

<p><b>DESCRIPTION</b></p> <p>The HX8205 uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge and high density cell Design for ultra low on-resistance. This device is suitable for use as a load switch or in PWM applications.</p> <p><b>GENERAL FEATURES</b></p> <ul style="list-style-type: none"> <li>◇ <math>V_{DS} = 20V</math>, <math>I_D = 4A</math></li> <li><math>R_{DS(ON)}(Typ.) = 28m\Omega</math> @ <math>V_{GS} = 2.5V</math></li> <li><math>R_{DS(ON)}(Typ.) = 22m\Omega</math> @ <math>V_{GS} = 4.5V</math></li> <li>◇ High power and current handling capability</li> <li>◇ Lead free product is acquired</li> <li>◇ Surface mount package</li> </ul> <p><b>APPLICATION</b></p> <ul style="list-style-type: none"> <li>◇ PWM applications</li> <li>◇ Load switch</li> </ul> <p><b>PACKAGE</b></p> <ul style="list-style-type: none"> <li>◇ SOT23-6L</li> </ul>	<p><b>SCHEMATIC DIAGRAM</b></p> <p><b>PIN ASSIGNMENT</b></p> <p>SOT23-6L (Topview)</p>
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## ORDERING INFORMATION

Part Number	Storage Temperature	Package	Marking	Devices Per Reel
HX8205	-55°C to +150°C	SOT23-6L	8205	3000

## ABSOLUTE MAXIMUM RATINGS

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	$V_{DS}$	20	V
Gate-source voltage	$V_{GS}$	$\pm 12$	V
Continuous drain current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	4.0	A
	$T_A = 70^\circ\text{C}$	3.0	
Pulsed drain current <sup>b</sup>	$I_{DM}$	20	
Continuous source current (diode conduction) <sup>a</sup>	$I_S$	1.2	
Power dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	1.4	W
	$T_A = 70^\circ\text{C}$	0.9	
Operating junction and storage temperature range	$T_J, T_{stg}$	-55—150	°C

## THERMAL CHARACTERISTICS

Parameter		Symbol	Typ	Max	Unit
Maximum junction-to-ambient <sup>a</sup>	≤ 10 s	R <sub>θJA</sub>	70	90	°C/W
	Steady-State		100	125	
Maximum junction-to-foot	Steady-State	R <sub>θJC</sub>	63	80	

### Notes

- Surface mounted on 1" x 1" FR4 board
- Pulse width limited by maximum junction temperature

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

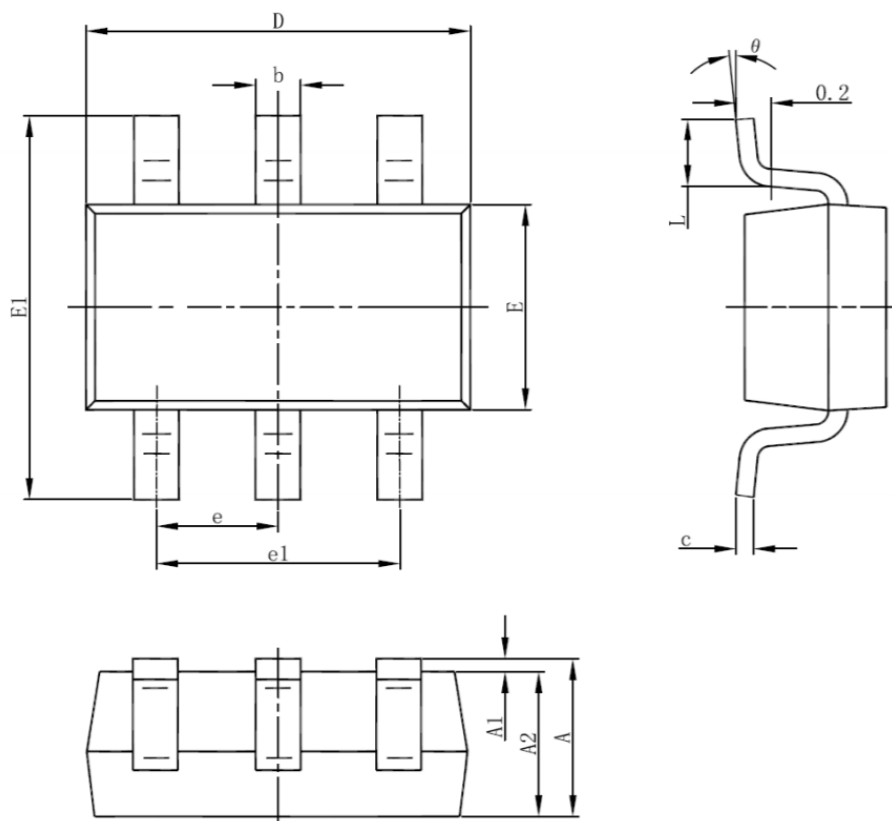
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-body leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V	-	-	±100	nA
<b>ON Characteristics</b>						
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.45	0.65	1.2	V
Drain-source on-state resistance <sup>a</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.0A	-	22	26	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.0A	-	28	35	
Forward transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =4A	-	10	-	S
<b>Dynamic Characteristics <sup>b</sup></b>						
Input capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V f=1.0MHz	-	600	-	pF
Output capacitance	C <sub>OSS</sub>		-	330	-	
Reverse transfer capacitance	C <sub>RSS</sub>		-	140	-	
<b>Switching Characteristics</b>						
Turn-on delay time	t <sub>D(ON)</sub>	V <sub>DD</sub> =10V R <sub>L</sub> =3 ohm V <sub>GEN</sub> =4.5V R <sub>GEN</sub> =6ohm	-	18	-	ns
Rise time	t <sub>r</sub>		-	5	-	
Turn-off delay time	t <sub>D(OFF)</sub>		-	43	-	
Fall time	t <sub>f</sub>		-	20	-	
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =10V I <sub>D</sub> =4A V <sub>GS</sub> =4.5V	-	11	-	nC
Gate-source charge	Q <sub>gs</sub>		-	2.3	-	
Gate-drain charge	Q <sub>gd</sub>		-	2.5	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =2A	-	0.76	1.16	V

### Notes

- Pulse test: Pulse width ≤ 300 μs, duty cycle ≤ 2 %
- Guaranteed by design, not subject to production testing

## PACKAGE INFORMATION

- SOT23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
$\theta$	0°	8°	0°	8°

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