

Description

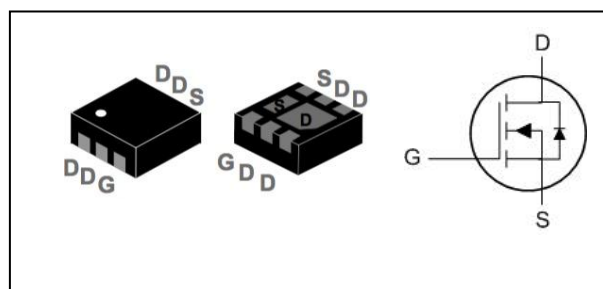
The HSCB3014 is the high cell density trenched N-ch MOSFETs, which provide excellent R_{DS(on)} and gate charge for most of the synchronous buck converter applications.

The HSCB3014 meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

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

Product Summary

V _{DS}	30	V
R _{DS(ON),typ}	9	mΩ
I _D	10	A

DFN2*2-6L Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	± 20	V
I _D @T _A =25°C	Continuous Drain Current, V _{GS} @ 10V ¹	10	A
I _D @T _A =70°C	Continuous Drain Current, V _{GS} @ 10V ¹	8	A
I _{DM}	Pulsed Drain Current ²	40	A
EAS	Single Pulse Avalanche Energy ³	24.2	mJ
I _{AS}	Avalanche Current	22	A
P _D @T _c =25°C	Total Power Dissipation ⁴	26	W
P _D @T _A =25°C	Total Power Dissipation ⁴	1.67	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	---	75	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	4.8	°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	30	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =10A	---	9	12	mΩ
		V _{GS} =4.5V , I _D =8A	---	12	17	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.6	2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =24V , 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 =8A	---	24	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	1.8	3	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V , V _{GS} =4.5V , I _D =8A	---	9.63	---	nC
Q _{gs}	Gate-Source Charge		---	3.88	---	
Q _{gd}	Gate-Drain Charge		---	3.44	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V , V _{GS} =10V , R _G =1.5Ω I _D =8A	---	4.2	---	ns
T _r	Rise Time		---	8.2	---	
T _{d(off)}	Turn-Off Delay Time		---	31	---	
T _f	Fall Time		---	4	---	
C _{iss}	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	940	---	pF
C _{oss}	Output Capacitance		---	131	---	
C _{rss}	Reverse Transfer Capacitance		---	109	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	10	A
I _{SM}	Pulsed Source Current ^{2,5}		---	---	40	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1	V
t _{rr}	Reverse Recovery Time	I _F =8A , dI/dt=100A/μs , T _J =25°C	---	8	---	nS
Q _{rr}	Reverse Recovery Charge		---	2.9	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch²FR-4 board with 20Z 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}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=22A
- 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.



N-Ch 30V Fast Switching MOSFETs

Typical Characteristics

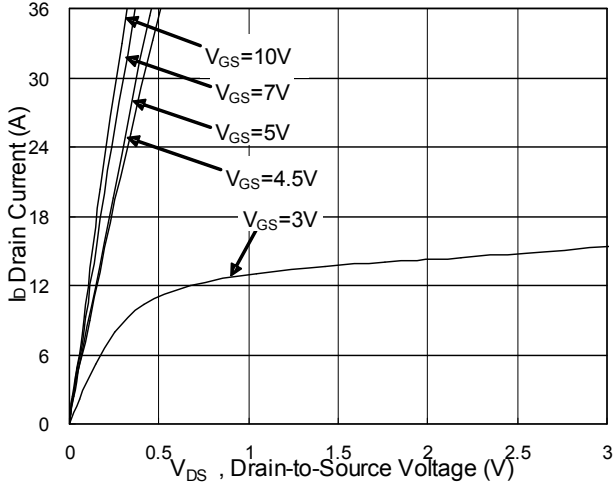


Fig.1 Typical Output Characteristics

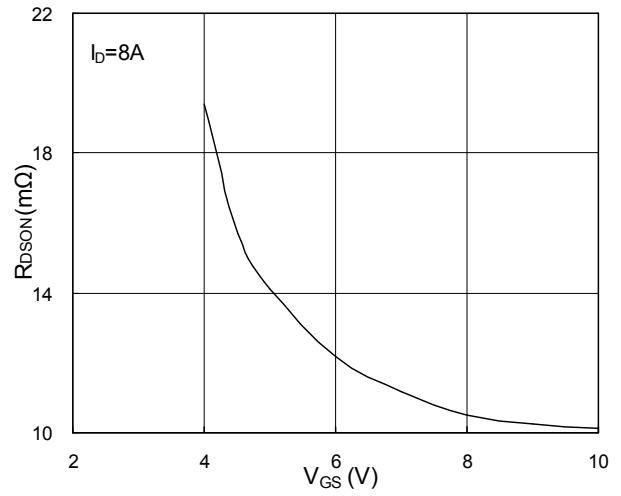


Fig.2 On-Resistance vs. G-S Voltage

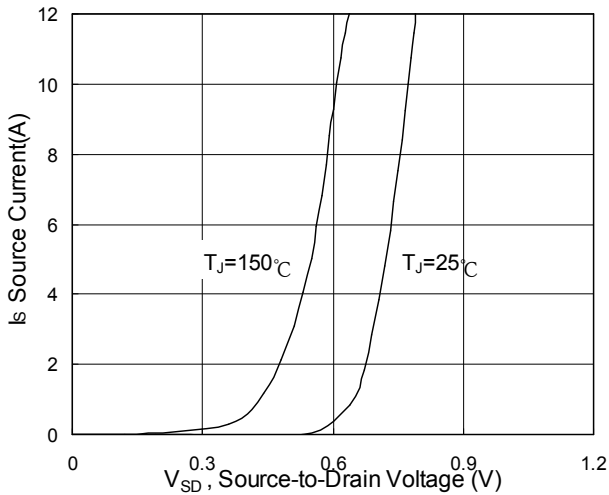


Fig.3 Forward Characteristics of Reverse

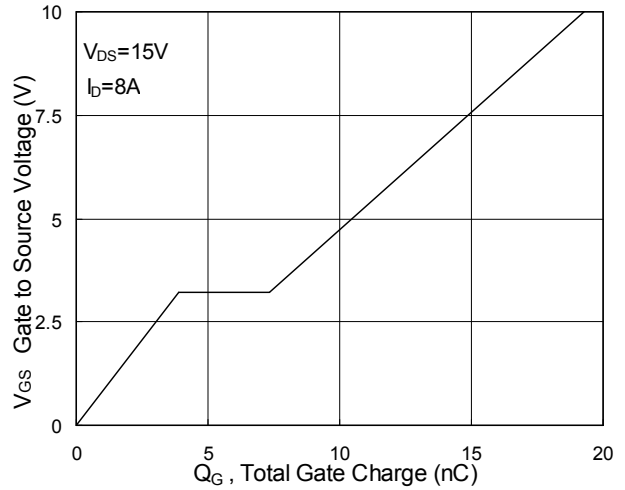


Fig.4 Gate-Charge Characteristics

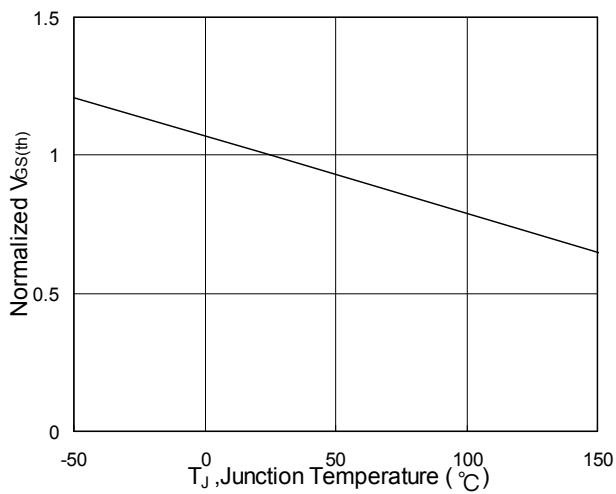


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

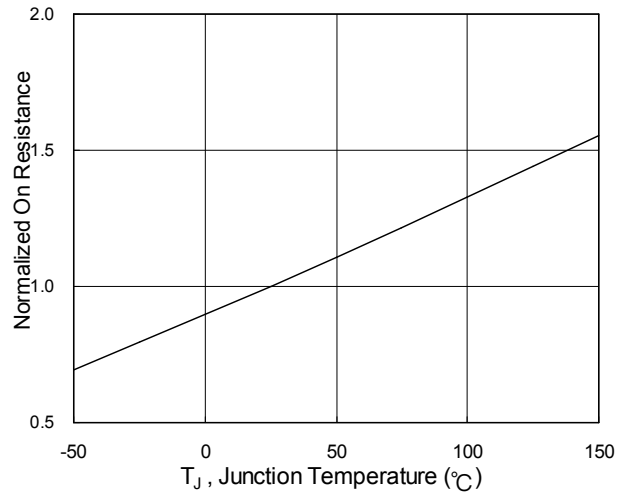


Fig.6 Normalized $R_{DS(on)}$ vs. T_J



N-Ch 30V Fast Switching MOSFETs

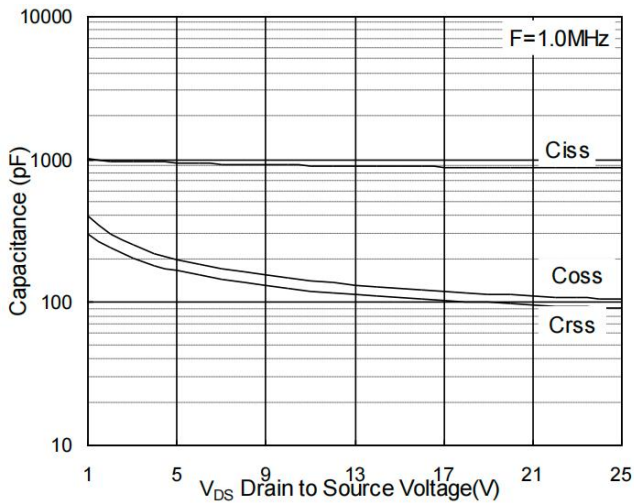


Fig.7 Capacitance

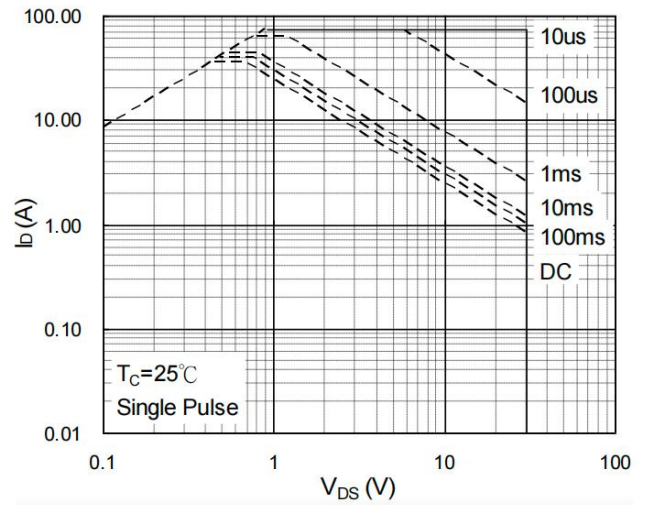


Fig.8 Safe Operating Area

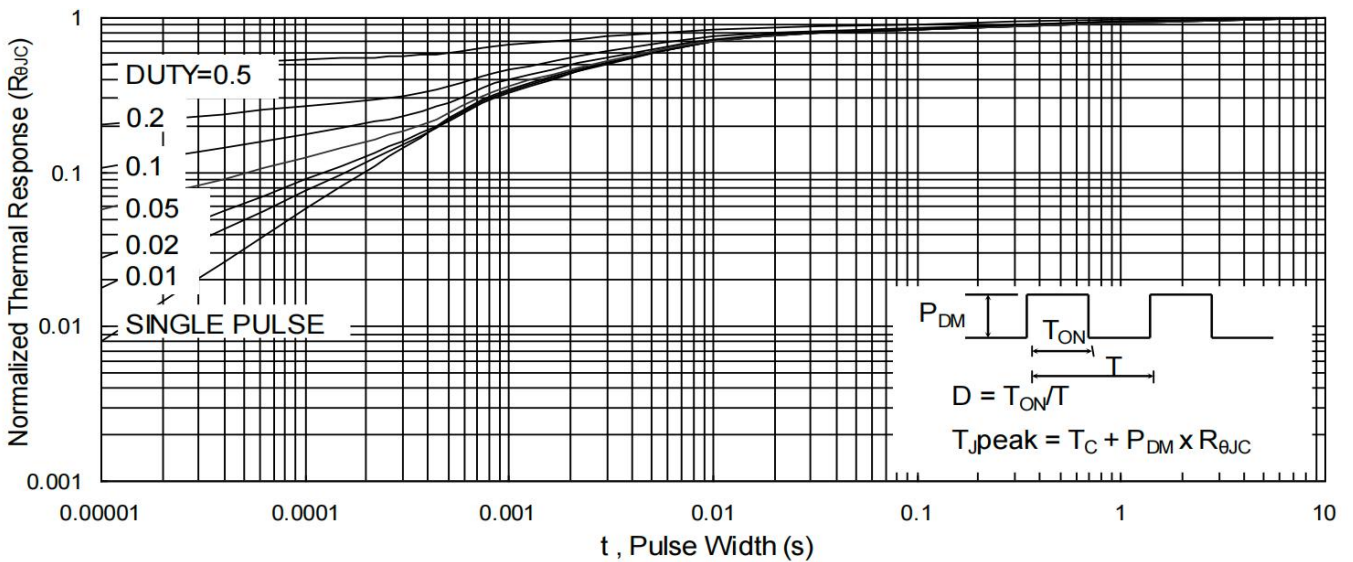


Fig.9 Normalized Maximum Transient Thermal Impedance

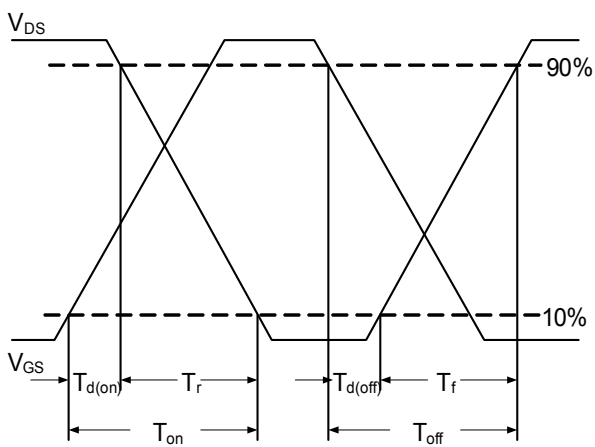


Fig.10 Switching Time Waveform

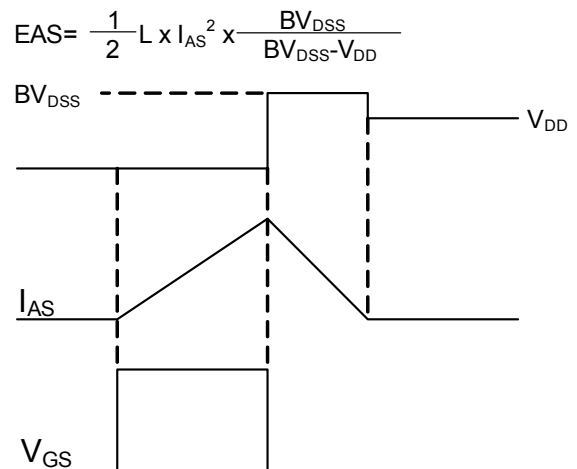
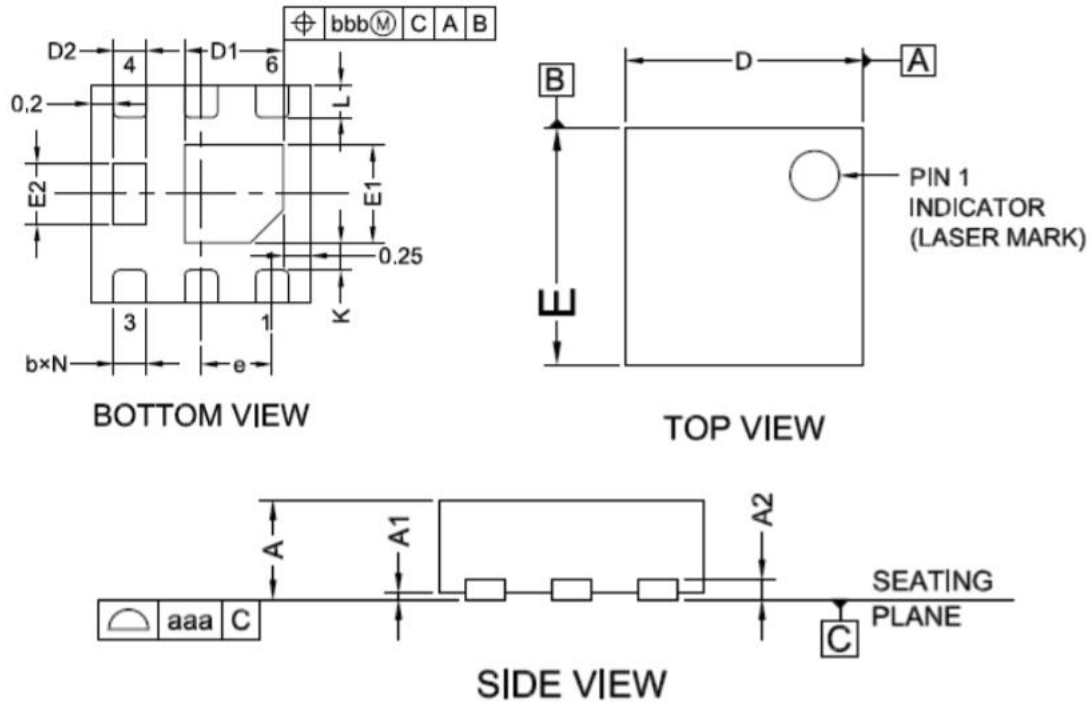


Fig.11 Unclamped Inductive Switching Waveform



DFN2x2-6L 2EP PACKAGE INFORMATION



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
A2	0.152REF,		
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D1	0.80	0.90	1.00
D2	0.25	0.30	0.35
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
E2	0.46	0.56	0.66
e	0.65BSC		
L	0.25	0.30	0.35
J	0.40BSC		
K	0.20MIN		
N	6		
aaa	0.08		
bbb	0.10		

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