HUASHUO SEMICONDUCTOR

HSY6129

P-Ch 60V Fast Switching MOSFETs

Applications

- High Frequency Switching and Synchronous Rectification.
- DC/DC Converters.
- Power Tool Application.

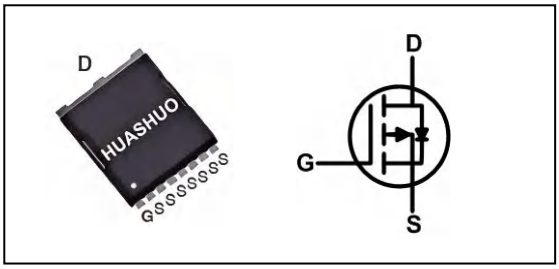
Product Summary

V_{DS}	-60	V
$R_{DS(ON),typ}$	3.5	mΩ
I_D	-210	A

Features

- 100% EAS Guaranteed
- Green Device Available
- Fast Switching Speed
- Advanced high cell density Trench MOS Technology

TOLL Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ -10V[1]	-210	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ -10V[1]	-138	A
I_{DM}	Pulsed Drain Current[2]	-840	A
EAS	Single Pulse Avalanche Energy[3]	605	mJ
I_{AS}	Avalanche Current	-84	A
P_D@T_C=25°C	Total Power Dissipation[4]	183	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]	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.4	°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	-60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-30A	---	3.5	4.5	mΩ
		V_{GS}=-4.5V , I_D=-30A	---	4.2	6.0	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.0	-1.6	-2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-60V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
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	V_{DS}=-48V , V_{GS}=-10V , I_D=-5A	---	280	---	nC
Q_{gs}	Gate-Source Charge		---	55	---	
Q_{gd}	Gate-Drain Charge		---	24	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-48V , V_{GS}=-10V , R_G=6Ω, I_D=-1A	---	88	---	ns
T_r	Rise Time		---	258	---	
$T_{d(off)}$	Turn-Off Delay Time		---	509	---	
T_f	Fall Time		---	244	---	
C_{iss}	Input Capacitance	V_{DS}=-25V , V_{GS}=0V , f=1MHz	---	17900	---	pF
C_{oss}	Output Capacitance		---	1701	---	
C_{rss}	Reverse Transfer Capacitance		---	680	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	-210	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-40A , T_J=25℃	---	---	1.2	V
Trr	Reverse Recovery Time	Is=-10A,dI/dt=100A/us	---	46	---	ns
Qrr	Reverse Recovery Charge		---	117	---	nC

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 EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH,Ias=84A.
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.

Typical Characteristics

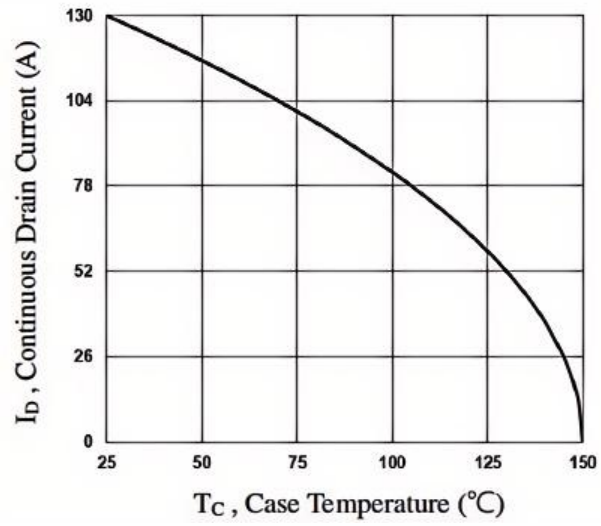


Fig.1 Continuous Drain Current vs.Tc

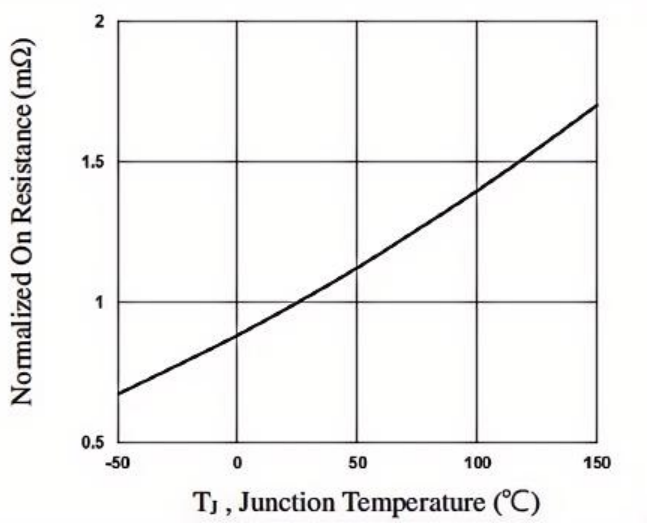


Fig.2 Normalized RDSON vs.Tj

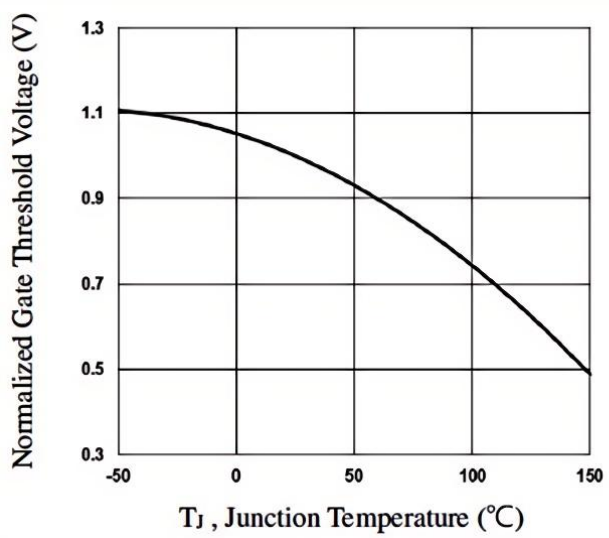


Fig.3 Normalized Vth vs.Tj

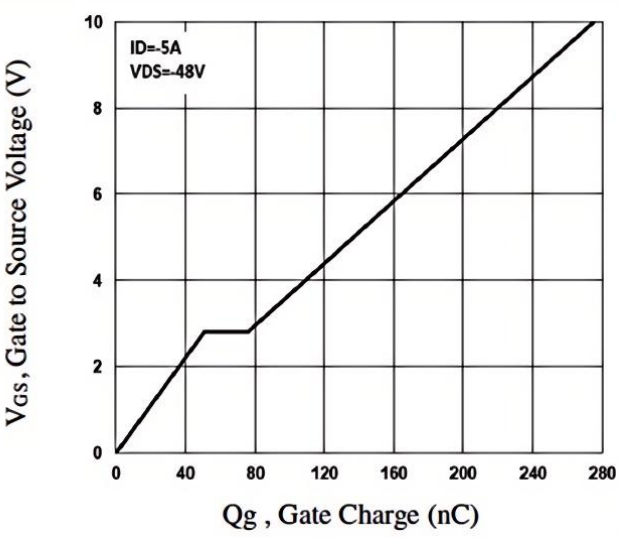


Fig.4 Gate Charge Characteristics

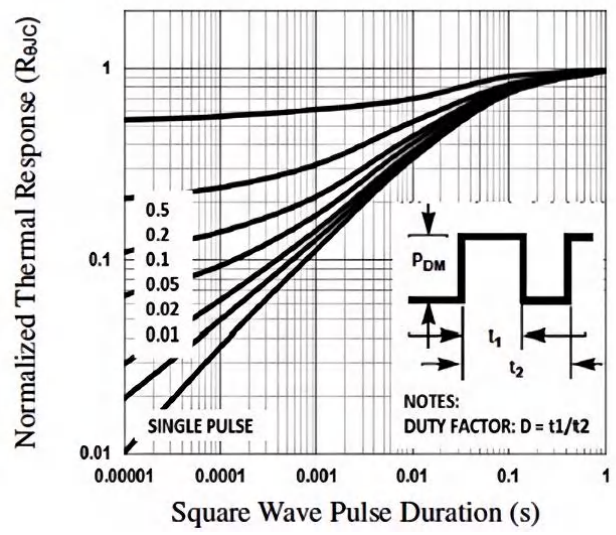


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

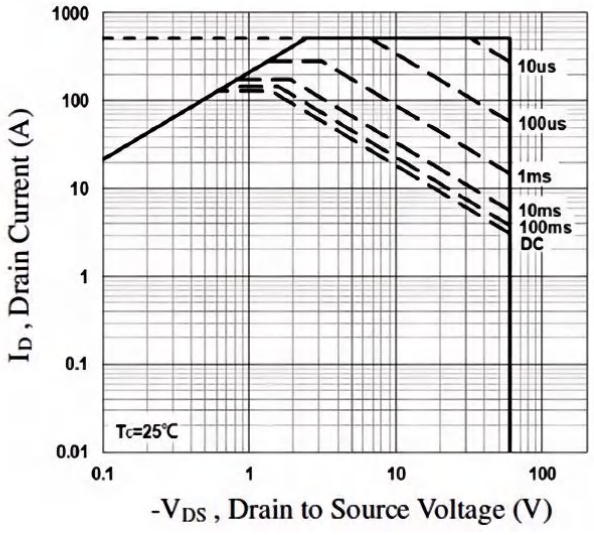


Fig.6 Normalized R_{DSON} vs. T_J

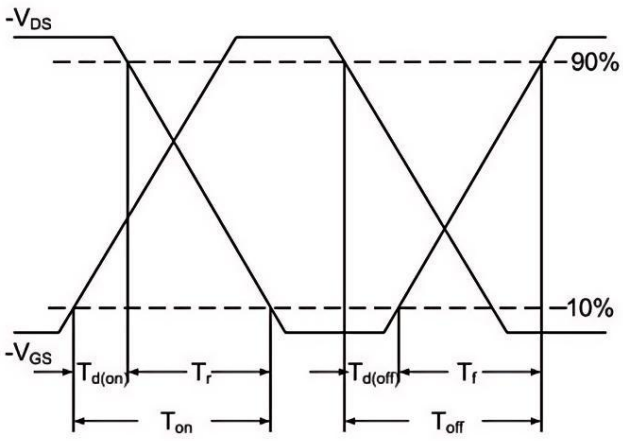


Fig.7 Switching Time Waveform

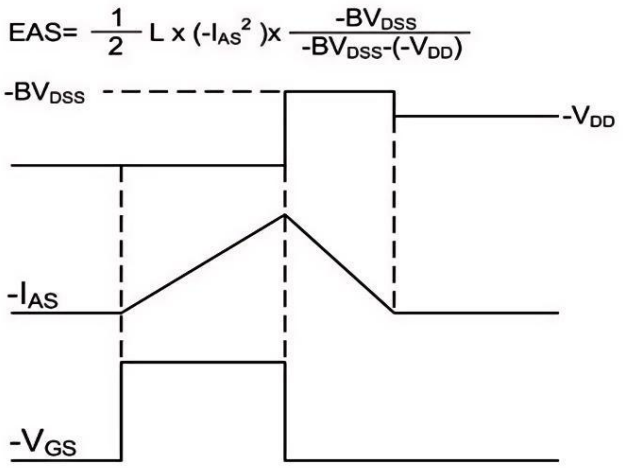
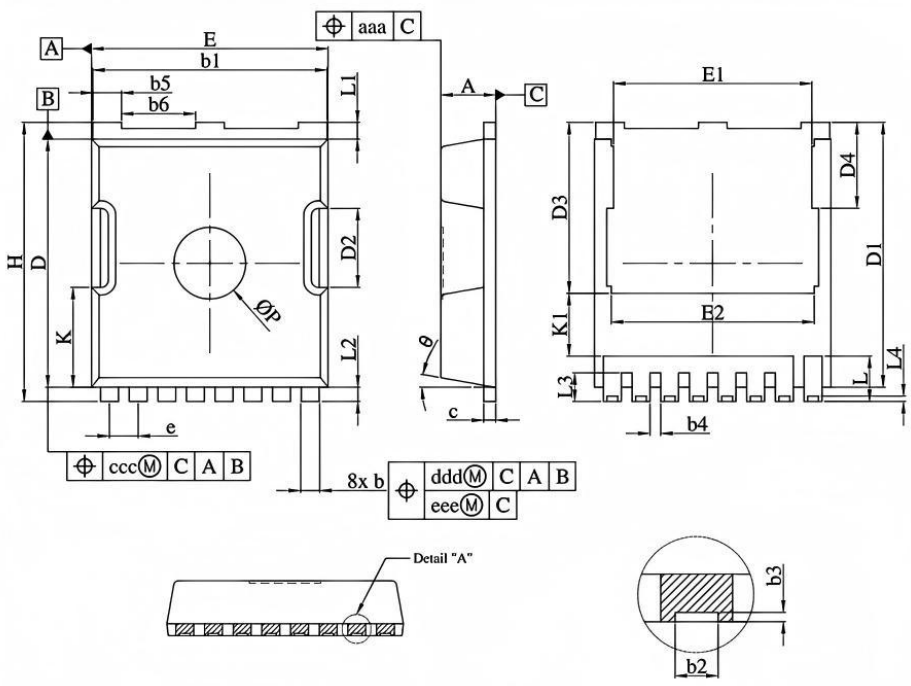


Fig.8 Unclamped Inductive Waveform

Ordering Information

Part Number	Package code	Packaging
HSY6129	TOLL	2000/Tape&Reel

TOLL Package Outline



COMMON DIMENSIONS(MM)							
SYMBOL	MIN.	NOMINAL	MAX.	SYMBOL	MIN.	NOMINAL	MAX.
A	2.20	2.30	2.40	E1	8.20	8.30	8.40
b	0.70	0.80	0.90	E2	8.35	8.50	8.65
bl	9.70	9.80	9.90	H	11.50	11.68	11.85
b2	0.36	0.45	0.55	K	4.08	4.18	4.28
b3	0.05	0.100	0.35	K1	2.45	---	---
b4	0.30	0.40	0.50	L	1.60	1.90	2.10
b5	1.10	1.20	1.30	L1	0.50	0.70	0.90
b6	3.00	3.10	3.20	L2	0.50	0.60	0.70
C	0.40	0.50	0.60	L3	1.00	1.20	1.30
D	10.28	10.38	10.55	L4	0.13	0.23	0.33
D1	10.98	11.08	11.18	P	2.85	3.00	3.15
D2	3.20	3.30	3.40	θ	10°REF		
D3	7.00	7.15	7.30	aaa	0.20		
D4	3.44	3.59	3.74	ccC	0.20		
e	1.10	1.20	1.30	ddd	0.25		
E	9.80	9.90	10.00	eee	0.20		

HSY6129 Marking: