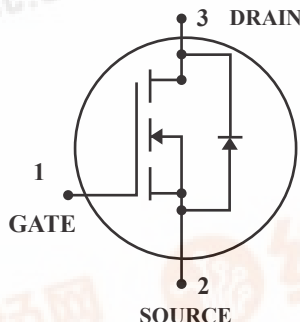




WTC2306A

N-Channel Enhancement Mode Power MOSFET



DRAIN CURRENT

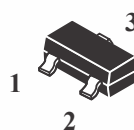
5 AMPERES

DRAIN SOURCE VOLTAGE

30 VOLTAGE

Features:

- *Super High Dense Cell Design For Low $R_{DS(ON)}$
 $R_{DS(ON)} < 30m\Omega @ V_{GS} = 10V$
- *Rugged and Reliable
- *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}	30	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	5	A
		4	
Pulsed Drain Current ^{1,2}	I_{DM}	20	
Total Power Dissipation($T_A = 25^\circ C$)	P_D	1.38	W
Maximum Thermal Resistance Junction-ambient ³	$R_{\theta JA}$	90	$^\circ C/W$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55~+150	$^\circ C$

Device Marking

WTC2306A=2306A



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 $V_{GS}=0, I_D=250\mu\text{A}$	$V_{(BR)DSS}$	30	-	-	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 $V_{GS}=\pm 20\text{V}$	I_{GSS}	-	-	± 100	nA
Drain- Source Leakage Current($T_j=25^\circ\text{C}$) $V_{DS}=30\text{V}, V_{GS}=0$	I_{DSS}	-	-	1	μA
Drain- Source Leakage Current($T_j=70^\circ\text{C}$) $V_{DS}=24\text{V}, V_{GS}=0$		-	-	25	
Drain-Source On-Resistance $V_{GS}=10\text{V}, I_D=5\text{A}$ $V_{GS}=4.5\text{V}, I_D=5\text{A}$ $V_{GS}=2.5\text{V}, I_D=2.6\text{A}$ $V_{GS}=1.8\text{V}, I_D=1.0\text{A}$	$R_{DS(on)}$	- - - -	- - - -	30 35 50 90	$\text{m}\Omega$
Forward Transconductance $V_{DS}=5\text{V}, I_D=5\text{A}$	g_{fs}	-	13	-	S

Dynamic

Input Capacitance $V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$	C_{iss}	-	660	1050	pF
Output Capacitance $V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$	C_{oss}	-	90	-	
Reverse Transfer Capacitance $V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$	C_{rss}	-	70	-	

Switching

Turn-on Delay Time ² $V_{DS}=15V, V_{GS}=10V, I_D=5A, R_D=3\Omega, R_G=3.3\Omega$	$t_{d(on)}$	-	6	-	ns
Rise Time $V_{DS}=15V, V_{GS}=10V, I_D=5A, R_D=3\Omega, R_G=3.3\Omega$	t_r	-	20	-	
Turn-off Delay Time $V_{DS}=15V, V_{GS}=10V, I_D=5A, R_D=3\Omega, R_G=3.3\Omega$	$t_{d(off)}$	-	20	-	
Fall Time $V_{DS}=15V, V_{GS}=10V, I_D=5A, R_D=3\Omega, R_G=3.3\Omega$	t_f	-	3	-	
Total Gate Charge ² $V_{DS}=16V, V_{GS}=4.5V, I_D=5.0A$	Q_g	-	8.7	15	nC
Gate-Source Charge $V_{DS}=16V, V_{GS}=4.5V, I_D=5.0A$	Q_{gs}	-	1.5	-	
Gate-Drain Charge $V_{DS}=16V, V_{GS}=4.5V, I_D=5.0A$	Q_{gd}	-	3.2	-	

Source-Drain Diode Characteristics

Forward On Voltage ² $V_{GS}=0, I_S=1.2A$	V_{SD}	-	-	1.2	V
Reverse Recovery Time ² $V_{GS}=0, I_S=5A, di/dt=100A/\mu s$	T_{rr}	-	14	-	nS
Reverse Recovery Charge $V_{GS}=0, I_S=5A, di/dt=100A/\mu s$	Q_{rr}	-	7	-	nC

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.

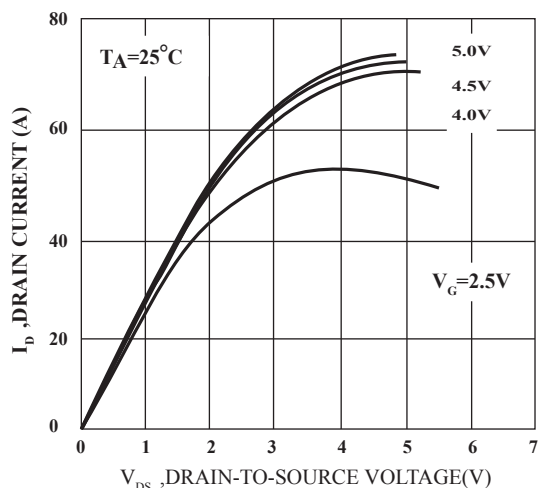


FIG.1 Typical Output Characteristics

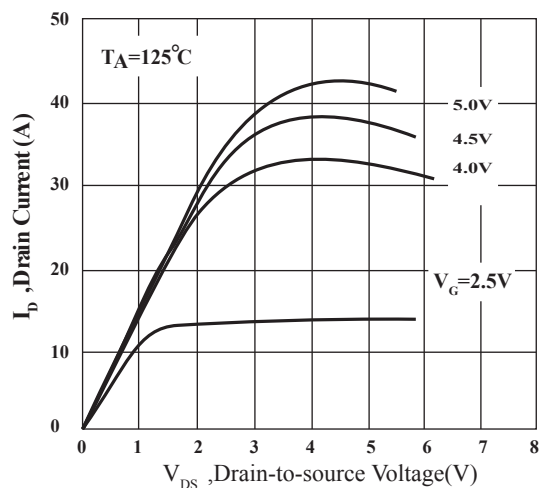


Fig.2 Typical Output Characteristics

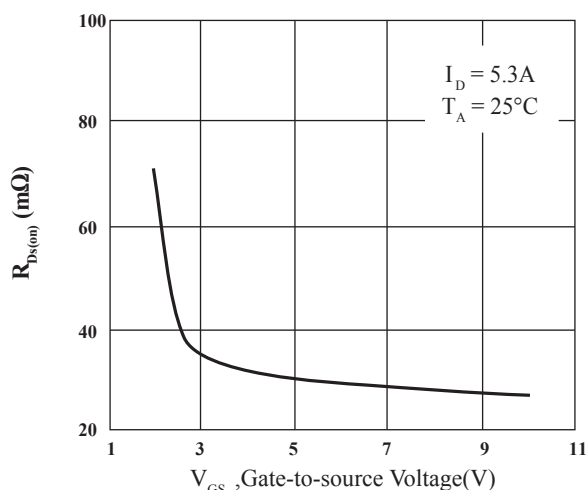


Fig.3 On-Resistance v.s. Gate Voltage

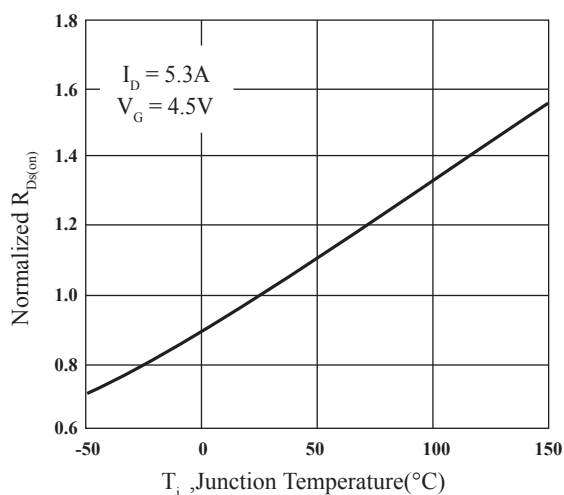


Fig.4 Normalized OnResistance

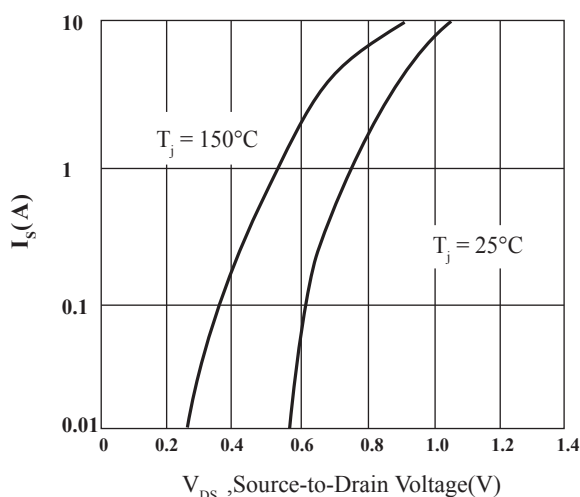


Fig.5 Forward Characteristics of Reverse Diode

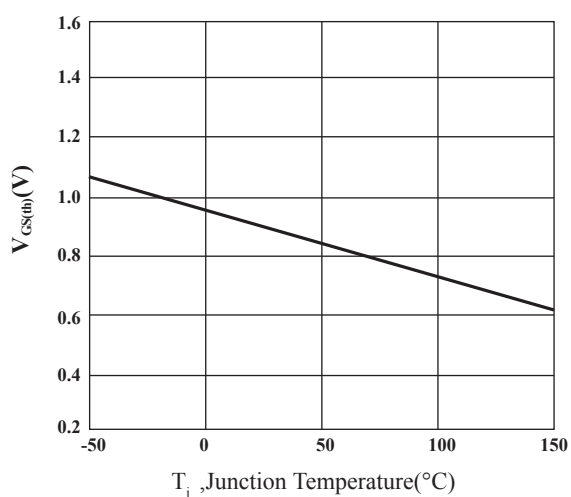
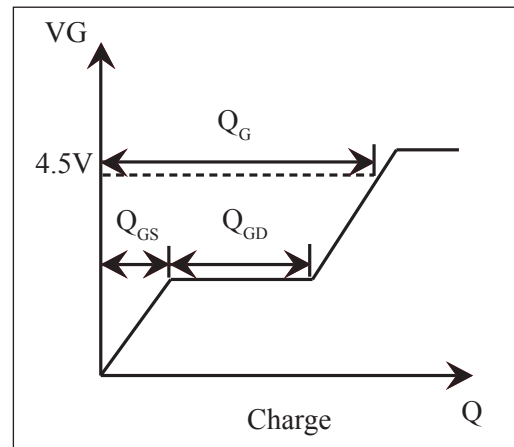
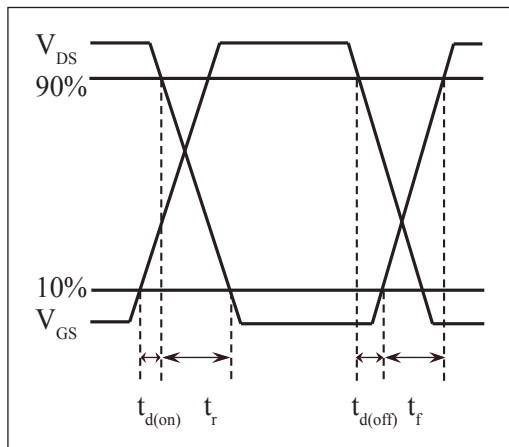
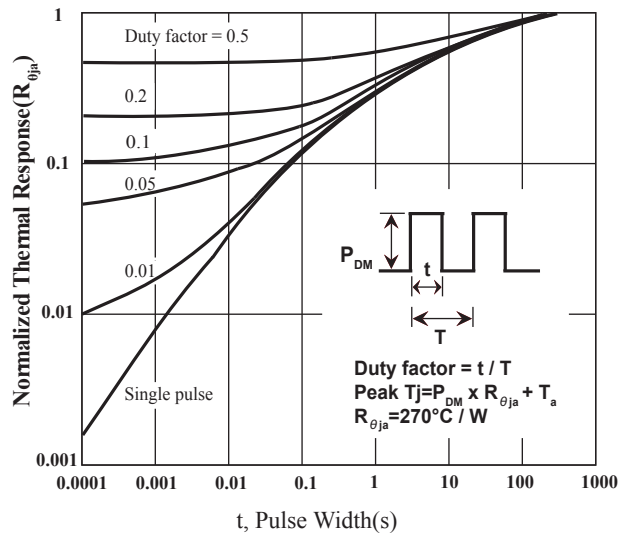
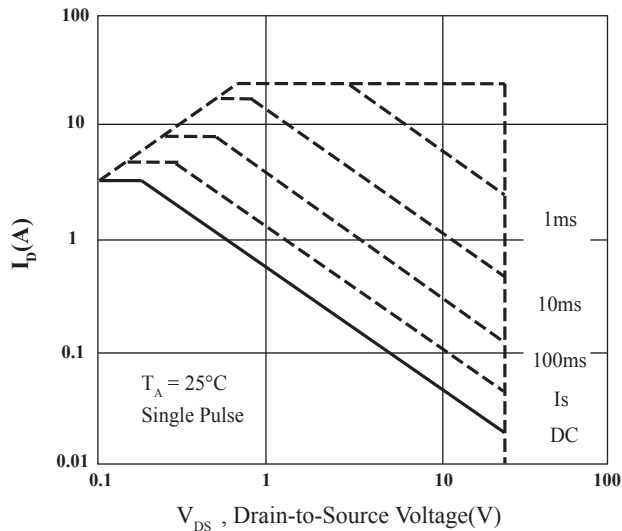
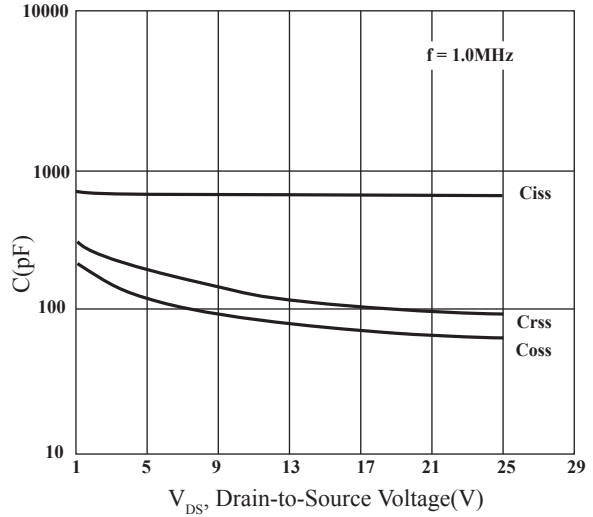
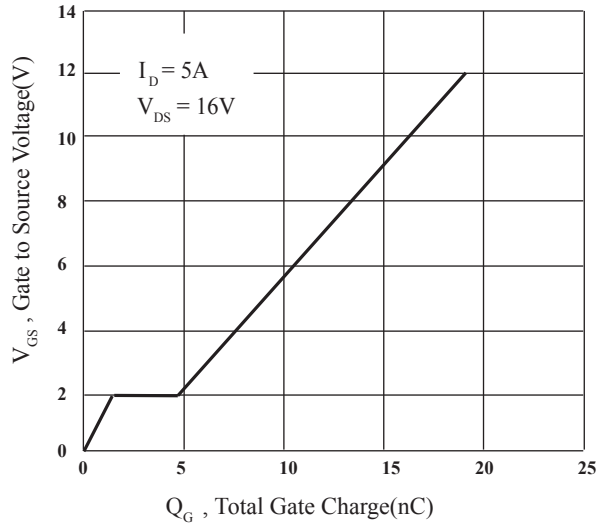
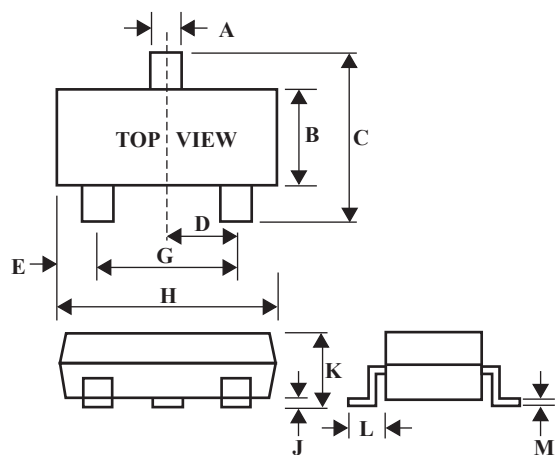


Fig.6 Gate Threshold Voltage v.s. Junction Temperature



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