



30V P-Channel Trench Power MOSFET

General Description

The SJD30D160 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
- 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} | -30 | V |
| $R_{DS(ON_TYP)}$ | 16.8 | m Ω |
| I_D | -24 | A |
| Q_G | 8 | nC |



Package Marking and Ordering Information

| Device/Ordering Code | Marking | Package | Packing | Reel Size | Tape width | Quantity |
|----------------------|-----------|---------|---------|-----------|------------|----------|
| SJD30P160 | SJD30P160 | TO-252 | Tape | \ | \ | 2500 Pcs |

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

| Symbol | Parameter | Limit | Unit |
|------------------|--|------------|------------------|
| V_{DS} | Drain-Source Voltage ($V_{GS}=0V$) | -30 | V |
| V_{GS} | Gate-Source Voltage ($V_{DS}=0V$) | ± 20 | V |
| I_D | Drain Current-Continuous($T_C=25^\circ\text{C}$) | -24 | A |
| | Drain Current-Continuous($T_C=100^\circ\text{C}$) | -15 | A |
| I_{DM} (pluse) | Drain Current-Continuous@ Current-Pulsed (Note 1) | -96 | A |
| P_D | Maximum Power Dissipation($T_C=25^\circ\text{C}$) | 19 | W |
| | Maximum Power Dissipation($T_C=100^\circ\text{C}$) | 7.7 | W |
| E_{AS} | Avalanche energy (Note 2) | 56 | 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 | | 6.5 | $^\circ\text{C/W}$ |



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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 | -30 | | | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =-30V, V _{GS} =0V T _J =25°C | | | -1 | μA |
| | | V _{DS} =-30V, 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 | -2.5 | | -1 | V |
| g _{FS} | Forward Transconductance | V _{DS} =-5V, I _D =-10A | | 15.8 | | S |
| R _{DS(ON)} | Drain-Source On-State Resistance | V _{GS} =-10V, I _D =-10A T _J =25°C | | 16.8 | 21 | mΩ |
| R _{DS(ON)} | Drain-Source On-State Resistance | V _{GS} =-4.5V, I _D =-5A T _J =25°C | | 22.1 | 29.4 | mΩ |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =-15V, V _{GS} =0V, f=1.0MHz | | 1180 | | pF |
| C _{oss} | Output Capacitance | | | 137 | | pF |
| C _{rss} | Reverse Transfer Capacitance | | | 119 | | pF |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, f=1.0MHz | | 5.2 | | Ω |
| Switching Parameters | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{GS} =-10V, V _{DS} =-15V, R _L =1.5Ω, R _{GEN} =3Ω | | 8 | | nS |
| t _r | Turn-on Rise Time | | | 16 | | nS |
| t _{d(off)} | Turn-Off Delay Time | | | 45 | | nS |
| t _f | Turn-Off Fall Time | | | 33 | | nS |
| Q _g | Total Gate Charge | V _{GS} =-10V, V _{DS} =-15V, I _D =-10A | | 8 | | nC |
| Q _{gs} | Gate-Source Charge | | | 2 | | nC |
| Q _{gd} | Gate-Drain Charge | | | 2 | | nC |
| Source-Drain Diode Characteristics | | | | | | |
| I _{SD} | Source-Drain Current (Body Diode) | | | | -24 | A |
| V _{SD} | Forward on Voltage ^(Note 3) | V _{GS} =0V, I _S =-10A | | | -1.2 | V |
| t _{rr} | Reverse Recovery Time | I _F =-10A, dI/dt=100A/μs | | 8 | | ns |
| Q _{rr} | Reverse Recovery Charge | I _F =-10A, dI/dt=100A/μs | | 3 | | nC |

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

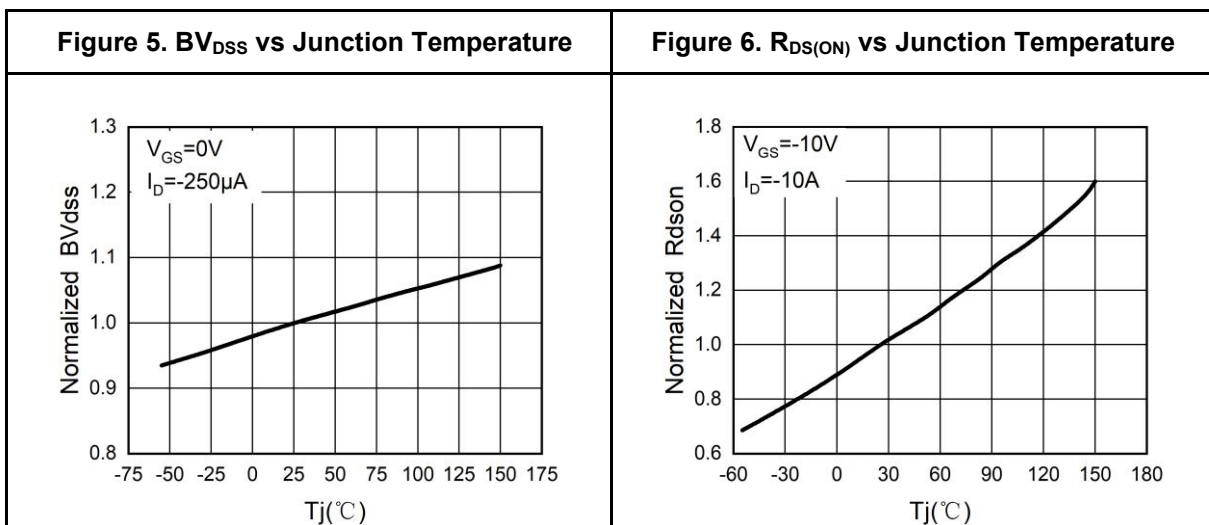
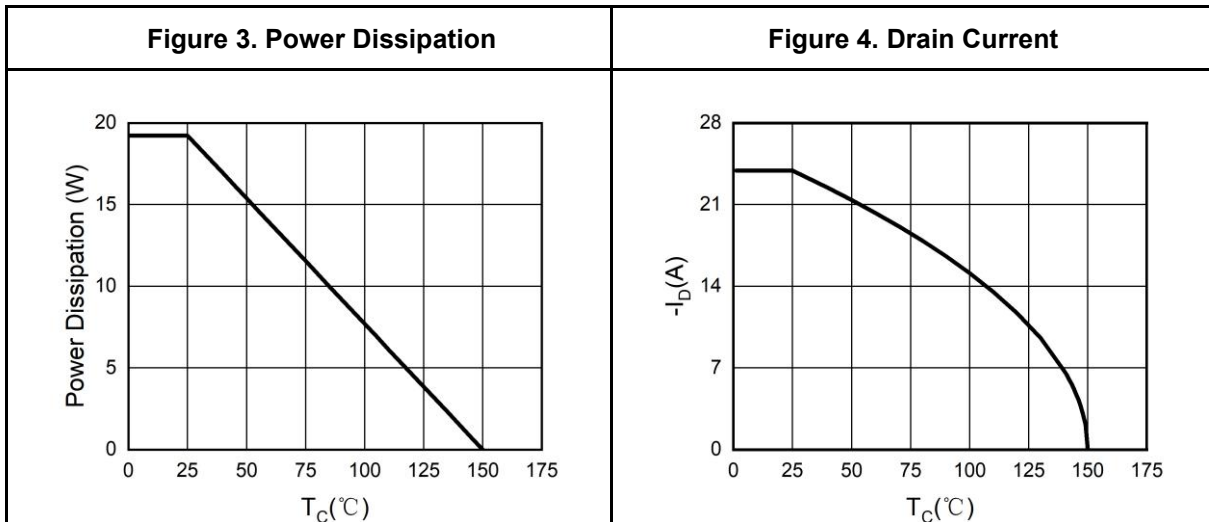
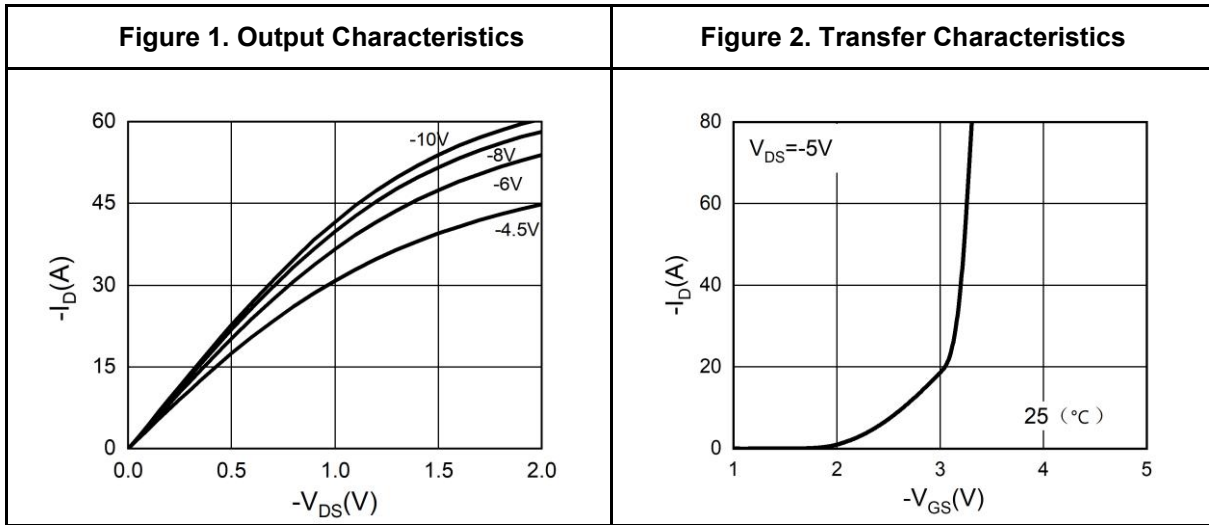
Notes 2.EAS condition: T_J=25°C, V_{DD}=-30V, V_G=10V, R_g=25Ω, L=0.5mH.

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



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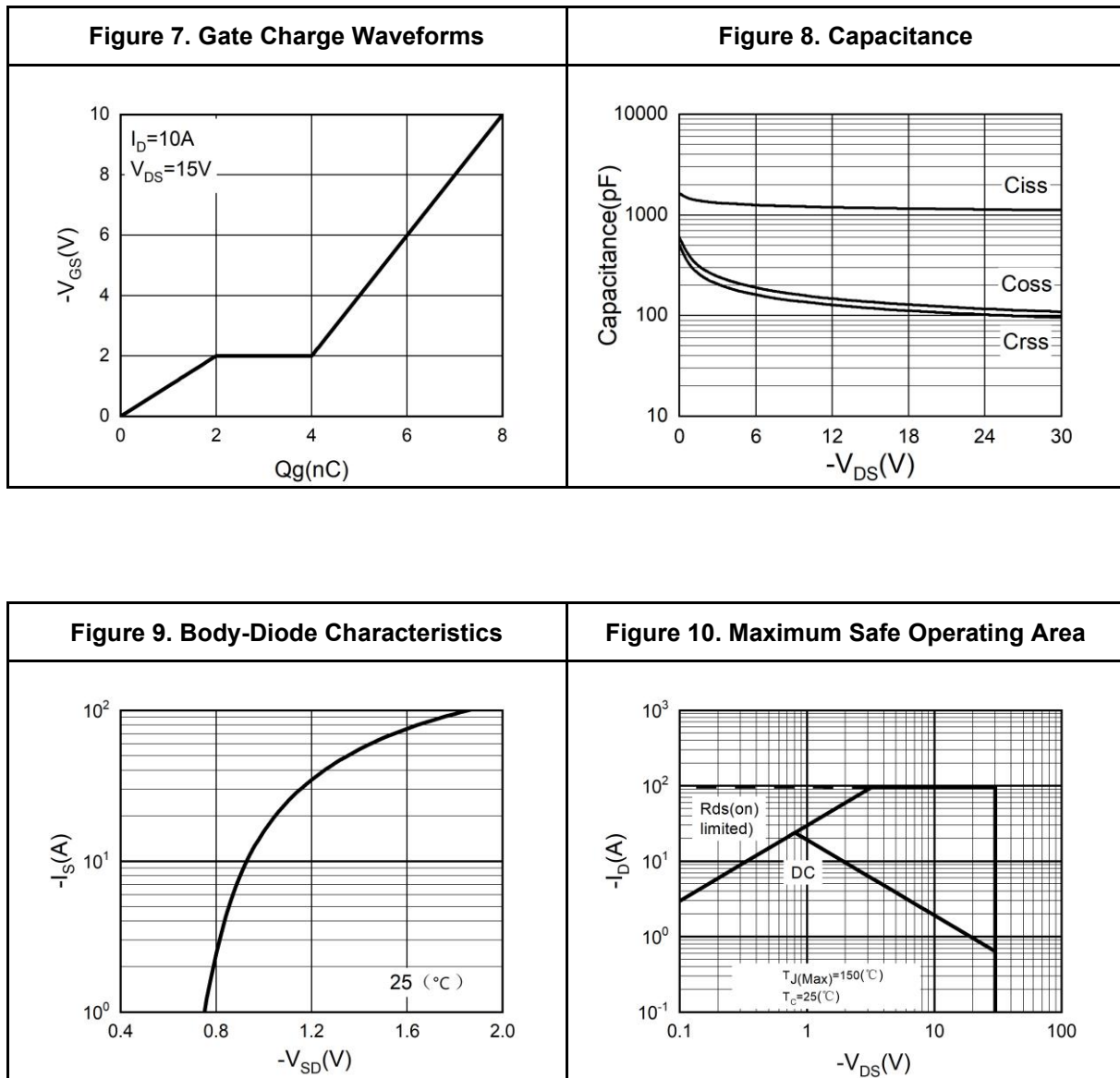
Typical Electrical And Thermal Characteristics (Curves)





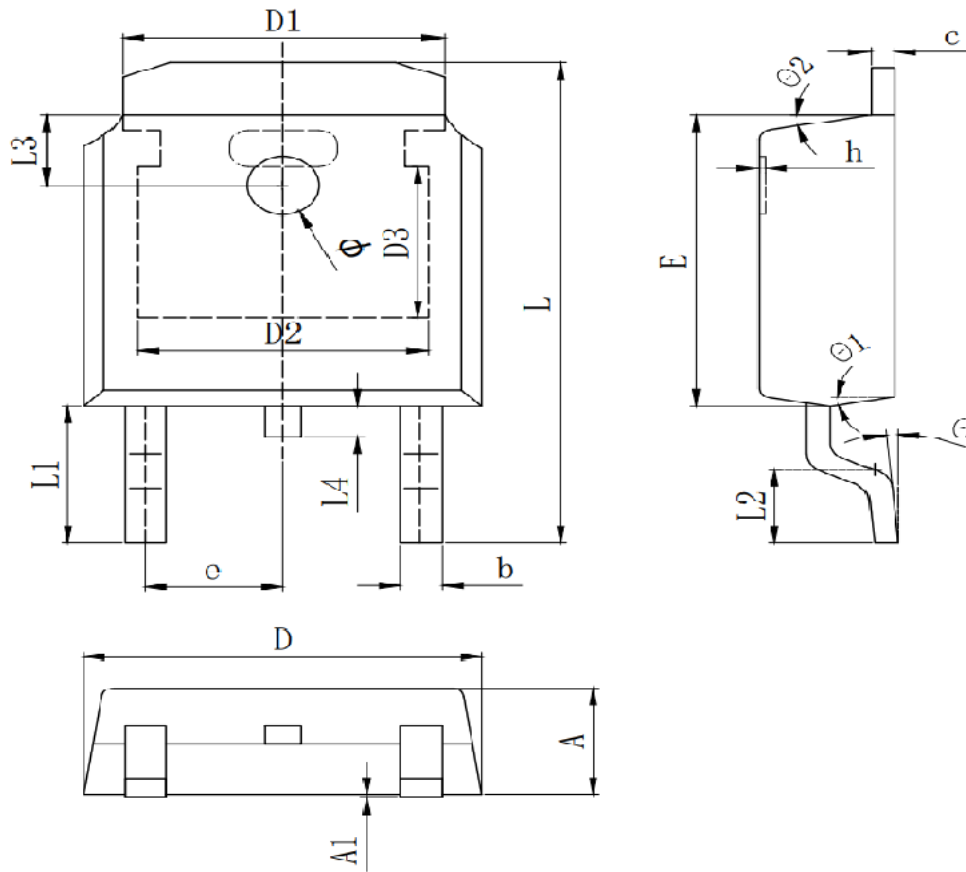
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Typical Electrical And Thermal Characteristics (Curves)





TO-252 Package Information



| Symbol | Dimensions In Millimeters | | |
|--------|---------------------------|--------|--------|
| | Min. | Typ. | Max. |
| A | 2.200 | 2.300 | 2.400 |
| A1 | 0.000 | | 0.127 |
| b | 0.640 | 0.690 | 0.740 |
| c(电镀后) | 0.460 | 0.520 | 0.580 |
| D | 6.500 | 6.600 | 6.700 |
| D1 | 5.334 REF | | |
| D2 | 4.826 REF | | |
| D3 | 3.166 REF | | |
| E | 6.000 | 6.100 | 6.200 |
| e | 2.286 TYP | | |
| h | 0.000 | 0.100 | 0.200 |
| L | 9.900 | 10.100 | 10.300 |
| L1 | 2.888 REF | | |
| L2 | 1.400 | 1.550 | 1.700 |
| L3 | 1.600 REF | | |
| L4 | 0.600 | 0.800 | 1.000 |
| Φ | 1.100 | 1.200 | 1.300 |
| θ | 0° | | 8° |
| θ1 | 9° TYP | | |
| θ2 | 9° TYP | | |



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