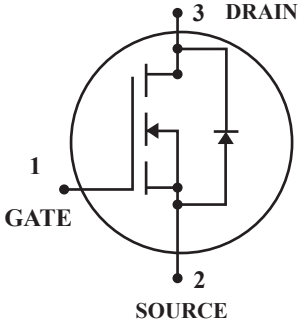
WEITRON

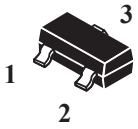
WTC2306A

N-Channel Enhancement Mode Power MOSFET

Lead(Pb)-Free



DRAIN CURRENT
5 AMPERES
DRAIN SOURCE VOLTAGE
30 VOLTAGE



SOT-23

Features:

*Super High Dense Cell Design For Low $R_{DS(ON)}$
$R_{DS(ON)}$ <30mΩ@V_{GS}=10V
*Rugged and Reliable
*Simple Drive Requirement
*SOT-23 Package

Maximum Ratings(T_A=25℃ 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°C)	I_D	5	A
,V_{GS}@4.5V(T_A=70°C)		4	
Pulsed Drain Current [1,2]	I_{DM}	20	
Total Power Dissipation(T_A=25°C)	P_D	1.38	W
Maximum Thermal Resistance Junction-ambient [3]	$R_{\theta JA}$	90	°C/W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	°C

Device Marking

WTC2306A=2306A

Electrical Characteristics (T_A = 25℃ Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Static					
Drain-Source Breakdown Voltage V_{GS}=0,I_D=250μA	$V_{(BR)DSS}$	30	-	-	V
Gate-Source Threshold Voltage V_{DS}=V_{GS},I_D=250μA	$V_{GS(Th)}$	0.5	-	1.2	
Gate-Source Leakage Current V_{GS}=±20V	I_{GSS}	-	-	±100	nA
Drain-Source Leakage Current(Tj=25°C) V_{DS}=30V,V_{GS}=0	I_{DSS}	-	-	1	μA
Drain-Source Leakage Current(Tj=70°C) V_{DS}=24V,V_{GS}=0		-	-	25	
Drain-Source On-Resistance V_{GS}=10V,I_D=5A V_{GS}=4.5V,I_D=5A V_{GS}=2.5V,I_D=2.6A V_{GS}=1.8V,I_D=1.0A	$R_{DS(on)}$	- - - -	- - - -	30 35 50 90	mΩ
Forward Transconductance V_{DS}=5V,I_D=5A	g_{fs}	-	13	-	S
Dynamic					
Input Capacitance V_{GS}=0V,V_{DS}=25V,f=1.0MHz	C_{iss}	-	660	1050	pF
Output Capacitance V_{GS}=0V,V_{DS}=25V,f=1.0MHz	C_{oss}	-	90	-	
Reverse Transfer Capacitance V_{GS}=0V,V_{DS}=25V,f=1.0MHz	C_{rss}	-	70	-	

Switching

Turn-on Delay Time[2] V_{DS}=15V,V_{GS}=10V,I_D=5A,R_D=3Ω,R_G=3.3Ω	t_d(on)	-	6	-	ns
Rise Time V_{DS}=15V,V_{GS}=10V,I_D=5A,R_D=3Ω,R_G=3.3Ω	t_r	-	20	-	
Turn-o ff Delay Time V_{DS}=15V,V_{GS}=10V,I_D=5A,R_D=3Ω,R_G=3.3Ω	t_d (off)	-	20	-	
Fall Time V_{DS}=15V,V_{GS}=10V,I_D=5A,R_D=3Ω,R_G=3.3Ω	t_f	-	3	-	
Total Gate Charge[2] V_{DS}=16V,V_{GS}=4.5,I_D=5.0A	Q_g	-	8.7	15	nC
Gate-Source Charge V_{DS}=16V,V_{GS}=4.5,I_D=5.0A	Q_{gs}	-	1.5	-	
Gate-Drain Change V_{DS}=16V,V_{GS}=4.5,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/μs	T_{rr}	-	14	-	nS
Reverse Recovery Charge V_{GS}=0,I_S=5A,dI/dt=100A/μs	Q_{rr}	-	7	-	nC

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 FR4 board; 270℃/W when mounted on min, copper pad.

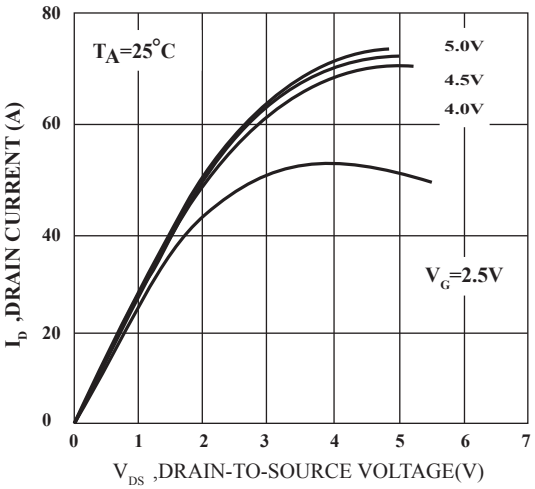


FIG.1 Typical Output Characteristics

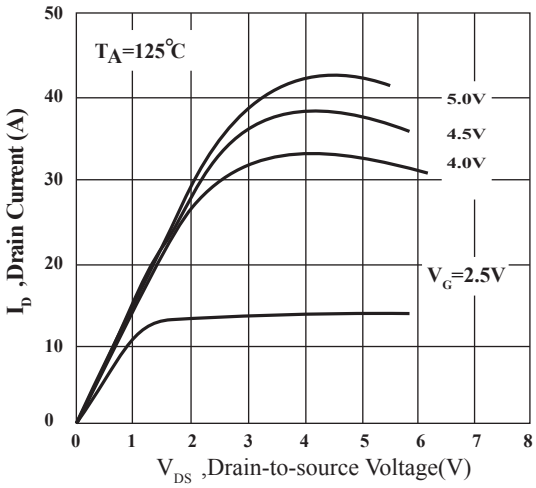


Fig.2 Typical Output Characteristics

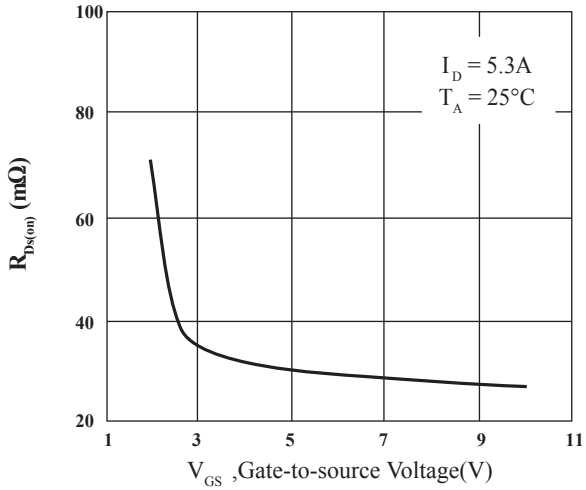


Fig.3 On-Resistance v.s. Gate Voltage

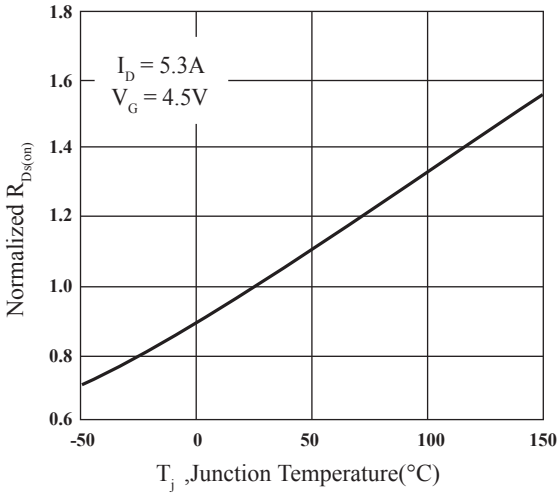


Fig.4 Normalized OnResistance

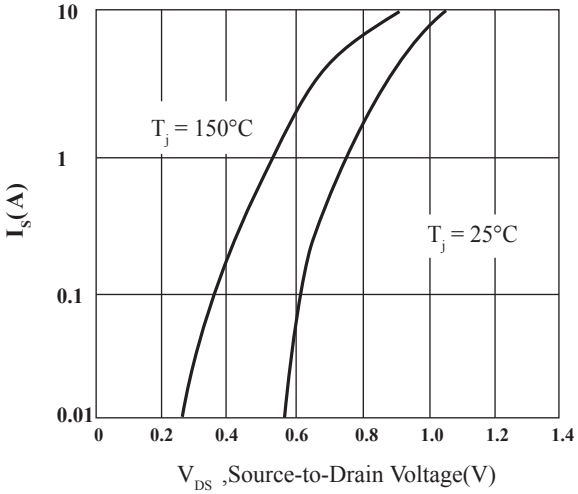


Fig.5 Forward Characteristics of Reverse Diode

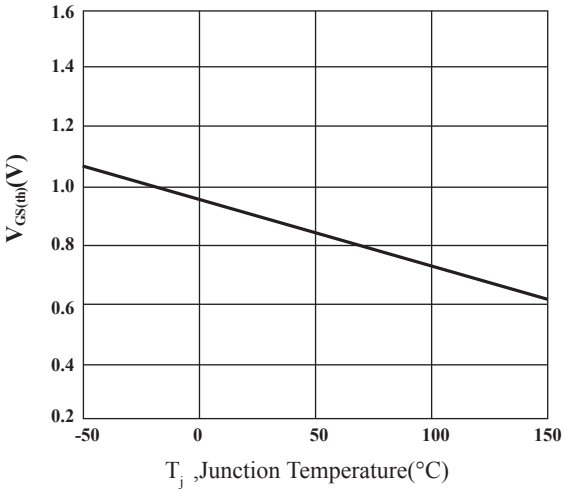


Fig.6 Gate Threshold Voltage v.s. Junction Temperature

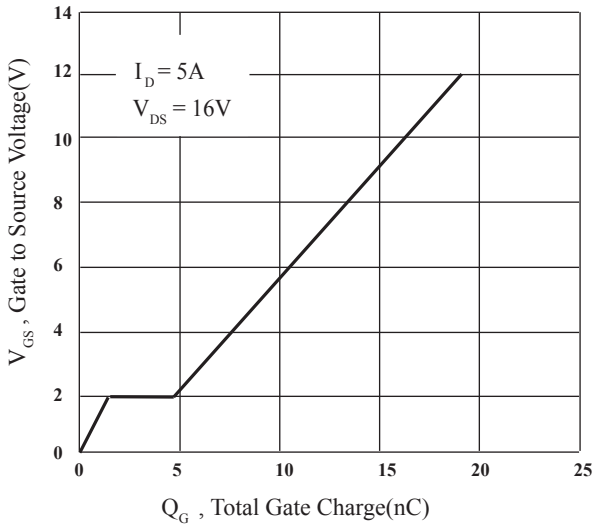


Fig 7. Gate Charge Characteristics

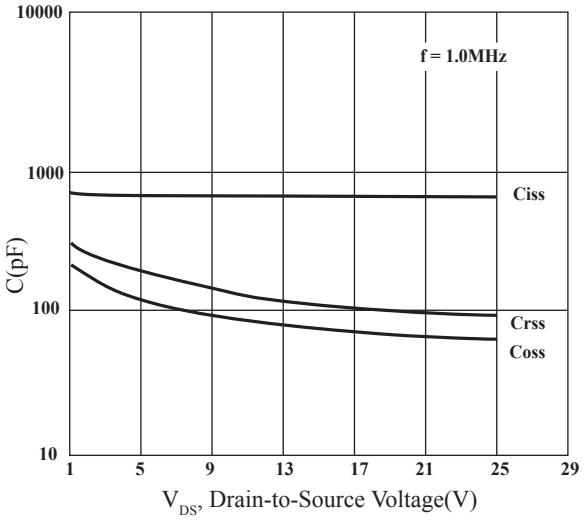


Fig 8. Typical Capacitance Characteristics

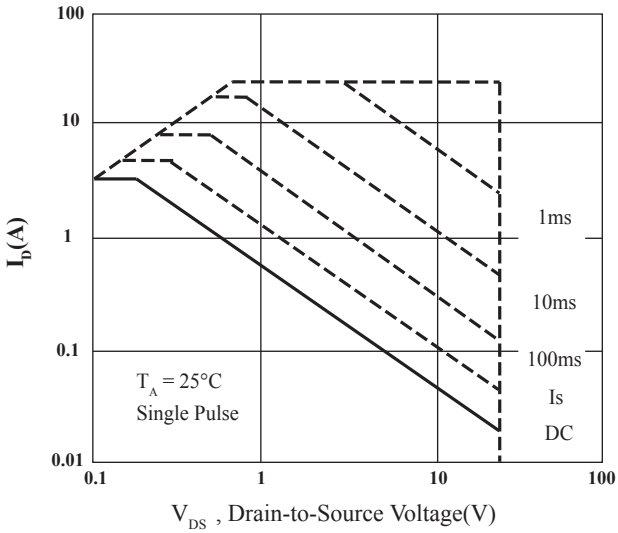


Fig 9. Maximum Safe Operation Area

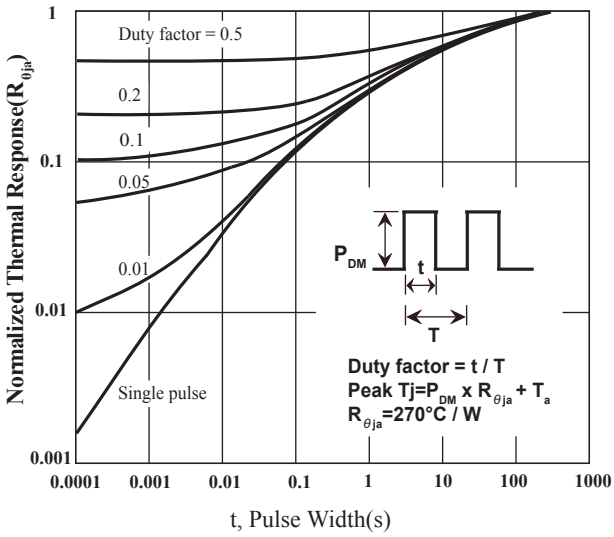


Fig 10. Effective Transient Thermal Impedance

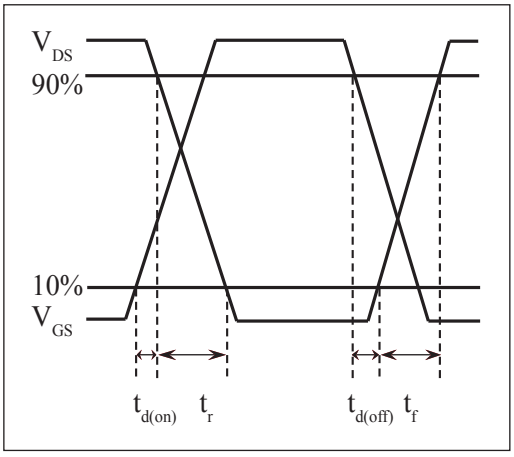


Fig 11. Switching Time Circuit

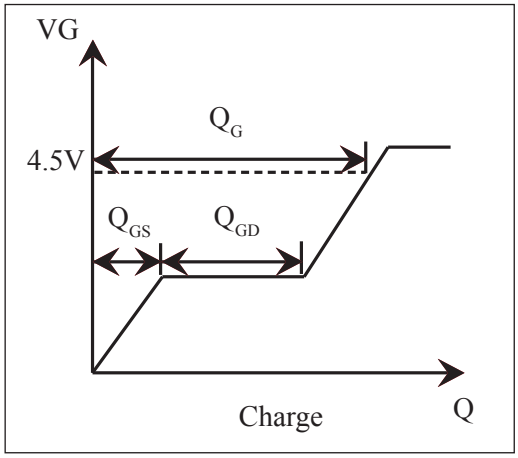
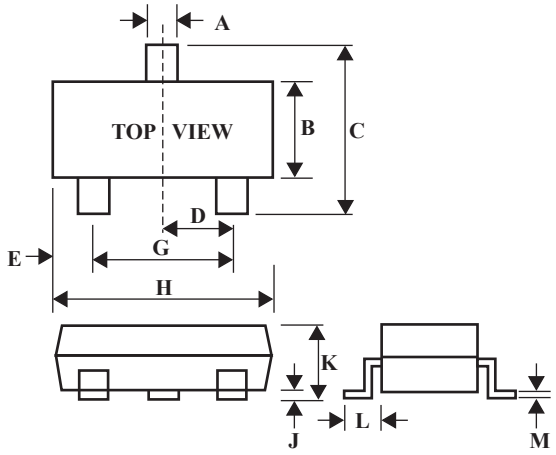


Fig.12 Gate Charge Waveform

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