



40V N-Channel Trench Power MOSFET

General Description

The SJH40ND076 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. 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 handing capability
- Lead free product is acquired

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Key Performance Parametes

| Parameter | Value | Unit |
|-------------------|-------|------------|
| V_{DS} | 40 | V |
| $R_{DS(ON_TYP)}$ | 7.8 | m Ω |
| I_D | 44 | A |
| Q_G | 32 | nC |



Package Marking and Ordering Information

| Device/Ordering Code | Marking | Package | Packing | Reel Size | Tape width | Quantity |
|----------------------|------------|---------|---------|-----------|------------|----------|
| SJH40ND076 | SJH40ND076 | PDFN5X6 | 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($T_C=25^\circ\text{C}$) | 44 | A |
| | Drain Current-Continuous($T_C=100^\circ\text{C}$) | 28 | A |
| I_{DM} (pluse) | Drain Current-Continuous@ Current-Pulsed (Note 1) | 176 | A |
| P_D | Maximum Power Dissipation($T_C=25^\circ\text{C}$) | 32 | W |
| | Maximum Power Dissipation($T_C=100^\circ\text{C}$) | 13 | W |
| E_{AS} | Avalanche energy (Note 2) | 110 | 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 | | 3.9 | $^\circ\text{C/W}$ |



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Table 3. Electrical Characteristics (T_J=25°C unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|---|-----|------|------|------|
| On/Off States | | | | | | |
| B _V DSS | Drain-Source Breakdown Voltage | V _{GS} =0V I _D =250μA | 40 | | | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =40V, V _{GS} =0V T _J =25°C | | | 1 | μA |
| | | V _{DS} =40V, V _{GS} =0V T _J =125°C | | | 100 | μA |
| I _{GSS} | Gate-Body Leakage Current | V _{GS} =±20V, V _{DS} =0V | | | ±100 | nA |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250μA | 1 | | 2.5 | V |
| g _{FS} | Forward Transconductance | V _{DS} =5V, I _D =20A | | 34 | | S |
| R _{DS(ON)} | Drain-Source On-State Resistance | V _{GS} =10V, I _D =20A T _J =25°C | | 7.8 | 9.8 | mΩ |
| | | V _{GS} =4.5V, I _D =15A T _J =25°C | | 9.6 | 12.8 | mΩ |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =20V, V _{GS} =0V, f=1.0MHz | | 1670 | | pF |
| C _{OSS} | Output Capacitance | | | 127 | | pF |
| C _{rSS} | Reverse Transfer Capacitance | | | 113 | | pF |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, f=1.0MHz | | 1.5 | | Ω |
| Switching Parameters | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{GS} =10V, V _{DS} =20V, R _L =1Ω, R _{GEN} =3Ω | | 8.4 | | nS |
| t _r | Turn-on Rise Time | | | 6.2 | | nS |
| t _{d(off)} | Turn-Off Delay Time | | | 40.2 | | nS |
| t _f | Turn-Off Fall Time | | | 7.8 | | nS |
| Q _g | Total Gate Charge | V _{GS} =10V, V _{DS} =20V, I _D =20A | | 32 | | nC |
| Q _{gs} | Gate-Source Charge | | | 5.8 | | nC |
| Q _{gd} | Gate-Drain Charge | | | 6 | | nC |
| Source-Drain Diode Characteristics | | | | | | |
| I _{SD} | Source-Drain Current (Body Diode) | | | | 44 | 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/μs | | 18.3 | | ns |
| Q _{rr} | Reverse Recovery Charge | I _F =20A, dI/dt=100A/μs | | 12.8 | | nC |

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

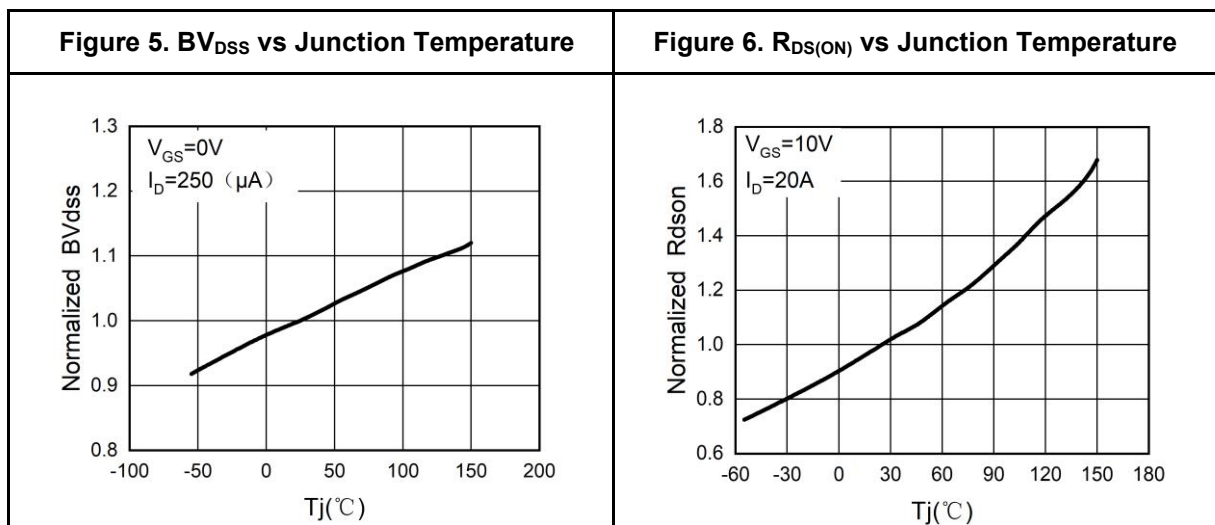
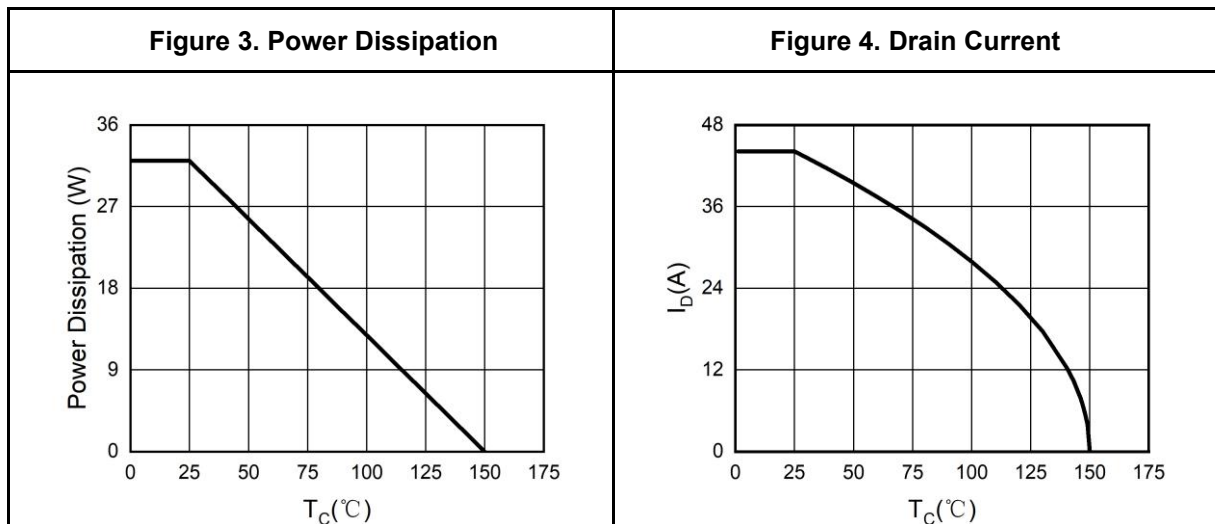
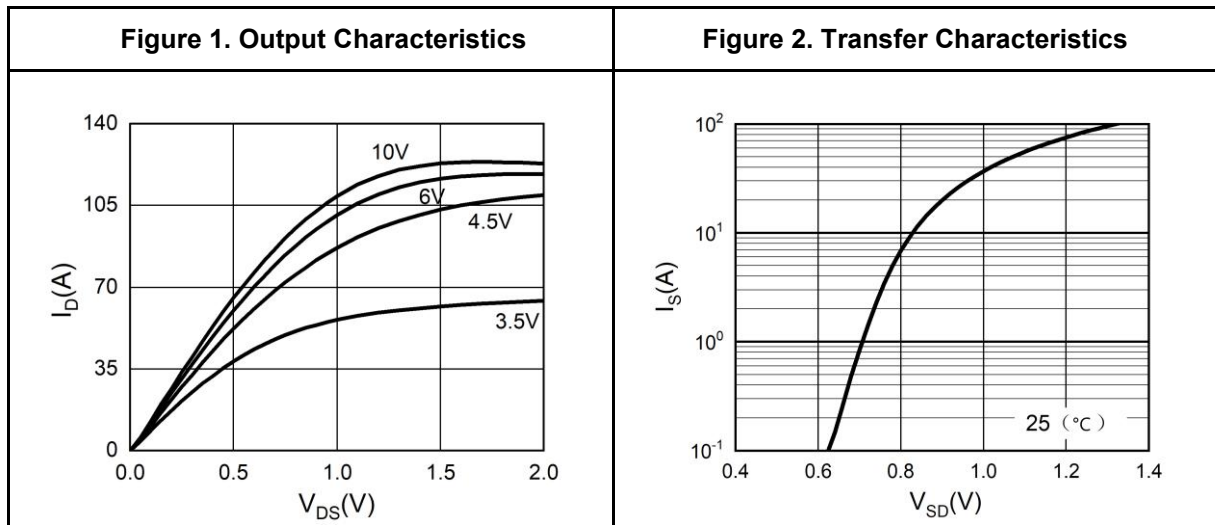
Notes 2.EAS condition: T_J=25°C, V_{DD}=40V, V_G=10V, R_g=25Ω, L=0.5mH.

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



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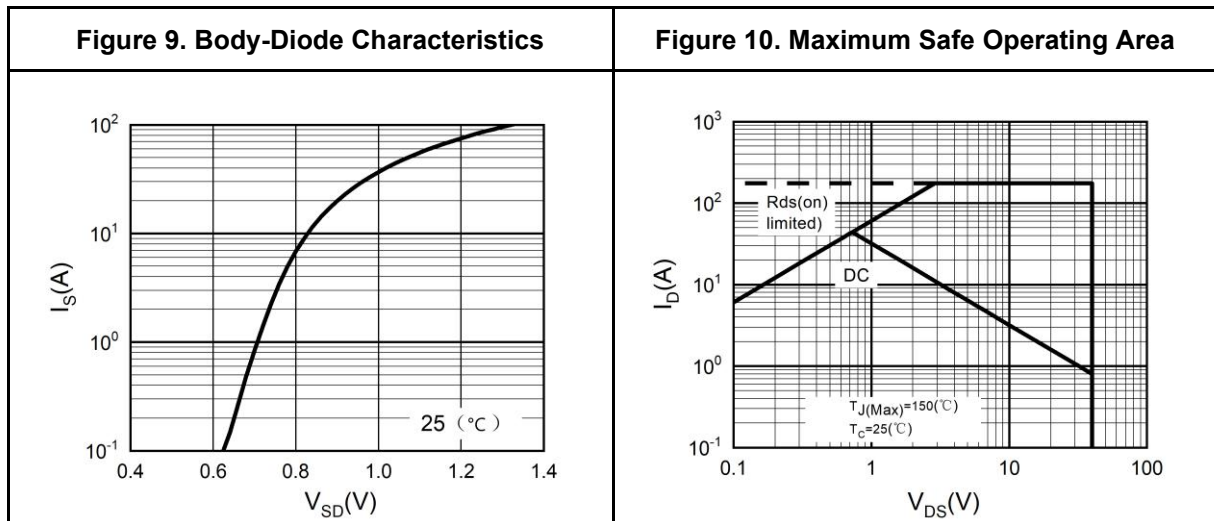
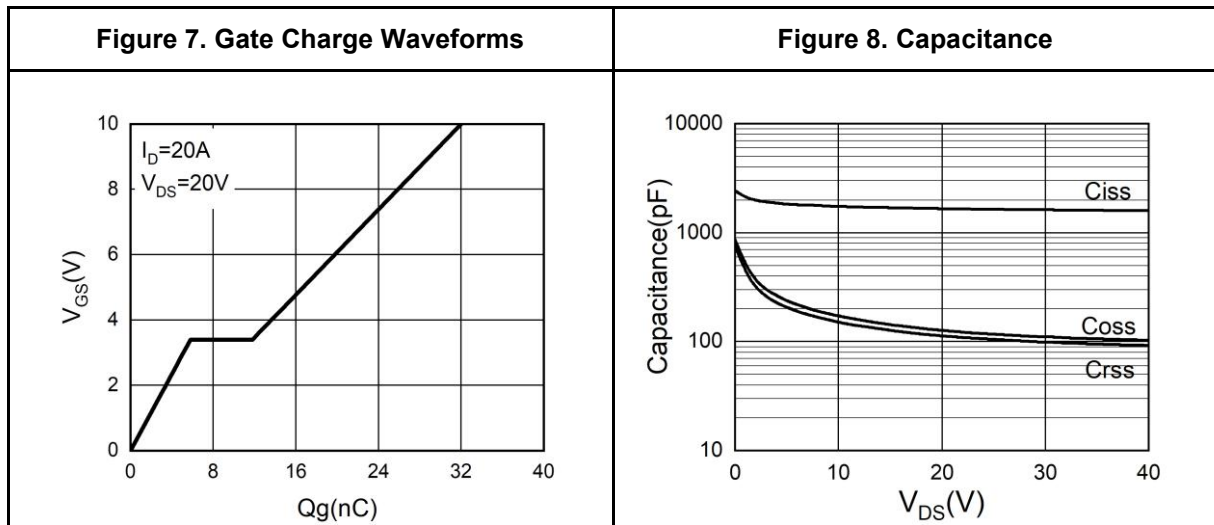
Typical Electrical And Thermal Characteristics (Curves)





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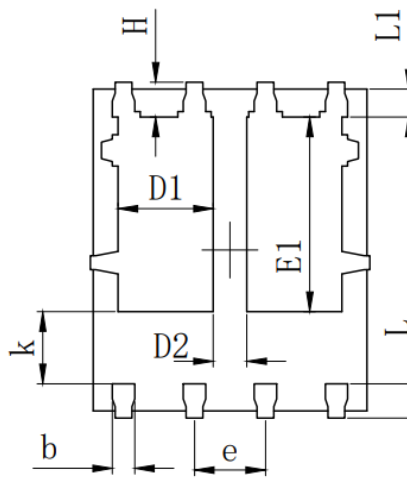
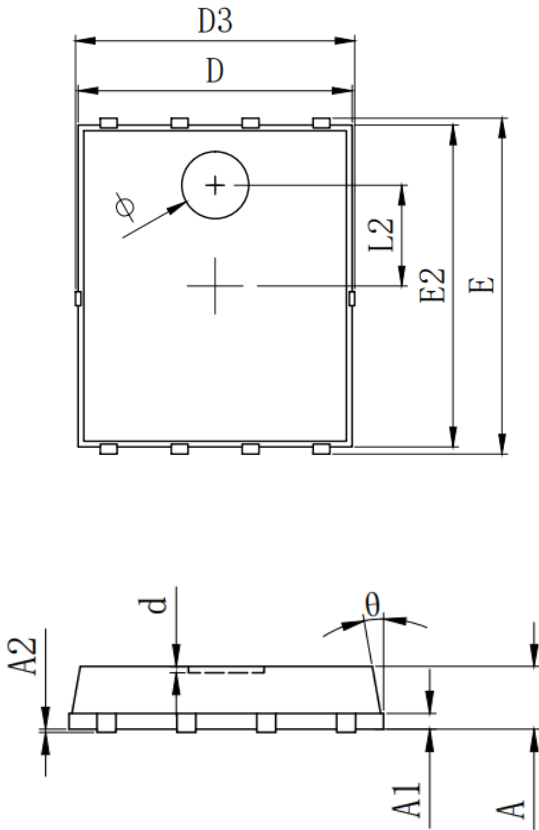
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PDFN5X6-8L Package Information



| SYMBOL | MILLIMETER | | |
|--------|------------|-------|-------|
| | MIN | Typ. | MAX |
| A | 0.900 | 1.000 | 1.100 |
| A1 | 0.254 REF. | | |
| A2 | 0~0.05 | | |
| D | 4.824 | 4.900 | 4.976 |
| D1 | 1.605 | 1.705 | 1.805 |
| D2 | 0.500 | 0.600 | 0.700 |
| D3 | 4.924 | 5.000 | 5.076 |
| E | 5.924 | 6.000 | 6.076 |
| E1 | 3.375 | 3.475 | 3.575 |
| E2 | 5.674 | 5.750 | 5.826 |
| b | 0.350 | 0.400 | 0.450 |
| e | 1.270 TYP. | | |
| L | 0.534 | 0.610 | 0.686 |
| L1 | 0.424 | 0.500 | 0.576 |
| L2 | 1.800 REF. | | |
| k | 1.190 | 1.290 | 1.390 |
| H | 0.549 | 0.625 | 0.701 |
| θ | 8° | 10° | 12° |
| φ | 1.100 | 1.200 | 1.300 |
| d | | | 0.100 |



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