

## ● Product Summary

- $V_{DS} = -20V$ ,  $I_D = -2.8A$   
 $R_{DS(on)}$  80mΩ@-2.5V( Typ )  
 110mΩ@-4.5V( Typ )
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

## Application

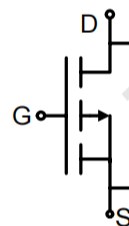
- PWM applications
- Load switch
- Power management

## Package and Pin Configuration

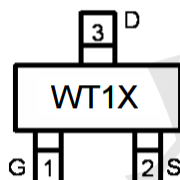
### SOT-23



## Circuit diagram



## Marking:



Marking: WTIX  
 "WTI" is part number, fixed  
 "X" is internal code

## ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

| Parameter                                         | Symbol         | Limit      | Unit |
|---------------------------------------------------|----------------|------------|------|
| Drain-Source Voltage                              | $V_{DS}$       | -20        | V    |
| Gate-Source Voltage                               | $V_{GS}$       | ±8         | V    |
| Drain Current-Continuous@ Current-Pulsed (Note 1) | $I_D$          | -2.8       | A    |
|                                                   | $I_{DM}$       | -10        | A    |
| Maximum Power Dissipation                         | $P_D$          | 1.25       | W    |
| Operating Junction and Storage Temperature Range  | $T_J, T_{STG}$ | -55 To 150 | °C   |

## THERMAL CHARACTERISTICS

|                                                  |                 |     |      |
|--------------------------------------------------|-----------------|-----|------|
| Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 100 | °C/W |
|--------------------------------------------------|-----------------|-----|------|

**ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)**

| Parameter                          | Symbol       | Condition                                               | Min   | Typ  | Max       | Unit    |
|------------------------------------|--------------|---------------------------------------------------------|-------|------|-----------|---------|
| OFF CHARACTERISTICS                |              |                                                         |       |      |           |         |
| Drain-Source Breakdown Voltage     | $BV_{DSS}$   | $V_{GS}=0V, I_D=-250\mu A$                              | -20   |      |           | V       |
| Zero Gate Voltage Drain Current    | $I_{DSS}$    | $V_{DS}=-20V, V_{GS}=0V$                                |       |      | -1        | $\mu A$ |
| Gate-Body Leakage Current          | $I_{GSS}$    | $V_{GS}=\pm 8V, V_{DS}=0V$                              |       |      | $\pm 100$ | nA      |
| ON CHARACTERISTICS (Note 3)        |              |                                                         |       |      |           |         |
| Gate Threshold Voltage             | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$                          | -0.45 |      | -1        | V       |
| Drain-Source On-State Resistance   | $R_{DS(ON)}$ | $V_{GS}=-4.5V, I_D=-2.8A$                               |       | 80   | 100       |         |
|                                    |              | $V_{GS}=-2.5V, I_D=-2A$                                 |       | 110  | 150       |         |
| Forward Transconductance           | $g_{FS}$     | $V_{DS}=-5V, I_D=-2.8A$                                 |       | 9    |           | S       |
| DYNAMIC CHARACTERISTICS (Note4)    |              |                                                         |       |      |           |         |
| Input Capacitance                  | $C_{iss}$    | $V_{DS}=-10V, V_{GS}=0V, F=1.0MHz$                      |       | 1160 |           | PF      |
| Output Capacitance                 | $C_{oss}$    |                                                         |       | 210  |           | PF      |
| Reverse Transfer Capacitance       | $C_{rss}$    |                                                         |       | 125  |           | PF      |
| SWITCHING CHARACTERISTICS (Note 4) |              |                                                         |       |      |           |         |
| Turn-on Delay Time                 | $t_{d(on)}$  | $V_{DD}=-10V, I_D=-2.8A, V_{GS}=-4.5V, R_{GEN}=3\Omega$ |       | 13.6 | 27.2      | nS      |
| Turn-on Rise Time                  | $t_r$        |                                                         |       | 8.6  | 17.2      | nS      |
| Turn-Off Delay Time                | $t_{d(off)}$ |                                                         |       | 73.6 | 147.2     | nS      |
| Turn-Off Fall Time                 | $t_f$        |                                                         |       | 34.6 | 69.2      | nS      |
| Total Gate Charge                  | $Q_g$        | $V_{DS}=-10V, I_D=-2.8A, V_{GS}=-4.5V$                  |       | 9.6  | 12.7      | nC      |
| Gate-Source Charge                 | $Q_{gs}$     |                                                         |       | 1.1  |           | nC      |
| Gate-Drain Charge                  | $Q_{gd}$     |                                                         |       | 2.6  |           | nC      |
| DRAIN-SOURCE DIODE CHARACTERISTICS |              |                                                         |       |      |           |         |
| Diode Forward Voltage (Note 3)     | $V_{SD}$     | $V_{GS}=0V, I_S=-0.75A$                                 |       |      | -1.2      | V       |
| Diode Forward Current (Note 2)     | $I_S$        |                                                         |       |      | -2.8      | A       |

## Typical Electrical and Thermal Characteristics

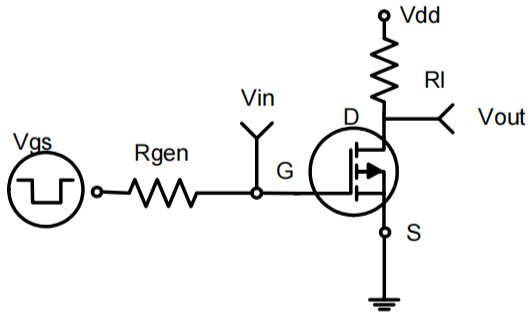


Figure1:Switching Test Circuit

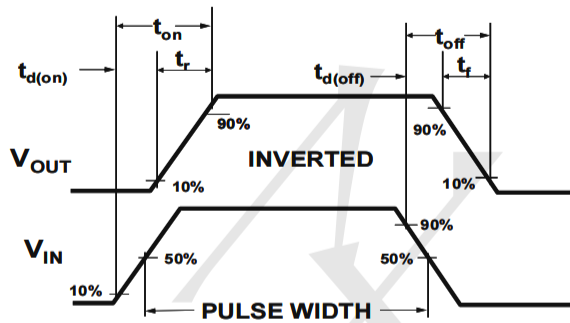


Figure 2:Switching Waveforms

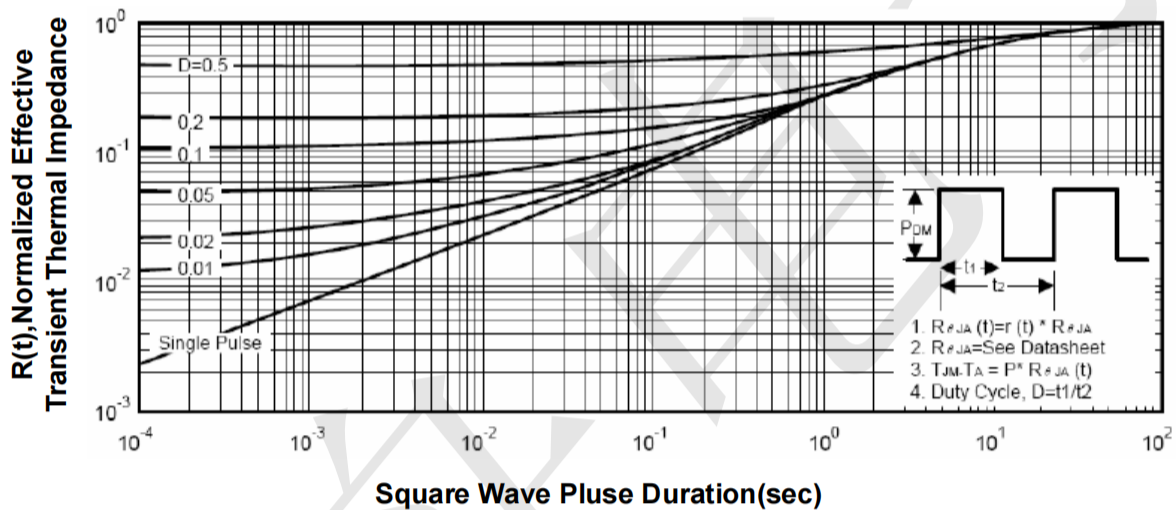
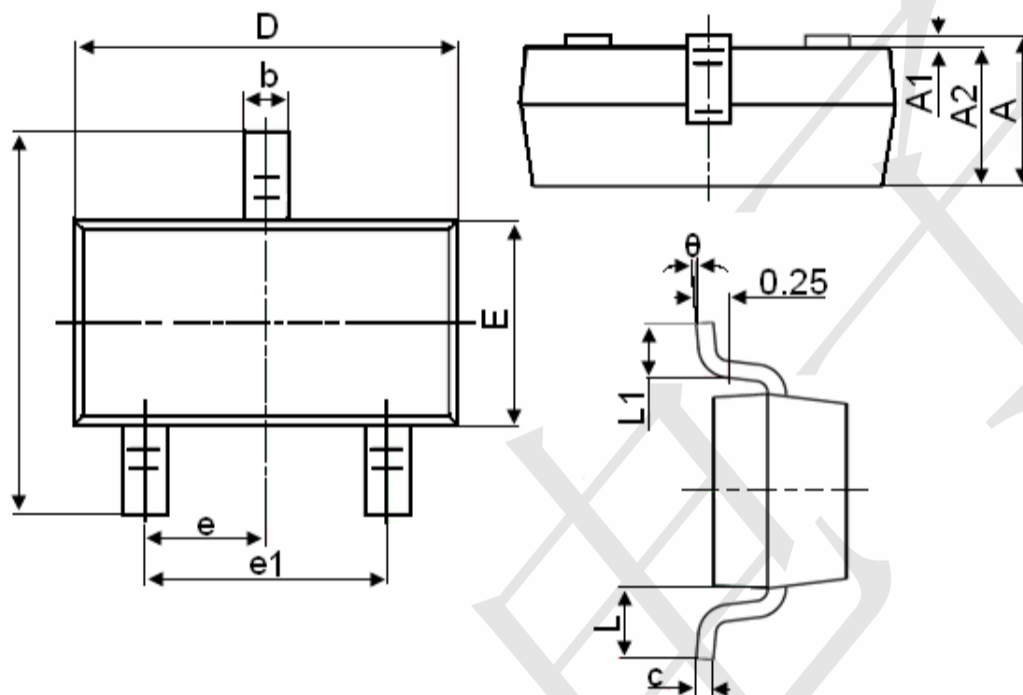


Figure 3: Normalized Maximum Transient Thermal Impedance

**SOT-23 Package Information**



| Symbol | Dimensions in Millimeters |       |
|--------|---------------------------|-------|
|        | MIN.                      | MAX.  |
| A      | 0.900                     | 1.150 |
| A1     | 0.000                     | 0.100 |
| A2     | 0.900                     | 1.050 |
| b      | 0.300                     | 0.500 |
| c      | 0.080                     | 0.150 |
| D      | 2.800                     | 3.000 |
| E      | 1.200                     | 1.400 |
| E1     | 2.250                     | 2.550 |
| e      | 0.950TYP                  |       |
| e1     | 1.800                     | 2.000 |
| L      | 0.550REF                  |       |
| L1     | 0.300                     | 0.500 |
| θ      | 0°                        | 8°    |