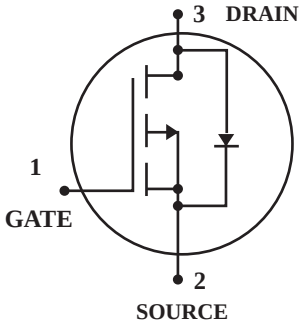
WEITRON

WTC3401

P-Channel Enhancement Mode Power MOSFET

Lead(Pb)-Free

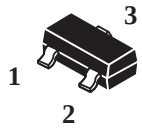


DRAIN CURRENT
-4.2 AMPERES
DRAIN SOURCE VOLTAGE
-30 VOLTAGE

Features:

*Advanced trench process technology

*High Density Cell Design For Ultra Low On-Resistance



SOT-23

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 [1] (T_A =25°C)	I_D	-4.2	A
Continuous Drain Current [1] (T_A =70°C)		-3.5	
Pulsed Drain Current [2]	I_{DM}	-30	
Power Dissipation (T_A=25°C)	P_D	1.4	W
Power Dissipation (T_A=70°C)		1.0	
Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	°C

Thermal Characteristics (T_A=25℃ Unless Otherwise Specified)

Rating		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient[1]	t ≤ 10s	$R_{\theta JA}$	65	90	°C/W
	Steady-State		85	125	
Maximum Junction-to-Lead [3]	Steady-State	$R_{\theta JL}$	43	60	°C/W

1.The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.The value in any given application depends on the user's specific board design. The current rating is based on the t≤10s thermal resistance rating.

2.Repetitive rating, pulse width limited by junction temperature.

3.The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ and lead to ambient.

Device Marking

WTC3401= A1

Electrical Characteristics (T_A = 25℃ Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Units
Static					
Drain-Source Breakdown Voltage I_D=-250μA, V_{GS}=0V	BV_{DSS}	-30			V
Zero Gate Voltage Drain Current V_{DS}=-24V, V_{GS}=0V	I_{DSS}			-1	μA
T_J=55°C				-5	
Gate-Body leakage current V_{DS}=0V, V_{GS}=±12V	I_{GSS}			±100	nA
Gate Threshold Voltage V_{DS}=V_{GS} I_D=-250μA	$V_{GS(th)}$	-0.7	-1	-1.3	V
On state drain current V_{GS}=-4.5V, V_{DS}=-5V	$I_{D(ON)}$	-25			A
Static Drain-Source On-Resistance V_{GS}=-10V, I_D=-4.2A	$R_{DS(ON)}$			70	mΩ
V_{GS}=-4.5V, I_D=-4A				80	
V_{GS}=-2.5V, I_D=-1A				120	
Forward Transconductance V_{DS}=-5V, I_D=-5A	g_{FS}	7	11		S
Diode Forward Voltage I_S=-1A,V_{GS}=0V	V_{SD}		-0.75	-1	V
Maximum Body-Diode Continuous Current	I_S			-2.2	A
Dynamic					
Input Capacitance V_{GS}=0V, V_{DS}=-15V, f=1MHz	C_{iss}		954		pF
Output Capacitance V_{GS}=0V, V_{DS}=-15V, f=1MHz	C_{oss}		115		pF
Reverse Transfer Capacitance V_{GS}=0V, V_{DS}=-15V, f=1MHz	C_{rss}		77		pF
Gate resistance V_{GS}=0V, V_{DS}=0V, f=1MHz	R_g		6		Ω
Switching					
Total Gate Charge V_{GS}=-4.5V, V_{DS}=-15V, I_D=-4A	Q_g		9.4		nC
Gate Source Charge V_{GS}=-4.5V, V_{DS}=-15V, I_D=-4A	Q_{gs}		2		nC
Gate Drain Charge V_{GS}=-4.5V, V_{DS}=-15V, I_D=-4A	Q_{gd}		3		nC
Turn-On DelayTime V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω, R_{GEN}=6Ω	$t_{D(on)}$		6.3		ns
Turn-On Rise Time V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω, R_{GEN}=6Ω	t_r		3.2		ns
Turn-Off DelayTime V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω, R_{GEN}=6Ω	$t_{D(off)}$		38.2		ns
Turn-Off Fall Time V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω, R_{GEN}=6Ω	t_f		12		ns
Body Diode Reverse Recovery Time I_F=-4A, dI/dt=100A/μs	t_{rr}		20.2		ns
Body Diode Reverse Recovery Charge I_F=-4A, dI/dt=100A/μs	Q_{rr}		11.2		nC

Typical Electrical Characteristics

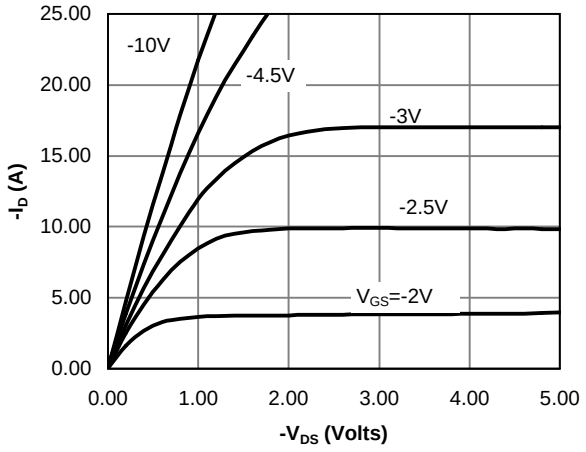


Fig 1: On-Region Characteristics

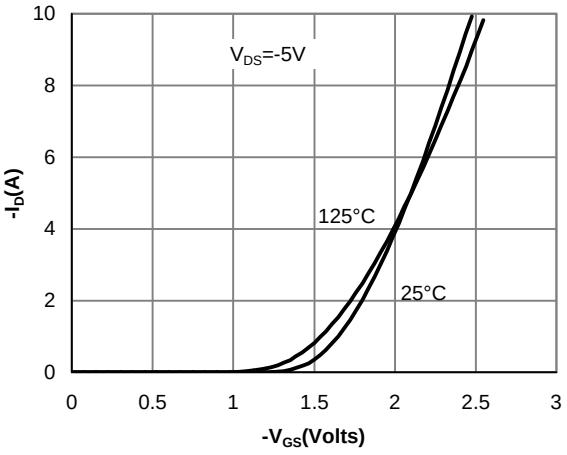


Figure 2: Transfer Characteristics

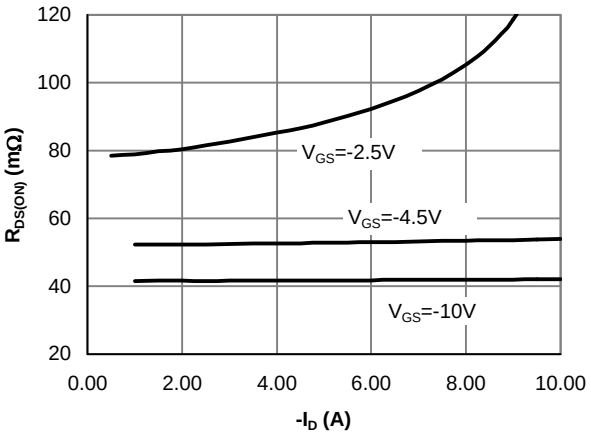


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

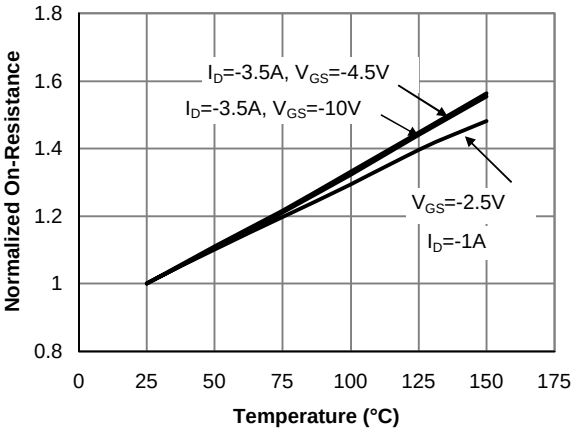


Figure 4: On-Resistance vs. Junction Temperature

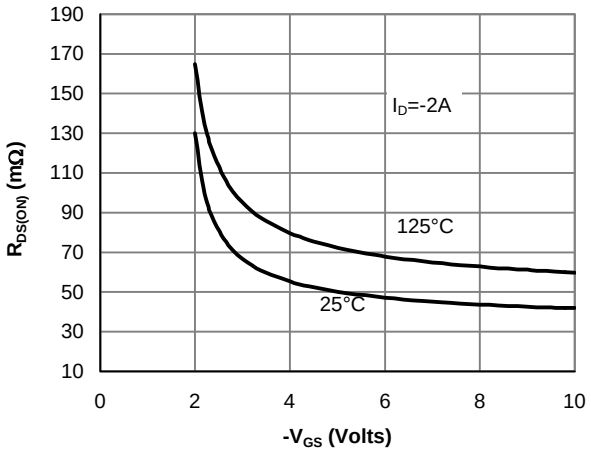


Figure 5: On-Resistance vs. Gate-Source Voltage

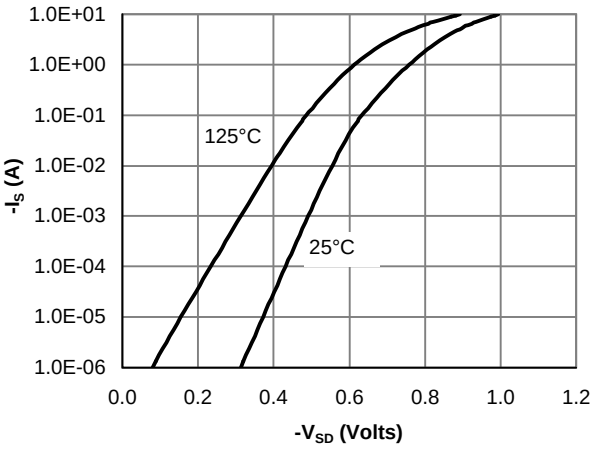


Figure 6: Body-Diode Characteristics

Typical Electrical Characteristics

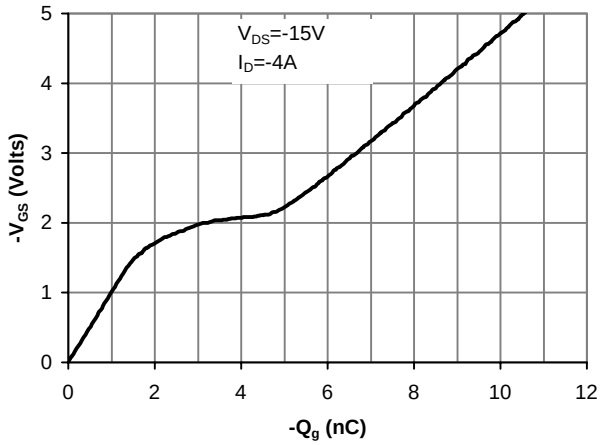


Figure 7: Gate-Charge Characteristics

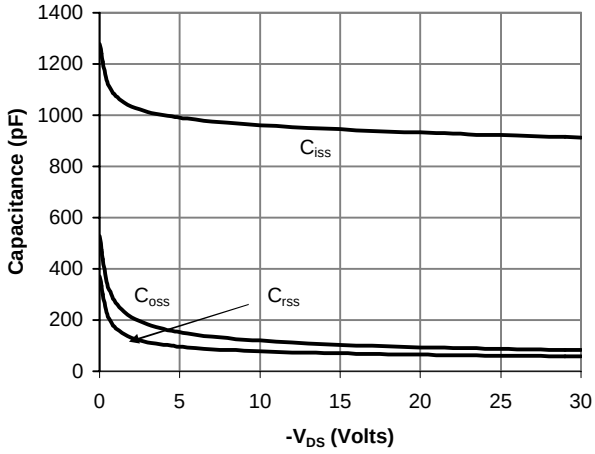


Figure 8: Capacitance Characteristics

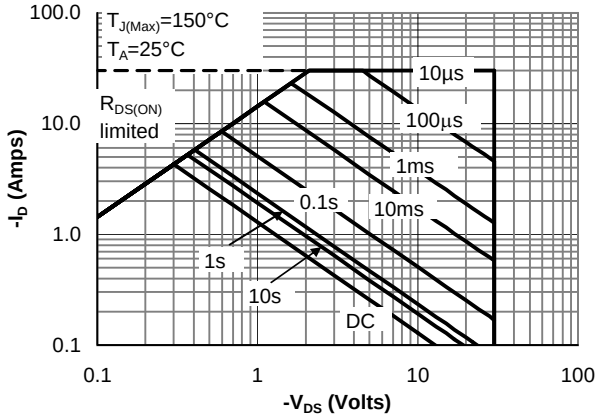


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

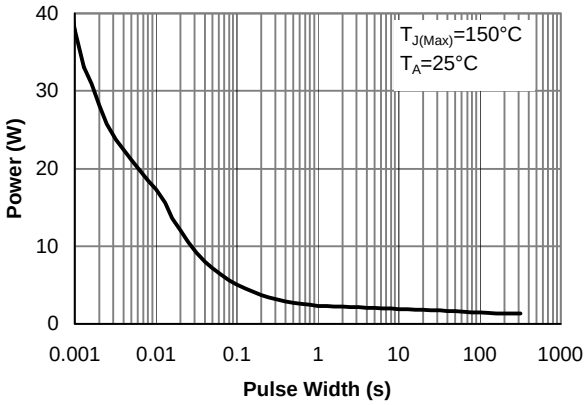


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

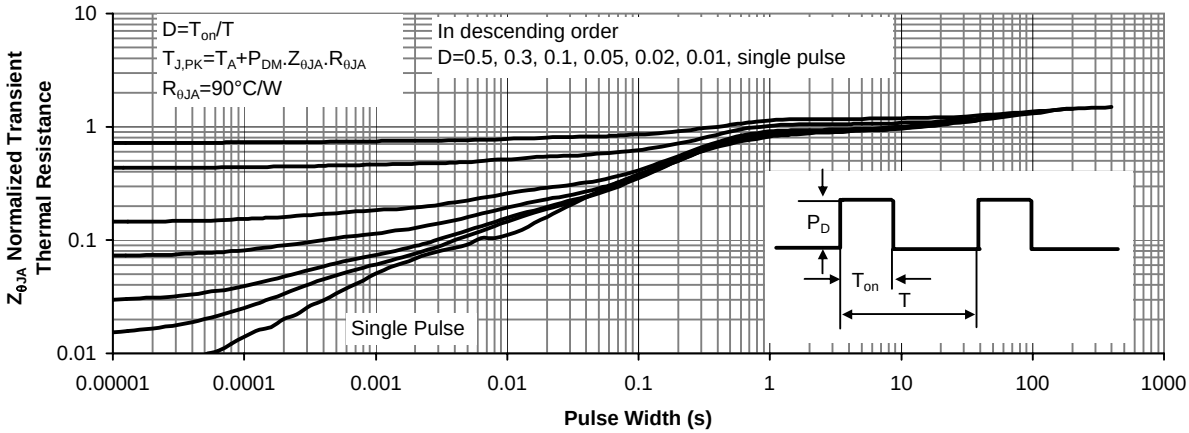
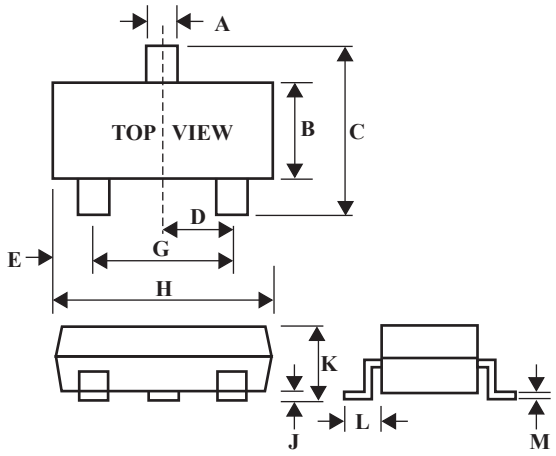


Figure 11: Normalized Maximum Transient Thermal Impedance

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