# HTT80N15

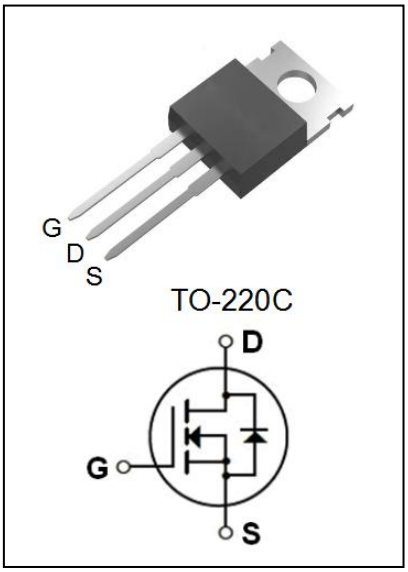
150V N-Channel MOSFET

● **Features：**

- 80A, 150V,$R_{DS(on)(Typ)}$ =11mΩ@$V_{GS}$=10V
- Low Gate Charge
- Low $C_{rss}$
- 100% Avalanche Tested
- Fast Switching
- Improved dv/dt Capability

● **Application:**

- High Frequency Switching Mode Power Supply
- Active Power Factor Correction




**Absolute Maximum Ratings**(Tc=25°C unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | 150 | V |
| $I_D$ | Drain Current - Continuous(Tc=25°C) | 80* | A |
| | - Continuous(Tc=100°C) | 50.6* | A |
| $I_{DM}$ | Drain Current -Pulsed | 320* | A |
| $V_{GSS}$ | Gate-Source Voltage | ±20 | V |
| $E_{AS}$ | Single Pulsed Avalanche Energy （Limit Reference Value） (Note5) | 274 | mJ |
| $P_D$ | Power Dissipation($T_C$ =25°C) | 190 | W |
| | -Derate above 25°C | 1.52 | W/°C |
| Tj | Operating Junction Temperature | 150 | °C |
| Tstg | Storage Temperature Range | -55 to+150 | °C |

**Thermal Characteristics**

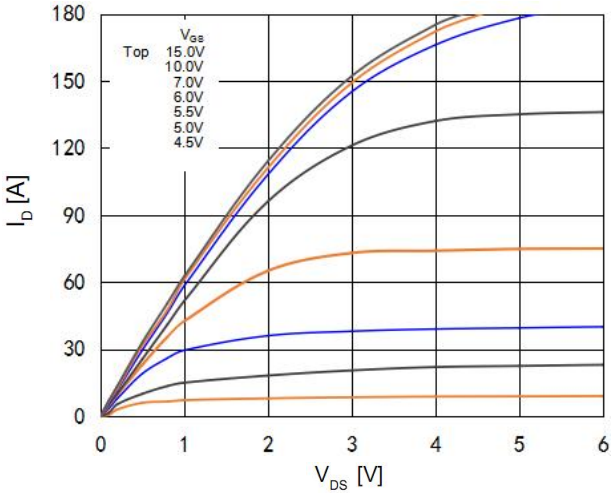
| Symbol | Parameter | Max | Unit |
|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance,Junction to Case (Note2) | 0.66 | °C /W |

**Electrical Characteristics**(Tc=25°C unless otherwise noted)

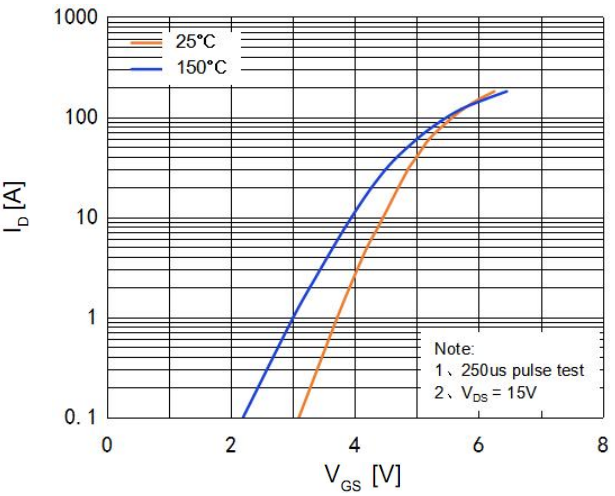
| Symbol | Parameter | Test Conditons | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-source Breakdown Voltage | $V_{GS}$=0V ,$I_D$=250μA | 150 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=150V,$V_{GS}$=0V | -- | -- | 1 | μA |
| $I_{GSSF}$ | Gate-Body Leakage Current,Forward | $V_{GS}$=+20V, $V_{DS}$=0V | -- | -- | 100 | nA |
| $I_{GSSR}$ | Gate-Body Leakage Current,Reverse | $V_{GS}$=-20V, $V_{DS}$=0V | -- | -- | -100 | nA |
| **On Characteristics** (Note3) | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$= $V_{GS}$, $I_D$=250μA | 2.0 | -- | 4.0 | V |
| $R_{DS(on)}$ | Static Drain-Source On-Resistance | $V_{GS}$=10 V, $I_D$=40A | -- | 11 | 14 | mΩ |
| **Dynamic Characteristics** (Note4) | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=25V,$V_{GS}$=0V, f=1.0MHz | -- | 5900 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 1400 | -- | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 124 | -- | pF |
| **Switching Characteristics** (Note4) | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$ = 30 V, $I_D$ =2 A, $R_G$ =2.5 Ω, $V_{GS}$=10V | -- | 41 | -- | ns |
| $t_r$ | Turn-On Rise Time | | -- | 38 | -- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 142 | -- | ns |
| $t_f$ | Turn-Off Fall Time | | -- | 61 | -- | ns |
| $Q_g$ | Total Gate Charge | $V_{DS}$ = 30 V, $I_D$ =30A, $V_{GS}$ = 10 V | -- | 162 | -- | nC |
| $Q_{gs}$ | Gate-Source Charge | | -- | 31 | -- | nC |
| $Q_{gd}$ | Gate-Drain Charge | | -- | 65 | -- | nC |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain-Source Diode Forward Current (Note2) | | -- | -- | 80 | A |
| $I_{SM}$ | Maximum Pulsed Drain-Source Diode Forward Current | | -- | -- | 320 | A |
| $V_{SD}$ | Drain-Source Diode Forward Voltage | $V_{GS}$ =0V,$I_S$=40A (Note3) | -- | -- | 1.3 | V |
| $t_{rr}$ | Reverse Recovery Time | $V_{GS}$ =0V, $I_S$=40A, d $I_F$ /dt=100A/μs (Note3) | -- | 58 | -- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | -- | 75 | -- | nC |

Notes:
1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
2、Surface Mounted on FR4 Board, t ≤ 10 sec.
3、Pulse Test : Pulse Width ≤300 μ s, Duty Cycle≤2%.
4、Guaranteed by design, not subject to production.
5、EAS condition：L = 0.5mH, $I_{AS}$ =28A, $V_{DD}$ = 50V, $R_G$ = 25 Ω, Starting $T_J$ = 25°C.

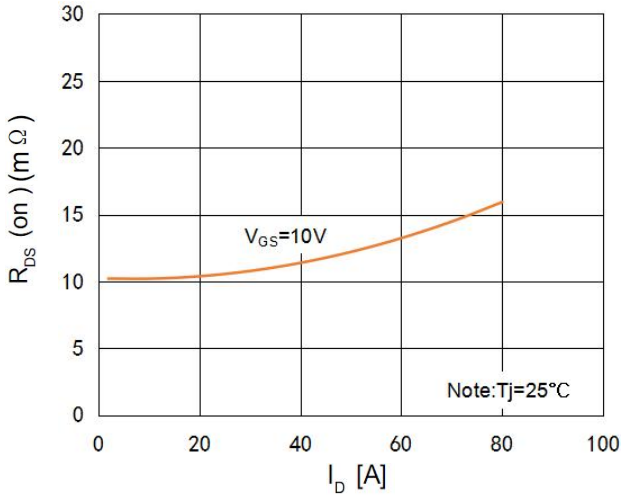
## On-Regin Characteristics



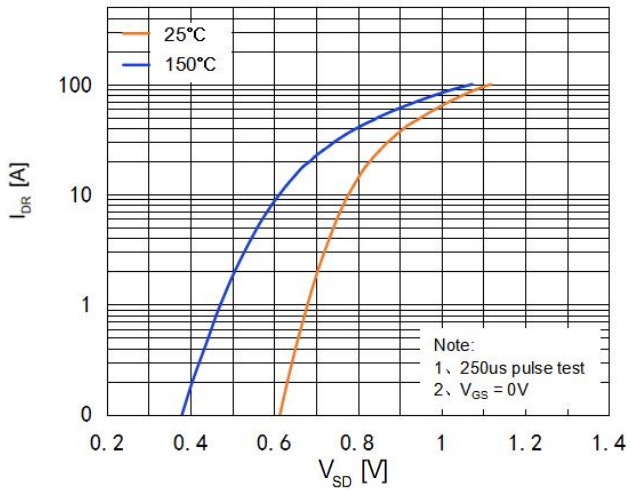

## Transfer Characteristics



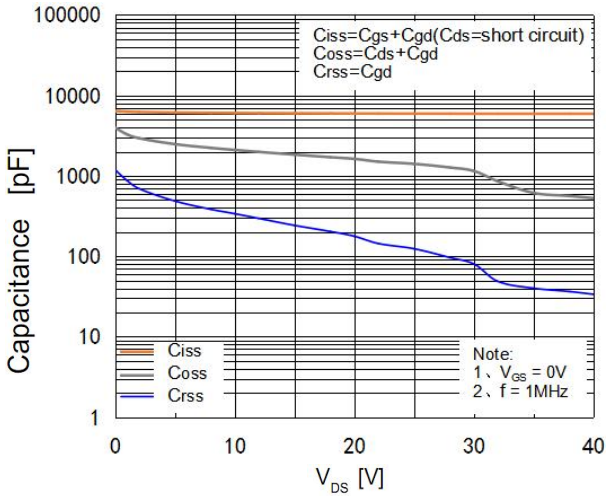

## On-Resistance Variation vs. Drain Current and Gate Voltage



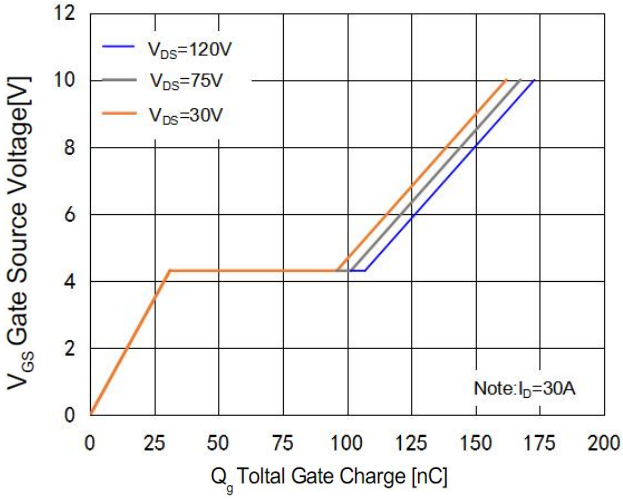

## Body Diode Forward Voltage Variation vs. Source Current and Temperature



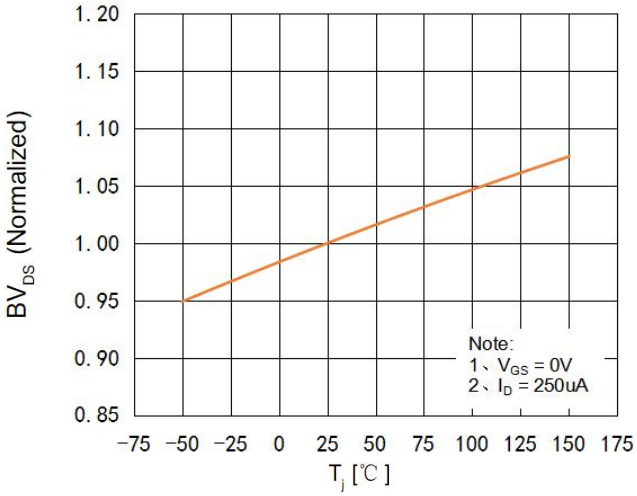

## Capacitance Characteristics



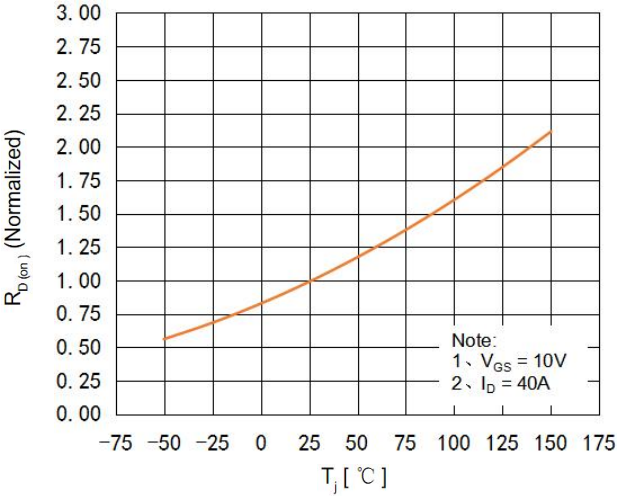

## Gate Charge Characteristics



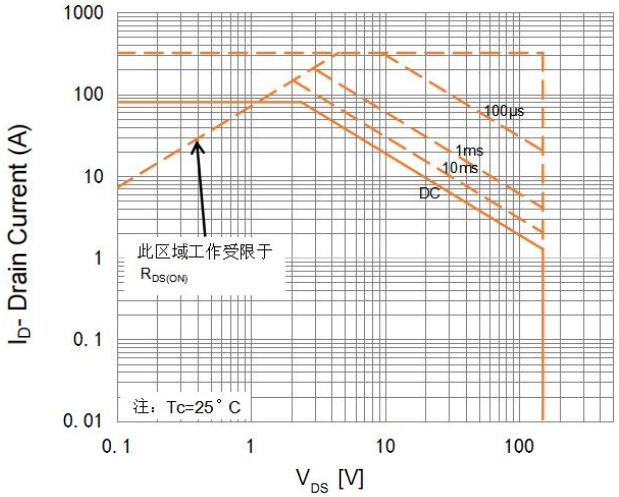
## Breakdown Voltage Variation vs. Temperature



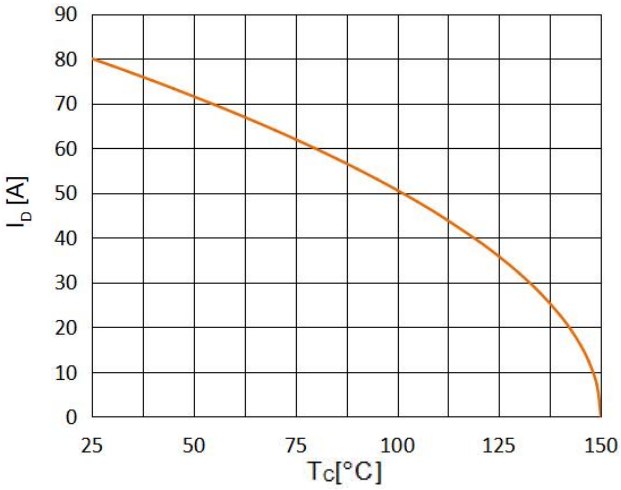

## On-Resistance Variation vs. Temperature




## Maximum Safe Operating Area



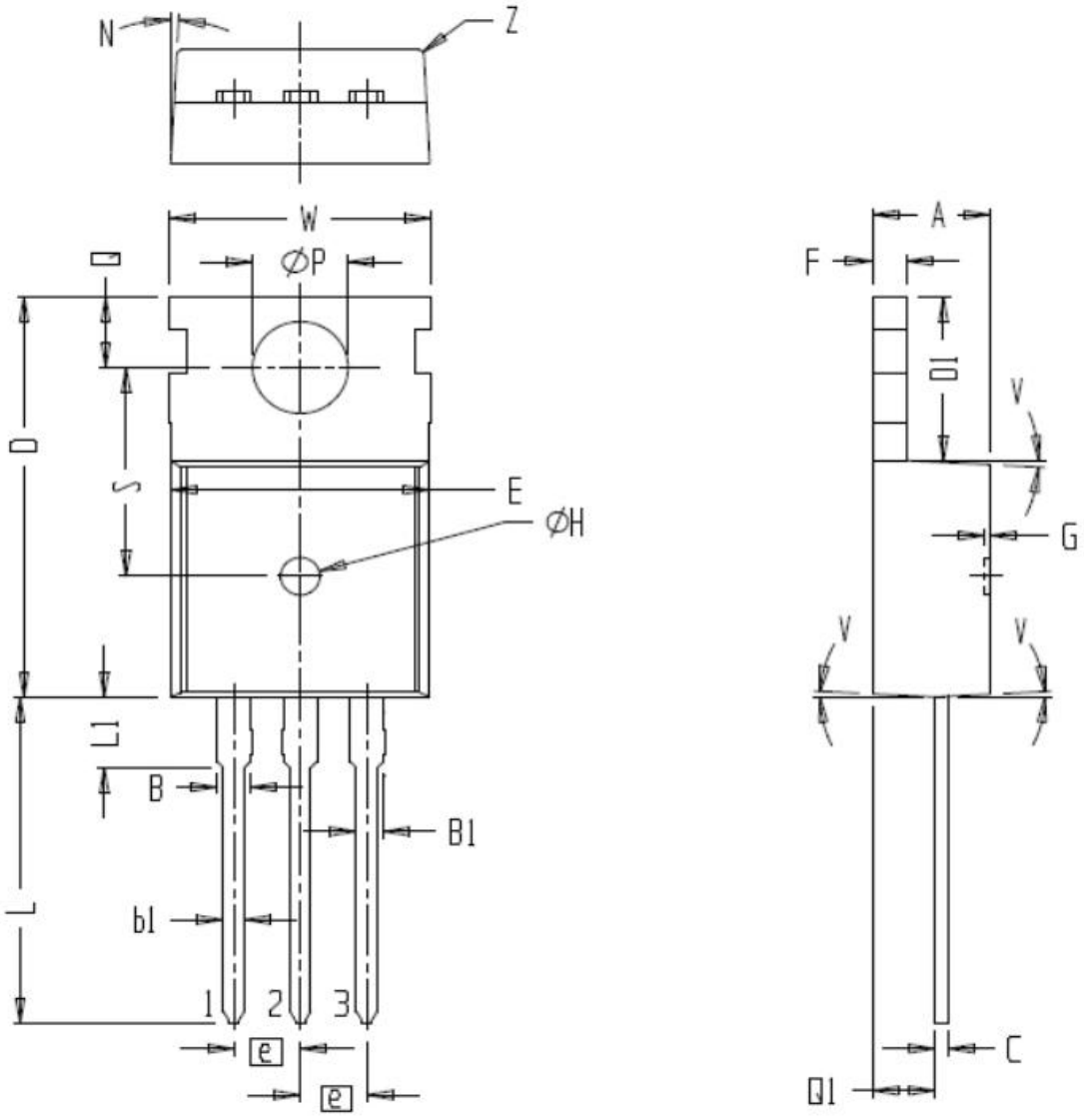

## Maximum Drain Current Vs. Case Temperature



## TO-220C Package Dimensions

UNIT：mm

| SYMBOL | min | nom | max | SYMBOL | min | nom | max |
|---|---|---|---|---|---|---|---|
| A | 4.00 | 4.40 | 4.80 | E | 9.40 | 9.90 | 10.40 |
| B | 1.17 | 1.32 | 1.47 | e | | 2.54 | |
| B1 | 0.91 | 1.06 | 1.21 | F | 1.15 | 1.30 | 1.45 |
| b1 | 0.65 | 0.80 | 0.95 | L | 12.00 | 13.00 | 14.00 |
| c | 0.40 | 0.50 | 0.60 | L1 | 2.50 | 3.00 | 3.50 |
| D | 14.90 | 15.90 | 16.90 | Q | 2.30 | 2.80 | 3.30 |
| D1 | 6.10 | 6.60 | 7.10 | Q1 | 1.90 | 2.40 | 2.90 |
| W | 9.50 | 10.00 | 10.50 | ϕP | 3.40 | 3.65 | 3.90 |
| S | | 8.30 | | Z | 0 | | 0.20 |
| ϕH | | 1.50 | | N | | 3 ° | |
| G | | 0.10 | | V | | 3 ° | |



注意事项：

1、在电路设计时请不要超过器件的最大额定值，否则会影响整机的可靠性。

2、MOSFET产品为静电敏感型器件，使用时应注意采取防静电保护措施，如佩戴防静电手环、设备接地等。

3、如需安装散热片，请注意控制扭力大小及散热片的平整度。

4、该规格书由华科公司制作，并可能不定期更改，恕不另行通知。

5、如有疑问，请及时联系我司销售代表。

版本履历表：

| 序号 | 版本号 | 修改时间 | 修改记录 |
|---|---|---|---|
| 1 | V1.0 | 2022-9-2 | 首次发行 |
| | | | |