HSH3129

P-Ch 30V Fast Switching MOSFETs

General Description

The HSH3129 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The HSH3129 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

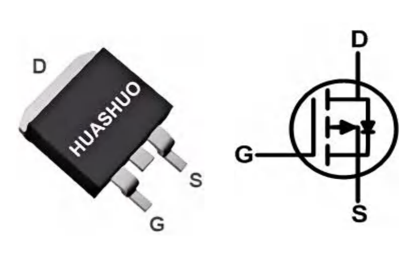
Product Summary

V_{DS}	-30	V
$R_{DS(ON),typ}$	1.4	mΩ
I_D	-220	A

Features

- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench Technology

TO-263 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25˚C	Continuous Drain Current, V_{GS} @ -10V[1,6]	-220	A
I_D@T_C=100˚C	Continuous Drain Current, V_{GS} @ -10V[1,6]	-140	A
I_{DM}	Pulsed Drain Current[2]	-880	A
EAS	Single Pulse Avalanche Energy[3]	1350	mJ
I_{AS}	Avalanche Current	-95	A
P_D@T_C=25˚C	Total Power Dissipation[4]	200	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](Steady State)	---	62	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction-case [1]	---	0.85	˚C/W

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
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-30A	---	1.4	1.8	mΩ
		V_{GS}=-4.5V , I_D=-20A	---	1.8	2.4	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.0	-1.7	-2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-30V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-30V , V_{GS}=0V , T_J=125℃	---	---	-100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Rg	Gate resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz		1.8		Ω
Q_g	Total Gate Charge (-10V)	V_{DS}=-15V , V_{GS}=-10V , I_D=-20A	---	420	---	nC
Q_{gs}	Gate-Source Charge		---	48	---	
Q_{gd}	Gate-Drain Charge		---	62	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V , V_{GS}=-10V , R_G=3Ω, I_D=-10A	---	17	---	ns
T_r	Rise Time		---	6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	21	---	
T_f	Fall Time		---	39	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	25400	---	pF
C_{oss}	Output Capacitance		---	2580	---	
C_{rss}	Reverse Transfer Capacitance		---	2410	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	-220	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-20A , T_J=25℃	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	I_F=-20A , di/dt=100A/μs , T_J=25℃	---	50	---	nS
Q_{rr}	Reverse Recovery Charge		---	120	---	nC

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 EAS data shows Max. rating . The test condition is V_{DD}=-30V,V_{GS}=-10V,L=0.5mH,I_{AS}=-95A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation
6.The maximum current rating is package limited.

Typical Characteristics

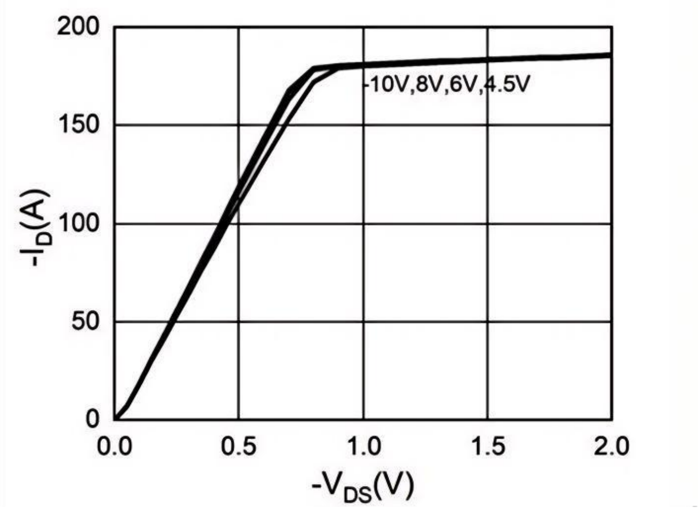


Fig.1 Typical Output Characteristics

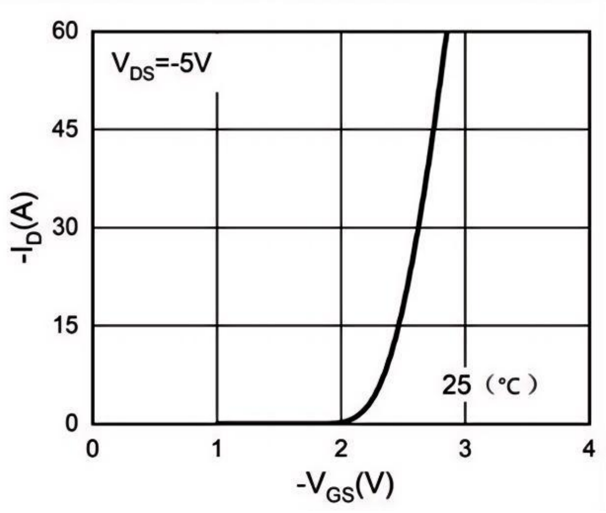


Fig.2 Transfer Characteristics

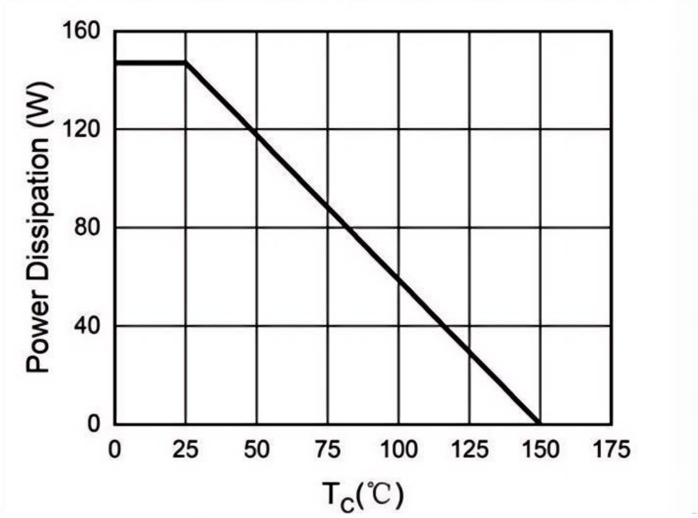


Fig.3 Power Dissipation

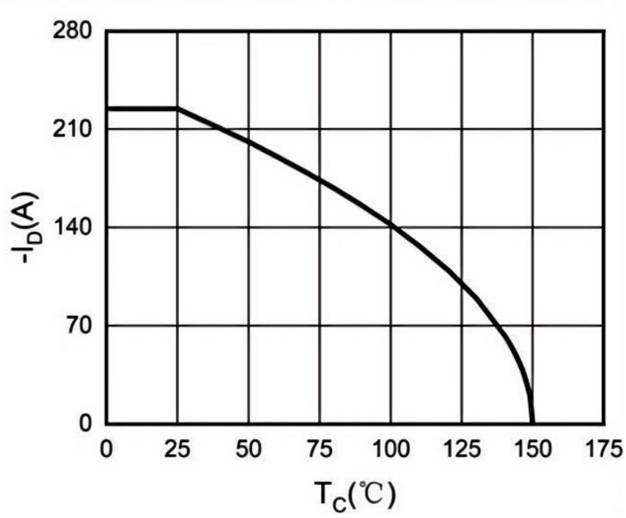


Fig.4 Drain Current

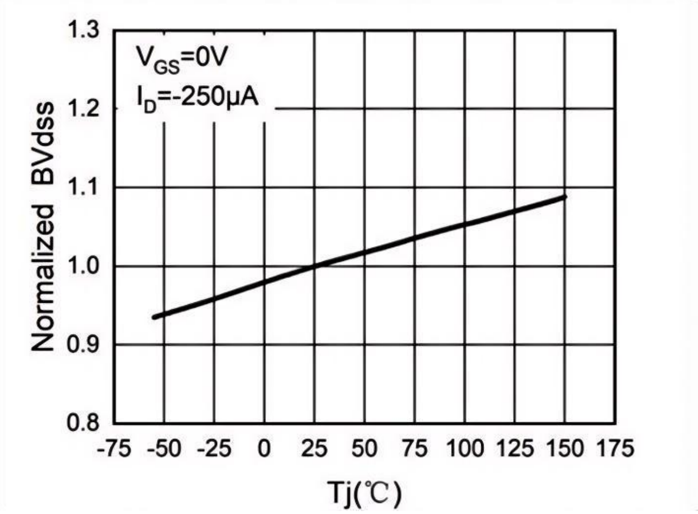


Fig.5 BV_{DSS} vs Junction Temperature

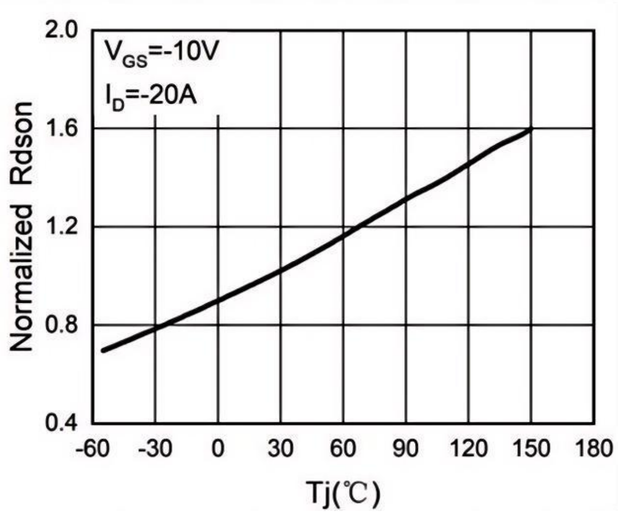


Fig.6 $R_{DS(ON)}$ vs Junction Temperature

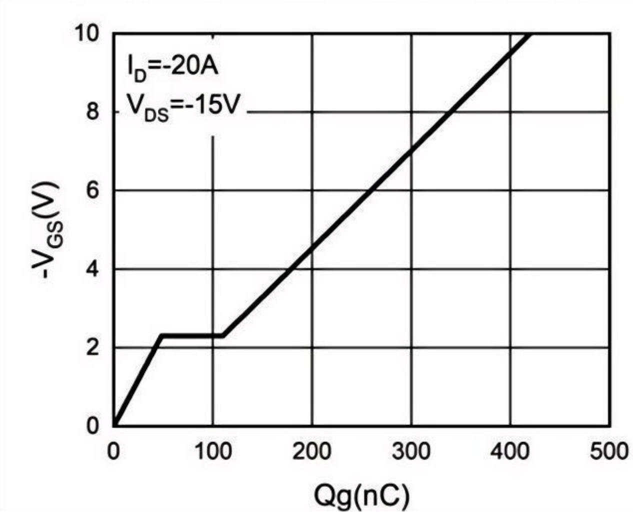


Fig.7 Gate Charge Waveforms

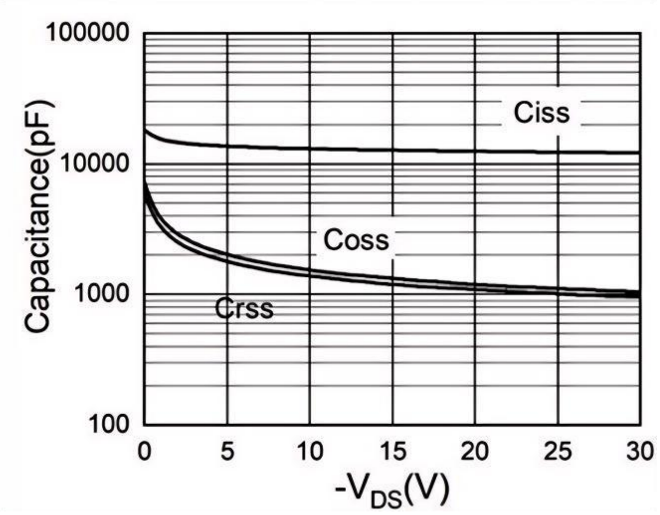


Fig.8 Capacitance

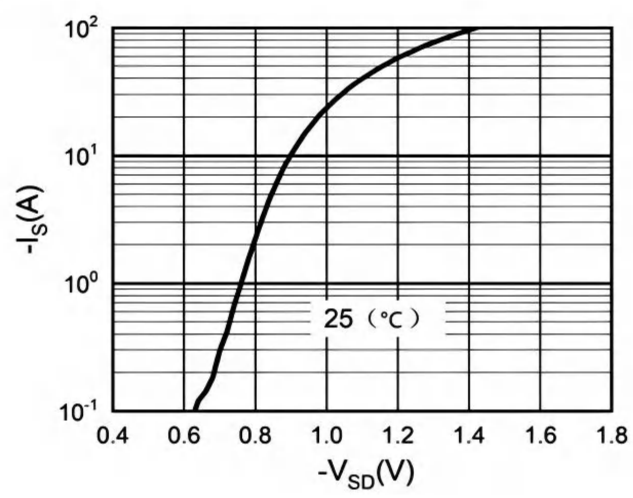


Fig.9 Body Diode Characteristics

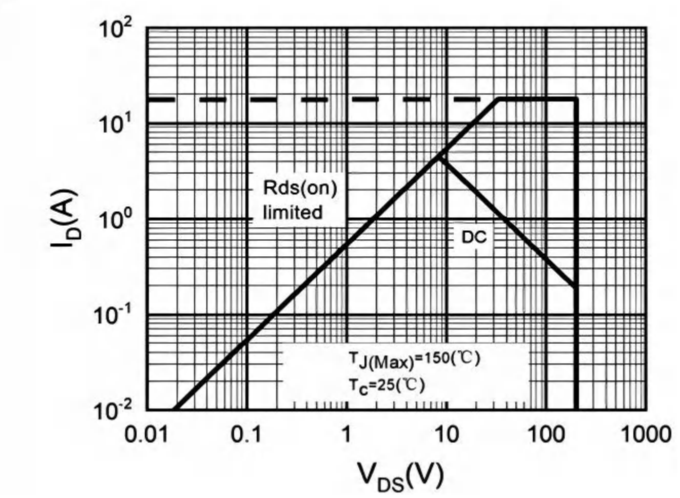
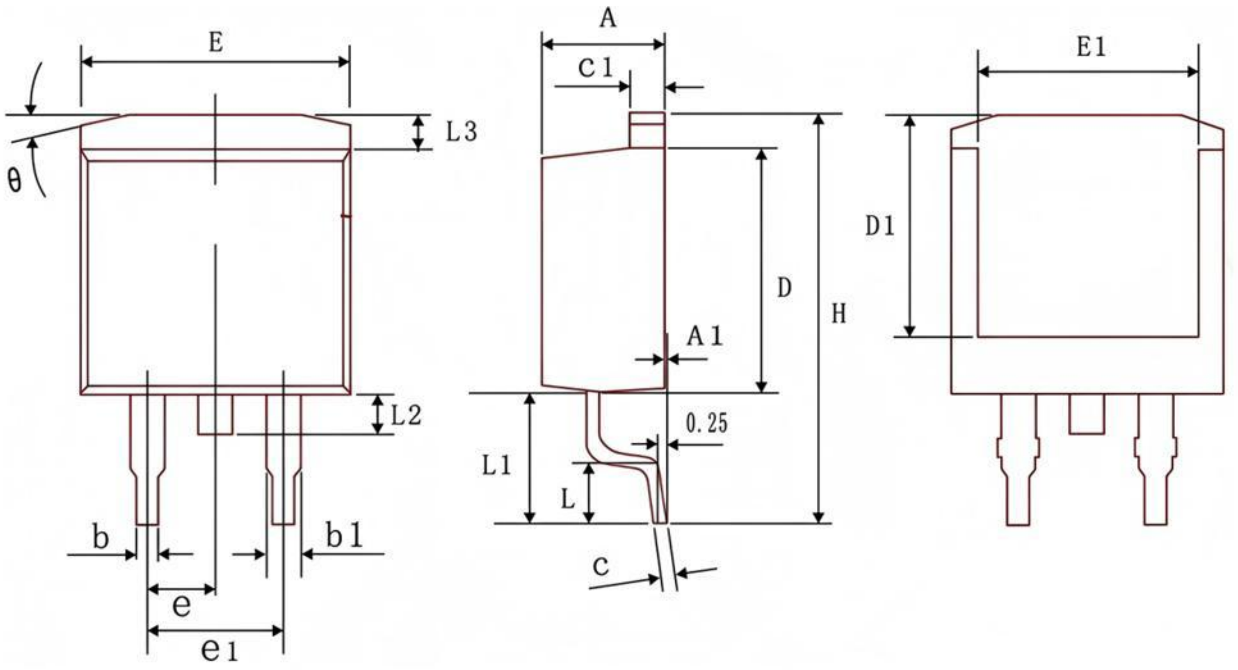


Fig.10 Maximum Safe Operating Area

Ordering Information

Part Number	Package code	Packaging
HSH3129	TO-263	800/Tape&Reel

TO-263 Package Outline



TOP VIEW SIDE VIEW BOTTOM VIEW

COMMON DIMENSIONS(UNIT OF MEASURE - MM)

SYMBOL	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	0.00	-	0.25
b	0.70	0.83	0.96
b1	1.00	1.24	1.47
C	0.35	0.45	0.55
C1	1.25	1.30	1.35
D	8.50	8.90	9.30
D1	7.50	8.00	8.50
H	14.7	15.20	15.7
E	9.80	10.08	10.4
E1	7.35	7.80	8.25
e1	4.93	5.08	5.23
L	2.00	2.30	2.60
L1	4.50	4.75	5.00
L2	1.30	1.53	1.75
L3	1.10	1.29	1.47
e	2.54 BSC		
θ	13°TYP		

HSH3129 Marking: