

## General Description

The WST2028 is the highest performance trench N-ch MOSFET with extreme high cell density, which provide excellent  $R_{DS(on)}$  and gate charge for most of the small power switching and load switch applications.

The WST2028 meet the RoHS and Green Product requirement with full function reliability approved.

## Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent  $C_{dv}/dt$  effect decline
- Green Device Available

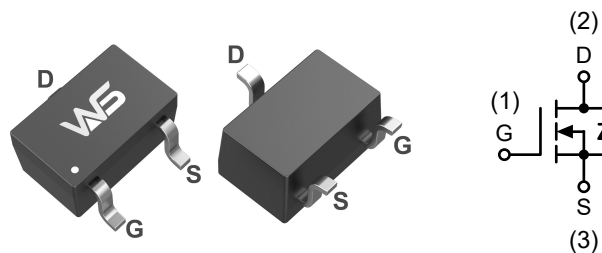
## Product Summary

$BV_{DSS}$	$R_{DS(on)}$	$I_D$
20V	50m $\Omega$	2.1A

## Applications

- High Frequency Point-of-Load Synchronous  
Small power switching for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

## SOT-323-3L Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 8$	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	2.1	A
$I_D@T_C=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	1.1	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	8.2	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation <sup>3</sup>	0.35	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
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	---	357	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	135	$^\circ\text{C}/\text{W}$

**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 $25^\circ\text{C}$ , $I_D=1mA$	---	0.022	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=4.5V, I_D=2A$	---	50	60	$m\Omega$
		$V_{GS}=2.5V, I_D=1A$	---	70	90	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	0.7	1.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-2.33	---	mV/ $^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=16V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=16V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=2A$	---	12	---	S
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	6.0	---	$\Omega$
$Q_g$	Total Gate Charge (4.5V)	$V_{DS}=10V, V_{GS}=4.5V, I_D=2A$	---	5.0	---	nC
$Q_{gs}$	Gate-Source Charge		---	0.8	---	
$Q_{gd}$	Gate-Drain Charge		---	1.7	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=10V,$ $V_{GS}=4.5V, R_G=6\Omega$ $I_D=1A$	---	3.2	---	ns
$T_r$	Rise Time		---	12	---	
$T_{d(off)}$	Turn-Off Delay Time		---	4	---	
$T_f$	Fall Time		---	26	---	
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	---	300	---	pF
$C_{oss}$	Output Capacitance		---	57	---	
$C_{rss}$	Reverse Transfer Capacitance		---	47	---	

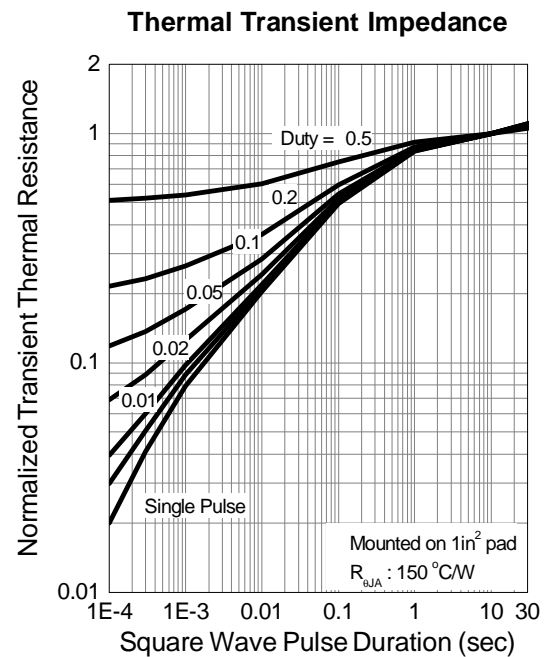
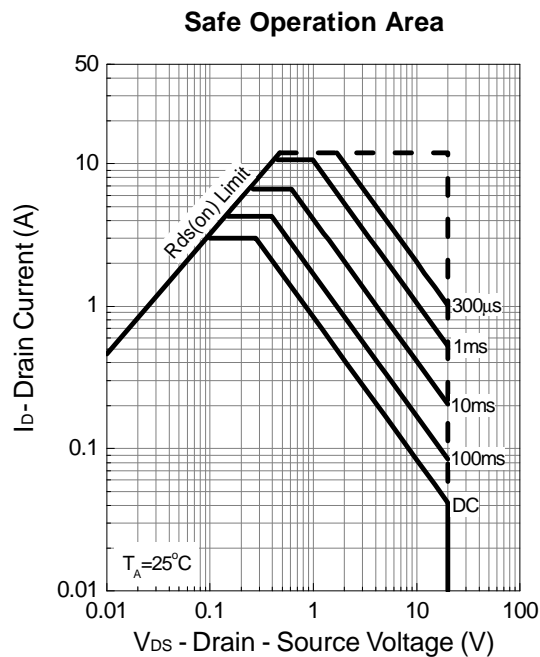
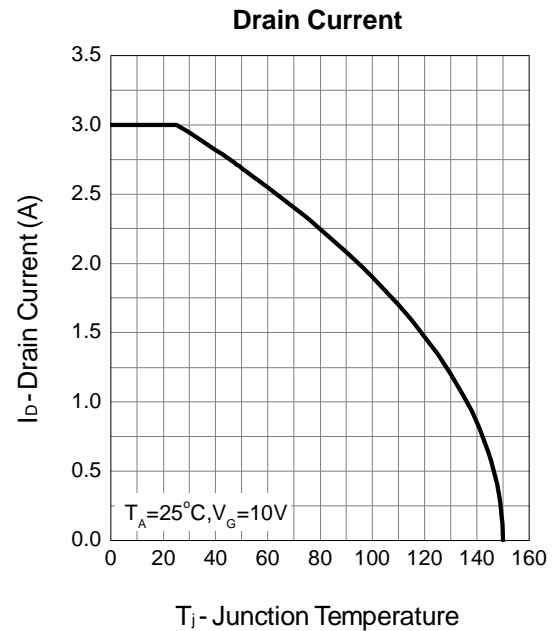
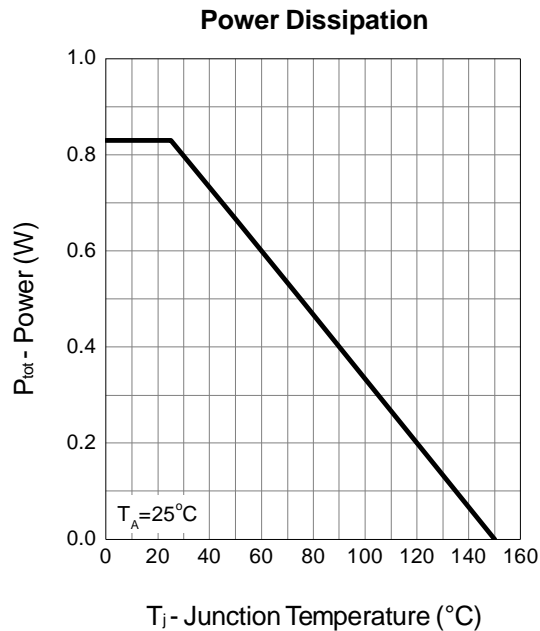
**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1,4</sup>	$V_G=V_D=0V$ , Force Current	---	---	2.1	A
$I_{SM}$	Pulsed Source Current <sup>2,4</sup>		---	---	8.0	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_F=2A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	10	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	3.2	---	nC

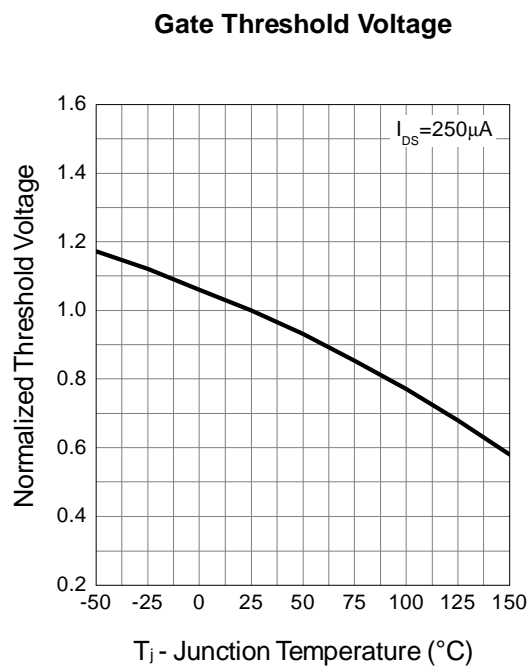
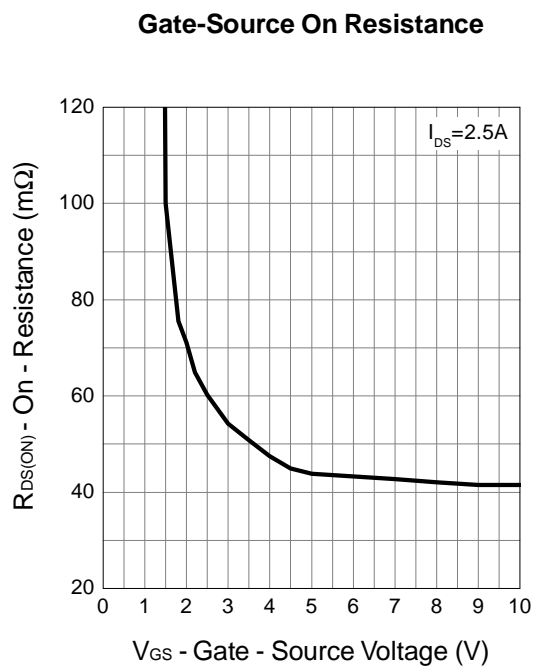
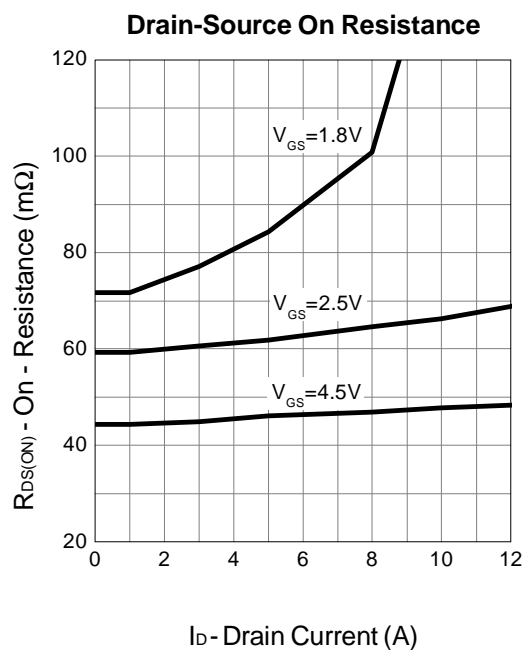
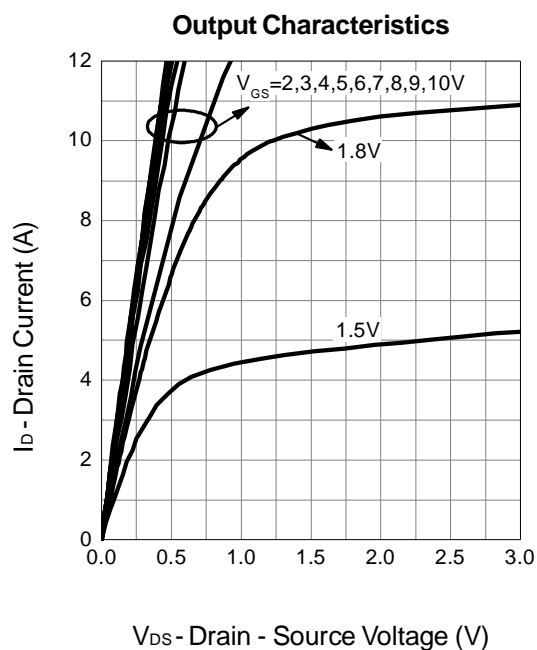
Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper,  $t < 10\text{sec}$ .
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3.The power dissipation is limited by  $150^\circ\text{C}$  junction temperature
- 4.The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.

## Typical Characteristics

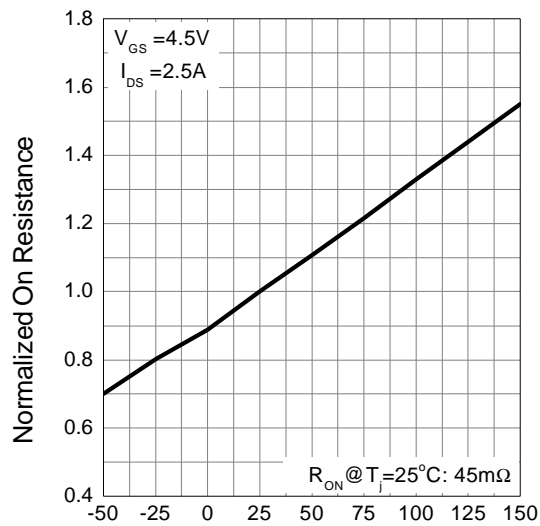


## Typical Characteristics



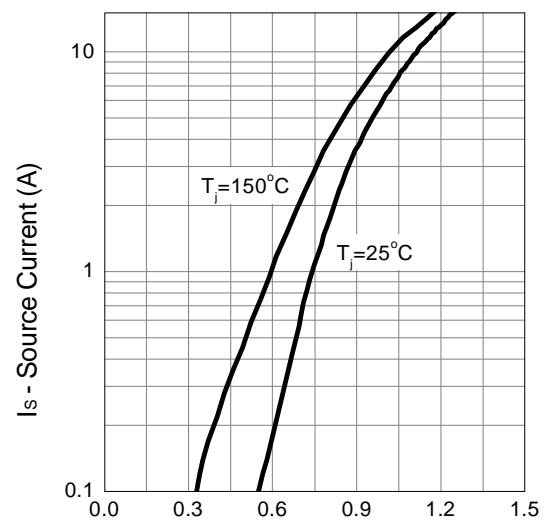
## Typical Characteristics

**Drain-Source On Resistance**



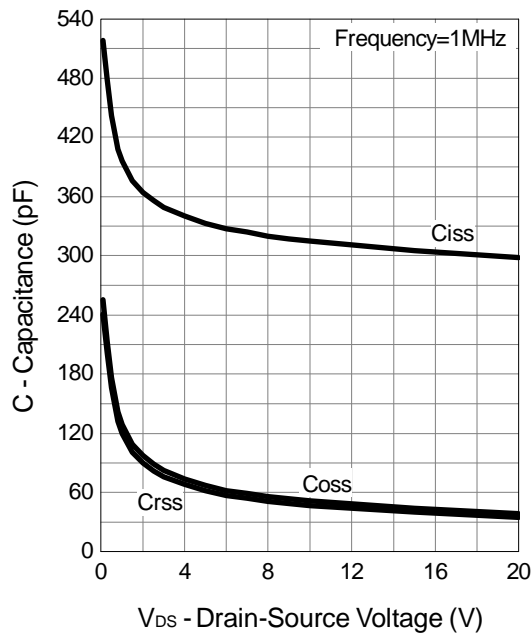
$T_j$  - Junction Temperature ( $^{\circ}\text{C}$ )

**Source-Drain Diode Forward**



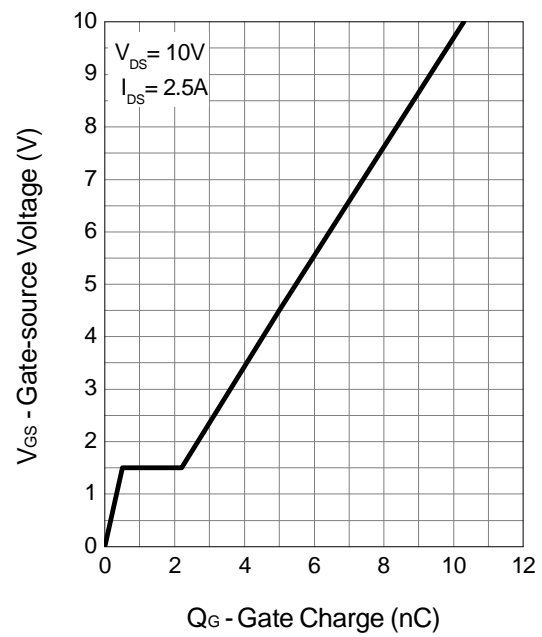
$V_{SD}$  - Source - Drain Voltage (V)

**Capacitance**



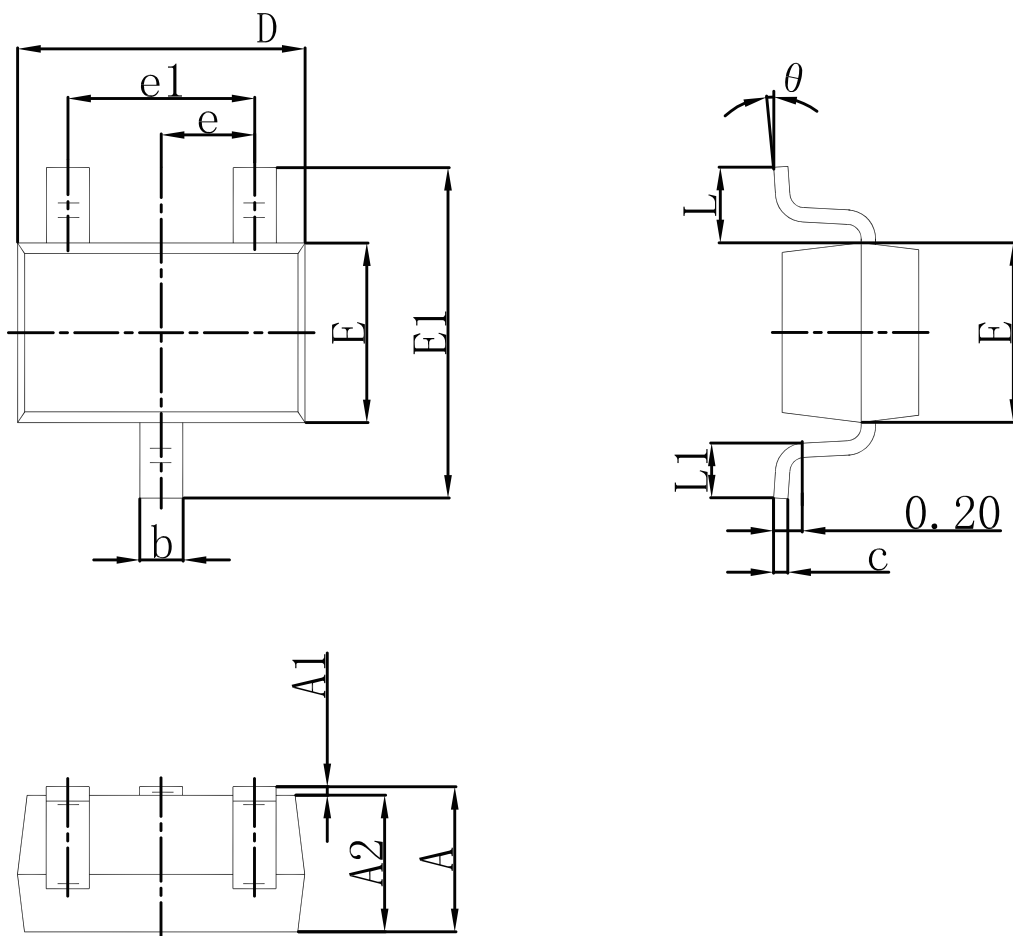
$V_{DS}$  - Drain-Source Voltage (V)

**Gate Charge**



$Q_G$  - Gate Charge (nC)

## Packaging information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
$\theta$	0°	8°	0°	8°

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