

## General Description

The WST2088A is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the small power switching and load switch applications.

The WST2088A meet the RoHS and Green Product requirement with full function reliability approved.

## Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Green Device Available

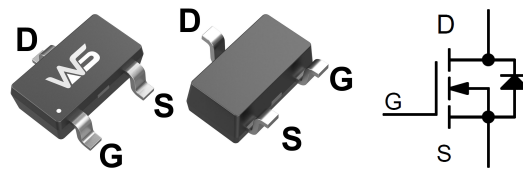
## Product Summary

BVDSS	RDSON	ID
20V	10.7mΩ	7.5A

## Applications

- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply

## SOT-23-3L Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D@T_c=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 4.5\text{V}$	7.5	A
$I_D@T_c=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 4.5\text{V}$	4.5	A
$I_{DP}$	Pulsed Drain Current	24	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	1.25	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

## Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient	---	100	$^\circ\text{C}/\text{W}$
Rthj-c	Maximum Thermal Resistance, Junction-case	---	8	$^\circ\text{C}/\text{W}$

**Electrical Characteristics ( $T_J=25^\circ\text{C}$ , unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=1\text{mA}$	---	0.018	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=4.5V, I_D=6A$	---	10.7	14	m $\Omega$
		$V_{GS}=2.5V, I_D=5A$	---	12.8	17	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.4	0.63	1.2	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=16V, V_{GS}=0V$	---	---	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA
$Q_g$	Total Gate Charge	$V_{DS}=15V, V_{GS}=4.5V, I_D=6A$	---	10	---	nC
$Q_{gs}$	Gate-Source Charge		---	1.6	---	
$Q_{gd}$	Gate-Drain Charge		---	3.4	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=10V, V_{GS}=4.5V,$ $R_G=3.3\Omega, I_D=1A$	---	8	---	ns
$T_r$	Rise Time		---	15	---	
$T_{d(off)}$	Turn-Off Delay Time		---	33	---	
$T_f$	Fall Time		---	13	---	
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	590	---	pF
$C_{oss}$	Output Capacitance		---	125	---	
$C_{riss}$	Reverse Transfer Capacitance		---	90	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	---	---	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=1A, V_{GS}=0V,$ $di/dt=100A/\mu s$	---	---	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	---	---	nC

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the  $t_s \leq 10\text{s}$  junction to ambient thermal resistance rating.

Typical Characteristics

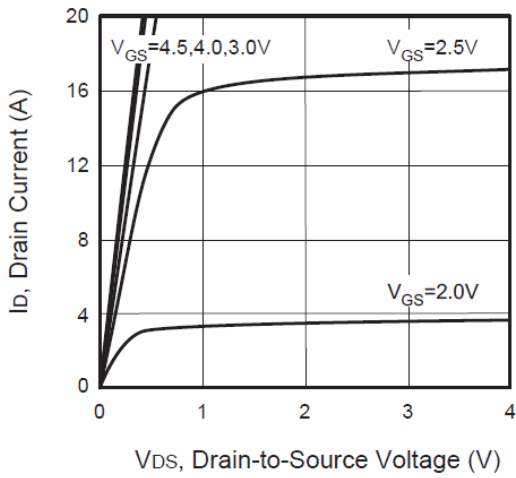


Figure 1. Output Characteristics

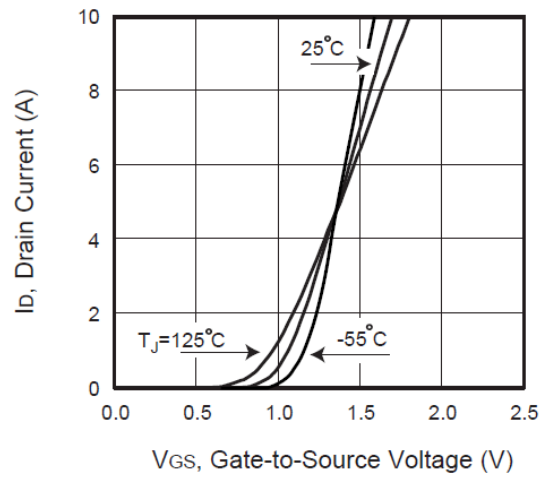


Figure 2. Transfer Characteristics

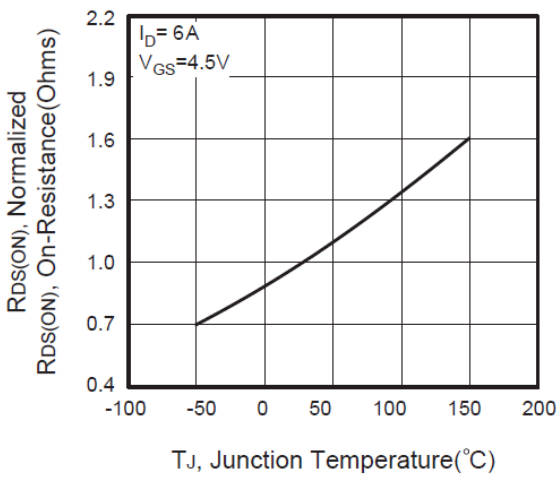


Figure 3. On-Resistance Variation with Temperature

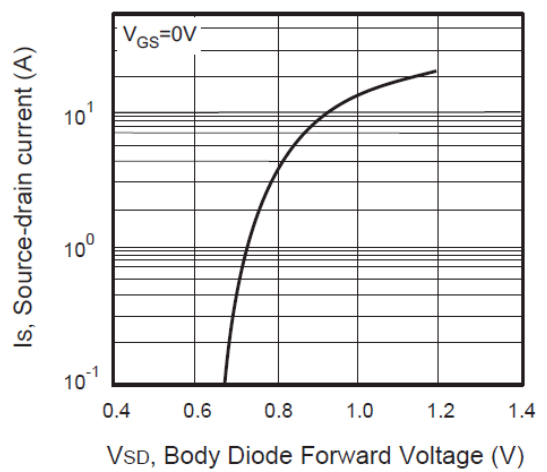


Figure 4. Body Diode Forward Voltage Variation with Source Current

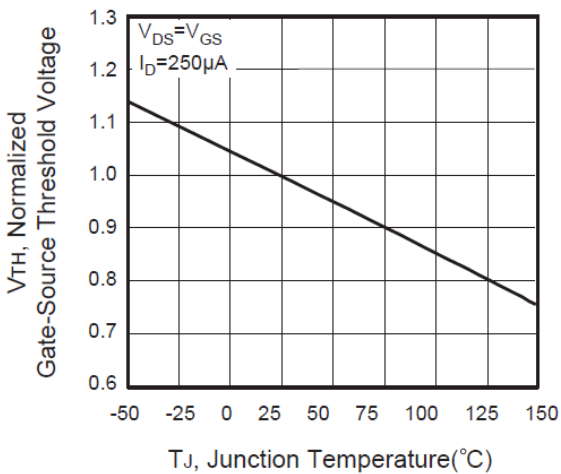


Figure 5. Gate Threshold Variation with Temperature

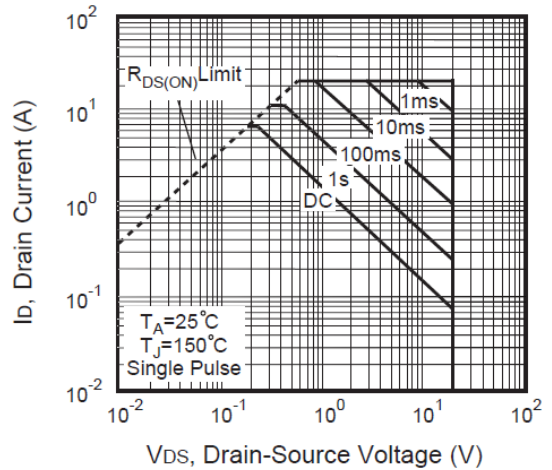


Figure 6. Maximum Safe Operating Area

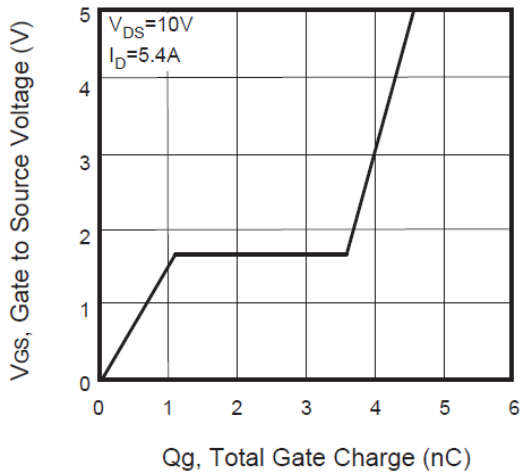


Figure 7. Gate Charge

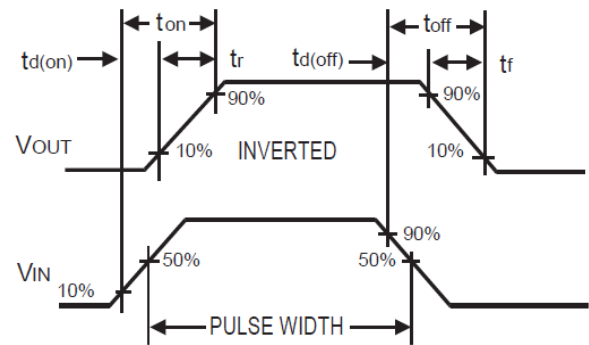


Figure 8. Switching Waveforms

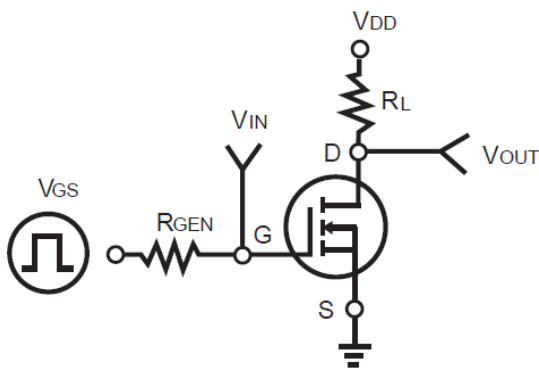


Figure 9. Switching Test Circuit

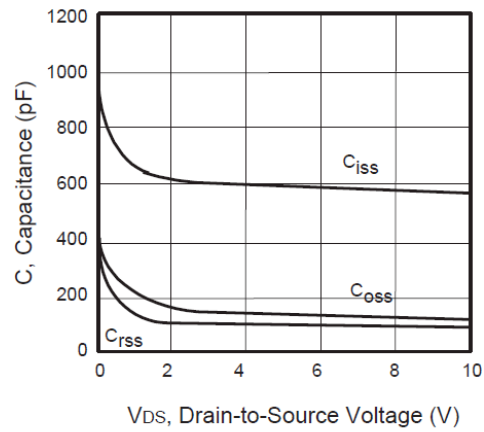


Figure 10. Capacitance

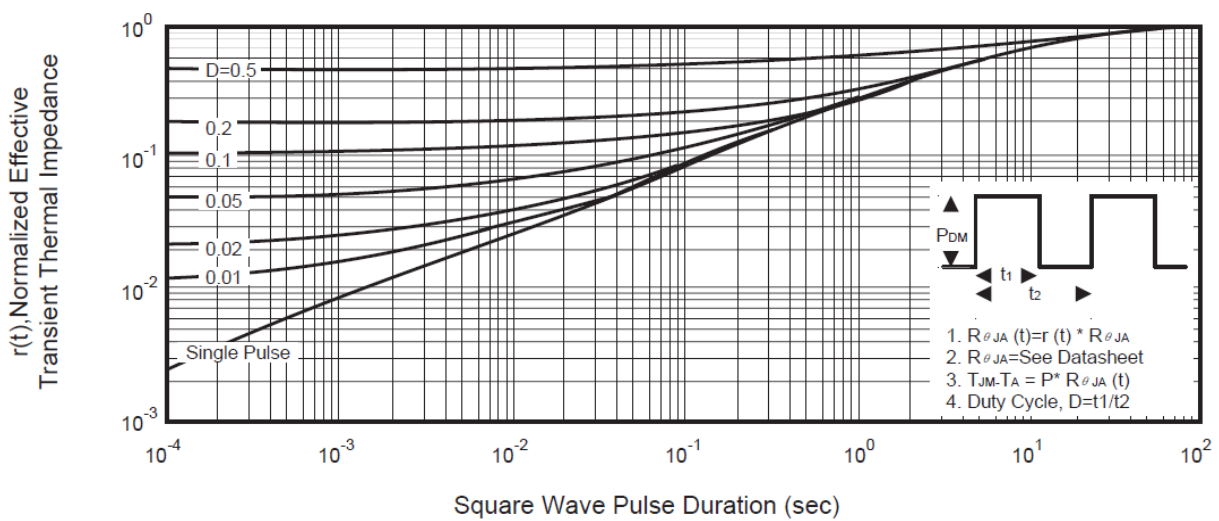


Figure 11. Normalized Thermal Transient Impedance Curve



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