

General Description

The WST2335A is the highest performance trench P-Channel 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 WST2335A 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

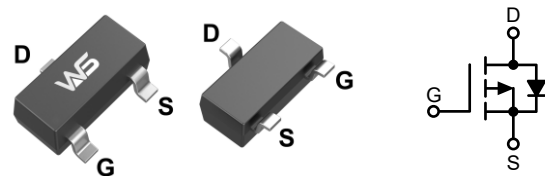
Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D
-20V	35mΩ	-5.8A

Applications

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

SOT-23L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±8	
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V$ ¹	-5.8	A
$I_D@T_C=70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V$ ¹	-3.7	
I_{DM}	Pulsed Drain Current ²	-18.1	
$P_D@T_A=25^\circ C$	Total Power Dissipation ³	1	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	

Thermal Data

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ¹	---	125	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case ¹	---	80	

Electrical Characteristics (T_J=25°C, Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.01	---	V/°C
R _{DS(on)}	Static Drain-Source On-Resistance ²	V _{GS} =-4.5V, I _D =-4A	---	35	45	mΩ
		V _{GS} =-2.5V, I _D =-2A	---	45	57	
		V _{GS} =-1.8V, I _D =-1.5A	---	85	105	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-0.3	-0.5	-1.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	2.96	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-16V, V _{GS} =0V, T _J =25°C	---	---	-1.0	μA
		V _{DS} =-16V, V _{GS} =0V, T _J =55°C	---	---	-5.0	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±8V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-4A	---	21	---	S
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-4A	---	27.3	38.2	nC
Q _{gs}	Gate-Source Charge		---	3.6	5.0	
Q _{gd}	Gate-Drain Charge		---	6.5	9.1	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-10V, V _{GS} =-4.5V, R _G =3.3Ω, I _D =-4A	---	9.2	18.4	ns
T _r	Rise Time		---	59	106	
T _{d(off)}	Turn-Off Delay Time		---	99	198	
T _f	Fall Time		---	71	142	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1.0MHz	---	1025	1120	pF
C _{oss}	Output Capacitance		---	220	308	
C _{rss}	Reverse Transfer Capacitance		---	187	262	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	-4.7	A
I _{SM}	Pulsed Source Current ^{2,4}		---	---	-18.1	
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1.0	V
t _{rr}	Reverse Recovery Time	I _F =-4A, dI/dt=100A/μs, T _J =25°C	---	52	---	nS
Q _{rr}	Reverse Recovery Charge		---	28	---	nC

Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, t≤10sec.
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.
3. The power dissipation is limited by 150°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

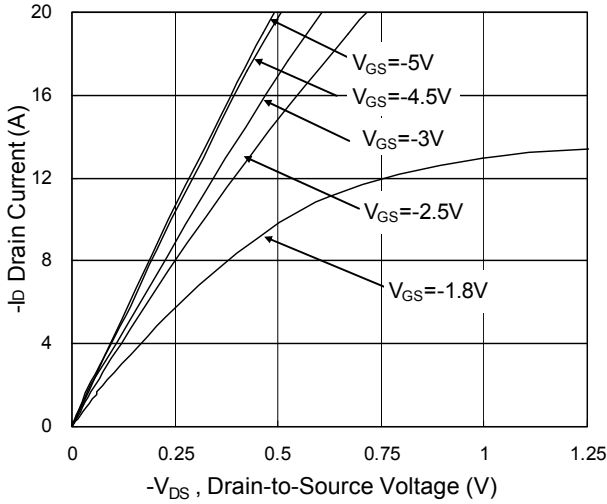


Fig.1 Typical Output Characteristics

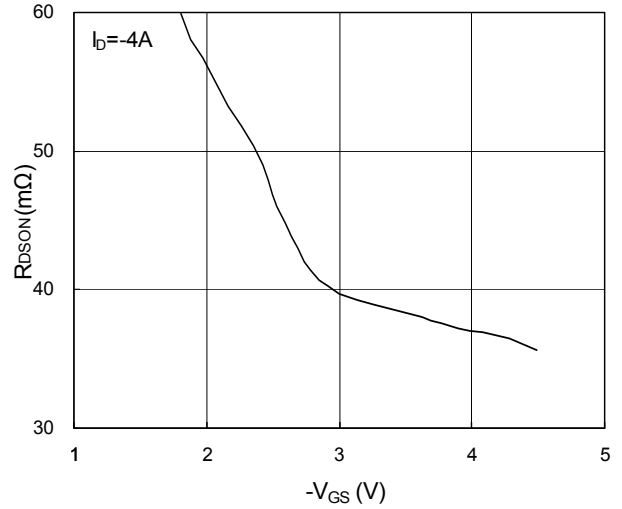


Fig.2 On-Resistance vs. Gate-Source

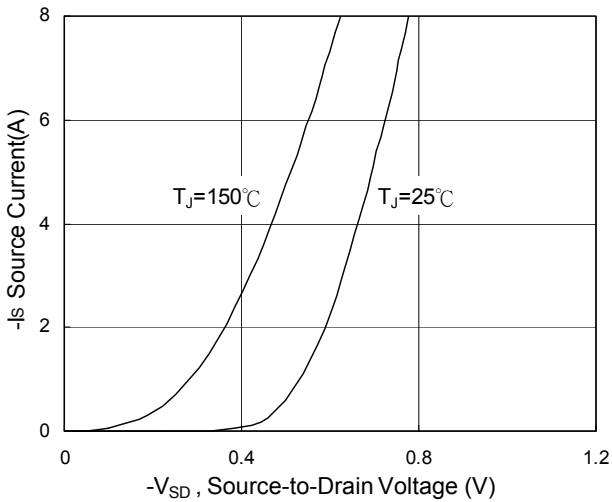


Fig.3 Forward Characteristics Of Reverse

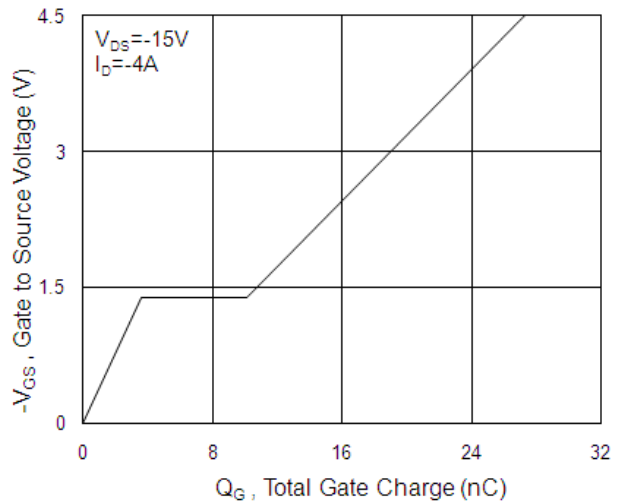


Fig.4 Gate-Charge Characteristics

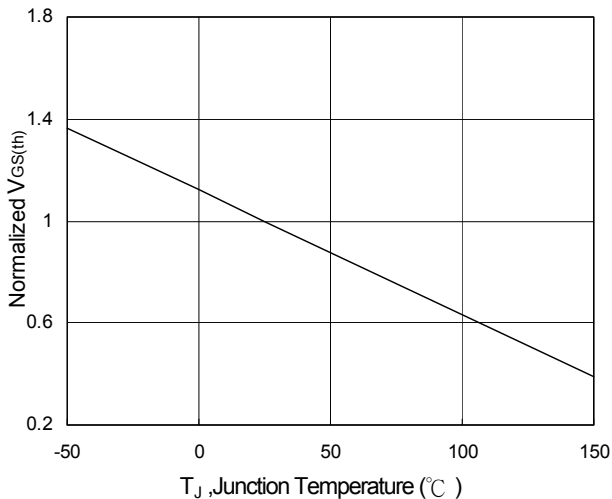


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

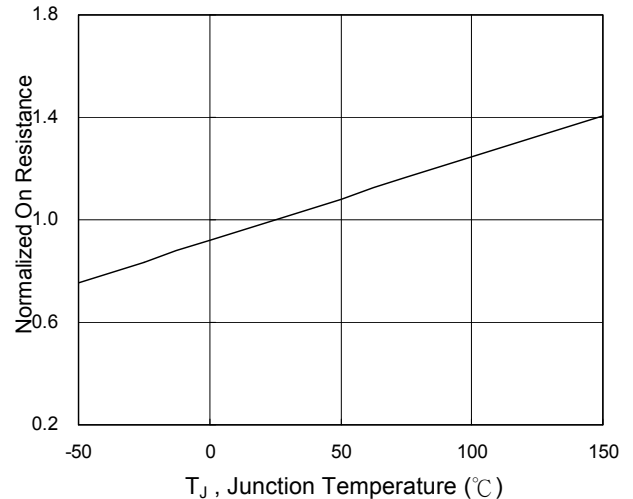


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics (Cont.)

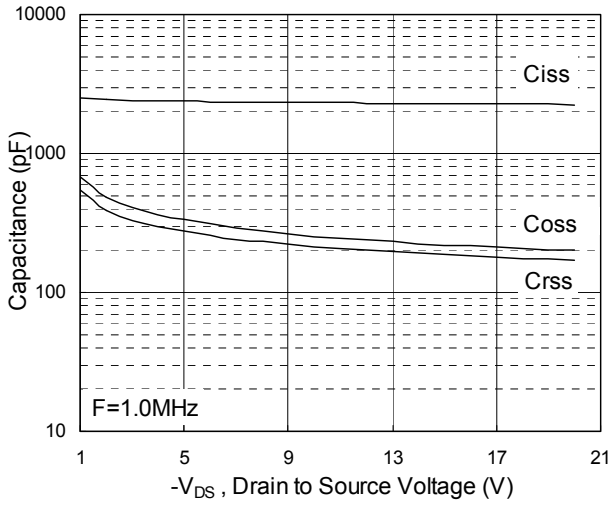


Fig.7 Capacitance

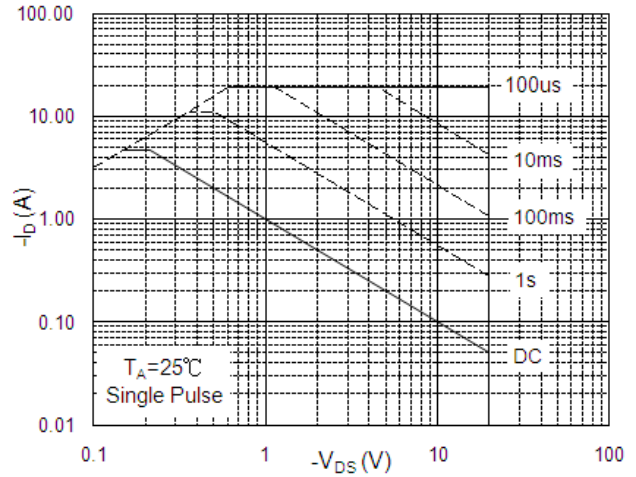


Fig.8 Safe Operating Area

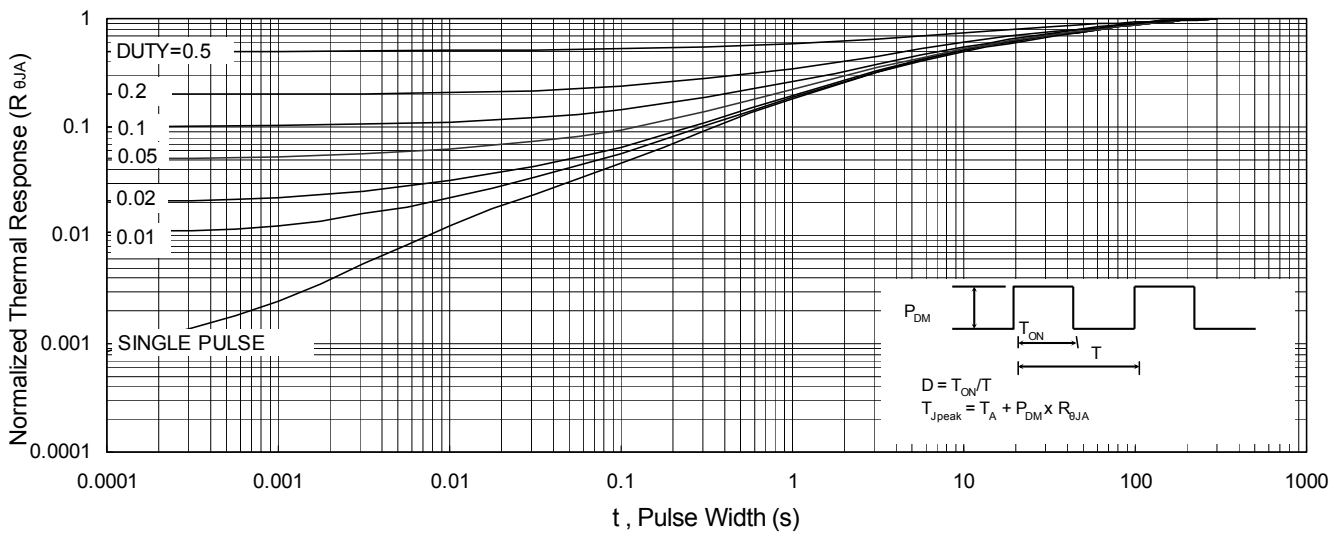


Fig.9 Normalized Maximum Transient Thermal Impedance

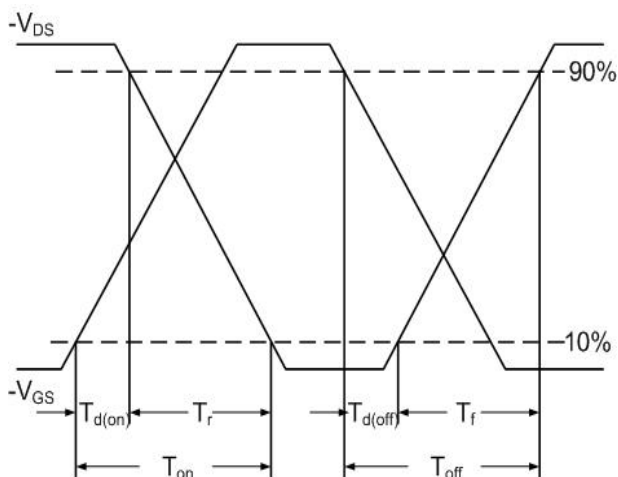


Fig.10 Switching Time Waveform

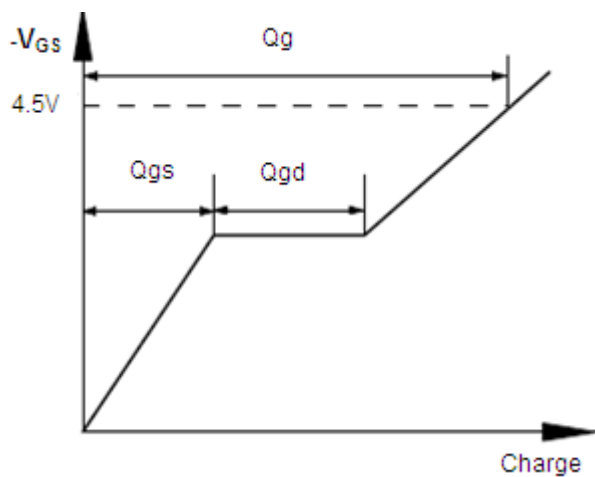
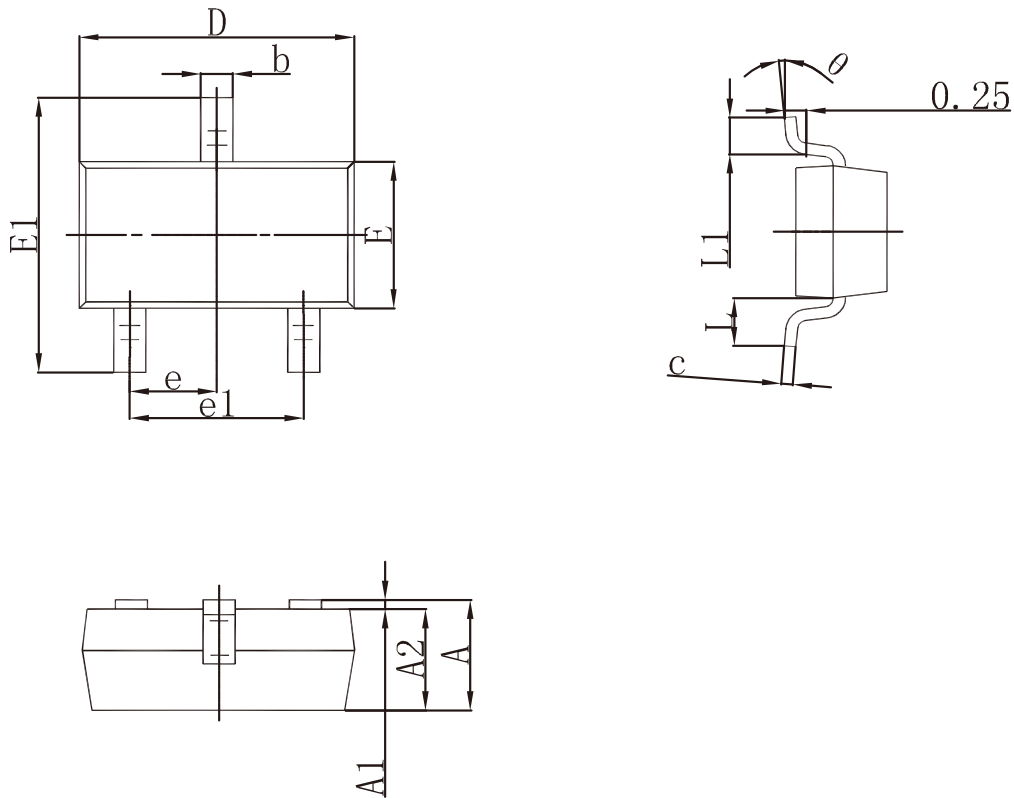


Fig.11 Gate Charge Waveform

Packaging information


SYMBOL	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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