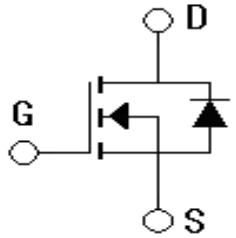
# MS65R022AR

## 主要参数 MAIN CHARACTERISTICS

| | |
|---|---|
| $I_D$ | 105A |
| $V_{DSS}$ | 650 V |
| Rdson-max （@Vgs=10V） | 22 mΩ |
| Qg-typ | 250 nC |

封装 **Package**



## 用途

- 高频开关电源
- 电子镇流器
- LED 电源

## APPLICATIONS

- High frequency switching mode power supply
- Electronic ballast
- LED power supply

## 产品特性

- 低栅极电荷
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品
- 超结产品

## FEATURES

- Low gate charge
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product
- Super Junction MOS

## 订货信息 ORDER MESSAGE

| 订 货 型 号 Order codes | | | | 印 记 Marking | 封 装 Package |
|---|---|---|---|---|---|
| 有卤-条管 | 无卤-条管 | 有卤-编带 | 无卤-编带 | | |
| Halogen-Tube | Halogen-Free-Tube | Halogen-reel | Halogen-Free-Reel | | |
| MS65R022AR-GE-B | MS65R022AR -GE-BR | N/A | N/A | MS65R022AR | TO-247 |

## 绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

| 项 目<br>Parameter | 符 号<br>Symbol | 数 值<br>Value | 单 位<br>Unit |
|---|---|---|---|
| 最高漏极－源极直流电压<br>Drain-Source Voltage | $V_{DSS}$ | 650 | V |
| 连续漏极电流<br>Drain Current -continuous | $I_D$<br>T=25℃ | 105* | A |
| | T=100℃ | 66* | A |
| 最大脉冲漏极电流（注 1）<br>Drain Current - pulse（note 1） | $I_{DM}$ | 315* | A |
| 最高栅源电压<br>Gate-Source Voltage | $V_{GSS}$ | ±30 | V |
| 单脉冲雪崩能量（注 2）<br>Single Pulsed Avalanche Energy（note 2） | $E_{AS}$ | 361 | mJ |
| 耗散功率<br>Power Dissipation | $P_D$<br>$T_C$=25℃ | 781 | W |
| | -Derate above 25℃ | 6.25 | W/℃ |
| 最高结温及存储温度<br>Operating and Storage Temperature Range | $T_J$，$T_{STG}$ | -55～+150 | ℃ |
| 引线最高焊接温度<br>Maximum Lead Temperature for Soldering Purposes | $T_L$ | 300 | ℃ |

*漏极电流由最高结温限制

*Drain current limited by maximum junction temperature

## 电特性 ELECTRICAL CHARACTERISTICS

| 项　　目<br>Parameter | 符　号<br>Symbol | 测试条件<br>Tests conditions | 最小<br>Min | 典型<br>Typ | 最 大<br>Max | 单 位<br>Units |
|---|---|---|---|---|---|---|
| **关态特性 Off –Characteristics** | | | | | | |
| 漏一源击穿电压<br>Drain-Source Voltage | $BV_{DSS}$ | $I_D$=250μA, $V_{GS}$=0V | 650 | - | - | V |
| 击穿电压温度特性<br>Breakdown Voltage Temperature Coefficient | $\Delta BV_{DSS}/\Delta T_J$ | $I_D$=250μA, referenced to 25℃ | - | 0.65 | - | V/℃ |
| 零栅压下漏极漏电流<br>Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=650V,$V_{GS}$=0V, $T_C$=25℃ | - | - | 10 | μA |
| 正向栅极体漏电流<br>Gate-body leakage current, forward | $I_{GSSF}$ | $V_{DS}$=0V,　$V_{GS}$ =30V | - | - | 100 | nA |
| 反向栅极体漏电流<br>Gate-body leakage current, reverse | $I_{GSSR}$ | $V_{DS}$=0V,　$V_{GS}$ =-30V | - | - | -100 | nA |
| **通态特性 On-Characteristics** | | | | | | |
| 阈值电压<br>Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$，　$I_D$=250μA | 3 | 3.5 | 4 | V |
| 静态导通电阻<br>Static Drain-Source On-Resistance | $R_{DS(ON)}$ | VGS =10V,ID=50A, Tj=25℃ | - | 20 | 22 | mΩ |
| | | VGS =10V,ID=50A, Tj=150℃ | - | 50 | - | mΩ |
| **动态特性 Dynamic Characteristics** | | | | | | |
| 输入电容<br>Input capacitance | $C_{iss}$ | $V_{DS}$=50V,<br>$V_{GS}$ =0V,<br>f=250K$H_Z$ | - | 7300 | - | pF |
| 输出电容<br>Output capacitance | $C_{oss}$ | | - | 271 | - | pF |
| 反向传输电容<br>Reverse transfer capacitance | $C_{rss}$ | | - | 3.6 | - | pF |
| 栅极电阻<br>Gate Resistance | RG | f=1M$H_Z$ | - | 0.66 | - | Ω |

## 电特性 ELECTRICAL CHARACTERISTICS

| | | | | | | |
|---|---|---|---|---|---|---|
| **开关特性 Switching Characteristics** | | | | | | |
| 延迟时间 Turn-On delay time | $t_d(on)$ | $V_{DD}$=325V,$I_D$=105A,$R_G$=25Ω, VGS=10V （note 3，4） | - | 154 | - | ns |
| 上升时间 Turn-On rise time | $t_r$ | | - | 116 | - | ns |
| 延迟时间 Turn-Off delay time | $t_d(off)$ | | - | 521 | - | ns |
| 下降时间 Turn-Off Fall time | $t_f$ | | - | 74 | - | ns |
| 栅极电荷总量 Total Gate Charge | $Q_g$ | $V_{DS}$ =520V , $I_D$=105A $V_{GS}$ =0 to10V （note 3，4） | - | 250 | - | nC |
| 栅－源电荷 Gate-Source charge | $Q_{gs}$ | | - | 62 | - | nC |
| 栅－漏电荷 Gate-Drain charge | $Q_{gd}$ | | - | 143 | - | nC |
| 漏－源二极管特性及最大额定值 **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| 正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current | $I_S$ | | - | - | 105 | A |
| 正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current | $I_{SM}$ | | - | - | 315 | A |
| 正向压降 Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=50A | - | - | 1.3 | V |
| 反向恢复时间 Reverse recovery time | $t_{rr}$ | $V_{DD}$=400V, $I_S$=40A di/dt=100A/μs (note 4) | - | 178 | - | ns |
| 反向恢复电荷 Reverse recovery charge | $Q_{rr}$ | | - | 1.4 | - | μC |
| 反向峰值电流 Peak reverse recovery current | $I_{rrm}$ | | - | -14 | - | A |

## 热特性 THERMAL CHARACTERISTIC

| 项　目 Parameter | 符　号 Symbol | 最大 Max | 单　位 Unit |
|---|---|---|---|
| 结到管壳的热阻 Thermal Resistance, Junction to Case | Rth(j-c) | 0.16 | ℃/W |
| 结到环境的热阻 Thermal Resistance, Junction to Ambient | $R_{th(j-A)}$ | 32 | ℃/W |

注释：

1：脉冲宽度由最高结温限制

2：L=500mH, $V_{DD}$=50V, $R_G$=25 Ω,VG=10V 起始结温 $T_J$=25℃

3：脉冲测试：脉冲宽度≤300μs,占空比≤2%

4：基本与工作温度无关

Notes:

1：Pulse width limited by maximum junction temperature

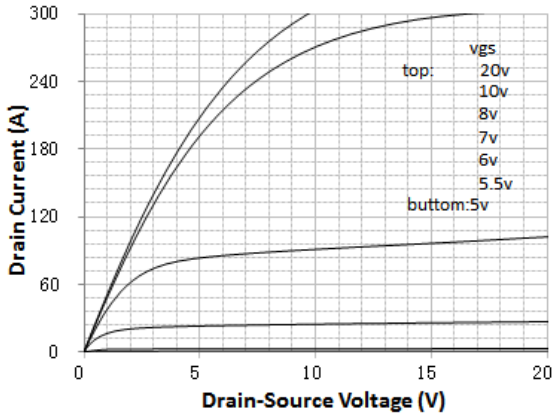
2：L = 500mH, VDD = 50V, RG = 25Ω, VG=10V, Starting TJ = 25°C

3：Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2%

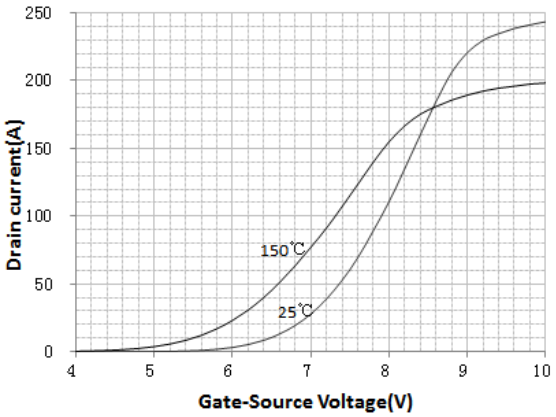
4：Essentially independent of operating temperature

## 特征曲线 ELECTRICAL CHARACTERISTICS (curves)

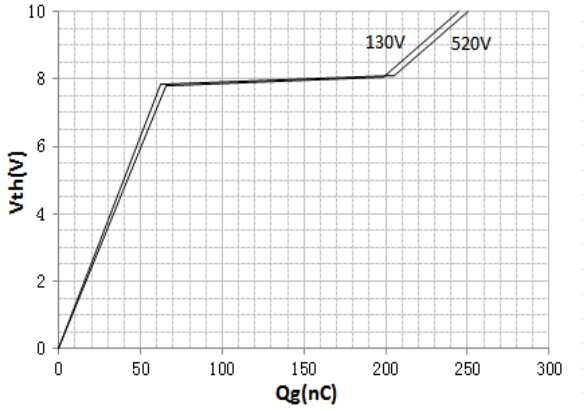
### On-Region Characteristics



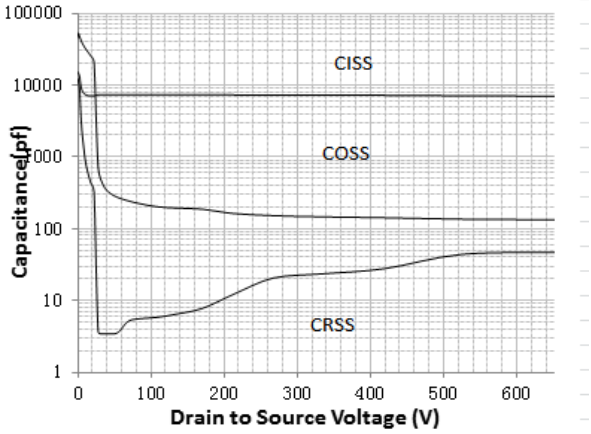

### Transfer Characteristics



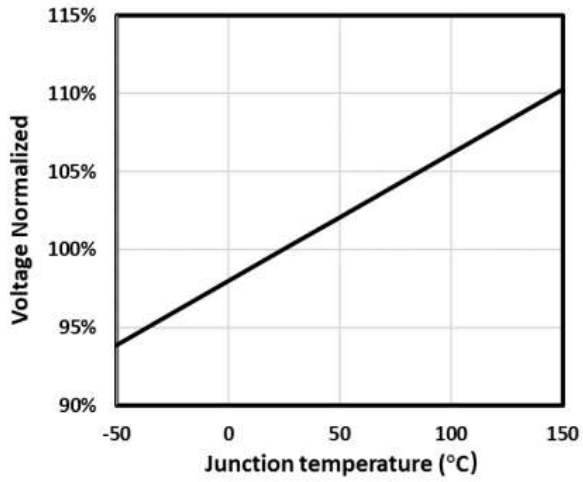

### Gate Charge Characteristics



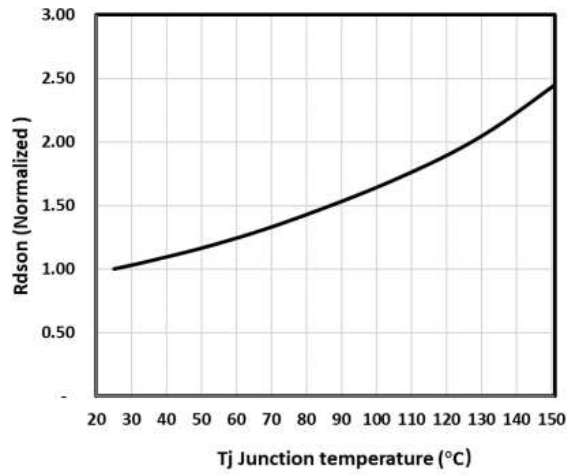

### Capacitance Characteristics



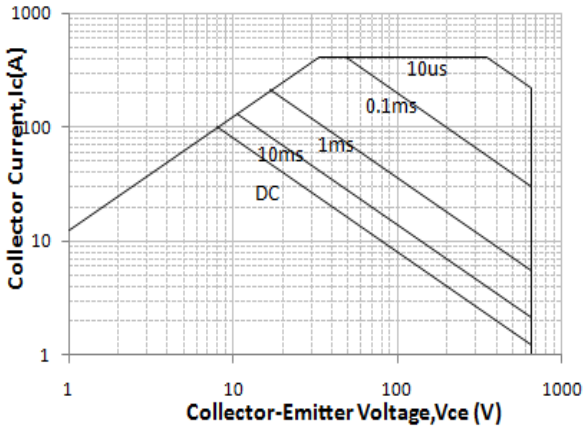

### Breakdown Voltage Variation vs. Temperature



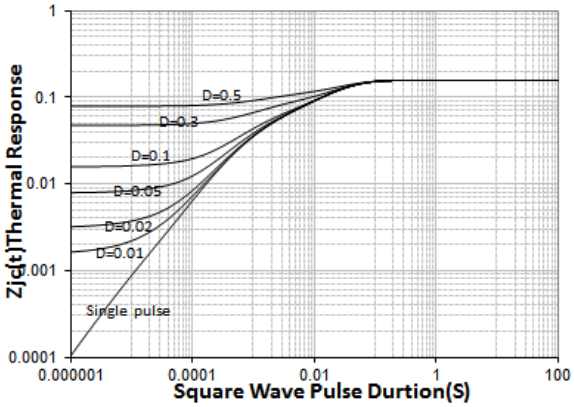

### On-Resistance Variation vs. Temperature



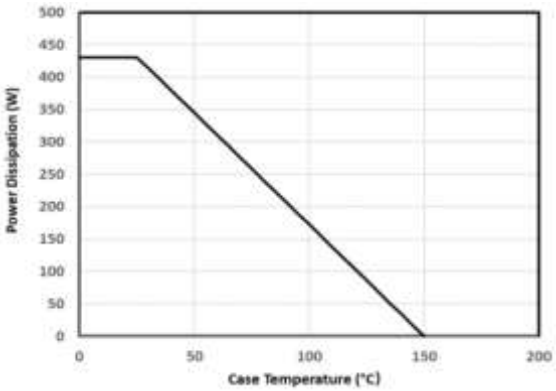
## Maximum Safe Operating Area For MS65R022AR/TO-247




## Transient Thermal Response Curve For MS65R022AR/TO-247



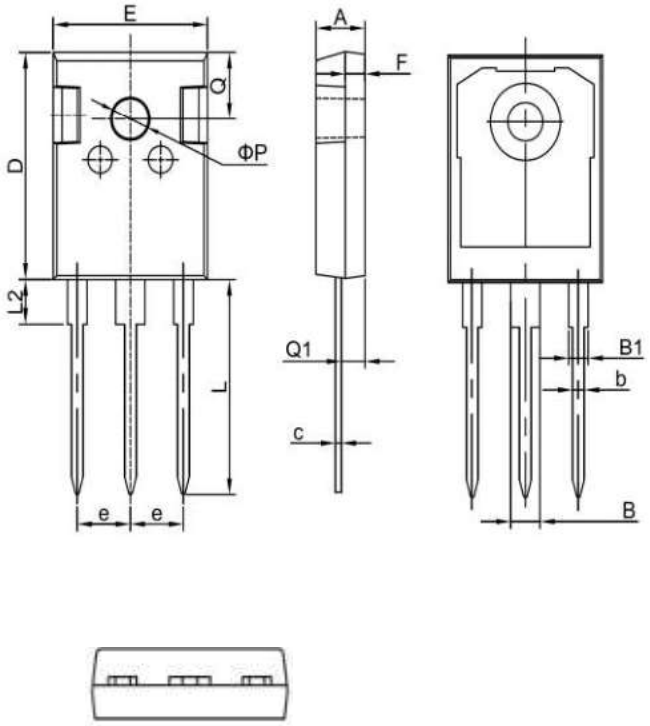

## Power Disspation vs. Temperature



## 外形尺寸 PACKAGE MECHANICAL DATA

**TO-247**

**单位 Unit：mm**




| 符号 symbol | MIN | MAX |
|---|---|---|
| A | 4.90 | 5.10 |
| B | 2.95 | 3.35 |
| B1 | 1.95 | 2.35 |
| b | 1.15 | 1.35 |
| c | 0.50 | 0.70 |
| D | 20.90 | 21.10 |
| E | 15.70 | 15.90 |
| e | 5.34 | 5.54 |
| F | 1.90 | 2.10 |
| L | 19.40 | 20.40 |
| L2 | 4.03 | 4.23 |
| Q | 6.00 | 6.40 |
| Q1 | 2.30 | 2.50 |
| P | 3.50 | 3.70 |

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## 联系方式

**吉林华微电子股份有限公司**

公司地址：吉林省吉林市深圳街 99 号

邮编：132013

总机：86-432-64678411

传真：86-432-64665812

网址：www.hwdz.com.cn

## CONTACT

**JILIN SINO-MICROELECTRONICS CO., LTD.**

ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.

Post Code: 132013

Tel： 86-432-64678411

Fax：86-432-64665812

Web Site：www.hwdz.com.cn