

### Description

The HSS2307 is the high cell density trenched P-ch MOSFETs, which provide excellent R<sub>DS(ON)</sub> and gate charge for most of the synchronous buck converter applications.

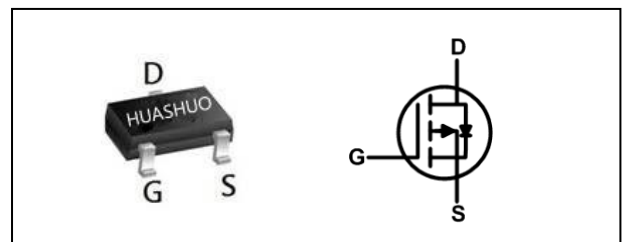
The HSS2307 meet the RoHS and Green Product requirement with full function reliability approved.

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

### Product Summary

V <sub>DS</sub>	-20	V
R <sub>DS(ON),typ</sub>	20	mΩ
I <sub>D</sub>	-6	A

### SOT 23 Pin Configurations



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	-20	V
V <sub>GS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub> @T <sub>A</sub> =25°C	Continuous Drain Current, V <sub>GS</sub> @ -4.5V <sub>1</sub>	-6	A
I <sub>D</sub> @T <sub>A</sub> =70°C	Continuous Drain Current, V <sub>GS</sub> @ -4.5V <sub>1</sub>	-4	A
I <sub>DM</sub>	Pulsed Drain Current <sub>2</sub>	-24	A
P <sub>D</sub> @T <sub>A</sub> =25°C	Total Power Dissipation <sub>3</sub>	1.4	W
P <sub>D</sub> @T <sub>A</sub> =70°C	Total Power Dissipation <sub>3</sub>	0.9	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-Ambient <sub>1</sub>	---	125	°C/W
R <sub>θJA</sub>	Thermal Resistance Junction-Ambient <sub>1</sub> (t ≤ 10s)	---	90	°C/W

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
B <sub>VDS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-20	---	---	V
ΔB <sub>VDS</sub> /ΔT <sub>J</sub>	B <sub>VDS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =-1mA	---	-0.014	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sub>2</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A	---	20	25	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-5A	---	25	30	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-3A	---	38	45	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-0.5	-0.7	-1.0	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	3.95	---	mV/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	-5	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-6A	---	8	---	S
Q <sub>g</sub>	Total Gate Charge (-4.5V)	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A	---	17	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	4.3	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	4.3	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =-10V, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =3.3Ω, I <sub>D</sub> =-3A	---	23	---	ns
T <sub>r</sub>	Rise Time		---	31	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	70	---	
T <sub>f</sub>	Fall Time		---	50	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz	---	2100	---	pF
C <sub>oss</sub>	Output Capacitance		---	489	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	304	---	

**Diode Characteristics**

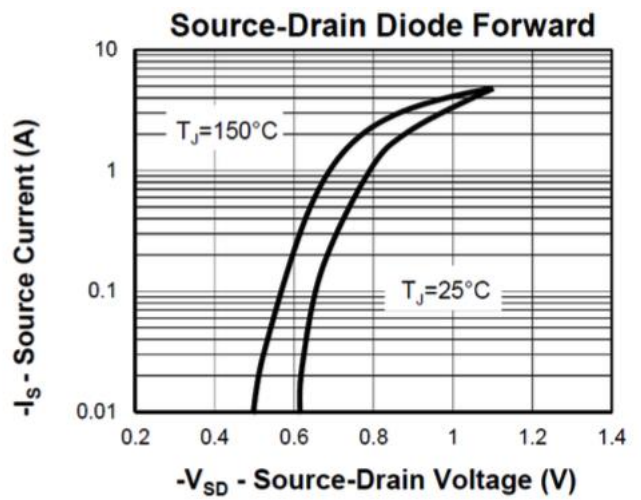
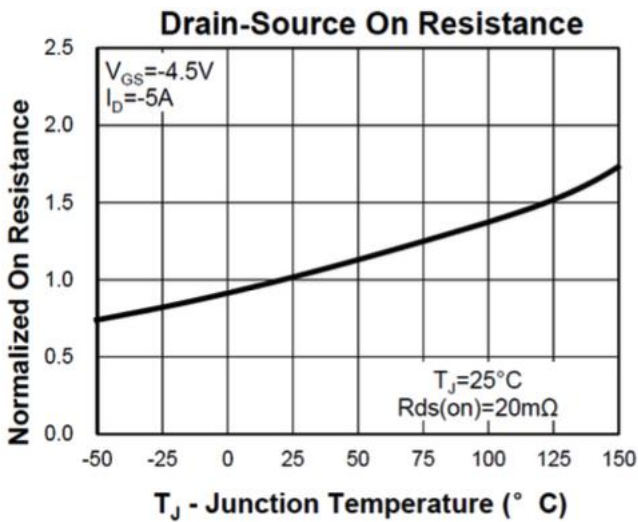
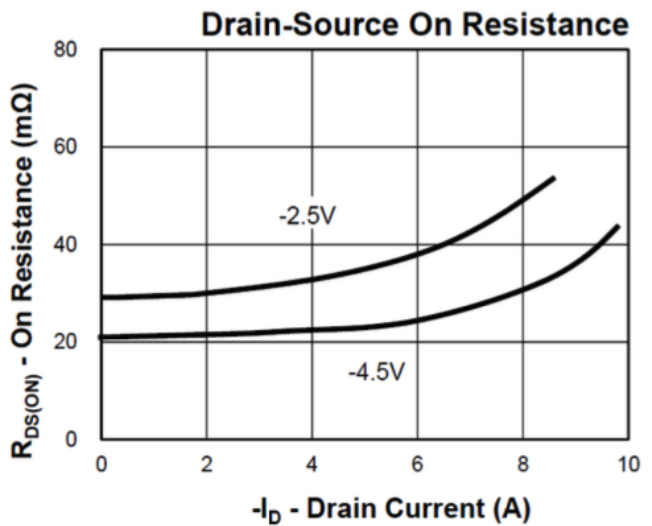
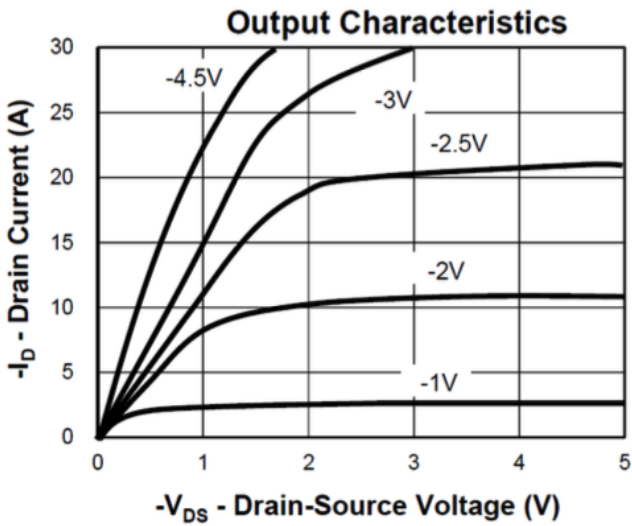
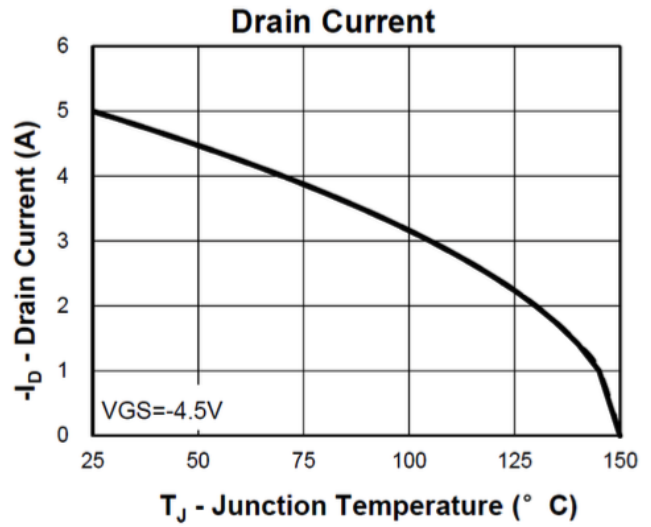
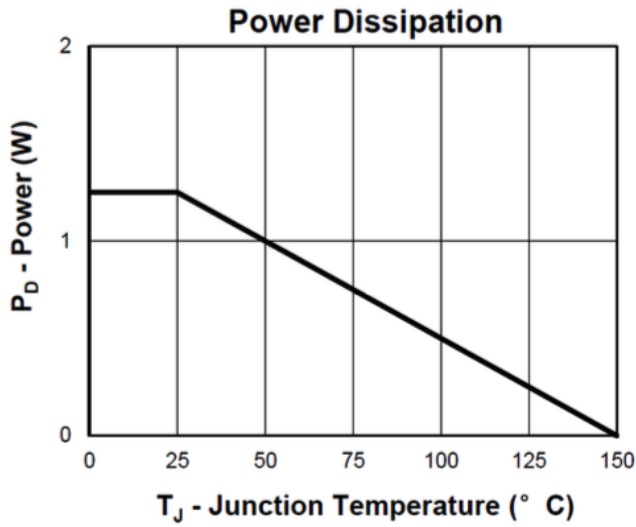
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sub>1,4</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-6	A
I <sub>SM</sub>	Pulsed Source Current <sub>2,4</sub>		---	---	-24	A
V <sub>SD</sub>	Diode Forward Voltage <sub>2</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> 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<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.

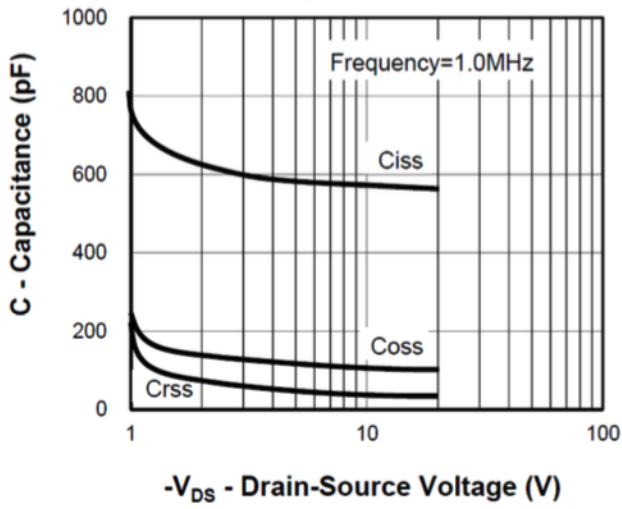


### Typical Characteristics

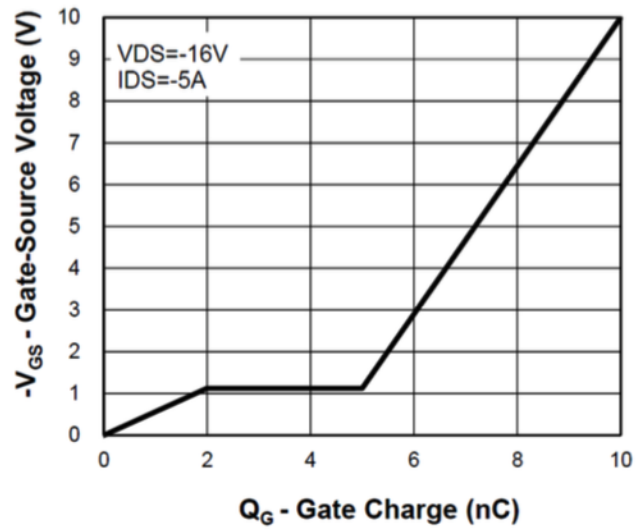




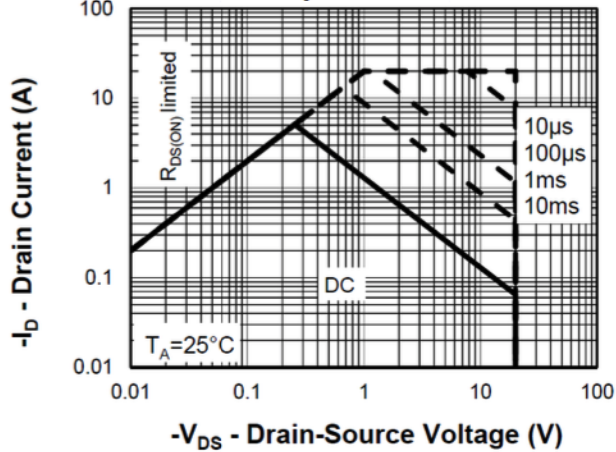
### Capacitance



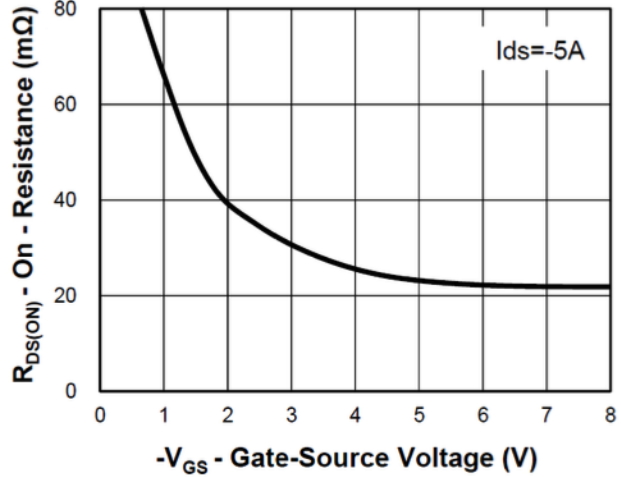
### Gate Charge



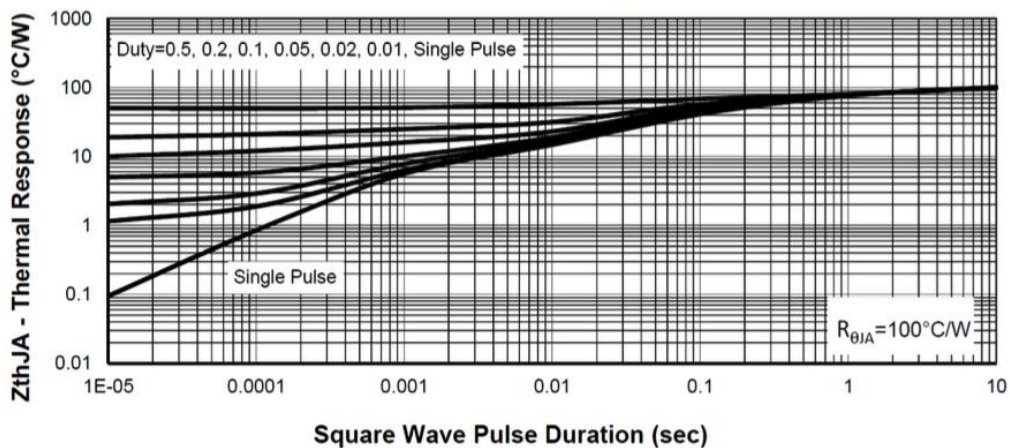
### Safe Operation Area



### Drain Current



### Thermal Transient Impedance



## Ordering Information

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

