Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

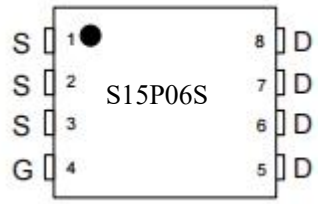
Bvdss	Rdson	ID
-60V	33mΩ	-15A

Application

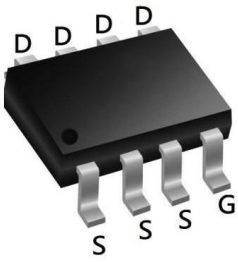
- Power management in half bridge and in
- Load Switch
- DC-DC Converter

RoHS

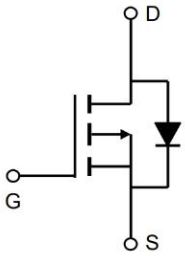
Package



Marking and pin assignment



SOP-8 top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
15P06	S15P06S	SOP-8	3000

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@Tc =25℃, V_{GS}@4.5V[1]	-15	A
	I_D@Tc=70℃, V_{GS}@4.5V[1]	-10	A
Pulsed Drain Current[2]	I_{DM}	-90	A
Total Power Dissipation[3]	P_D@Tc=25℃	89	W
Junction Temperature Range	T_J	-55 ~ 150	℃
Storage Temperature Range	T_{STG}	-55 ~ 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	1.4	℃/W
Thermal resistance, junction – ambient	$R_{\theta JA}$	47	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLS15P06S	SOP-8	4	5,6,7,8	1,2,3	Tape Reel

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V_{DSS}	V_{GS}=0V I_D=-250μA	-60	-	-	V
BV_{DSS} Temperature Coefficient	△BV_{DSS}/△T_J	Reference to 25℃ , I_D=1mA	-	-	-	V/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V , T_J=25℃	-	-	1	μA
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V , T_J=55℃	-	-	5	
Gate- Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+20V	-	-	100	nA
Gate- Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-20V	-	-	-100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.3	-1.7	-2.3	V
$V_{GS(th)}$ Temperature Coefficient	△$V_{GS(th)}$		-	-	-	mV/℃
Drain-Source On-State Resistance[2]	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-3A	-	33	43	mΩ
		V_{GS}=-4.5V, I_D=-2A	-	41	54	
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	13	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{lss}	V_{DS}=-30V,V_{GS}=0V, F=1.0MHz	-	862	-	pF
Output Capacitance	C_{oss}		-	163	-	pF
Reverse Transfer Capacitance	C_{rss}		-	8	-	pF
Forward Transconductance	gfs	V_{DS}=-5V , I_D=-3A	-	-	-	S
Resistive Switching Characteristics						
Turn-on Delay Time	$T_{d(on)}$)	V_{DD}=-30V,I_D=-10A, R_{GEN}=5Ω，V_{GS}=-10V	-	10	-	nS
Turn-on Rise Time	t_r		-	6	-	nS
Turn-Off Delay Time	$T_{d(off)}$		-	23	-	nS
Turn-Off Fall Time	T_f		-	11	-	nS
Total Gate Charge(-4.5V)	Q_g	V_{DS}=-30V,I_D=-10A, V_{GS}=-10V	-	13.4	-	nC
Gate-Source Charge	Q_{gs}		-	3.35	-	nC
Gate-Drain Charge	Q_{gd}		-	1.82	-	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-1A , T_J=25℃	-	-	-1.2	V
Reverse Recovery time	T_{rr}	I_S=-10A, dI/dt=100A/μs, T_J=25℃	-	18	-	ns
Reverse Recovery Charge	Q_{rr}		-	27	-	nC
Maximum Continuous Drain to Source Diode Forward Current[1, 5]	I_S	V_G=V_D=0V , Force Current	-	-	-15	A

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}=-30V,V_{GS}=-10V,L=1mH

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.

N-Channel Typical Characteristics

Fig1:Typ. output characteristics

I_D=f(-V_{DS})

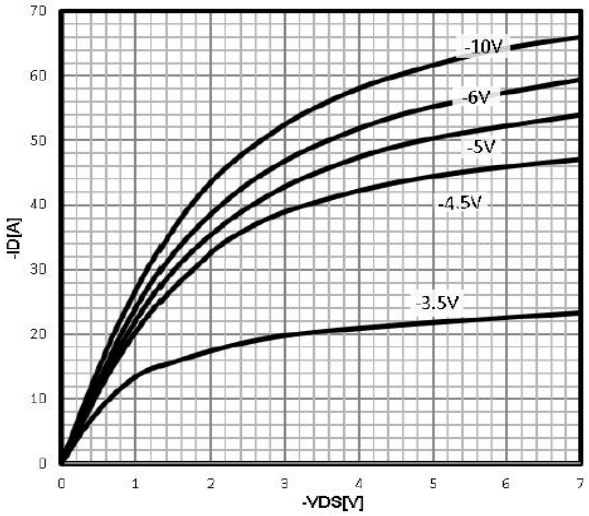


Fig2:Typ. drain-source on resistance

$R_{DS(on)}$=f(-I_D)

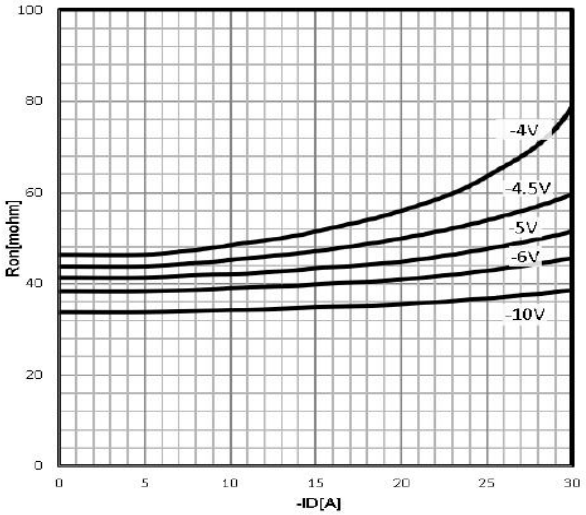


Fig3:Typ. transfer characteristics

-I_D=f(-V_{GS}) ;

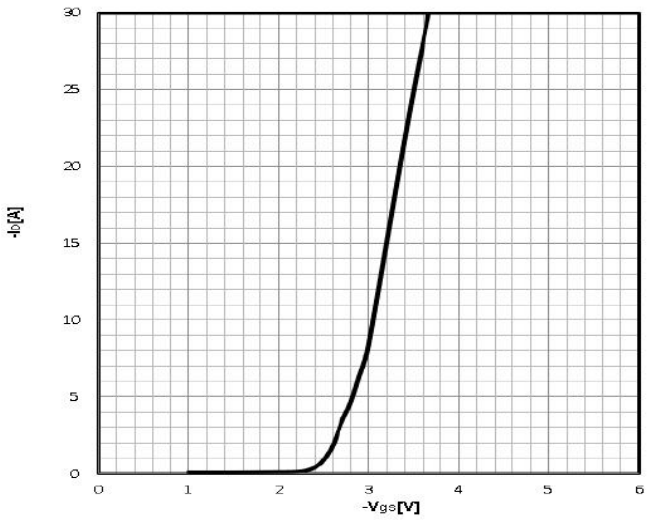


Fig4:Drain-source on-state resistance

$R_{DS(on)}$=f(T_j);I_D=-20A; V_{GS}=-10V

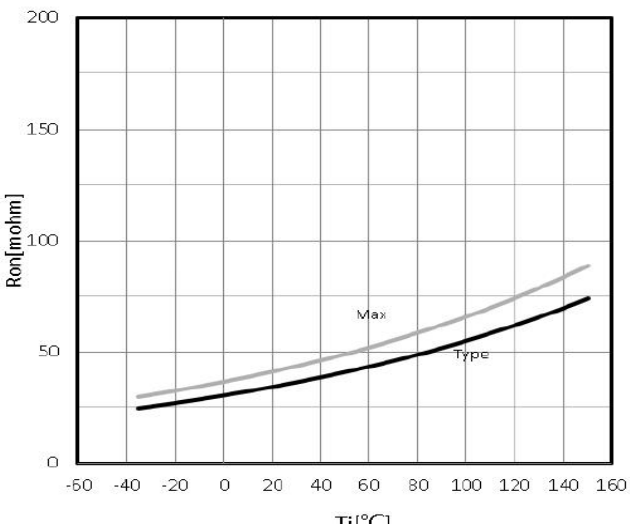


Fig5:Gate Threshold Voltage

-VTH=f(Tj); ID=-250uA

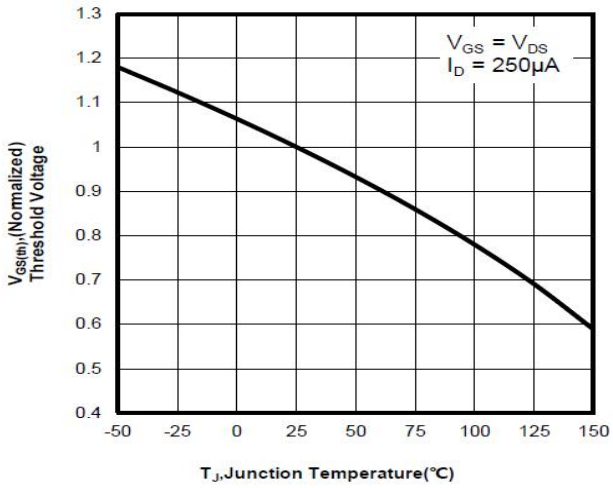


Fig6:Drain-source breakdown voltage

$V_{BR(DSS)}$=f(T_j); I_D=-250uA

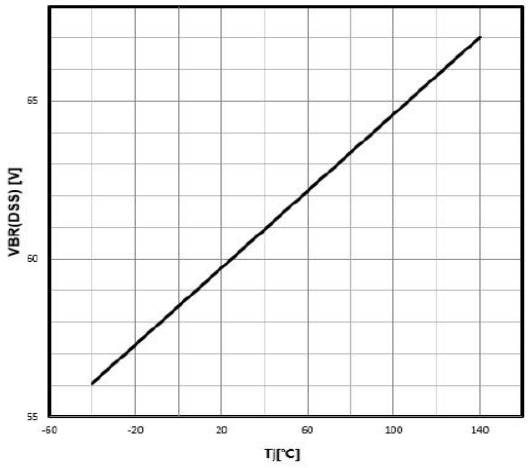


Fig7:Typ. gate charge

V_{GS}=f(Q_g), I_D=-15A;

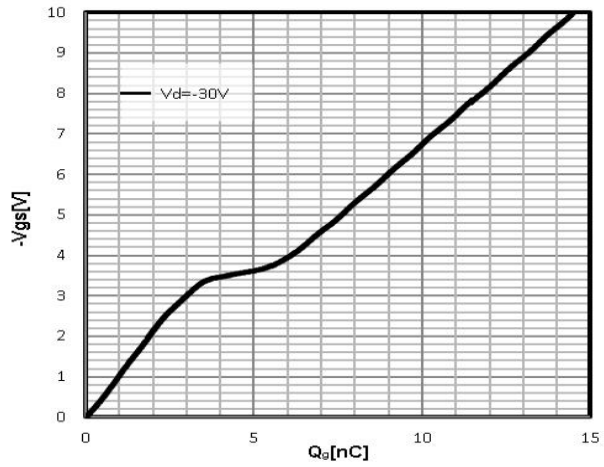


Fig8:Typ. capacitances

C =f(V_{DS}); V_{GS}=0V; f =1MHz

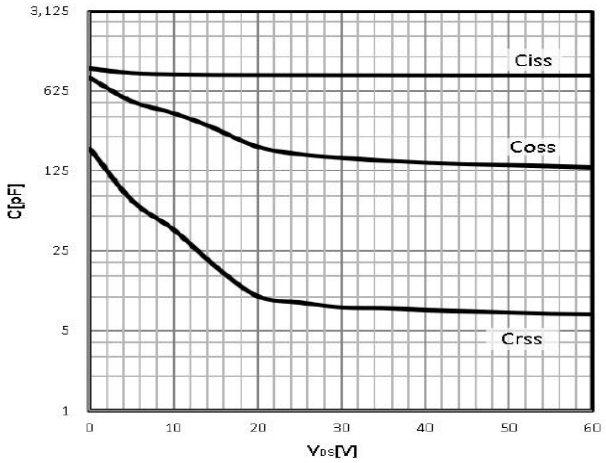


Fig9:Power Dissipation

P_{tot}=f(T_C)

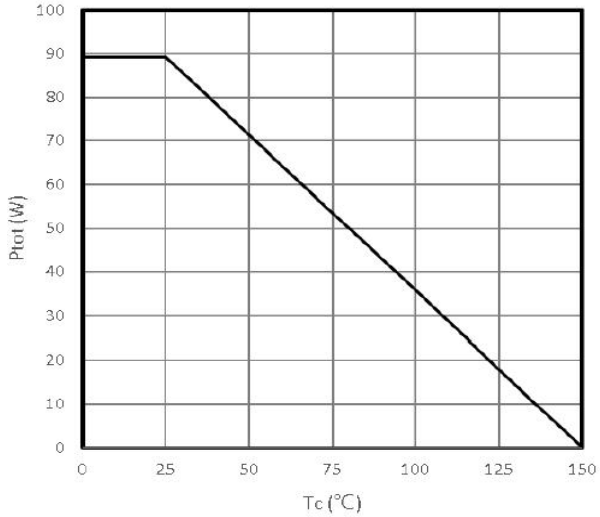


Fig10:Maximum Drain Current

-I_D=f(T_C)

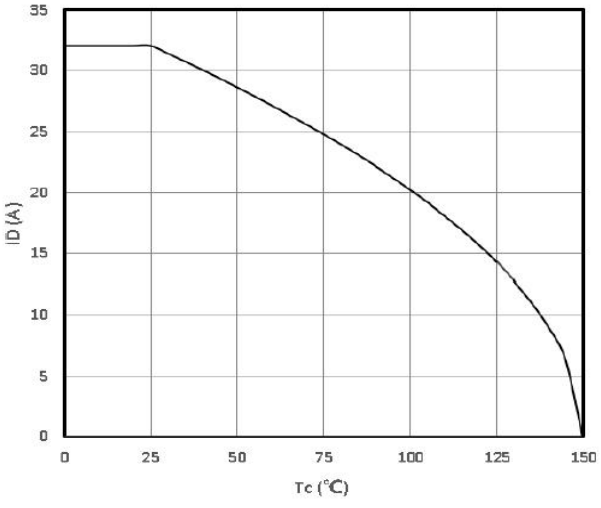


Fig11:Safe operating area

$I_D=f(V_{DS})$

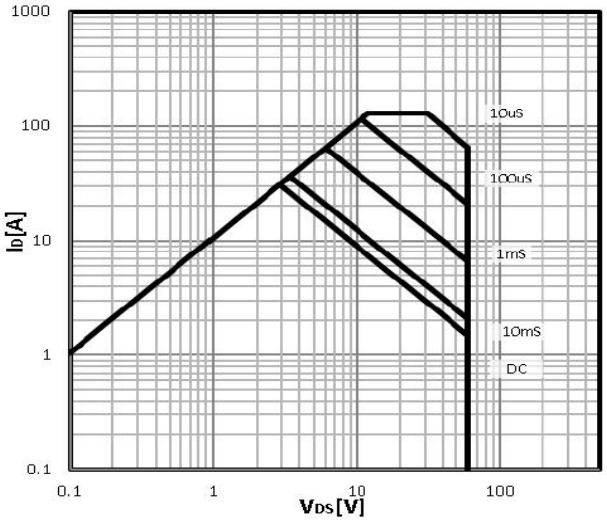


Fig12:Body Diode Forward Voltage Variation

$-I_F=f(-V_{DS})$

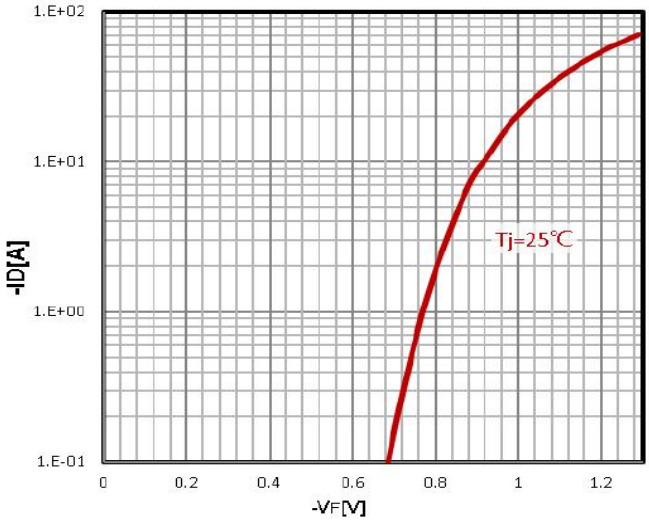
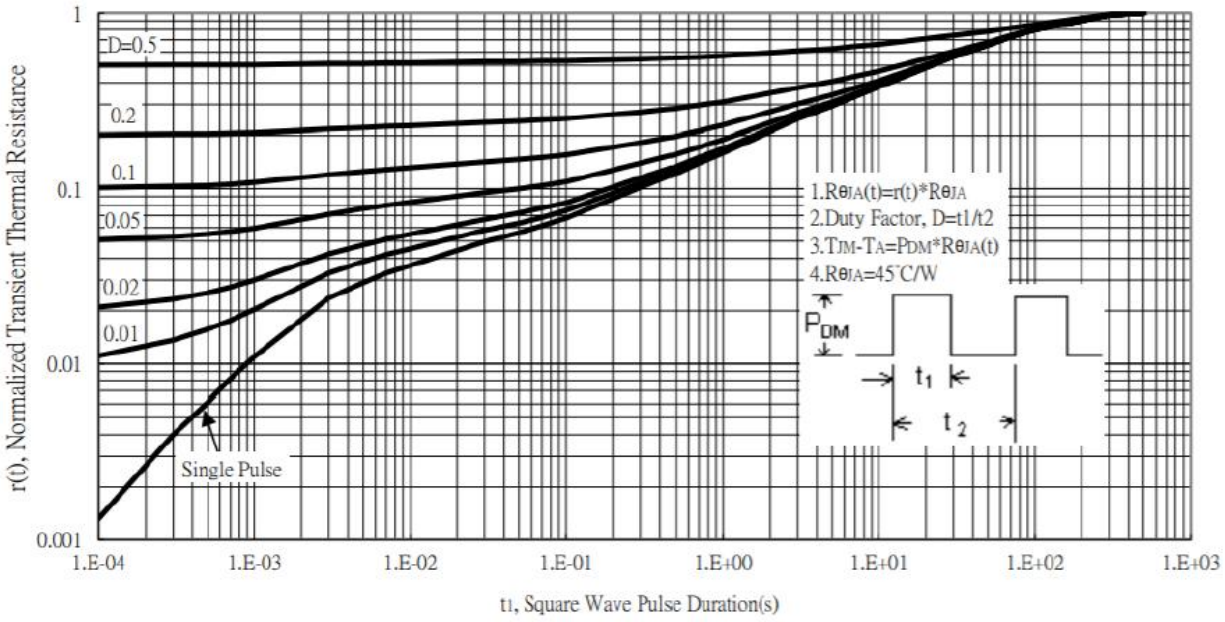
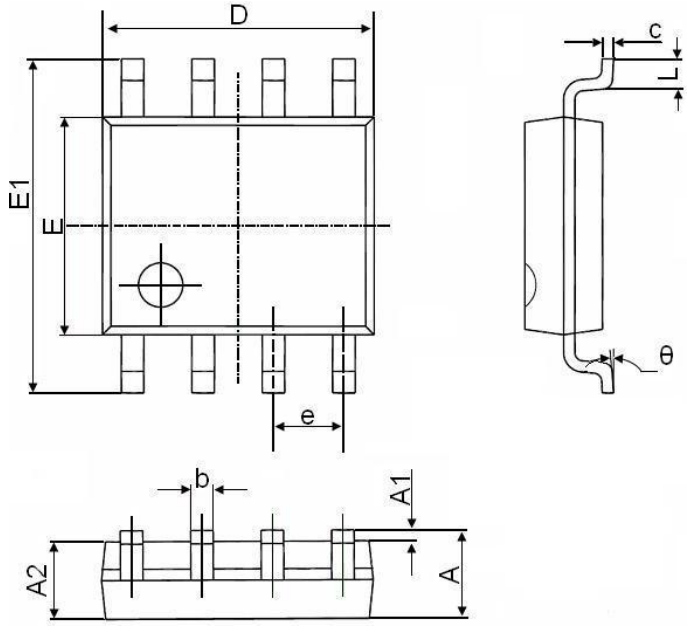


Figure 13: Max. Transient Thermal Impedance

$Z_{thJC}=f(t_p)$



Package Dimensions SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Important Notice and Disclaimer

HL Microelectronics reserves the right to make changes to this document and its products and specifications at any time without notice.
Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

HL Microelectronics makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, not does HL Microelectronics assume any liability for application assistance or customer product design.

HL Microelectronics does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of HL Microelectronics.

HL Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of HL Microelectronics.