

General Description

The WST2337A is the highest performance trench P-Ch MOSFET with extreme high cell density, which provide excellent RDSON and gate charge for most of the small power switching and load switch applications.

The WST2337A 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

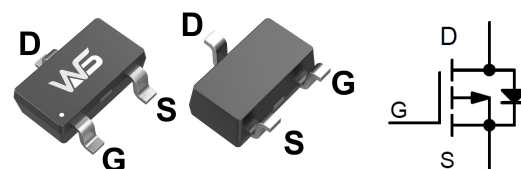
Product Summary

BVDSS	RDSON	ID
-15V	30mΩ	-4.8A

Applications

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

SOT-23N Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-15	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_c=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-4.8	A
$I_D@T_c=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-3.4	A
I_{DM}	Pulsed Drain Current	-24	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	1.4	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 ¹	---	125	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	80	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-15	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V$, $I_D=-4.1A$	---	30	48	$m\Omega$
		$V_{GS}=-2.5V$, $I_D=-3A$	---	45	65	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-0.45	-0.7	-1.2	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-12V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA
Q_g	Total Gate Charge	$V_{DS}=-4V, I_D=-4.1A, V_{GS}=-4.5V$	---	7.8	---	nC
Q_{gs}	Gate-Source Charge		---	1.2	---	
Q_{gd}	Gate-Drain Charge		---	1.6	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-4V, I_D=-3.3A$, $R_L=-1.2\Omega, V_{GEN}=-4.5V, R_g=1\Omega$	---	12	---	ns
T_r	Rise Time		---	35	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	$V_{DS}=-4V, V_{GS}=0V$, $F=1.0\text{MHz}$	---	738	1500	pF
C_{oss}	Output Capacitance		---	280	---	
C_{rss}	Reverse Transfer Capacitance		---	190	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-4.1	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=-1.6A$, $T_J=25^{\circ}\text{C}$	---	---	-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Characteristics

Figure 1: Switching Test Circuit

Figure 2: Switching Waveforms

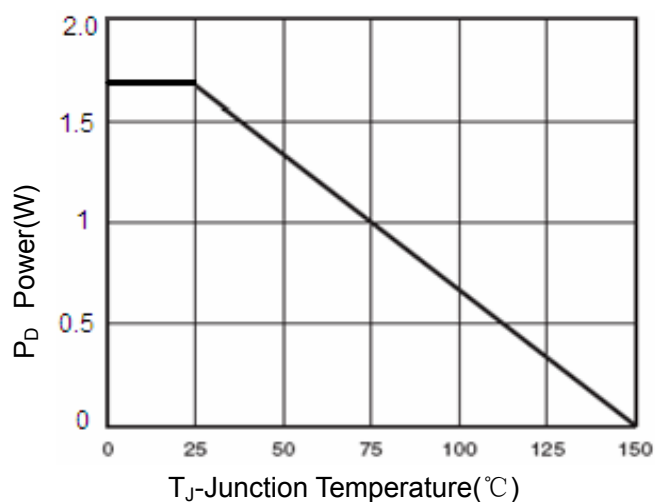


Figure 3 Power Dissipation

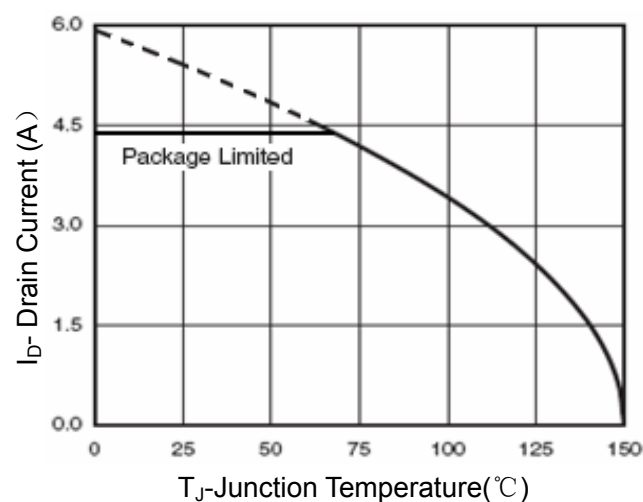


Figure 4 Drain Current

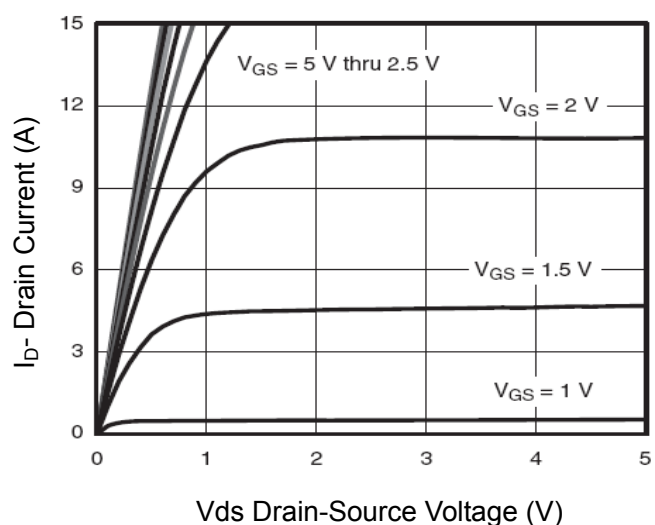


Figure 5 Output Characteristics

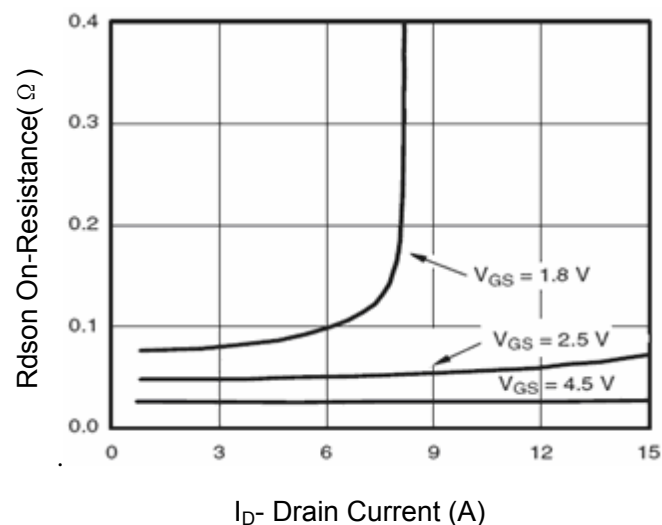
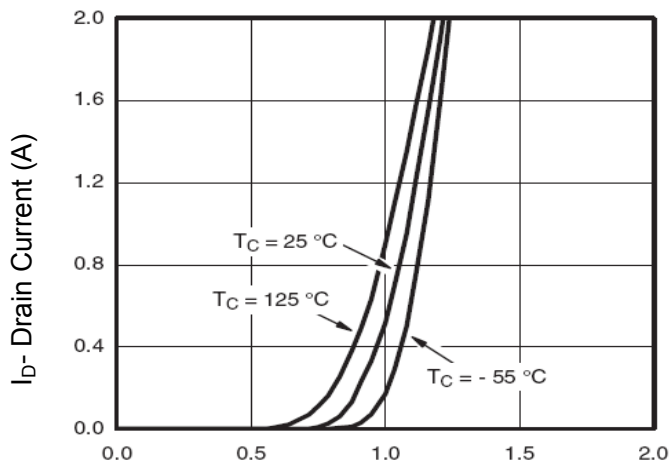
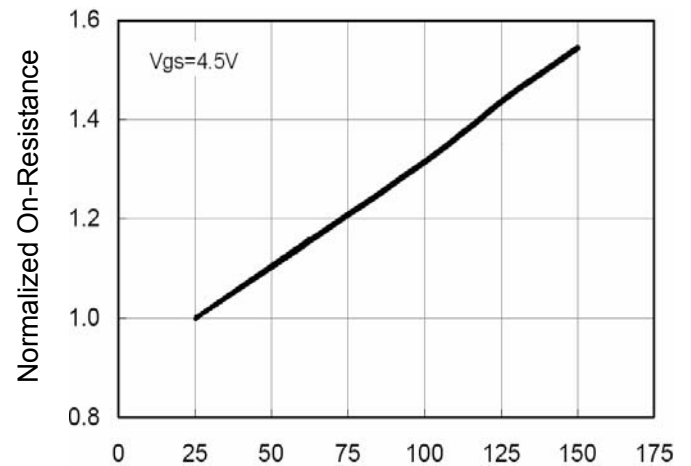


Figure 6 Drain-Source On-Resistance



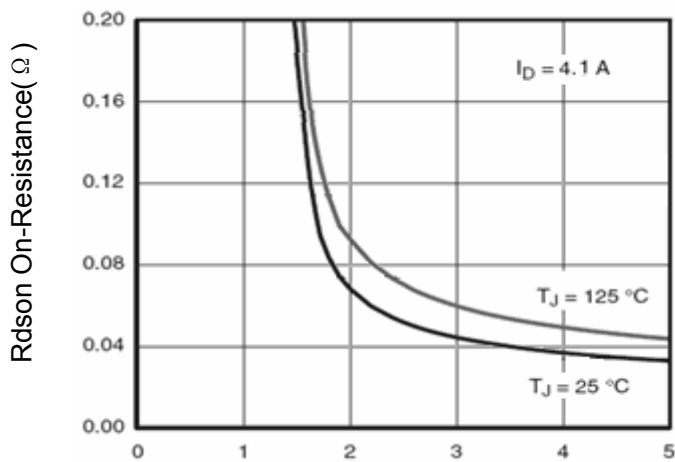
V_{gs} Gate-Source Voltage (V)

Figure 7 Transfer Characteristics



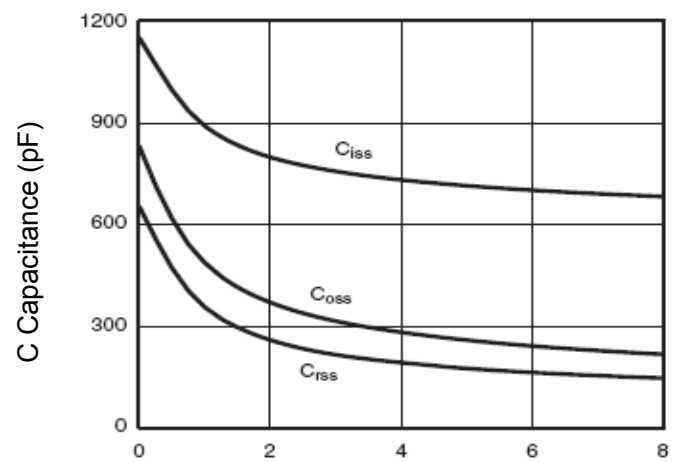
T_J-Junction Temperature(°C)

Figure 8 Drain-Source On-Resistance



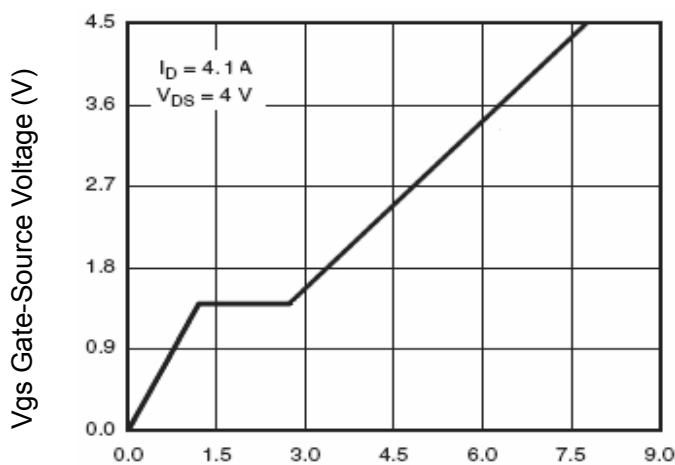
V_{gs} Gate-Source Voltage (V)

Figure 9 Rdson vs Vgs



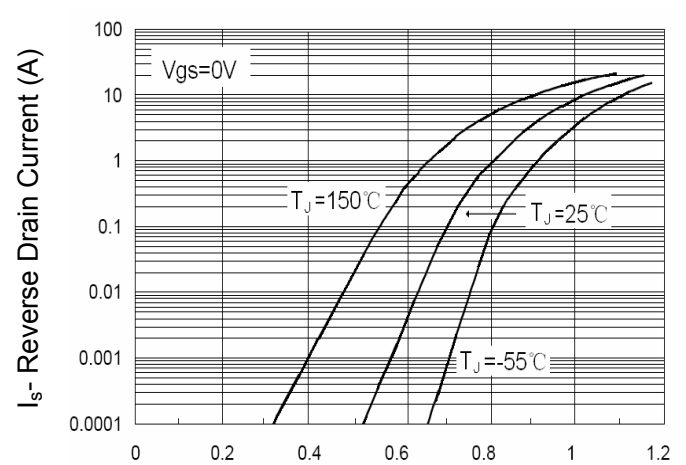
V_{ds} Drain-Source Voltage (V)

Figure 10 Capacitance vs Vds



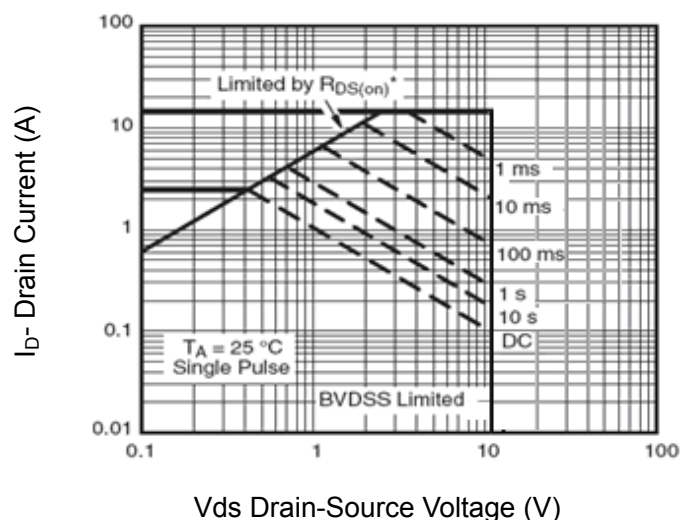
Q_g Gate Charge (nC)

Figure 11 Gate Charge



V_{sd} Source-Drain Voltage (V)

Figure 12 Source- Drain Diode Forward



Vds Drain-Source Voltage (V)
Figure 13 Safe Operation Area

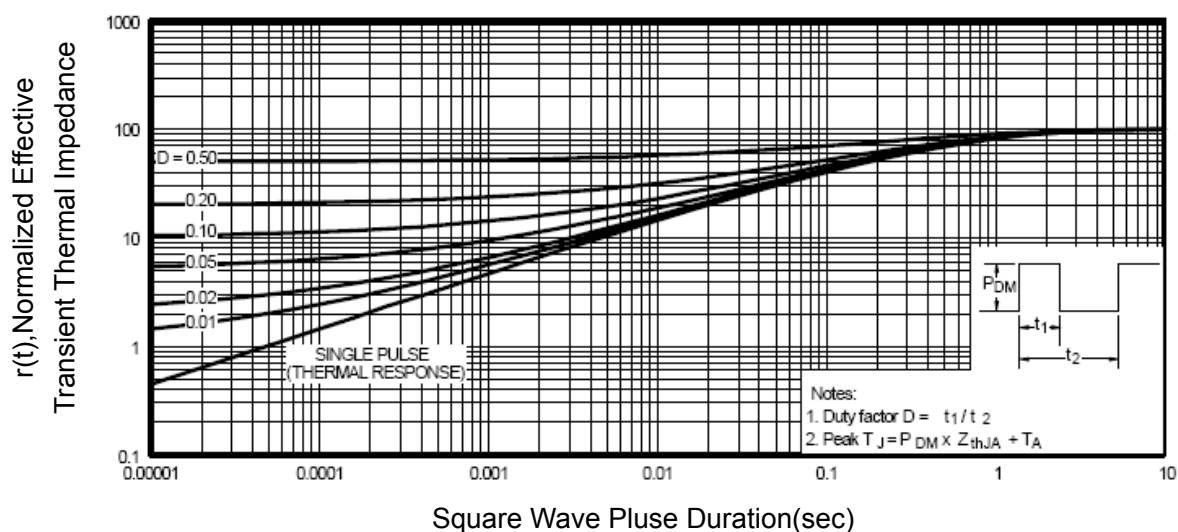


Figure 14 Normalized Maximum Transient Thermal Impedance

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