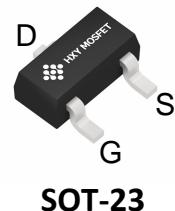


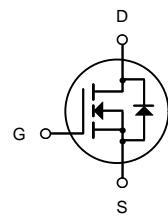


Description

The HXY2302I-C 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



N-Channel MOSFET

General Features

$V_{DS} = 20V$ $I_D = 2.8A$

$R_{DS(ON)} < 55m\Omega$ @ $V_{GS}=4.5V$

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXY2302I-C	SOT-23	A2SHB XXXYYYY	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	2.8	A
I_{DM}	Drain Current-Pulsed (Note 1)	12	A
P_D	Maximum Power Dissipation	0.9	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient (Note 2)	139	$^\circ C/W$



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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_{\text{D}}=250\mu\text{A}$	20	22	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$\text{V}_{\text{DS}}=20\text{V}, \text{V}_{\text{GS}}=0\text{V}$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$\text{V}_{\text{GS}}=\pm 12\text{V}, \text{V}_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{DS}}=\text{V}_{\text{GS}}, \text{I}_{\text{D}}=250\mu\text{A}$	0.5	0.75	1.2	V
Drain-Source On-State Resistance	$\text{R}_{\text{DS}(\text{ON})}$	$\text{V}_{\text{GS}}=2.5\text{V}, \text{I}_{\text{D}}=2\text{A}$	-	62	73	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}, \text{I}_{\text{D}}=2.8\text{A}$	-	43	55	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$\text{V}_{\text{DS}}=5\text{V}, \text{I}_{\text{D}}=3\text{A}$	-	8	-	S
Input Capacitance	C_{iss}	$\text{V}_{\text{DS}}=10\text{V}, \text{V}_{\text{GS}}=0\text{V},$ $F=1.0\text{MHz}$	-	260	-	PF
Output Capacitance	C_{oss}		-	48	-	PF
Reverse Transfer Capacitance	C_{rss}		-	27	-	PF
Turn-on Delay Time	$\text{t}_{\text{d}(\text{on})}$	$\text{V}_{\text{DD}}=10\text{V}, \text{R}_{\text{L}}=3.3\Omega$ $\text{V}_{\text{GS}}=4.5\text{V}, \text{R}_{\text{GEN}}=6\Omega$	-	2.5	-	nS
Turn-on Rise Time	t_{r}		-	3.2	-	nS
Turn-Off Delay Time	$\text{t}_{\text{d}(\text{off})}$		-	21	-	nS
Turn-Off Fall Time	t_{f}		-	3	-	nS
Total Gate Charge	Q_{g}	$\text{V}_{\text{DS}}=10\text{V}, \text{I}_{\text{D}}=3\text{A},$ $\text{V}_{\text{GS}}=4.5\text{V}$	-	2.9	5	nC
Gate-Source Charge	Q_{gs}		-	0.4	-	nC
Gate-Drain Charge	Q_{gd}		-	0.6	-	nC
Diode Forward Voltage ^(Note 3)	V_{SD}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_{\text{S}}=3.3\text{A}$	-	0.75	1.2	V
Diode Forward Current ^(Note 2)	I_{S}		-	-	3.3	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production



Typical Electrical and Thermal Characteristics

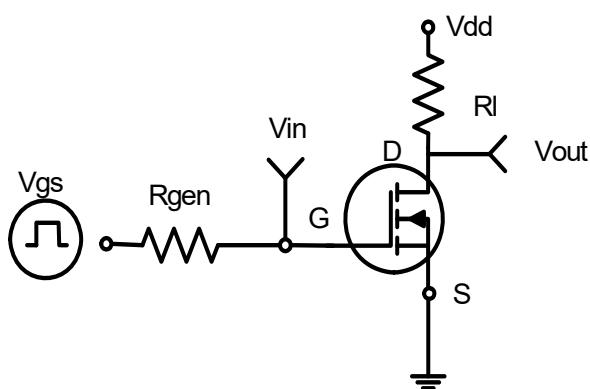


Figure 1:Switching Test Circuit

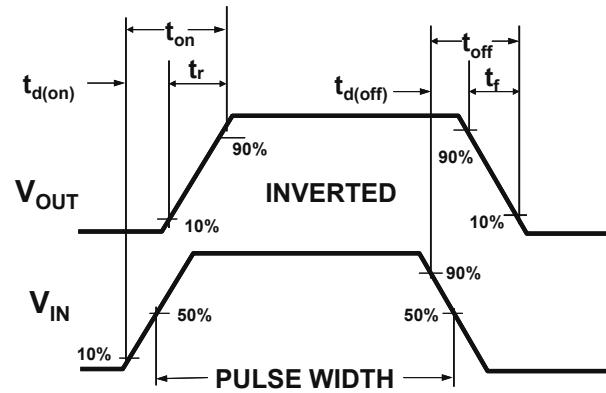


Figure 2:Switching Waveforms

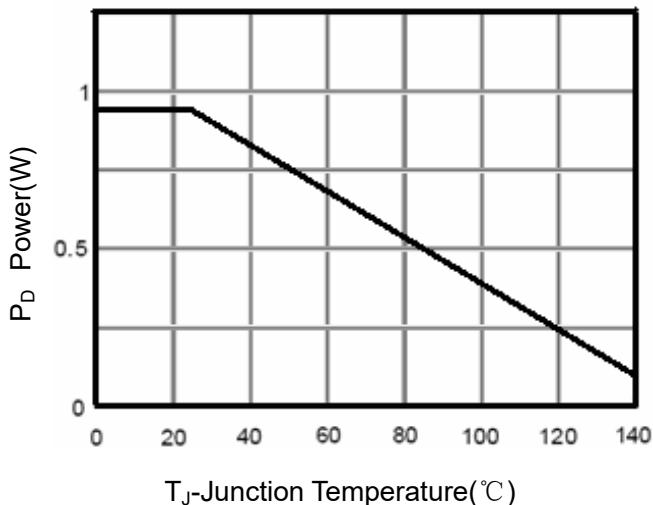


Figure 3 Power Dissipation

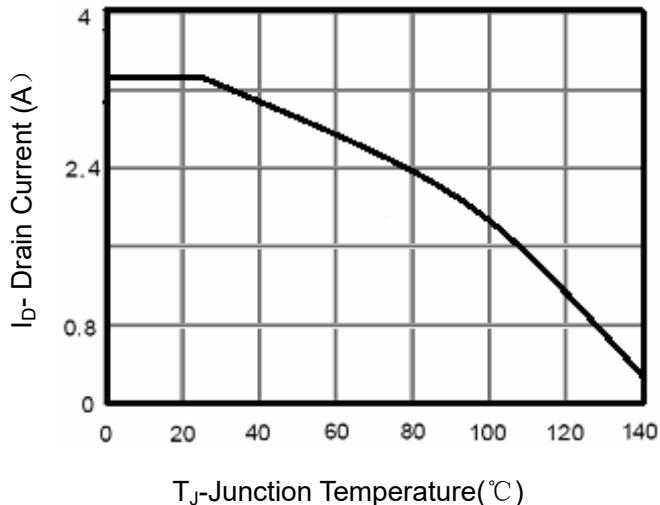


Figure 4 Drain Current

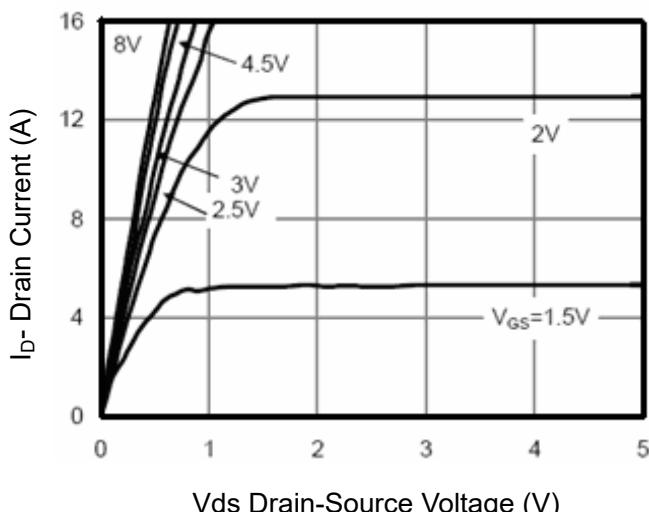


Figure 5 Output Characteristics

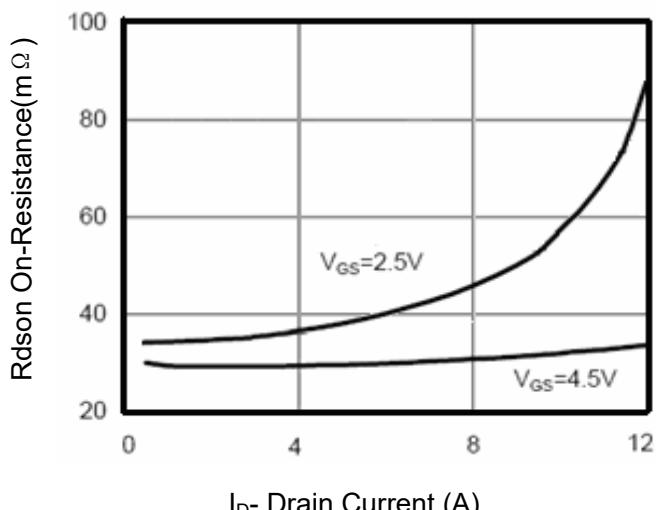


Figure 6 Drain-Source On-Resistance

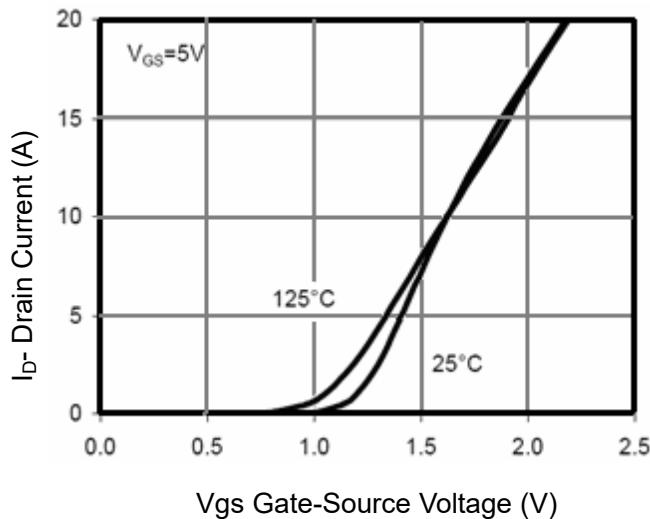


Figure 7 Transfer Characteristics

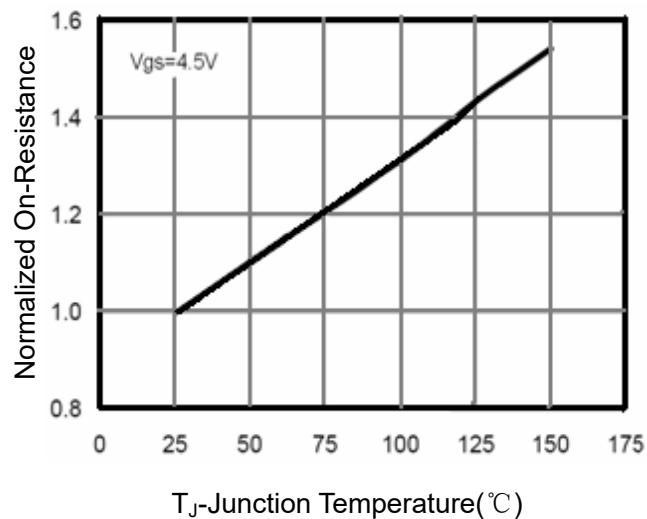


Figure 8 Drain-Source On-Resistance

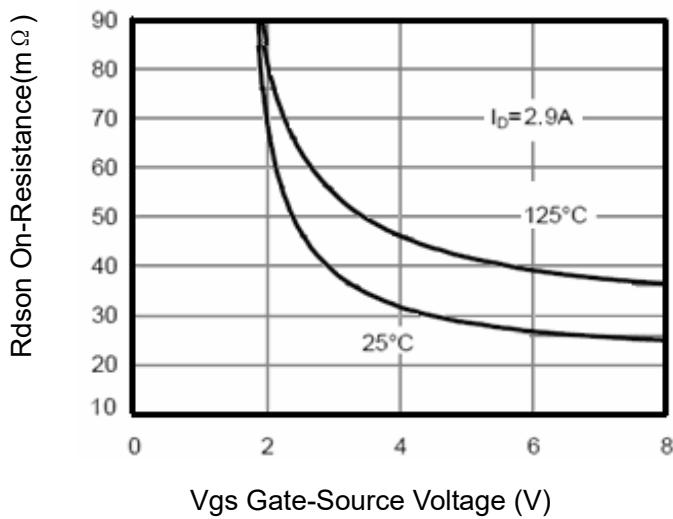


Figure 9 Rdson vs Vgs

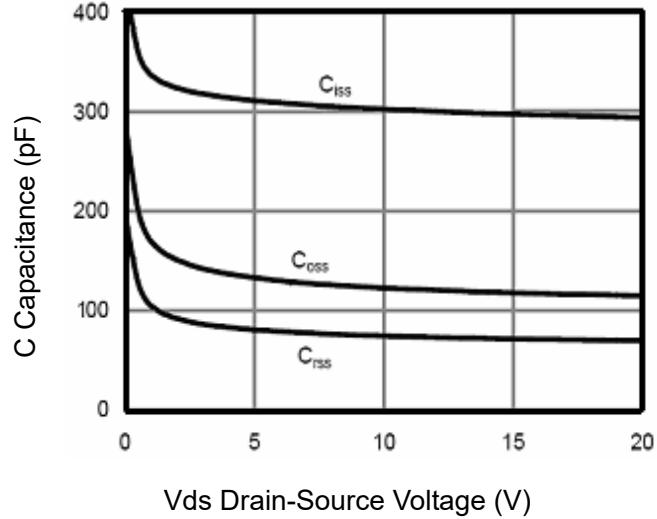


Figure 10 Capacitance vs Vds

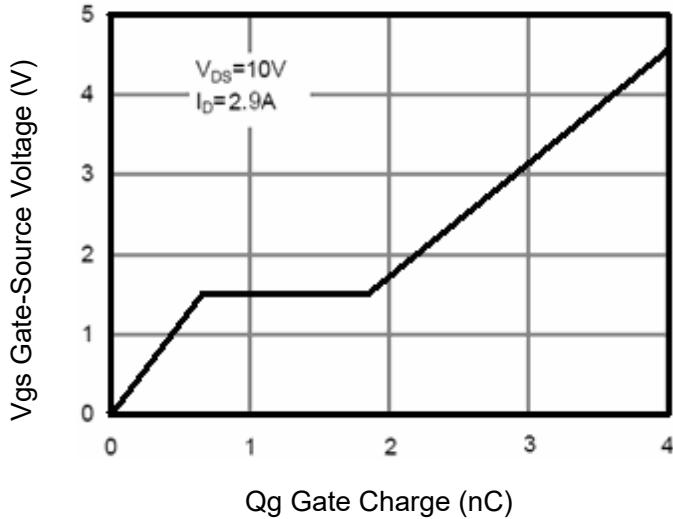


Figure 11 Gate Charge

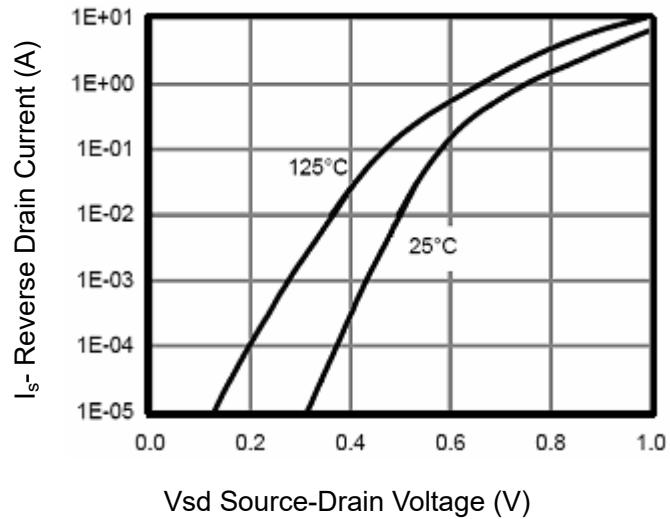
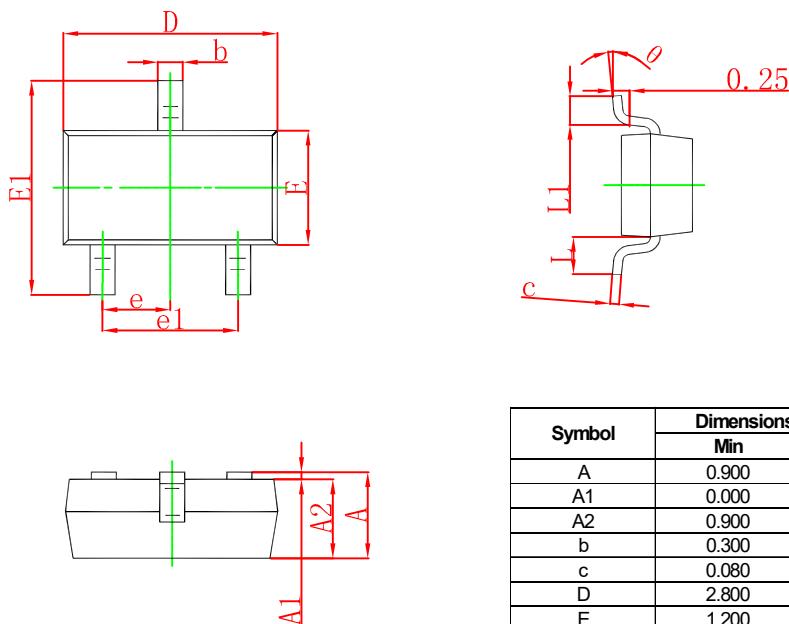


Figure 12 Source- Drain Diode Forward

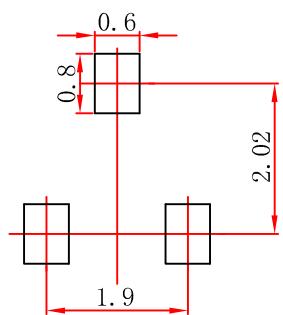


SOT-23 Package Outline Dimensions



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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