

# 广东协铨微电子科技有限公司

## N-Channel Enhancement-Mode MOSFET 增强型场效应管

## XCK2302

### DESCRIPTION & FEATURES 概述及特点

High dense cell design for extremely low RDS(ON). 高密度

单元设计低导通电阻

Rugged and reliable. 高可靠性

20V, 3.0A,  $R_{DS(ON)} = 84m\Omega$  @VGS = 4.5V

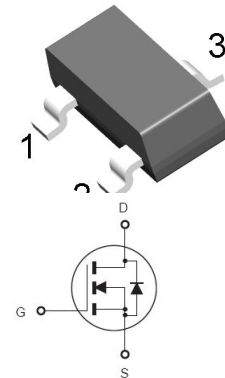
$R_{DS(ON)} = 130m$  (typ) @VGS=2.5V.

SOT23 package.

### PIN ASSIGNMENT 引脚说明

| PIN NAME<br>管脚符号 | PIN NUMBER 引脚序号 | FUNCTION<br>功能 |
|------------------|-----------------|----------------|
|                  | SOT-23/SC-59    |                |
| G                | 1               | Gate           |
| S                | 2               | Source         |
| D                | 3               | Drain          |

SOT-23



### MAXIMUM RATINGS(T<sub>a</sub>=25°C) 最大额定值

| CHARACTERISTIC 特性参数              | Symbol 符号        | Rating 额定值 | Unit 单位 |
|----------------------------------|------------------|------------|---------|
| Drain-Source Voltage 漏极-源极电压     | V <sub>DSS</sub> | 20         | Vdc     |
| Gate-Source Voltage 栅极-源极电压      | V <sub>GSS</sub> | ±8         | Vdc     |
| Drain Current—Continuous 漏极电流-连续 | I <sub>D</sub>   | 3.0        | Adc     |
| Peak Drain Current 峰值漏极电流        | I <sub>DM</sub>  | 10         | Adc     |

### THERMAL CHARACTERISTICS 热特性

| CHARACTERISTIC 特性参数                                                                | Symbol 符号                            | Max 最大值             | Unit 单位 |
|------------------------------------------------------------------------------------|--------------------------------------|---------------------|---------|
| Total Device Dissipation FR-5 Board(1) T <sub>A</sub> =25°C                        | PD                                   | 225                 | mW      |
| Total Device Dissipation Alumina Substrate,(2) T <sub>A</sub> =25°C<br>总耗散功率 氧化铝衬底 | P <sub>D</sub>                       | 300                 | mW      |
| Junction and Storage Temperature 结温和储存温度                                           | T <sub>J</sub> ,<br>T <sub>stg</sub> | 150,<br>-55 to +150 | °C      |

1. FR-5=1.0×0.75×0.062in, printed-circuit board.

2. Alumina=0.4×0.3×0.024in, 99.5%alumina

### DEVICE MARKING 打标

XCK2302=S2

### ELECTRICAL CHARACTERISTICS 电特性

(T<sub>A</sub>=25°C unless otherwise noted 如无特殊说明, 温度为 25°C)

| Characteristic 特性参数                            | Symbol 符号            | Test Condition 测试条件                                                                        | Min 最小值 | TYP 典型值 | Max 最大值   | Unit 单位 |
|------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------|---------|---------|-----------|---------|
| Drain-Source Breakdown Voltage 漏极-源极击穿电压       | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                                 | 20      | —       | —         | V       |
| Zero Gate Voltage Drain Current 零栅电压漏极电流       | I <sub>DSS</sub>     | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V                                                  | —       | —       | 1.0       | μA      |
| Gate-Body Leakage Current, Forward 栅泄漏电流       | I <sub>GSS</sub>     | V <sub>GS</sub> =±8V                                                                       | —       | —       | ±100      | nA      |
| Gate Threshold Voltage 开启电压                    | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                   | 0.45    | —       | 1.2       | V       |
| Static Drain-Source On-State Resistance 漏源导通电阻 | R <sub>DS(on)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.6A<br>V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.4A | —<br>—  | —<br>—  | 84<br>132 | mΩ      |
| Forward Transconductance 跨导                    | g <sub>fs</sub>      | V <sub>DS</sub> =5V, I <sub>D</sub> =3.0A                                                  | —       | 6.5     | —         | S       |
| Diode Forward On-Voltage 正向电压                  | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =1.6A                                                  | —       | —       | 1.15      | V       |

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|                                   |              |                                                           |   |     |    |    |
|-----------------------------------|--------------|-----------------------------------------------------------|---|-----|----|----|
| Turn-On Delay Time                | $t_{d(on)}$  | VDD = 10V, ID = 3.0A,<br>VGS = 4.5V, RGEN =<br>6 $\Omega$ | — | —   | 45 | ns |
| Turn-On Time                      | $t_r$        |                                                           | — | —   | 30 |    |
| Turn-Off Delay Time               | $t_{d(off)}$ |                                                           | — | —   | 70 |    |
| Turn-On Fall Time                 | $t_f$        |                                                           | — | —   | 70 |    |
| Input Capacitance 输入电容            | Ciss         | VDS = 10V, VGS =<br>0V, f = 1.0 MHz                       | — | 237 | —  | pF |
| Output Capacitance 输出电容           | Coss         |                                                           | — | 120 | —  |    |
| Reverse Transfer Capacitance 反馈电容 | Crss         |                                                           | — | 45  | —  |    |
| Total Gate Charge 栅极电量            | QG           | VDS = 10V, ID<br>=3.0A, VGS = 4.5V                        | — | 6.0 | —  | nC |
| Gate.to source charge 栅源极电量       | QGS          |                                                           | — | 1.4 | —  |    |
| Gate.to drain charge 栅漏极电量        | QGD          |                                                           | — | 1.8 | —  |    |