



MT30NC4A

主要参数 MAIN CHARACTERISTICS

| | |
|-------------------------------------|---------------|
| I_D | 130A |
| V_{DSS} | 30V |
| $R_{dson-max}$ (@ $V_{gs}=10V$) | 3.1m Ω |
| Q_g-typ | 98nC |

用途

- 电信与工业领域隔离 DC/DC 转换
- 同步整流领域 DC/DC 与 AC/DC 转换

产品特性

- 低栅极电荷
- 低 R_{dson}
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

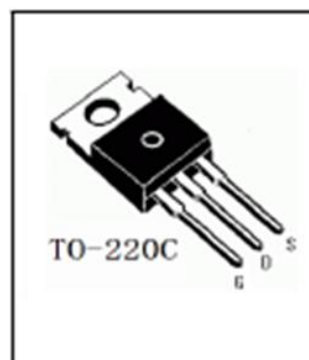
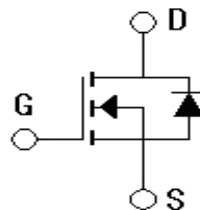
APPLICATIONS

- Isolated DC/DC Converters in Telecom and Industrial
- Synchronous Rectification in DC/DC and AC/DC Converters

FEATURES

- Low gate charge
- Low R_{dson}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

封装 Package



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 | | |
| MT30NC4A-C-B | MT30NC4A-C-BR | N/A | N/A | MT30NC4A | TO-220C |





绝对最大额定值 ABSOLUTE RATINGS (Tc=25°C)

| 项 目 Parameter | 符 号 Symbol | 数 值 Value | 单 位 Unit |
|--|---|--------------|-------------|
| | | MT30NC4A | |
| 最高漏极-源极直流电压 Drain-Source Voltage | V_{DSS} | 30 | V |
| 连续漏极电流 Drain Current -continuous | I_D T=25°C | 130* | A |
| | I_D T=100°C | 76* | A |
| 最大脉冲漏极电流 (注1) Drain Current - pulse (note 1) | I_{DM} | 520* | 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} | 135 | mJ |
| 雪崩电流 (注1) Avalanche Current (note 1) | I_{AS} | 43 | A |
| 耗散功率 Power Dissipation | P_D T _C =25°C -Derate above 25°C | 121 | W |
| | | 0.95 | W/°C |
| 最高结温及存储温度 Operating and Storage Temperature Range | T _J , T _{STG} | -55~+175 | °C |
| 引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes | T _L | 300 | °C |

*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 Parameter | 符 号 Symbol | 测试条件 Tests conditions | 最小 Min | 典型 Typ | 最大 Max | 单 位 Units |
|---|---------------|---|-----------|-----------|-----------|--------------|
| 关态特性 Off –Characteristics | | | | | | |
| 漏—源击穿电压 Drain-Source Voltage | BV_{DSS} | $I_D=250\mu A, V_{GS}=0V$ | 30 | - | - | V |
| 零栅压下漏极漏电流 Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=30V, V_{GS}=0V,$ $T_C=25^\circ C$ | - | - | 1 | μA |
| | | $V_{DS}=30V, V_{GS}=0V,$ $T_C=125^\circ C$ | - | - | 100 | μA |
| 正向栅极体漏电流 Gate-body leakage current, forward | I_{GSSF} | $V_{DS}=0V, V_{GS}=20V$ | - | - | 100 | nA |
| 反向栅极体漏电流 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 Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D=250\mu A$ | 1.0 | 1.7 | 2.4 | V |
| 静态导通电阻 Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=20A$ | - | 2.4 | 3.1 | m Ω |
| | | $V_{GS}=4.5V, I_D=20A$ | - | 3.2 | 4.2 | m Ω |
| 正向跨导 Forward Transconductance | g_{fs} | $V_{DS} = 10V, I_D=20A$ (note 4) | 20.8 | - | - | S |
| 动态特性 Dynamic Characteristics | | | | | | |
| 输入电容 Input capacitance | C_{iss} | $V_{DS}=15V,$ $V_{GS}=0V,$ $f=1.0MHz$ | - | 5471 | - | pF |
| 输出电容 Output capacitance | C_{oss} | | - | 1628 | - | pF |
| 反向传输电容 Reverse transfer capacitance | C_{rss} | | - | 1026 | - | pF |





电特性 ELECTRICAL CHARACTERISTICS

| 开关特性 Switching Characteristics | | | | | | |
|---|-------------------|--|---|----|-----|----|
| 延迟时间 Turn-On delay time | $t_d(\text{on})$ | $V_{DD}=15V, I_D=50A, R_G=3.0\Omega$ (note 3, 4) | - | 17 | - | ns |
| 上升时间 Turn-On rise time | t_r | | - | 41 | - | ns |
| 延迟时间 Turn-Off delay time | $t_d(\text{off})$ | | - | 55 | - | ns |
| 下降时间 Turn-Off Fall time | t_f | | - | 66 | - | ns |
| 栅极电荷总量 Total Gate Charge | Q_g | $V_{DS}=15V,$ $I_D=50A$ $V_{GS}=10V$ (note 3, 4) | - | 98 | - | nC |
| 栅-源电荷 Gate-Source charge | Q_{gs} | | - | 11 | - | nC |
| 栅-漏电荷 Gate-Drain charge | Q_{gd} | | - | 21 | - | 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 | $T_C=25^\circ\text{C}$ | - | - | 130 | A |
| 正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current | I_{SM} | $T_C=25^\circ\text{C}$ | - | - | 520 | A |
| 正向压降 Drain-Source Diode Forward Voltage | V_{SD} | $T_J=25^\circ\text{C}, V_{GS}=0V,$ $I_S=30A$ | - | - | 1.2 | V |
| 反向恢复时间 Reverse recovery time | t_{rr} | $I_S=30A$ $dI_F/dt=100A/\mu s$ (note 3) | - | 27 | - | ns |
| 反向恢复电荷 Reverse recovery charge | Q_{rr} | | - | 25 | - | nC |

热特性 THERMAL CHARACTERISTIC

| 项 目 Parameter | 符 号 Symbol | 最大 Max | 单 位 Unit |
|--|---------------|-----------|--------------------|
| | | MT30NC4A | |
| 结到管壳的热阻 Thermal Resistance, Junction to Case | $R_{th(j-c)}$ | 1.05 | $^\circ\text{C}/W$ |
| 结到环境的热阻 Thermal Resistance, Junction to Ambient | $R_{th(j-A)}$ | 60 | $^\circ\text{C}/W$ |

注释:

- 1: 脉冲宽度由最高结温限制
- 2: $I_{AS}=30A, V_{DD}=30V, R_G=25\Omega$, 起始结温 $T_J=25^\circ\text{C}$
- 3: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 1\%$
- 4: 基本与工作温度无关

Notes:

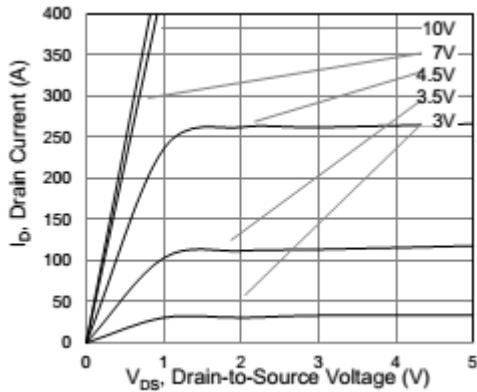
- 1: Pulse width limited by maximum junction temperature
- 2: $I_{AS}=30A, V_{DD}=30V, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
- 3: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 1\%$
- 4: Essentially independent of operating temperature



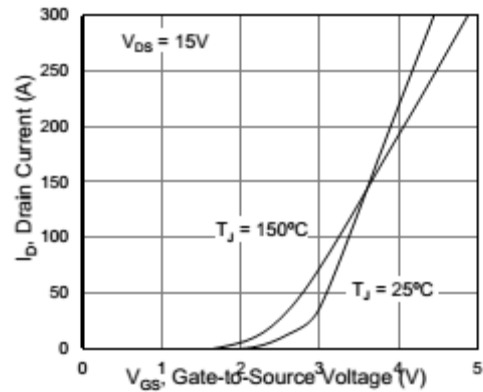


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

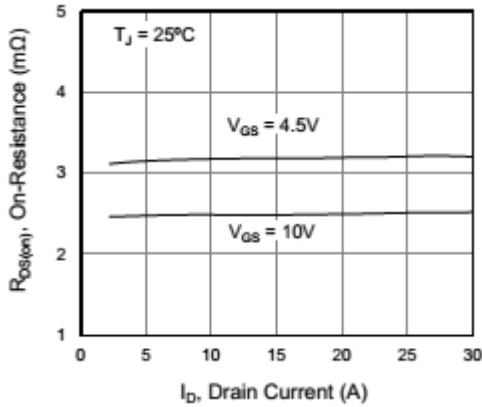
On-Region Characteristics



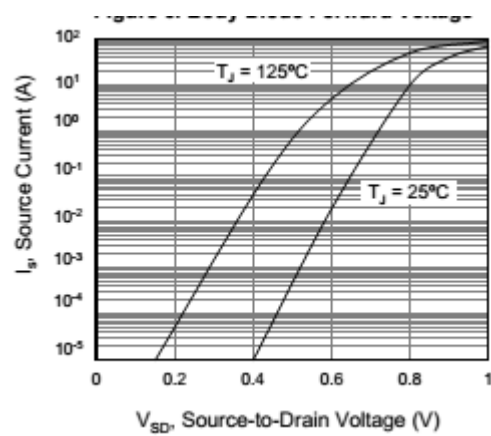
Transfer Characteristics



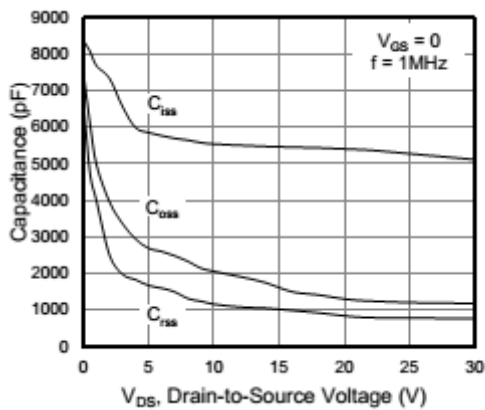
On-Resistance Variation vs. Drain Current



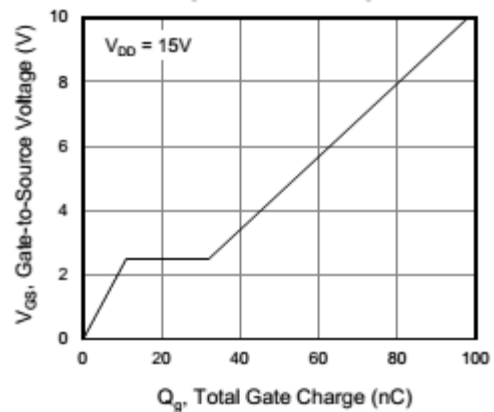
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics



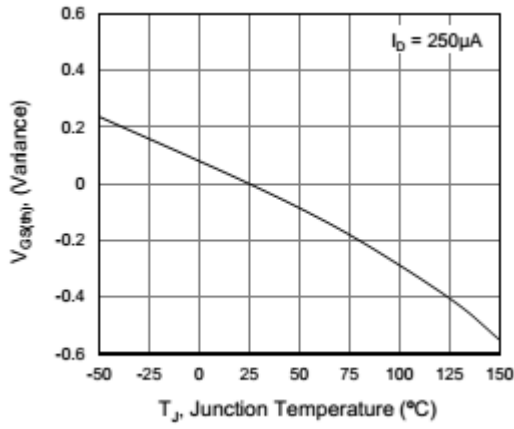
Gate Charge Characteristics



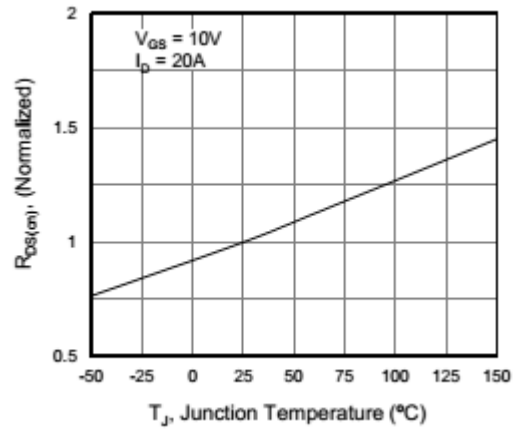


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

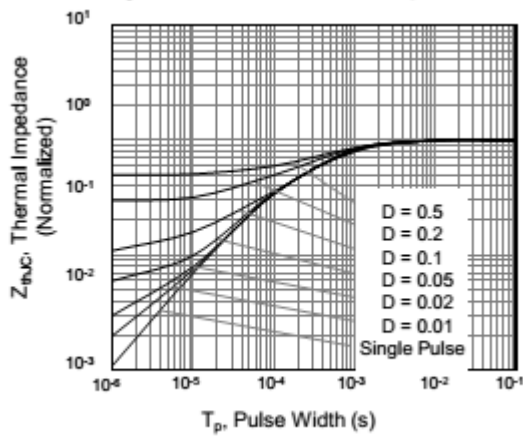
Threshold Voltage Variation vs. Temperature



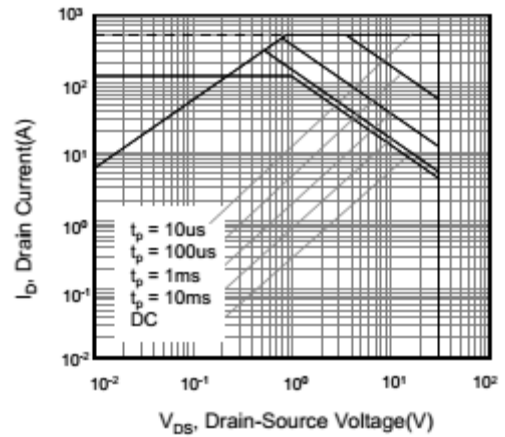
On-Resistance Variation vs. Temperature



Transient Thermal Response Curve For MT30NC4A



Safe operation area

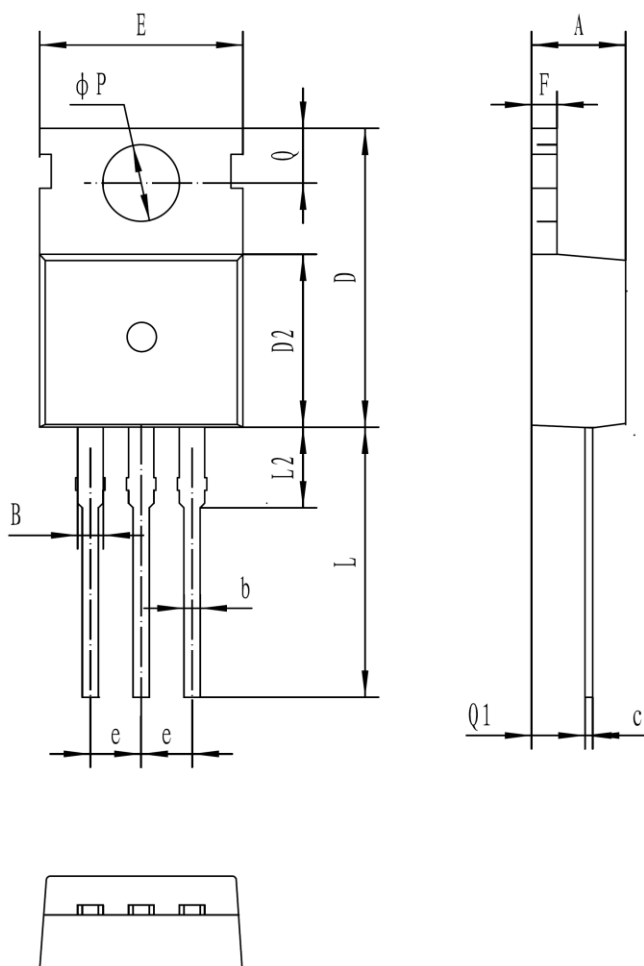




外形尺寸 PACKAGE MECHANICAL DATA

TO-220C

单位 Unit: mm



| 符号 symbol | MIN | MAX |
|--------------|-------|-------|
| A | 4.30 | 4.70 |
| B | 1.10 | 1.40 |
| b | 0.70 | 0.95 |
| c | 0.40 | 0.65 |
| D | 15.20 | 16.20 |
| D2 | 9.00 | 9.40 |
| E | 9.70 | 10.10 |
| e | 2.39 | 2.69 |
| F | 1.25 | 1.40 |
| L | 12.60 | 13.60 |
| L2 | 2.80 | 3.20 |
| Q | 2.60 | 3.00 |
| Q1 | 2.20 | 2.60 |
| P | 3.50 | 3.80 |



**注意事项**

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