



XTMT20N110S

200V N-Channel MOSFET

Product Description

| | | |
|-------------------|-----|------------|
| BV_{DSS} | 200 | V |
| I_D | 110 | A |
| $R_{DS(ON),Typ.}$ | 9.3 | m Ω |

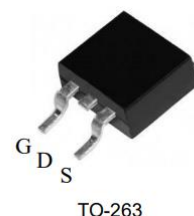
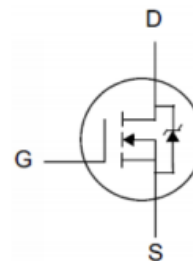
General Features

- Proprietary Advance Trench Technology
- $R_{DS(ON),typ.}=9.3m\Omega@V_{GS}=10V$
- Fast Recovery Body Diode
- Low Gate Charge Minimize Switching Loss

Applications

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

封装 Package



| Device | Package | Marking |
|-------------|---------|-------------|
| XTMT20N110S | TO-263 | XTMT20N110S |

Absolute Maximum Ratings $T_j=25^\circ\text{C}$

| Symbol | Parameter | Value | Unit |
|------------------|--|------------|---------------------|
| V_{DSS} | Drain-to-Source Voltage | 200 | V |
| V_{GSS} | Gate-to-Source Voltage | ± 20 | |
| I_D | Continuous Drain Current | 110 | A |
| I_{DM} | Pulsed Drain Current at $V_{GS}=10V$ | 440 | |
| E_{AS} | Single Pulse Avalanche Energy | 2000 | mJ |
| P_D | Power Dissipation | 278 | W |
| | Derating Factor above 25°C | 2.22 | W/ $^\circ\text{C}$ |
| T_L | Soldering Temperature Distance of 1.6mm from case for 10 seconds | 300 | $^\circ\text{C}$ |
| $T_J \& T_{STG}$ | Operating and Storage Temperature Range | -55 to 150 | |

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.



Thermal Characteristics

| Symbol | Parameter | Value | Unit |
|-----------------|---|-------|---------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case | 0.45 | $^{\circ}C/W$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 62 | $^{\circ}C/W$ |

Electrical Characteristics $T_j=25^{\circ}C$

OFF Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|------------|-----------------------------------|-----|-----|------|------|--|
| BV_{DSS} | Drain-to-Source Breakdown Voltage | 200 | - | - | V | $V_{GS}=0V, I_D=250\mu A$ |
| I_{DSS} | Drain-to-Source Leakage Current | - | - | 1 | uA | $V_{DS}=200V, V_{GS}=0V$ |
| | | - | - | 100 | | $V_{DS}=160V, V_{GS}=0V, T_J=125^{\circ}C$ |
| I_{GSS} | Gate-to-Source Leakage Current | - | - | +100 | nA | $V_{GS}=+20V, V_{DS}=0V$ |
| | | - | - | -100 | | $V_{GS}=-20V, V_{DS}=0V$ |

ON Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|--------------|--------------------------------------|-----|-----|------|------------|-------------------------------|
| $R_{DS(ON)}$ | Static Drain-to-Source On-Resistance | - | 9.3 | 10.5 | m Ω | $V_{GS}=10V, I_D=35A$ |
| $V_{GS(TH)}$ | Gate Threshold Voltage | 2.0 | - | 4.0 | V | $V_{DS}=V_{GS}, I_D=250\mu A$ |



Dynamic Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|------------------|-------------------------------|-----|-------|-----|------|--|
| C _{iss} | Input Capacitance | - | 10656 | - | pF | V _{GS} =0V, V _{DS} =100V, f=1.0MHz |
| C _{rss} | Reverse Transfer Capacitance | - | 16 | - | | |
| C _{oss} | Output Capacitance | - | 389 | - | | |
| Q _g | Total Gate Charge | - | 145 | - | nC | V _{DD} =100V, I _D =55A, V _{GS} = 10V |
| Q _{gs} | Gate-to-Source Charge | - | 49 | - | | |
| Q _{gd} | Gate-to-Drain (Miller) Charge | - | 27 | - | | |

Resistive Switching Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|---------------------|---------------------|-----|-----|-----|------|--|
| t _{d(ON)} | Turn-on Delay Time | - | 46 | - | ns | V _{DD} =100V, I _D =55A, V _{GS} =10V R _g =4.7Ω |
| t _{rise} | Rise Time | - | 21 | - | | |
| t _{d(OFF)} | Turn-Off Delay Time | - | 88 | - | | |
| t _{fall} | Fall Time | - | 18 | - | | |

Source-Drain Body Diode Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|-----------------|--|-----|-----|-----|------|---|
| I _{SD} | Continuous Source Current ^[1] | - | - | 110 | A | Integral pn-diode in MOSFET |
| I _{SM} | Pulsed Source Current ^[1] | - | - | 440 | | |
| V _{SD} | Diode Forward Voltage | - | - | 1.2 | V | I _S =70A, V _{GS} =0V |
| t _{rr} | Reverse Recovery Time | - | 185 | - | ns | I _F =55A, di _F /dt=100A/μs |
| Q _{rr} | Reverse Recovery Charge | - | 469 | - | nC | |

[1] Pulse width≤380μs; duty cycle≤2%



Typical Characteristics

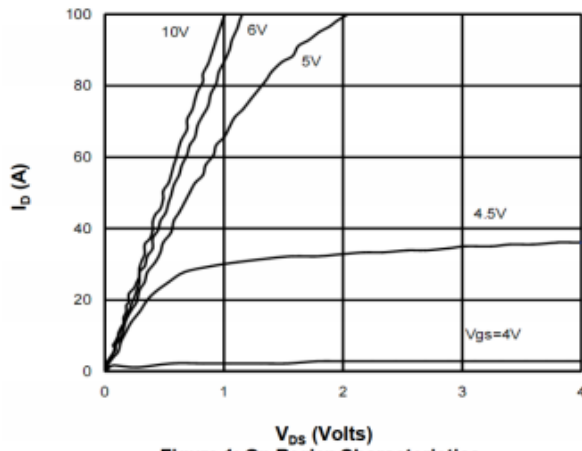


Figure 1: On-Region Characteristics

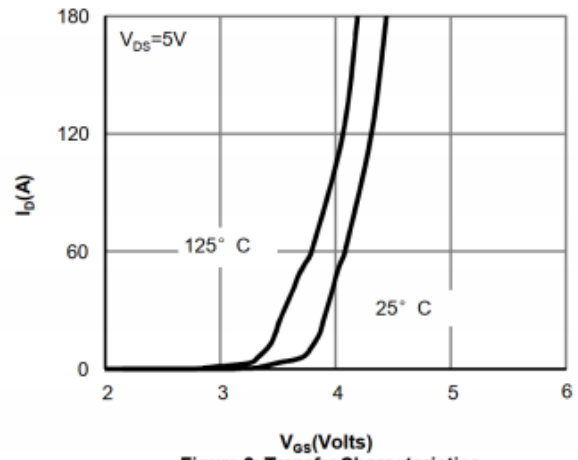


Figure 2: Transfer Characteristics

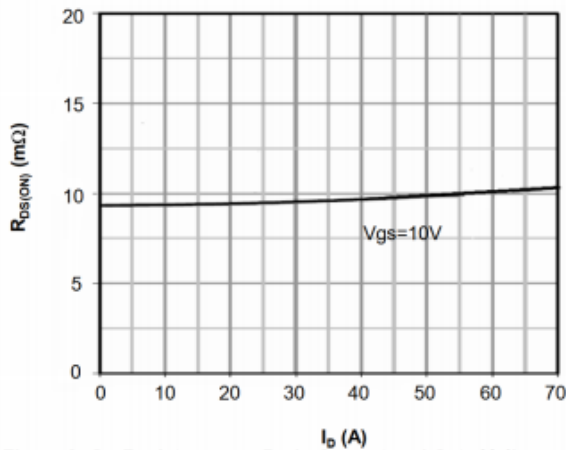


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

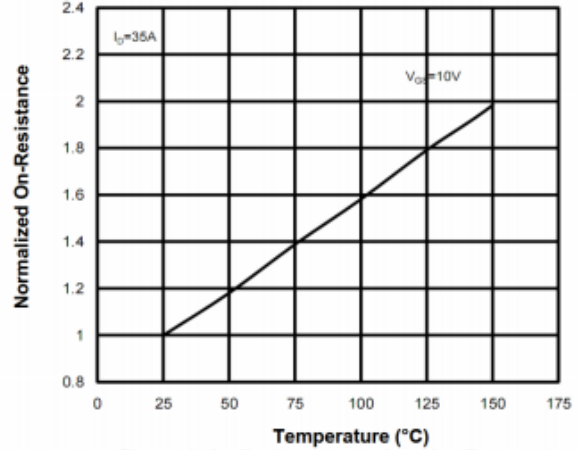


Figure 4: On-Resistance vs. Junction Temperature

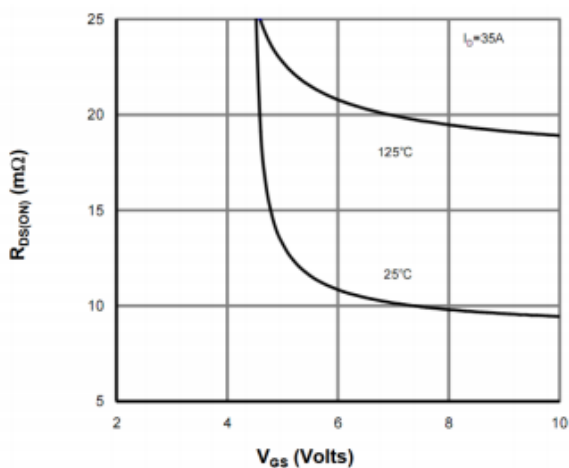


Figure 5: On-Resistance vs. Gate-Source Voltage

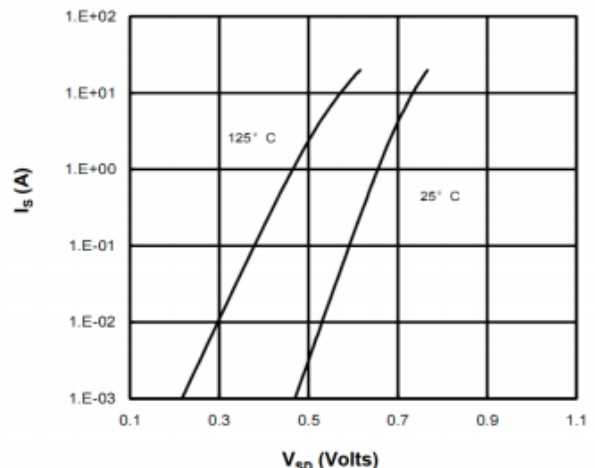
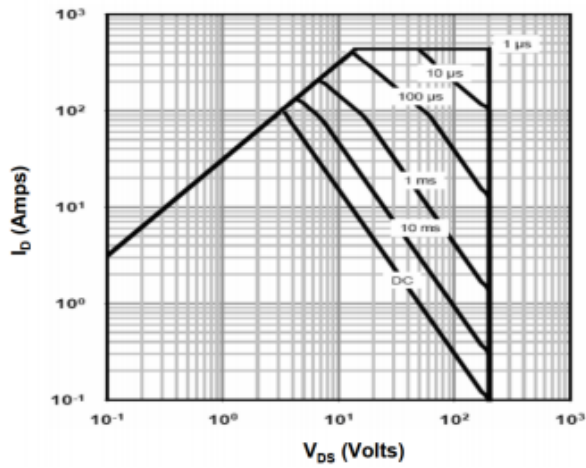
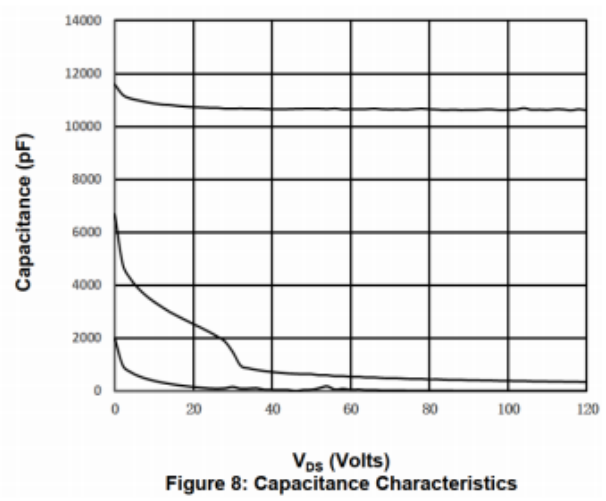
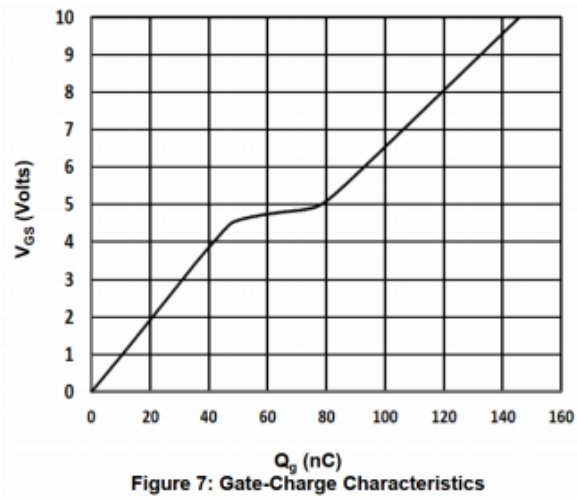


Figure 6: Body-Diode Characteristics



Typical Characteristics





Test Circuits and Waveforms

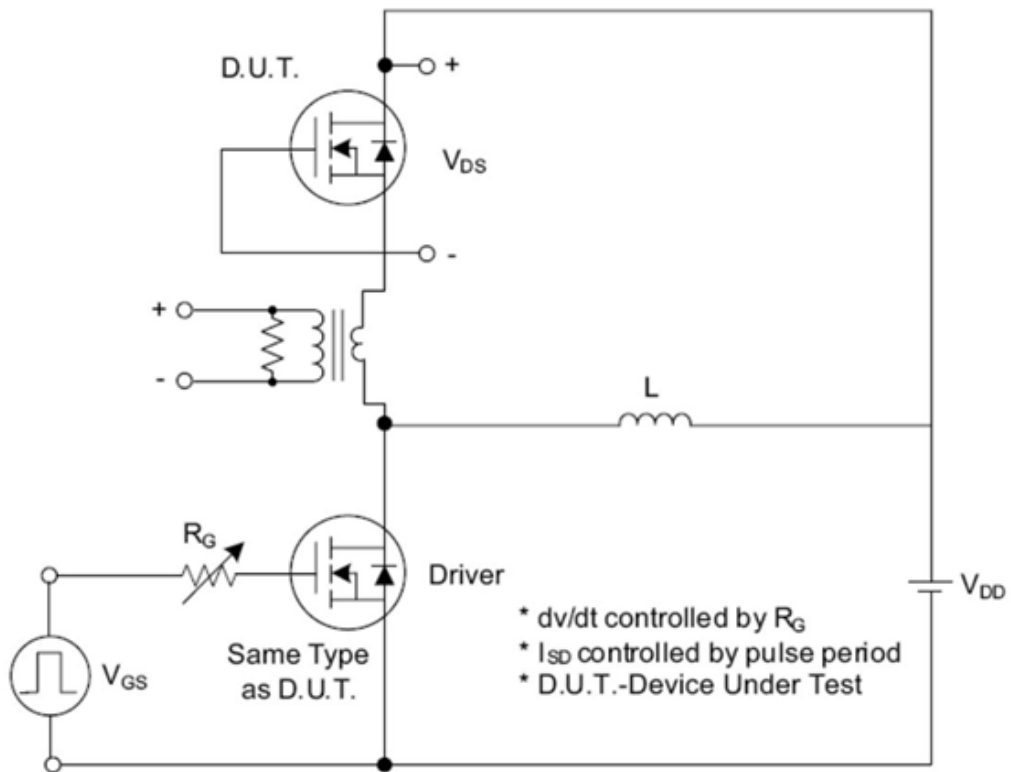


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

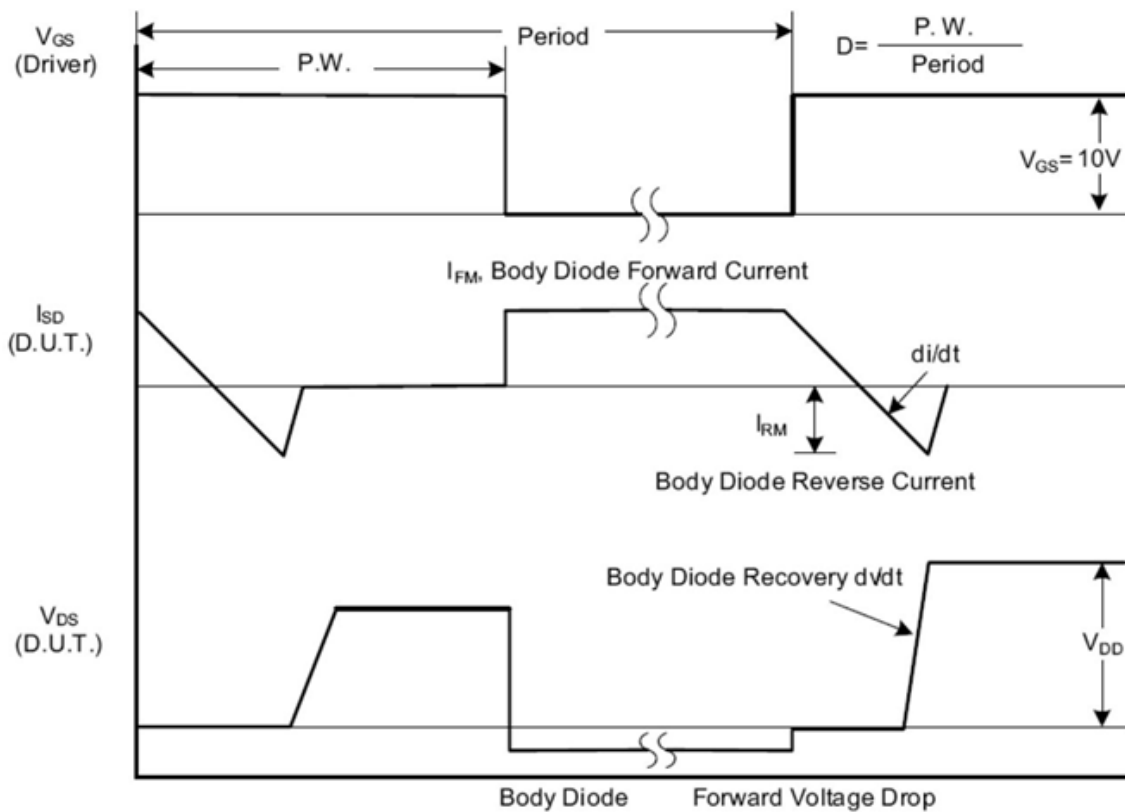


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms



Test Circuits and Waveforms (Cont.)

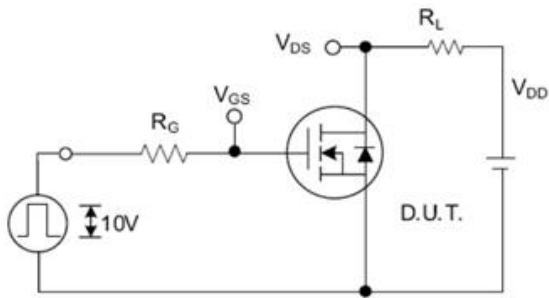


Fig. 2.1 Switching Test Circuit

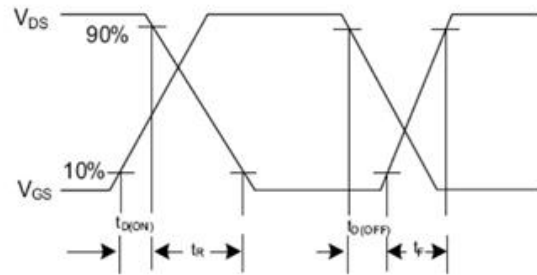


Fig. 2.2 Switching Waveforms

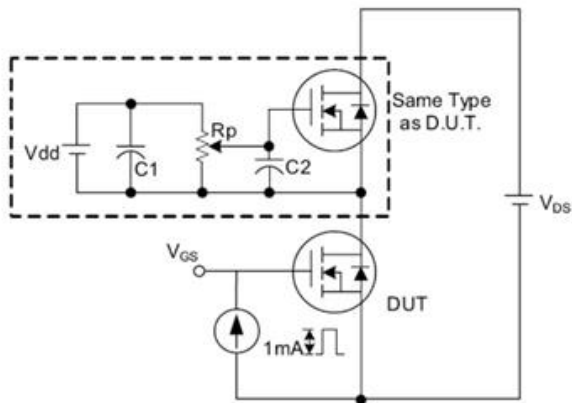


Fig. 3.1 Gate Charge Test Circuit

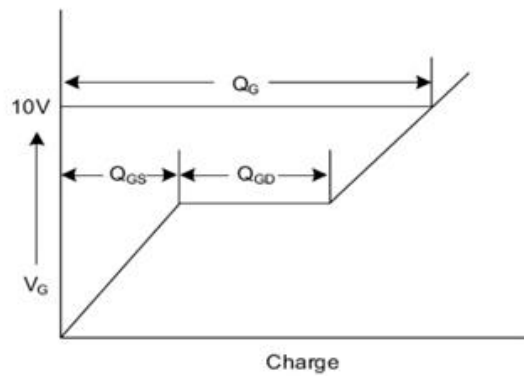


Fig. 3.2 Gate Charge Waveform

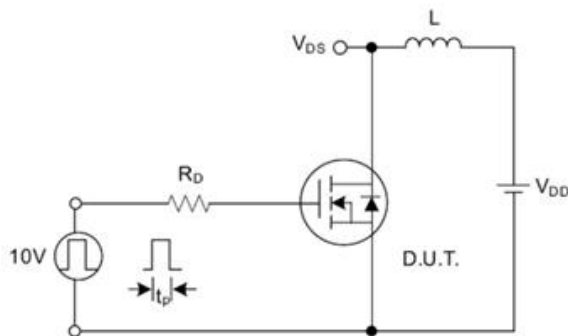


Fig. 4.1 Unclamped Inductive Switching Test Circuit

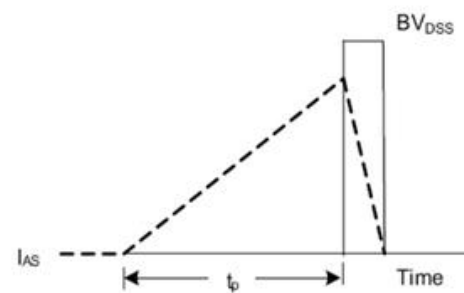


Fig. 4.2 Unclamped Inductive Switching Waveforms