

Description

The HSBA8016 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

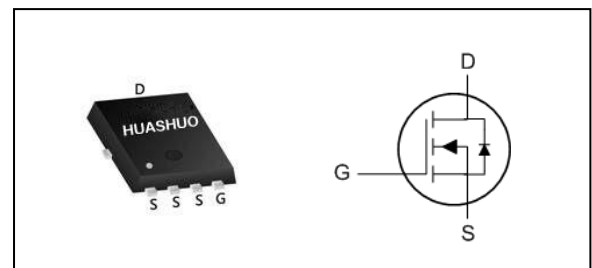
The HSBA8016 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

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

Product Summary

V _{DS}	80	V
R _{DS(ON),max}	12	mΩ
I _D	62	A

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	80	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current ¹	62	A
I _D @T _C =70°C	Continuous Drain Current ¹	49	A
I _{DM}	Pulsed Drain Current ²	200	A
EAS	Single Pulse Avalanche Energy ³	80	mJ
P _D @T _C =25°C	Total Power Dissipation ⁴	89	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ¹	---	62	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	1.3	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	80	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ₂	V _{GS} =10V, I _D =10A	---	9.6	12	mΩ
		V _{GS} =4.5V, I _D =8A	---	12	14.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	---	2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =64V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =64V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =10A	---	32	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	0.66	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =64V, V _{GS} =10V, I _D =4A	---	60.9	---	nC
Q _{gs}	Gate-Source Charge		---	8.1	---	
Q _{gd}	Gate-Drain Charge		---	17.9	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =40V, V _{GS} =10V, R _G =3.3Ω, I _D =4A	---	12.2	---	ns
T _r	Rise Time		---	24.5	---	
T _{d(off)}	Turn-Off Delay Time		---	50.5	---	
T _f	Fall Time		---	17.6	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	3120	---	pF
C _{oss}	Output Capacitance		---	140	---	
C _{rss}	Reverse Transfer Capacitance		---	110	---	

Diode Characteristics

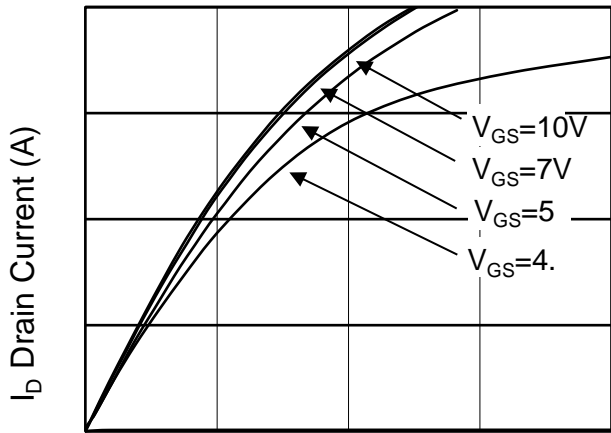
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current _{1,5}	V _G =V _D =0V, Force Current	---	---	62	A
V _{SD}	Diode Forward Voltage ₂	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =4A, dI/dt=100A/μs, T _J =25°C	---	18.6	---	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	65	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=40A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

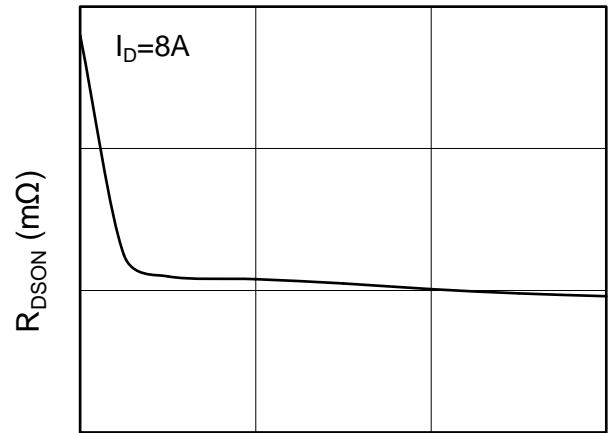


Typical Characteristics



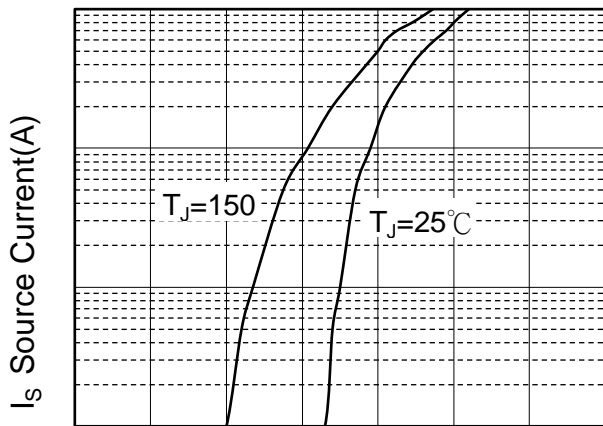
V_{DS} , Drain-to-Source Voltage (V)

Fig.1 Typical Output Characteristics



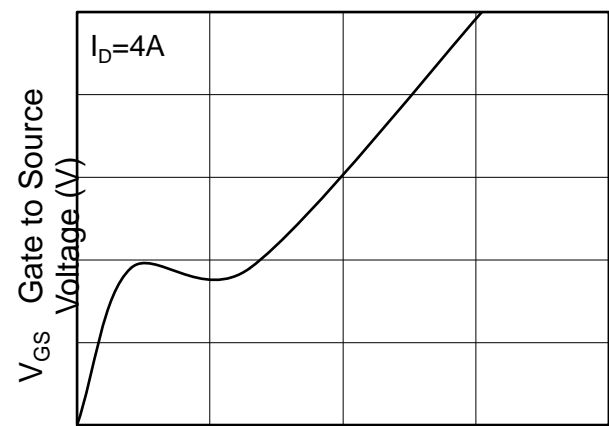
V_{GS} (V)

Fig.2 On-Resistance vs. Gate-Source Voltage



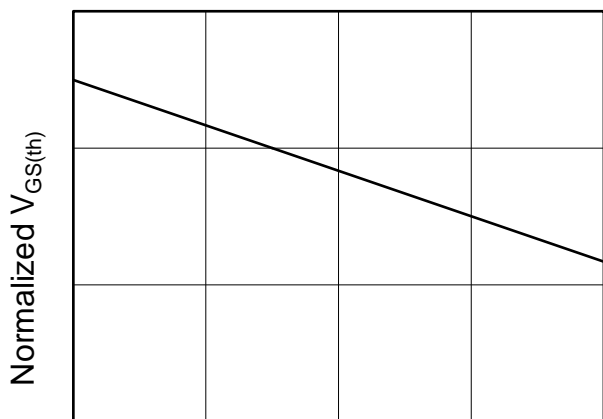
V_{SD} , Source-to-Drain Voltage (V)

Fig.3 Forward Characteristics of Reverse



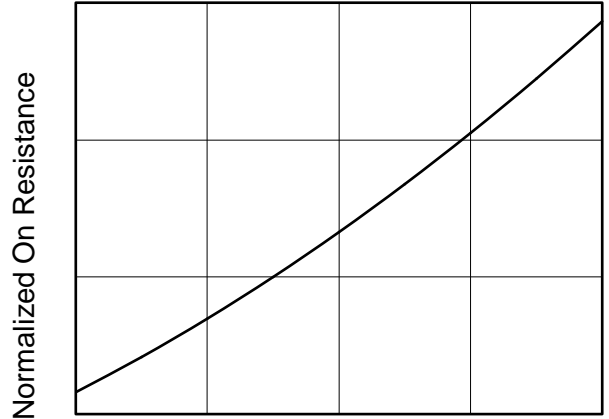
Q_G , Total Gate Charge (nC)

Fig.4 Gate-Charge Characteristics



T_J , Junction Temperature (°C)

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



T_J , Junction Temperature (°C)

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

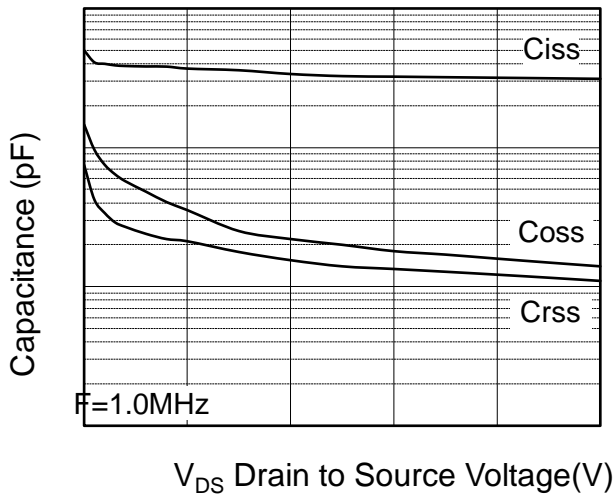


Fig.7 Capacitance

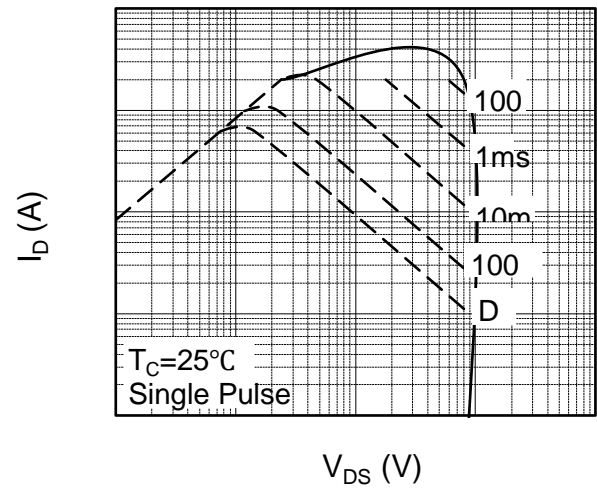


Fig.8 Safe Operating Area

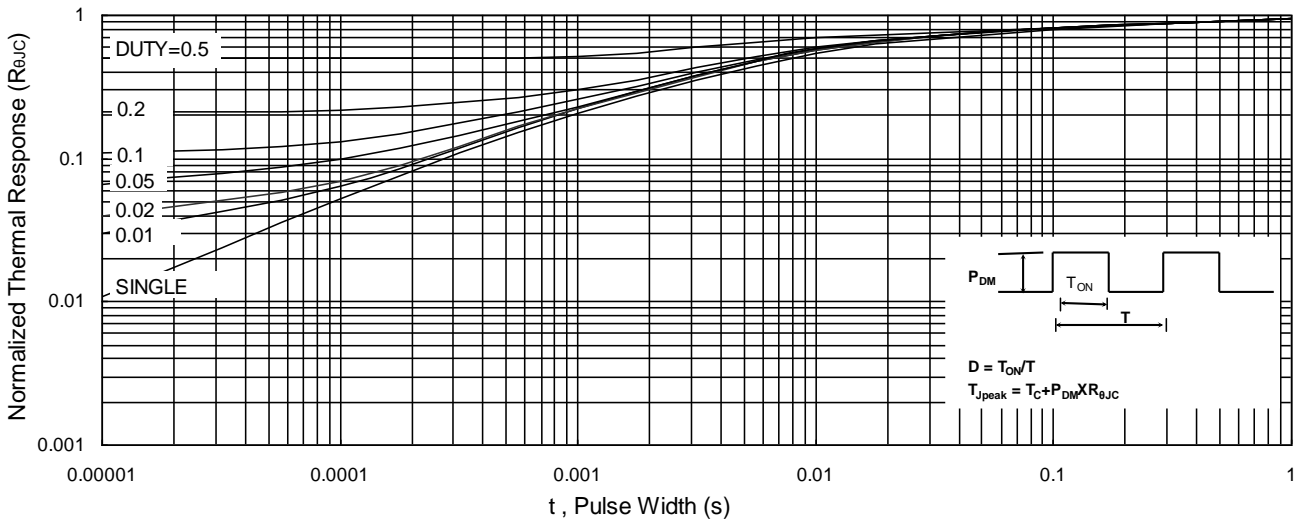


Fig.9 Normalized Maximum Transient Thermal Impedance

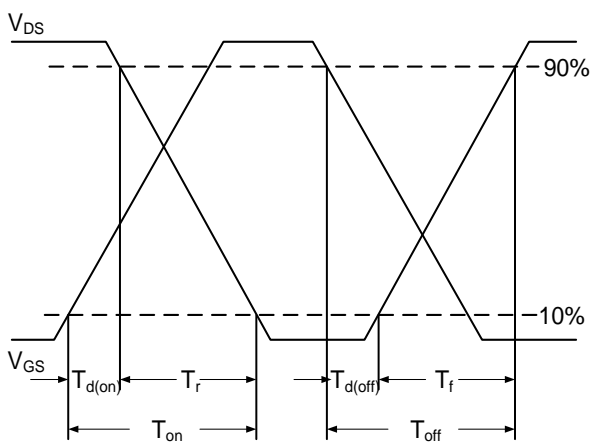


Fig.10 Switching Time Waveform

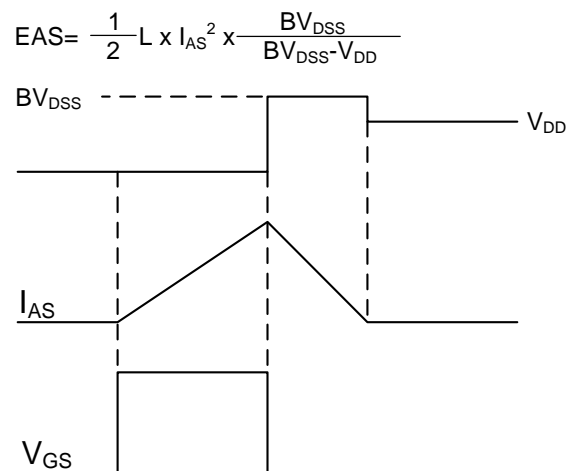
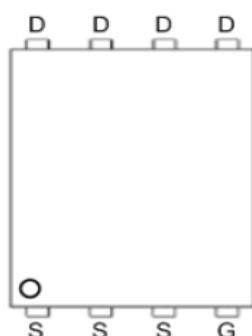
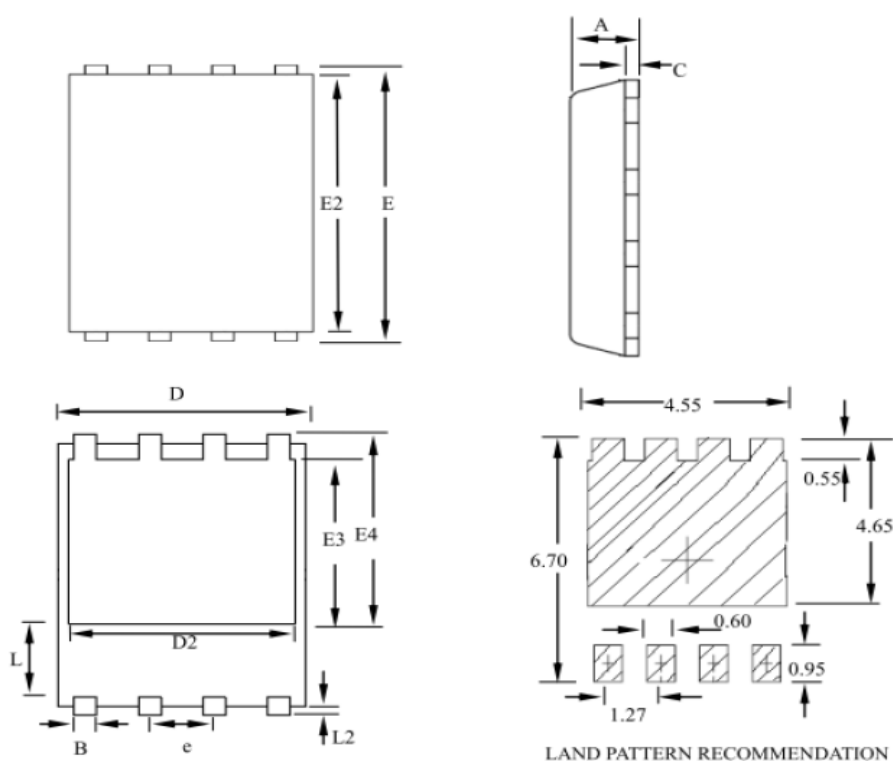


Fig.11 Unclamped Inductive Switching

Ordering Information

Part Number	Package code	Packaging
HSBA8016	PRPAK5*6	3000/Tape&Reel



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	--