



## Description

The HSI2343CDST1GE3 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.



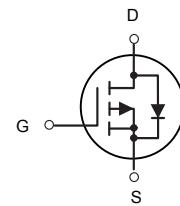
SOT-23

## General Features

$V_{DS} = -30V, I_D = -4.1A$   
 $R_{DS(ON)} < 56m\Omega @ V_{GS}=10V$

## Application

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



P-Channel MOSFET

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HSI2343CDST1GE3	SOT-23	3407 XXXX	3000PCS

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

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current-Continuous	-4.1	A
$I_{DM}$	Drain Current-Pulsed (Note 1)	-13	A
$P_D$	Maximum Power Dissipation	1.32	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)	125	°C/W



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{I}_{\text{D}}=-250\text{uA}$	-30	---	---	V
$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	$\text{BV}_{\text{DSS}}$ Temperature Coefficient	Reference to $25^\circ\text{C}$ , $\text{I}_{\text{D}}=-1\text{mA}$	---	-0.02	---	$\text{V}/^\circ\text{C}$
$\text{R}_{\text{DS}(\text{ON})}$	Static Drain-Source On-Resistance <sup>2</sup>	$\text{V}_{\text{GS}}=-10\text{V}$ , $\text{I}_{\text{D}}=-3\text{A}$	---	48	56	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=-4.5\text{V}$ , $\text{I}_{\text{D}}=-1.5\text{A}$	---	78	90	
$\text{V}_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}$ , $\text{I}_{\text{D}}=-250\text{uA}$	-1.2	-1.5	-2.5	V
$\Delta \text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}(\text{th})}$ Temperature Coefficient		---	4.32	---	$\text{mV}/^\circ\text{C}$
$\text{I}_{\text{DSS}}$	Drain-Source Leakage Current	$\text{V}_{\text{DS}}=-24\text{V}$ , $\text{V}_{\text{GS}}=0\text{V}$ , $T_J=25^\circ\text{C}$	---	---	-1	$\text{uA}$
		$\text{V}_{\text{DS}}=-24\text{V}$ , $\text{V}_{\text{GS}}=0\text{V}$ , $T_J=55^\circ\text{C}$	---	---	-5	
$\text{I}_{\text{GSS}}$	Gate-Source Leakage Current	$\text{V}_{\text{GS}}=\pm 20\text{V}$ , $\text{V}_{\text{DS}}=0\text{V}$	---	---	$\pm 100$	nA
$\text{g}_{\text{fs}}$	Forward Transconductance	$\text{V}_{\text{DS}}=-5\text{V}$ , $\text{I}_{\text{D}}=-3\text{A}$	---	4.8	---	S
$\text{R}_{\text{g}}$	Gate Resistance	$\text{V}_{\text{DS}}=0\text{V}$ , $\text{V}_{\text{GS}}=0\text{V}$ , $f=1\text{MHz}$	---	24	48	$\Omega$
$\text{Q}_{\text{g}}$	Total Gate Charge (-4.5V)	$\text{V}_{\text{DS}}=-20\text{V}$ , $\text{V}_{\text{GS}}=-4.5\text{V}$ , $\text{I}_{\text{D}}=-3\text{A}$	---	5.22	7.3	$\text{nC}$
$\text{Q}_{\text{gs}}$	Gate-Source Charge		---	1.25	1.8	
$\text{Q}_{\text{gd}}$	Gate-Drain Charge		---	2.3	3.2	
$\text{T}_{\text{d}(\text{on})}$	Turn-On Delay Time	$\text{V}_{\text{DD}}=-15\text{V}$ , $\text{V}_{\text{GS}}=-10\text{V}$ , $\text{R}_{\text{G}}=3.3\Omega$ $\text{I}_{\text{D}}=-1\text{A}$	---	18.4	37	$\text{ns}$
$\text{T}_{\text{r}}$	Rise Time		---	11.4	21	
$\text{T}_{\text{d}(\text{off})}$	Turn-Off Delay Time		---	39.4	79	
$\text{T}_{\text{f}}$	Fall Time		---	5.2	10.4	
$\text{C}_{\text{iss}}$	Input Capacitance	$\text{V}_{\text{DS}}=-15\text{V}$ , $\text{V}_{\text{GS}}=0\text{V}$ , $f=1\text{MHz}$	---	463	650	$\text{pF}$
$\text{C}_{\text{oss}}$	Output Capacitance		---	82	115	
$\text{C}_{\text{rss}}$	Reverse Transfer Capacitance		---	68	95	
$\text{I}_{\text{s}}$	Continuous Source Current <sup>1,4</sup>	$\text{V}_{\text{G}}=\text{V}_{\text{D}}=0\text{V}$ , Force Current	---	---	-3.2	A
$\text{I}_{\text{SM}}$	Pulsed Source Current <sup>2,4</sup>		---	---	-13	A
$\text{V}_{\text{SD}}$	Diode Forward Voltage <sup>2</sup>	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{I}_{\text{s}}=-1\text{A}$ , $T_J=25^\circ\text{C}$	---	---	-1	V

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\text{us}$  , duty cycle  $\leq 2\%$
- 3.The power dissipation is limited by  $150^\circ\text{C}$  junction temperature
- 4.The data is theoretically the same as  $\text{I}_{\text{D}}$  and  $\text{I}_{\text{DM}}$  , in real applications , should be limited by total power dissipation.



## Typical Characteristics

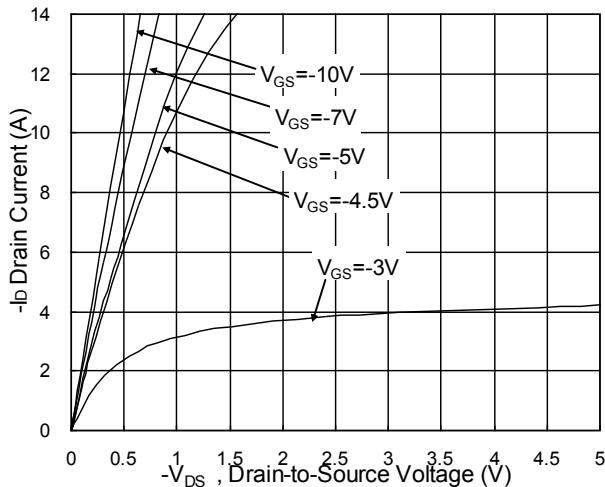


Fig.1 Typical Output Characteristics

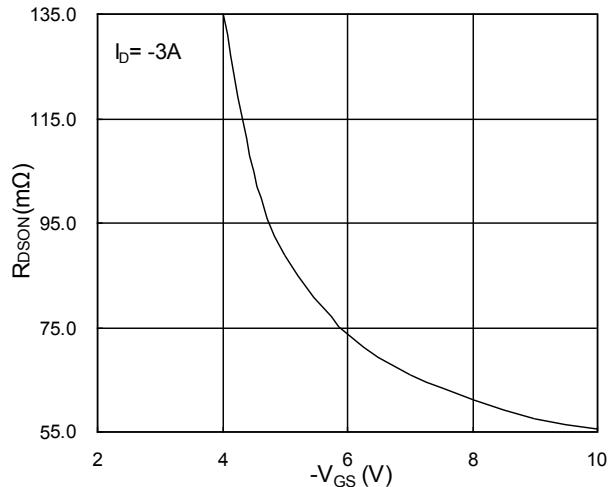


Fig.2 On-Resistance vs. G-S Voltage

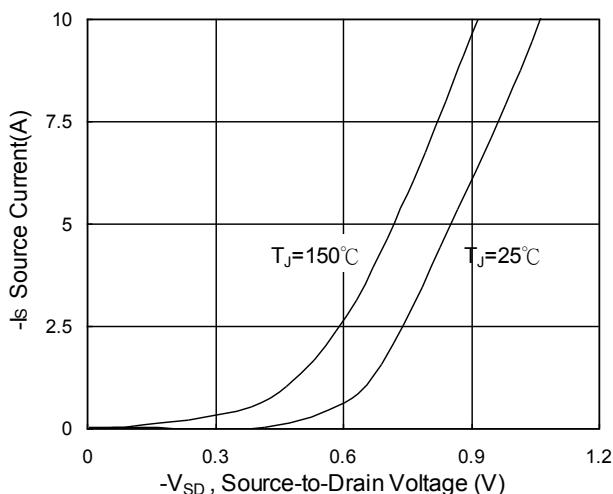


Fig.3 Source Drain Forward Characteristics

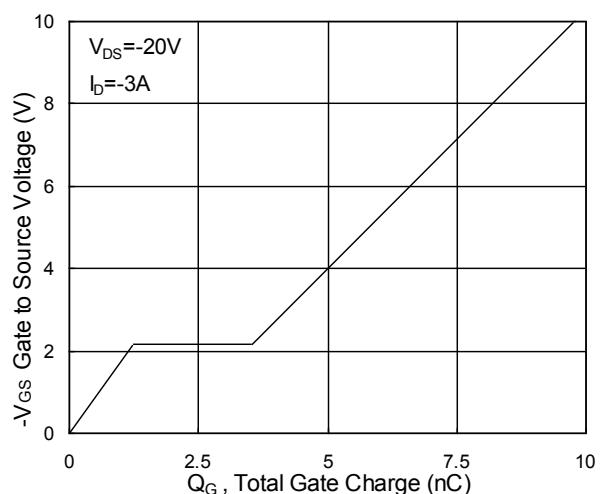


Fig.4 Gate-Charge Characteristics

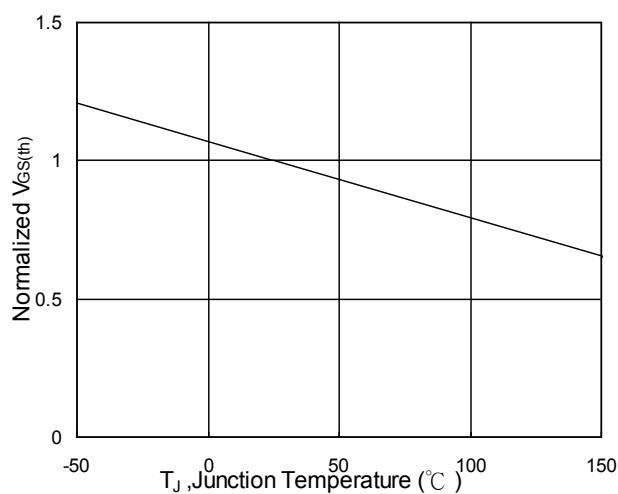


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

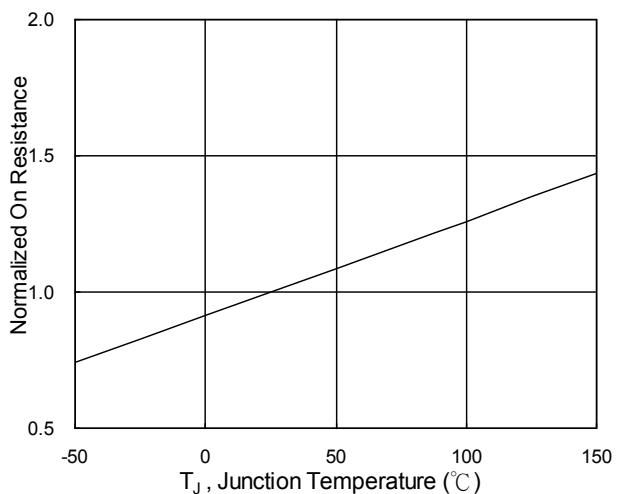


Fig.6 Normalized  $R_{DSON}$  vs.  $T_J$

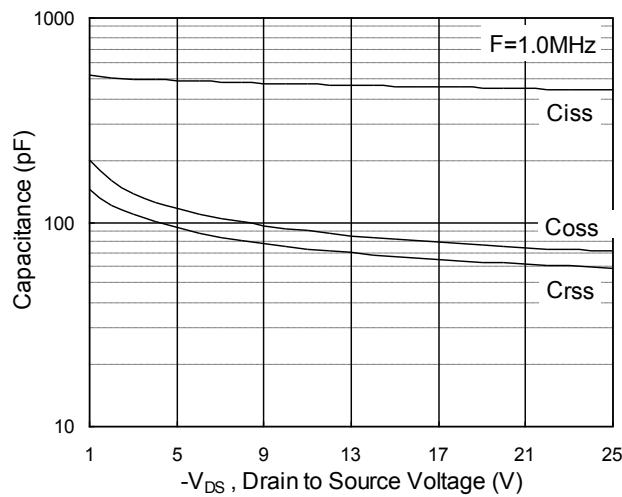


Fig.7 Capacitance

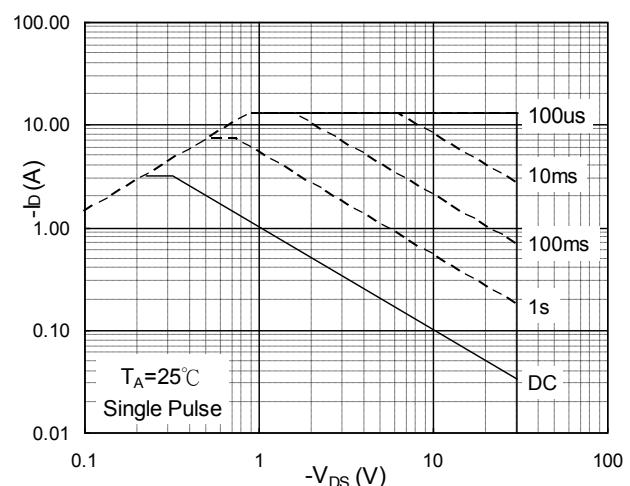


Fig.8 Safe Operating Area

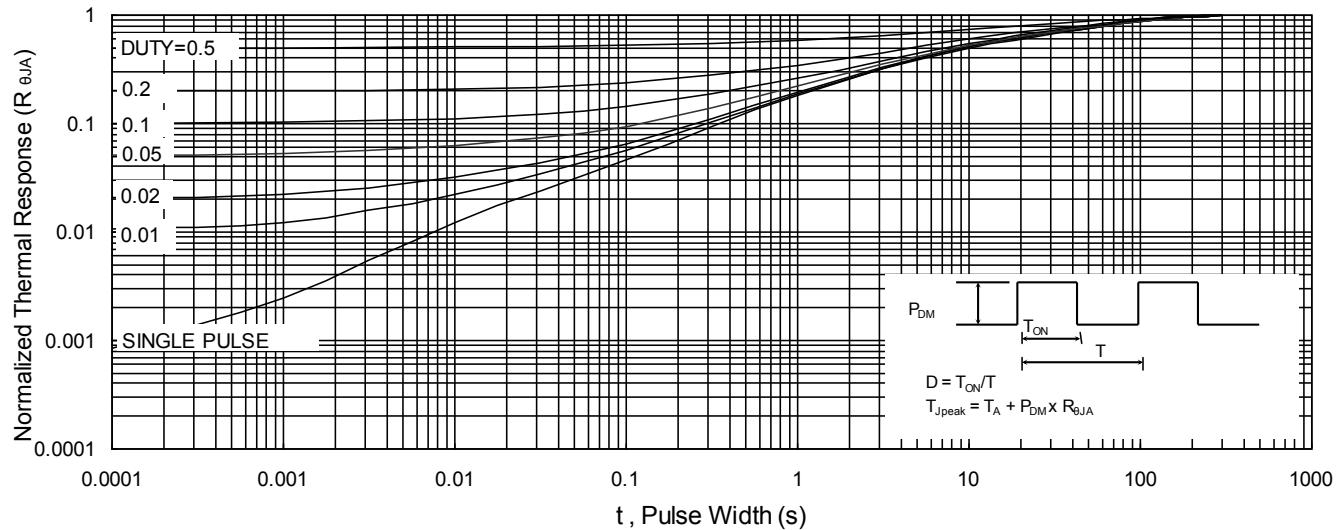


Fig.9 Normalized Maximum Transient Thermal Impedance

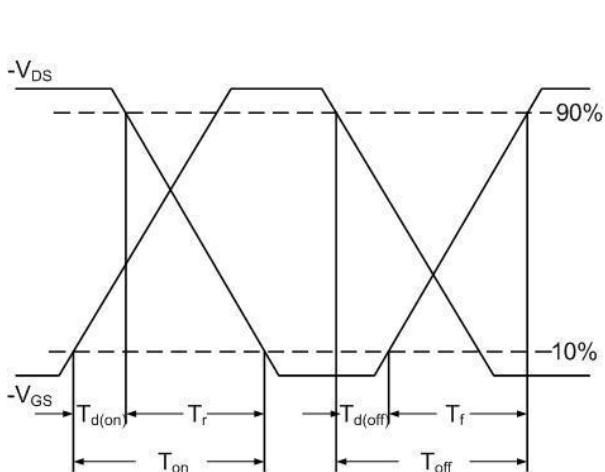


Fig.10 Switching Time Waveform

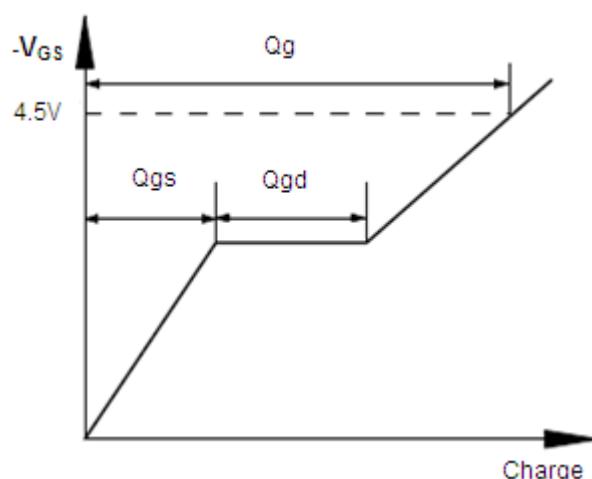
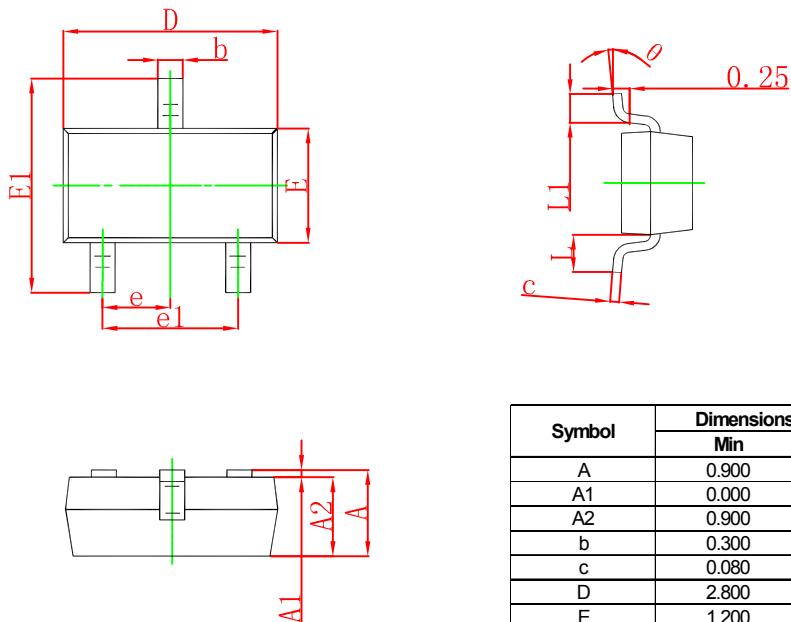


Fig.11 Gate Charge Waveform

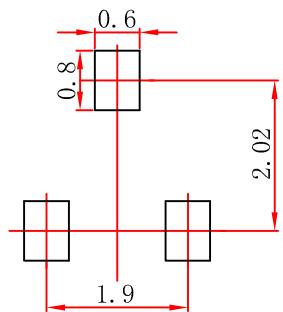


### SOT-23 Package Outline Dimensions



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:  $\pm 0.05$ mm.  
3. The pad layout is for reference purposes only.



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