## / Descriptions

N TO-252

N-Channel MOSFET in a TO-252 Plastic Package.

## / Features

$V_{DS}$=200V $I_D$=18A $V_{GS}$=±20V

$R_{DS(on)}$@10V≤170mΩ(Type.130mΩ)

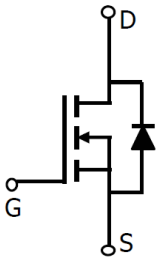
$R_{DS(on)}$@4.5V≤200mΩ(Type.150mΩ)

HF Product.

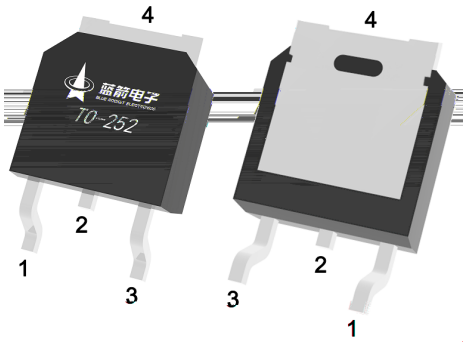
## / Applications

Networking,Load Switch,LED applications.

## / Equivalent Circuit




## / Pinning




PIN1 G PIN 2 4 D PIN 3 S

## / Marking

See Marking Instructions.

## / Absolute Maximum Ratings(Ta=25 )

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 200 | V |
| Drain Current | | $I_D$(Tc=25 ) | 18 | A |
| Drain Current - Pulsed | | $I_{DM}$ | 43 | A |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Single Pulsed Avalanche Energy(L=10mH) | | $E_{AS}$ | 125 | mJ |
| Avalanche Current(L=10mH) | | $I_{AS}$ | 9.5 | A |
| Power Dissipation | | $P_D$(Tc=25 ) | 90 | W |
| Operating and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55 to 150 | ℃ |
| Maximum Junction-to-Ambient | t ≤ 10s | $R_{\theta JA}$ | 20 | ℃/W |
| Maximum Junction-to-Ambient | Steady-State | | 50 | |
| Maximum Junction-to-Case | Steady-State | $R_{\theta JC}$ | 1.39 | |

## / Electrical Characteristics(Ta=25 )

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V $I_D$=250μA | 200 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=200V $V_{GS}$=0V | | | 1 | μA |
| Gate-Body Leakage Current Forward | $I_{GSS}$ | $V_{GS}$=±20V $V_{DS}$=0V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ $I_D$=250μA | 1.0 | 1.5 | 2.0 | V |
| Total gate charge | $R_{DS(on)}$ | $V_{GS}$=10V $I_D$=10A | | 130 | 170 | mΩ |
| | | $V_{GS}$=4.5V $I_D$=10A | | 150 | 200 | mΩ |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V $I_S$=1A | | | 1.2 | V |
| Gate resistance | $R_g$ | VGS=0V VDS=0V, f=1MHz | | 6.5 | | Ω |
| Input Capacitance | $C_{iss}$ | VDS=25V VGS=0V f=1MHz | | 830 | | pF |
| Output Capacitance | $C_{oss}$ | | | 150 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 65 | | |
| Total Gate Charge | $Q_{g(10V)}$ | VGS=10V, VDS=100V, ID=18A | | 27 | | nC |
| Total Gate Charge | $Q_{g(4.5V)}$ | | | 12 | | |
| Gate Source Charge | $Q_{gs}$ | | | 7 | | |
| Gate Drain Charge | $Q_{gd}$ | | | 3 | | |

## / Electrical Characteristics(Ta=25 )

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}$=10V $V_{DS}$=75V<br>$R_L$=2.5Ω $R_{GEN}$=3Ω | | 8 | | ns |
| Turn-On Rise Time | $t_r$ | | | 10 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 30 | | |
| Turn-Off Fall Time | $t_f$ | | | 4 | | |

## / Electrical Characteristic Curve

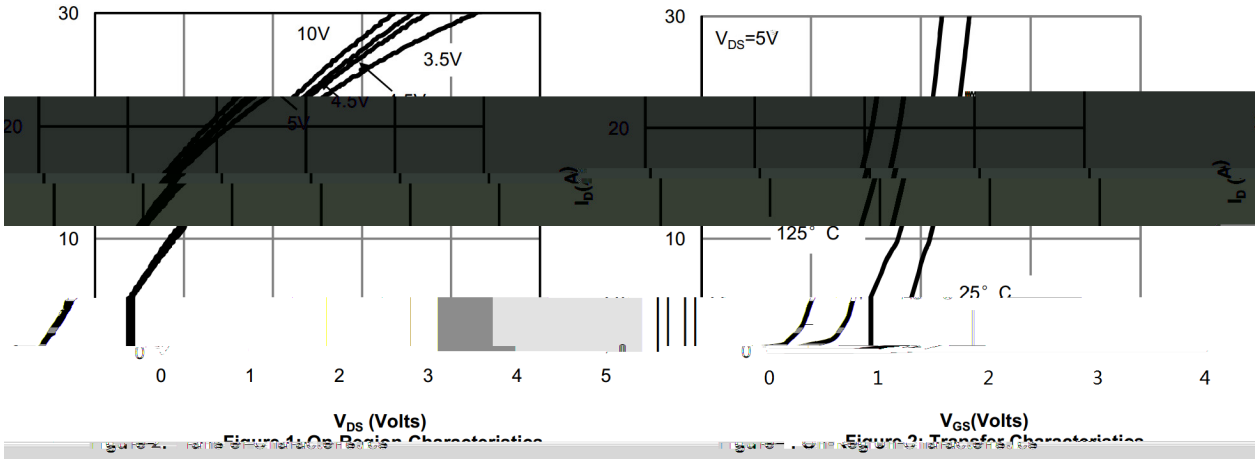



Figure 1: On-Region Characteristics

Figure 2: Transfer Characteristics

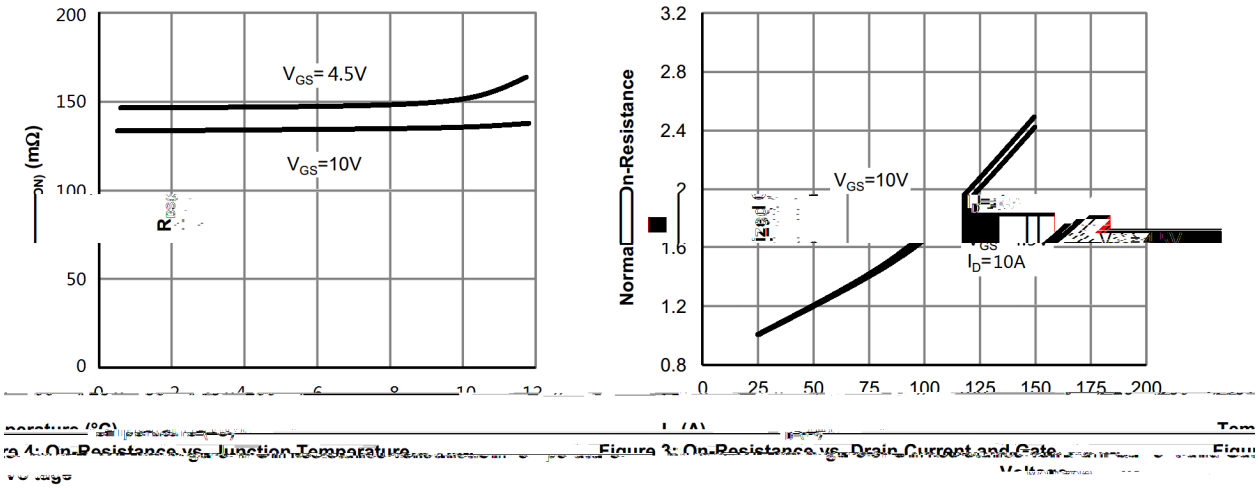
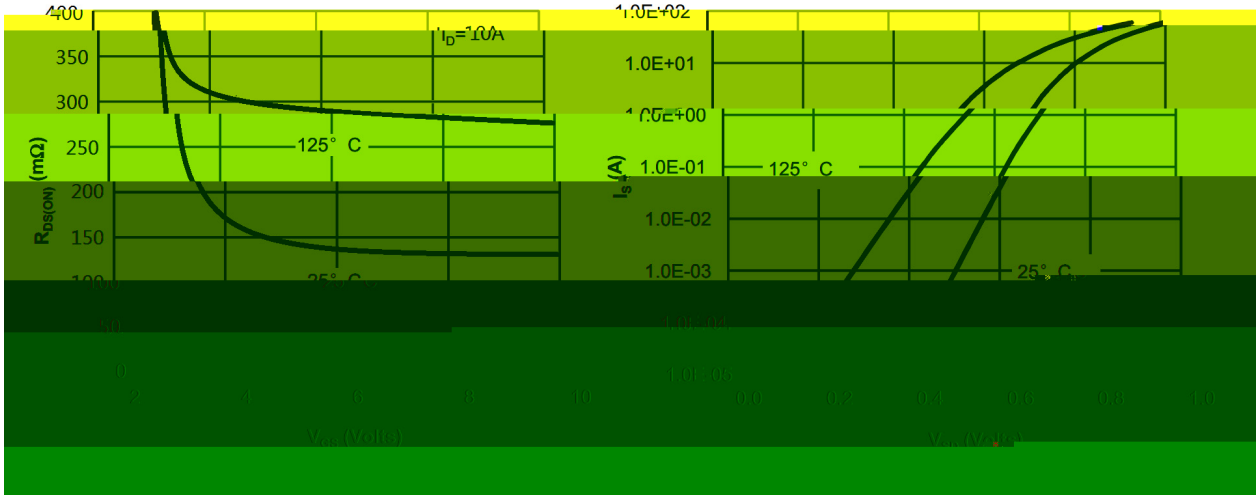
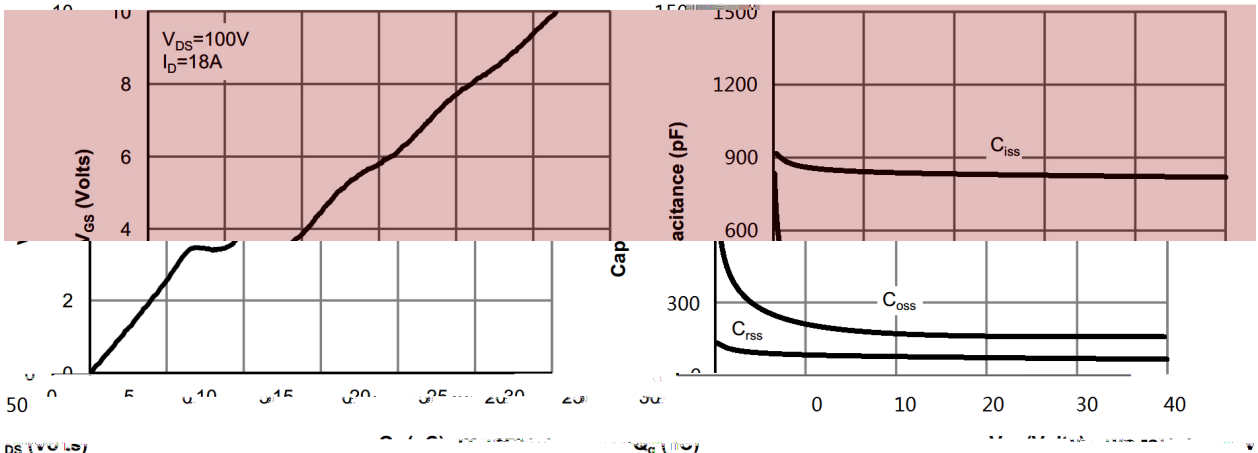



Figure 4: On-Resistance vs. Junction Temperature

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



## / Electrical Characteristic Curve




citance Characteristics

**Figure 7: Gate-Charge Characteristics**

**Figure 8: Capa**

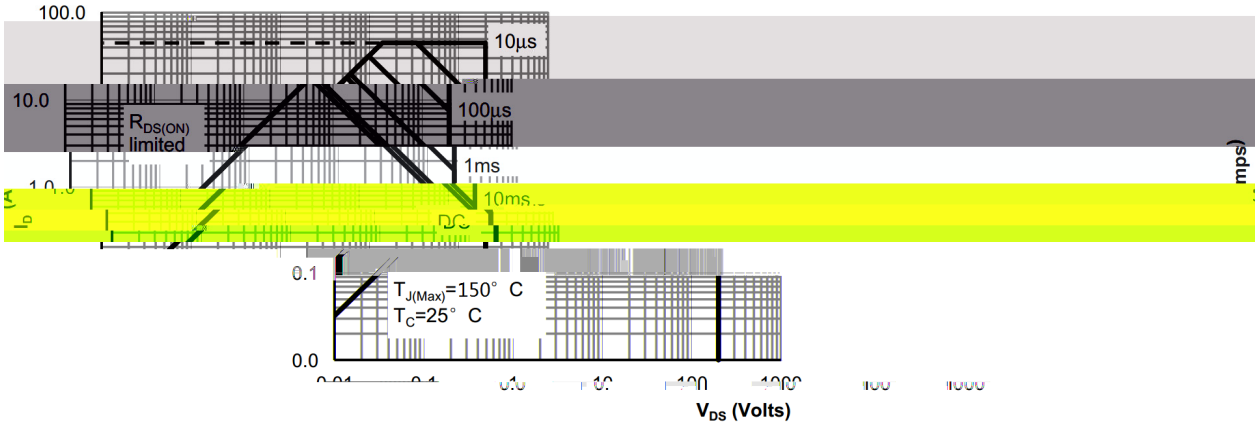



**Figure 9: Maximum Forward Biased Safe Operating Area**

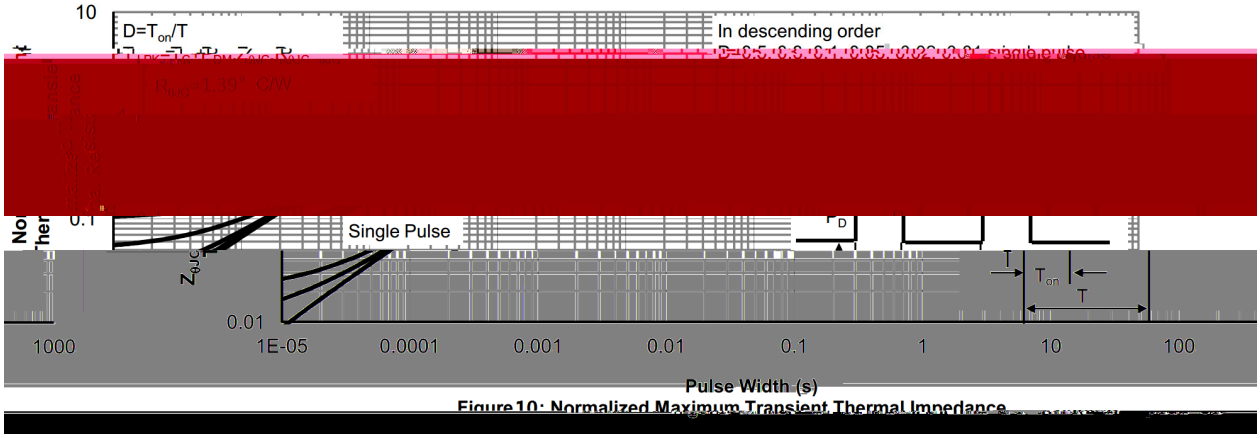
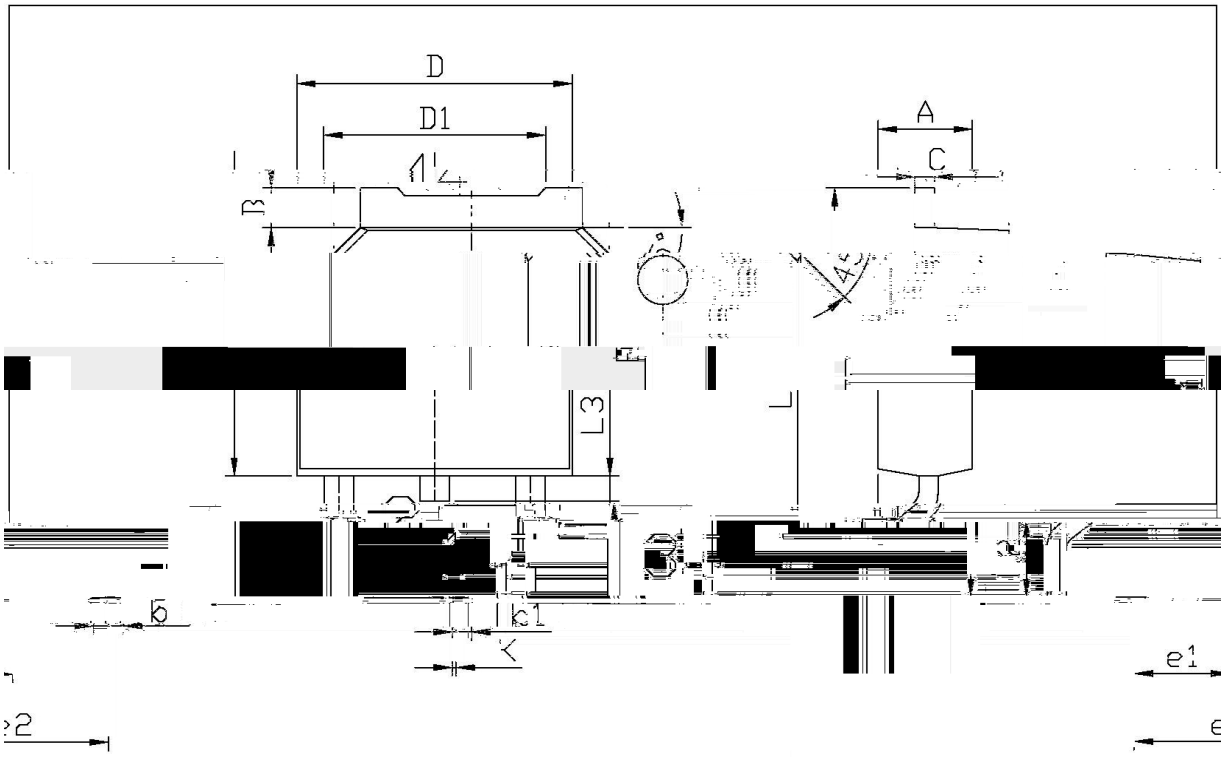



**Figure 10: Normalized Maximum Transient Thermal Impedance**

## / Package Dimensions

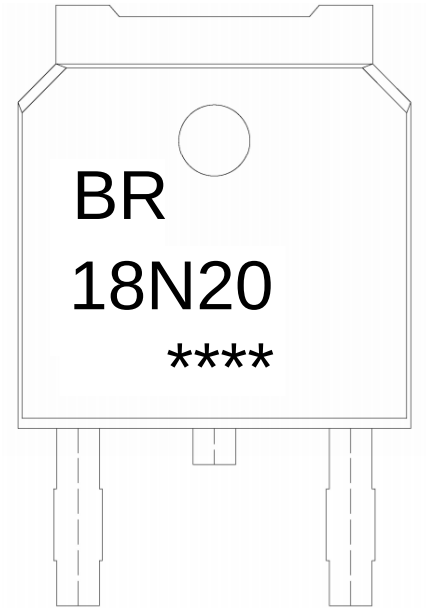



单位：mm

| Symbol | Dimensions In Millimeters | | Symbol | Dimensions In Millimeters | |
|---|---|---|---|---|---|
| | Min | Max | | Min | Max |
| | 6.25 | | A | 2.20 | 2.40 |
| 0.95 | 1.25 | e1 | 2.24 | 2.34 | B |
| | | e2 | 4.43 | 4.73 | |
| 0.45 | 0.55 | L1 | 9.85 | 10.35 | b1 |
| | 0.45 | | 0.55 | 1.70 | |
| 0.60 | 0.90 | | D | 6.45 | 6.75 |
| | | | | | |

TO-252

## / Marking Instructions




Note:

| | |
|---|---|
| BR: | Company Code |
| 18N20: | Product Type Code |
| ****: | Lot No. Code, code change with Lot No. |

## ( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)

| |
|---|
| |
| |
| |
| |
| |
| |
| |

| | | |
|---|---|---|
| | | Note: |
| 1 | 150 180 60 90sec; | 1.Preheating:150~180 , Time:60~90sec. |
| 2 | 245 5 5 0.5sec; | 2.Peak Temp.:245 5 , Duration:5 0.5sec. |
| 3 | 2 10 /sec. | 3. Cooling Speed: 2~10 /sec. |

## / Resistance to Soldering Heat Test Conditionsest Cond45D/Cp6du□5 5 Duration5