



40V N-Channel SGT Power MOSFET

General Description

The SJM036N04 uses SGT technology to provide excellent $R_{DS(ON)}$, low gate charge and fast switching characteristics. This device is suitable for use as a wide variety of applications.

Features

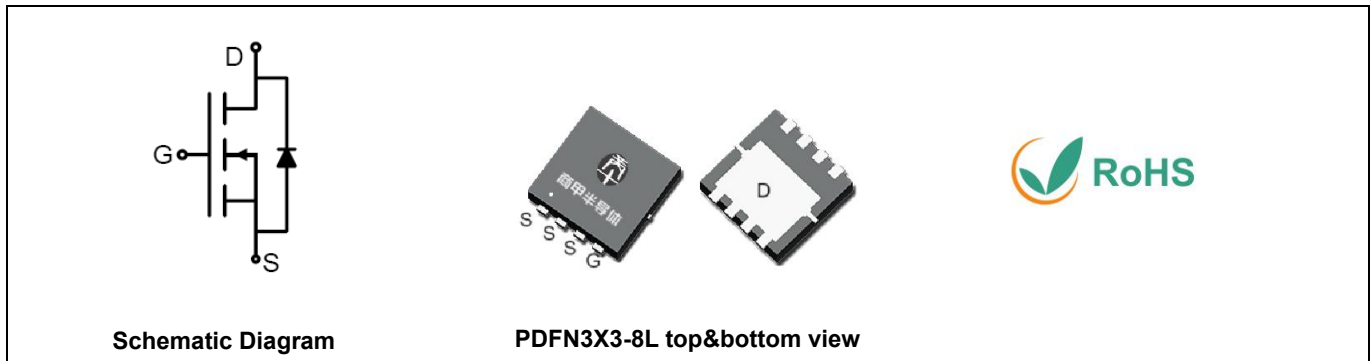
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

- DC/DC Converter
- Load Switching, Quick/Wireless Charging, Motor Driving

Key Performance Parameters

| Parameter | Value | Unit |
|-------------------|-------|------------|
| V_{DS} | 40 | V |
| $R_{DS(ON_TYP)}$ | 2.8 | m Ω |
| I_D | 92 | A |
| Q_G | 18 | nC |



Package Marking and Ordering Information

| Device/Ordering Code | Marking | Package | Packing | Reel Size | Tape width | Quantity |
|----------------------|-----------|---------|---------|-----------|------------|----------|
| SJM036N04 | SJM036N04 | PDFN3X3 | Tape | \ | \ | 5000 Pcs |

Table 1. Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Limit | Unit |
|------------------|--|------------|------------------|
| V_{DS} | Drain-Source Voltage ($V_{GS}=0V$) | 40 | V |
| V_{GS} | Gate-Source Voltage ($V_{DS}=0V$) | ± 20 | V |
| I_D | Drain Current-Continuous($T_C=25^\circ\text{C}$) | 92 | A |
| | Drain Current-Continuous($T_C=100^\circ\text{C}$) | 58 | A |
| I_{DM} (pluse) | Drain Current-Continuous@ Current-Pulsed (Note 1) | 368 | A |
| P_D | Maximum Power Dissipation($T_C=25^\circ\text{C}$) | 50 | W |
| | Maximum Power Dissipation($T_C=100^\circ\text{C}$) | 20 | W |
| E_{AS} | Avalanche energy (Note 2) | 182 | mJ |
| T_J, T_{STG} | Operating Junction and Storage Temperature Range | -55 To 150 | $^\circ\text{C}$ |

Table 2. Thermal Characteristic

| Symbol | Parameter | Typ | Max | Unit |
|-----------------|--------------------------------------|-----|-----|---------------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case | | 2.5 | $^\circ\text{C}/\text{W}$ |



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Table 3. Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|-----------------------------------|--|-----|------|-----------|------------|
| On/Off States | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 40 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=40V, V_{GS}=0V, T_J=25^\circ\text{C}$ | | | 1 | μA |
| | | $V_{DS}=40V, V_{GS}=0V, T_J=125^\circ\text{C}$ | | | 100 | μA |
| I_{GSS} | Gate-Body Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | | 4 | V |
| g_{FS} | Forward Transconductance | $V_{DS}=5V, I_D=20A$ | | 40 | | S |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance | $V_{GS}=10V, I_D=30A, T_J=25^\circ\text{C}$ | | 2.8 | 3.6 | m Ω |
| Dynamic Characteristics | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS}=20V, V_{GS}=0V, f=1.0\text{MHz}$ | | 1400 | | pF |
| C_{oss} | Output Capacitance | | | 1120 | | pF |
| C_{rss} | Reverse Transfer Capacitance | | | 63 | | pF |
| R_g | Gate resistance | $V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$ | | 3.2 | | Ω |
| Switching Parameters | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{GS}=10V, V_{DS}=20V, R_L=1\Omega, R_{GEN}=3\Omega$ | | 8 | | nS |
| t_r | Turn-on Rise Time | | | 44 | | nS |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 25 | | nS |
| t_f | Turn-Off Fall Time | | | 7 | | nS |
| Q_g | Total Gate Charge | $V_{GS}=10V, V_{DS}=20V, I_D=20A$ | | 18 | | nC |
| Q_{gs} | Gate-Source Charge | | | 4.7 | | nC |
| Q_{gd} | Gate-Drain Charge | | | 3.7 | | nC |
| Source-Drain Diode Characteristics | | | | | | |
| I_{SD} | Source-Drain Current (Body Diode) | | | | 92 | A |
| V_{SD} | Forward on Voltage (Note 3) | $V_{GS}=0V, I_S=20A$ | | | 1.2 | V |
| t_{rr} | Reverse Recovery Time | $I_F=20A, dI/dt=100A/\mu s$ | | 38 | | ns |
| Q_{rr} | Reverse Recovery Charge | $I_F=20A, dI/dt=100A/\mu s$ | | 18 | | nC |

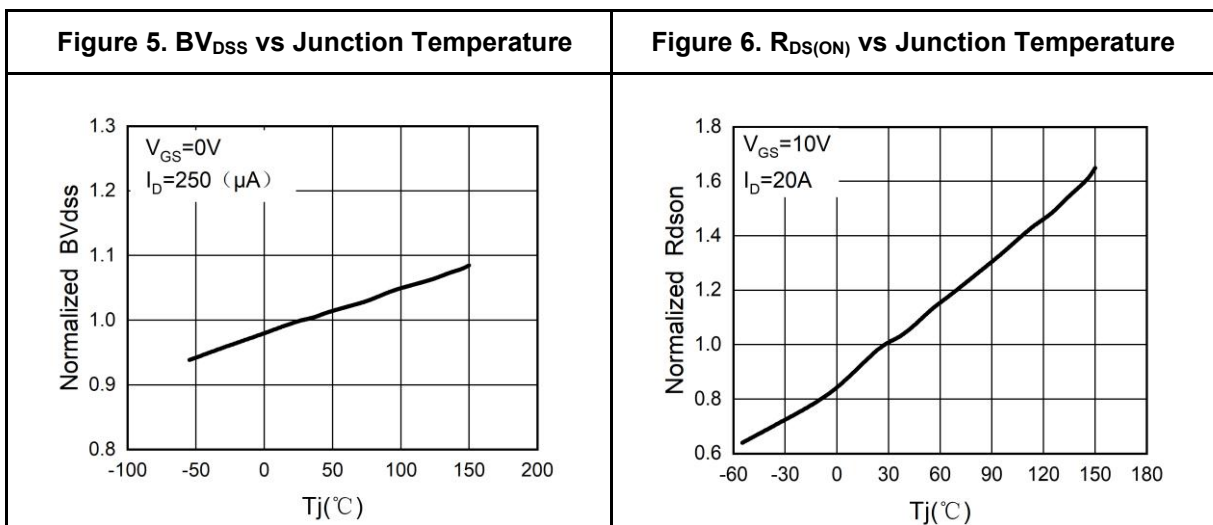
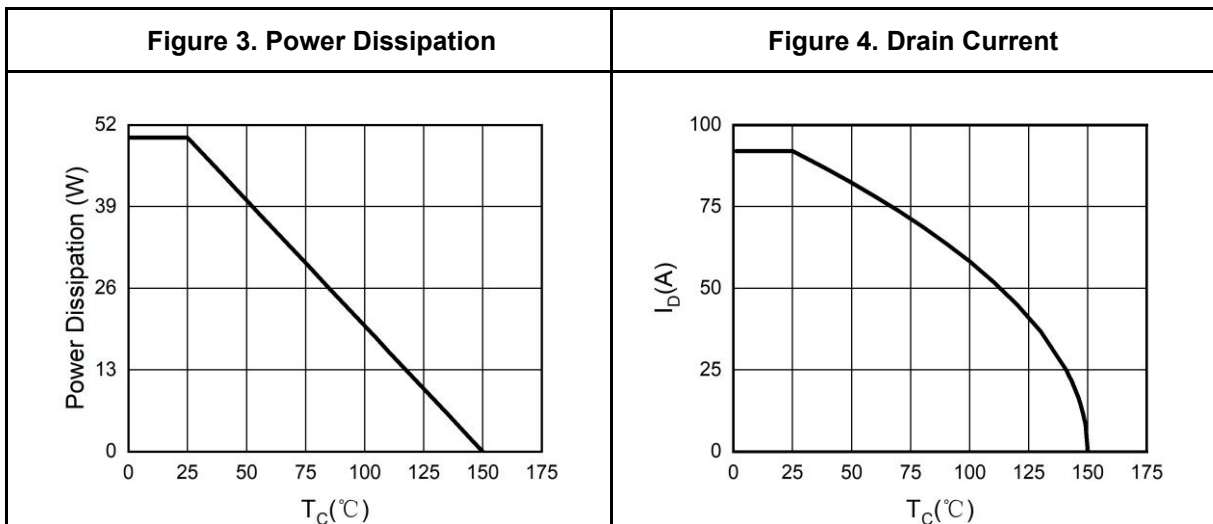
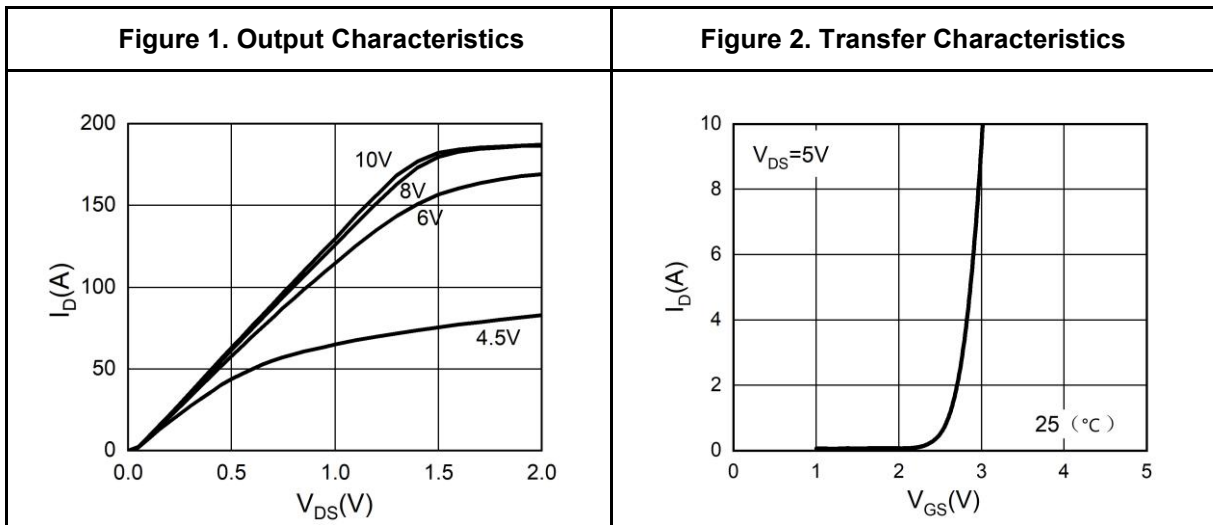
Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition: $T_J=25^\circ\text{C}, V_{DD}=30V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

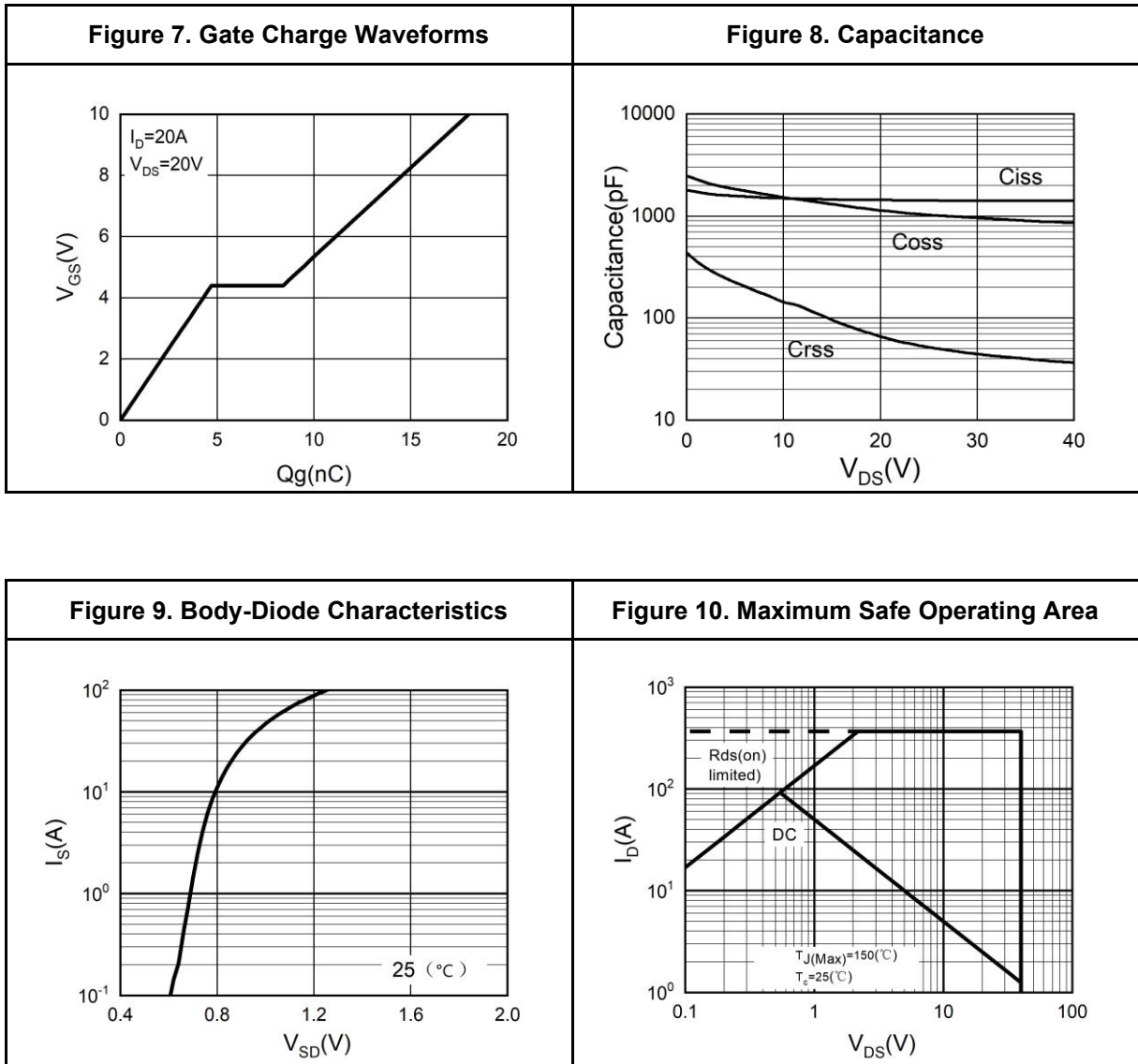


Typical Electrical And Thermal Characteristics (Curves)



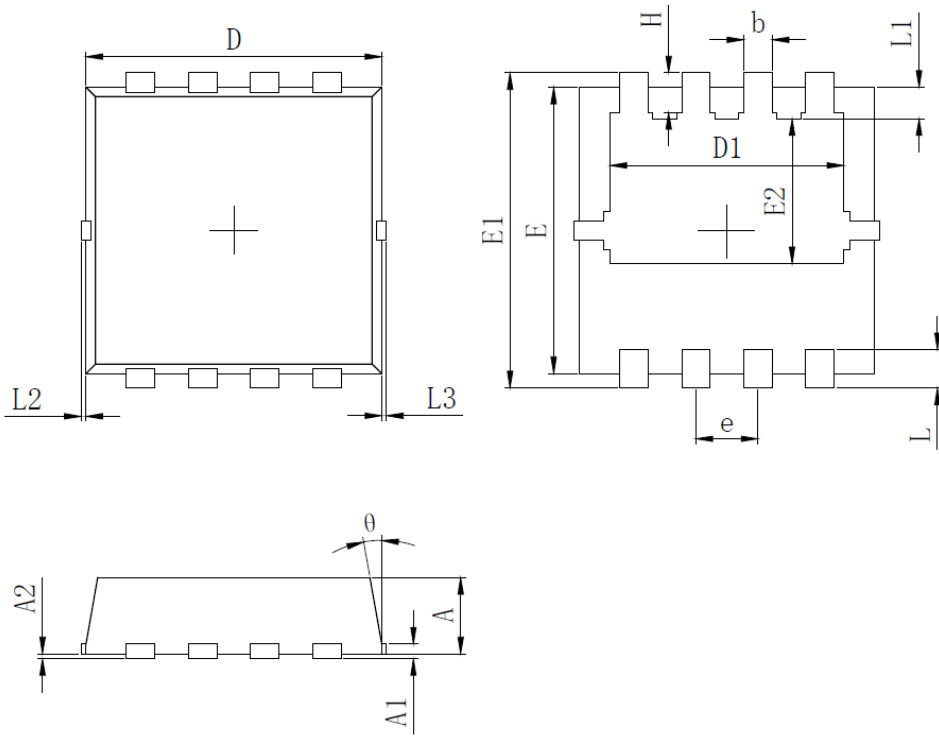


Typical Electrical And Thermal Characteristics (Curves)





PDFN3X3-8L Package Information



| SYMBOL | MILLIMETER | | |
|----------|------------|-------|-------|
| | MIN | Typ. | MAX |
| A | 0.700 | 0.800 | 0.900 |
| A1 | 0.152 REF. | | |
| A2 | 0~0.05 | | |
| D | 3.000 | 3.100 | 3.200 |
| D1 | 2.300 | 2.450 | 2.600 |
| E | 2.900 | 3.000 | 3.100 |
| E1 | 3.150 | 3.300 | 3.450 |
| E2 | 1.320 | 1.520 | 1.720 |
| b | 0.200 | 0.300 | 0.400 |
| e | 0.550 | 0.650 | 0.750 |
| L | 0.300 | 0.400 | 0.500 |
| L1 | 0.180 | 0.330 | 0.480 |
| L2 | 0~0.100 | | |
| L3 | 0~0.100 | | |
| H | 0.315 | 0.415 | 0.515 |
| θ | 8° | 10° | 12° |



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