

BRCS060N04SZCQ

Rev.A Sep.-2022

描述 / Descriptions

PDFN5×6 封装 N 沟道场效应管。

N-Channel MOSFET in a PDFN5×6 Plastic Package.

特征 / Features

低电阻可最大地降低导电损耗；低栅极电荷，可实现快速切换；低热阻；符合 AEC-Q101 标准高可靠性要求；无卤产品。

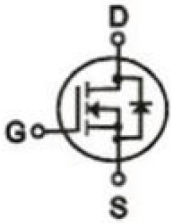
Low $R_{DS(ON)}$ to minimize conductive loss; low Gate Charge for fast switching; Low Thermal resistance; Qualified to AEC-Q101 Standards for High Reliability; HF Product.

用途 / Applications

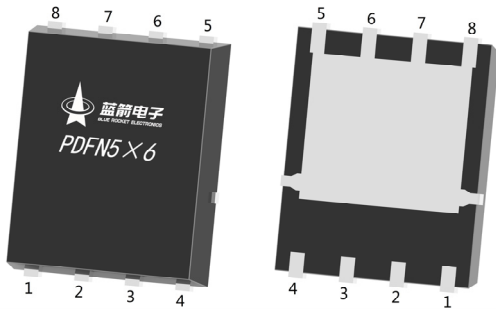
电池管理，MB/NB/UMPC/VGA 高频负载点同步 Buck 变换器，联网直流-直流电力系统，负荷开关，满足汽车应用的严格要求。

Battery Management, High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA, Networking DC-DC Power System, Load Switch, Meet the stringent requirements of automotive applications.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1、2、3: S PIN4: G PIN5、6、7、8: D

| Pin | 极性 |
|-----|----|
| 1 | S |
| 2 | S |
| 3 | S |
| 4 | G |
| 5 | D |
| 6 | D |
| 7 | D |
| 8 | D |

印章代码 / Marking

见印章说明。 See Marking Instructions.

极限参数 / Absolute Maximum Ratings($T_a=25^\circ\text{C}$)

| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit |
|--|-----------------------------|-----------------|--------------------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Drain Current - Continuous | I_D | 30 | A |
| Drain Current – Pulsed | I_{DM} | 110 | A |
| Gate-Source Voltage | V_{GS} | $\pm 20V$ | V |
| Power Dissipation | $P_D(T_c=25^\circ\text{C})$ | 36.5 | W |
| Single Pulse Avalanche Energy(L=0.5mH) | E_{AS} | 78.5 | mJ |
| Avalanche Current(L=0.5mH) | I_{AS} | 15 | A |
| Junction and Storage Temperature Range | T_j, T_{stg} | -55 to 150 | $^\circ\text{C}$ |
| Thermal resistance, junction - ambient | $t \leq 10s$ | $R_{\theta JA}$ | $^\circ\text{C/W}$ |
| | Steady-State | | |
| Thermal resistance, junction - case | Steady-State | $R_{\theta JC}$ | 3.4 |

电性能参数 / Electrical Characteristics($T_a=25^\circ\text{C}$)

| 参数 Parameter | 符号 Symbol | 测试条件 Test Conditions | 最小值 Min | 典型值 Typ | 最大值 Max | 单位 Unit |
|-----------------------------------|---------------|--|------------|------------|------------|---------------|
| Drain-Source Breakdown Voltage | BV_{DSS} | $I_D=250\mu\text{A}, V_{GS}=0V$ | 40 | 46 | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=40V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Body leakage current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ | 1.0 | 1.6 | 2.5 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=10A$ | | 5.6 | 6 | m Ω |
| | | $V_{GS}=4.5V, I_D=10A$ | | 7.8 | 9 | |
| Diode Forward Voltage | V_{SD} | $I_S=1A, V_{GS}=0V$ | | | 1.2 | V |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$ | | 990 | | pF |
| Output Capacitance | C_{oss} | | | 390 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 42 | | |
| Gate resistance | R_g | $V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$ | | 5.2 | | Ω |
| Total Gate Charge | $Q_{g(10V)}$ | $V_{GS}=10V, V_{DS}=20V, I_D=20A$ | | 20 | | nC |
| Total Gate Charge | $Q_{g(4.5V)}$ | | | 8.5 | | |
| Gate Source Charge | Q_{gs} | | | 5.5 | | |
| Gate Drain Charge | Q_{gd} | | | 3 | | |

电性能参数 / Electrical Characteristics(Ta=25°C)

| 参数 Parameter | 符号 Symbol | 测试条件 Test Conditions | 最小值 Min | 典型值 Typ | 最大值 Max | 单位 Unit |
|---------------------|--------------|--|------------|------------|------------|------------|
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}=10V$ $V_{DS}=20V$ $R_L=1.0\Omega$ $R_{GEN}=3\Omega$ | | 7.5 | | ns |
| Turn-On Rise Time | t_r | | | 2 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 23 | | |
| Turn-Off Fall Time | t_f | | | 3 | | |

电参数曲线图 / Electrical Characteristic Curve

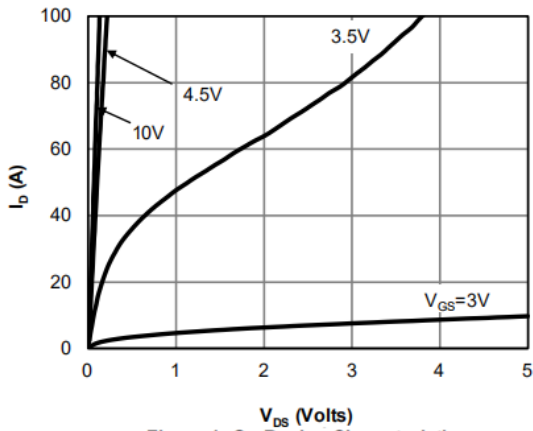


Figure 1: On-Region Characteristics

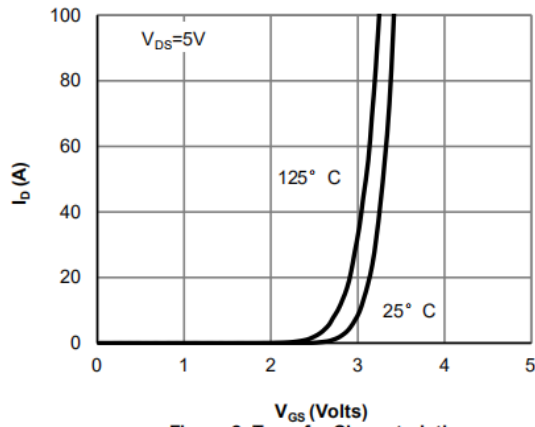


Figure 2: Transfer Characteristics

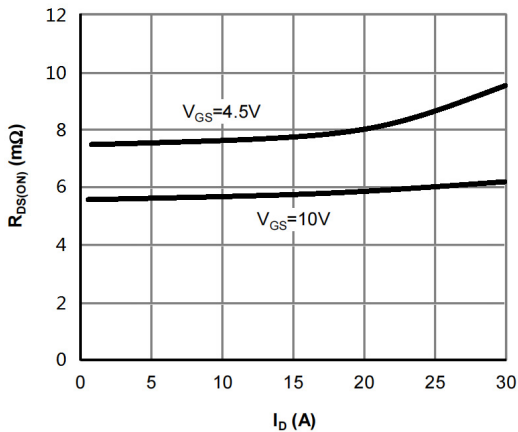


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

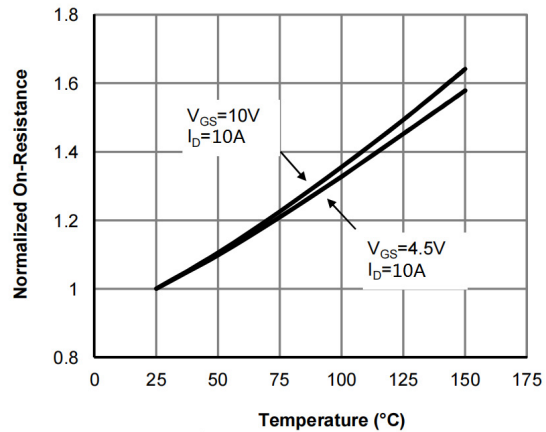


Figure 4: On-Resistance vs. Junction Temperature

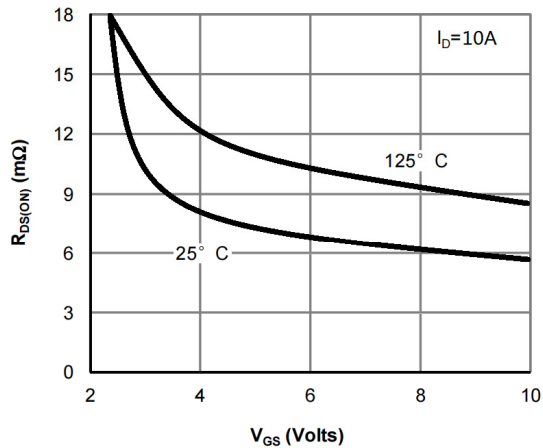


Figure 5: On-Resistance vs. Gate-Source Voltage

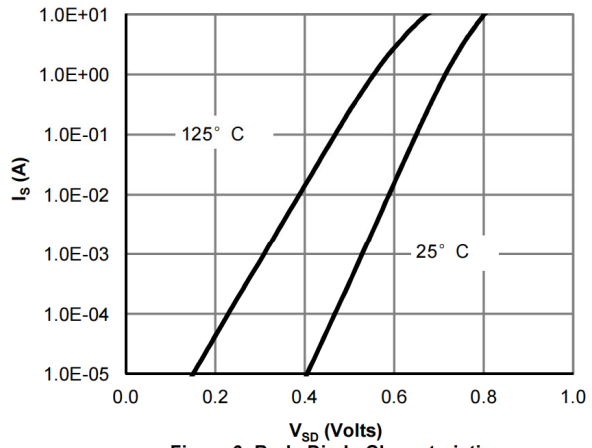


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

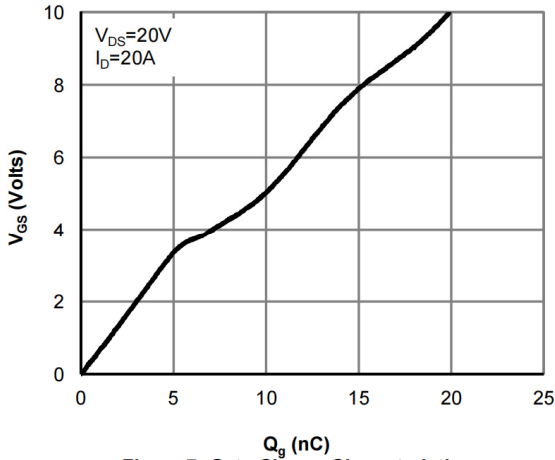


Figure 7: Gate-Charge Characteristics

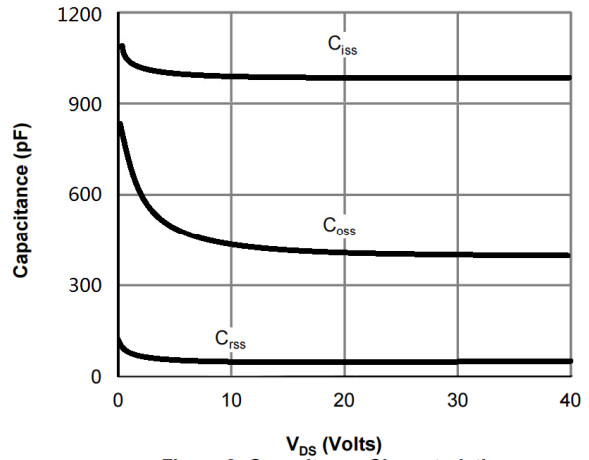


Figure 8: Capacitance Characteristics

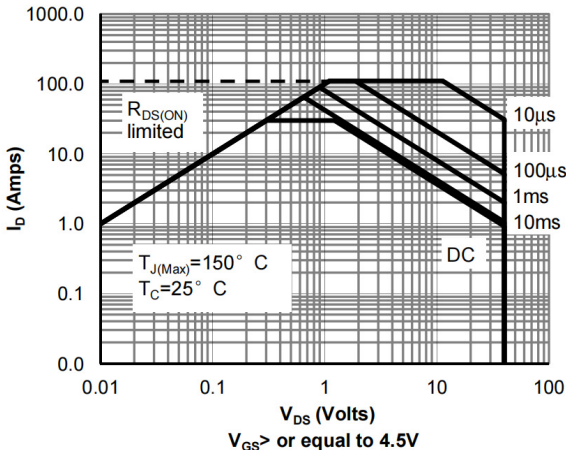


Figure 9: Maximum Forward Biased Safe Operating Area

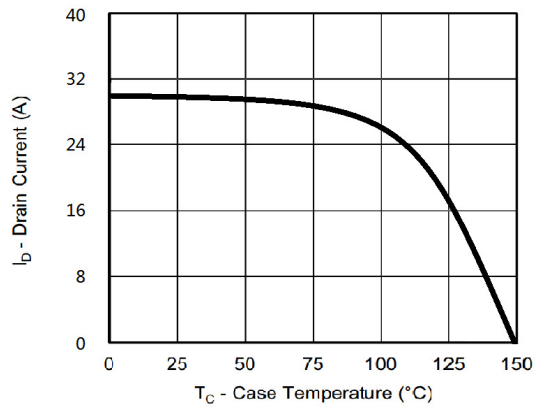


Figure 10: Maximum Continuous Drain Current vs Case Temperature

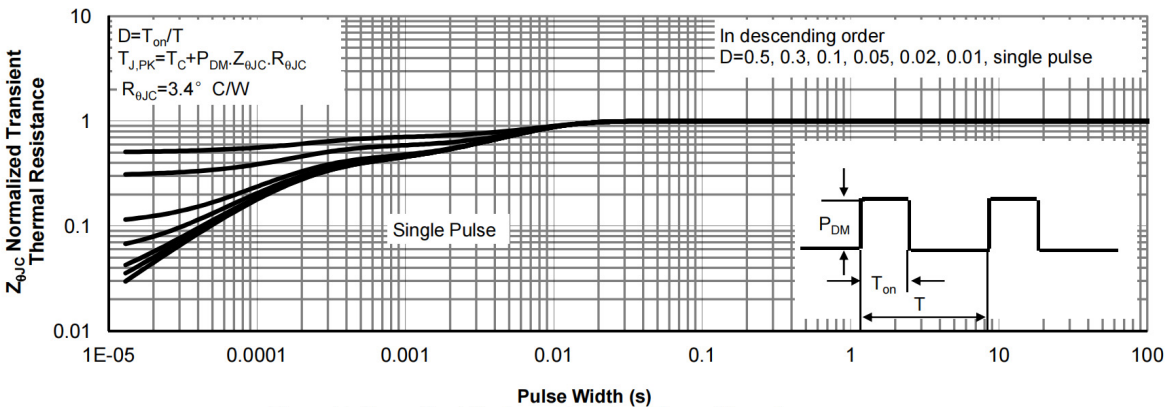
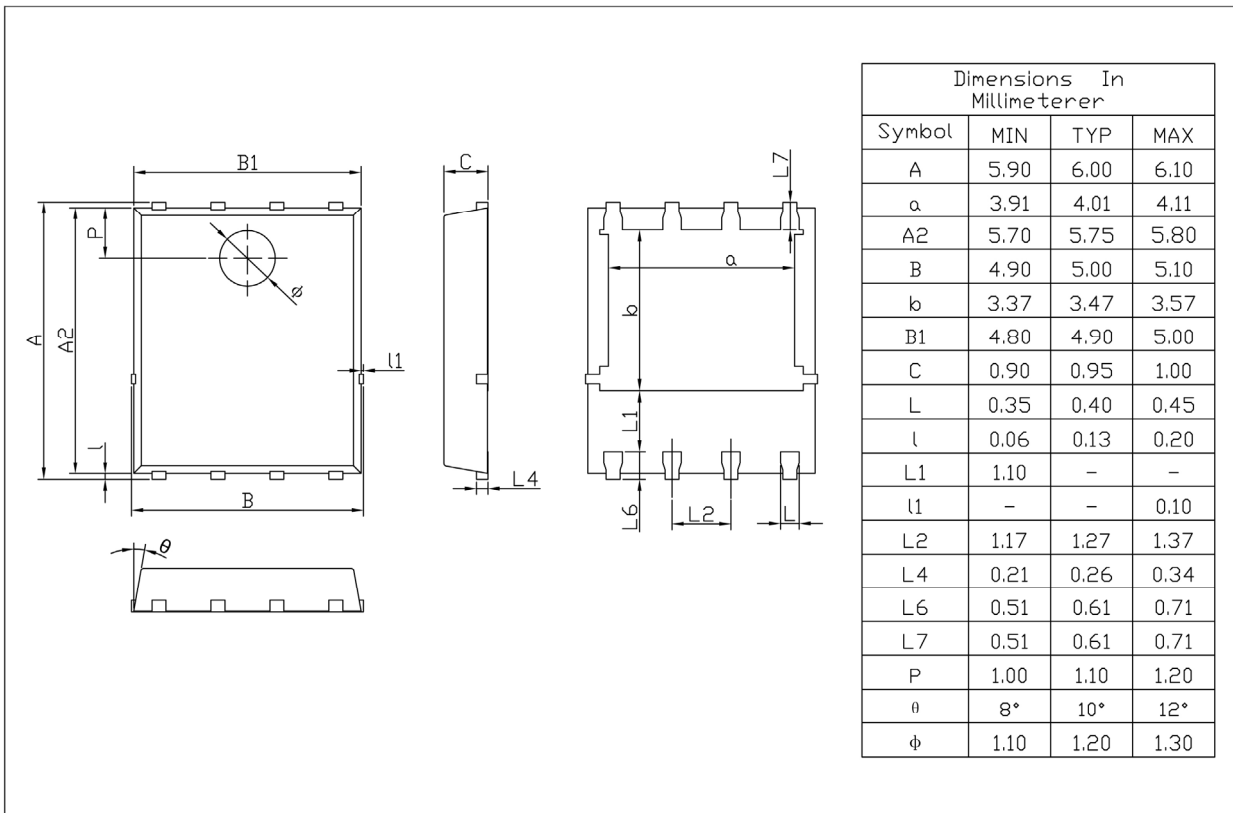


Figure 11: Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions

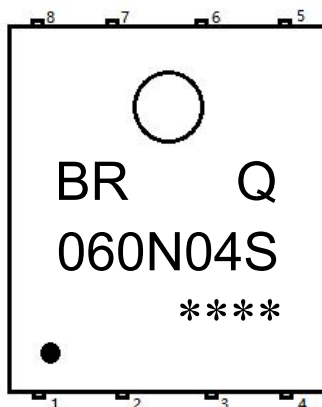
PDFN5 X6

Unit:mm



Rev.00 201812

印章说明 / Marking Instructions



说明：

BR： 为公司代码

Q： 为汽车无卤产品标识

060N04S： 为产品型号

****： 为生产批号代码，随生产批号变化

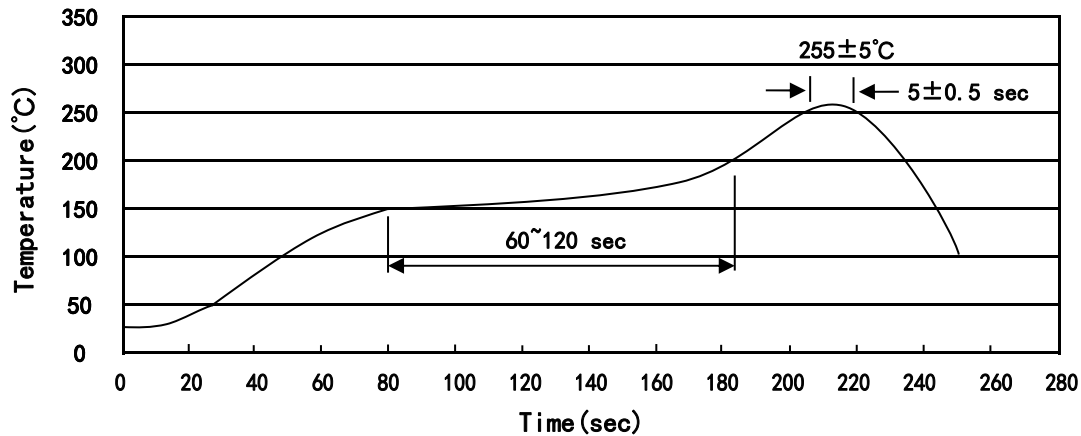
Note：

BR： Company Code

Q: Automobile halogen-free product Code

060N04S： Product Type

****: Lot No. Code, code change with Lot No

回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)


说明：

- 1、预热温度 150~200°C，时间 60~120sec;
- 2、峰值温度 255±5°C，时间持续为 5±0.5sec;
- 3、焊接制程冷却速度为 2~10°C/sec.

Note:

- 1.Preheating:150~200°C, Time:60~120sec.
- 2.Peak Temp.:255±5°C, Duration:5±0.5sec.
3. Cooling Speed: 2~10°C/sec.

耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions

温度：260±5°C

时间：10±1 sec.

Temp.:260±5°C

Time:10±1 sec

包装规格 / Packaging SPEC.

卷盘包装 / REEL

| Package Type 封装形式 | Units 包装数量 | | | | | Dimension 包装尺寸 (unit: mm ³) | | |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|---|-------------|-------------|
| | Units/Reel 只/卷盘 | Reels/Inner Box 卷盘/盒 | Units/Inner Box 只/盒 | Inner Boxes/Outer Box 盒/箱 | Units/Outer Box 只/箱 | Reel | Inner Box 盒 | Outer Box 箱 |
| PDFN5×6 | 5000 | 2 | 10000 | 6 | 60000 | 13"×12 | 360×360×50 | 380×335×366 |

使用说明 / Notices