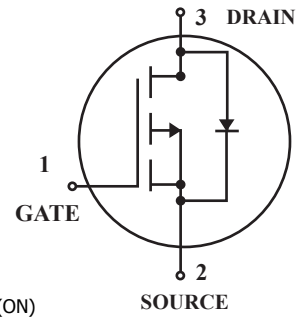
WEITRON

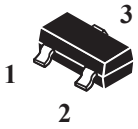
WTC6401

P-Channel Enhancement Mode Power MOSFET

Pb Lead(Pb)-Free



DRAIN CURRENT
-4.3 AMPERES
DRAIN SOURCE VOLTAGE
-12 VOLTAGE



SOT-23

Features:

*Super High Dense Cell Design For Low $R_{DS(ON)}$
$R_{DS(ON)}$ <50mΩ@V_{GS}=-4.5V
*Rugged and Reliable
*Simple Drive Requirement
*Fast Switching
*SOT-23 Package

Applications

*Power Management in Notebook Computer
*Portable Equipment
*Battery Powered System

Maximum Ratings(T_A=25°C Unless Otherwise Specified)

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-12	V
Gate-Source Voltage	V_{GS}	± 8	
Continuous Drain Current [3] ,(T_A=25°C)	I_D	-4.3	A
,(T_A=70°C)		-3.4	
Pulsed Drain Current [1]	I_{DM}	-12	
Total Power Dissipation(T_A=25°C)	P_D	1.38	W
Maximum Thermal Resistace Junction-ambient [3]	$R_{\theta JA}$	90	°C/W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55~+150	°C

Device Marking

WTC6401=6401

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	BV_{DSS}	-12	-	-	V
Gate-Source Threshold Voltage V_{DS}=V_{GS},I_D=-250μA	$V_{GS(Th)}$	-	-	-1.0	
Gate-Source Leakage current V_{GS}= ±8V	I_{GSS}	-	-	±100	nA
Drain-Source Leakage Current(Tj=25°C) V_{DS}=-16V,V_{GS}=0	I_{DSS}	-	-	-1	μA
Drain-Source Leakage Current(Tj=70°C) V_{DS}=-12V,V_{GS}=0		-	-	-25	
Drain-Source On-Resistance [2] V_{GS}=-4.5V,I_D=-4.3A V_{GS}=-2.5V,I_D=-2.5A V_{GS}=-1.8V,I_D=-2.0A	$R_{DS(on)}$	- - -	- - -	50 85 125	mΩ
Forward Transconductance V_{DS}=-5.0,I_D=-4.0A	g_{fs}	-	12	-	S
Dynamic					
Input Capacitance V_{GS}=0V,V_{DS}=-15V,f=1.0MHz	C_{iss}	-	985	1580	pF
Output Capacitance V_{GS}=0V,V_{DS}=-15V,f=1.0MHz	C_{oss}	-	180	-	
Reverse Transfer Capacitance V_{GS}=0V,V_{DS}=-15V,f=1.0MHz	C_{rss}	-	160	-	

Switching

Turn-on Delay Time [2] V_{DS}=-10V,V_{GS}=-10V,I_D=-1A,R_D=10Ω, R_G=3.3Ω	$t_{d(on)}$	-	8	-	ns
Rise Time V_{DS}=-10V,V_{GS}=-10V,I_D=-1A,R_D=10Ω, R_G=3.3Ω	t_r	-	11	-	
Turn-off Delay Time V_{DS}=-10V,V_{GS}=-10V,I_D=-1A,R_D=10Ω, R_G=3.3Ω	$t_{d(off)}$	-	54	-	
Fall Time V_{DS}=-10V,V_{GS}=-10V,I_D=-1A,R_D=10Ω, R_G=3.3Ω	t_f	-	36	-	
Total Gate Charge [2] V_{DS}=-12V,V_{GS}=-4.5V,I_D=-4.0A	Q_g	-	15	24	nC
Gate-Source Charge V_{DS}=-12V,V_{GS}=-4.5V,I_D=-4.0A	Q_{gs}	-	1.3	-	
Gate-Source Change V_{DS}=-12V,V_{GS}=-4.5V,I_D=-4.0A	Q_{gd}	-	4	-	

Source-Drain Diode Characteristics

Forward On Voltage [2] V_{GS}=0V,I_S=-1.2A	V_{SD}	-	-	1.2	V
Reverse Recovery Time [2] V_{GS}=0V,I_S=-4.0A, dI/dt=100A/μs	T_{rr}	-	39	-	ns
Reverse Recovery Charge V_{GS}=0V,I_S=-4.0A, dI/dt=100A/μs	Q_{rr}	-	26	-	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.

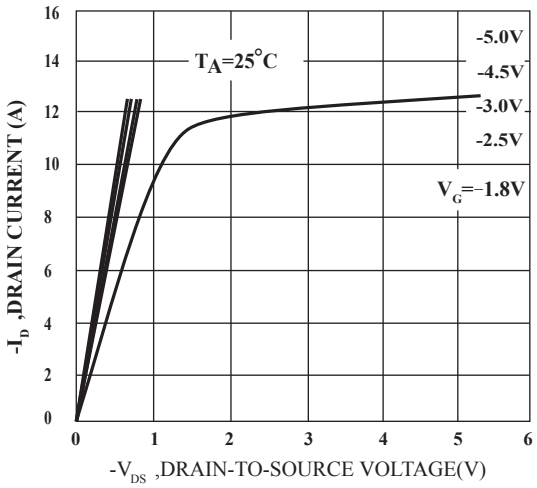


FIG.1 Typical Output Characteristics

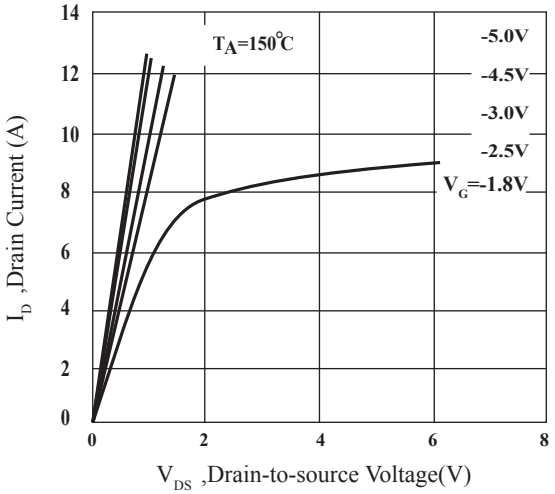


Fig.2 Typical Output Characteristics

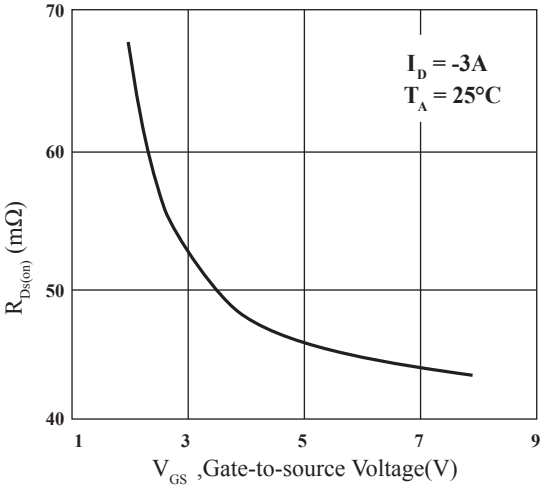


Fig.3 On-Resistance v.s. Gate Voltage

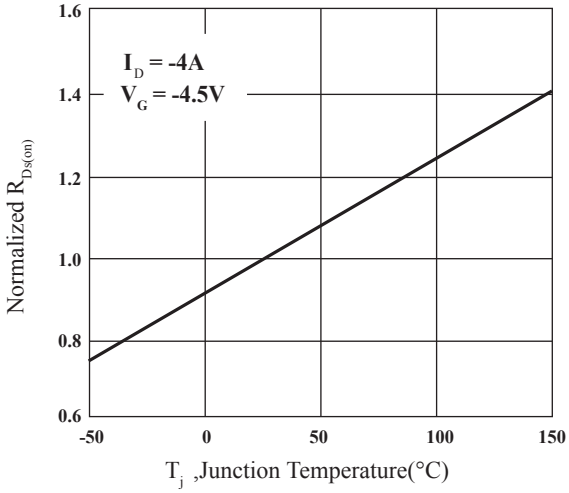


Fig.4 Normalized OnResistance

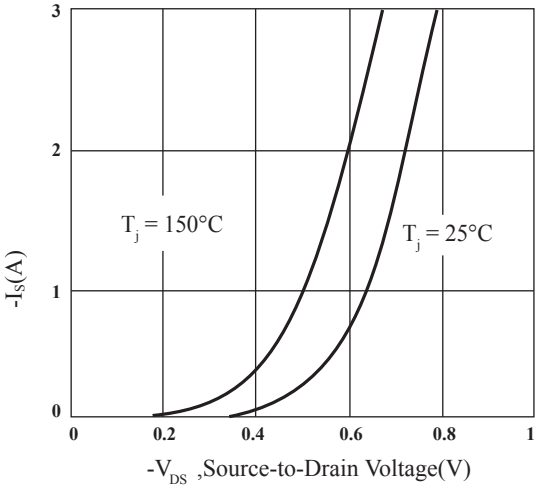


Fig.5 Forward Characteristics of Reverse Diode

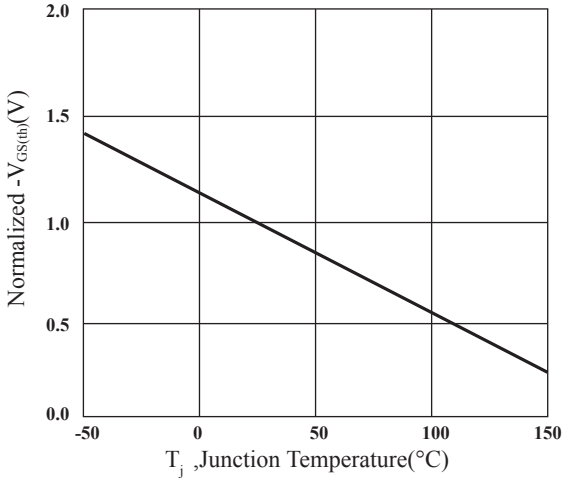


Fig.6 Gate Threshold Voltage v.s. Junction Temperature

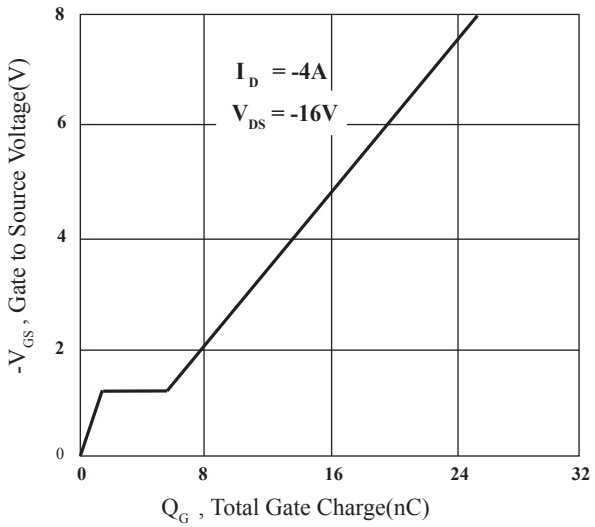


Fig 7. Gate Charge Characteristics

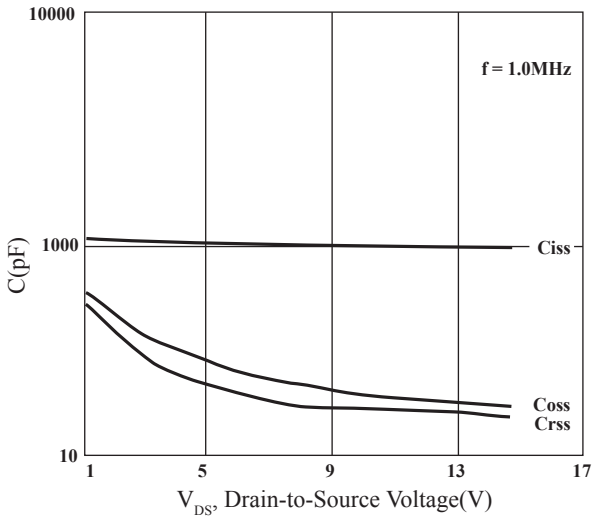


Fig 8. Typical Capacitance Characteristics

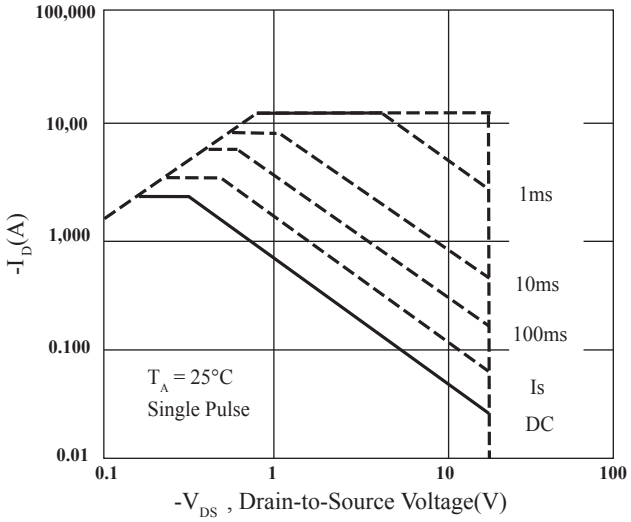


Fig 9. Maximum Safe Operation Area

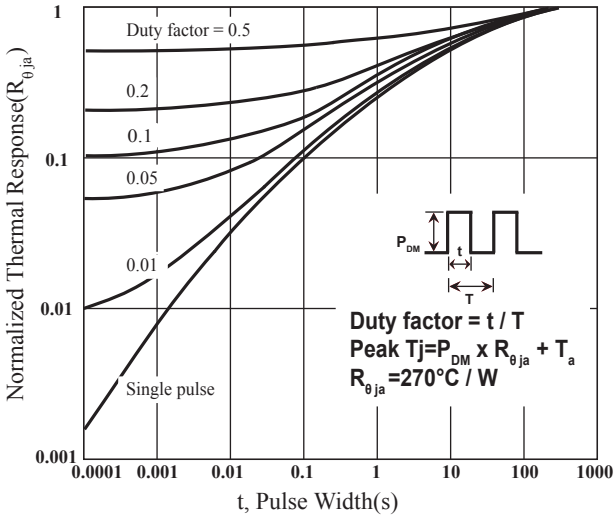


Fig 10. Effective Transient Thermal Impedance

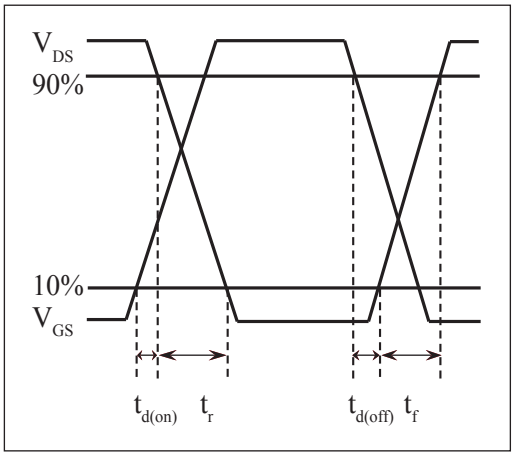


Fig 11. Switching Time Circuit

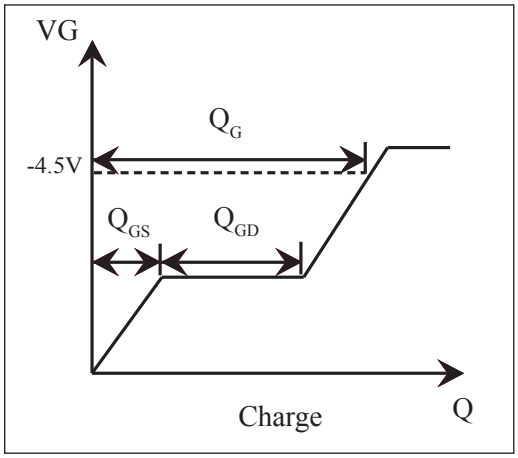
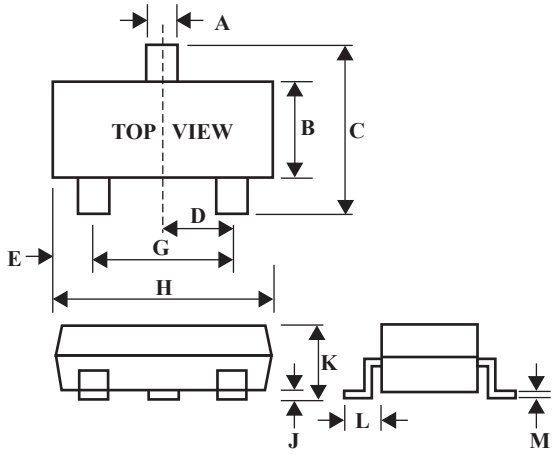


Fig.12 Gate Charge Waveform

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