

## N-Channel ENHANCEMENT MODE POWER MOSFET

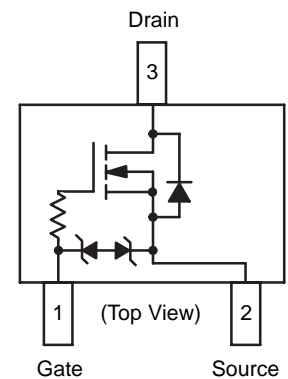
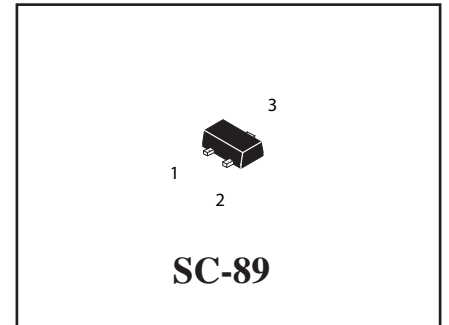
**(Pb)** Lead(Pb)-Free

### FEATURES:

- \* Low Gate Charge for Fast Switching
- \* ESD Protected Gate

### APPLICATIONS:

- \* Power Management Load Switch
- \* Portable Applications such as Cell Phones, Media Players, Digital Cameras, PDA's, Video Games, Hand Held Computers, etc.



### Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Values	Unit
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 10$	V
Drain Current	$I_D$	154	mA
Pulsed Drain Current $tp \leq 10\mu\text{s}$	$I_{DM}$	618	mA
Continuous Source Current (Body Diode)	$I_{SD}$	154	mA
Total Power Dissipation	$P_D^1$	300	mW
Junction temperature Range	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Note 1. Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces).

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### Device Marking

WTX7002 = T6

## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified, per element)

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS(Note2)

Drain-Source Breakdown Voltage V <sub>GS</sub> =0V, I <sub>D</sub> =100μA	V <sub>(BR)DSS</sub>	30	-	-	V
Zero Gate Voltage Drain Current V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	I <sub>DSS</sub>	-	-	1.0	μA
Gate-source Leakage V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V	I <sub>GSS</sub>	-	-	±25	μA

### ON CHARACTERISTICS(Note2)

Gate Threshold Voltage V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =100μA	V <sub>GS(th)</sub>	0.5	1.0	1.5	V
Static Drain-Source On-Resistance V <sub>GS</sub> =4.5V, I <sub>D</sub> =154mA V <sub>GS</sub> =2.5V, I <sub>D</sub> =154mA	R <sub>DS(ON)</sub>	-	1.4 2.3	7.0 7.5	Ω
Forward transfer admittance V <sub>DS</sub> =3V, I <sub>D</sub> =154mA	g <sub>fs</sub>	-	80	-	mS

### DYNAMIC CHARACTERISTICS

Input Capacitance V <sub>DS</sub> =5V, V <sub>GS</sub> =0V, f=1.0MHz	C <sub>iss</sub>	-	11.5	-	pF
Output Capacitance V <sub>DS</sub> =5V, V <sub>GS</sub> =0V, f=1.0MHz	C <sub>oss</sub>	-	10	-	
Reverse Transfer Capacitance V <sub>DS</sub> =5V, V <sub>GS</sub> =0V, f=1.0MHz	C <sub>rss</sub>	-	3.5	-	

### SWITCHING CHARACTERISTICS

Turn-On Delay Time V <sub>DS</sub> =5.0V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =75mA, R <sub>G</sub> =10Ω	t <sub>d(ON)</sub> *	-	13	-	nS
Rise Time V <sub>DS</sub> =5.0V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =75mA, R <sub>G</sub> =10Ω	t <sub>r</sub>	-	15	-	
Turn-Off Delay Time V <sub>DS</sub> =5.0V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =75mA, R <sub>G</sub> =10Ω	t <sub>d(OFF)</sub> *	-	98	-	
Fall Time V <sub>DS</sub> =5.0V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =75mA, R <sub>G</sub> =10Ω	t <sub>f</sub>	-	60	-	

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### Drain-Source Diode Characteristics

Input Capacitance V <sub>GS</sub> =0V, I <sub>S</sub> =0.154mA	V <sub>SD</sub>	-	0.77	0.9	V
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\*Pulse Test : pulse width ≤ 300μs, Duty cycle ≤ 2%.

## Characteristics Curve

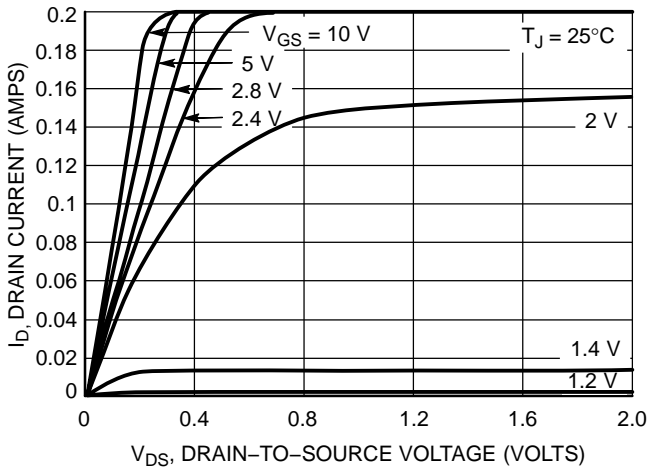


Figure 1. On-Region Characteristics

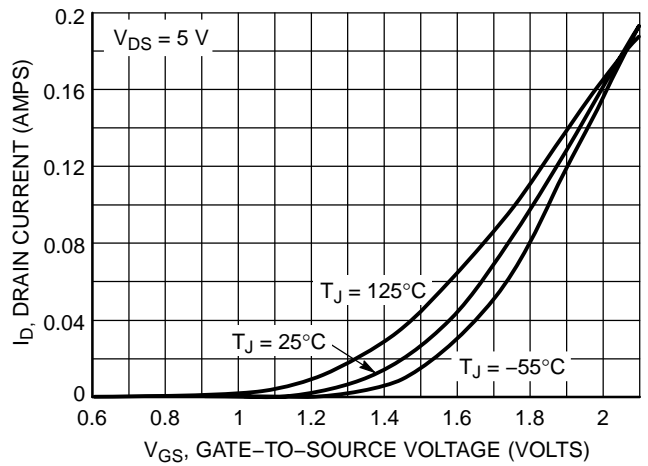


Figure 2. Transfer Characteristics

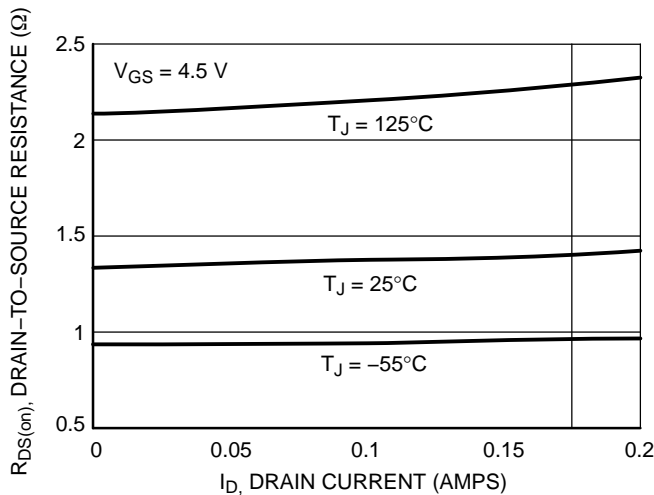


Figure 3. On-Resistance vs. Drain Current and Temperature

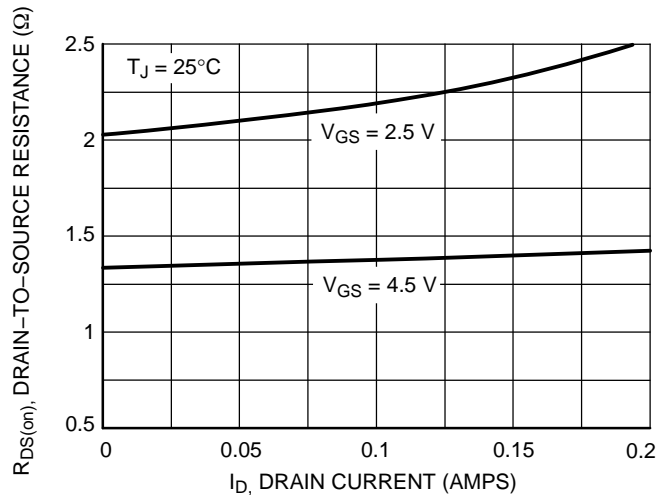


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

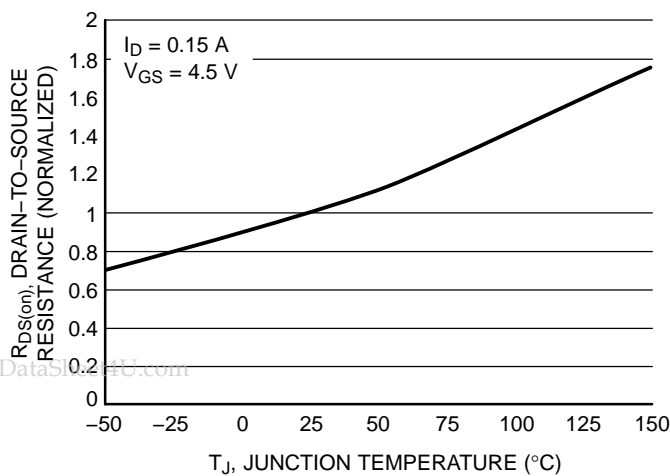


Figure 5. On-Resistance Variation with Temperature

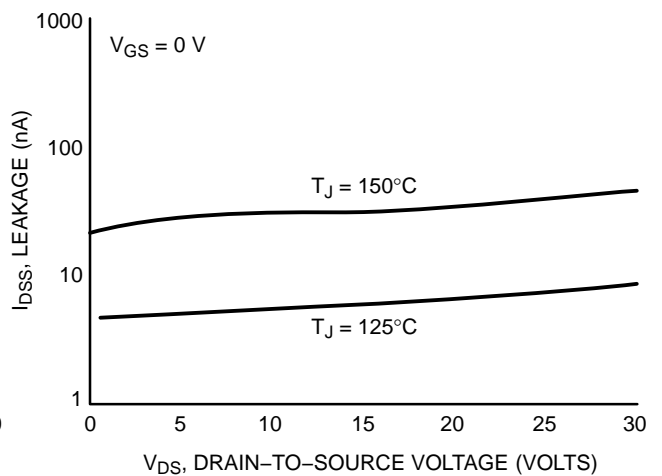
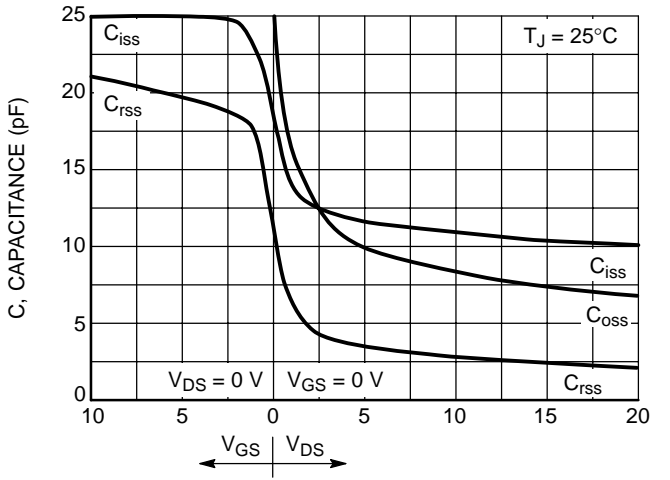
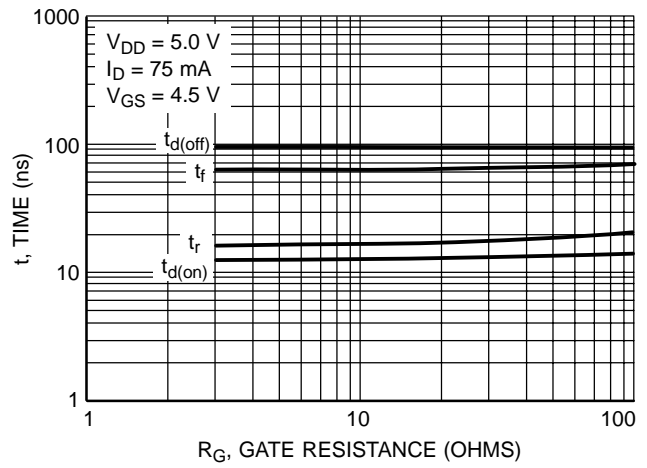


Figure 6. Drain-to-Source Leakage Current vs. Voltage

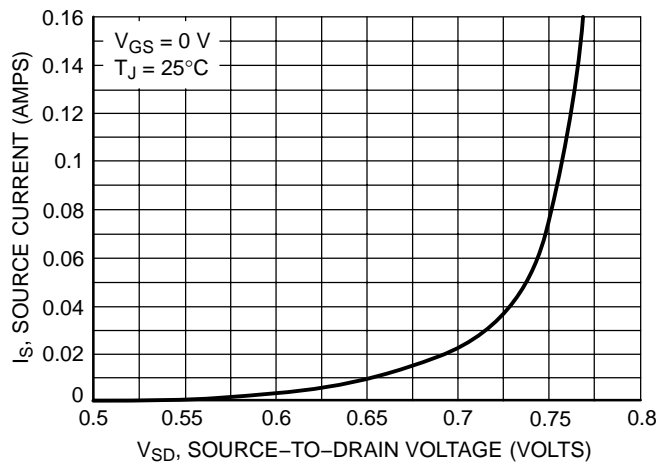
## Characteristics Curve



**Figure 7. Capacitance Variation**



**Figure 8. Resistive Switching Time Variation vs. Gate Resistance**



**Figure 9. Diode Forward Voltage vs. Current**

**SC-89 Outline Demensions**

Unit:mm

