TO-252 P MOS
P-CHANNEL MOSFET in a TO-252 Plastic Package.

Low $R_{DS(on)}$,low gate charge, low $C_{rss}$

## / Absolute Maximum Ratings(Ta=25 )

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -60 | V |
| Drain Current | | $I_D$(Tc=25 ) | -50 | A |
| Drain Current - Pulsed | | $I_{DM}$ | -200 | A |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Power Dissipation | | $P_D$(Tc=25 ) | 85 | W |
| Single Pulsed Avalanche Energy | | $E_{AS}$ | 250 | mJ |
| Avalanche Current(L=0.5mH) | | $I_{AS}$ | 25 | A |
| Junction and Storage Temperature Range | | $T_j$, $T_{stg}$ | -55 to 150 | |
| Thermal resistance, junction - ambient | t ≤ 10s | $R_{\theta JA}$ | 25 | / W |
| | Steady-State | | 50 | |
| Thermal resistance, junction - case | Steady-State | $R_{\theta JC}$ | 1.5 | |

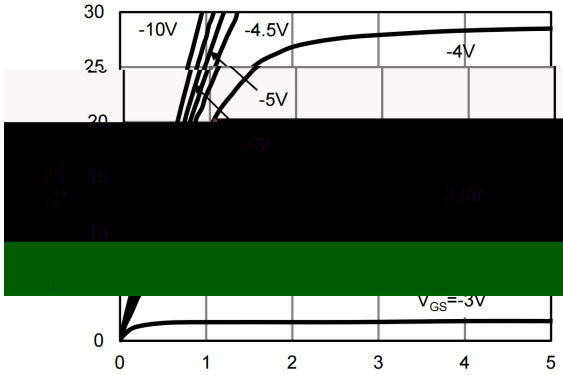
## / Electrical Characteristics(Ta=25 )

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V $I_D$=-250μA | -60 | -68 | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-60V $V_{GS}$=0V | | | -1.0 | μA |
| | | $V_{DS}$=-48V $T_C$=150 | | | -10 | |
| Gate-Body Leakage Current Forward | $I_{GSS}$ | $V_{GS}$=±20V $V_{DS}$=0V | | | ±0.1 | μA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ $I_D$=-250μA | -1 | -1.6 | -3 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=-10V $I_D$=-20A | | 30 | 35 | mΩ |
| | $R_{DS(on)}$ | $V_{GS}$=-4.5V $I_D$=-10A | | 40 | 45 | mΩ |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V $I_S$=-1A | | | -1.2 | V |
| Gate resistance | Rg | | | 10 | | Ω |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-25V $V_{GS}$=0V f=1.0MHz | | 3200 | | pF |
| Output Capacitance | $C_{oss}$ | | | 800 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 270 | | pF |
| Total Gate Charge | $Q_{g(10V)}$ | $V_{GS}$=-10V, $V_{DS}$=-30V, $I_D$=-20A | | 45 | | nC |
| Total Gate Charge | $Q_{g(4.5V)}$ | | | 23 | | |
| Gate Source Charge | $Q_{gs}$ | | | 9.3 | | |
| Gate Drain Charge | $Q_{gd}$ | | | 10.2 | | nC |

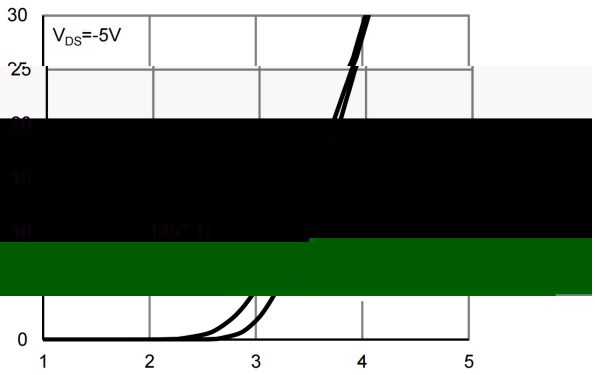
## / Electrical Characteristics(Ta=25 )

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}$=-10V<br>$V_{DS}$=-30V $R_L$=1.5<br>$R_{GEN}$=3Ω | | 12 | | ns |
| Turn-On Rise Time | $t_r$ | | | 14.5 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 38 | | |
| Turn-Off Fall Time | $t_f$ | | | 15 | | |

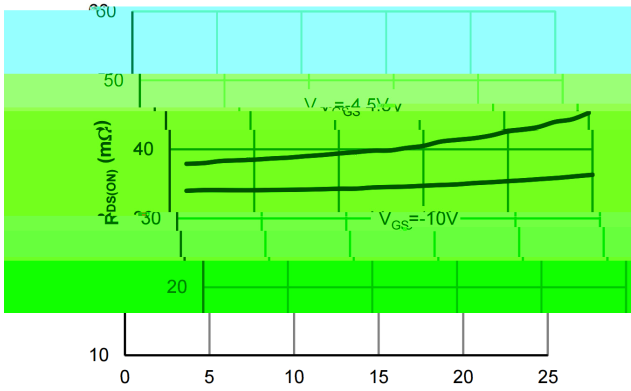
## / Electrical Characteristic Curve



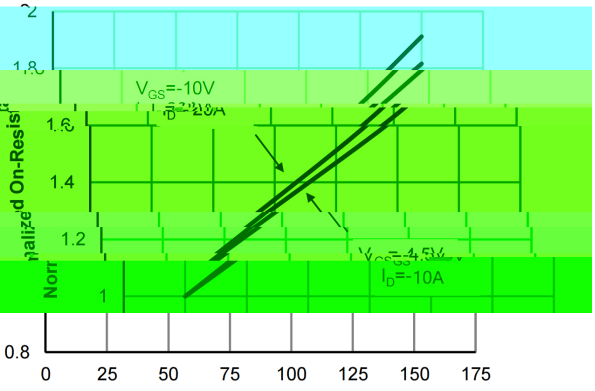

$-V_{DS}$ (Volts)
**Figure 1: On-Region Characteristics**



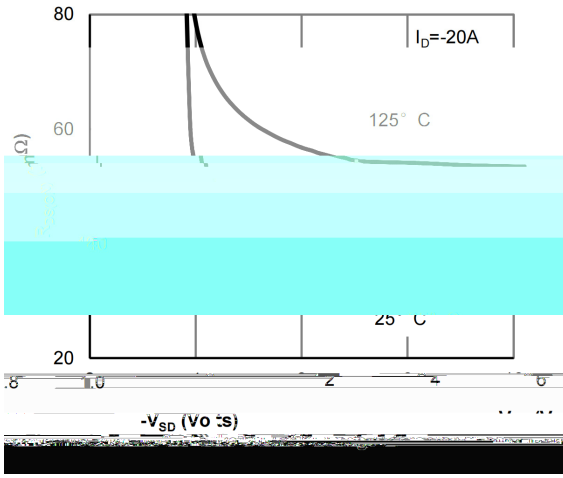

$-V_{GS}$(Volts)
**Figure 2: Transfer Characteristics**



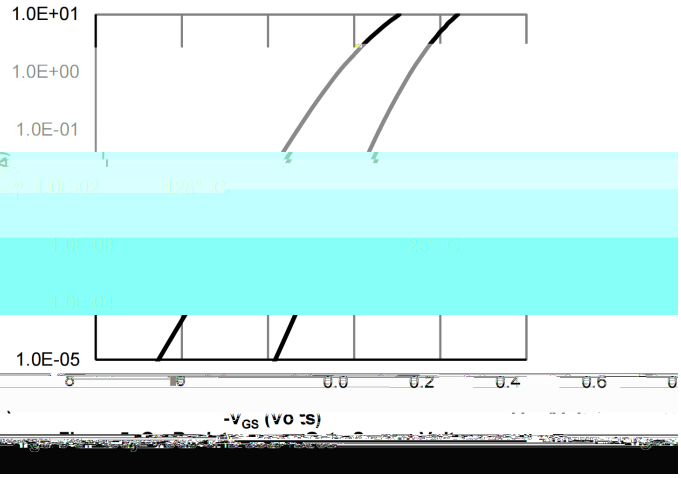

$-I_D$ (A)
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**




Temperature (°C)
**Figure 4: On-Resistance vs. Junction Temperature**

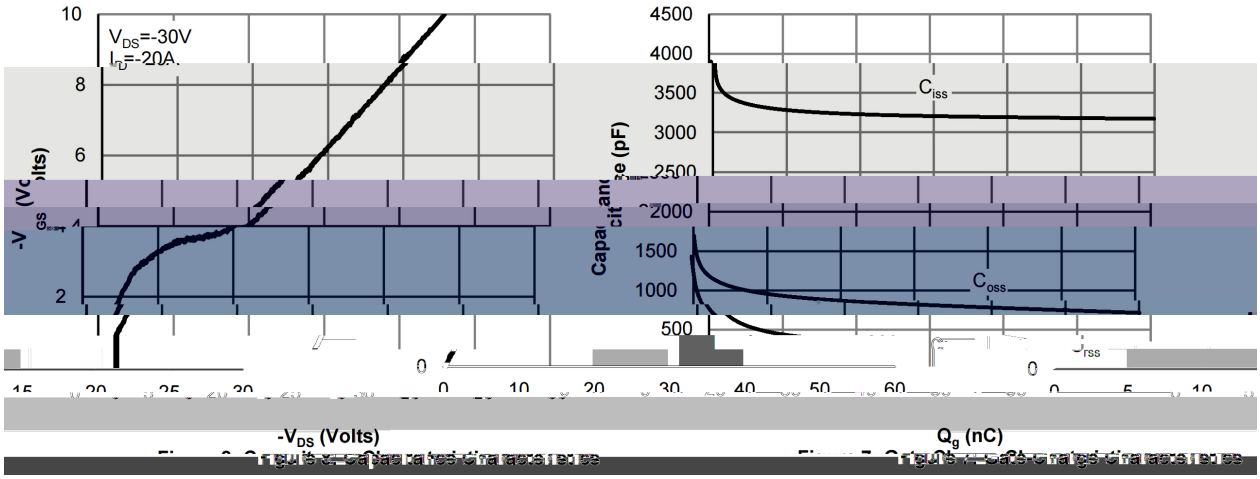



$-V_{SD}$ (Volts)
**Figure 5: Body-Diode Characteristics**




$-V_{GS}$ (Volts)
**Figure 6: Gate-Charge Characteristics**

## / Electrical Characteristic Curve



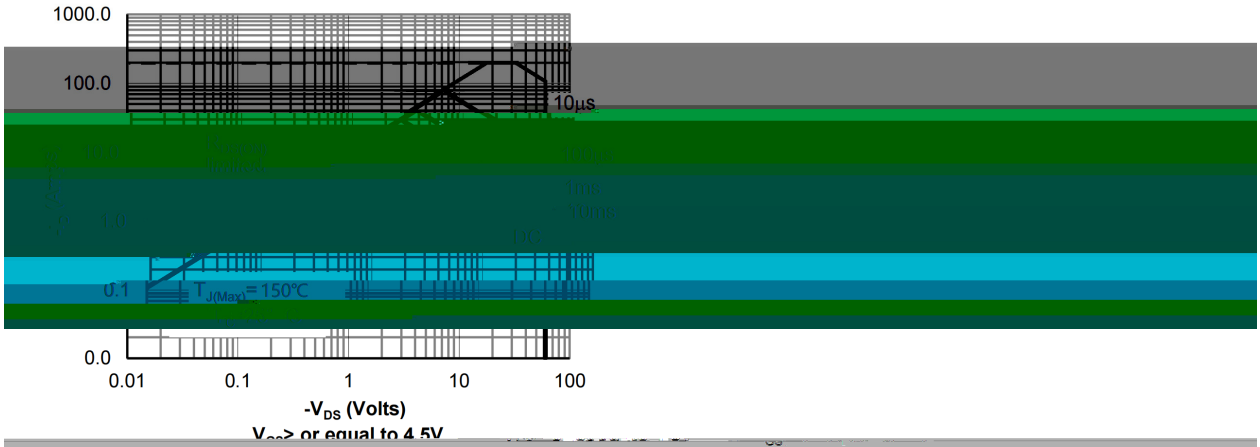




Figure 9: Maximum Forward Biased Safe Operating Area

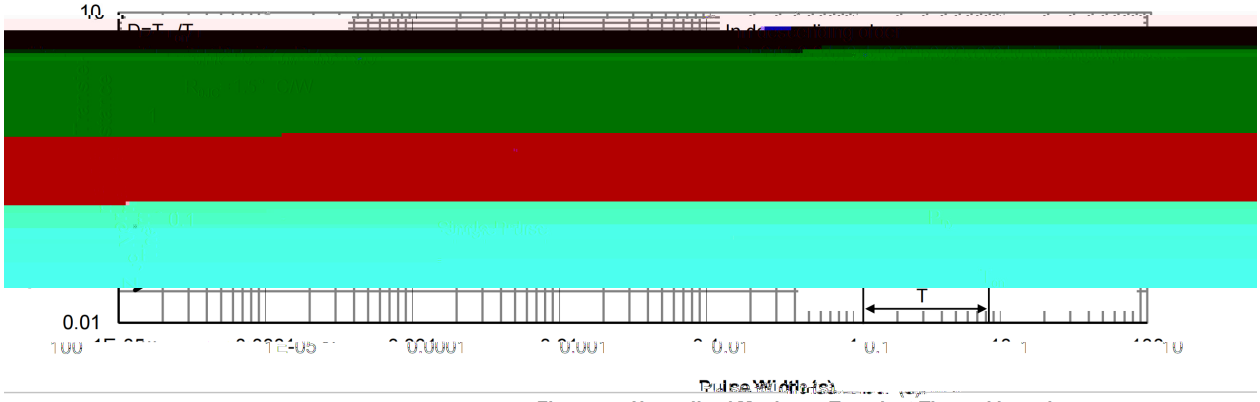
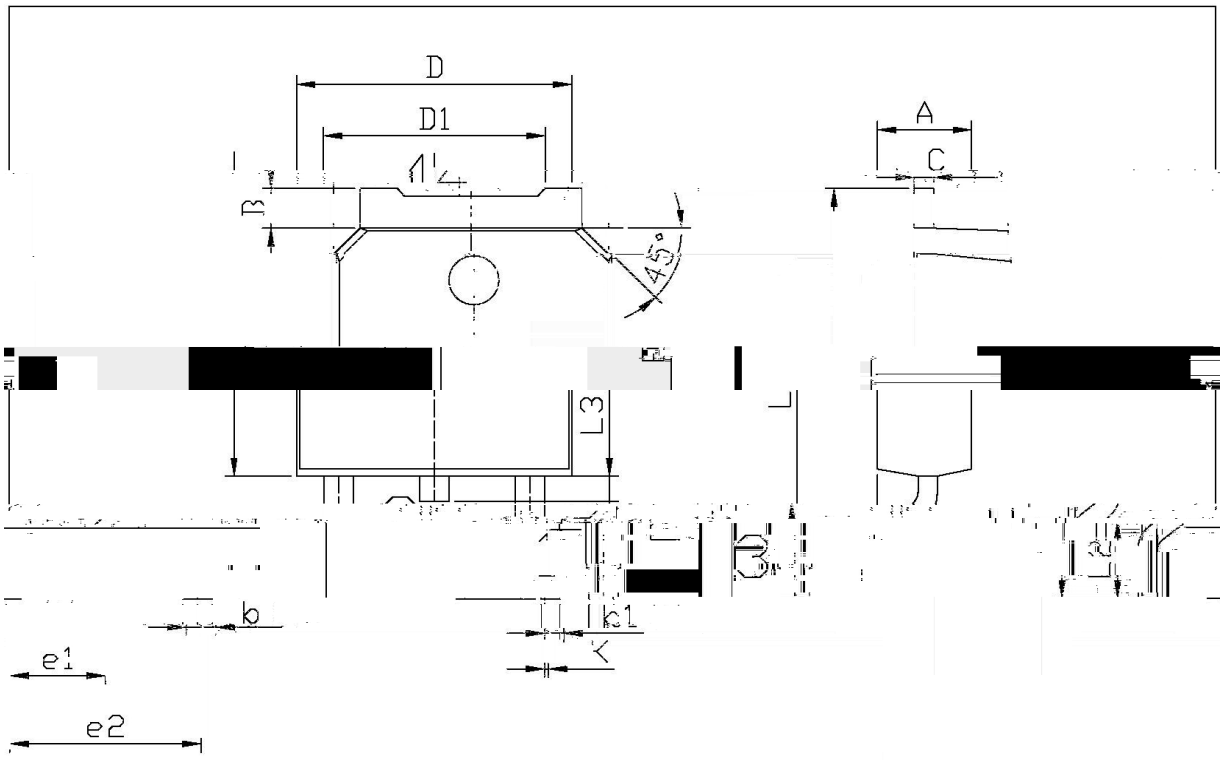



Figure 10: Normalized Maximum Transient Thermal Impedance

## / Package Dimensions

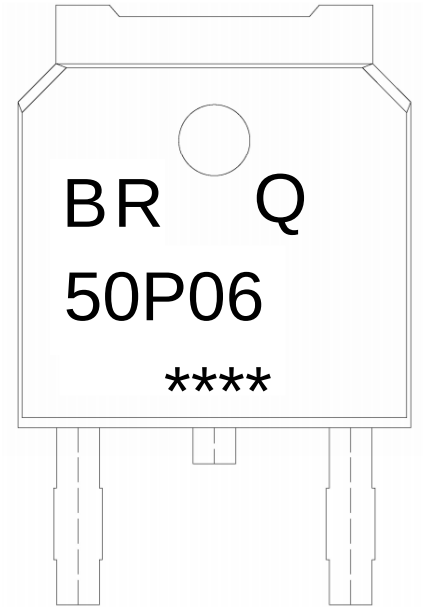



单位：mm

| Symbol | Dimensions In Millimeters | | Symbol | Dimensions In Millimeters | |
|---|---|---|---|---|---|
| | Min | Max. | | Min | Max |
| [illegible] | 6.35 | [illegible] | A | 2.20 | 2.40 |
| 0.95 | 1.25 | e1 | 2.24 | 2.34 | B |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| b1 | 0.45 | 0.55 | L1 | 9.85 | 10.35 |
| [illegible] | 0.45 | 0.55 | [illegible] | 1.70 | 3.00 |
| L3 | 0.60 | 0.90 | D | 6.45 | 6.75 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

TO-252

## / Marking Instructions




BR

Q

Note:

| | |
|---|---|
| BR: | Company Code |
| Q: | Automobile halogen-free product Code |
| 50P06: | Product Type Code |
| ****: | Lot No. Code, code change with Lot No |

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

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

Note:

| | | |
|---|---|---|
| 1 | 150 200 60 120sec; | 1.Preheating:150~200 , Time:60~120sec. |
| 2 | 255 5 5 0.5sec; | 2.Peak Temp.:255 5 , Duration:5 0.5sec. |
| 3 | 2 10 /sec. | 3. Cooling Speed: 2~10 /sec. |

## / Resistance to Soldering Heat Test Conditions

260 5 10 1 sec. Temp.:260±5 Time:10±1 sec

## / Packaging SPEC.

/ REEL

| Package Type | Units | | | | | Dimension | | (unit mm³) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |