



Description

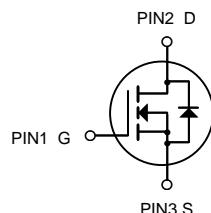
The HSI8810TP uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

$V_{DS} = 20V, I_D = 7A$
 $R_{DS(ON)} < 17m\Omega$ @ $V_{GS}=4.5V$
 $R_{DS(ON)} < 25m\Omega$ @ $V_{GS}=2.5V$

SOT-23



N-Channel MOSFET

Application

High power and current handing capability
Lead free product is acquired
Surface mount package
PWM applications

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HSI8810TP	SOT-23	2320	3000PCS

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current-Continuous	7	A
I_{DM}	Drain Current-Pulsed ^(Note 1)	32	A
P_D	Maximum Power Dissipation	2	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ^(Note 2)	120	°C/W



Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristics						
$V_{(\text{BR})\text{DSS}}$	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}$, $I_D=250\mu\text{A}$	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{\text{DS}}=20\text{V}$, $V_{\text{GS}}=0\text{V}$,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{\text{DS}}=0\text{V}$, $V_{\text{GS}}=\pm 12\text{V}$	-	-	± 100	nA
On Characteristics						
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}$, $I_D=250\mu\text{A}$	0.5	0.75	1.2	V
$R_{\text{DS}(\text{on})}$ note2	Static Drain-Source on-Resistance	$V_{\text{GS}}=4.5\text{V}$, $I_D=7\text{A}$	-	15	17	$\text{m}\Omega$
		$V_{\text{GS}}=2.5\text{V}$, $I_D=5\text{A}$	-	19	25	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{\text{DS}}=10\text{V}$, $V_{\text{GS}}=0\text{V}$, $f=1.0\text{MHz}$	-	700	-	pF
C_{oss}	Output Capacitance		-	132	-	pF
C_{rss}	Reverse Transfer Capacitance		-	114	-	pF
Q_g	Total Gate Charge	$V_{\text{DS}}=10\text{V}$, $I_D=4\text{A}$, $V_{\text{GS}}=4.5\text{V}$	-	15	-	nC
Q_{gs}	Gate-Source Charge		-	2	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	5.2	-	nC
Switching Characteristics						
$t_{\text{d}(\text{on})}$	Turn-on Delay Time	$V_{\text{DS}}=10\text{V}$, $I_D=4\text{A}$, $R_{\text{GEN}}=3\Omega$, $V_{\text{GS}}=4.5\text{V}$	-	9	-	ns
t_r	Turn-on Rise Time		-	25	-	ns
$t_{\text{d}(\text{off})}$	Turn-off Delay Time		-	37	-	ns
t_f	Turn-off Fall Time		-	14	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_s	Maximum Continuous Drain to Source Diode Forward Current		-	-	7.5	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	32	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{\text{GS}}=0\text{V}$, $I_s=8\text{A}$	-	-	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$



Typical Performance Characteristics

Figure 1: Output Characteristics

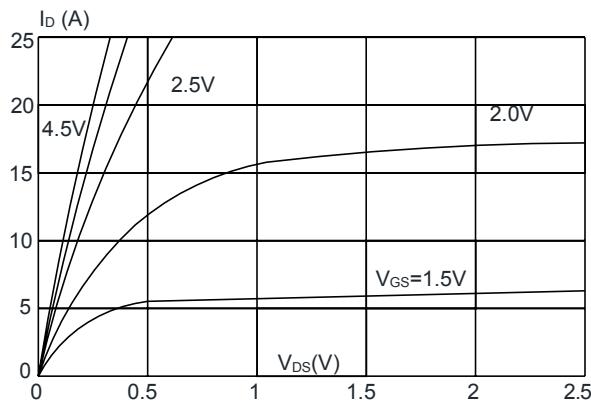


Figure 3: On-resistance vs. Drain Current

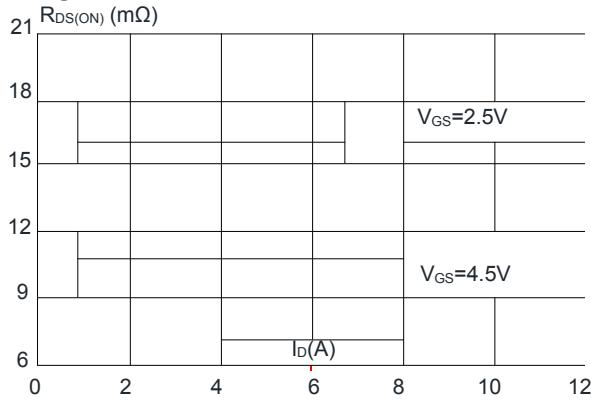


Figure 5: Gate Charge Characteristics

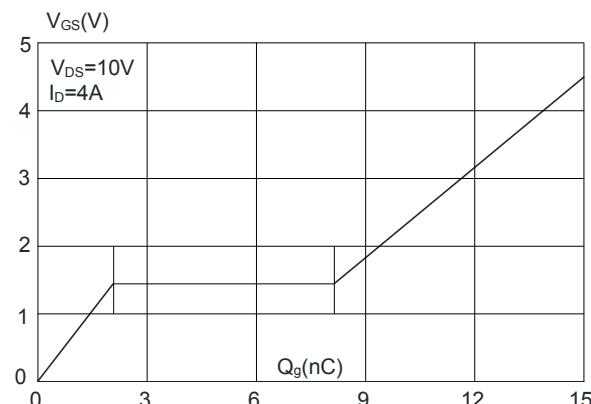


Figure 2: Typical Transfer Characteristics

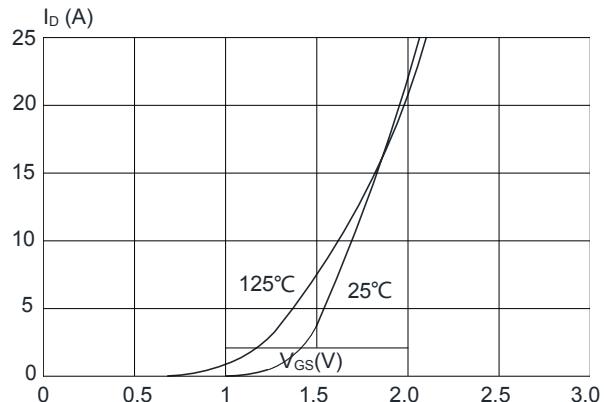


Figure 4: Body Diode Characteristics

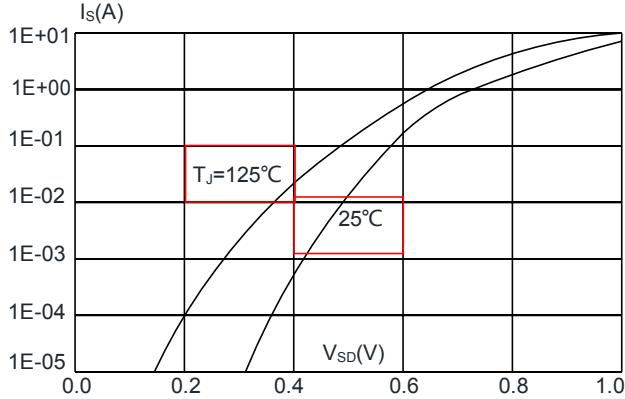


Figure 6: Capacitance Characteristics

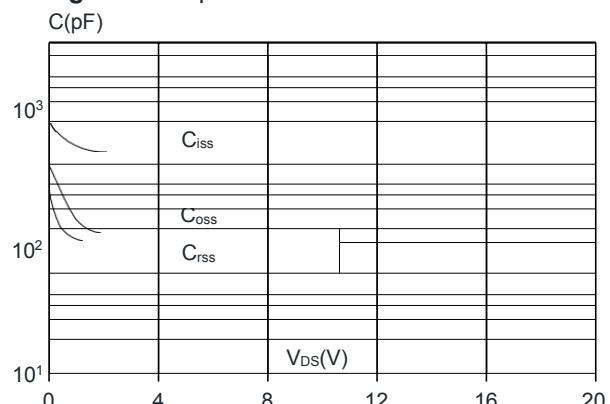




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

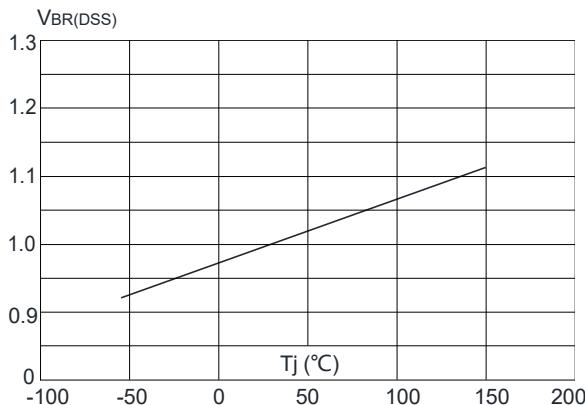


Figure 8: Normalized on Resistance vs. Junction Temperature

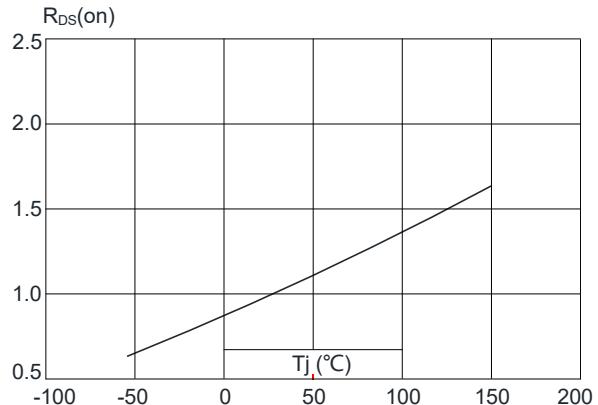


Figure 9: Maximum Safe Operating Area

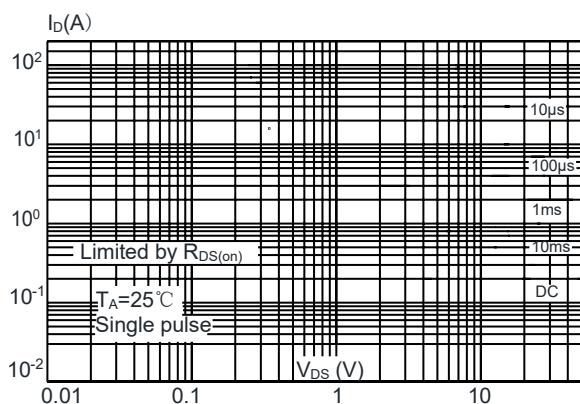


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

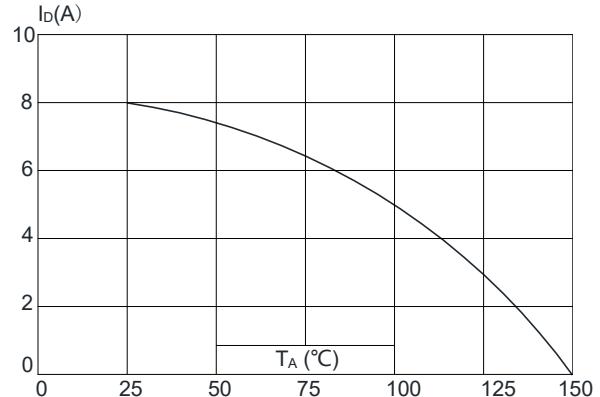
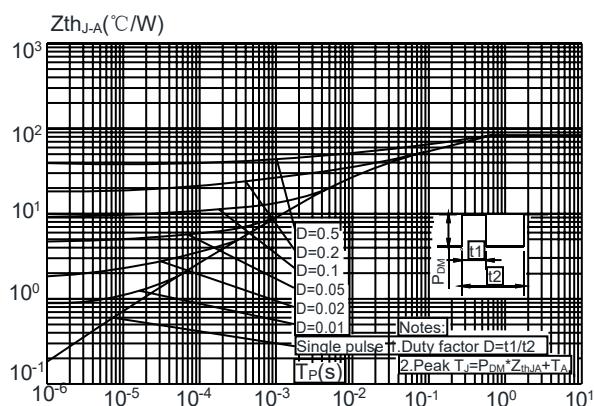
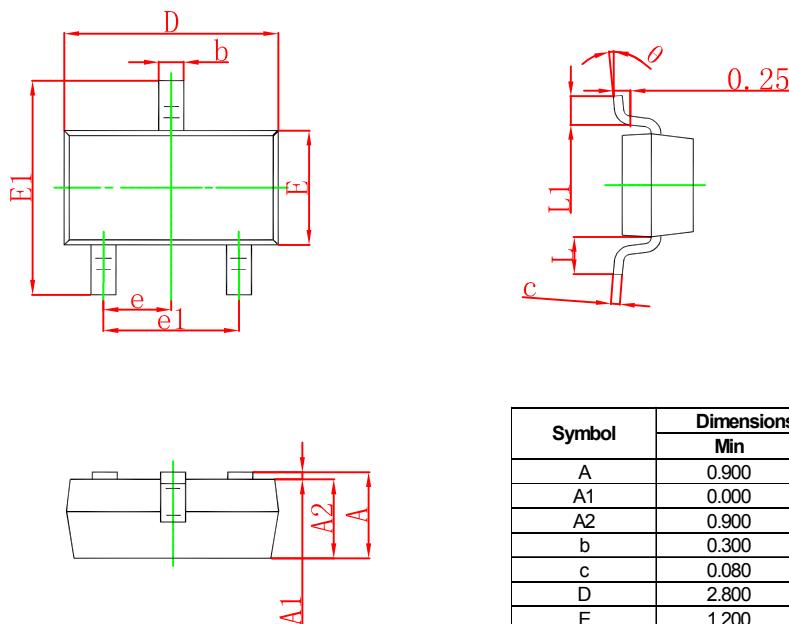


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



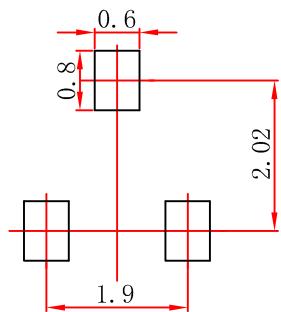


SOT-23 Package Outline Dimensions



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: ± 0.05 mm.
3. The pad layout is for reference purposes only.



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