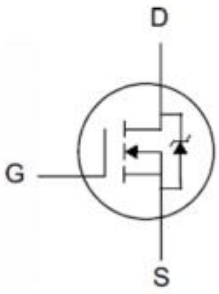
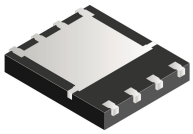
# XTMT03N170L

## 30V N-ch Planar MOSFET

封装 **Package**



PDFN 5×6

### Product Description

| | | |
|---|---|---|
| $BV_{DSS}$ | 30 | V |
| $I_D$ | 170 | A |
| $R_{DS(ON),Typ.}$ | 0.97 | mΩ |

## General Features

- Excellent gate charge x RDS(on) product(FOM)
- $R_{DS(ON),typ.}$=0.97mΩ@$V_{GS}$=10V
- 150 °C operating temperature
- Pb-free lead plating
- 100% UIS tested

## Applications

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

| Device | Package | Marking |
|---|---|---|
| XTMT03N170L | PDFN5*6 | XTMT03N170L |

## Absolute Maximum Ratings $T_j$=25℃

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{DSS}$ | Drain-to-Source Voltage | 30 | V |
| $V_{GSS}$ | Gate-to-Source Voltage | ±20 | |
| $I_D$ | Continuous Drain Current | 170 | A |
| $I_{DM}$ | Pulsed Drain Current at $V_{GS}$=10V | 680 | |
| $E_{AS}$ | Single Pulse Avalanche Energy | 1350 | mJ |
| $P_D$ | Power Dissipation | 135 | W |
| | Derating Factor above 25℃ | 1.08 | W/℃ |
| $T_J$& $T_{STG}$ | 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 | 0.926 | ℃/W |

## Electrical Characteristics $T_j$=25℃

### OFF Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-to-Source Breakdown Voltage | 30 | - | - | V | $V_{GS}$=0V, $I_D$=250uA |
| $I_{DSS}$ | Drain-to-Source Leakage Current | - | - | 1 | uA | $V_{DS}$=30V, $V_{GS}$=0V,TJ=25℃ |
| | | - | - | 1.5 | uA | $V_{DS}$=30V, $V_{GS}$=0V,TJ=55℃ |
| $I_{GSS}$ | Gate-to-Source Leakage Current | - | - | ±80 | nA | $V_{GS}$=±5V, $V_{DS}$=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 | 0.75 | 0.97 | 1.2 | mΩ | $V_{GS}$=10V, $I_D$=20A |
| | | 1 | 1.25 | 1.5 | mΩ | $V_{GS}$=4.5V, $I_D$=20A |
| $V_{GS(TH)}$ | Gate Threshold Voltage | 1.0 | 1.5 | 2.0 | V | $V_{DS}$=$V_{GS}$, $I_D$=250uA |
| gfs | Forward Transconductance | - | 80 | - | S | $V_{DS}$=5V,$I_D$=20A |

## Dynamic Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| $C_{iss}$ | Input Capacitance | - | 5300 | 6890 | pF | $V_{GS}$=0V, $V_{DS}$=15V, f=1.0MHz |
| $C_{rss}$ | Reverse Transfer Capacitance | - | 1800 | 2600 | | |
| $C_{oss}$ | Output Capacitance | - | 100 | 200 | | |
| $Q_g$ | Total Gate Charge | - | 90 | 126 | nC | VDS=15V,ID=20A, VGS=10V |
| $Q_{gs}$ | Gate-to-Source Charge | - | 12 | 18 | | |
| $Q_{gd}$ | Gate-to-Drain (Miller) Charge | - | 13 | 19.5 | | |

## Resistive Switching Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| $td_{(ON)}$ | Turn-on Delay Time | - | 12 | - | nS | VDD=15V,ID=20A VGS=10V,RG=1.6Ω |
| $t_{rise}$ | Rise Time | - | 6.5 | - | | |
| $td_{(OFF)}$ | Turn-Off Delay Time | - | 48 | - | | |
| $t_{fall}$ | Fall Time | - | 7.5 | - | | |

## Source-Drain Body Diode Characteristics

| Symbol | Parameter | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| $V_{SD}$ | Diode Forward Voltage | - | - | 1.2 | V | $I_S$=20A, $V_{GS}$=0V |
| IS | Diode Forward Current | - | - | 170 | A | |
| $t_{rr}$ | Reverse Recovery Time | - | - | 30 | ns | TJ = 25° C, IF = IS di/dt = 100A/μs |
| $Q_{rr}$ | Reverse Recovery Charge | - | - | 110 | uC | |

[1] Pulse width≤380μs; duty cycle≤2%

## Typical Characteristics(Cont.)

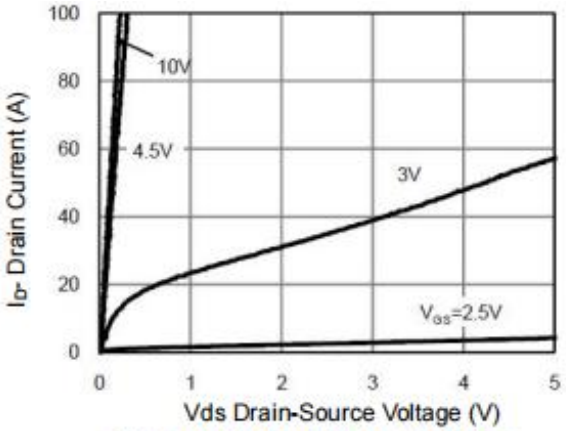



**Figure 1 Output Characteristics**

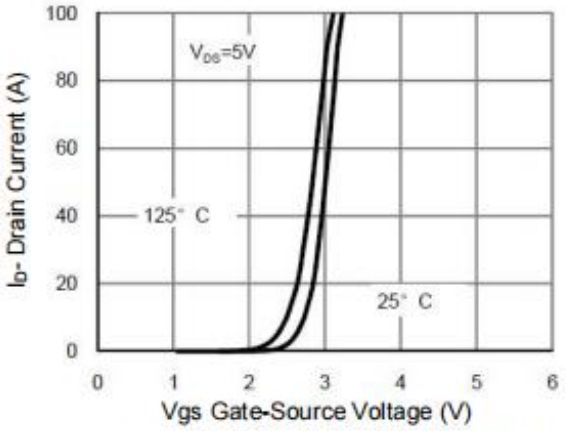



**Figure 2 Transfer Characteristics**

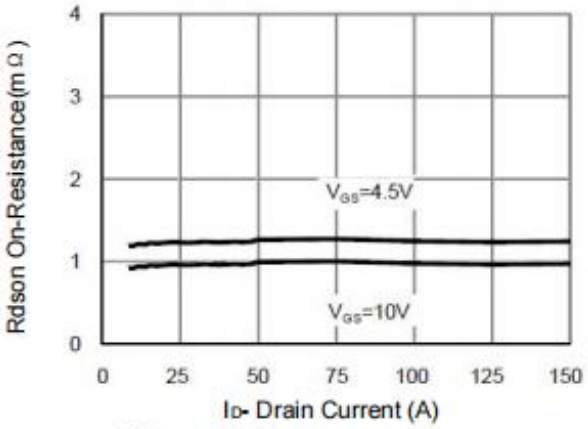



**Figure 3 Rdson- Drain Current**

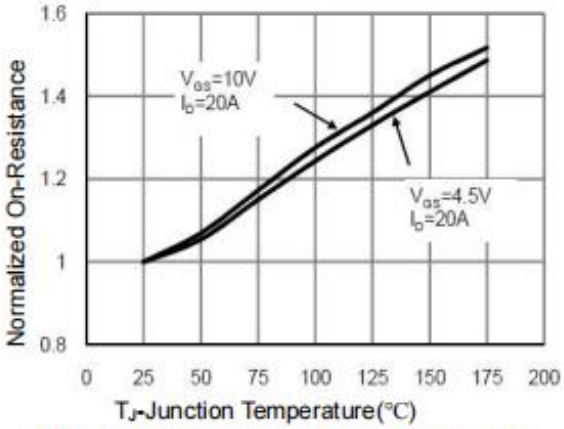



**Figure 4 Rdson-Junction Temperature**

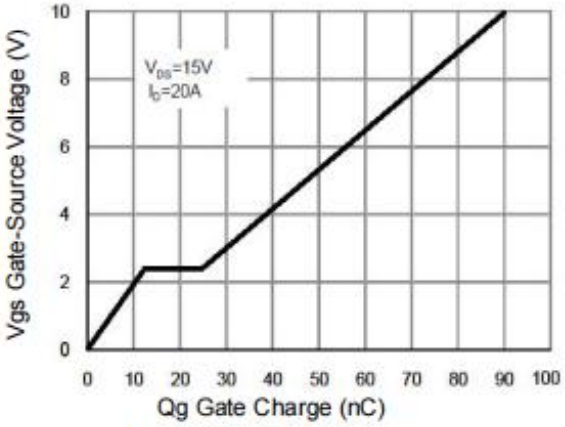



**Figure 5 Gate Charge**

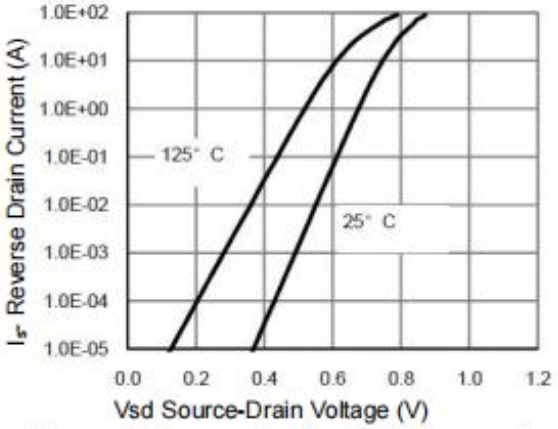



**Figure 6 Source- Drain Diode Forward**

## Typical Characteristics(Cont.)

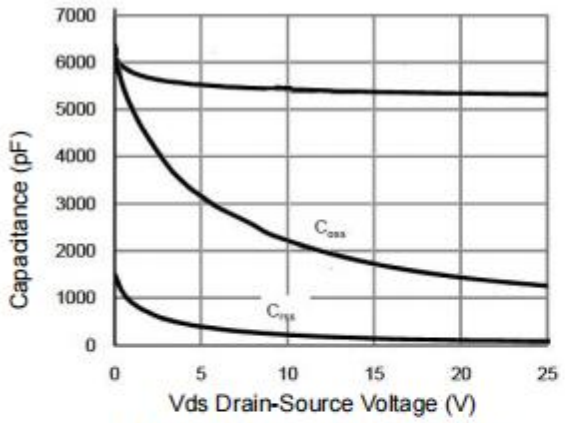



**Figure 7 Capacitance vs Vds**

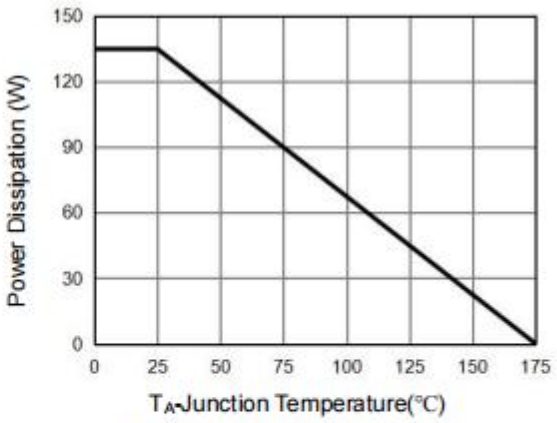



**Figure 9 Power De-rating**

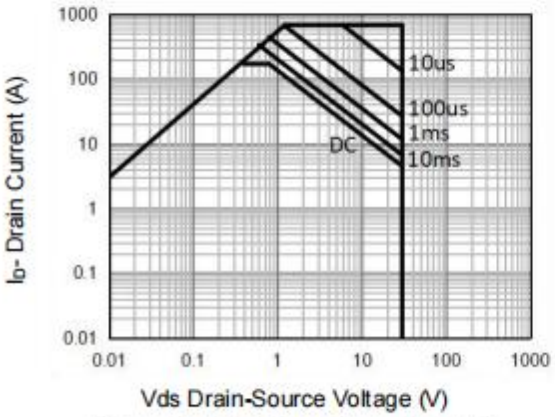



**Figure 8 Safe Operation Area** (Note3)

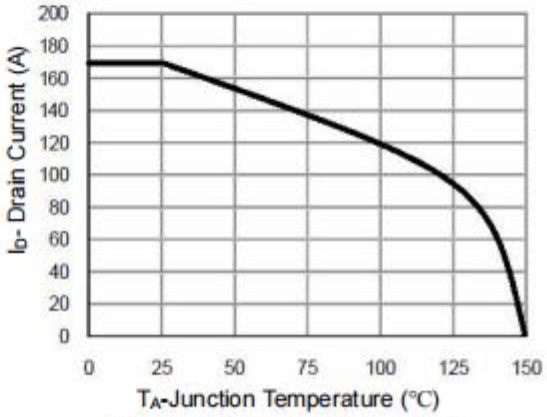



**Figure 10 Current De-rating**

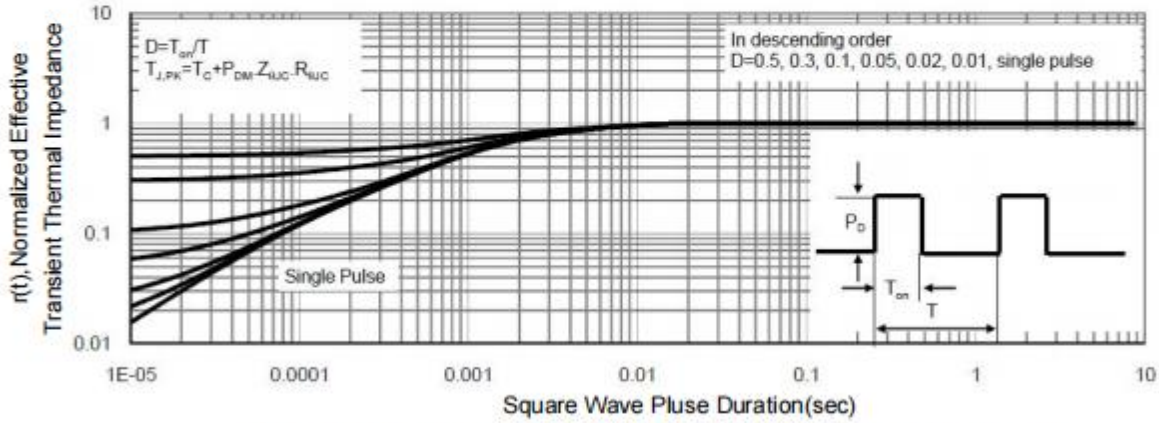



**Figure 11 Normalized Maximum Transient Thermal Impedance**