WEITRON

WTC2312

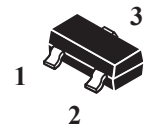# N-Channel Enhancement Mode Power MOSFET

Pb **Lead(Pb)-Free**

3 DRAIN

1 GATE

2 SOURCE

DRAIN CURRENT
4.9 AMPERES
DRAIN SOUCE VOLTAGE
20 VOLTAGE

SOT-23

Features:

* Super High Dense Cell Design For Low $R_{DS(ON)}$
  $R_{DS(ON)} < 41m\Omega$ @$V_{GS}=4.5V$
  $R_{DS(ON)} < 47m\Omega$ @$V_{GS}=2.5V$
  $R_{DS(ON)} < 57m\Omega$ @$V_{GS}=1.8V$
* Capable of 2.5V gate drive
* Rugged and Reliable
* Lower On-Resistance

Application:

* 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}	20	V
Gate-Source Voltage	V_{GS}	±8	
Continuous Drain Current[3] ,V_{GS}@4.5V(T_A=25℃)	I_D	4.9	A
,V_{GS}@4.5V(T_A=70℃)		3.4	
Pulsed Drain Current [1,2]	I_{DM}	15	
Total Power Dissipation(T_A=25℃)	P_D	0.75	W
Maximum Junction-ambient[3]	$R_{\theta JA}$	140	℃/W
Operating Junction Temperature Range	T_J	+150	℃
Storage Temperature Range	T_{stg}	-55~+150	℃

Device Marking

WTC2312=N12

Electrical Characteristics$(T_A=25°C$ Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit

Static

Characteristic	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage $V_{GS}=0, I_D=250\mu A$	$V_{(BR)DSS}$	20	-	-	V
Gate-Source Threshold Voltage $V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(Th)}$	0.4	0.6	1.0	
Gate-Source Leakage Current $V_{GS}=\pm 8V$	I_{GSS}	-	-	±100	nA
Drain-Source Leakage Current$(T_j=25°C)$ $V_{DS}=20V, V_{GS}=0$	I_{DSS}	-	-	1	μA
Drain-Source On-Resistance $V_{GS}=1.8V, I_D=4.0A$ $V_{GS}=2.5V, I_D=4.5A$ $V_{GS}=4.5V, I_D=5.0A$	$R_{DS(on)}$	- - -	31 24 21	57 47 41	$m\Omega$
Forward Transconductance $V_{DS}=10V, I_D=5.0A$	g_{fs}	-	40	-	S

Dynamic

Characteristic	Symbol	Min	Typ	Max	Unit
Input Capacitance $V_{GS}=0V, V_{DS}=8V, f=1.0MHz$	C_{iss}	-	500	-	pF
Output Capacitance $V_{GS}=0V, V_{DS}=8V, f=1.0MHz$	C_{oss}	-	300	-	
Reverse Transfer Capacitance $V_{GS}=0V, V_{DS}=8V, f=1.0MHz$	C_{rss}	-	140	-	

Switching

Turn-on Delay Time[2] V_{GEN}=4.5V, V_{DD}=10V, I_D=1.0A, R_G=6Ω	$t_d(on)$	-	15	25	ns
Rise Time V_{GEN}=4.5V, V_{DD}=10V, I_D=1.0A, R_G=6Ω	t_r	-	40	60	
Turn-off Delay Time V_{GEN}=4.5V, V_{DD}=10V, I_D=1.0A, R_G=6Ω	$t_d(off)$	-	48	70	
Fall Time V_{GEN}=4.5V, V_{DD}=10V, I_D=1.0A, R_G=6Ω	t_f	-	31	45	
Total Gate Charge[2] V_{DS}=10V, V_{GS}=4.5V, I_D=5A	Q_g	-	11.2	-	nC
Gate-Source Charge V_{DS}=10V, V_{GS}=4.5V, I_D=5A	Q_{gs}	-	1.4	-	
Gate-Drain Change V_{DS}=10V, V_{GS}=4.5V, I_D=5A	Q_{gd}	-	2.2	-	

Source-Drain Diode Characteristics

Forward On Voltage[2] V_{GS}=0V, I_S=1.7A	V_{SD}	-	-	1.2	V
Diode Forward Current	I_S	-	-	1.7	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 PCB board.
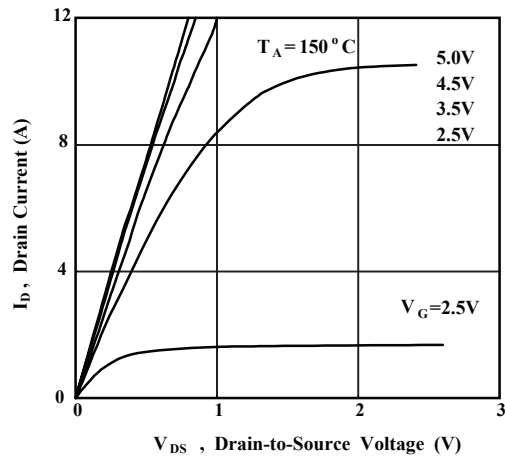
Fig 1. Typical Output Characteristics
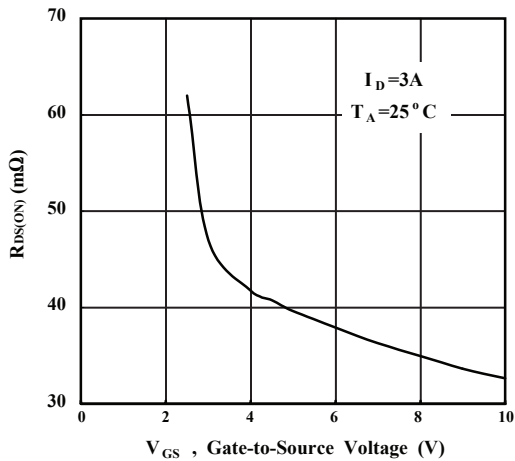

Fig 2. Typical Output Characteristics
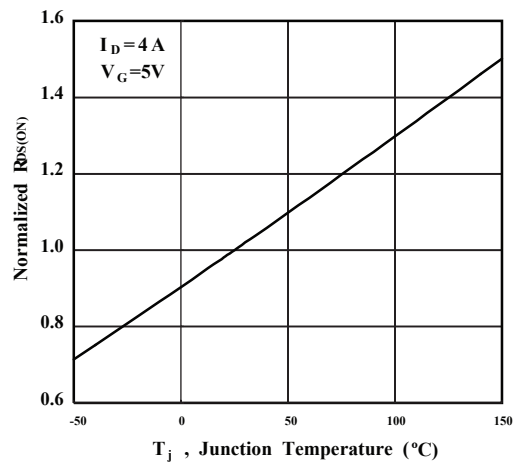

Fig 3. On-Resistance v.s. Gate Voltage

Fig 4. Normalized On-Resistance v.s. Junction Temperature
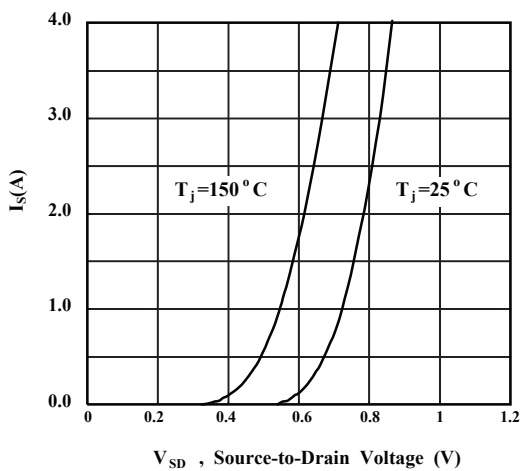

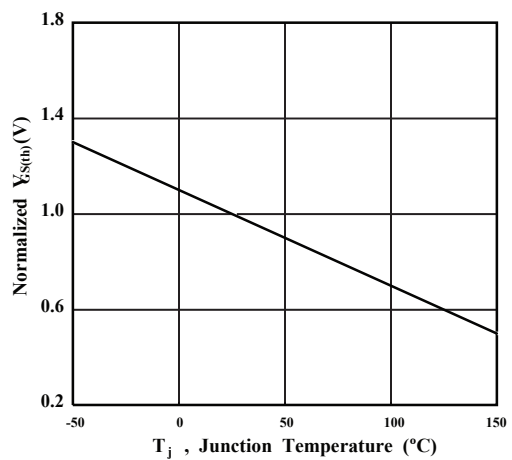**Fig 5. Forward Characteristic of Reverse Diode**

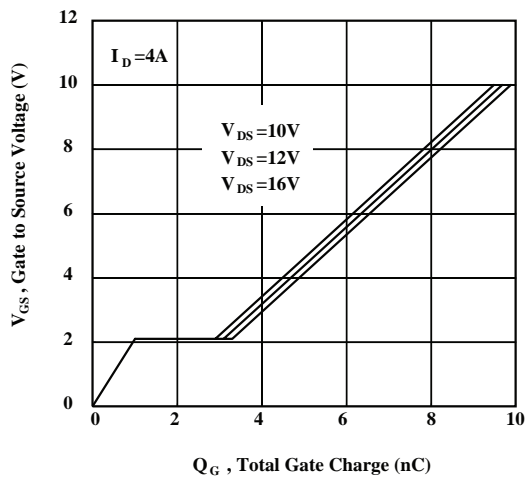**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**
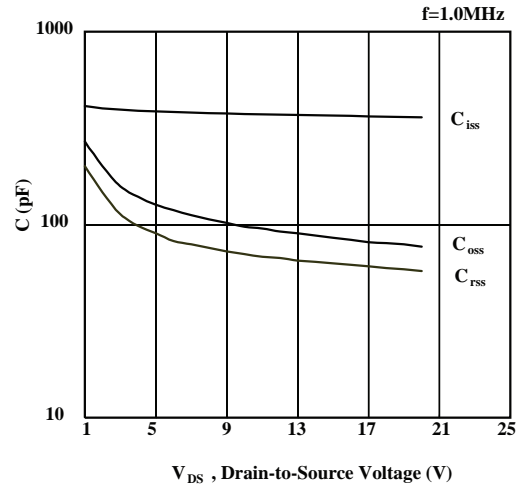
Fig 7. Gate Charge Characteristics
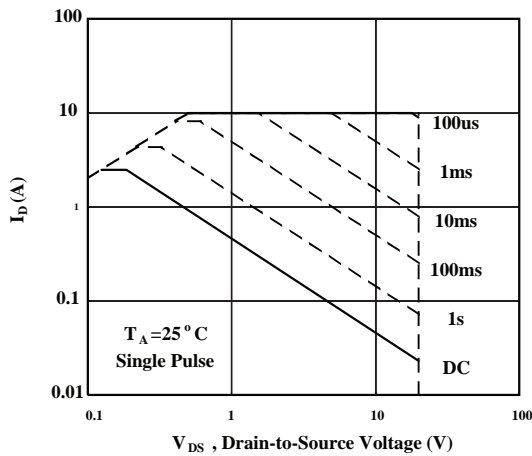
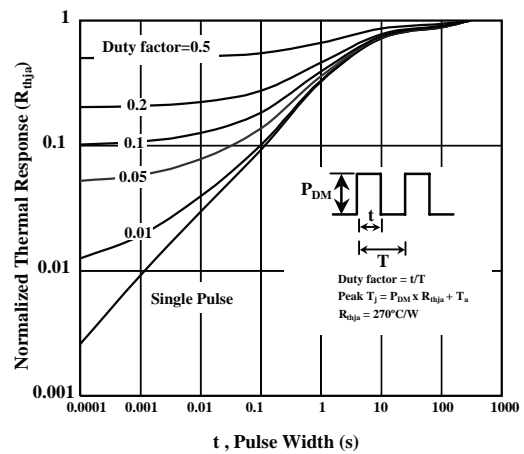Fig 8. Typical Capacitance Characteristics

Fig 9. Maximum Safe Operating Area
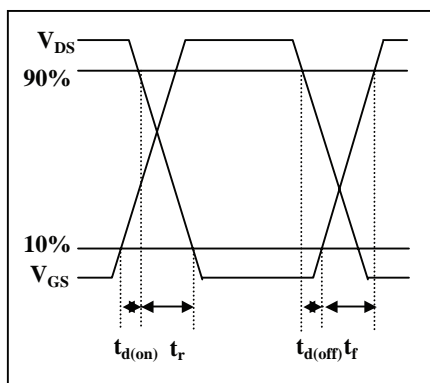
Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Circuit

Fig 12. Gate Charge Circuit

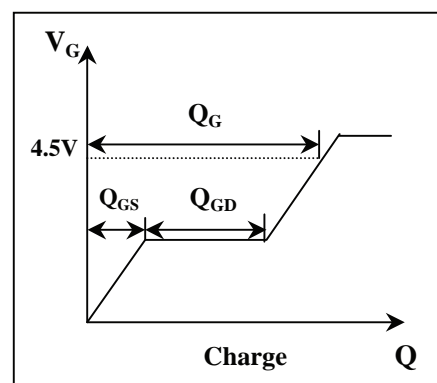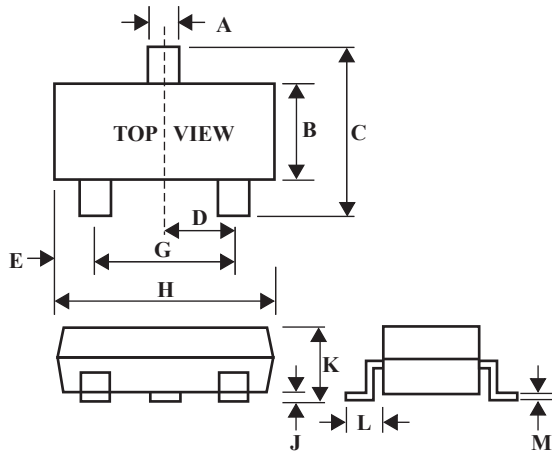## SOT-23 Outline Dimension

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