

General Description

The WST2088 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 WST2088 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	8mΩ	8.8A

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	± 12	V
I _D @T _c =25°C	Continuous Drain Current, V _{GS} @ 4.5V	8.8	A
I _D @T _c =70°C	Continuous Drain Current, V _{GS} @ 4.5V	6.2	A
I _{DP}	Pulsed Drain Current	40	A
P _D @T _A =25°C	Total Power Dissipation	1.5	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient	---	25	°C/W
R _{thj-c}	Maximum Thermal Resistance, Junction-case	---	8	°C/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°C , $I_D=1\text{mA}$	---	0.018	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=4.5V, I_D=6A$	---	8	13	m Ω
		$V_{GS}=2.5V, I_D=5A$	---	10	19	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	---	1.3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=16V, V_{GS}=0V$.	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA
Q_g	Total Gate Charge	$V_{DS}=15V, V_{GS}=4.5V, I_D=6A$	---	16	---	nC
Q_{gs}	Gate-Source Charge		---	3	---	
Q_{gd}	Gate-Drain Charge		---	4.5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=10V, V_{GS}=4.5V,$ $R_G=3.3\Omega, I_D=1A$	---	10	---	ns
T_r	Rise Time		---	13	---	
$T_{d(off)}$	Turn-Off Delay Time		---	28	---	
T_f	Fall Time		---	7	---	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	1400	---	pF
C_{oss}	Output Capacitance		---	170	---	
C_{riss}	Reverse Transfer Capacitance		---	135	---	

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	$I_F=1A, V_{GS}=0V,$ $di/dt=100A/\mu s$	---	8.5	---	nS
Q_{rr}	Reverse Recovery Charge		---	2.5	---	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board, $t \leq 10\text{sec}$; $60^\circ\text{C}/\text{W}$ at steady state.
- 4.Starting $T_J=25^\circ\text{C}$, $V_{DD}=20V$, $L=0.1\text{mH}$, $R_G=25\Omega$, $V_{GS}=10V$

Typical Characteristics

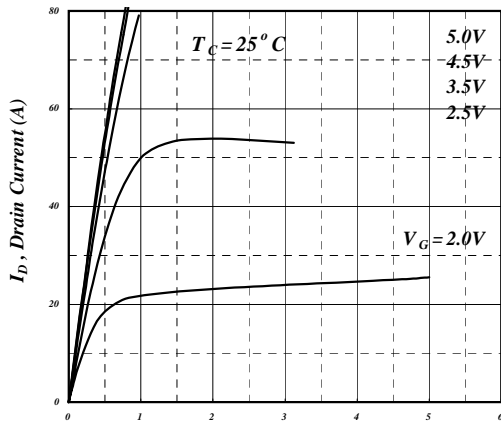


Fig 1. Typical Output Characteristics

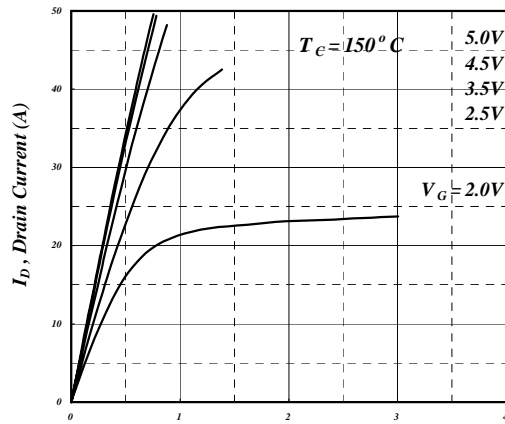


Fig 2. Typical Output Characteristics

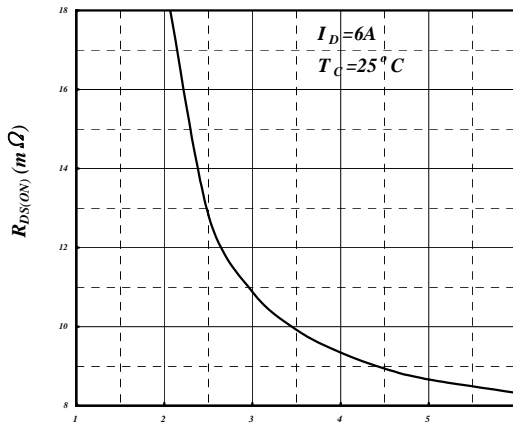


Fig 3. On-Resistance v.s. Gate Voltage

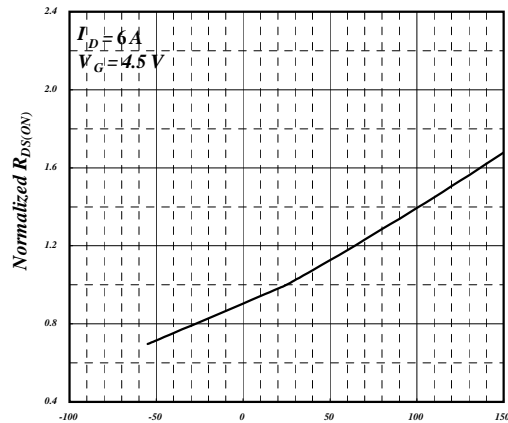


Fig 4. Normalized On-Resistance v.s. Junction Temperature

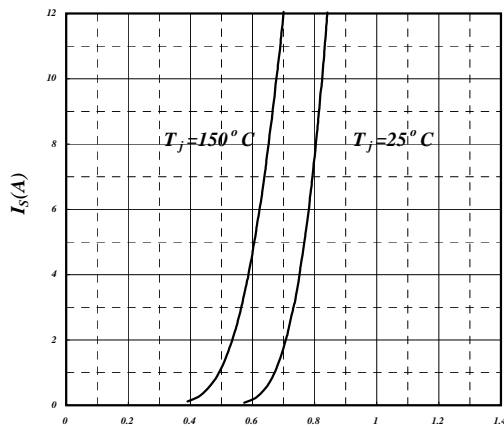


Fig 5. Forward Characteristic of Reverse Diode

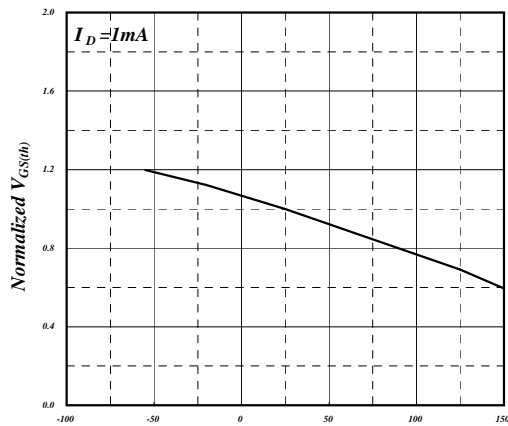


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

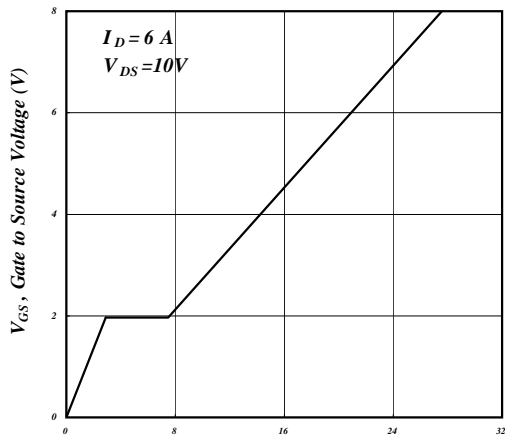


Fig 7. Gate Charge Characteristics

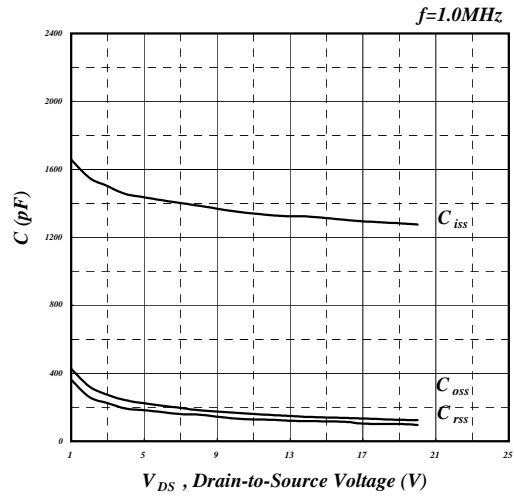


Fig 8. Typical Capacitance Characteristics

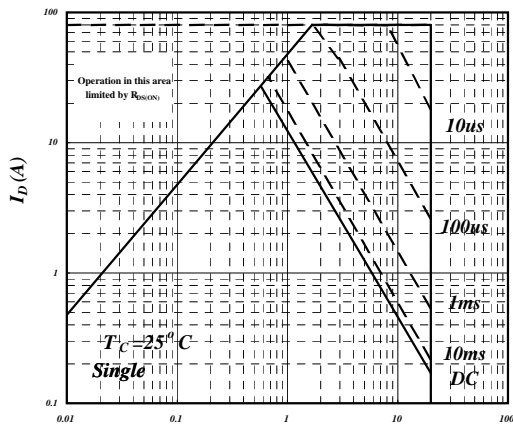


Fig 9. Maximum Safe Operating Area

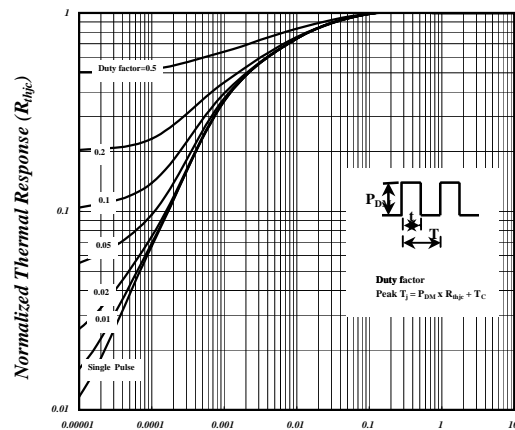


Fig 10. Effective Transient Thermal Impedance

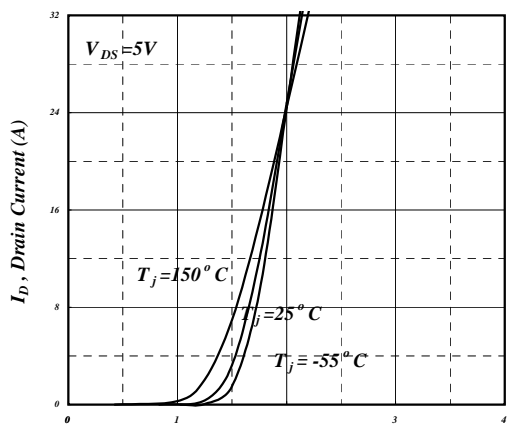


Fig 11. Transfer Characteristics

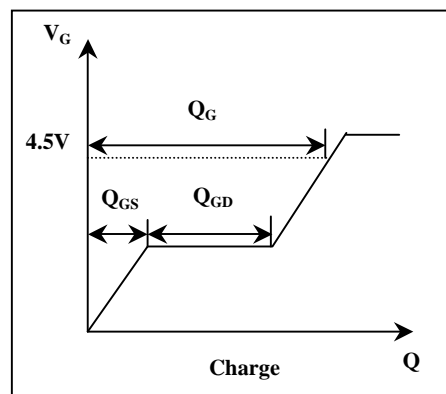


Fig 12. Gate Charge Waveform

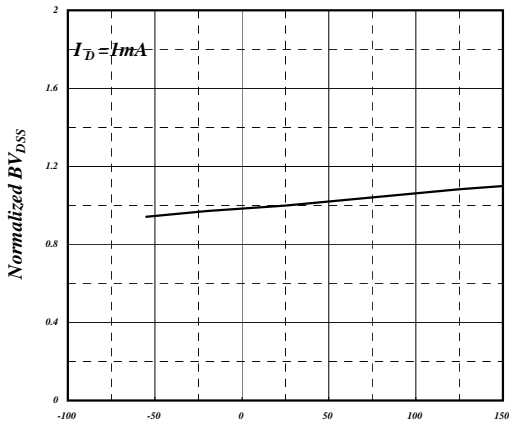


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

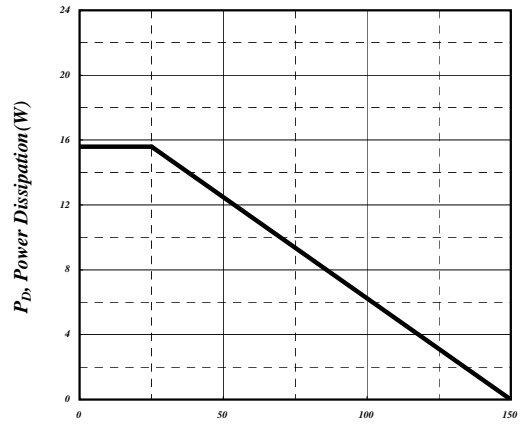


Fig 14. Total Power Dissipation

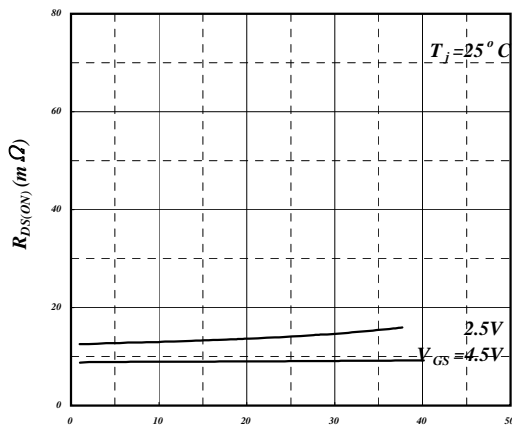


Fig 15. Typ. Drain-Source on State Resistance



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