

### 30V P-Channel Enhancement Mode MOSFET

#### Description

The HX3403 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 load switch or in PWM applications.

#### General Features

- ◆  $V_{DS} = -30V$ ,  $I_D = -2.6A$   
 $R_{DS(ON)}(Typ.) = 84m\Omega$  @  $V_{GS} = -4.5V$   
 $R_{DS(ON)}(Typ.) = 110m\Omega$  @  $V_{GS} = -2.5V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

#### Application

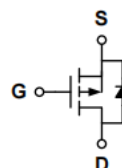
- ◆ PWM applications
- ◆ Load switch

#### Package

- ◆ SOT-23



#### Schematic diagram



#### Marking and pin assignment

SOT-23-3L  
(TOP VIEW)



#### Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
HX3403	-55°C to +150°C	SOT-23-3L	3000

#### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	$V_{DS}$	-30	V
Gate-source voltage	$V_{GS}$	±12	V
Drain current-continuous <sup>a</sup> @ $T_J = 125^\circ C$ -pulse <sup>b</sup>	$I_D$	-2.6	A
	$I_{DM}$	-12	A
Drain-source Diode forward current	$I_S$	-1.25	A
Maximum power dissipation	$P_D$	1	W
Operating junction Temperature range	$T_J$	-55—150	°C

#### Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-body leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	$\pm 100$	nA
<b>ON Characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-0.9	-1.5	V
	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-2A$	-	84	120	m $\Omega$
		$V_{GS}=-2.5V, I_D=-1A$	-	110	150	
Forward transconductance	gfs	$V_{GS}=-5V, I_D=-2A$	-	5	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{ISS}$	$V_{DS}=-10V, V_{GS}=0V$ $f=1.0MHz$	-	469	-	pF
Output capacitance	$C_{OSS}$		-	34	-	
Reverse transfer capacitance	$C_{RSS}$		-	27	-	
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{D(ON)}$	$V_{DD}=-15V$	-	12.5	-	ns
Rise time	tr	$I_D=-2A$	-	6.6	-	
Turn-off delay time	$t_{D(OFF)}$	$V_{GEN}=-10V$	-	113	-	
Fall time	tf	$R_L=10ohm$	-	46.6	-	
Total gate charge	Qg	$R_{GEN}=6ohm$	-	5.6	-	
Gate-source charge	Qgs	$V_{DS}=-15V, I_D=-2A$	-	1.1	-	nC
Gate-drain charge	Qgd	$V_{GS}=-4.5V$	-	1.2	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=-2A$	-	-0.81	-1.2	V

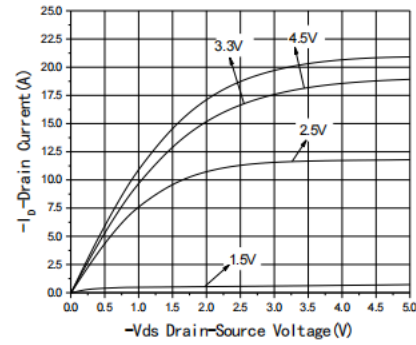
**Notes:**

- surface mounted on FR4 board,  $t_s \leq 10sec$
- pulse test: pulse width  $\leq 300\mu s$ , duty  $\leq 2\%$
- guaranteed by design, not subject to production testing

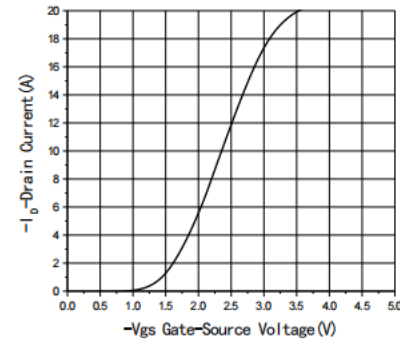
**Thermal Characteristics**

Thermal Resistance junction-to ambient	Rth JA	100	$^{\circ}C/W$
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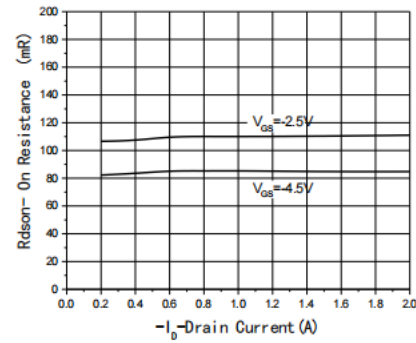
**Typical Performance Characteristics**



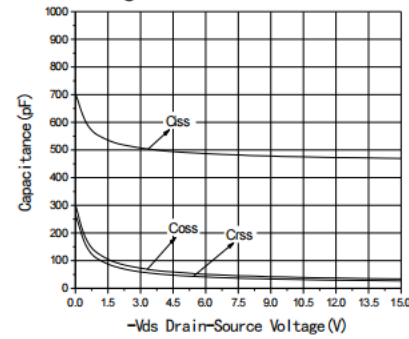
**Fig1 Output Characteristics**



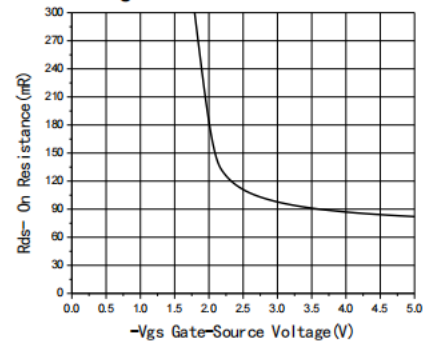
**Fig2 Transfer Characteristics**



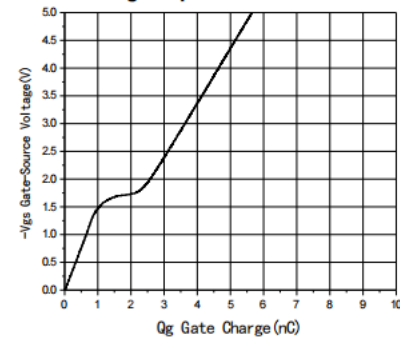
**Fig3 Rdson-Drain current**



**Fig4 Capacitance vs Vds**



**Fig5 Rdson-Gate Drain voltage**



**Fig6 Gate Charge**

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