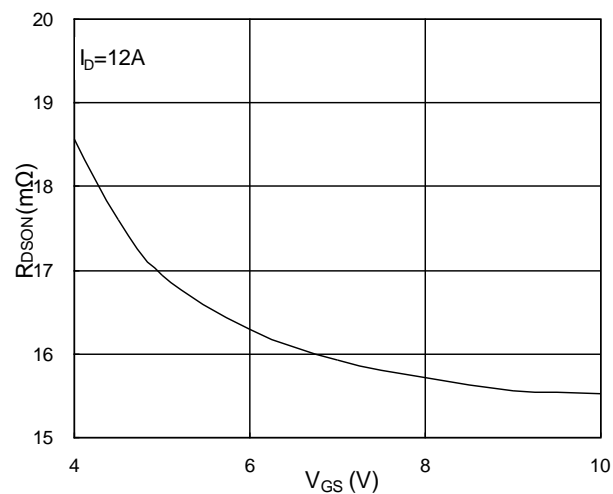


Fig.2 On-Resistance v.s Gate-Source

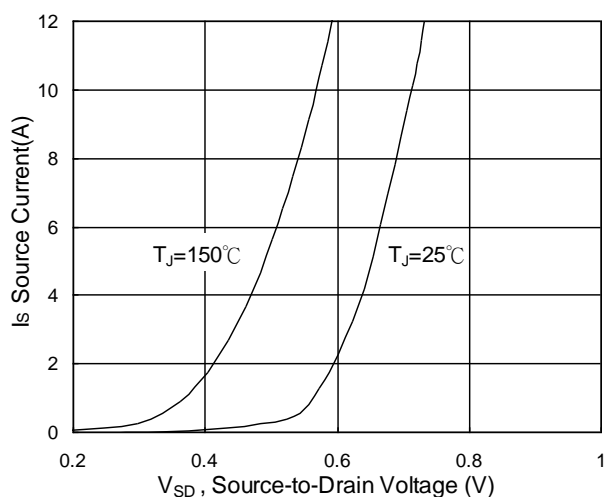


Fig.3 Forward Characteristics of Reverse

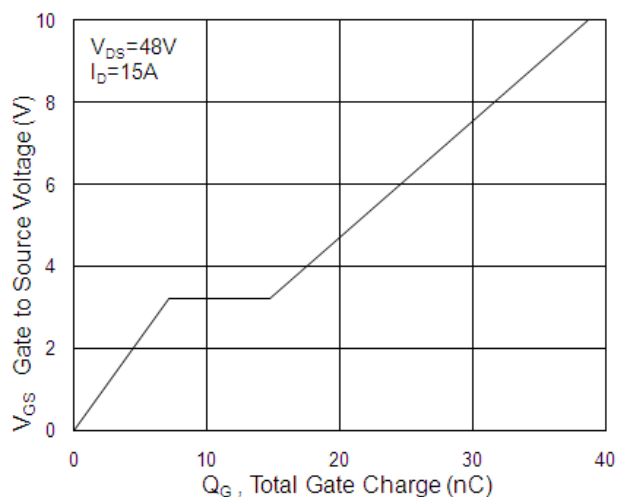


Fig.4 Gate-Charge Characteristics

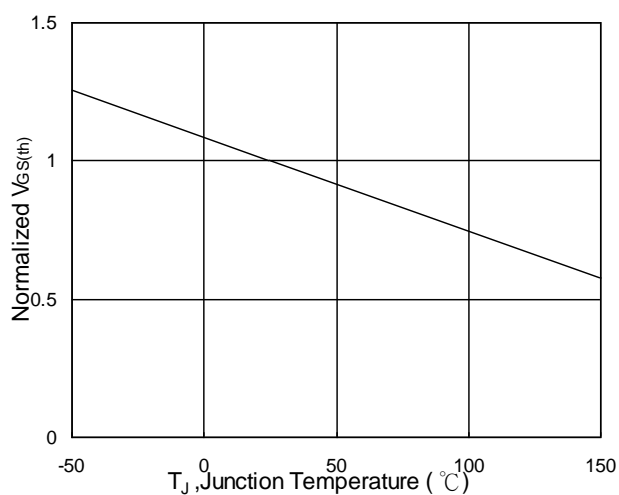


Fig.5 Normalized  $V_{GS(th)}$  v.s  $T_J$

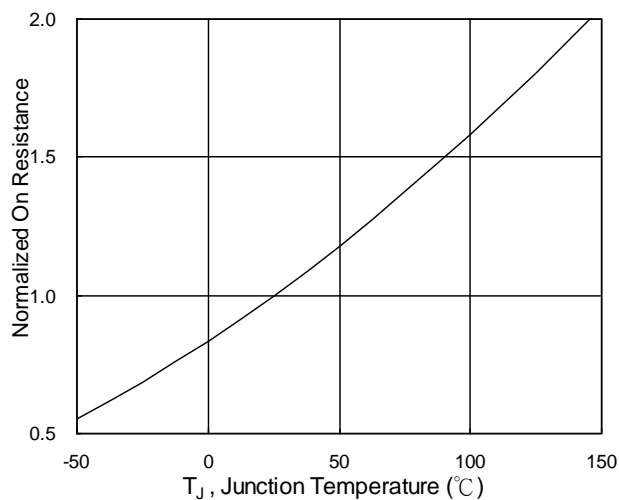


Fig.6 Normalized  $R_{DS(on)}$  v.s  $T_J$

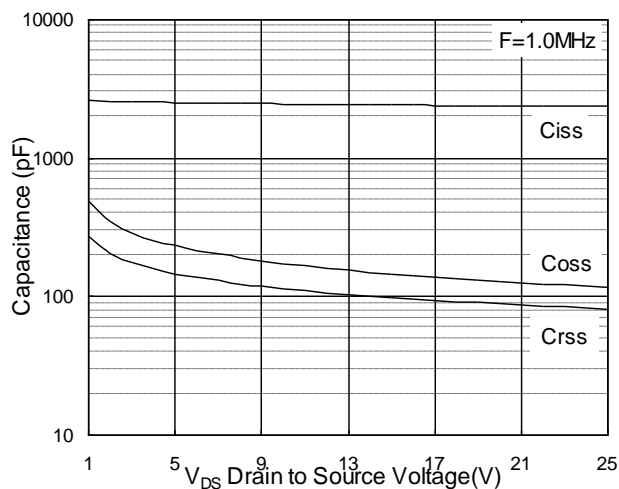


Fig.7 Capacitance

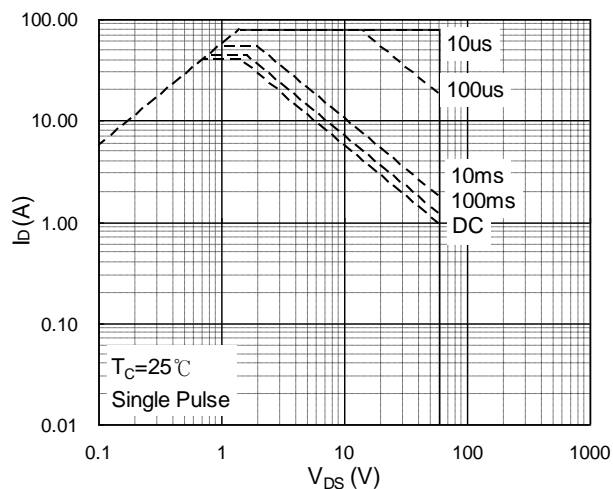


Fig.8 Safe Operating Area

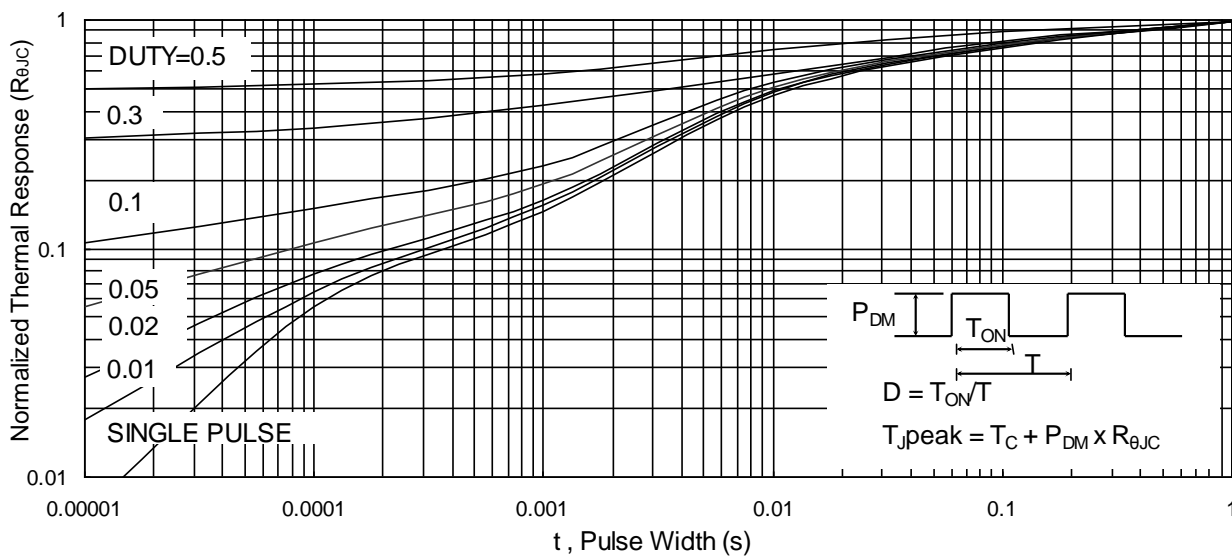


Fig.9 Normalized Maximum Transient Thermal Impedance

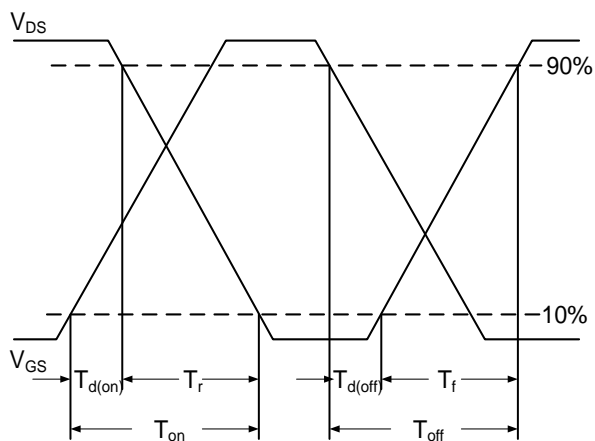


Fig.10 Switching Time Waveform

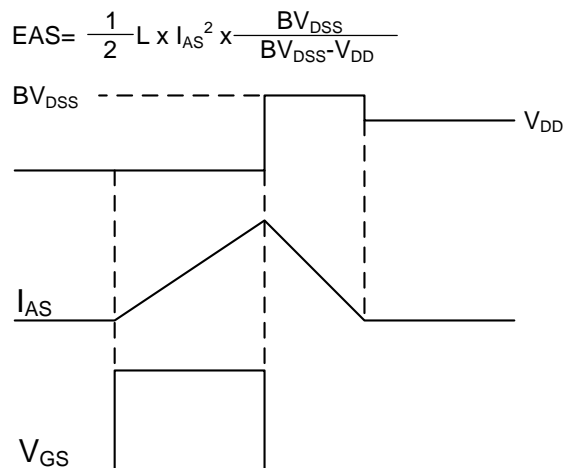
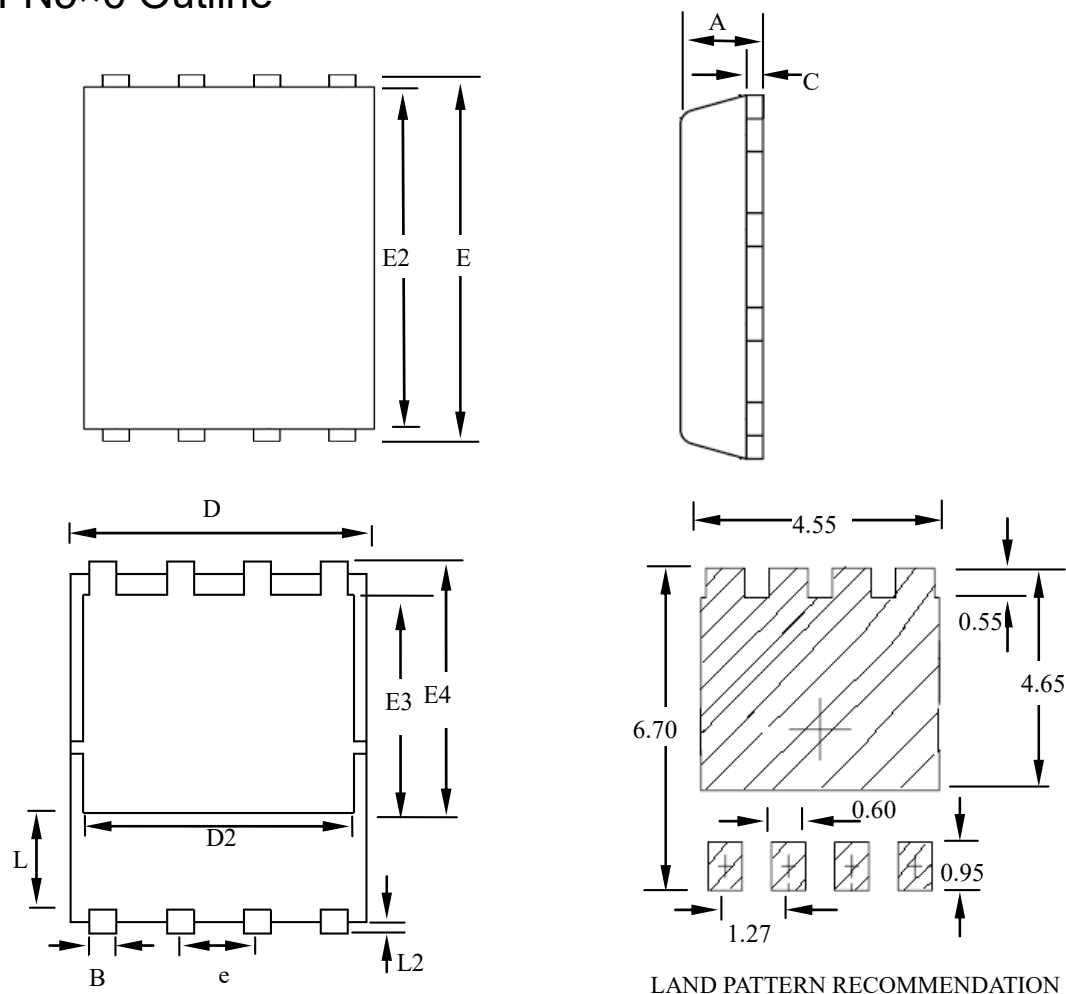


Fig.11 Unclamped Inductive Switching Waveform

## DFN5×6 Outline



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.30	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.30	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	5.90	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145	--	0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--

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