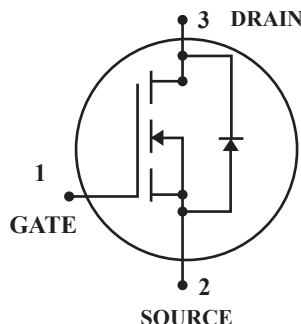


N-Channel Enhancement Mode Power MOSFET

(Pb) Lead(Pb)-Free



DRAIN CURRENT
3.2 AMPERS

DRAIN SOURCE VOLTAGE
20 VOLTAGE

Features:

- *Super High Dense Cell Design For Low $R_{DS(ON)}$
 $R_{DS(ON)} < 90m\Omega @ V_{GS}=4.5V$
- *Rugged and Reliable
- *Capable of 2.5V Gate Drive
- *Simple Drive Requirement
- *SOT-23 Package



SOT-23

Maximum Ratings($T_A=25^\circ C$ Unless Otherwise Specified)

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current ³ , $V_{GS}@4.5V(T_A=25^\circ C)$ $V_{GS}@4.5V(T_A=70^\circ C)$	I_D	3.2	A
		2.6	
Pulsed Drain Current ^{1,2}	I_{DM}	10	
Total Power Dissipation($T_A=25^\circ C$)	P_D	1.38	W
Maximum Junction-ambient ³	$R_{\theta JA}$	90	$^\circ C/W$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	$-55 \sim +150$	$^\circ C$

Device Marking

WTC2302=2302

Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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Static

Drain-Source Breakdown Voltage $V_{GS}=0, I_D=250\mu\text{A}$	$V_{(BR)DSS}$	20	–	–	V
Gate-Source Threshold Voltage $V_{DS}=V_{GS}, I_D=250\mu\text{A}$	$V_{GS(Th)}$	0.5	–	1.2	
Gate-Source Leakage Current $V_{GS}= \pm 12\text{V}$	I_{GSS}	–	–	± 100	nA
Drain-Source Leakage Current($T_j=25^\circ\text{C}$) $V_{DS}=20\text{V}, V_{GS}=0$	I_{DSS}	–	–	1	μA
Drain-Source Leakage Current($T_j=70^\circ\text{C}$) $V_{DS}=20\text{V}, V_{GS}=0$		–	–	10	
Drain-Source On-Resistance $V_{GS}=4.5\text{V}, I_D=3.6\text{A}$ $V_{GS}=2.5\text{V}, I_D=3.1\text{A}$	$R_{DS(on)}$	– –	– –	85 115	$\text{m}\Omega$
Forward Transconductance $V_{DS}=5\text{V}, I_D=3.6\text{A}$	g_{fs}	–	6	–	S

Dynamic

Input Capacitance $V_{GS}=0\text{V}, V_{DS}=10\text{V}, f=1.0\text{MHz}$	C_{iss}	–	145	–	pF
Output Capacitance $V_{GS}=0\text{V}, V_{DS}=10\text{V}, f=1.0\text{MHz}$	C_{oss}	–	100	–	
Reverse Transfer Capacitance $V_{GS}=0\text{V}, V_{DS}=10\text{V}, f=1.0\text{MHz}$	C_{rss}	–	50	–	

Switching

Turn-on Delay Time ² $V_{DS}=10V, V_{GS}=5V, I_D=3.6A, R_D=2.8\Omega, R_G=6\Omega$	$t_d(\text{on})$	—	5.2	—	ns
Rise Time $V_{DS}=10V, V_{GS}=5V, I_D=3.6A, R_D=2.8\Omega, R_G=6\Omega$	t_r	—	37	—	
Turn-off Delay Time $V_{DS}=10V, V_{GS}=5V, I_D=3.6A, R_D=2.8\Omega, R_G=6\Omega$	$t_d(\text{off})$	—	15	—	
Fall Time $V_{DS}=10V, V_{GS}=5V, I_D=3.6A, R_D=2.8\Omega, R_G=6\Omega$	t_f	—	5.7	—	
Total Gate Charge ² $V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$	Q_g	—	4.4	—	nC
Gate-Source Charge $V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$	Q_{gs}	—	0.6	—	
Gate-Drain Change $V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$	Q_{gd}	—	1.9	—	

Source-Drain Diode Characteristics

Forward On Voltage ² $V_{GS}=0V, I_S=1.6A$	V_{SD}	—	—	1.2	V
Continuous Source Current(Body Diode) $V_D=V_G=0V, V_S=1.2V$	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 $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Surface mounted on 1 in² copper pad of FR4 board; 270°C/W when mounted on min, copper pad.

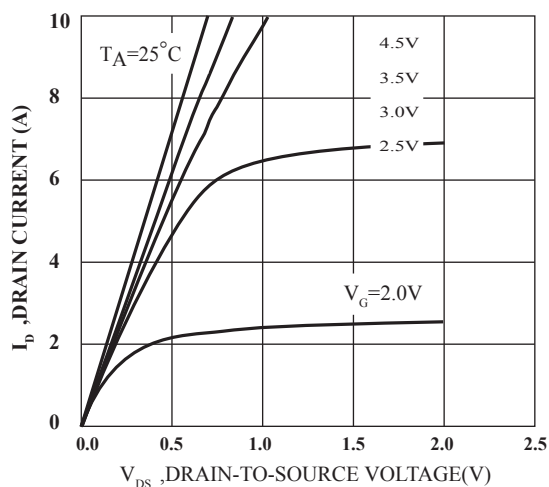


FIG.1 Typical Output Characteristics

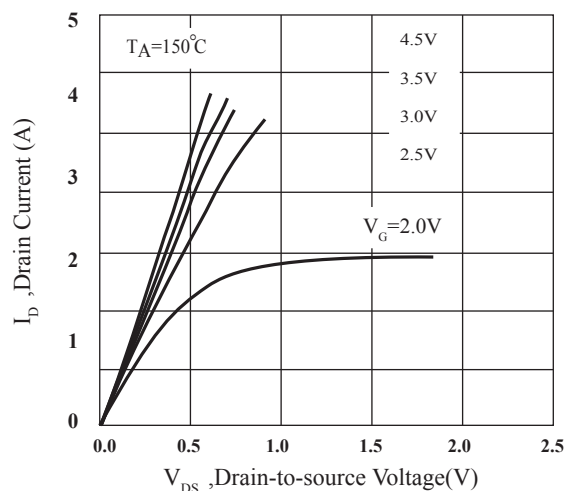


Fig.2 Typical Output Characteristics

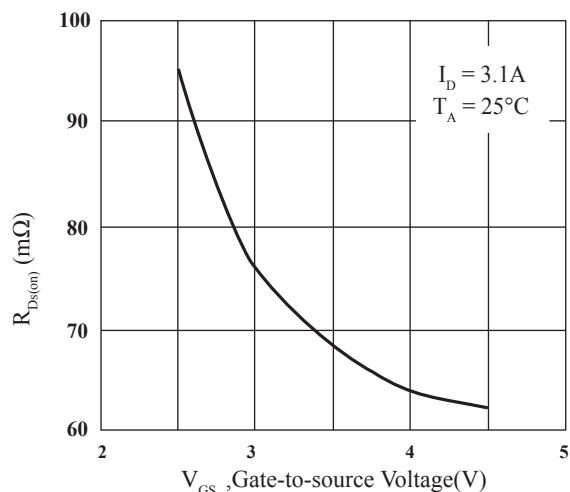


Fig.3 On-Resistance v.s. Gate Voltage

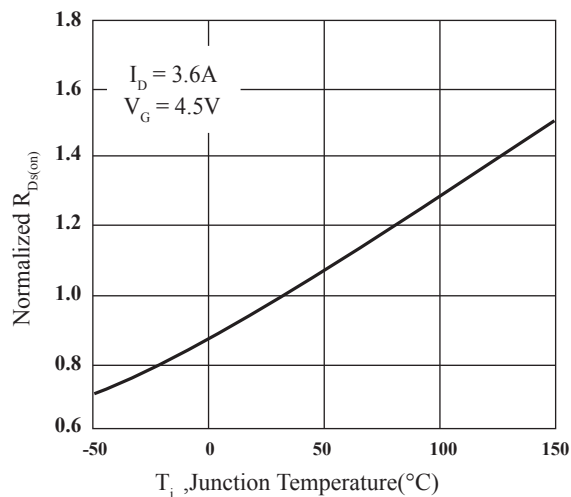


Fig.4 Normalized OnResistance

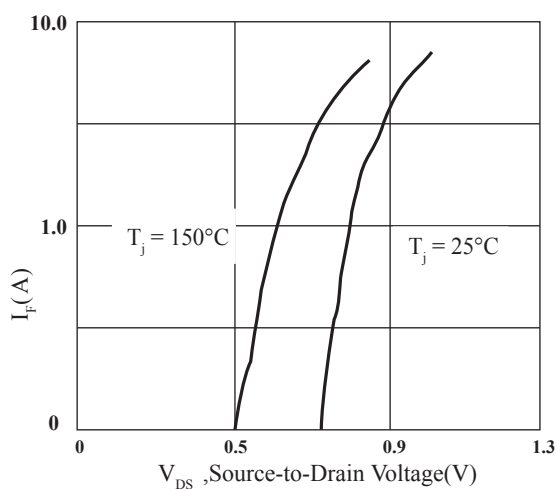


Fig.5 Forward Characteristics of Reverse Diode

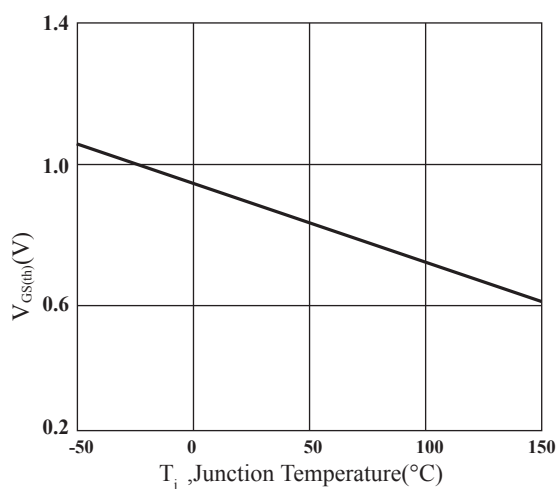
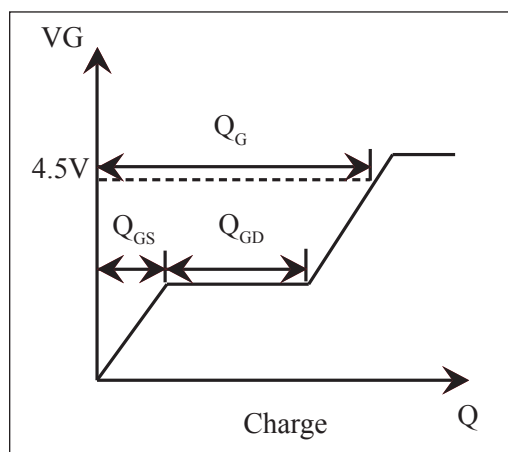
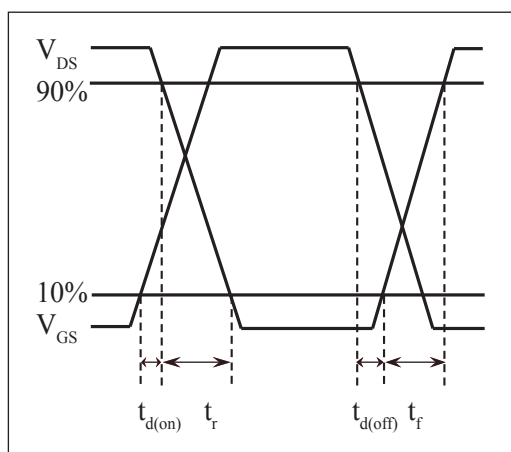
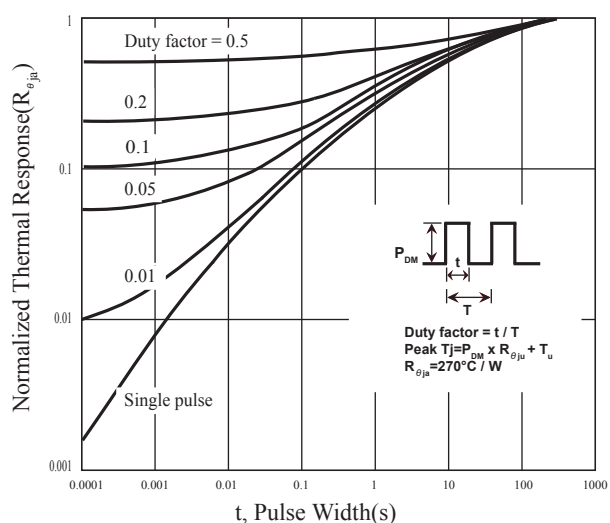
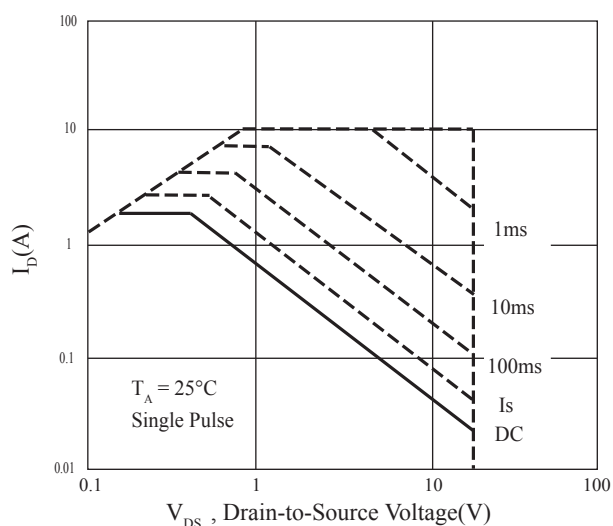
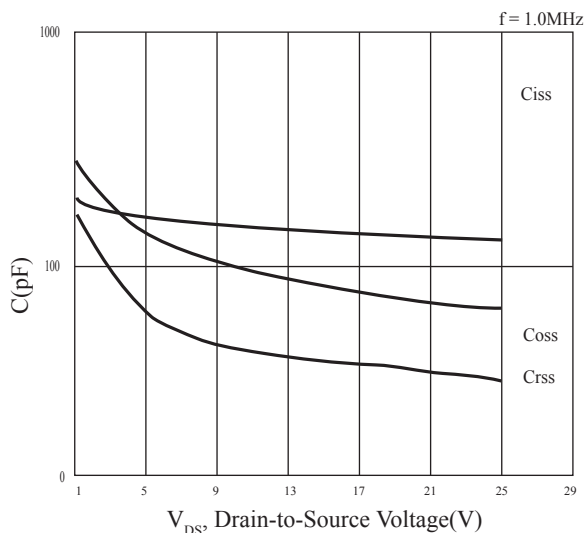
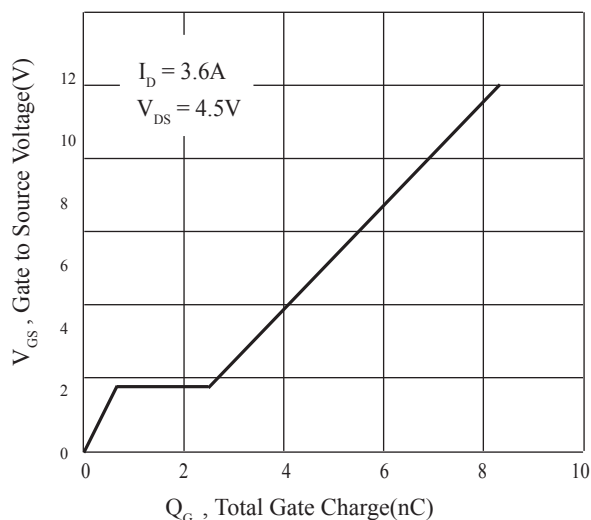
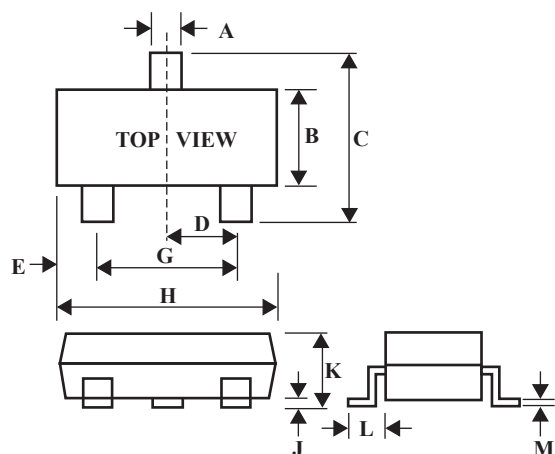


Fig.6 Gate Threshold Voltage v.s. Junction Temperature



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