

Description

The HSS2307 is the high cell density trenched P-ch MOSFETs, which provide excellent R_{DS(ON)} and gate charge for most of the synchronous buck converter applications.

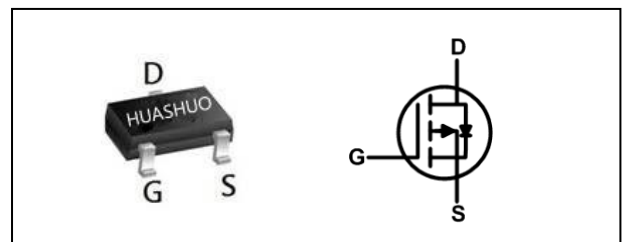
The HSS2307 meet the RoHS and Green Product requirement with full function reliability approved.

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

Product Summary

V _{DS}	-20	V
R _{DS(ON),typ}	20	mΩ
I _D	-6	A

SOT 23 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°C	Continuous Drain Current, V _{GS} @ -4.5V ₁	-6	A
I _D @T _A =70°C	Continuous Drain Current, V _{GS} @ -4.5V ₁	-4	A
I _{DM}	Pulsed Drain Current ₂	-24	A
P _D @T _A =25°C	Total Power Dissipation ₃	1.4	W
P _D @T _A =70°C	Total Power Dissipation ₃	0.9	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	---	125	°C/W
R _{θJA}	Thermal Resistance Junction-Ambient ₁ (t ≤ 10s)	---	90	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
B _{VDS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-20	---	---	V
ΔB _{VDS} /ΔT _J	B _{VDS} 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 =-6A	---	20	25	mΩ
		V _{GS} =-2.5V, I _D =-5A	---	25	30	
		V _{GS} =-1.8V, I _D =-3A	---	38	45	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.5	-0.7	-1.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	3.95	---	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 =-6A	---	8	---	S
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-6A	---	17	---	nC
Q _{gs}	Gate-Source Charge		---	4.3	---	
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	---	23	---	ns
T _r	Rise Time		---	31	---	
T _{d(off)}	Turn-Off Delay Time		---	70	---	
T _f	Fall Time		---	50	---	
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	---	2100	---	pF
C _{oss}	Output Capacitance		---	489	---	
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	---	---	-6	A
I _{SM}	Pulsed Source Current _{2,4}		---	---	-24	A
V _{SD}	Diode Forward Voltage ₂	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1.2	V

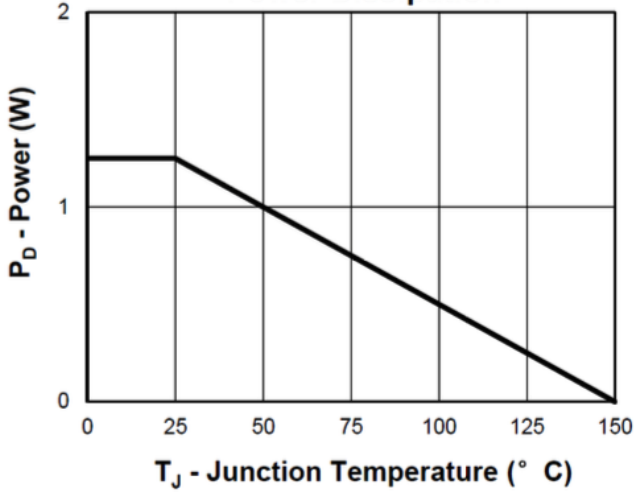
Note :

- 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.

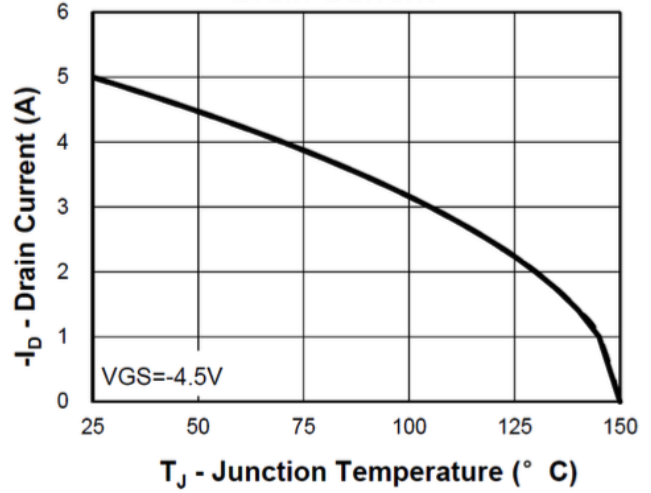


Typical Characteristics

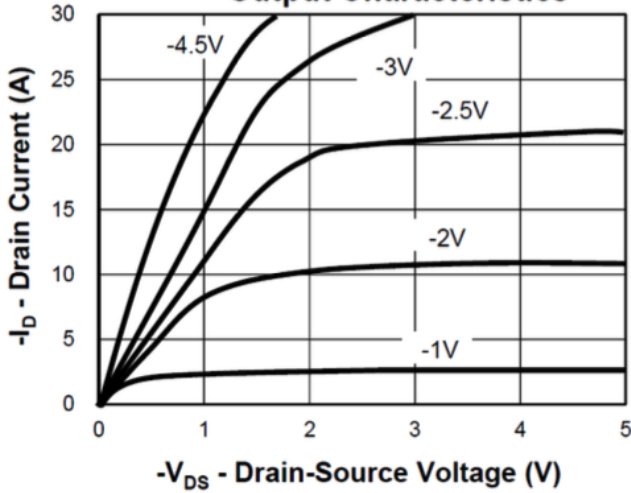
Power Dissipation



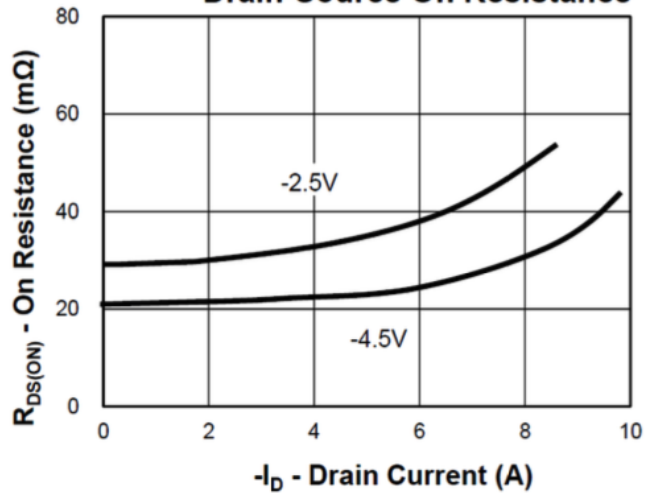
Drain Current



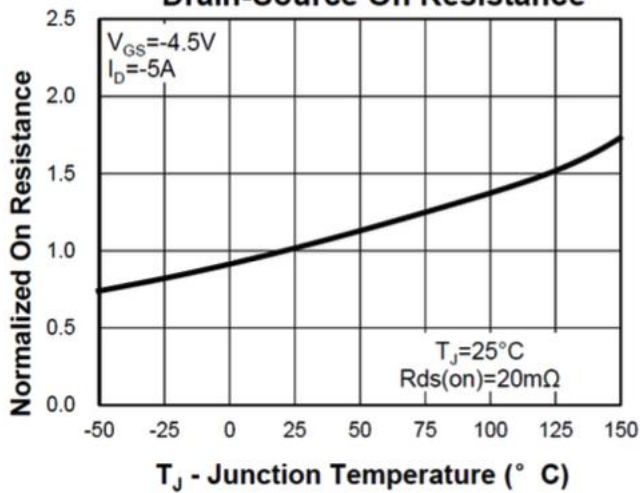
Output Characteristics



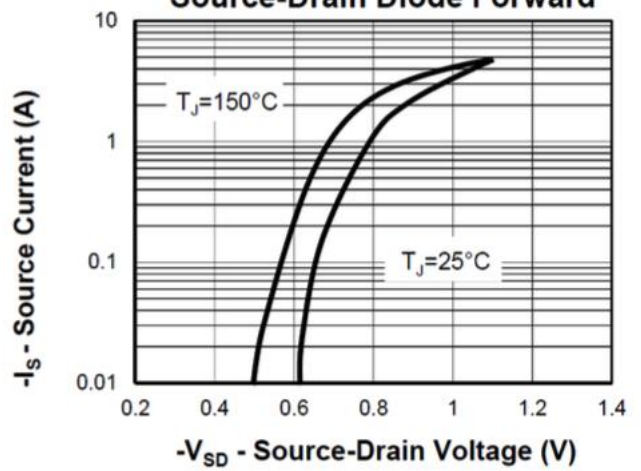
Drain-Source On Resistance



Drain-Source On Resistance

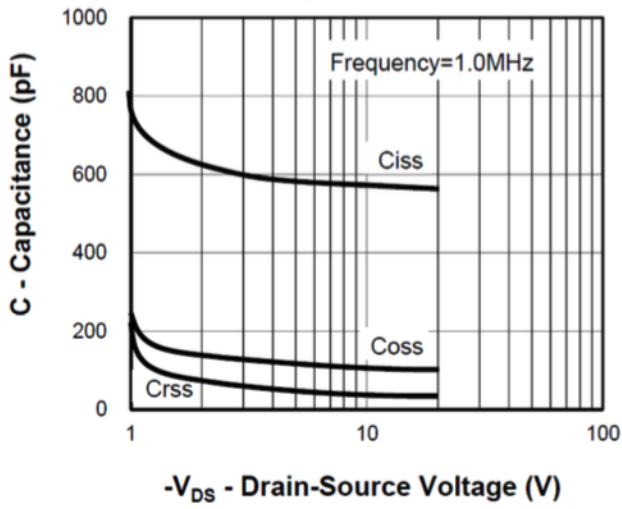


Source-Drain Diode Forward

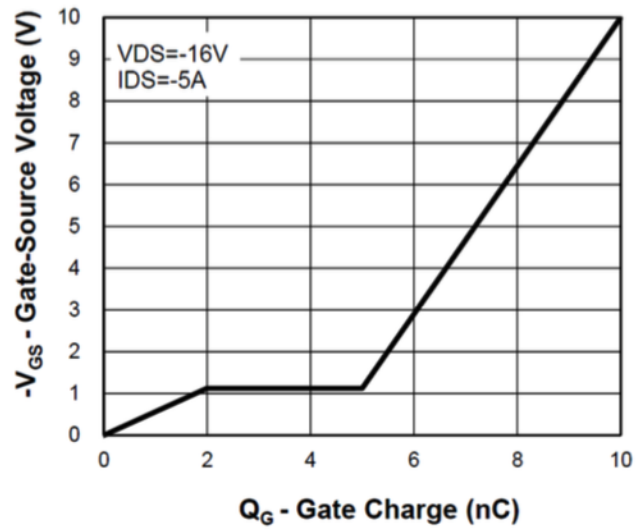




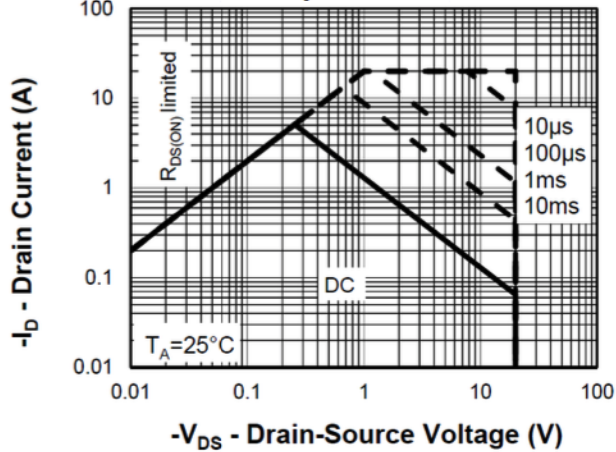
Capacitance



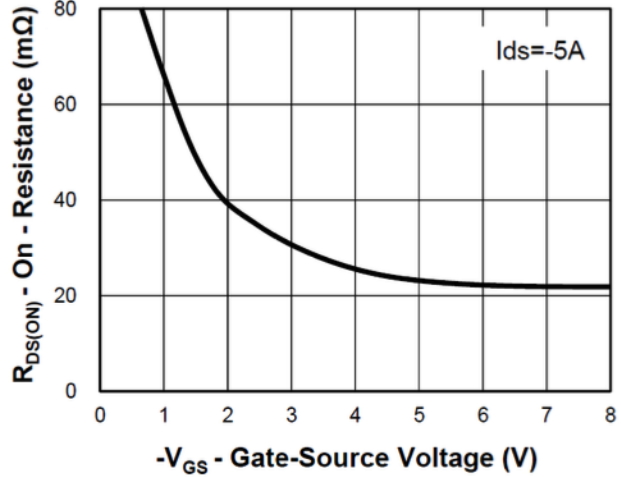
Gate Charge



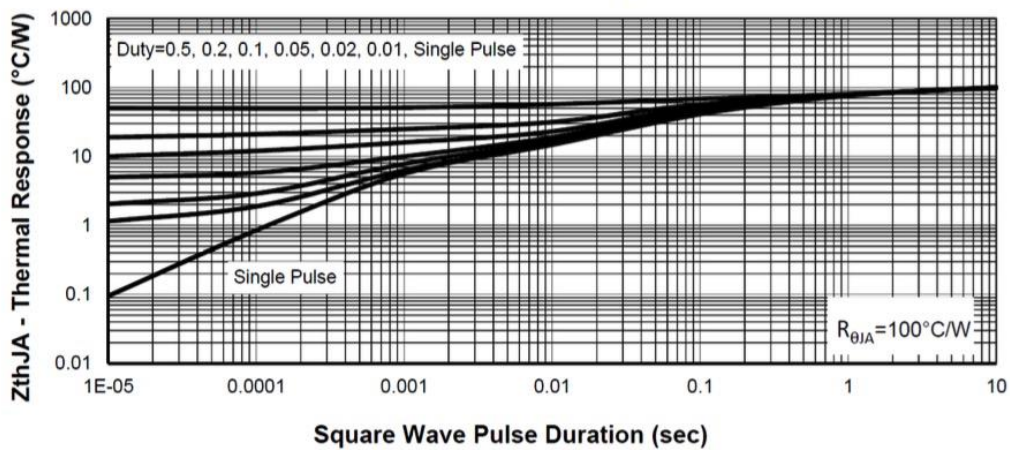
Safe Operation Area



Drain Current

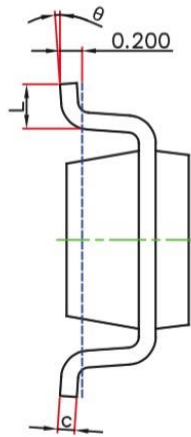
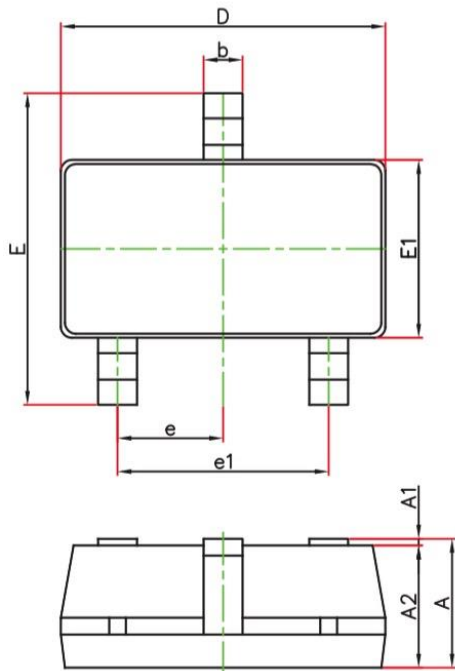


Thermal Transient Impedance



Ordering Information

Part Number	Package code	Packaging
HSS2307	SOT-23L	3000/Tape&Reel



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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