HSS3107

P-Ch 30V Fast Switching MOSFETs

Description

The HSS3107 is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.
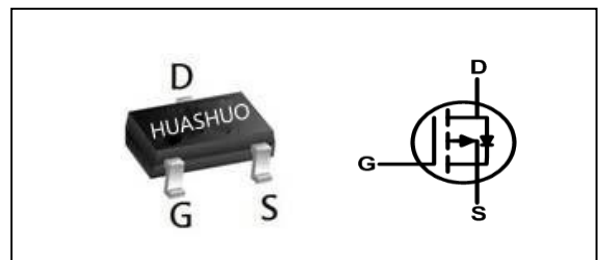
The HSS3107 meet the RoHS and Green Product requirement with full function reliability approved.

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

Product Summary

V_{DS}	-30	V
$R_{DS(ON),max}$	70	mΩ
I_D	-3.2	A

SOT23 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		10s	Steady State	
V_{DS}	Drain-Source Voltage	-30		V
V_{GS}	Gate-Source Voltage	±20		V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ -10V[1]	-3.6	-3.2	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ -10V[1]	-2.9	-2.5	A
I_{DM}	Pulsed Drain Current[2]	-13		A
P_D@T_A=25°C	Total Power Dissipation[3]	1.32	1	W
P_D@T_A=70°C	Total Power Dissipation[3]	0.84	0.64	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
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	125	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	---	95	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	80	°C/W

P-Ch 30V Fast Switching MOSFETs

Electrical Characteristics (T$_J$=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V , I$_D$=-250uA	-30	---	---	V
△BV$_{DSS}$/△T$_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I$_D$=-1mA	---	-0.02	---	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=-10V , I$_D$=-3A	---	55	70	mΩ
		V$_{GS}$=-4.5V , I$_D$=-1.5A	---	90	120	
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =-250uA	-1.2	-1.5	-2.5	V
△V$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	4.32	---	mV/℃
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=-24V , V$_{GS}$=0V , T$_J$=25℃	---	---	-1	uA
		V$_{DS}$=-24V , V$_{GS}$=0V , T$_J$=55℃			-5	
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±20V , V$_{DS}$=0V	---	---	±100	nA
gfs	Forward Transconductance	V$_{DS}$=-5V , I$_D$=-3A	---	4.8	---	S
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	24	48	Ω
Q$_g$	Total Gate Charge (-4.5V)	V$_{DS}$=-20V , V$_{GS}$=-4.5V , I$_D$=-3A	---	5.22	7.3	nC
Q$_{gs}$	Gate-Source Charge		---	1.25	1.8	
Q$_{gd}$	Gate-Drain Charge		---	2.3	3.2	
T$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=-15V , V$_{GS}$=-10V , R$_G$=3.3Ω I$_D$=-1A	---	18.4	37	ns
T$_r$	Rise Time		---	11.4	21	
T$_{d(off)}$	Turn-Off Delay Time		---	39.4	79	
T$_f$	Fall Time		---	5.2	10.4	
C$_{iss}$	Input Capacitance	V$_{DS}$=-15V , V$_{GS}$=0V , f=1MHz	---	463	650	pF
C$_{oss}$	Output Capacitance		---	82	115	
C$_{rss}$	Reverse Transfer Capacitance		---	68	95	

Diode Characteristics

| Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current[1,4]	V$_G$=V$_D$=0V , Force Current	---	---	-3.2	A
I$_{SM}$	Pulsed Source Current[2,4]		---	---	-13	A
V$_{SD}$	Diode Forward Voltage[2]	V$_{GS}$=0V , I$_S$=-1A , T$_J$=25℃	---	---	-1	V

Note :

1.The data tested by surface mounted on a 1 inch[2] 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℃ 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.
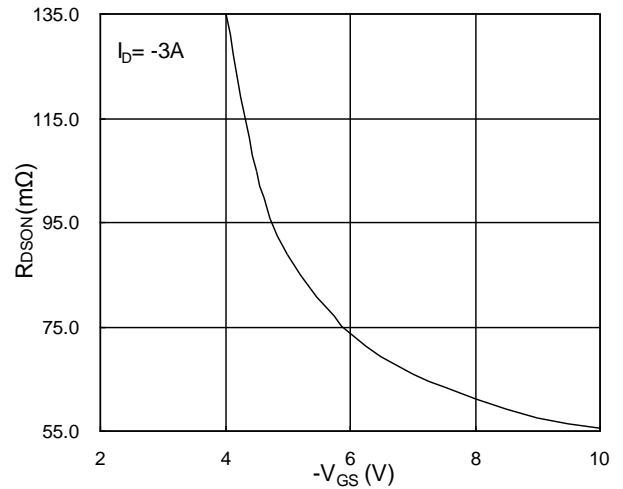
HUASHUO SEMICONDUCTOR

Typical Characteristics

P-Ch 30V Fast Switching MOSFETs
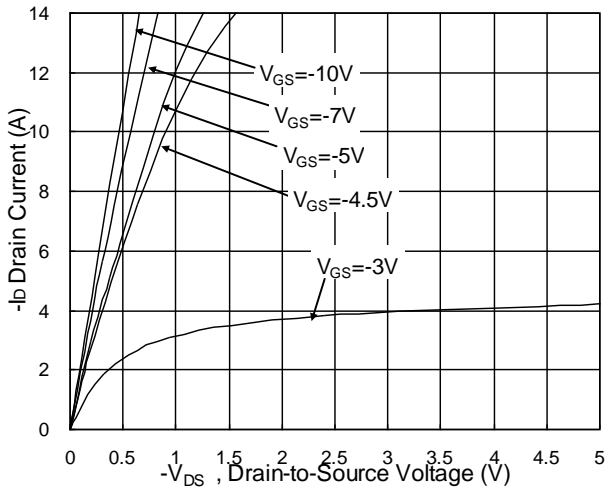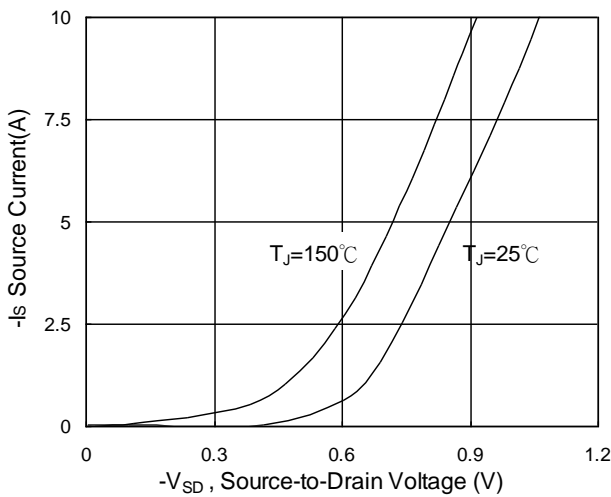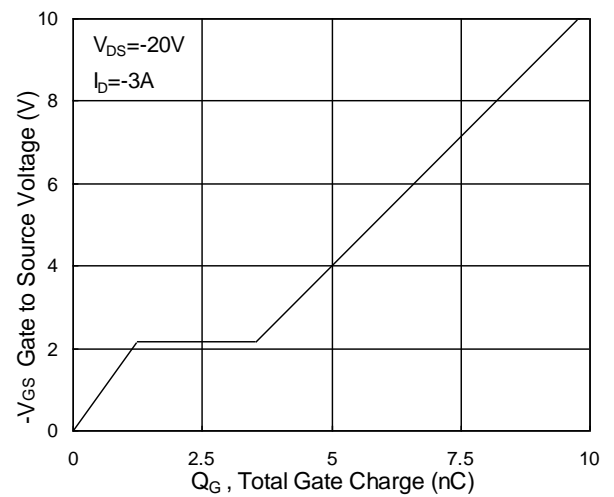

Fig.1 Typical Output Characteristics
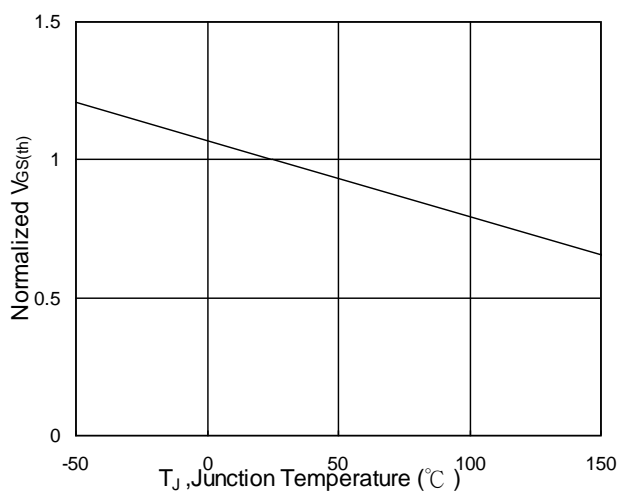

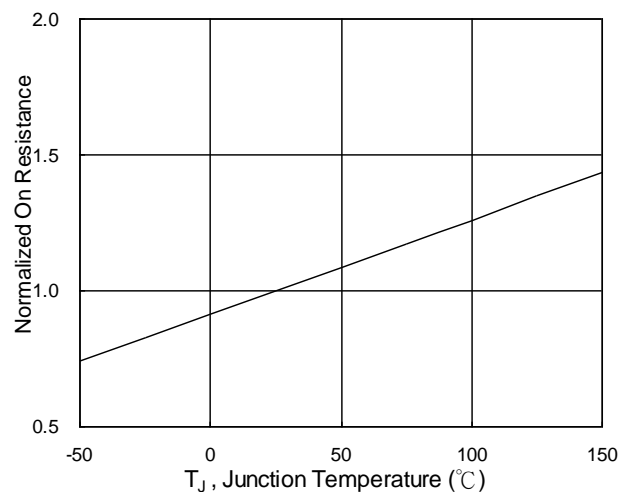**Fig.2 On-Resistance vs. G-S Voltage**

Fig.3 Forward Characteristics of Reverse

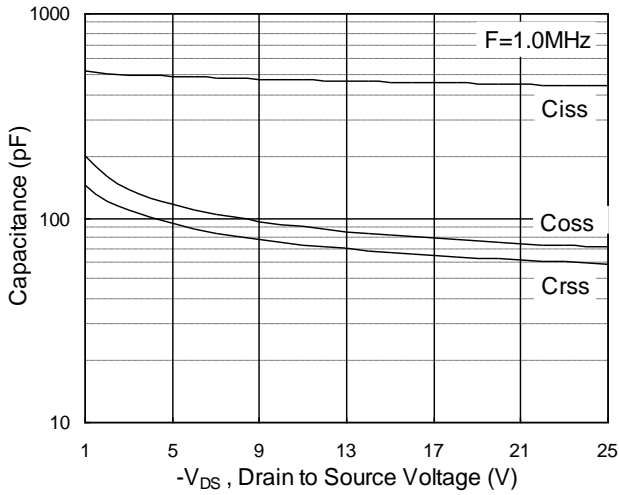**Fig.4 Gate-Charge Characteristics**
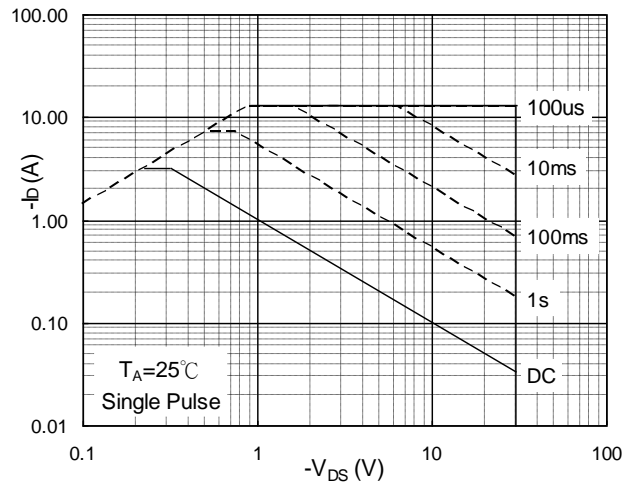

Fig.5 Normalized $V_{GS(th)}$ vs. T_J

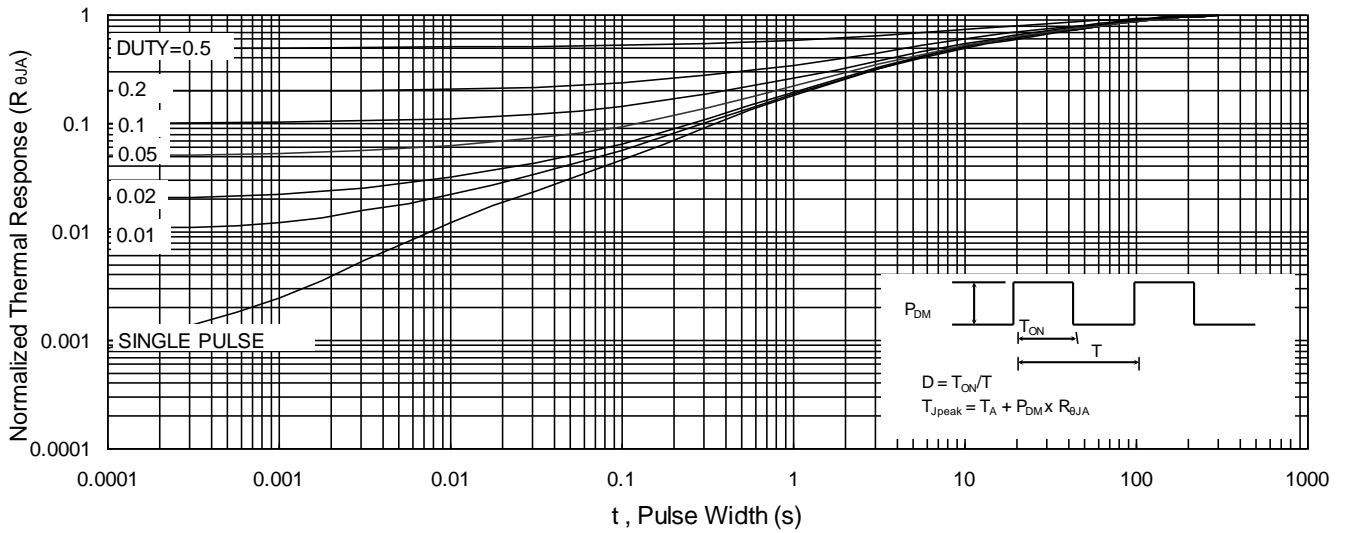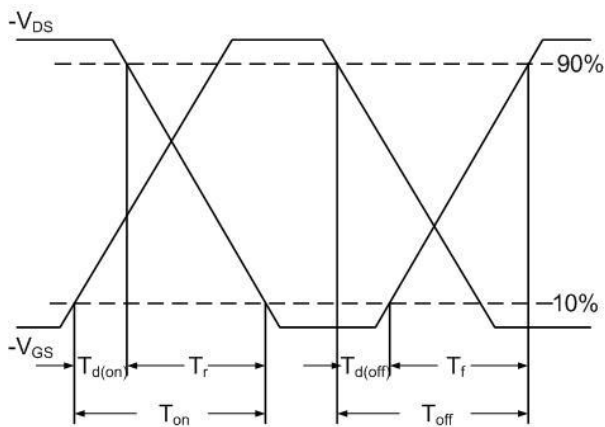**Fig.6 Normalized R_{DSON} vs. T_J**
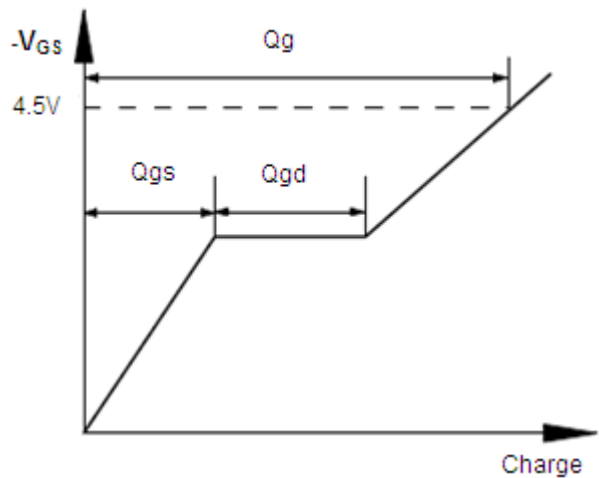
Fig.7 Capacitance

Fig.8 Safe Operating Area

Fig.9 Normalized Maximum Transient Thermal Impedance
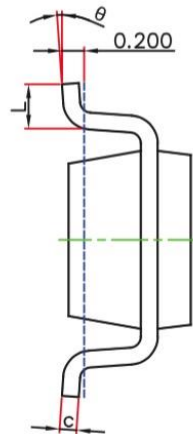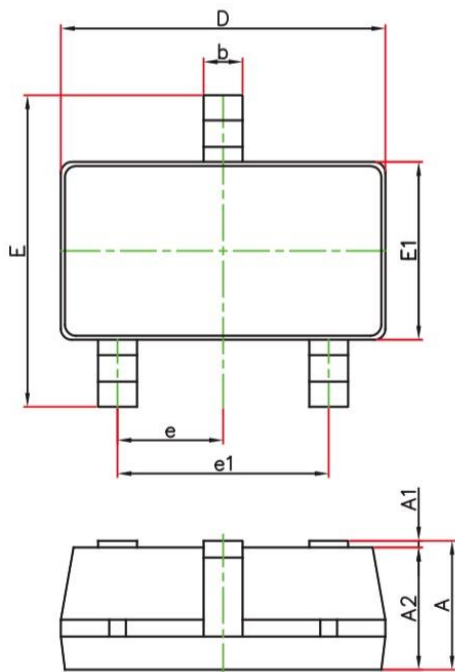

Fig.10 Switching Time Waveform

Fig.11 Gate Charge Waveform

Ordering Information

Part Number	Package code	Packaging
HSS3107	SOT-23L	3000/Tape&Reel

Symbol	Dimensions In Millimeters Min.	Dimensions In Millimeters Max.	Dimensions In Inches Min.	Dimensions In Inches 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°