



MC11N06A

主要参数 MAIN CHARACTERISTICS

| | |
|-------------------------------------|----------------|
| I_D | 50.0A |
| V_{DSS} | 60V |
| $R_{Dson-max}$ (@ $V_{gs}=10V$) | 13.0m Ω |
| Q_g-typ | 17nC |

用途

- LED 应用
- 负载开关

- 同步整流领域 DC/DC 与 AC/DC 转换

产品特性

- 沟槽功率 MOSFET 技术
- 低 $R_{DS(ON)}$
- 低栅极电荷
- 开关速度快

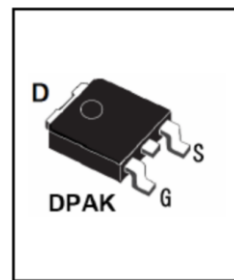
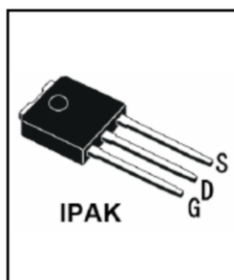
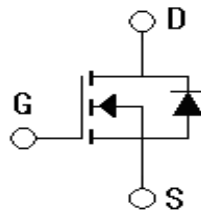
APPLICATIONS

- LED applications
- Load Switch
- Synchronous Rectification in DC/DC and AC/DC Converters

FEATURES

- Trench Power MOSFET Technology
- Low $R_{DS(ON)}$
- Low gate charge
- Fast-switching

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 | | |
| MC11N06A-I-B | MC11N06A-I-BR | N/A | N/A | MC11N06A | IPAK |
| MC11N06A-R-B | MC11N06A-R-BR | MC11N06A-R-A | MC11N06A-R-AR | MC11N06A | DPAK |





绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

| 项 目 Parameter | 符 号 Symbol | 数 值 Value | 单 位 Unit |
|--|--|--------------|-------------|
| | | MC11N06A | |
| 最高漏极-源极直流电压 Drain-Source Voltage | V _{DSS} | 60 | V |
| 连续漏极电流 Drain Current -continuous | I _D T=25℃ | 50* | A |
| | I _D T=100℃ | 31* | A |
| 最大脉冲漏极电流 (注1) Drain Current - pulse (note 1) | I _{DM} | 200* | A |
| 最高栅源电压 Gate-Source Voltage | V _{GSS} | +20/-12 | V |
| 单脉冲雪崩能量 (注2) Single Pulsed Avalanche Energy (note 2) | E _{AS} | 51.2 | mJ |
| 雪崩电流 (注1) Avalanche Current (note 1) | I _{AS} | 32 | A |
| 耗散功率 Power Dissipation | P _D T _C =25℃ -Derate above 25℃ | 87.5 | W |
| | | 0.70 | W/℃ |
| 最高结温及存储温度 Operating and Storage Temperature Range | T _J , T _{STG} | -55~+150 | ℃ |
| 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 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} | $I_D=250\mu A, V_{GS}=0V$ | 60 | - | - | V |
| 零栅压下漏极漏电流 Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=60V, V_{GS}=0V,$ $T_C=25^\circ C$ | - | - | 1 | μA |
| | | $V_{DS}=48V, V_{GS}=0V, T_C=85^\circ C$ | - | - | 10 | 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} | $V_{DS}=0V, V_{GS}=-12V$ | - | - | -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 | 1.6 | 2.5 | V |
| 静态导通电阻 Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS} = 10V, I_D=20A$ | - | 10.0 | 13.0 | m Ω |
| | | $V_{GS} = 4.5V, I_D=10A$ | - | 16.0 | 22 | m Ω |
| 正向跨导 Forward Transconductance | g_{fs} | $V_{DS} = 10V, I_D=3A$ (note 4) | - | 6 | - | S |
| 动态特性 Dynamic Characteristics | | | | | | |
| 输入电容 Input capacitance | C_{iss} | $V_{DS}=30V,$ $V_{GS}=0V,$ $f=1.0MHz$ | - | 945 | 1890 | pF |
| 输出电容 Output capacitance | C_{oss} | | - | 275 | 550 | pF |
| 反向传输电容 Reverse transfer capacitance | C_{rss} | | - | 26 | 52 | pF |
| 栅电阻 Gate resistance | R_g | $V_{DS}=0V, V_{GS}=0V, f=1.0MHz$ | | 0.3 | | Ω |



**电特性 ELECTRICAL CHARACTERISTICS**

| 开关特性 Switching Characteristics | | | | | | |
|---|-------------------|--|---|------|-----|----|
| 延迟时间 Turn-On delay time | $t_d(\text{on})$ | $V_{\text{DD}}=30\text{V}, I_{\text{D}}=50\text{A}, R_{\text{G}}=3.3\Omega$ (note 3, 4) | - | 10 | 20 | ns |
| 上升时间 Turn-On rise time | t_r | | - | 13.5 | 27 | ns |
| 延迟时间 Turn-Off delay time | $t_d(\text{off})$ | | - | 28 | 56 | ns |
| 下降时间 Turn-Off Fall time | t_f | | - | 20 | 40 | ns |
| 栅极电荷总量 Total Gate Charge | Q_g | $V_{\text{DS}}=30\text{V},$ $I_{\text{D}}=50\text{A}$ $V_{\text{GS}}=10\text{V}$ (note 3, 4) | - | 17.0 | 34 | nC |
| 栅-源电荷 Gate-Source charge | Q_{gs} | | - | 3 | 6 | nC |
| 栅-漏电荷 Gate-Drain charge | Q_{gd} | | - | 6 | 12 | 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 | $T_c=25^\circ\text{C}$ | - | - | 50 | A |
| 正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current | I_{SM} | $T_c=25^\circ\text{C}$ | - | - | 200 | A |
| 正向压降 Drain-Source Diode Forward Voltage | V_{SD} | $T_j=25^\circ\text{C}, V_{\text{GS}}=0\text{V}, I_s=50\text{A}$ | - | - | 1.4 | V |
| 反向恢复时间 Reverse Recovery time | t_{rr} | $V_{\text{GS}}=0\text{V}, I_s=5\text{A}$ $dI_{\text{F}}/dt=100\text{A}/\mu\text{s}$ (note 4) | | 30 | | ns |
| 反向恢复电荷 Reverse recovery charge | Q_{rr} | | | 80 | | nc |

热特性 THERMAL CHARACTERISTIC

| 项 目 Parameter | 符 号 Symbol | 最大 Max | 单位 Unit |
|--|----------------------|-----------|---------------------------|
| | | MC11N06A | |
| 结到环境的热阻 Thermal Resistance, Junction to Ambient | $R_{\text{th(j-A)}}$ | 62.5 | $^\circ\text{C}/\text{W}$ |
| 结到管壳的热阻 Thermal Resistance, Junction to Case | $R_{\text{th(j-C)}}$ | 1.43 | $^\circ\text{C}/\text{W}$ |

注释:

- 1: 脉冲宽度由最高结温限制
- 2: $I_{\text{AS}}=50\text{A}, V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.4\text{mH},$
 $R_{\text{G}}=25\Omega,$ 起始结温 $T_j=25^\circ\text{C}$
- 3: 脉冲测试: 脉冲宽度 $\leq 300\mu\text{s}$, 占空比 $\leq 2\%$
- 4: 基本与工作温度无关

Notes:

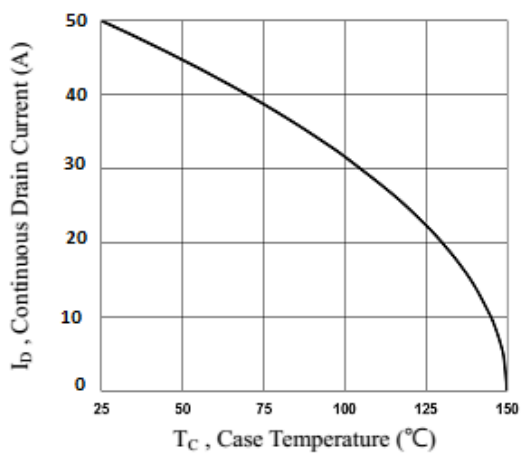
- 1: Pulse width limited by maximum junction temperature
- 2: $I_{\text{AS}}=50\text{A}, V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.4\text{mH},$
 $R_{\text{G}}=25\Omega,$ Starting $T_j=25^\circ\text{C}$
- 3: Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- 4: Essentially independent of operating temperature



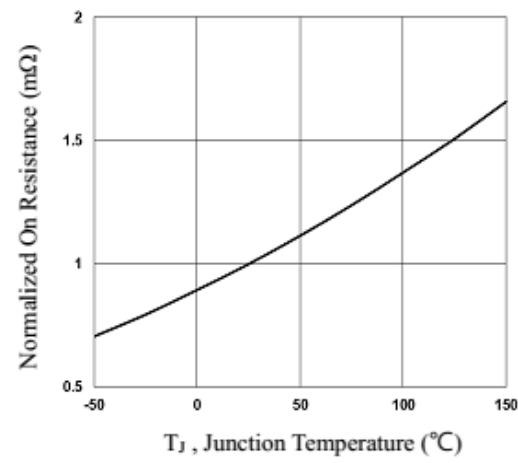


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

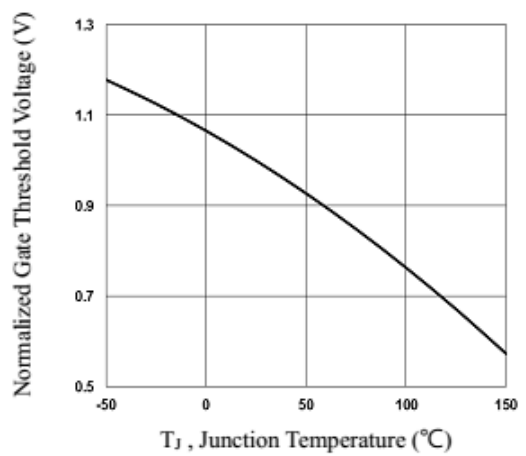
Continuous Drain Current vs. T_C



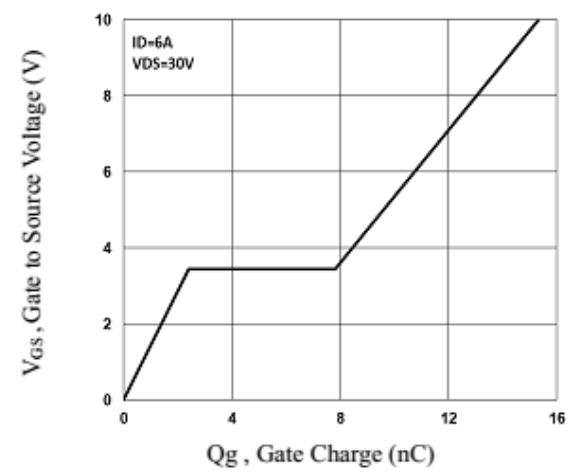
Normalized $R_{DS(on)}$ vs. T_J



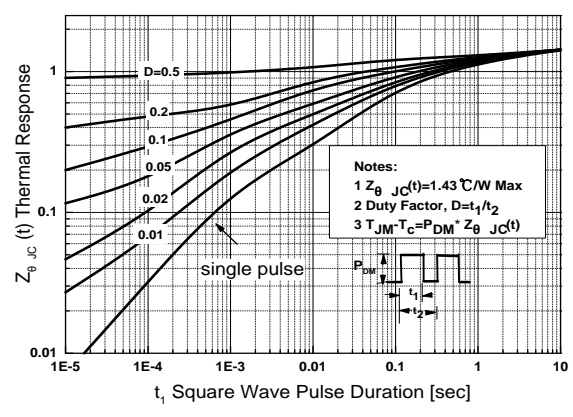
Normalized V_{th} vs. T_J



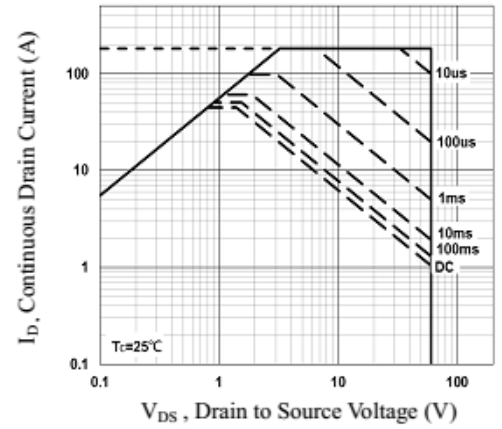
Gate Charge Characteristics



Transient Response

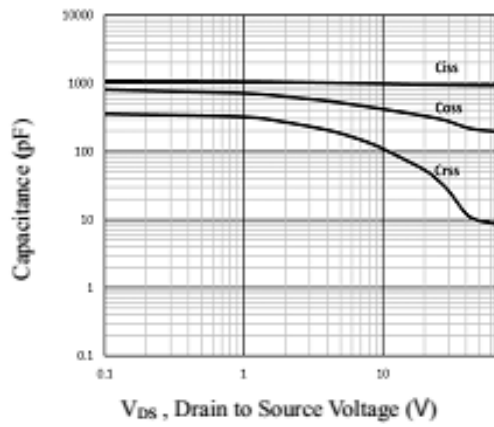


Maximum Safe Operation

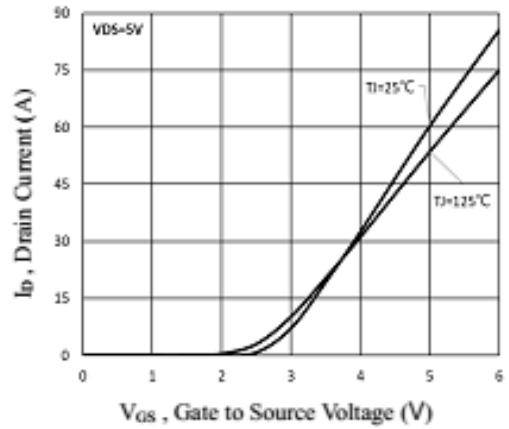




Capacitance Characteristics



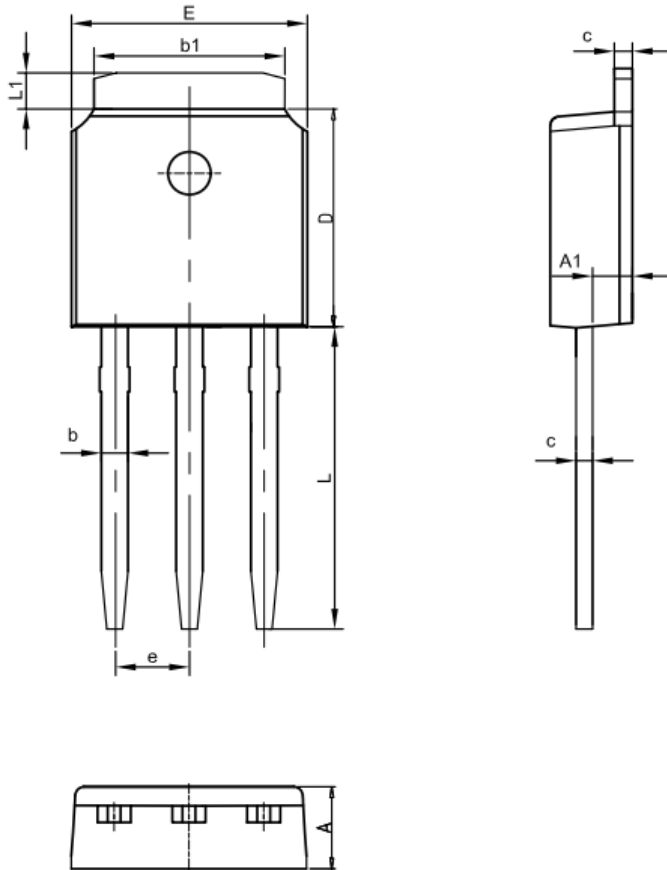
Transfer Characteristics





IPAK

单位 Unit: mm

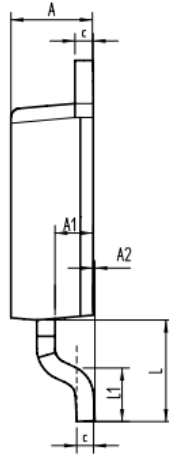
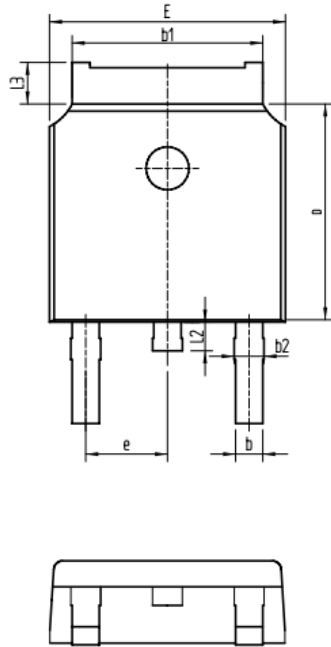


| SYMBOL | MM | |
|--------|----------|------|
| | MIN | MAX |
| A | 2.1 | 2.5 |
| A1 | 0.87 | 1.27 |
| b | 0.63 | 0.93 |
| b1 | 5.13 | 5.53 |
| c | 0.40 | 0.60 |
| D | 5.80 | 6.40 |
| E | 6.30 | 6.90 |
| L | 9.10 | 9.70 |
| e | 2.286BSC | |
| L1 | 0.82 | 1.22 |



**DPAK**

单位 Unit: mm



| SYMBOL | mm | |
|--------|----------|------|
| | MIN | MAX |
| A | 2.16 | 2.41 |
| A1 | 0.97 | 1.17 |
| A2 | 0.00 | 0.15 |
| b | 0.63 | 0.93 |
| b1 | 5.13 | 5.53 |
| b2 | 0.66 | 0.96 |
| c | 0.40 | 0.60 |
| D | 5.80 | 6.40 |
| E | 6.30 | 6.90 |
| e | 2.286BSC | |
| L | 2.50 | 3.30 |
| L1 | 1.20 | 1.80 |
| L2 | 0.60 | 1.00 |
| L3 | 0.85 | 1.30 |



**注意事项**

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