Description

The HI6301 uses advanced trench technology to provide excellent $R_{DS(ON)}$, This device is suitable for use as a load switch or in PWM applications.



SOT-23

General Features

V_{DS} = -30V,I_D = -4.2A

$R_{DS(ON)}$ < 55mΩ @ V_{GS}=-10V

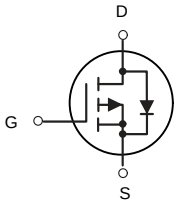
$R_{DS(ON)}$ < 75mΩ @ V_{GS}=-4.5V

Application

Battery protection

Load switch

Uninterruptible power supply



P-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HI6301	SOT-23	A19T	3000

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current-Continuous	-4.2	A
I_{DM}	Drain Current-Pulsed (Note 1)	-30	A
P_D	Maximum Power Dissipation	1.2	W
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient (Note 2)	104	℃/W

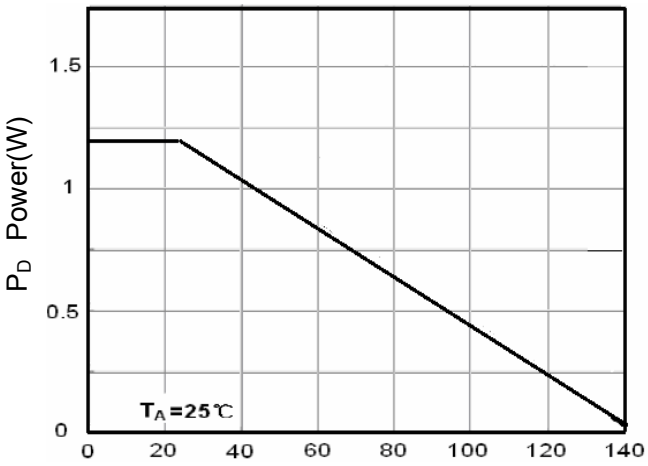
Electrical Characteristics (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-30		-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.7	-1	-1.3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.2A	-	45	55	mΩ
		V_{GS}=-4.5V, I_D=-4A	-	56	75	mΩ
		V_{GS}=-2.5V, I_D=-1A		72	90	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-4.2A	-	10	-	S
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	880	-	PF
Output Capacitance	C_{oss}		-	105	-	PF
Reverse Transfer Capacitance	C_{rss}		-	65	-	PF
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V,I_D=-4.2A V_{GS}=-10V,R_{GEN}=6Ω	-	7	-	nS
Turn-on Rise Time	t_r		-	3	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	t_f		-	12	-	nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-4.2A,V_{GS}=-4.5V	-	8.5	-	nC
Gate-Source Charge	Q_{gs}		-	1.8	-	nC
Gate-Drain Charge	Q_{gd}		-	2.7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-4.2A	-	-	-1.2	V

Notes:

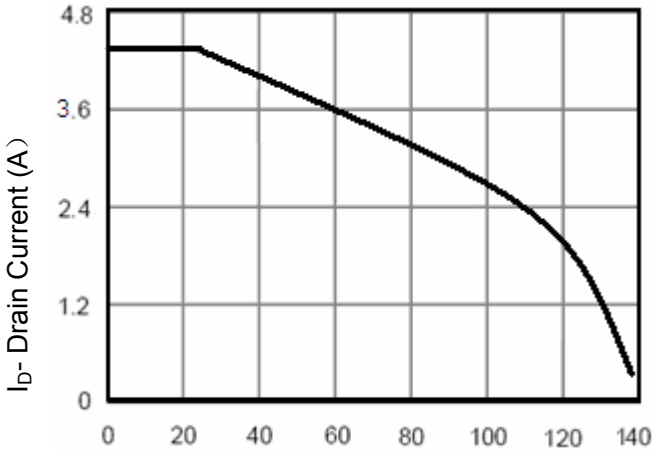
1、Repetitive Rating: Pulse width limited by maximum junction temperature.
2、Surface Mounted on FR4 Board, t ≤ 10 sec.
3、Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4、Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics



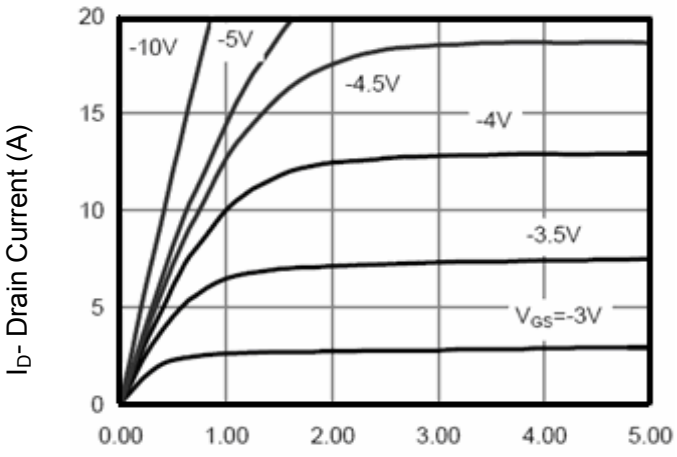
T_J-Junction Temperature(℃)

Figure 1 Power Dissipation



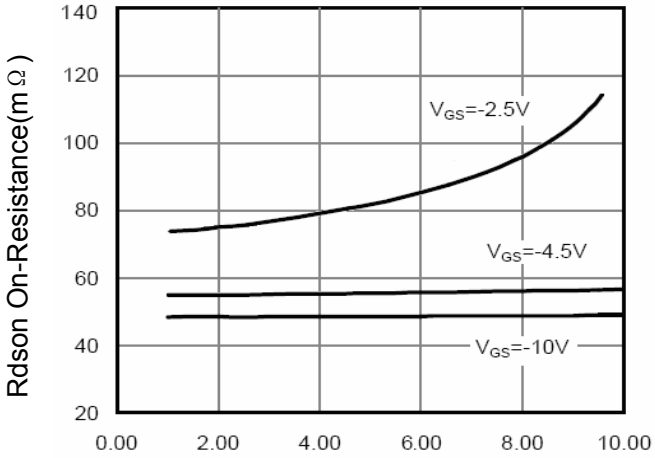
T_J-Junction Temperature(℃)

Figure 2 Drain Current



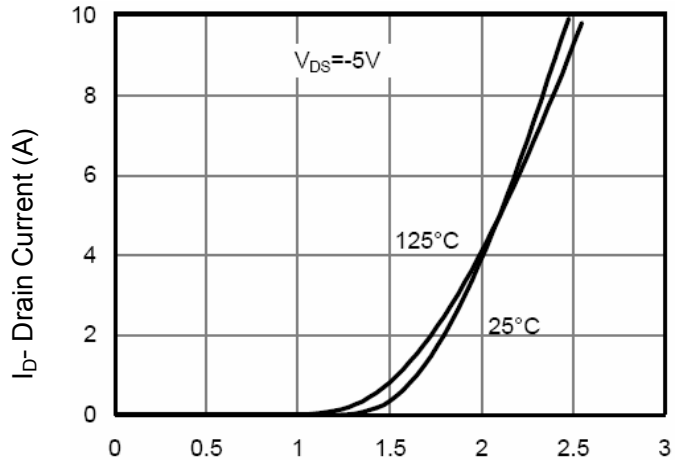
Vds Drain-Source Voltage (V)

Figure 3 Output Characteristics



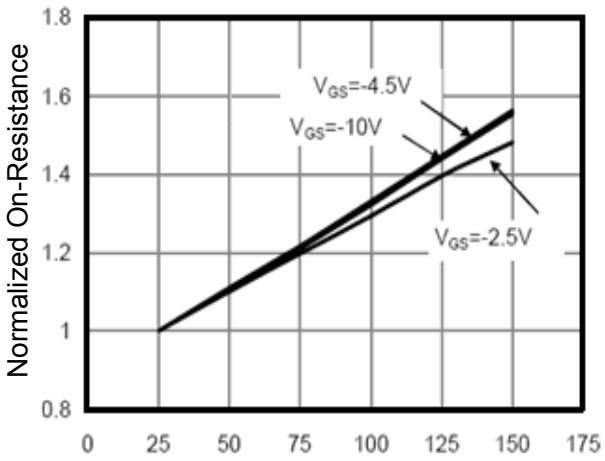
I_D- Drain Current (A)

Figure 4 Drain-Source On-Resistance



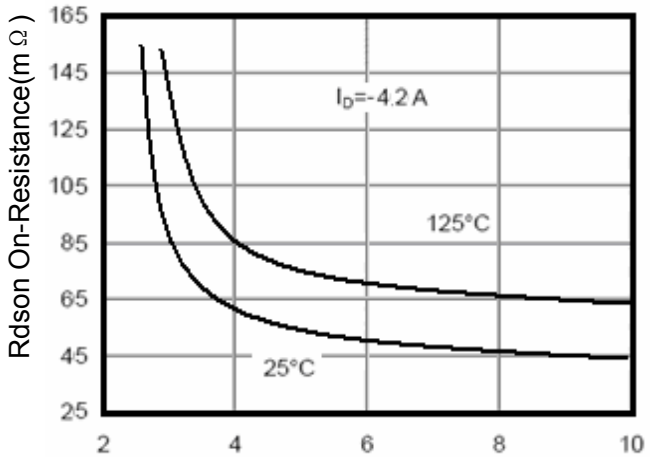
Vgs Gate-Source Voltage (V)

Figure 5 Transfer Characteristics



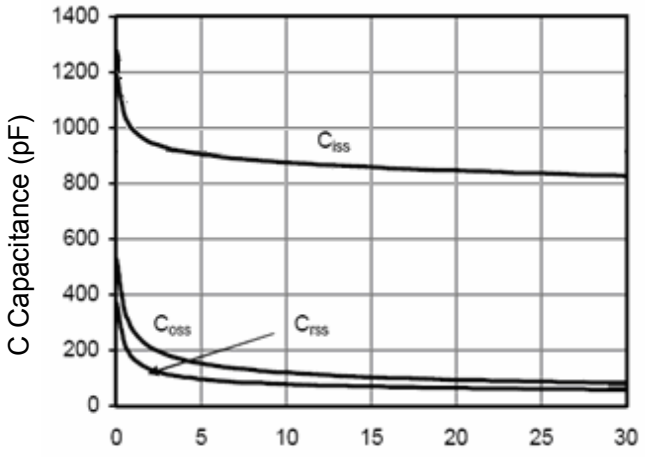
T_J-Junction Temperature(℃)

Figure 6 Drain-Source On-Resistance



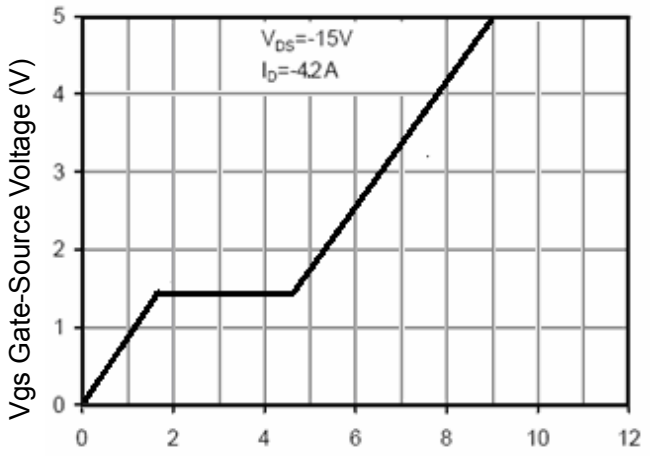
Vgs Gate-Source Voltage (V)

Figure 7 Rdson vs Vgs



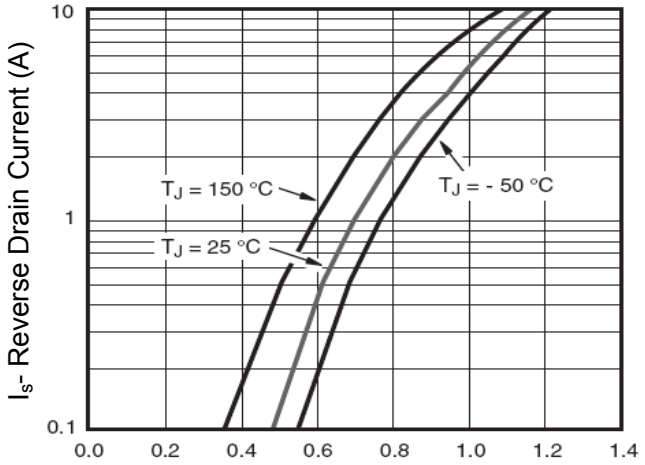
Vds Drain-Source Voltage (V)

Figure 8 Capacitance vs Vds



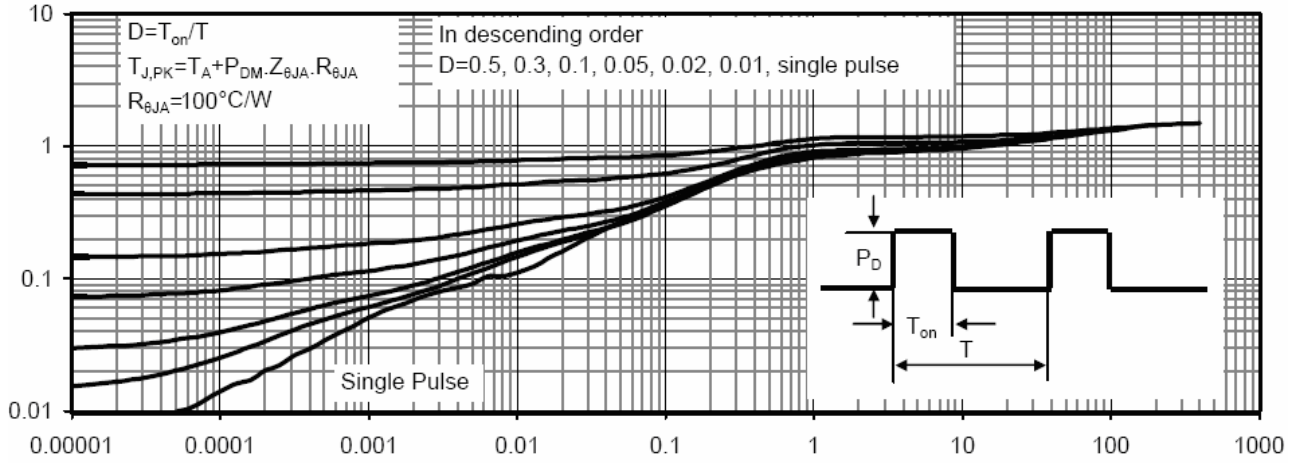
Qg Gate Charge (nC)

Figure 9 Gate Charge



Vsd Source-Drain Voltage (V)

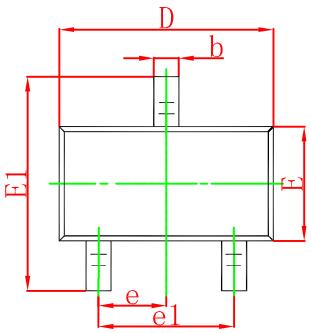
Figure 10 Source- Drain Diode Forward

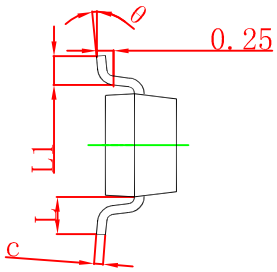


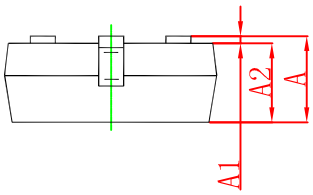
Square Wave Pluse Duration(sec)

Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23 Package Outline Dimensions

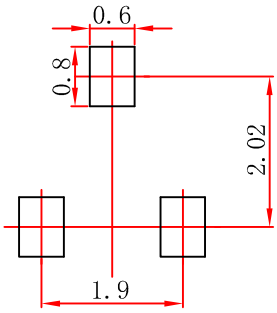






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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