

General Description

The WST2333B is the highest performance trench P-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 WST2333B 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

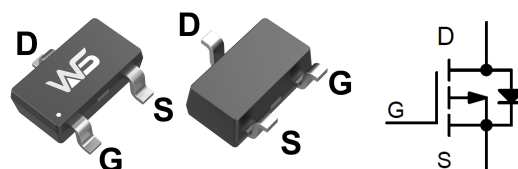
Product Summary

BVDSS	R _{DS(on)}	I _D
-15V	40mΩ	-4.4A

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°C	Continuous Drain Current, V _{GS} @ -4.5V ¹	-4.4	A
I _D @T _c =70°C	Continuous Drain Current, V _{GS} @ -4.5V ¹	-3.4	A
I _{DM}	Pulsed Drain Current	-24	A
P _D @T _A =25°C	Total Power Dissipation ³	1.4	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 _{θJA}	Thermal Resistance Junction-ambient ¹	---	125	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	80	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-15	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-4.1A	---	40	48	mΩ
		V _{GS} =-2.5V, I _D =-3A	---	45	65	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.45	-0.7	-1.2	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-12V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±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 =-1.2Ω, V _{GEN} =-4.5V, R _g =1Ω	---	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=1.0MHz	---	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°C	---	---	-1.2	V

Notes:

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

Typical Characteristics

Figure 1: Switching Test Circuit

Figure 2: Switching Waveforms

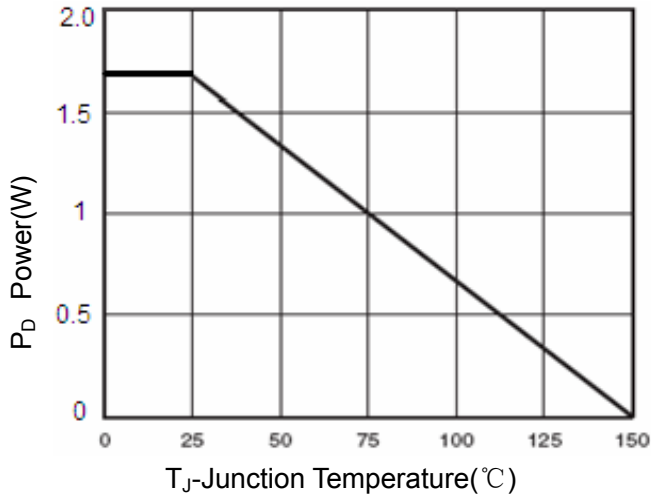


Figure 3 Power Dissipation

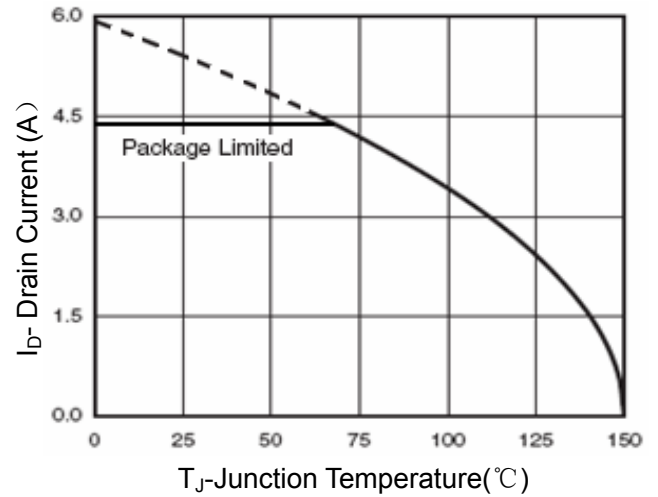


Figure 4 Drain Current

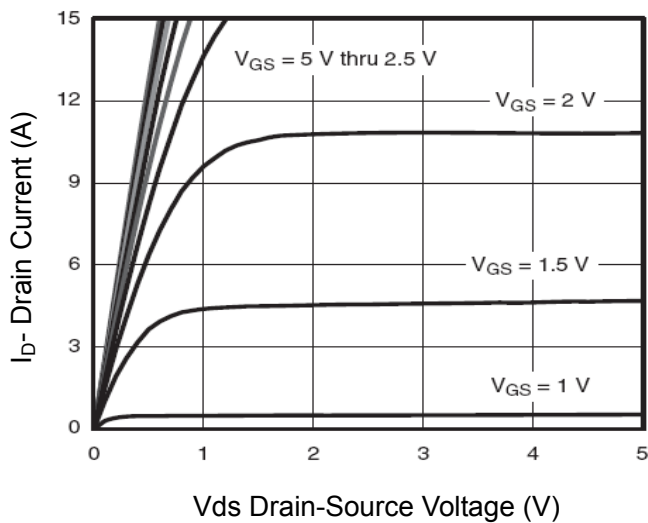


Figure 5 Output Characteristics

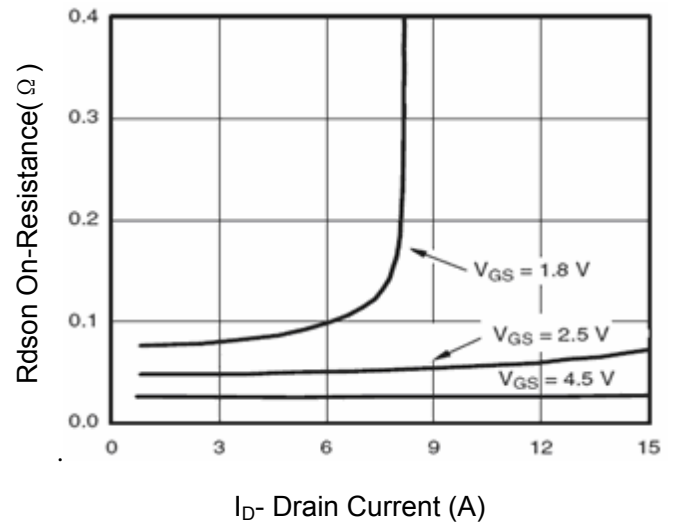
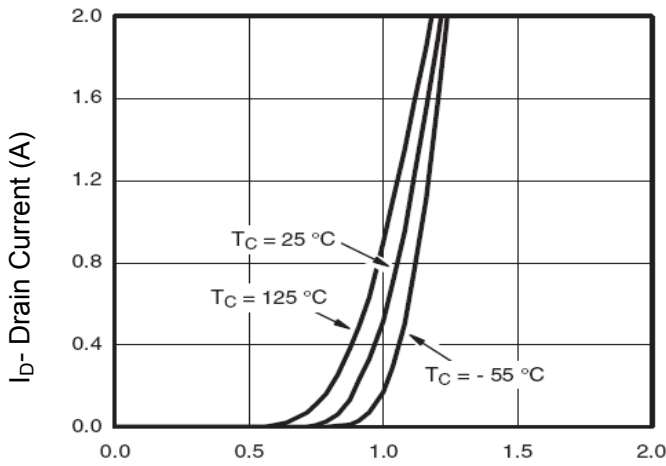
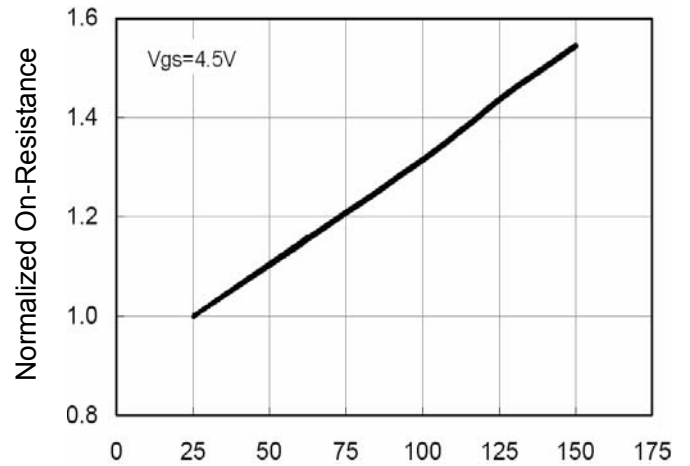


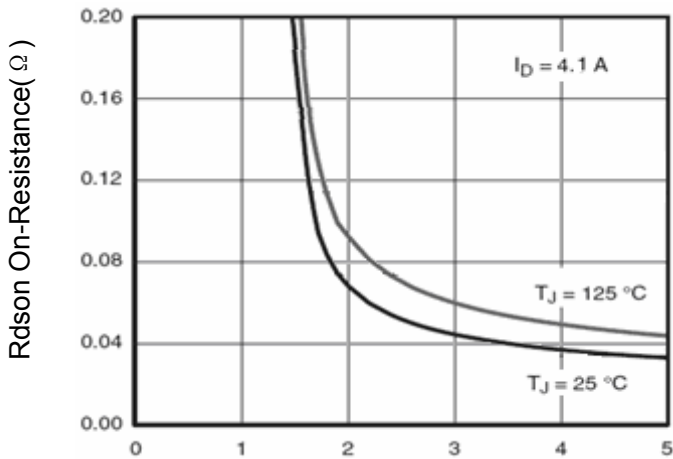
Figure 6 Drain-Source On-Resistance



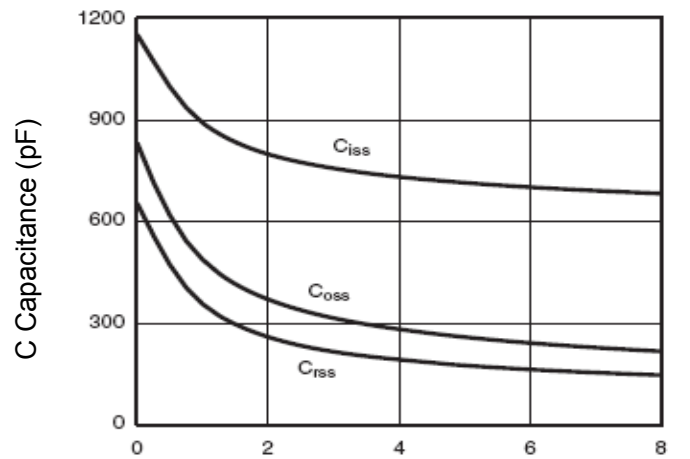
Vgs Gate-Source Voltage (V)
Figure 7 Transfer Characteristics



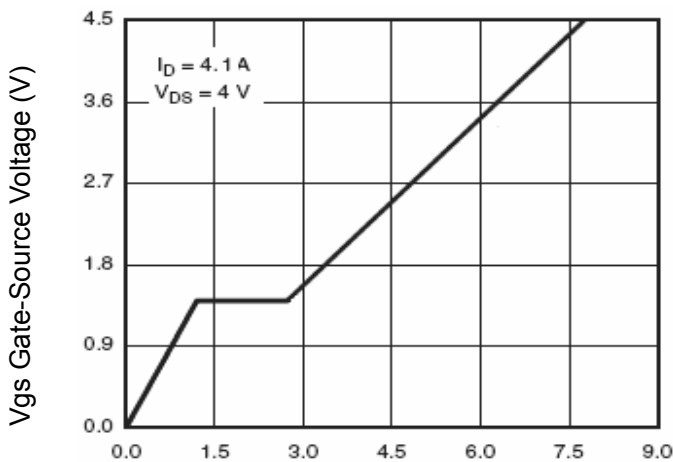
T_J -Junction Temperature($^\circ\text{C}$)
Figure 8 Drain-Source On-Resistance



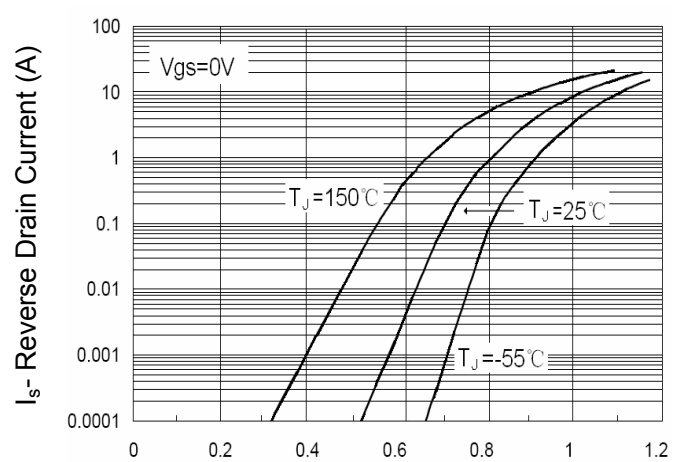
Vgs Gate-Source Voltage (V)
Figure 9 Rdson vs Vgs



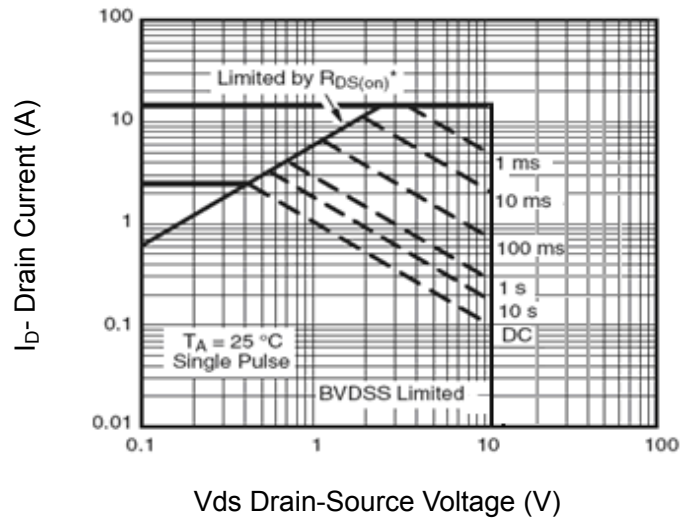
V_{DS} Drain-Source Voltage (V)
Figure 10 Capacitance vs Vds



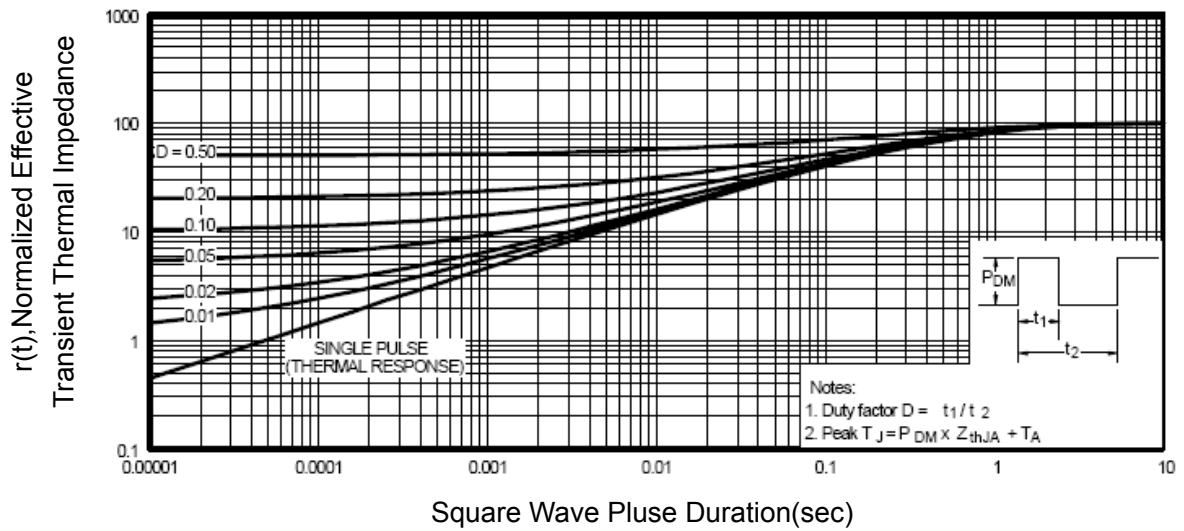
Q_g Gate Charge (nC)
Figure 11 Gate Charge



V_{SD} Source-Drain Voltage (V)
Figure 12 Source-Drain Diode Forward



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



Square Wave Pulse Duration(sec)
Figure 14 Normalized Maximum Transient Thermal Impedance



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