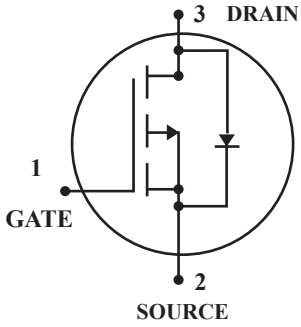
# WEITRON

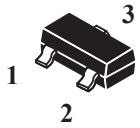
# WTC2303

## P-Channel Enhancement Mode Power MOSFET

Lead(Pb)-Free




**DRAIN CURRENT**
**-1.9 AMPERES**
**DRAIN SOURCE VOLTAGE**
**-30 VOLTAGE**




**SOT-23**



## Features:

*Super High Dense Cell Design For Low $R_{DS(ON)}$
$R_{DS(ON)}$ <240mΩ@$V_{GS}$=-10V
*Rugged and Reliable
*Simple Drive Requirement
*SOT-23 Package

## Applications

*Power Management in Notebook Computer
*Portable Equipment
*Battery Powered System

## Maximum Ratings($T_A$=25℃ Unless Otherwise Specified)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | |
| Continuous Drain Current [3] ,($T_A$=25°C) | $I_D$ | -1.9 | A |
| ,($T_A$=70°C) | | -1.5 | |
| Pulsed Drain Current [1,2] | $I_{DM}$ | -10 | |
| Total Power Dissipation($T_A$=25°C) | $P_D$ | 1.38 | W |
| Maximum Thermal Resistance Junction-ambient [3] | $R_{\theta JA}$ | 90 | °C/W |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | -55~+150 | °C |

## Device Marking

WTC2303=2303

## Electrical Characteristics ($T_A$ = 25℃ Unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **Static** | | | | | |
| Drain-Source Breakdown Voltage<br>$V_{GS}$=0,$I_D$=-250μA | $V_{(BR)DSS}$ | -30 | - | - | V |
| Gate-Source Threshold Voltage<br>$V_{DS}$=$V_{GS}$,$I_D$=-250μA | $V_{GS(Th)}$ | -1.0 | - | - | |
| Gate-Source Leakage Current<br>$V_{GS}$= ±20V | $I_{GSS}$ | - | - | ±100 | nA |
| Drain- Source Leakage Current($T_j$=25°C)<br>$V_{DS}$=-30V,$V_{GS}$=0 | $I_{DSS}$ | - | - | -1 | μA |
| Drain- Source Leakage Current($T_j$=70°C)<br>$V_{DS}$=-30V,$V_{GS}$=0 | | - | - | -10 | |
| Drain-Source On-Resistance [2]<br>$V_{GS}$=-10V,$I_D$=-1.7A<br>$V_{GS}$=-4.5V,$I_D$=-1.3A | $R_{DS(on)}$ | -<br>- | -<br>- | 240<br>460 | mΩ |
| Forward Transconductance<br>$V_{DS}$=-10V, $I_D$=-1.7A | $g_{fs}$ | - | 2 | - | S |
| **Dynamic** | | | | | |
| Input Capacitance<br>$V_{GS}$=0V,$V_{DS}$=-15V,f=1.0MHz | $C_{iss}$ | - | 230 | - | pF |
| Output Capacitance<br>$V_{GS}$=0V,$V_{DS}$=-15V,f=1.0MHz | $C_{oss}$ | - | 130.4 | - | |
| Reverse Transfer Capacitance<br>$V_{GS}$=0V,$V_{DS}$=-15V,f=1.0MHz | $C_{rss}$ | - | 40 | - | |

## Switching

| | | | | | |
|---|---|---|---|---|---|
| Turn-on Delay Time[2]<br>$V_{DS}$=-15V,$V_{GS}$=-10V,$I_D$=-1A,$R_D$=15Ω ,$R_G$=6Ω | $t_{d(on)}$ | - | 7.6 | - | ns |
| Rise Time<br>$V_{DS}$=-15V,$V_{GS}$=-10V,$I_D$=-1A,$R_D$=15Ω ,$R_G$=6Ω | $t_r$ | - | 8.2 | - | |
| Turn-off Delay Time<br>$V_{DS}$=-15V,$V_{GS}$=-10V,$I_D$=-1A,$R_D$=15Ω ,$R_G$=6Ω | $t_{d(off)}$ | - | 17.5 | - | |
| Fall Time<br>$V_{DS}$=-15V,$V_{GS}$=-10V,$I_D$=-1A,$R_D$=15Ω ,$R_G$=6Ω | $t_f$ | - | 9 | - | |
| Total Gate Charge[2]<br>$V_{DS}$=-15V,$V_{GS}$=-10V,$I_D$=-1.7A | $Q_g$ | - | 6.2 | 10 | nC |
| Gate-Source Charge<br>$V_{DS}$=-15V,$V_{GS}$=-10V,$I_D$=-1.7A | $Q_{gs}$ | - | 1.4 | - | |
| Gate-Drain Change<br>$V_{DS}$=-15V,$V_{GS}$=-10V,$I_D$=-1.7A | $Q_{gd}$ | - | 0.3 | - | |

## Source-Drain Diode Characteristics

| | | | | | |
|---|---|---|---|---|---|
| Forward On Voltage[2]<br>$V_{GS}$=0V,$I_S$=-1.25A @Tj=25°C | $V_{SD}$ | - | - | -1.2 | V |
| Continuous Source Current(Body Diode)<br>$V_D$=$V_G$=0V,$V_S$=-1.2V | $I_S$ | - | - | -1 | A |
| Pulsed Source Current(Body Diode)[1] | $I_{SM}$ | - | - | -10 | A |

Note: 1. Pulse width limited by Max, junction temperature.
2. pulse width≦300μs, duty cycle≦2%.
3. Surface mounted on 1 in² copper pad of FR4 board; 270℃/W when mounted on min, copper pad.

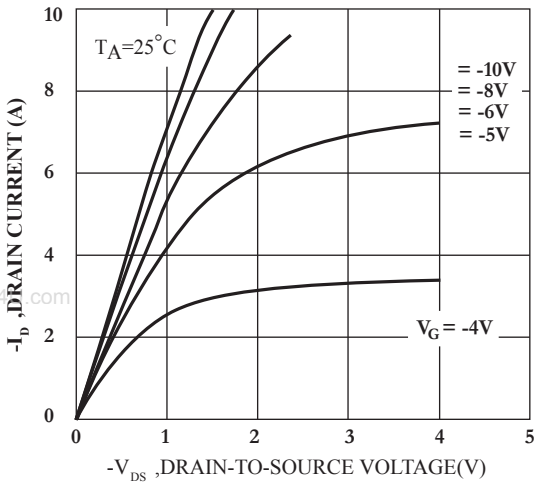



**FIG.1 Typical Output Characteristics**

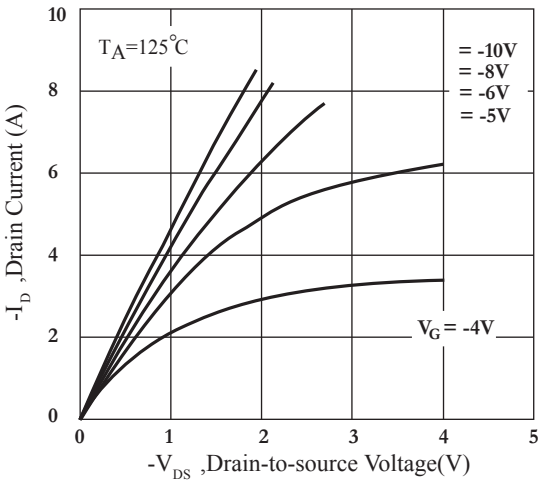



**Fig.2 Typical Output Characteristics**

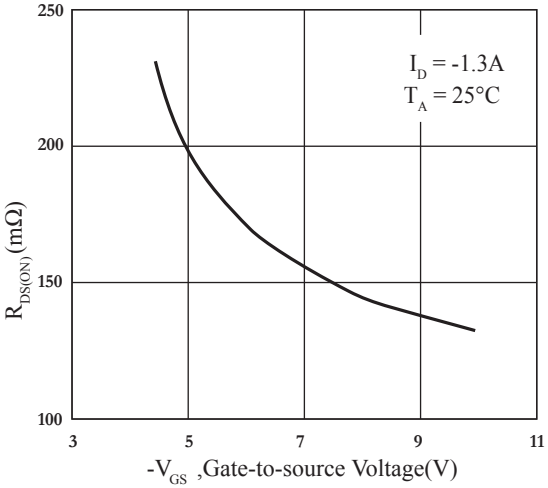



**Fig.3 On-Resistance v.s. Gate Voltage**

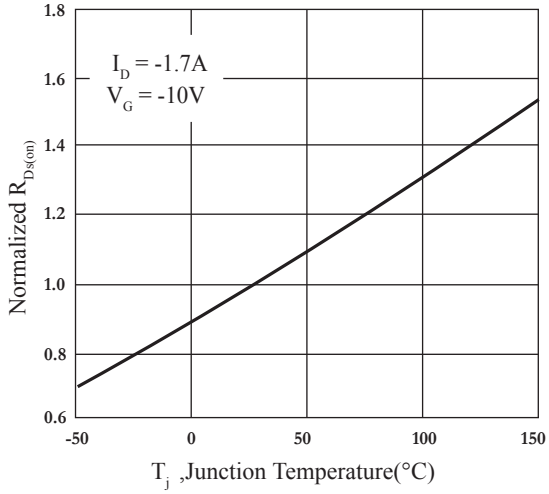



**Fig.4 Normalized On-Resistance**

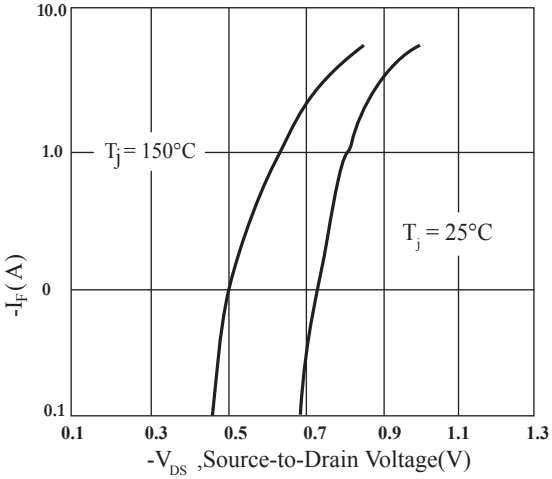



**Fig.5 Forward Characteristics of Reverse Diode**

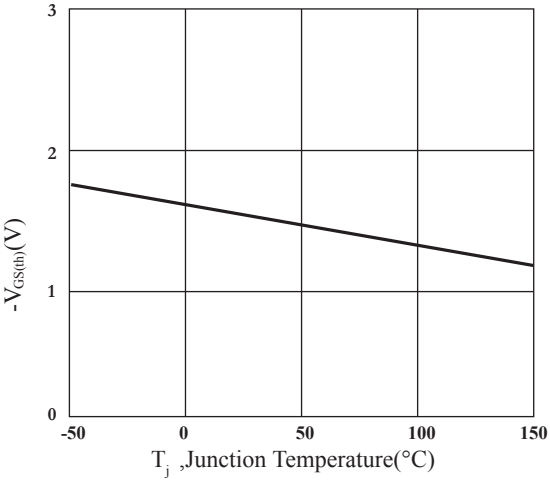



**Fig.6 Gate Threshold Voltage v.s. Junction Temperature**

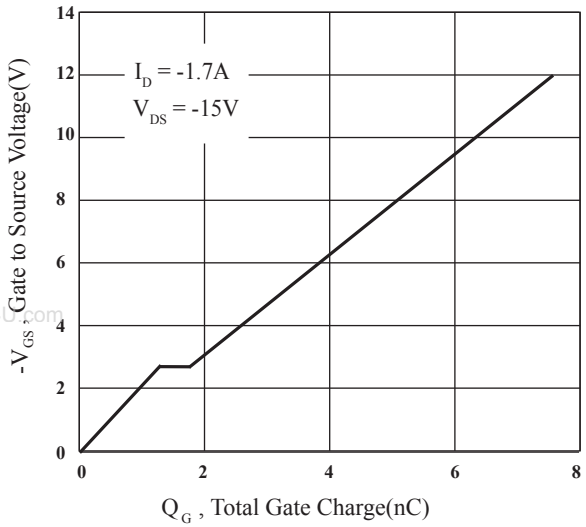



**Fig 7. Gate Charge Characteristics**

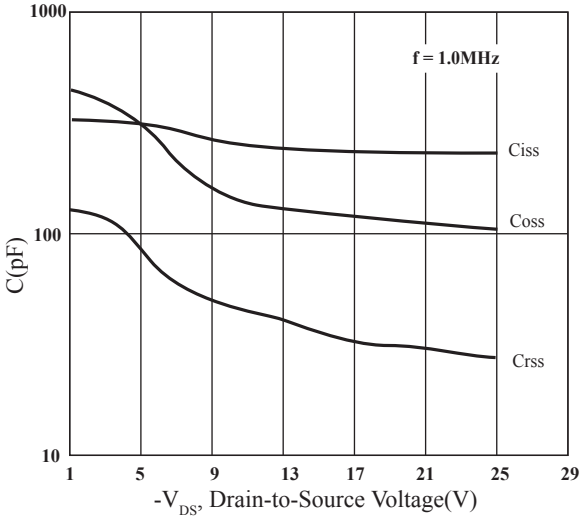



**Fig 8. Typical Capacitance Characteristics**

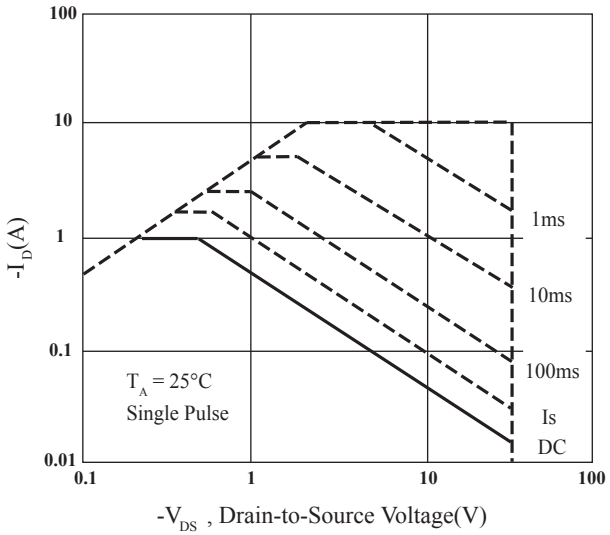



**Fig 9. Maximum Safe Operation Area**

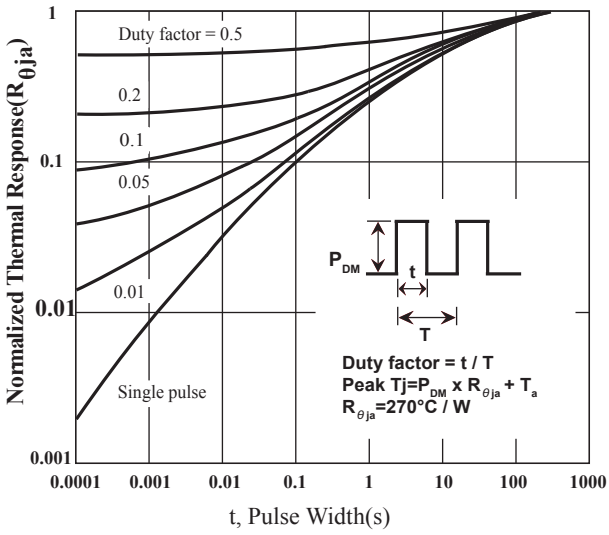



**Fig 10. Effective Transient Thermal Impedance**

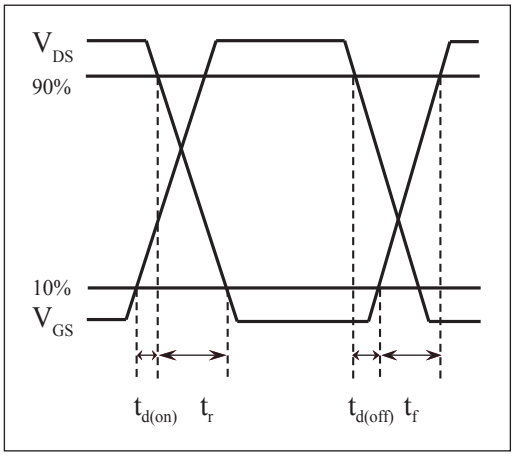



**Fig 11. Switching Time Waveform**

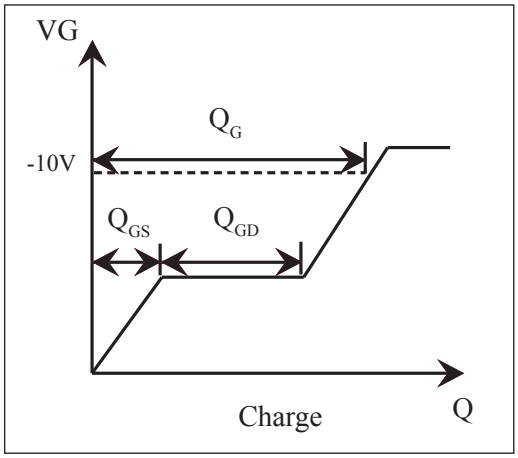
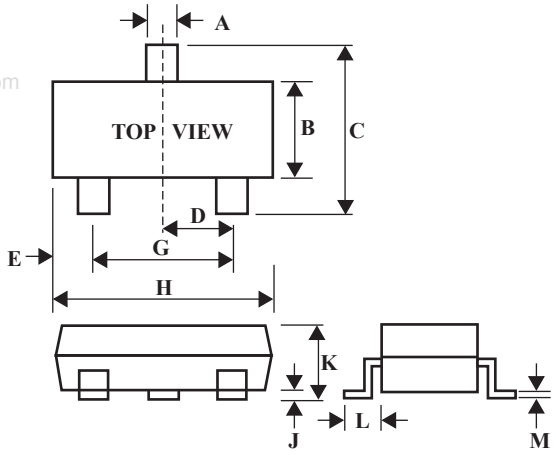



**Fig.12 Gate Charge Waveform**

# SOT-23 Outline Dimension




| SOT-23 | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 0.35 | 0.51 |
| **B** | 1.19 | 1.40 |
| **C** | 2.10 | 3.00 |
| **D** | 0.85 | 1.05 |
| **E** | 0.46 | 1.00 |
| **G** | 1.70 | 2.10 |
| **H** | 2.70 | 3.10 |
| **J** | 0.01 | 0.13 |
| **K** | 0.89 | 1.10 |
| **L** | 0.30 | 0.61 |
| **M** | 0.076 | 0.25 |