# WGD15N10

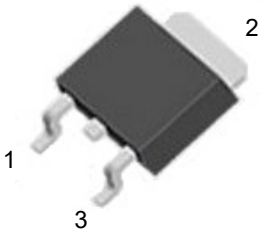
100V N-Channel MOSFET

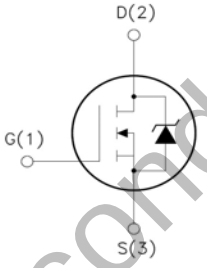
## Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg= 15.6nC (Typ.).
- ☐ BVDSS=100V,$I_D$=15A
- ☐ $R_{DS}$(on) : 0.9Ω (Max) @$V_G$=10V
- ☐ 100% Avalanche Tested

TO-252

RoHS COMPLIANT




1. Gate (G)
2. Drain (D)
3. Source (S)



**Electrical Characteristics** (TA =25℃ Unless Otherwise Specified)

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-Source breakdown voltage | | 100 | V |
| VGS | Gate-Source voltage | | ±20 | V |
| ID | Continuous drain current@VGS=10V | $T_C$ =25°C | 15 | A |
| | | $T_C$ =70°C | 9.6 | A |
| IDM | Pulse drain current tested ① | $T_C$ =25°C | 40 | A |
| PD | Maximum power dissipation | TC =25°C | 30 | W |
| IS | Diode Continuous Forward Current | $T_C$ =25°C | 17 | A |
| IAS | Avalanche Current Max | L=0.5mH | 11 | A |
| EAS | Avalanche energy, single pulsed ② | | 9 | mJ |
| TSTG,TJ | Storage and operating temperature range | | -55 to 175 | °C |
| R JA | Thermal Resistance Junction-Ambient | | 60 | °C/W |
| R JC | Thermal Resistance-Junction to Case | | 5 | °C/W |

## Static Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | VGS=0V ID=250μA | 100 | -- | -- | V |
| IDSS | Zero Gate Voltage Drain Current(Tc=25℃) | VDS=100V,VGS=0V | -- | -- | 1 | μA |
| | Zero Gate Voltage Drain Current(Tc=125℃) | VDS=100V,VGS=0V | -- | -- | 100 | μA |
| IGSS | Gate-Body Leakage Current | VGS=±20V,VDS=0V | -- | -- | ±100 | nA |
| VGS(TH) | Gate Threshold Voltage | VDS=VGS,ID=250μA | 1.0 | 1.6 | 2.2 | V |
| RDS(ON) | Drain-Source On-State Resistance③ | VGS=10V, ID=10A | -- | 85 | 90 | mΩ |
| RDS(ON) | Drain-Source On-State Resistance③ | VGS=4.5V, ID =5A | -- | 95 | 100 | mΩ |
| **Dynamic Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)** | | | | | | |
| Ciss | Input Capacitance | VDS=30V,VGS=0V, f=1MHz | -- | 525 | -- | pF |
| Coss | Output Capacitance | | -- | 41 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 36 | -- | pF |
| $R_g$ | Gate Resistance | | | 2.6 | | |
| Qg | Total Gate Charge | VDS=50V,ID=3A, VGS=10V | -- | 15.6 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 3.2 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 4.4 | -- | nC |
| **Switching Characteristics** | | | | | | |
| td(on) | Turn-on Delay Time | VDD=50V, ID=1A, RG=6.8 , VGS=4.5V | -- | 8 | -- | nS |
| tr | Turn-on Rise Time | | -- | 4.5 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 26 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 3.8 | -- | nS |
| **Source- Drain Diode Characteristics@ $T_J$ = 25°C (unless otherwise stated)** | | | | | | |
| VSD | Forward on voltage | ISD=10A,VGS=0V | -- | 0.89 | 1.20 | V |
| trr | Reverse Recovery Time | Tj=25℃,Isd=10A, VGS=0V di/dt=500A/μs | -- | 26 | -- | nS |
| Qrr | Reverse Recovery Charge | | | 115 | | nC |

NOTE:

1. Repetitive rating; pulse width limited by max. junction temperature

2.Limited by $T_{Jmax}$, starting $T_J$ = 25°C, L = 0.5mH,$R_G$ = 25, $I_{AS}$ = 6A, $V_{GS}$ =10V. Part not recommended for use

3.above this value. ③ Pulse width ≤ 300μs; duty cycle≤ 2%.

## Typical Characteristics

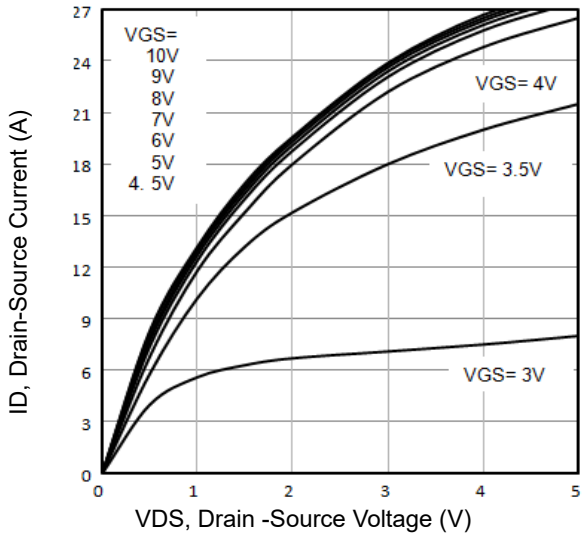



**Fig1.** Typical Output Characteristics

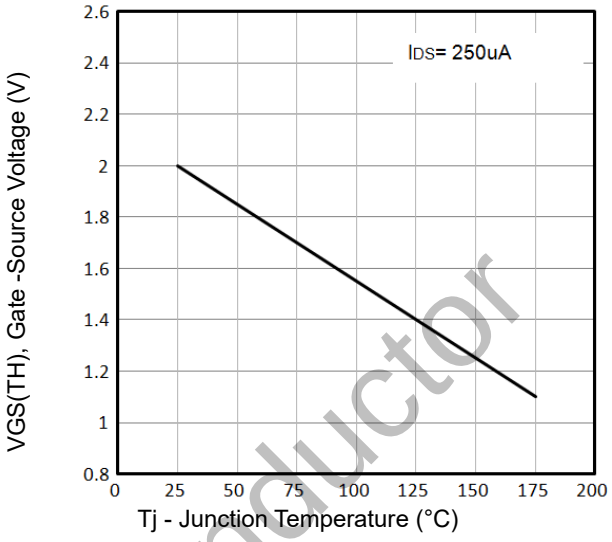



**Fig2.** $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

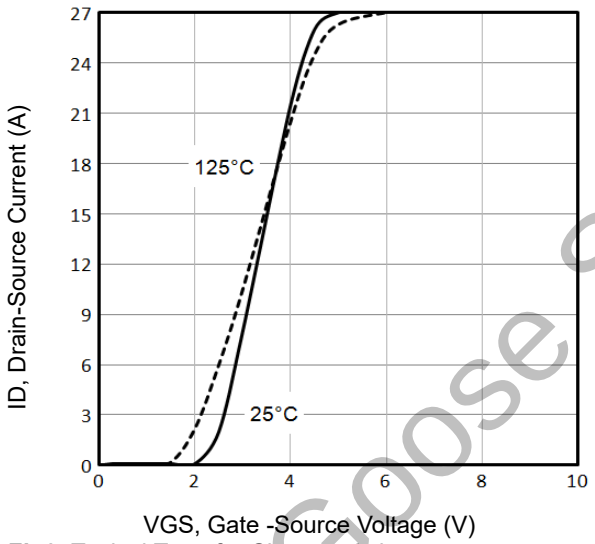



**Fig3.** Typical Transfer Characteristics

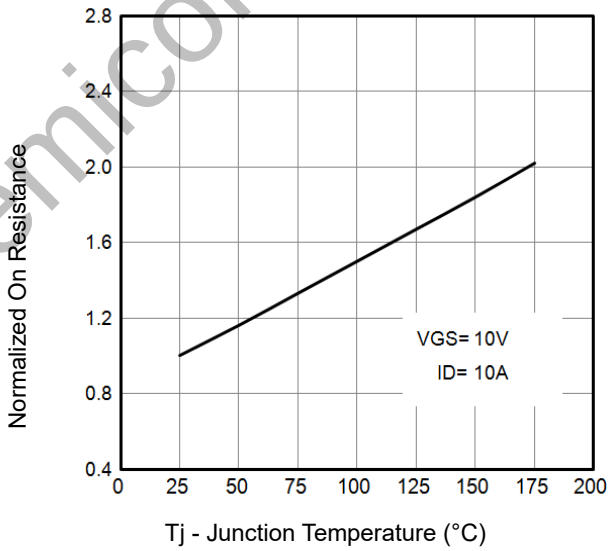



**Fig4.** Normalized On-Resistance Vs. Tj

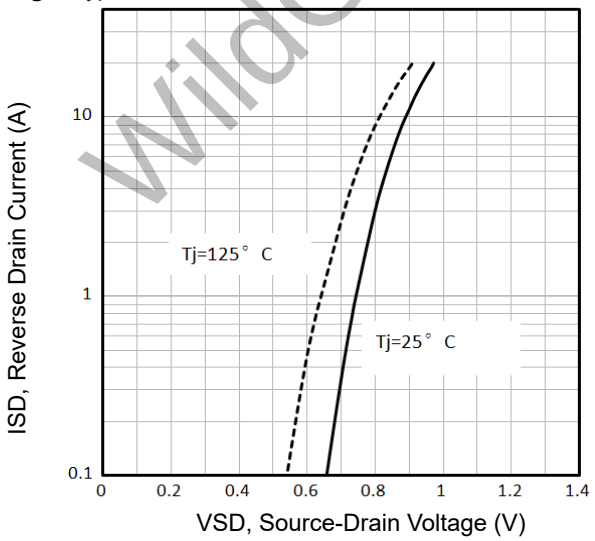



**Fig5.** Typical Source-Drain Diode Forward Voltage

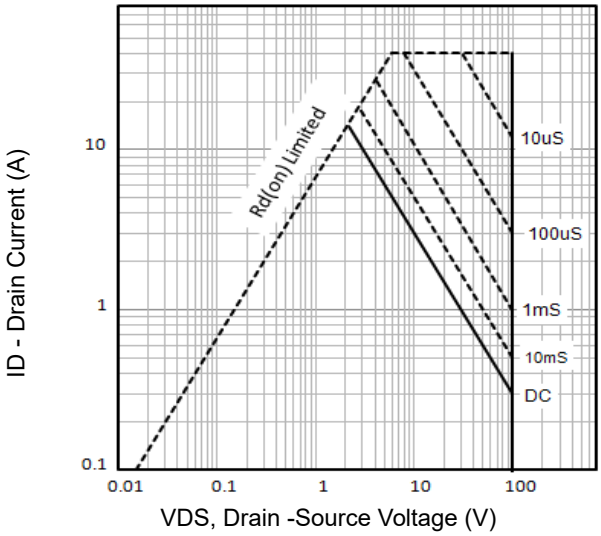



**Fig6.** Maximum Safe Operating Area

## Typical Characteristics (Continued)

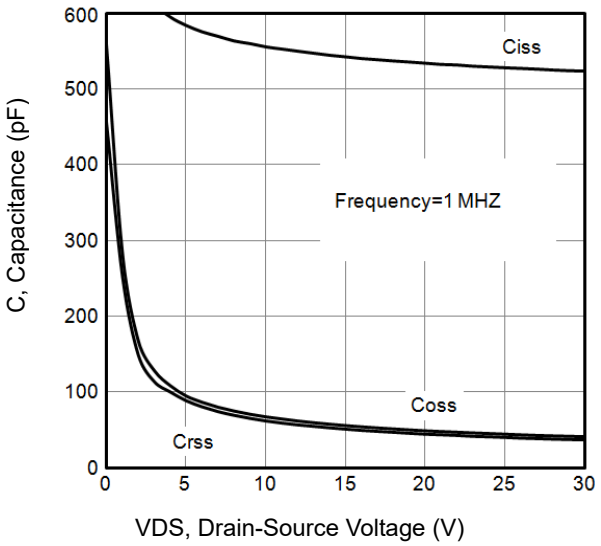



**Fig7.** Typical Capacitance Vs. Drain-Source Voltage

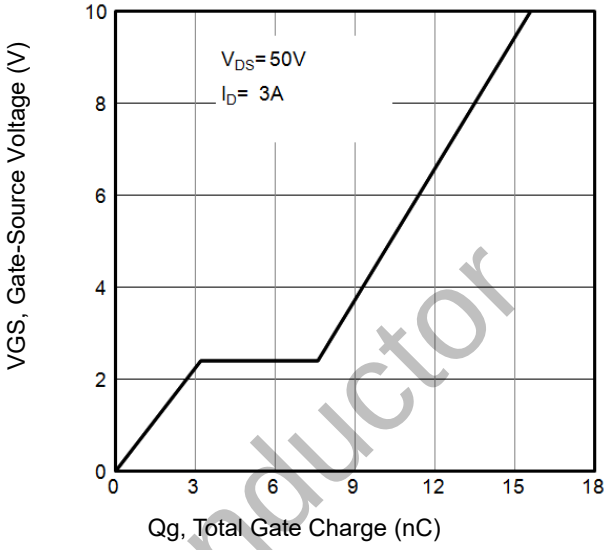



**Fig8.** Typical Gate Charge Vs. Gate-Source Voltage

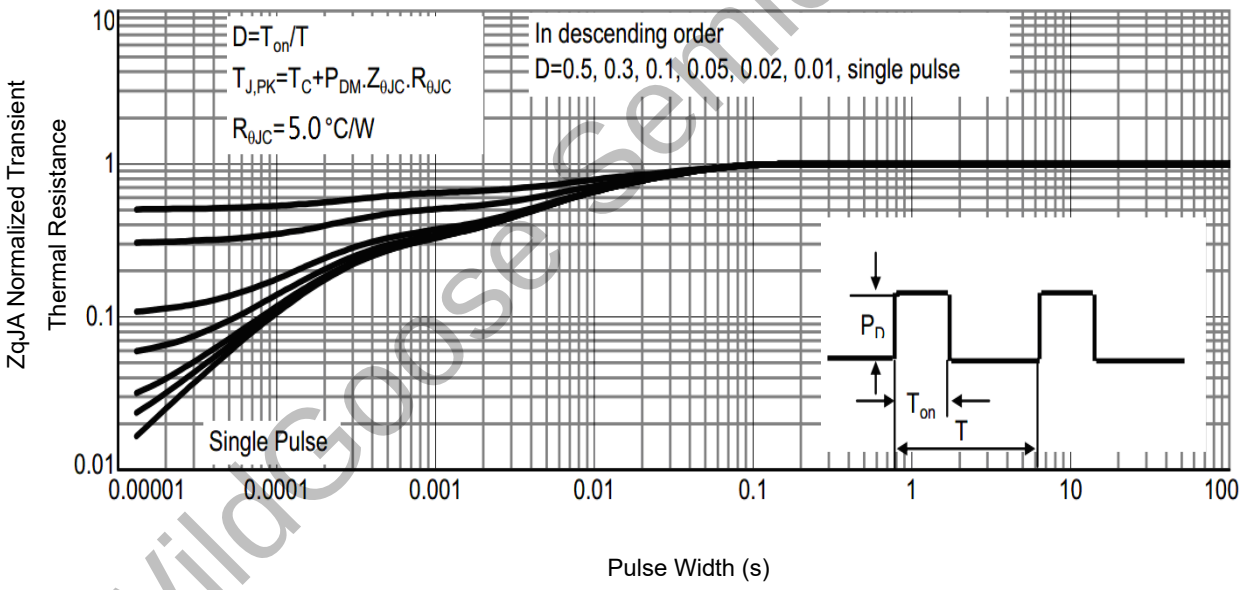
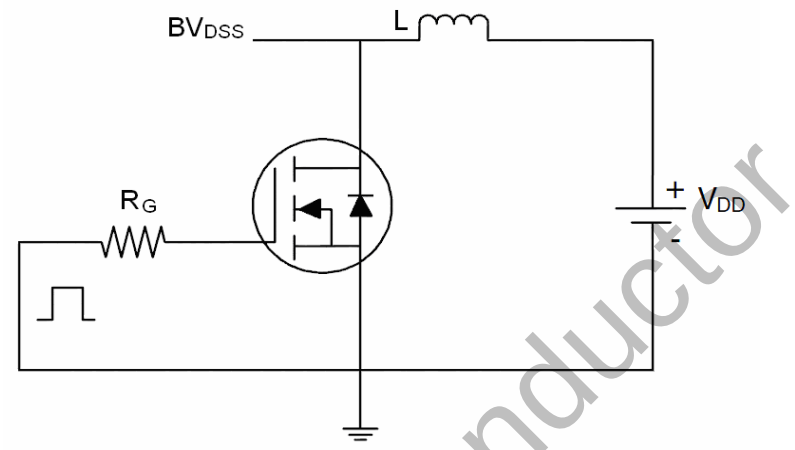


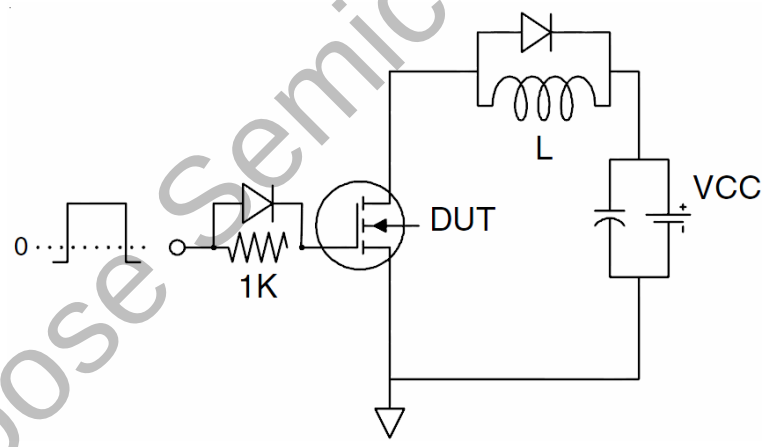

**Fig9.** Normalized Maximum Transient Thermal Impedance

## Test Circuit

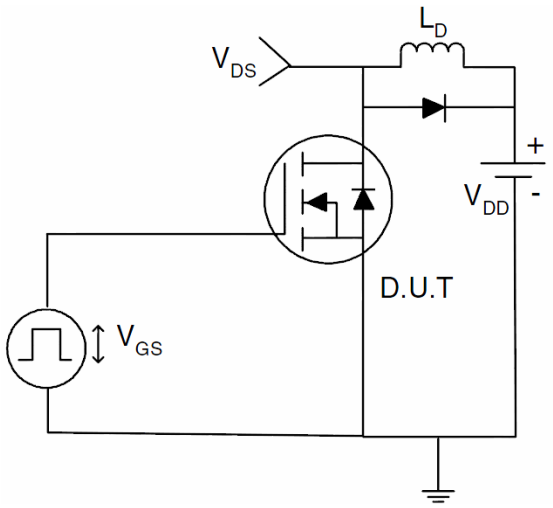
### 1) $E_{AS}$ test Circuit




### 2) Gate charge test Circuit

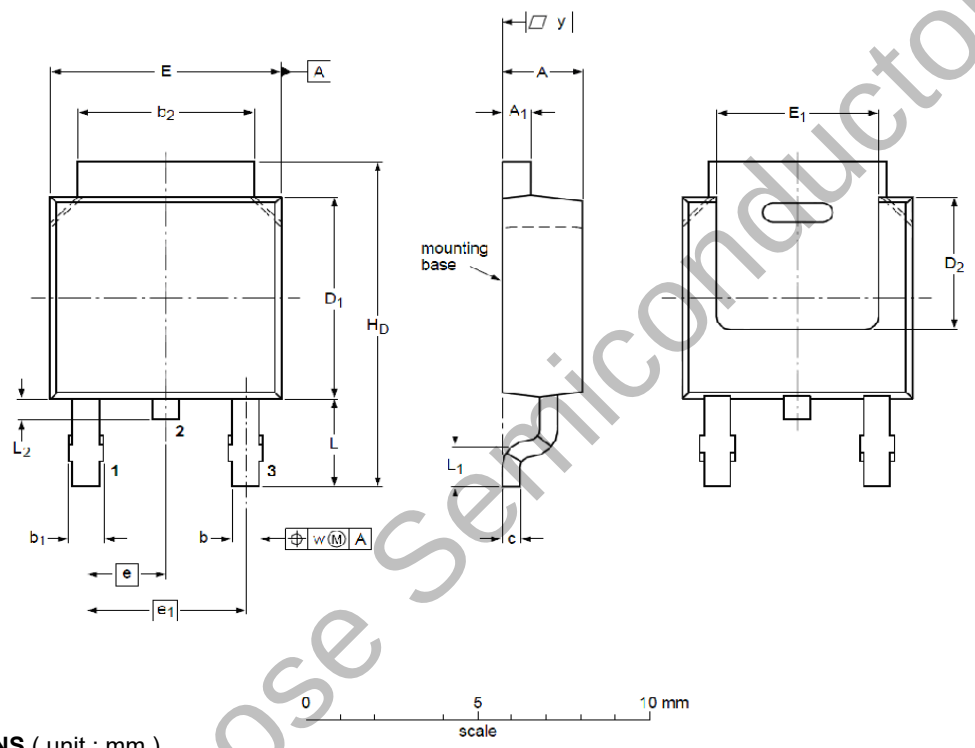



### 3) Switch Time Test Circuit



## Package Dimension

TO-252




**DIMENSIONS** ( unit : mm )

| Symbol | Min | Typ | Max | Symbol | Min | Typ | Max |
|---|---|---|---|---|---|---|---|
| **A** | 2.22 | 2.30 | 2.38 | **$A_1$** | 0.46 | 0.58 | 0.93 |
| **b** | 0.71 | 0.79 | 0.89 | **$b_1$** | 0.90 | 0.98 | 1.10 |
| **$b_2$** | 5.00 | 5.30 | 5.46 | **c** | 0.20 | 0.40 | 0.56 |
| **$D_1$** | 5.98 | 6.05 | 6.22 | **$D_2$** | -- | 4.00 | -- |
| **E** | 6.47 | 6.60 | 6.73 | **$E_1$** | 5.10 | 5.28 | 5.45 |
| **e** | -- | 2.28 | -- | **$e_1$** | -- | 4.57 | -- |
| **$H_D$** | 9.60 | 10.08 | 10.40 | **L** | 2.75 | 2.95 | 3.05 |
| **$L_1$** | -- | 0.50 | -- | **$L_2$** | 0.80 | 0.90 | 1.10 |
| **w** | -- | 0.20 | -- | **y** | 0.20 | -- | -- |