

Description

The HSCB2012 is the high cell density trench N-ch MOSFETs, which provides excellent R_{DS(ON)} and efficiency for most of the small power switching and load switch applications.

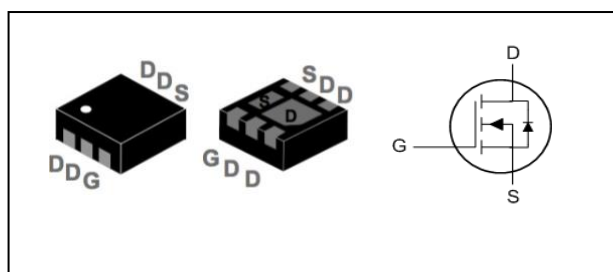
The HSCB2012 meet the RoHS and Green Product requirement with full function reliability approved.

- Green Device Available
- Super Low Gate Charge
- Excellent C_{dv/dt} effect decline
- Advanced high cell density Trench technology

Product Summary

V _{DS}	20	V
R _{DS(ON),typ}	12	mΩ
I _D	12	A

DFN2*2-6L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	20	V
V _{GS}	Gate-Source Voltage	±12	V
I _D @T _A =25°C	Continuous Drain Current, V _{GS} @ 4.5V ₁	12	A
I _{DM}	Pulsed Drain Current ₂	48	A
P _D @T _A =25°C	Total Power Dissipation ₃	3.3	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient ₁	100	°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	20	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.018	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =12A	---	12	15	mΩ
		V _{GS} =2.5V, I _D =8A	---	15	20	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	0.7	0.9	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-3.1	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =16V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =12A	---	10	---	S
Q _g	Total Gate Charge (4.5V)	V _{DS} =10V, V _{GS} =4.5V, I _D =12A	---	13	---	nC
Q _{gs}	Gate-Source Charge		---	2.2	---	
Q _{gd}	Gate-Drain Charge		---	1	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =10V, V _{GS} =4.5V, R _G =3.3Ω I _D =4A	---	9	---	ns
T _r	Rise Time		---	11	---	
T _{d(off)}	Turn-Off Delay Time		---	33	---	
T _f	Fall Time		---	36	---	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz	---	960	---	pF
C _{oss}	Output Capacitance		---	240	---	
C _{rss}	Reverse Transfer Capacitance		---	110	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	12	A
I _{SM}	Pulsed Source Current ^{2,4}		---	---	48	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.2	V

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 power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Typical Characteristics

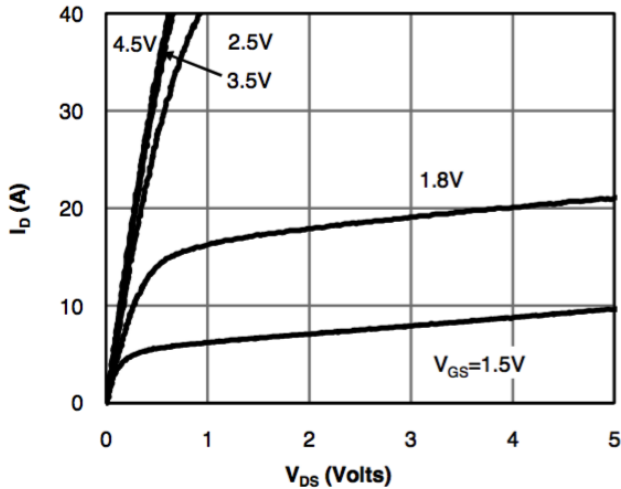


Fig 1: On-Region Characteristics (Note E)

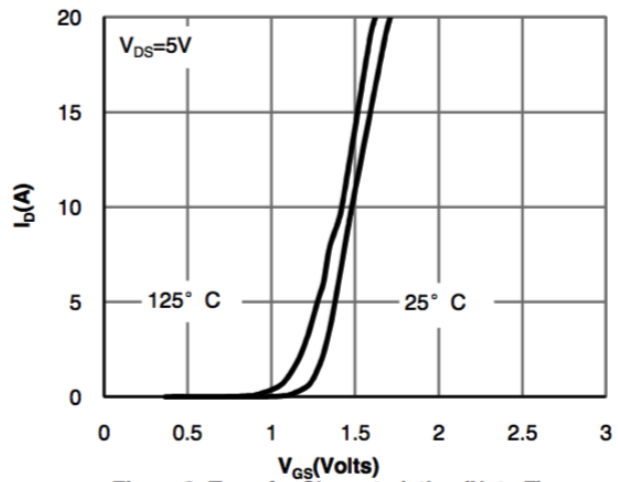


Figure 2: Transfer Characteristics (Note E)

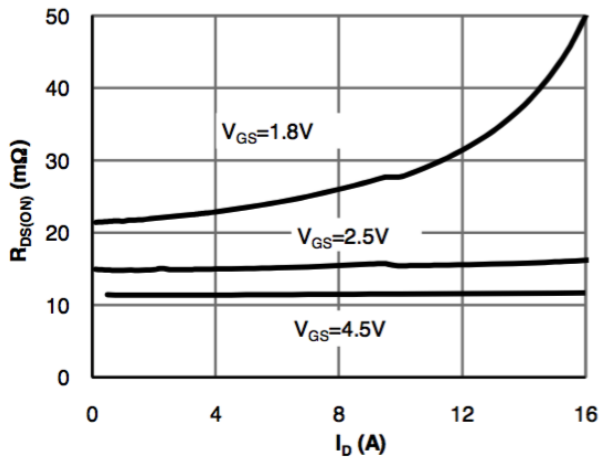


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

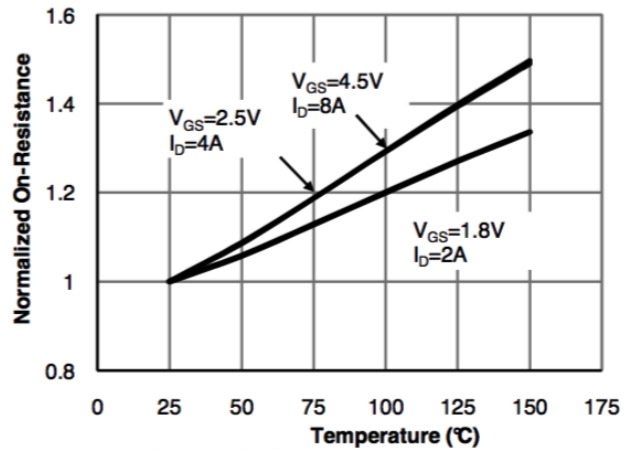


Figure 4: On-Resistance vs. Junction Temperature (Note E)

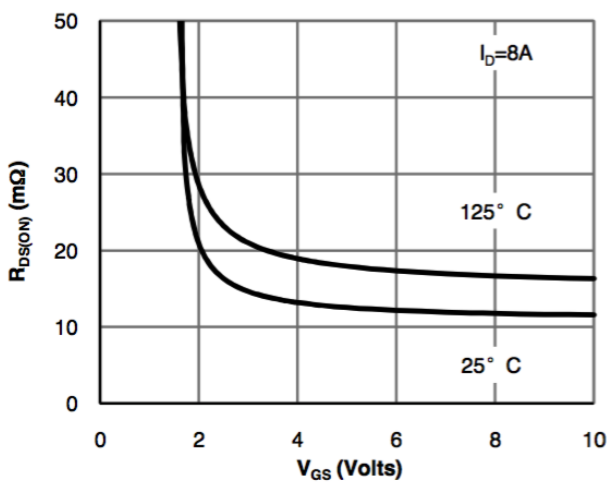


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

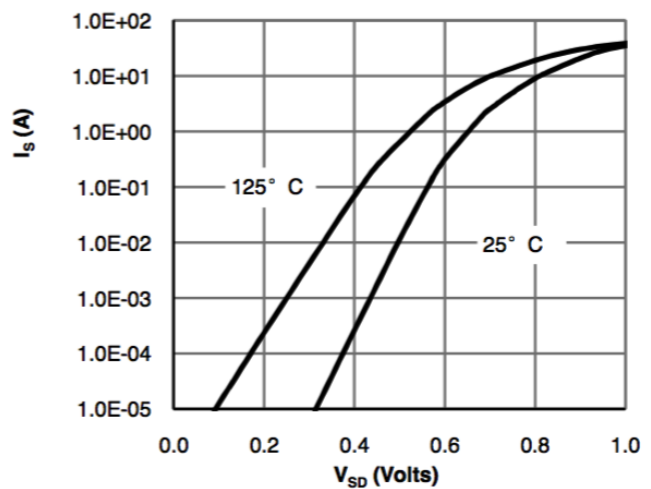


Figure 6: Body-Diode Characteristics (Note E)



N-Ch 20V Fast Switching MOSFETs

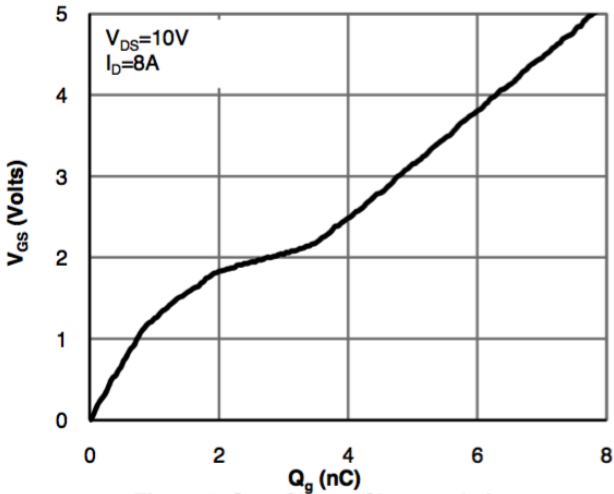


Figure 7: Gate-Charge Characteristics

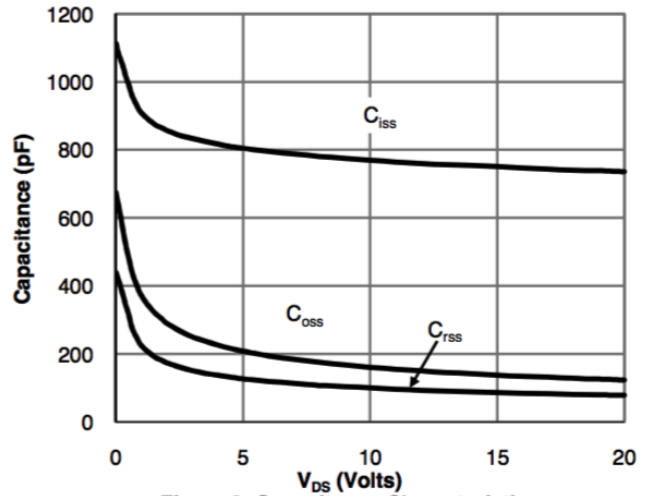


Figure 8: Capacitance Characteristics

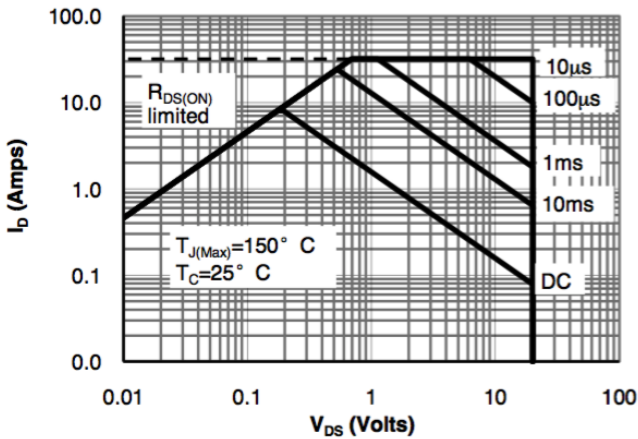


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

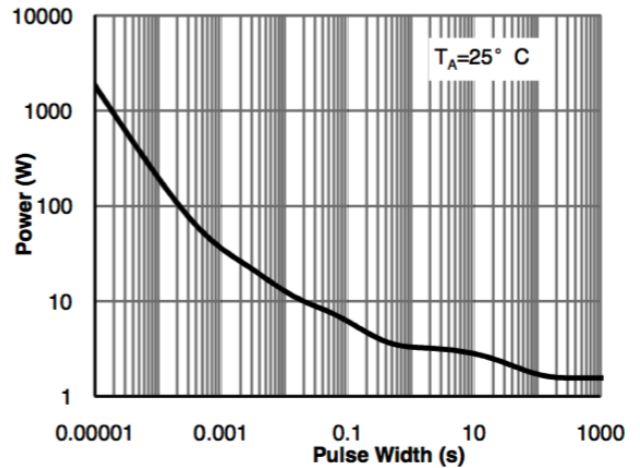


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note H)

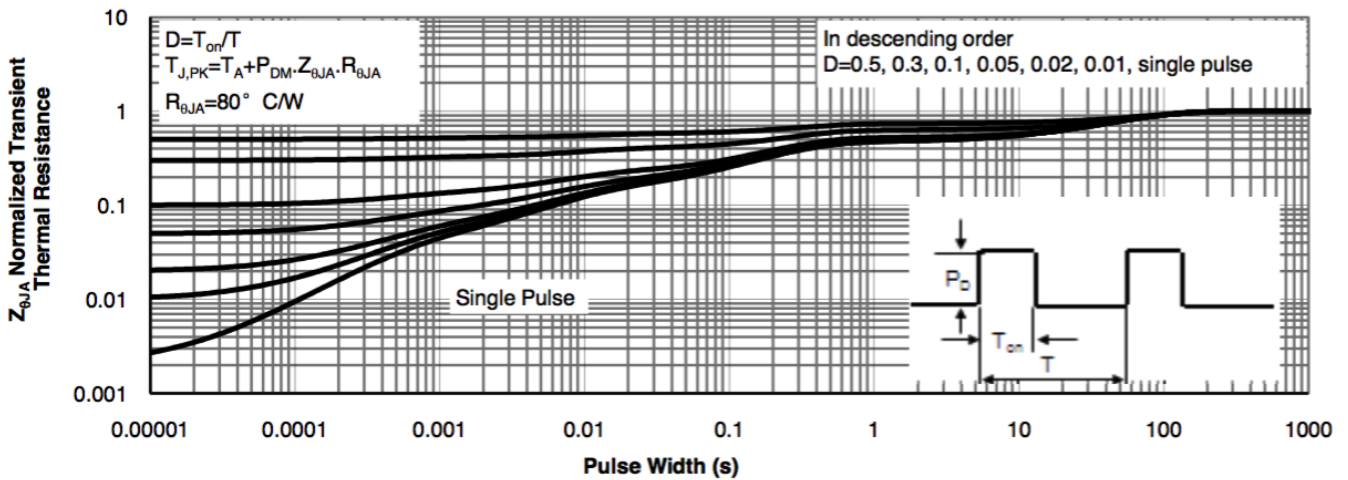
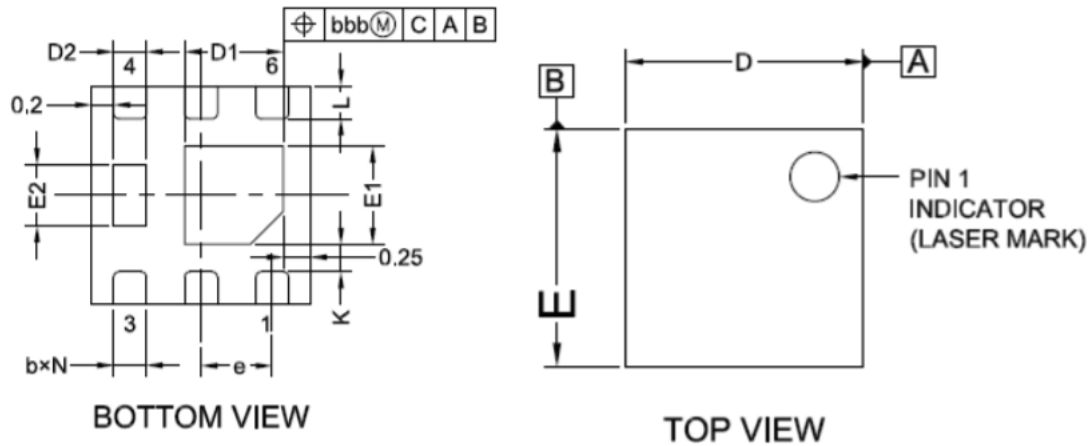


Figure 12: Normalized Maximum Transient Thermal Impedance (Note H)

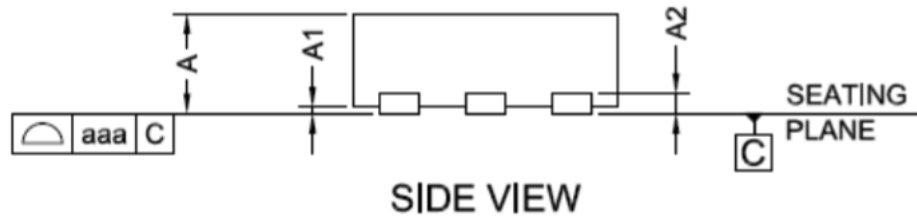


DFN2x2-6L 2EP PACKAGE INFORMATION



BOTTOM VIEW

TOP VIEW



SIDE VIEW

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		