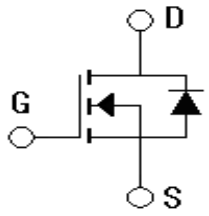
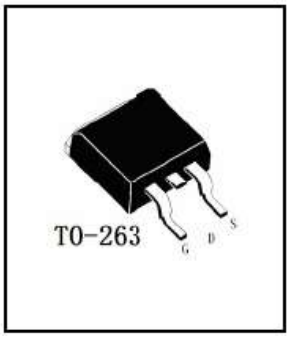
# JCS160N08I

## 主要参数 MAIN CHARACTERISTICS

| | |
|---|---|
| $I_D$ | 160A |
| $V_{DSS}$ | 80V |
| Rdson-max (@Vgs=10V) | 5.8mΩ |
| Qg-typ | 133nC |

封装 Package




## 用途

- 高功率 DC/DC 转换与功率开关
- 直流电机控制
- 汽车应用
- 不间断电源

## APPLICATIONS

- High power DC/DC converters and switch mode power supplies
- DC motor control
- Automotive applications
- Uninterruptible power supply

## 产品特性

- 低栅极电荷
- 低 Rdson(典型值 4.3mΩ )
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

## FEATURES

- Low gate charge
- Low Rdson(typical 4.3mΩ)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

## 订货信息 ORDER MESSAGE

| 订 货 型 号 Order codes | | | | 印 记 Marking | 封 装 Package |
|---|---|---|---|---|---|
| 有卤-条管 Halogen-Tube | 无卤-条管 Halogen-Free-Tube | 有卤-编带 Halogen-Reel | 无卤-编带 Halogen-Free-Reel | | |
| JCS160N08I-S-B | JCS160N08I-S-BR | JCS160N08I-S-A | JCS160N08I-S-AR | JCS160N08 | TO-263 |

## 绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

| 项 目 Parameter | 符 号 Symbol | 数 值 Value | 单位 Unit |
|---|---|---|---|
| | | JCS160N08I(TO-263) | |
| 最高漏极—源极直流电压 Drain-Source Voltage | $V_{DSS}$ | 80 | V |
| 连续漏极电流 Drain Current -continuous | $I_D$ T=25℃ | 160* | A |
| | $I_D$ T=100℃ | 128* | A |
| 最大脉冲漏极电流（注 1） Drain Current - pulse （note 1） | $I_{DM}$ | 640* | A |
| 最高栅源电压 Gate-Source Voltage | $V_{GSS}$ | ±20 | V |
| 单脉冲雪崩能量（注 2） Single Pulsed Avalanche Energy（note 2） | $E_{AS}$ | 1200 | mJ |
| 雪崩电流（注 1） Avalanche Current （note 1） | $I_{AR}$ | 70 | A |
| 重复雪崩能量（注 1） Repetitive Avalanche Current （note 1） | $E_{AR}$ | 600 | mJ |
| 二极管反向恢复最大电压变化速率（注 3） Peak Diode Recovery dv/dt （note 3） | dv/dt | 18 | V/ns |
| 耗散功率 Power Dissipation | $P_D$ $T_C$=25℃ | 250 | W |
| | -Derate above 25℃ | 1.67 | W/℃ |
| 最高结温及存储温度 Operating and Storage Temperature Range | $T_J$，$T_{STG}$ | -55～+175 | ℃ |
| 引线最高焊接温度 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－源击穿电压<br>Drain-Source Voltage | $BV_{DSS}$ | $I_D$=250μA, $V_{GS}$=0V | 80 | - | - | V |
| 零栅压下漏极漏电流<br>Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=80V,$V_{GS}$=0V,<br>$T_C$=25℃ | - | - | 1 | μA |
| | | $V_{DS}$=80V,$V_{GS}$=0V,<br>$T_C$=100℃ | - | - | 10 | μA |
| 正向栅极体漏电流<br>Gate-body leakage current, forward | $I_{GSSF}$ | $V_{DS}$=0V,　$V_{GS}$ =20V | - | - | 100 | nA |
| 反向栅极体漏电流<br>Gate-body leakage current, reverse | $I_{GSSR}$ | $V_{DS}$=0V,　$V_{GS}$ =-20V | - | - | -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 | 2.0 | - | 4.0 | V |
| 静态导通电阻<br>Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$ =10V ,　$I_D$=40A | - | 4.6 | 5.8 | mΩ |
| 正向跨导<br>Forward Transconductance | $g_{fs}$ | $V_{DS}$ = 40V , $I_D$=20A<br>（note 4） | - | 30 | - | S |
| **动态特性 Dynamic Characteristics** | | | | | | |
| 输入电容<br>Input capacitance | $C_{iss}$ | $V_{DS}$=25V,<br>$V_{GS}$ =0V,<br>f=1.0MH$_Z$ | - | 6600 | - | pF |
| 输出电容<br>Output capacitance | $C_{oss}$ | | - | 585 | - | pF |
| 反向传输电容<br>Reverse transfer capacitance | $C_{rss}$ | | - | 316 | - | pF |

## 电特性 ELECTRICAL CHARACTERISTICS

| | | | | | | |
|---|---|---|---|---|---|---|
| **开关特性 Switching Characteristics** | | | | | | |
| 延迟时间 Turn-On delay time | $t_d$(on) | $V_{DD}$=40V,$I_D$=50A,$R_G$=25Ω （note 4，5） | - | 104 | - | ns |
| 上升时间 Turn-On rise time | $t_r$ | | - | 186 | - | ns |
| 延迟时间 Turn-Off delay time | $t_d$(off) | | - | 343 | - | ns |
| 下降时间 Turn-Off Fall time | $t_f$ | | - | 181 | - | ns |
| 栅极电荷总量 Total Gate Charge | $Q_g$ | $V_{DS}$ =50V，$I_D$=50A $V_{GS}$ =10V （note 4，5） | - | 133 | - | nC |
| 栅－源电荷 Gate-Source charge | $Q_{gs}$ | | - | 36 | - | nC |
| 栅－漏电荷 Gate-Drain charge | $Q_{gd}$ | | - | 40 | - | 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 | $I_S$ | | - | - | 160 | A |
| 正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current | $I_{SM}$ | | - | - | 640 | A |
| 正向压降 Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=40A | - | - | 1.2 | V |
| 反向恢复时间 Reverse recovery time | $t_{rr}$ | $V_{GS}$=0V, $I_S$=40A $dI_F/dt$=100A/μs (note 4) | - | 49 | - | ns |
| 反向恢复电荷 Reverse recovery charge | $Q_{rr}$ | | - | 91 | - | nC |

## 热特性 THERMAL CHARACTERISTIC

| 项 目 Parameter | 符 号 Symbol | 最大 Max JCS160N08I | 单位 Unit |
|---|---|---|---|
| 结到管壳的热阻 Thermal Resistance, Junction to Case | $R_{th(j-c)}$ | 0.60 | ℃/W |
| 结到环境的热阻 Thermal Resistance, Junction to Ambient | $R_{th(j-A)}$ | 62.5 | ℃/W |

注释：

1：脉冲宽度由最高结温限制

2：L=0.5mH, $I_{AS}$=56A, $V_{DD}$=64V, $R_G$=25 Ω,起始结温 $T_J$=25℃

3：$I_{SD}$ ≤160A,di/dt ≤200A/μs,VDD≤$BV_{DSS}$,起始结温 $T_J$=25℃

4：脉冲测试：脉冲宽度≤300μs,占空比≤2%

5：基本与工作温度无关

Notes:

1：Pulse width limited by maximum junction temperature

2：L=0.5mH, $I_{AS}$=56A, $V_{DD}$=64V, $R_G$=25 Ω,Starting $T_J$=25℃

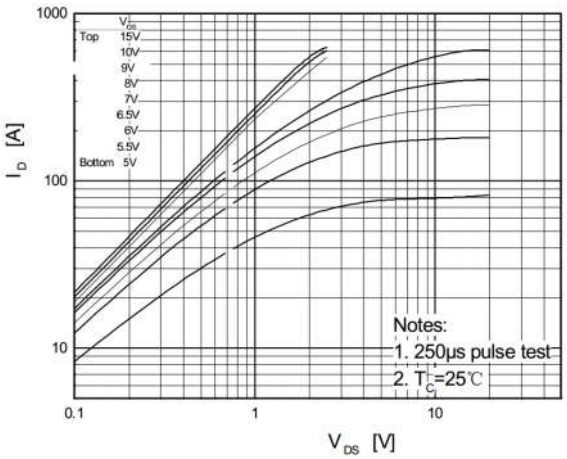
3：$I_{SD}$ ≤160A,di/dt ≤200A/μs,VDD≤$BV_{DSS}$, Starting $T_J$=25℃

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

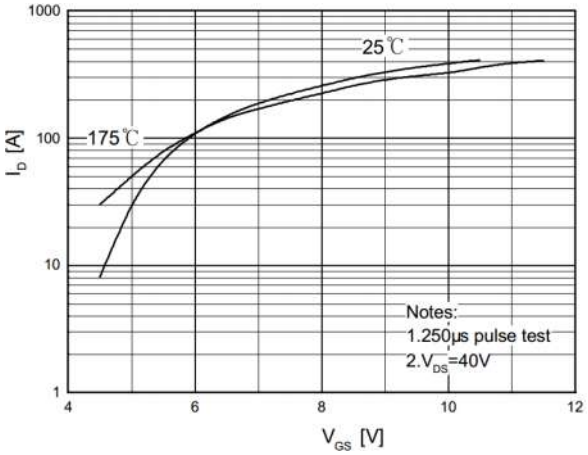
5：Essentially independent of operating temperature

## 特征曲线 ELECTRICAL CHARACTERISTICS (curves)

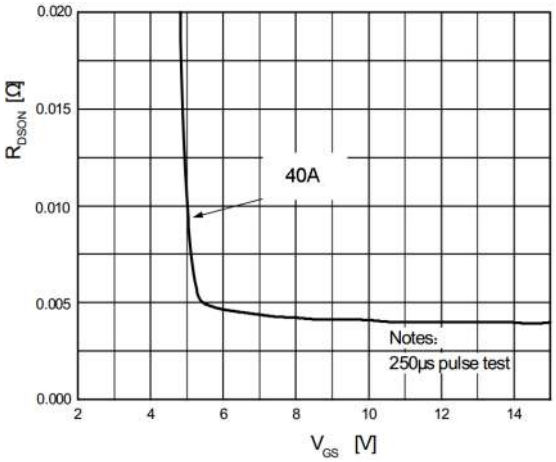
### On-Region Characteristics



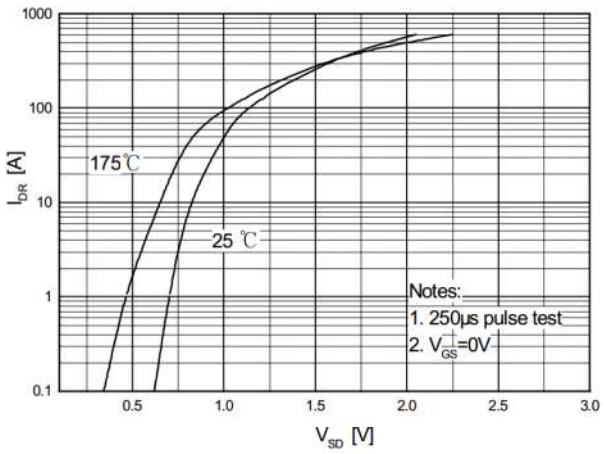

### Transfer Characteristics



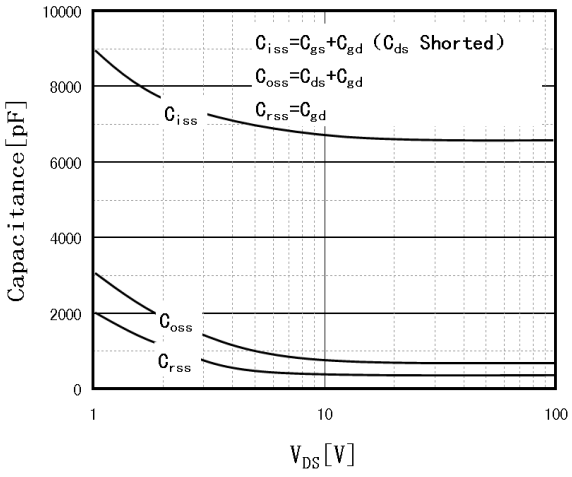

### On-Resistance Variation vs. Drain Current and Gate Voltage



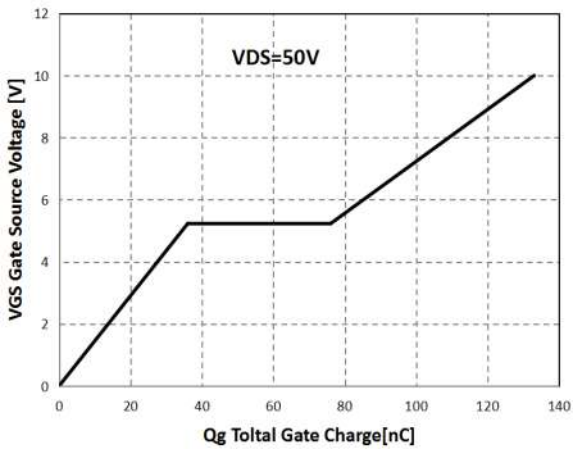

### Body Diode Forward Voltage Variation vs. Source Current and Temperature




### Capacitance Characteristics

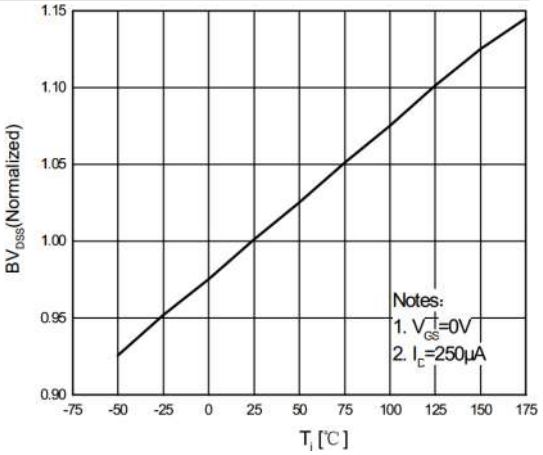



### Gate Charge Characteristics

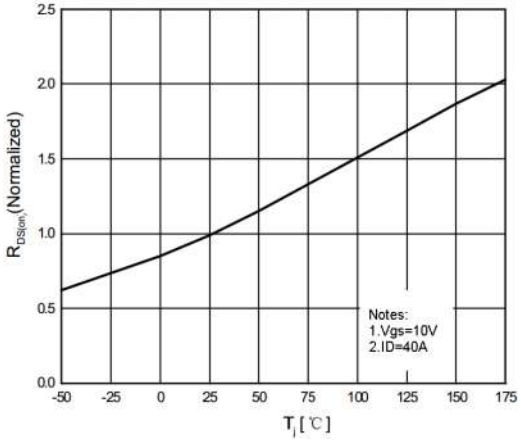


## 特征曲线 ELECTRICAL CHARACTERISTICS (curves)

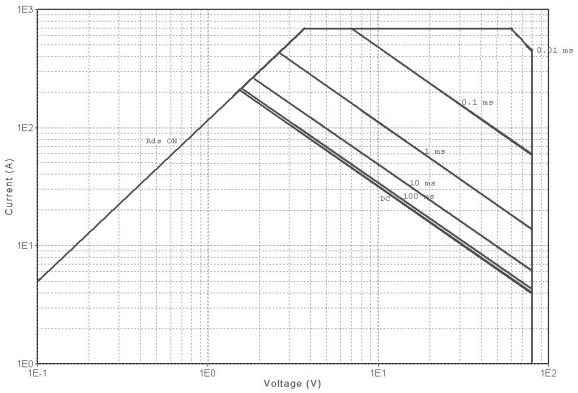
### Breakdown Voltage Variation vs. Temperature



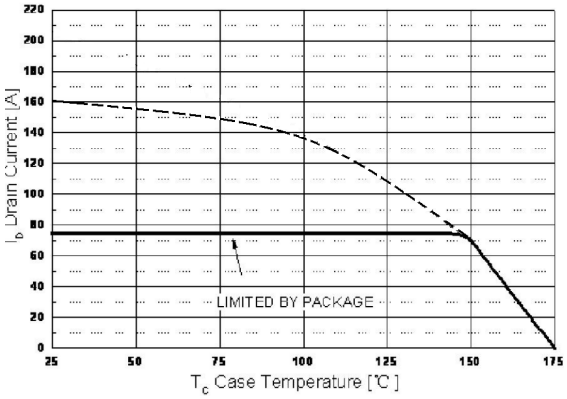

### On-Resistance Variation vs. Temperature



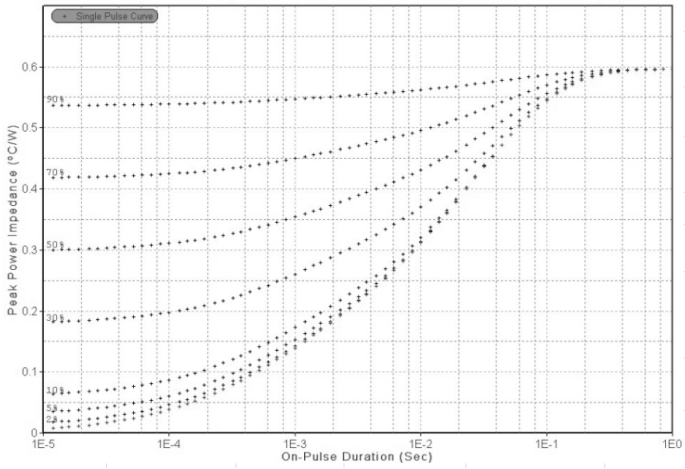

### Maximum Safe Operating Area For JCS160N08I(TO-263)




### Maximum Drain Current vs. Case Temperature



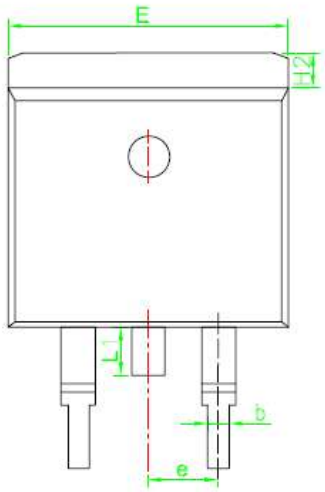

### Transient Thermal Response Curve For JCS160N08I(TO-263)

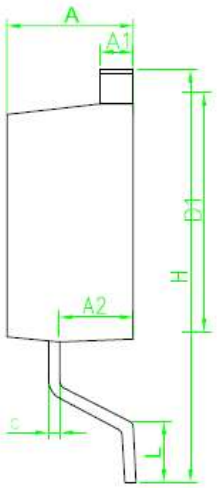


外形尺寸 **PACKAGE MECHANICAL DATA**

**TO-263**

**单位 Unit：mm**




| SYMBOL | MM | |
|---|---|---|
| | MIN | MAX |
| A | 4.30 | 4.80 |
| A1 | 1.12 | 1.42 |
| A2 | 2.54 | 2.84 |
| b | 0.67 | 1.00 |
| c | 0.29 | 0.52 |
| D1 | 8.40 | 9.00 |
| E | 9.80 | 10.46 |
| e | 2.54BSC | |
| H | 14.00 | 16.00 |
| H2 | 1.12 | 1.45 |
| L | 1.50 | 3.10 |
| L1 | 1.45 | 1.70 |

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