General Description

The WST1614T5 is the highest performance trench N-Channel MOSFET with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The WST1614T5 meet the RoHS and Green Product requirement, with full function reliability approved.

Product Summery

BV_{DSS}	$R_{DS(ON)}$	I_D
20V	180mΩ	0.75A

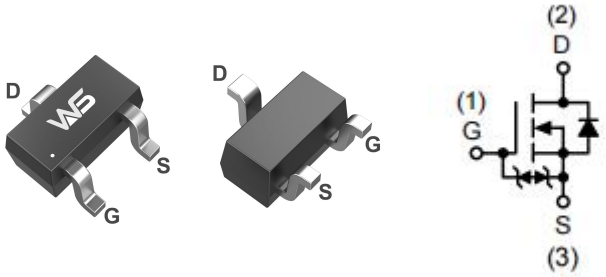
Applications

- Power Management for Industrial

Features

- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- ESD Protected: 2KV

SOT-523-3L Pin Configuration



Absolute Maximum Ratings (T_A=25°C, Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±10	
I_D [7]	Continuous Drain Current	T_C=25°C	0.75	A
		T_C=100°C	0.5	
I_{DM} [3]	Pulse Drain Current		3	
P_D [2]	Power Dissipation	T_C=25°C	0.17	W
		T_C=100°C	---	
T_{STG}	Storage Temperature Range		-55 to 150	°C
T_J	Operating Junction Temperature Range		-55 to 150	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		625	°C/W

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
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=4.5V , I_D=0.5A	---	180	240	mΩ
		T_J=125°C	---	200	280	
		V_{GS}=2.5V , I_D=0.4A	---	220	320	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	0.4	0.7	1.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V , V_{GS}=0V	---	---	1.0	μA
		T_J=55°C	---	---	5.0	
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V , V_{GS}=±20V	---	---	±10	μA
g_{fs}	Forward Transconductance	V_{DS}=5V , I_D=0.5A	---	100	---	S
R_G	Gate Resistance	f=1.0MHz	---	---	10.0	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=10V , V_{GS}=4.5V , I_D=0.75A	---	1	---	nC
Q_g	Total Gate Charge (4.5V)		---	0.5	---	
Q_{gs}	Gate-Source Charge		---	0.28	---	
Q_{gd}	Gate-Drain Charge		---	0.22	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=10V , V_{GS}=4.5V , R_L=1Ω , R_{GEN}=10Ω	---	2	---	ns
T_r	Rise Time		---	19	---	
$T_{d(off)}$	Turn-Off Delay Time		---	10	---	
T_f	Fall Time		---	23	---	
C_{iss}	Input Capacitance	V_{DS}=20V , V_{GS}=0V , f=1.0MHz	---	60	---	pF
C_{oss}	Output Capacitance		---	22	---	
C_{rss}	Reverse Transfer Capacitance		---	12	---	

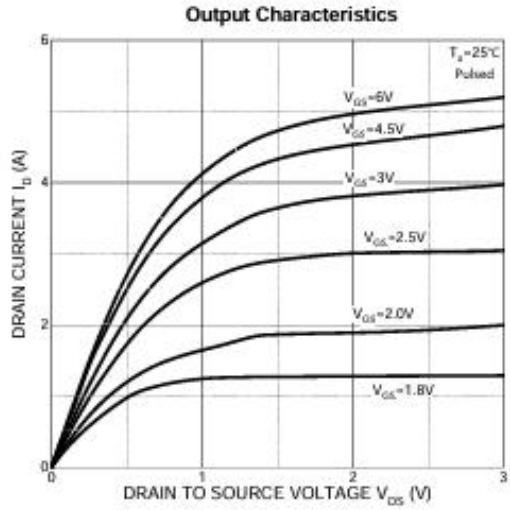
Diode Characteristics

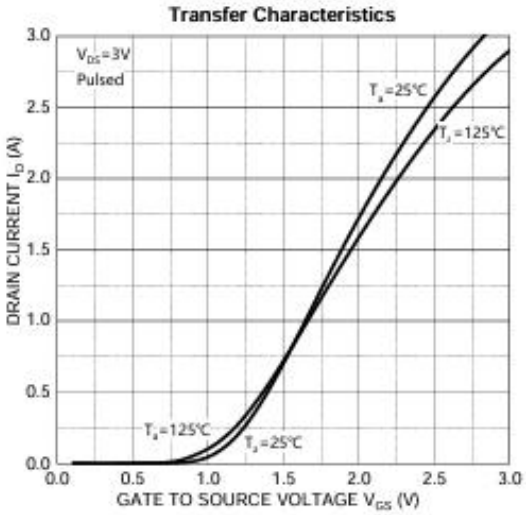
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S [7]	Continuous Source Current		---	---	0.75	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A	---	---	1.2	V

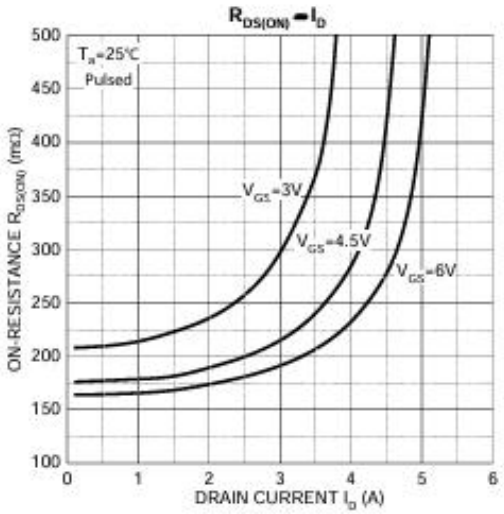
Note:

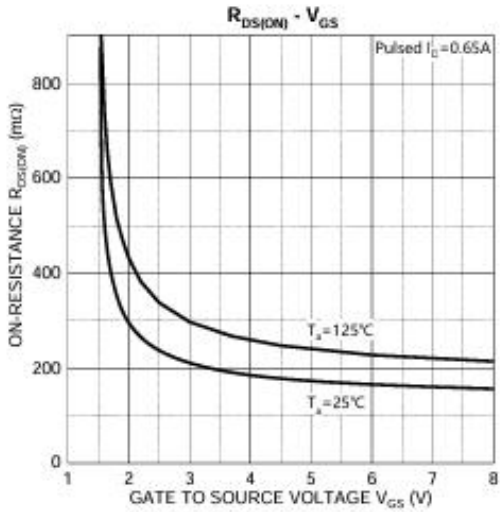
1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
5. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.
6. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.
7. The maximum current rating is package limited.
8. These tests are performed with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.
9. The maximum current rating is silicon limited

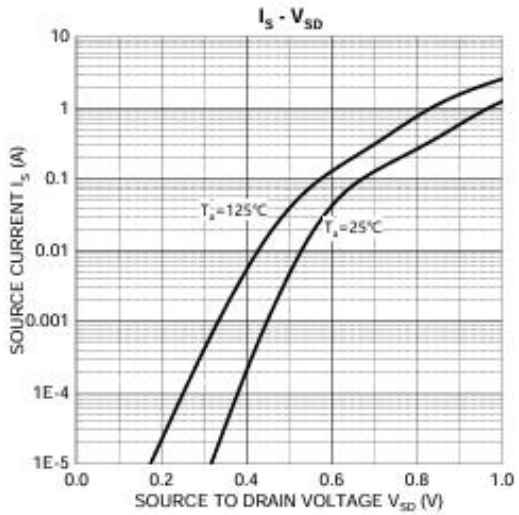
Typical Characteristics

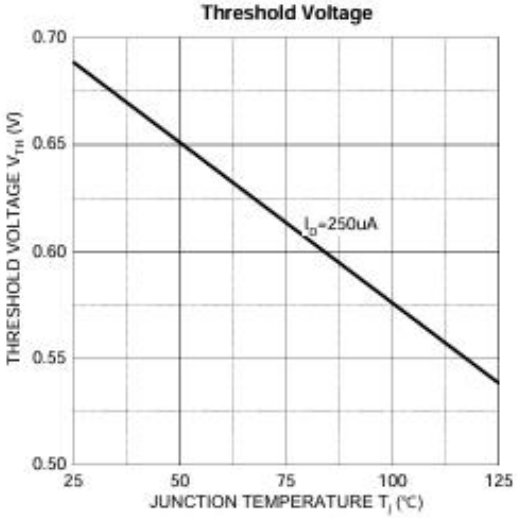




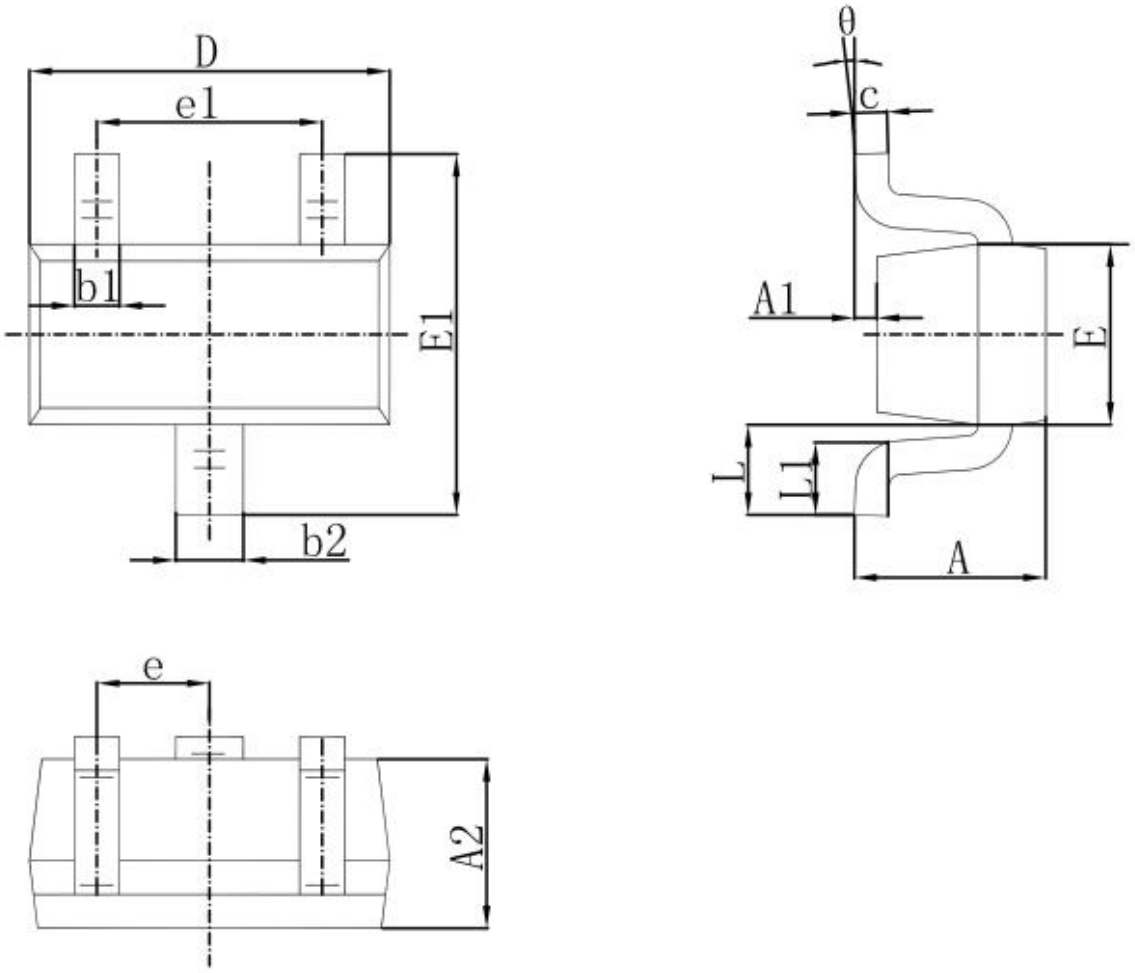








Packaging information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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