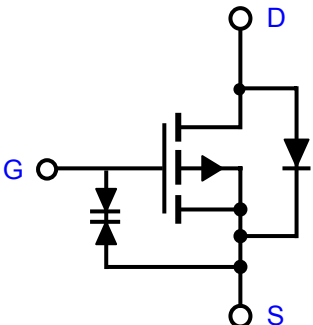
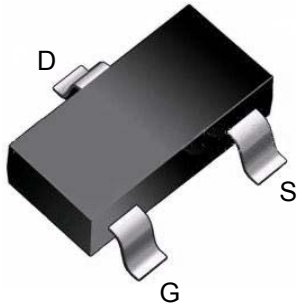


|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>P沟道 增强型 场效应晶体管<br/>P-Channel Enhancement-Mode MOS FETs</p>                                                                                                                                                                                                                                                                                                                                                                                           | <p><b>HPM3415</b><br/>P-Channel<br/>Enhancement<br/>Mode MOS FETs</p> <p>对应其他工业型号<br/>SI3415<br/>AO3415<br/>ME3415<br/>GM3415</p> |
| <p><b>Features</b></p> <ul style="list-style-type: none"> <li>■ -20V, -4.0A, <math>R_{DS(ON)}=35m\Omega</math> @ <math>V_{GS}=-4.5V</math></li> <li>■ High dense cell design for extremely low <math>R_{DS(ON)}</math></li> <li>■ Rugged and reliable</li> <li>■ Lead free product is acquired</li> <li>■ SOT-23 Package</li> <li>■ Marking Code: A15E</li> </ul> <p>Case Material: Molded Plastic.<br/>UL Flammability Classification Rating 94V-0</p> |                                                                                                                                   |

|                                                                                                                                      |                                                                                                                                        |                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>Internal Block Diagram</p>  <p>SOT-23 内部结构图</p> | <p>HPM3415 (Package: SOT-23)</p>  <p>SOT-23 管脚排列</p> | <p>元件标识 (打印)</p>  <p>DEVICE MARKING: A15E</p> |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

■ MAXIMUM RATINGS 最大额定值

| Characteristic 特性参数                                           | Symbol 符号  | Max 最大值     | Unit 单位      |
|---------------------------------------------------------------|------------|-------------|--------------|
| Drain-Source Voltage 漏极-源极电压                                  | $BV_{DSS}$ | -20         | V            |
| Gate- Source Voltage 栅极-源极电压                                  | $V_{GS}$   | $\pm 8$     |              |
| Drain Current (continuous) 漏极电流-连续                            | $I_D$      | -4          | A            |
| Drain Current (pulsed) 漏极电流-脉冲                                | $I_{DM}$   | -17         |              |
| ESD (HBM) 静电释放 (人体模型)                                         |            | 2500        | V            |
| Total Device Dissipation 总耗散功率<br>$T_A=25^\circ C$ (环境温度为25℃) | $P_D$      | 1000        | mW           |
| Junction 结温                                                   | $T_j$      | 150         | $^\circ C$   |
| Storage Temperature 储存温度                                      | $T_{stg}$  | -55 to +150 |              |
| Solder Temperature/Solder Time 焊接温度/焊接时间                      | $T/t$      | 260/10      | $^\circ C/S$ |

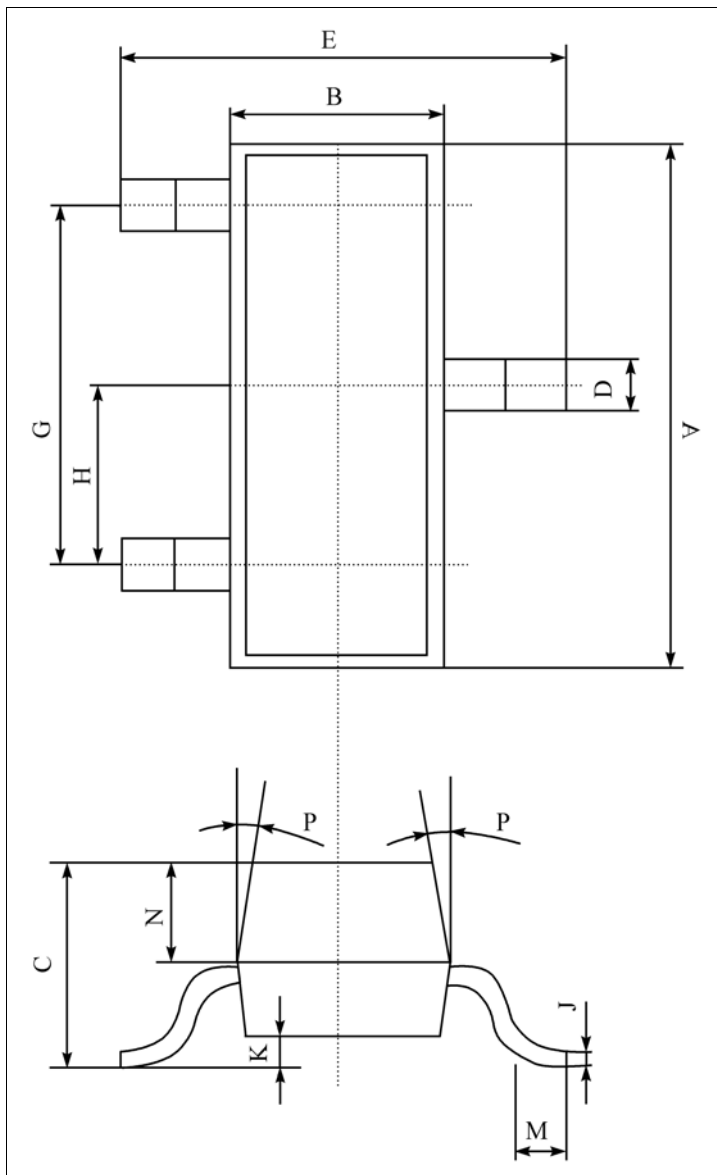
■ ELECTRICAL CHARACTERISTICS 电特性 ( $T_A=25^{\circ}\text{C}$  unless otherwise noted 如无特殊说明, 温度为 $25^{\circ}\text{C}$ )

| Characteristic<br>特性参数                                                                                     |                                                                      | Symbol<br>符号 | Min<br>最小值 | Typ<br>典型值 | Max<br>最大值 | Unit<br>单位    |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------|------------|------------|------------|---------------|
| Drain-Source Breakdown Voltage<br>漏极-源极击穿电压 ( $I_D=-250\mu\text{A}$ , $V_{GS}=0\text{V}$ )                 |                                                                      | $BV_{DSS}$   | -20        | --         | --         | V             |
| Gate Threshold Voltage<br>栅极开启电压 ( $I_D=-250\mu\text{A}$ , $V_{GS}=V_{DS}$ )                               |                                                                      | $V_{GS(th)}$ | -0.3       | --         | -1.0       |               |
| Diode Forward Voltage Drop<br>内附二极管正向压降 ( $I_S=-0.75\text{A}$ , $V_{GS}=0\text{V}$ )                       |                                                                      | $V_{SD}$     | --         | --         | -1.5       |               |
| Zero Gate Voltage<br>Drain Current<br>零栅压漏极电流                                                              | $V_{GS}=0\text{V}$ , $V_{DS}=-16\text{V}$                            | $I_{DSS}$    | --         | --         | -1         | $\mu\text{A}$ |
|                                                                                                            | $V_{GS}=0\text{V}$ , $V_{DS}=-16\text{V}$ , $T_A=55^{\circ}\text{C}$ |              | --         | --         | -10        |               |
| Gate Body Leakage<br>栅极漏电流                                                                                 | $V_{GS}=\pm 8\text{V}$ , $V_{DS}=0\text{V}$                          | $I_{GSS}$    | --         | --         | $\pm 10$   | nA            |
| Static Drain-Source<br>On-State Resistance<br>静态漏源导通电阻                                                     | $I_D=-4\text{A}$ , $V_{GS}=-4.5\text{V}$                             | $R_{DS(ON)}$ | --         | 35         | 43         | m $\Omega$    |
|                                                                                                            | $I_D=-3\text{A}$ , $V_{GS}=-2.5\text{V}$                             |              | --         | 45         | 54         |               |
|                                                                                                            | $I_D=-2\text{A}$ , $V_{GS}=-1.8\text{V}$                             |              | --         | 56         | 73         |               |
| Input Capacitance 输入电容<br>( $V_{GS}=0\text{V}$ , $V_{DS}=-10\text{V}$ , $f=1\text{MHz}$ )                  |                                                                      | $C_{ISS}$    | --         | 1450       | --         | pF            |
| Common Source Output Capacitance<br>共源输出电容 ( $V_{GS}=0\text{V}$ , $V_{DS}=-10\text{V}$ , $f=1\text{MHz}$ ) |                                                                      | $C_{OSS}$    | --         | 205        | --         |               |
| Turn-ON Time 开启时间<br>( $V_{DS}=-10\text{V}$ , $I_D=-2.8\text{A}$ , $R_{GEN}=6\Omega$ )                     |                                                                      | $t_{(on)}$   | --         | 9.5        | --         | nS            |
| Turn-OFF Time 关断时间<br>( $V_{DS}=-10\text{V}$ , $I_D=-2.8\text{A}$ , $R_{GEN}=6\Omega$ )                    |                                                                      | $t_{(off)}$  | --         | 94         | --         |               |

Pulse Width  $\leq 300\mu\text{s}$ ; Duty Cycle  $\leq 2.0\%$

■ DIMENSION 外形封装尺寸数据

Package: SOT-23 HAOHAI Package Code: MM



| 序号                                                                                                                                                                    | 数值及公差     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| A                                                                                                                                                                     | 2.90±0.10 |
| B                                                                                                                                                                     | 1.30±0.10 |
| C                                                                                                                                                                     | 1.00±0.10 |
| D                                                                                                                                                                     | 0.40±0.10 |
| E                                                                                                                                                                     | 2.40±0.20 |
| G                                                                                                                                                                     | 1.90±0.10 |
| H                                                                                                                                                                     | 0.95±0.05 |
| J                                                                                                                                                                     | 0.13±0.05 |
| K                                                                                                                                                                     | 0.00-0.10 |
| M                                                                                                                                                                     | ≥0.20     |
| N                                                                                                                                                                     | 0.60±0.10 |
| P                                                                                                                                                                     | 7±2°      |
| Packing<br>Tape & Reel, 3Kpcs/Reel<br>SOT-23 包装规格<br>SMD片式表面贴封装<br>包装方式: 载带卷盘包装<br>每卷数量3000只 (3Kpcs/Reel)<br>每盒数量30000只 (30Kpcs/BOX)<br>每箱数量300000只 (300Kpcs/Carbons) |           |



经中华人民共和国工商行政管理总局商标局批准  
HAOHAI、HHE 图案、字母、均为我公司正式注册商标，仿冒、盗用均属侵权，违法必究！

## 深圳市浩海电子有限公司

**SHENZHEN HAOHAI ELECTRONICS CO., LTD.**

2 floor(whole floor), BAOXIN Building. 0 Lane on the 8th. Yufeng Garden.  
82 District. BAOAN District, Shenzhen City, Guangdong Province, China.

中国 广东省 深圳市 宝安区 82区 裕丰花园 零巷8号 宝馨楼 二楼 (全层)

公司电话 TEL: +86-755-29955080、29955081、29955082、29955083  
总机八线 29955090、29955091、29955092、29955093

FAX: +86-755-27801767

E-mail: [kkg@kkg.com.cn](mailto:kkg@kkg.com.cn)

产品主页 <http://www.szhhe.com>

<http://www.kkg.com.cn>