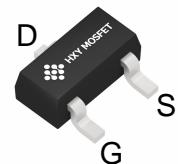




Description

The HXY2301CI 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

$V_{DS} = -20V$ $I_D = -2.5A$

$R_{DS(ON)} < 125m\Omega$ @ $V_{GS} = -4.5V$

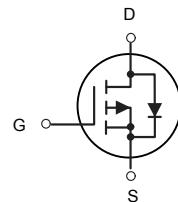
$R_{DS(ON)} < 190m\Omega$ @ $V_{GS} = -2.5V$

Application

Battery protection

Load switch

Uninterruptible power supply



P-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXY2301CI	SOT-23	A1SHB	3000

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	-2.5	A
I_{DM}	Drain Current-Pulsed	-8	A
P_D	Maximum Power Dissipation	0.8	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	156	$^\circ C/W$



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(\text{BR})\text{DSS}}$	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}, I_{\text{D}}= -250\mu\text{A}$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{\text{DS}} = -20\text{V}, V_{\text{GS}} = 0\text{V},$	-	-	-1	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	$V_{\text{DS}}= V_{\text{GS}}, I_{\text{D}}= -250\mu\text{A}$	-0.4	-0.7	-1.0	V
$R_{\text{DS}(\text{on})}$ note2	Static Drain-Source on-Resistance	$V_{\text{GS}} = -4.5\text{V}, I_{\text{D}} = -2\text{A}$	-	95	125	$\text{m}\Omega$
		$V_{\text{GS}} = -2.5\text{V}, I_{\text{D}} = -1\text{A}$	-	135	190	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{\text{DS}} = -10\text{V}, V_{\text{GS}} = 0\text{V},$ $f = 1.0\text{MHz}$	-	185	-	pF
C_{oss}	Output Capacitance		-	35	-	pF
C_{rss}	Reverse Transfer Capacitance		-	25	-	pF
Q_{g}	Total Gate Charge	$V_{\text{DS}} = -10\text{V}, I_{\text{D}} = -2\text{A},$ $V_{\text{GS}} = -4.5\text{V}$	-	2.2	-	nC
Q_{gs}	Gate-Source Charge		-	0.5	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	0.5	-	nC
Switching Characteristics						
$t_{\text{d}(\text{on})}$	Turn-on Delay Time	$V_{\text{DD}} = -10\text{V}, R_{\text{L}}=5\Omega,$ $R_{\text{GEN}}=3\Omega, V_{\text{GS}}=-4.5\text{V},$	-	10	-	ns
t_{r}	Turn-on Rise Time		-	30	-	ns
$t_{\text{d}(\text{off})}$	Turn-off Delay Time		-	63	-	ns
t_{f}	Turn-off Fall Time		-	50	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_{s}	Maximum Continuous Drain to Source Diode Forward Current	-	-	-2	-	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current	-	-	-8	-	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{\text{GS}} = 0\text{V}, I_{\text{s}} = -2\text{A}$	-	-	-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 $\leq 2\%$



Typical Performance Characteristics

Figure 1: Output Characteristics

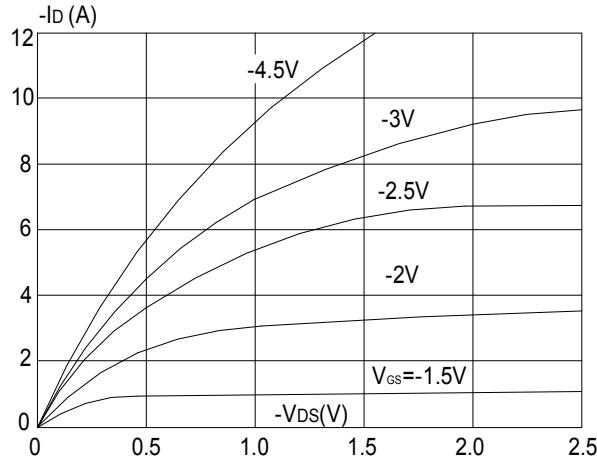


Figure 2: Typical Transfer Characteristics

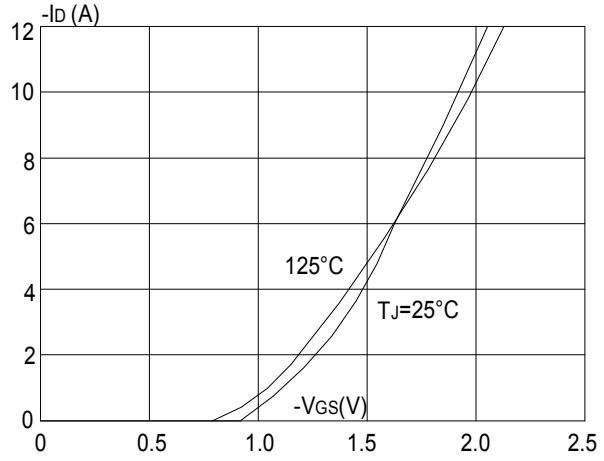


Figure 3: On-resistance vs. Drain Current

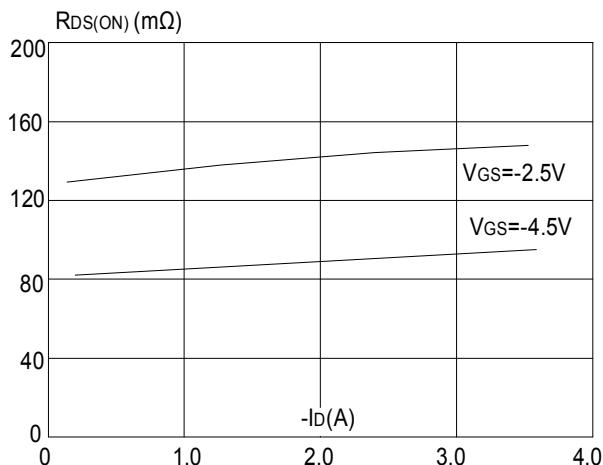


Figure 4: Body Diode Characteristics

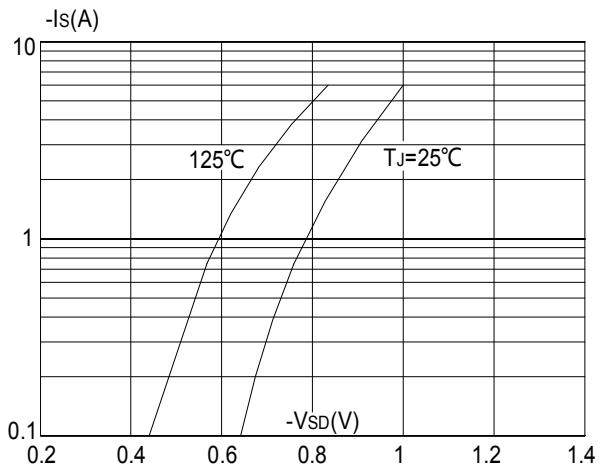


Figure 5: Gate Charge Characteristics

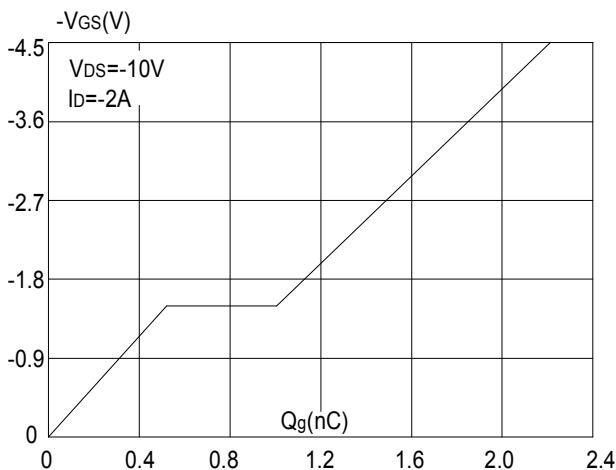


Figure 6: Capacitance Characteristics

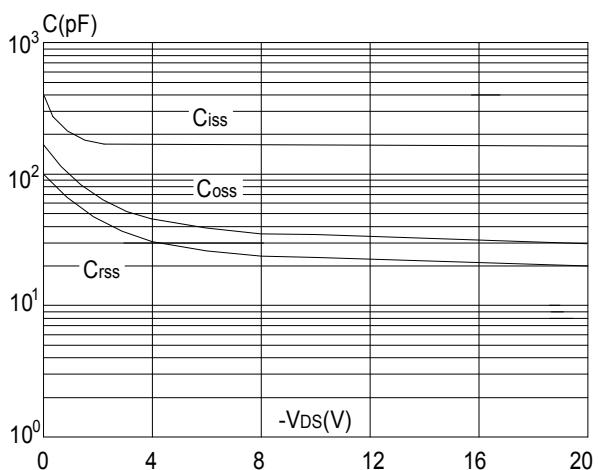




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

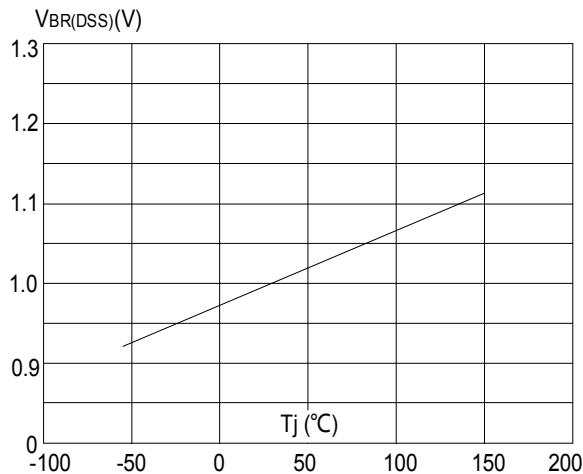


Figure 8: Normalized on Resistance vs. Junction Temperature

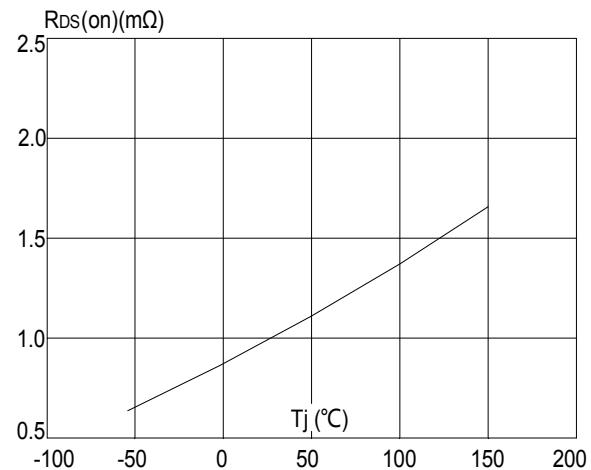


Figure 9: Maximum Safe Operating Area

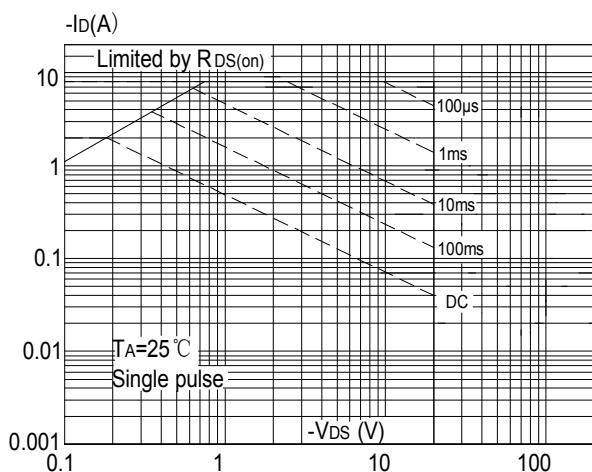


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

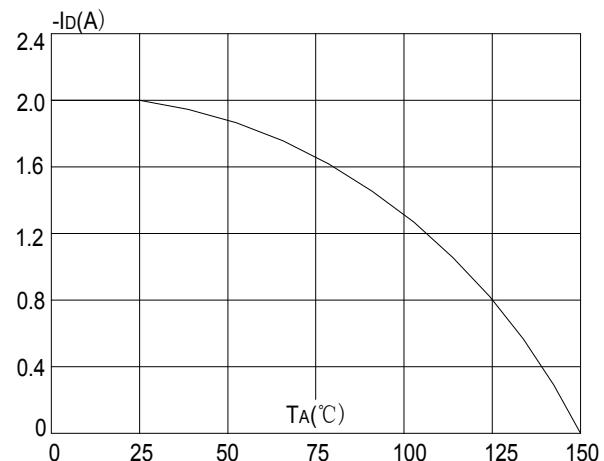
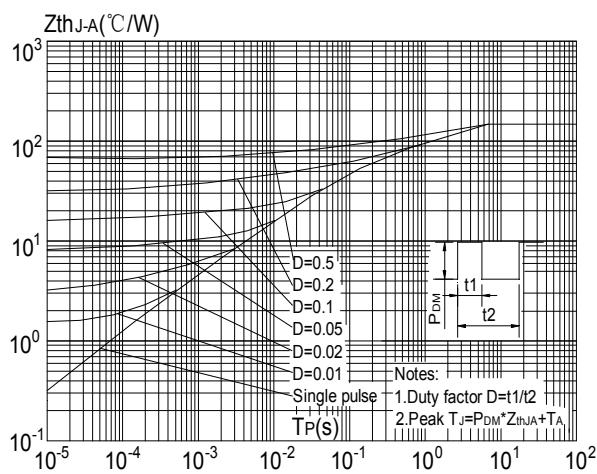
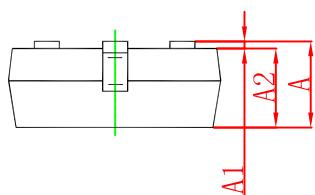
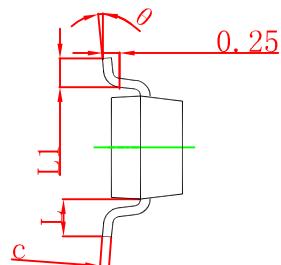
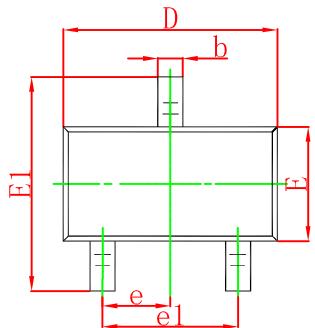


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



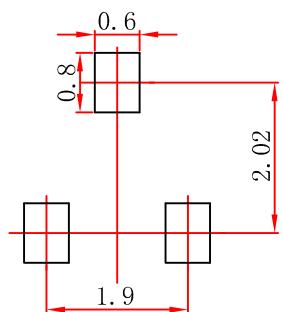


SOT-23 Package Outline Dimensions



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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