

General Description

The HSBG2301 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 HSBG2301 meet the RoHS and Green Product requirement with full function reliability approved.

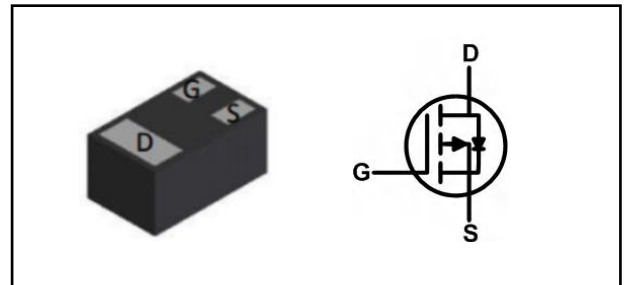
Features

- Super Low Gate Charge
- Low Threshold
- High-Side Switching
- Advanced high cell density Trench Technology

Product Summary

V_{DS}	-20	V
$R_{DS(ON),typ}$	130	m Ω
I_D	-2.0	A

DFN1006 Pin Configurations



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^{\circ}C$	Continuous Drain Current, V_{GS} @ -4.5V	-2.0	A
I_{DM}	Pulsed Drain Current	-6.0	A
$P_D@T_A=25^{\circ}C$	Total Power Dissipation	0.27	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	---	420	$^{\circ}C/W$



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
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-1.0A	---	130	170	mΩ
		V _{GS} =-2.5V, I _D =-1.0A	---	160	190	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.45	-0.55	-0.85	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-20V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-450mA	---	3.0	---	nC
Q _{gs}	Gate-Source Charge		---	0.2	---	
Q _{gd}	Gate-Drain Charge		---	0.8	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-10V, V _{GS} =-4.5V, R _G =6Ω, I _D =-450mA	---	5	---	ns
T _r	Rise Time		---	5	---	
T _{d(off)}	Turn-Off Delay Time		---	53	---	
T _f	Fall Time		---	34	---	
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	---	248	---	pF
C _{oss}	Output Capacitance		---	30	---	
C _{rss}	Reverse Transfer Capacitance		---	28	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A, T _J =25°C	-0.5	-0.85	-1.1	V



Typical Characteristics

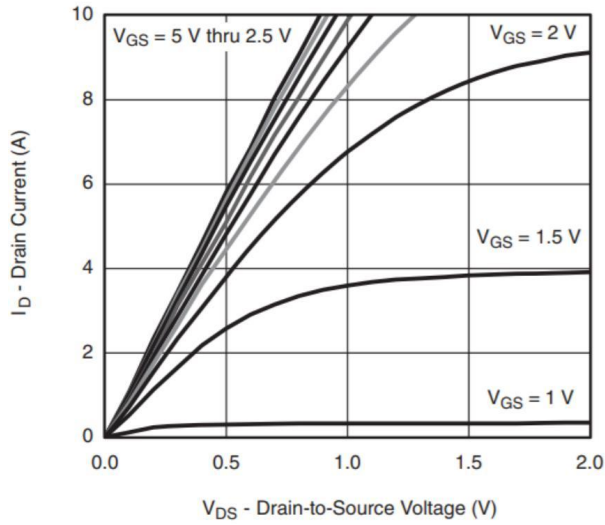


Fig.1 Typical Output Characteristics

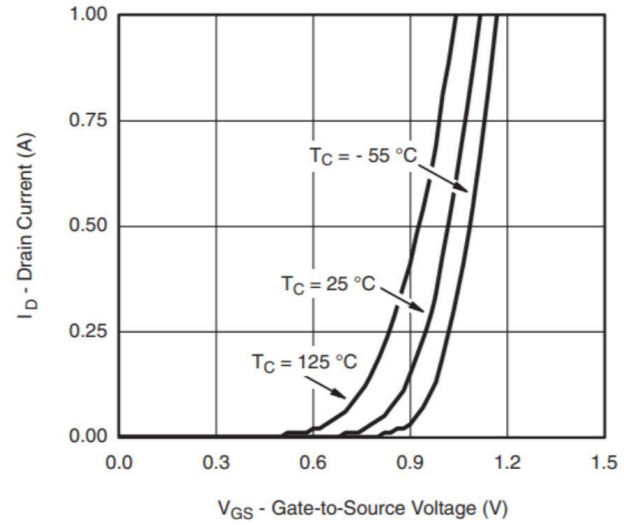


Fig.2 Transfer Characteristics

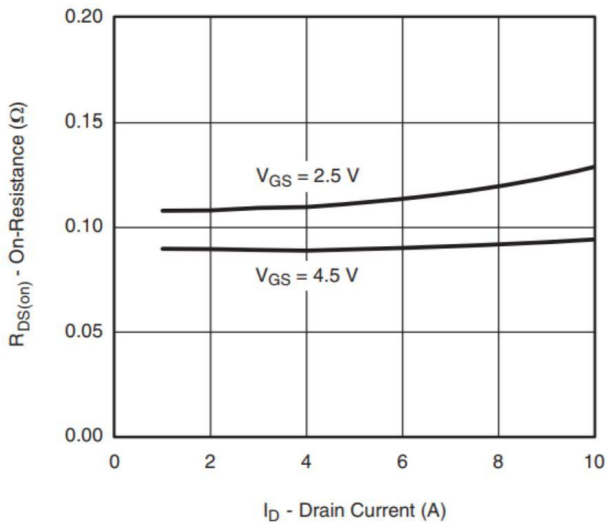


Fig.3 On-Resistance vs Drain Current & Gate Voltage

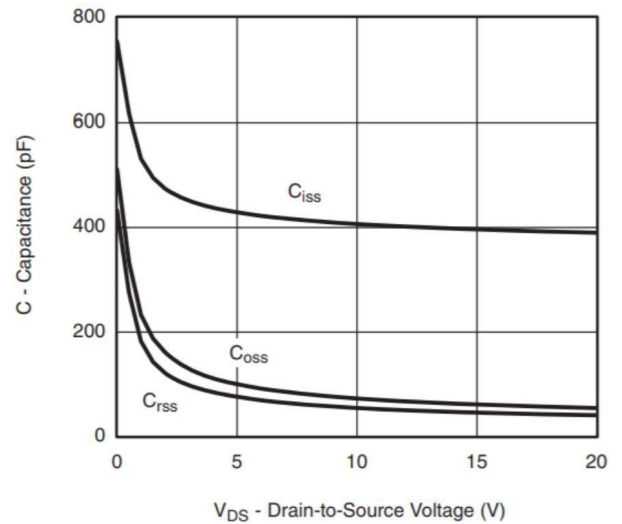


Fig.4 Capacitance Characteristics

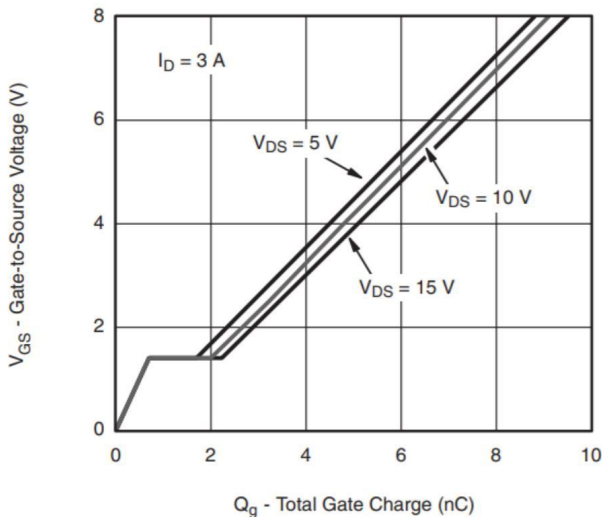


Fig.5 Gate Charge Characteristics

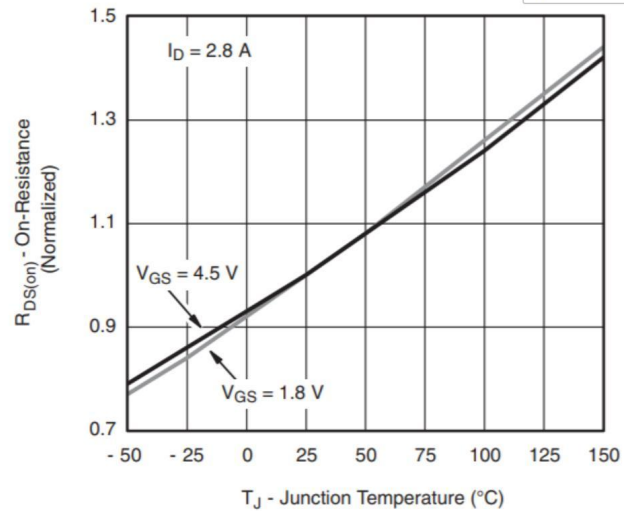


Fig.6 On-Resistance vs Junction Temperature

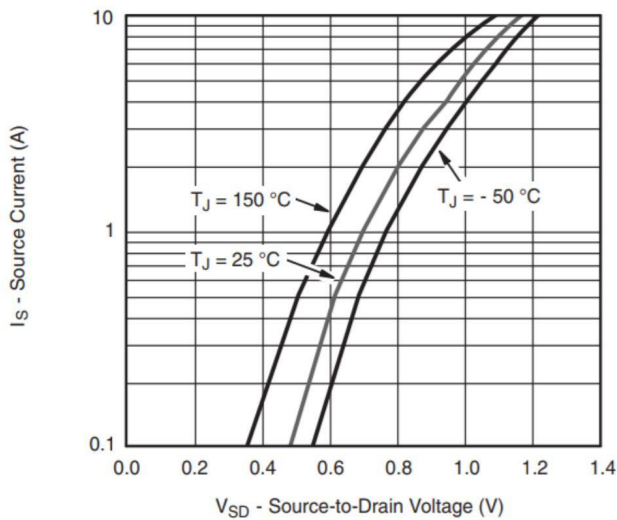


Fig.7 Source-Drain Forward Voltage

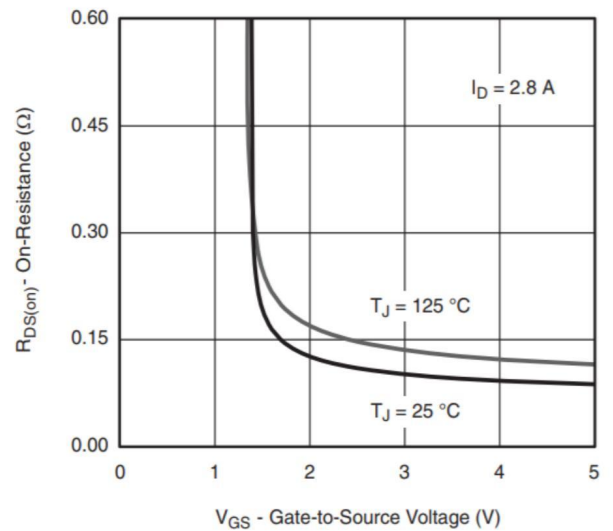


Fig.8 On-Resistance vs Gate to Source Voltage

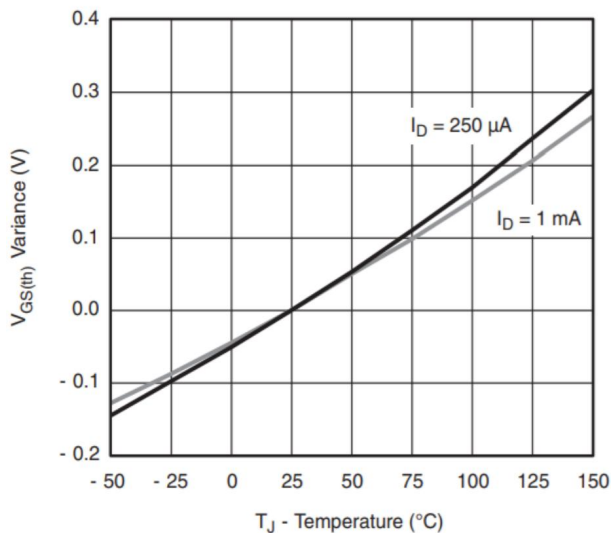


Fig.9 Threshold Voltage

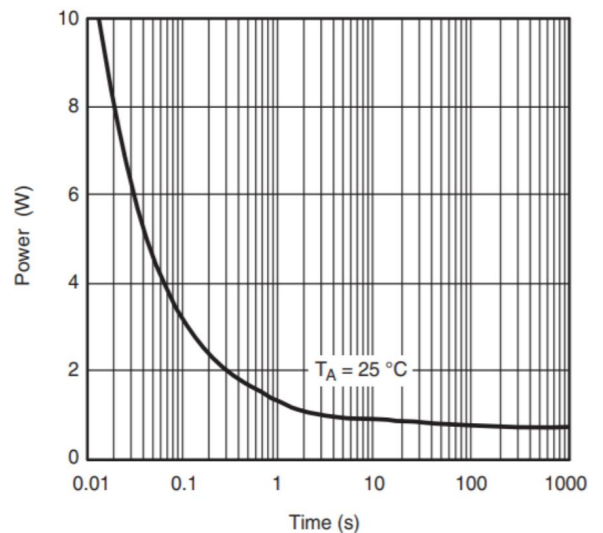


Fig.10 Single Pulse Power

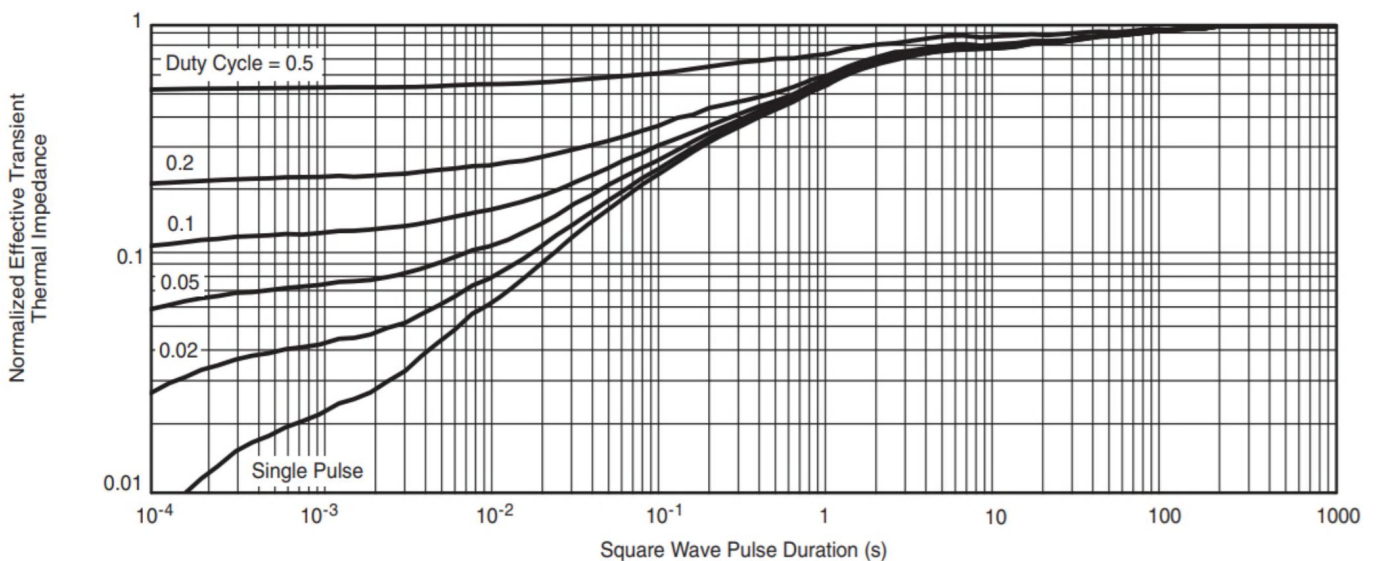


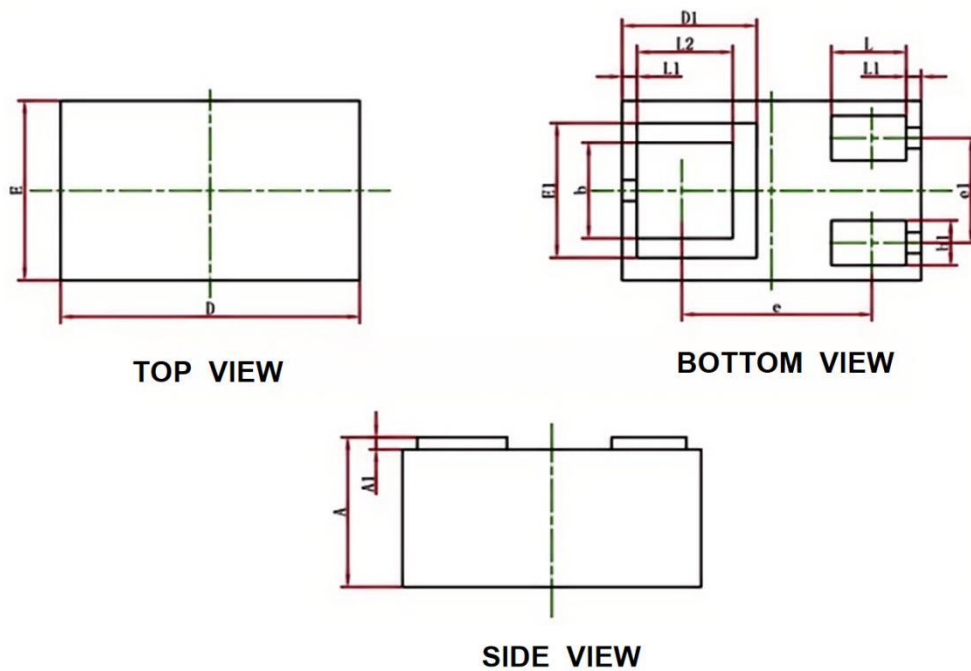
Fig.11 Normalized Maximum Transient Thermal Impedance



Ordering Information

Part Number	Package code	Packaging
HSBG2301	DFN1006-3	10000/Tape&Reel

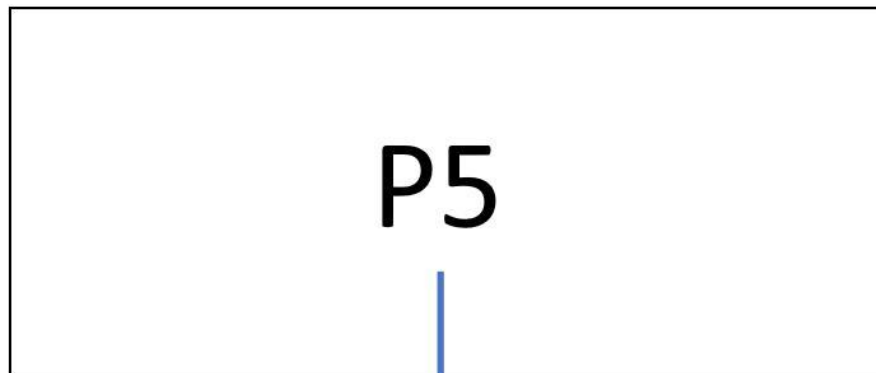
DFN1006-3 Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
AL	0.010	0.100	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450REF.		0.0178REF.	
E1	0.450REF.		0.0178REF.	
b	0.270	0.370	0.011	0.015
bl	0.100	0.200	0.004	0.008
e	0.635REF.		0.025REF.	
el	0.300	0.400	0.012	0.016
L	0.200	0.300	0.008	0.012
L1	0.050REF.		0.002REF.	
L2	0.270	0.370	0.011	0.015



HSBG2301 Marking



Marking