

General Description

The HSCB1216 is the high cell density trench P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The HSCB1216 meet the RoHS and Green Product requirement with full function reliability approved.

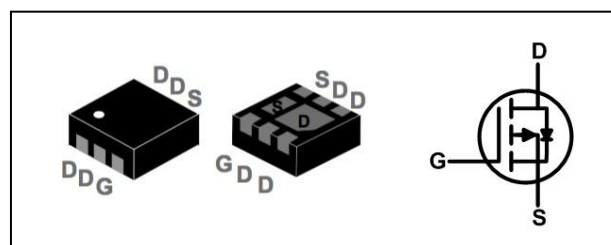
Product Summary

V_{DS}	-12	V
$R_{DS(ON),typ}$	13	m Ω
I_D	-16	A

Features

- Super Low Gate Charge
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench Technology

DFN2*2-6L Pin Configurations



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-12	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5\text{V}^1$	-16	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5\text{V}^1$	-12	A
I_{DM}	Pulsed Drain Current ²	-28	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	3.5	W
$P_D@T_A=70^\circ\text{C}$	Total Power Dissipation ³	2.2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	36	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Ambient ¹	---	6.5	$^\circ\text{C/W}$

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	-12	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.014	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-4.5V, I _D =-8A	---	13	15	mΩ
		V _{GS} =-2.5V, I _D =-6A	---	18	23	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.5	-0.75	-1.2	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	3.95	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-12V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-12V, 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} =-10V, I _D =-8A	---	32	---	S
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-6V, V _{GS} =-4.5V, I _D =-9A	---	13	---	nC
Q _{gs}	Gate-Source Charge		---	3	---	
Q _{gd}	Gate-Drain Charge		---	4.3	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-10V, V _{GS} =-4.5V, R _G =3.3Ω, I _D =-3A	---	11	---	ns
T _r	Rise Time		---	31	---	
T _{d(off)}	Turn-Off Delay Time		---	30	---	
T _f	Fall Time		---	10	---	
C _{iss}	Input Capacitance	V _{DS} =-6V, V _{GS} =0V, f=1MHz	---	1300	---	pF
C _{oss}	Output Capacitance		---	390	---	
C _{rss}	Reverse Transfer Capacitance		---	304	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	-16	A
I _{SM}	Pulsed Source Current ^{2,4}		---	---	-28	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 20Z 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

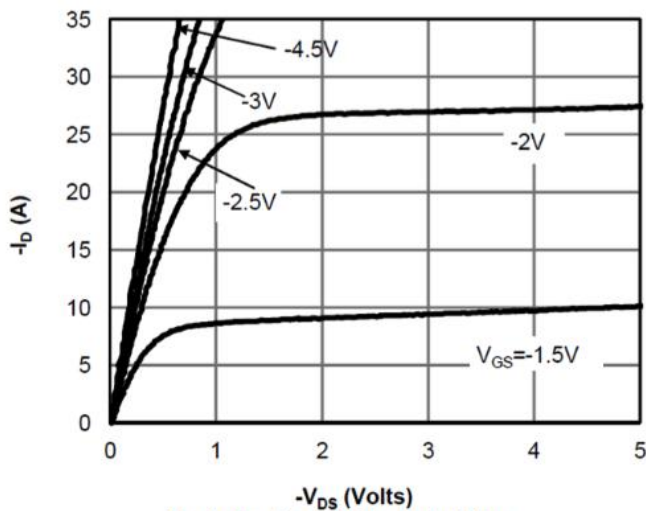


Fig 1: On-Region Characteristics

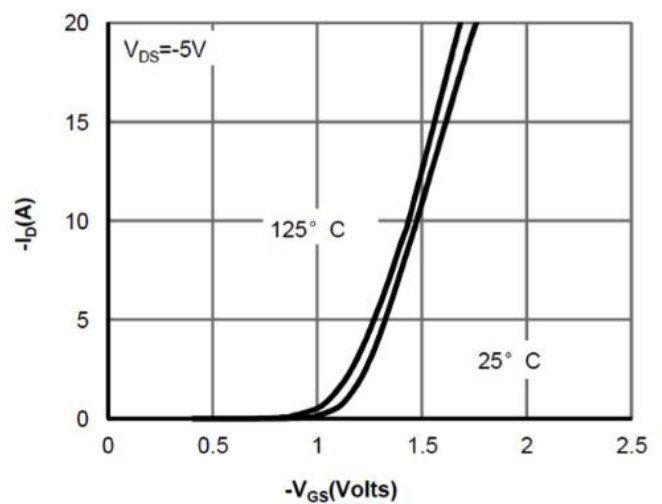


Figure 2: Transfer Characteristics

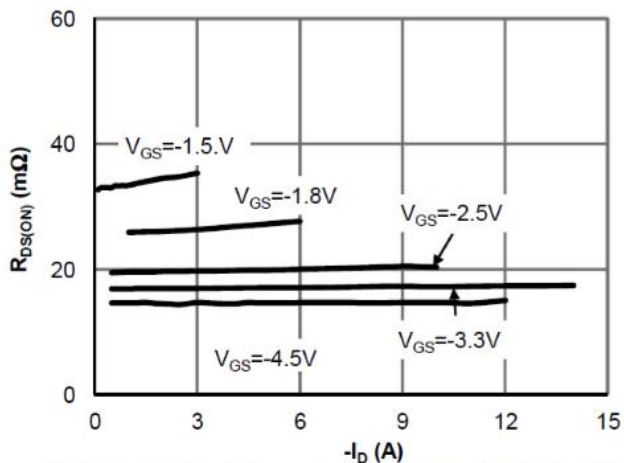


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

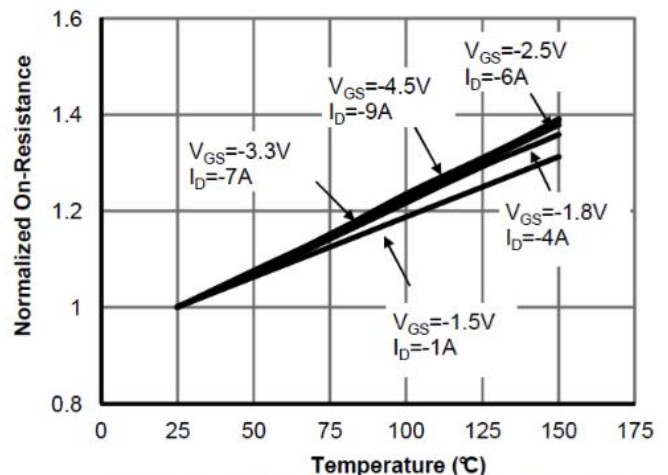


Figure 4: On-Resistance vs. Junction Temperature

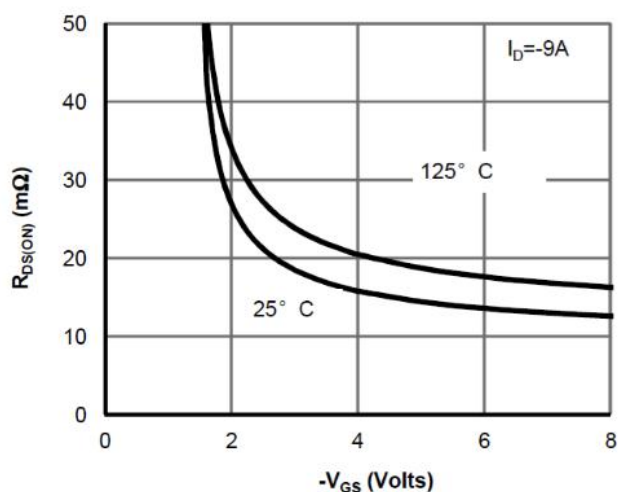


Figure 5: On-Resistance vs. Gate-Source Voltage

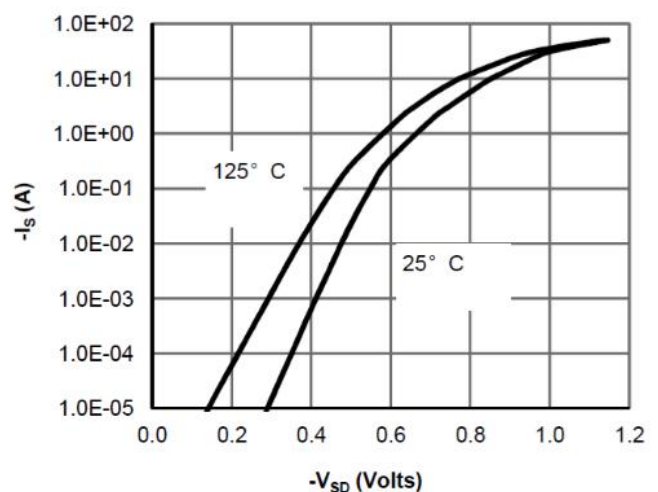


Figure 6: Body-Diode Characteristics

P-Ch 12V Fast Switching MOSFETs

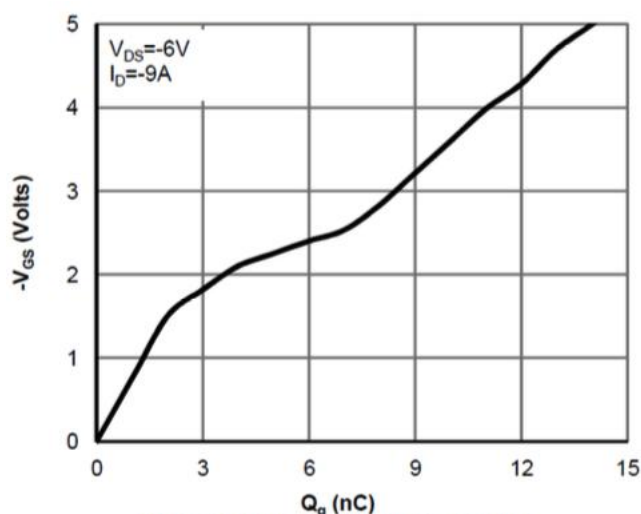


Figure 7: Gate-Charge Characteristics

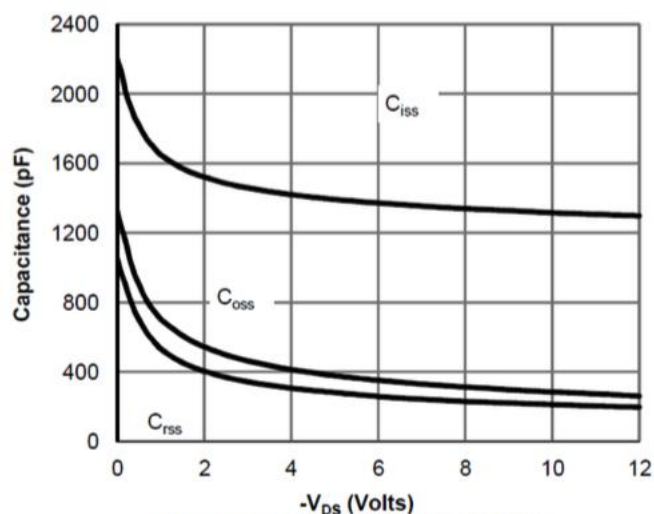


Figure 8: Capacitance Characteristics

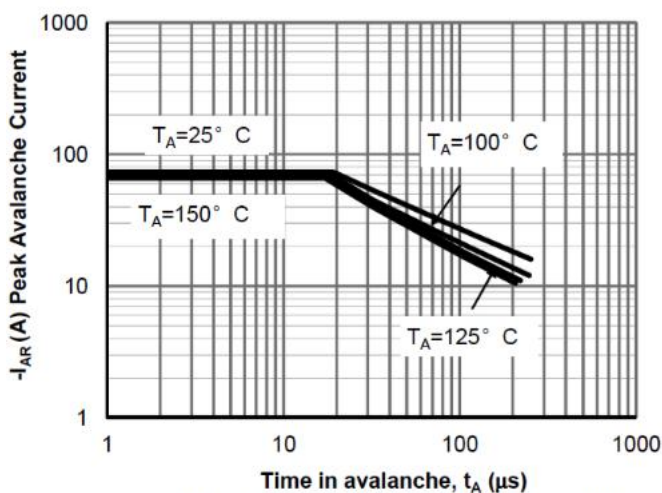


Figure 9: Single Pulse Avalanche capability

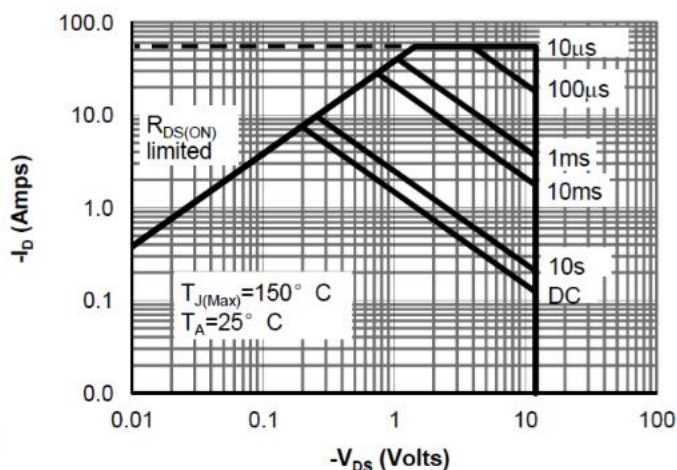


Figure 10: Maximum Forward Biased Safe Operating Area

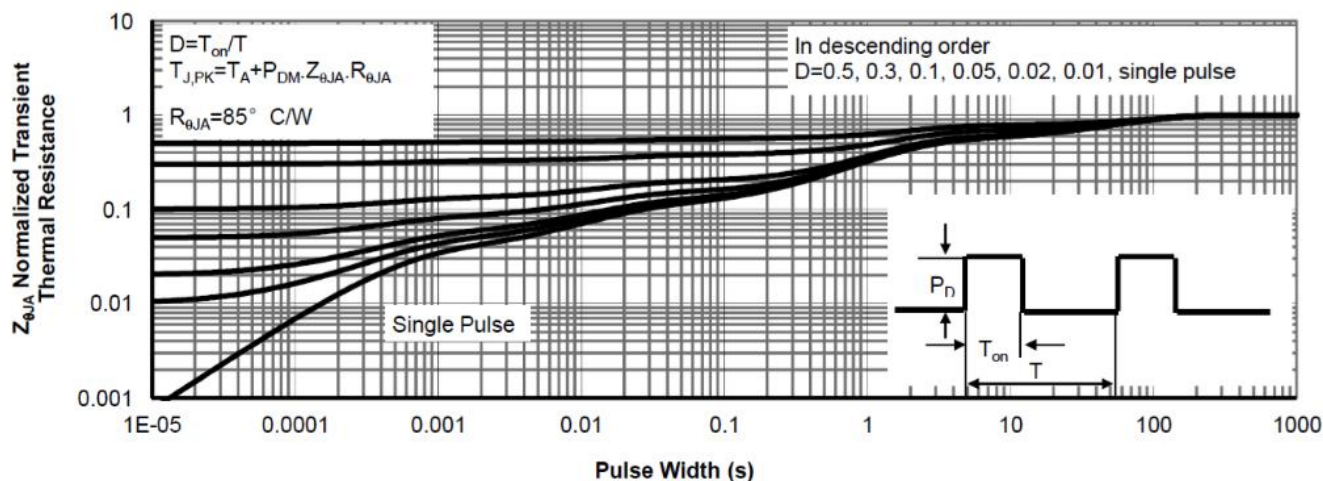
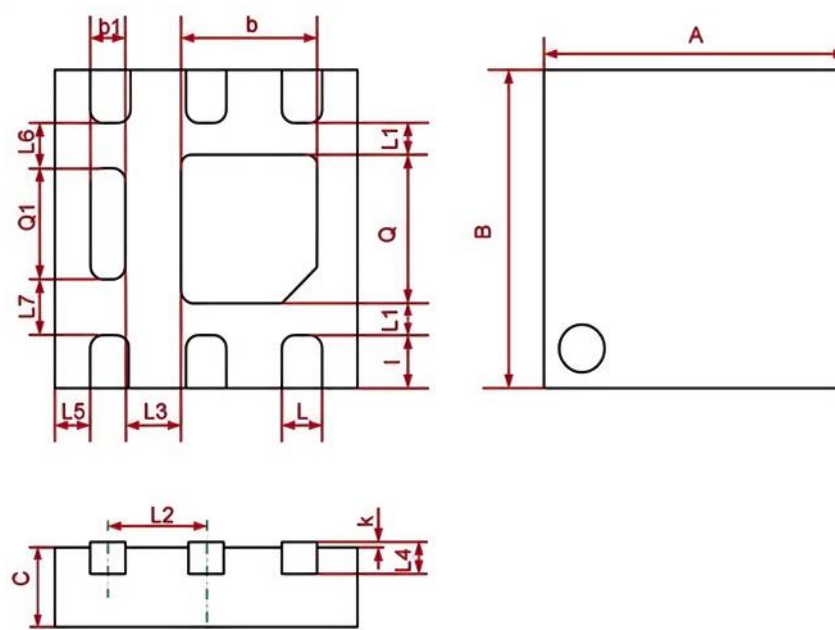


Figure 12: Normalized Maximum Transient Thermal Impedance

Ordering Information

Part Number	Package code	Packaging
HSCB1216	DFN2*2-6L	3000/Tape&Reel

DFN2*2-6L 2EP Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.950	2.050	0.077	0.081
a	0.900	1.100	0.035	0.043
a1	0.720	0.920	0.028	0.036
B	1.950	2.050	0.077	0.081
b	0.850	1.050	0.033	0.041
b1	0.130	0.330	0.005	0.013
C	0.450	0.550	0.018	0.022
1	0.250	0.350	0.010	0.014
k	0.000	0.050	0.000	0.002
L	0.250	0.350	0.010	0.014
L1	0.100	0.300	0.004	0.012
L2	0.650 TYP.		0.026 TYP.	
L3	0.300	0.500	0.012	0.020
L4	0.152 TYP.		0.006 TYP.	
L5	0.120	0.320	0.005	0.013
L6	0.150	0.350	0.006	0.014
L7	0.230	0.430	0.009	0.017

HSCB1216 Marking:

