



# HX2305A

## P-Channel Enhancement Mode MOSFET

### ● Features

VDS	VGS	RDSon TYP	ID
-12V	±8V	38mR@-4V5 47mR@-2V5 61mR@-1V8	-3.8A

### ● General Description

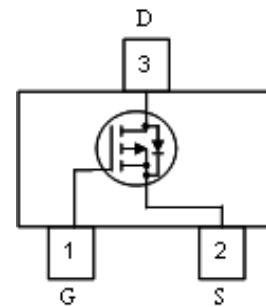
This device is produced with high cell density DMOS trench technology, which is especially used to minimize on-state resistance. This device particularly suits low voltage applications such as portable equipment, power management and other battery powered circuits, and low in-line power dissipation are needed in a very small outline surface mount package. Excellent thermal and electrical capabilities.

### ● Applications

- Load Switch
- Portable Devices
- DCDC conversion

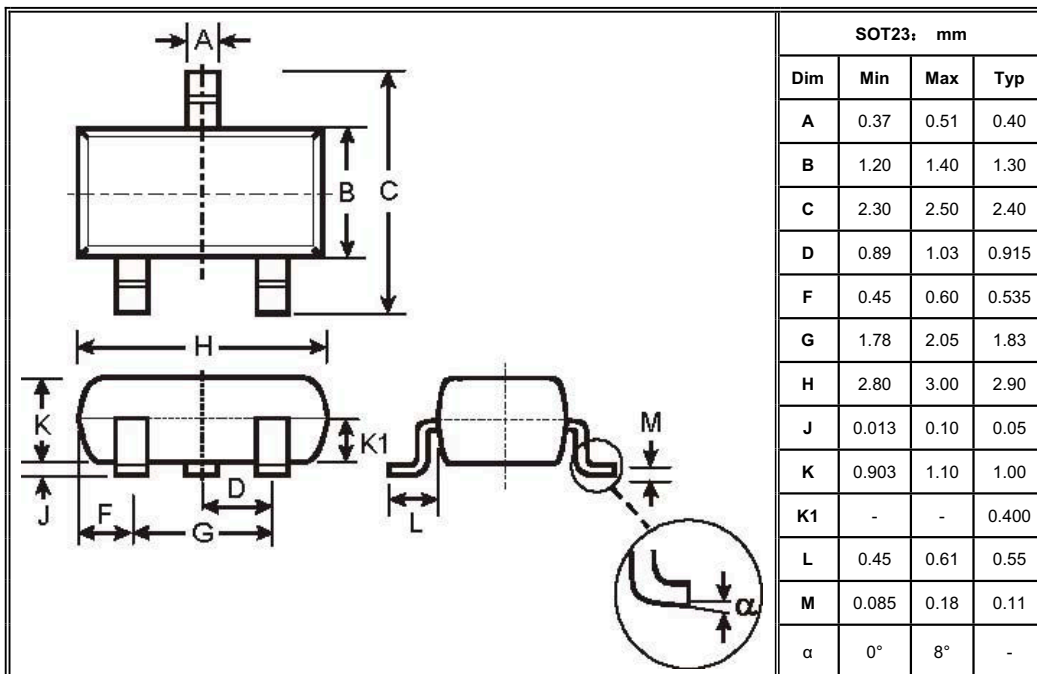
### ● Pin Configuration

Top View



D: Drain; G: Gate; S: Source

### ● Package Information





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● **Absolute Maximum Ratings** @ $T_A=25^{\circ}\text{C}$  unless otherwise noted

Parameter	Symbol	Ratings	Unit	
Drain-Source Voltage	$V_{\text{DSS}}$	-12	V	
Gate-Source Voltage	$V_{\text{GSS}}$	$\pm 8$	V	
Drain Current (Continuous)	$I_{\text{D}}$	-3.8	A	
Drain Current (Pulse)	$I_{\text{DM}}$	-20	A	
Power Dissipation	25 $^{\circ}\text{C}$	$P_{\text{D}25}$	550	mW
	70 $^{\circ}\text{C}$	$P_{\text{D}70}$	350	
Operating Temperature/ Storage Temperature		$T_{\text{J}}/T_{\text{STG}}$	-55~150	$^{\circ}\text{C}$

● **Electrical Characteristics** @ $T_A=25^{\circ}\text{C}$  unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_{\text{D}} = -10\mu\text{A}$	-12	--	--	V
Drain Cut-off Current	$I_{\text{DSS}}$	$V_{\text{DS}} = -12\text{V}, V_{\text{GS}} = 0\text{V}$	--	--	-1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}} = \pm 8\text{V}, V_{\text{DS}} = 0\text{V}$	--	--	$\pm 10$	$\mu\text{A}$
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{\text{GS(th)}}$	$I_{\text{D}} = -250\mu\text{A}, V_{\text{DS}} = V_{\text{GS}}$	-0.45	-0.62	-1.2	V
Drain-Source On-state Resistance	$R_{\text{DS(on)}}$	$V_{\text{GS}} = -4.5\text{V}, I_{\text{D}} = -3.5\text{A}$	--	38	60	mR
		$V_{\text{GS}} = -2.5\text{V}, I_{\text{D}} = -3\text{A}$	--	47	90	mR
		$V_{\text{GS}} = -1.8\text{V}, I_{\text{D}} = -2\text{A}$		61	100	mR
Forward Transconductance	$g_{\text{FS}}$	$V_{\text{DS}} = -5\text{V}, I_{\text{D}} = -3.5\text{A}$	--	9.5	--	S
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}} = -4\text{V}, V_{\text{GS}} = 0\text{V}$ $f = 1\text{MHz}$	--	1060	--	pF
Output Capacitance	$C_{\text{oss}}$		--	273	--	pF
Feedback Capacitance	$C_{\text{rss}}$		--	252	--	pF
<b>SWITCHING CHARACTERISTICS</b>						
Turn-on Delay Time	$t_{\text{d(on)}}$	$V_{\text{DD}} = -6\text{V}, R_{\text{L}} = 6\text{R}, I_{\text{D}} = -1.0\text{A}$	--	13	25	ns
Turn-off Delay Time	$t_{\text{d(off)}}$	$V_{\text{GEN}} = -4.5\text{V}, R_{\text{G}} = 6\text{R}$	--	42	70	ns
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Drain-Source Diode Forward Voltage	$V_{\text{SD}}$	$I_{\text{S}} = -1.6\text{A}, V_{\text{GS}} = 0\text{V}$	-0.5	-0.75	-1.2	V

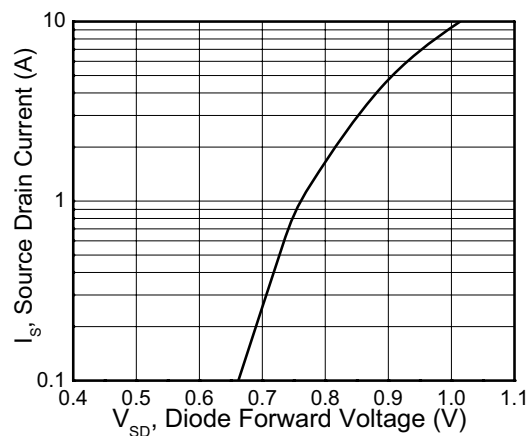
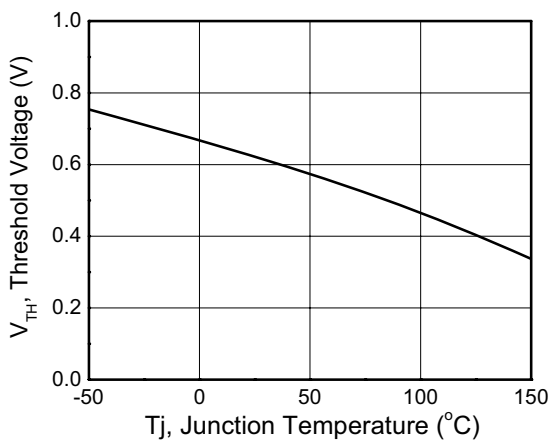
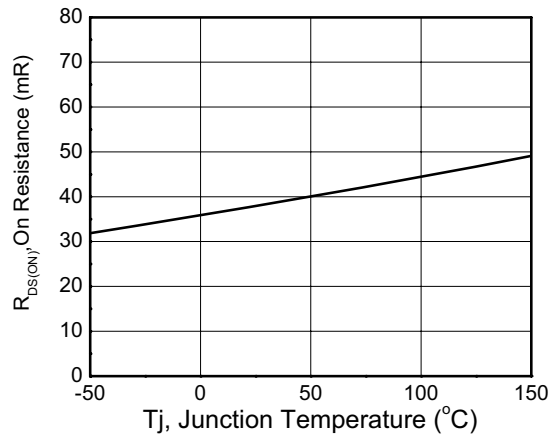
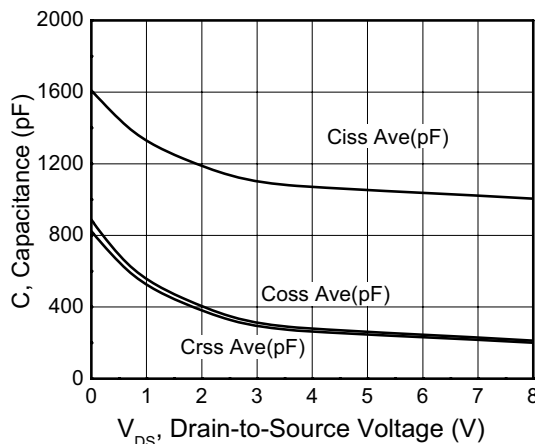
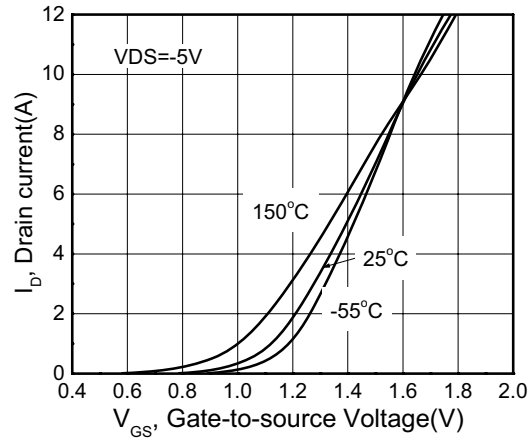
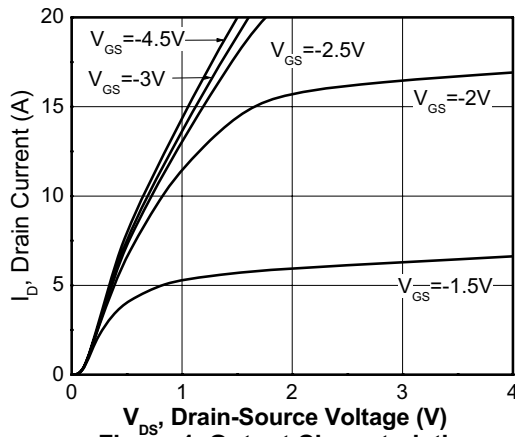
Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test:  $PW \leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
3. For design AID only, not subject to production testing.
4. Switching time is essentially independent of operating temperature.



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## ● Typical Performance Characteristics





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