

General Description

The WST1614T7 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 WST1614T7 meet the RoHS and Green Product requirement, with full function reliability approved.

Features

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

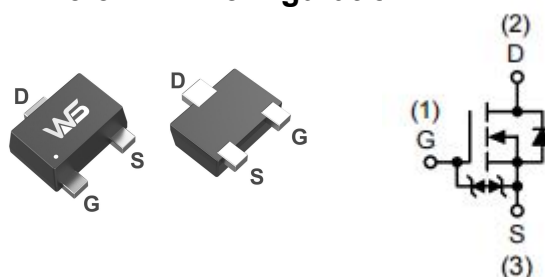
Product Summary

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

Applications

- Power Management for Industrial

SOT-723-3L Pin Configuration



Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$, 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	$T_C=25^{\circ}\text{C}$	0.75	A
		$T_C=100^{\circ}\text{C}$	0.5	
I_{DM} ³	Pulse Drain Current		3	W
P_D ²	Power Dissipation	$T_C=25^{\circ}\text{C}$	0.17	
		$T_C=100^{\circ}\text{C}$	---	
T_{STG}	Storage Temperature Range		-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range		-55 to 150	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		625	$^{\circ}\text{C/W}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V$, $I_D=0.5A$	---	180	240	m Ω
		$T_J=125^{\circ}\text{C}$	---	200	280	
		$V_{GS}=2.5V$, $I_D=0.4A$	---	220	320	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.4	0.7	1.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=20V$, $V_{GS}=0V$	---	---	1.0	μA
		$T_J=55^{\circ}\text{C}$	---	---	5.0	
I_{GSS}	Gate-Source Leakage Current	$V_{DS}=0V$, $V_{GS}=\pm 20V$	---	---	± 10	μA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=0.5A$	---	100	---	S
R_G	Gate Resistance	$f=1.0\text{MHz}$	---	---	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	$V_{DS}=10V$, $V_{GS}=4.5V$, $R_L=1\Omega$, $R_{GEN}=10\Omega$	---	2	---	ns
T_r	Rise Time		---	19	---	
$T_{d(off)}$	Turn-Off Delay Time		---	10	---	
T_f	Fall Time		---	23	---	
C_{iss}	Input Capacitance	$V_{DS}=20V$, $V_{GS}=0V$, $f=1.0\text{MHz}$	---	60	---	pF
C_{oss}	Output Capacitance		---	22	---	
C_{rss}	Reverse Transfer Capacitance		---	12	---	

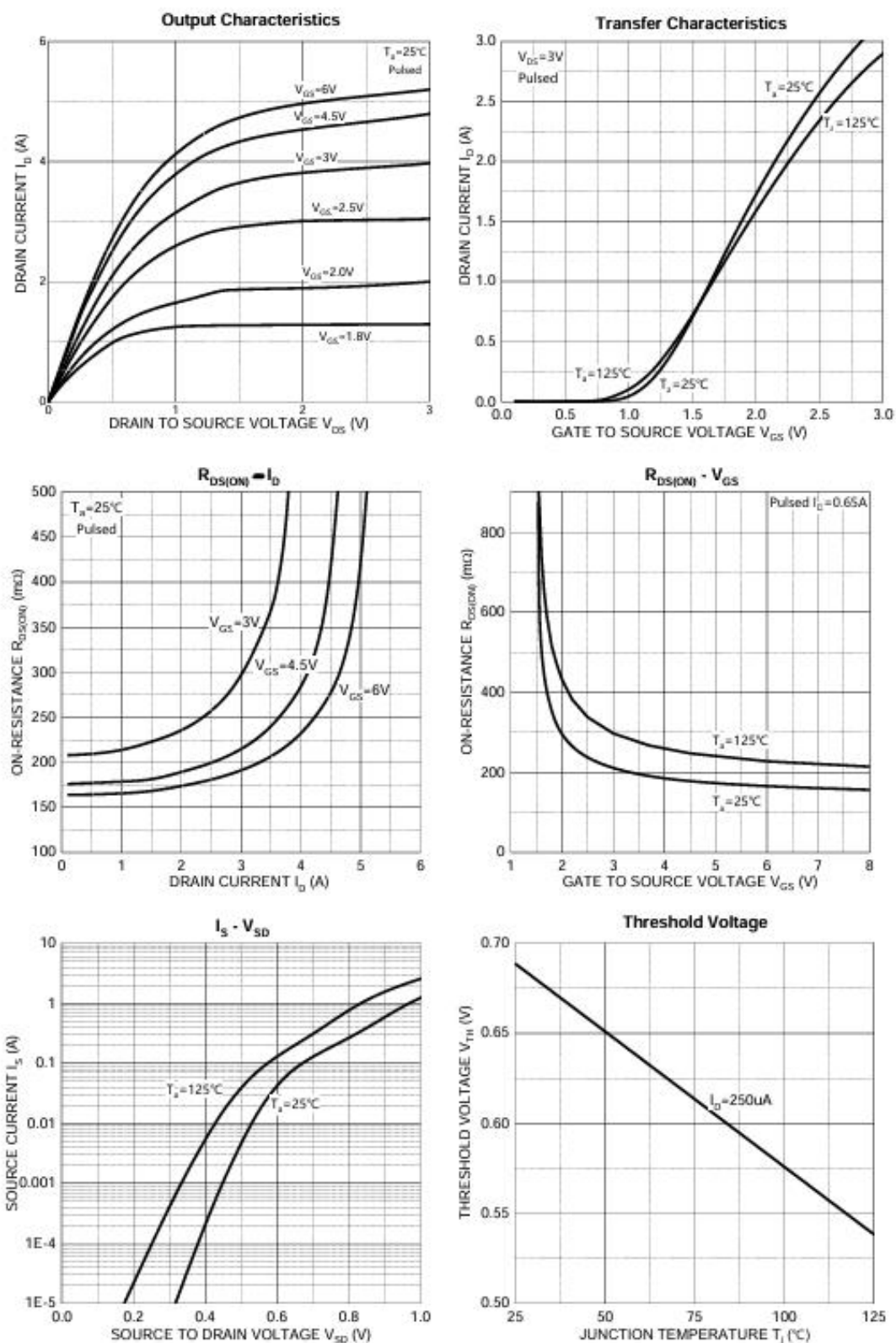
Diode Characteristics

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

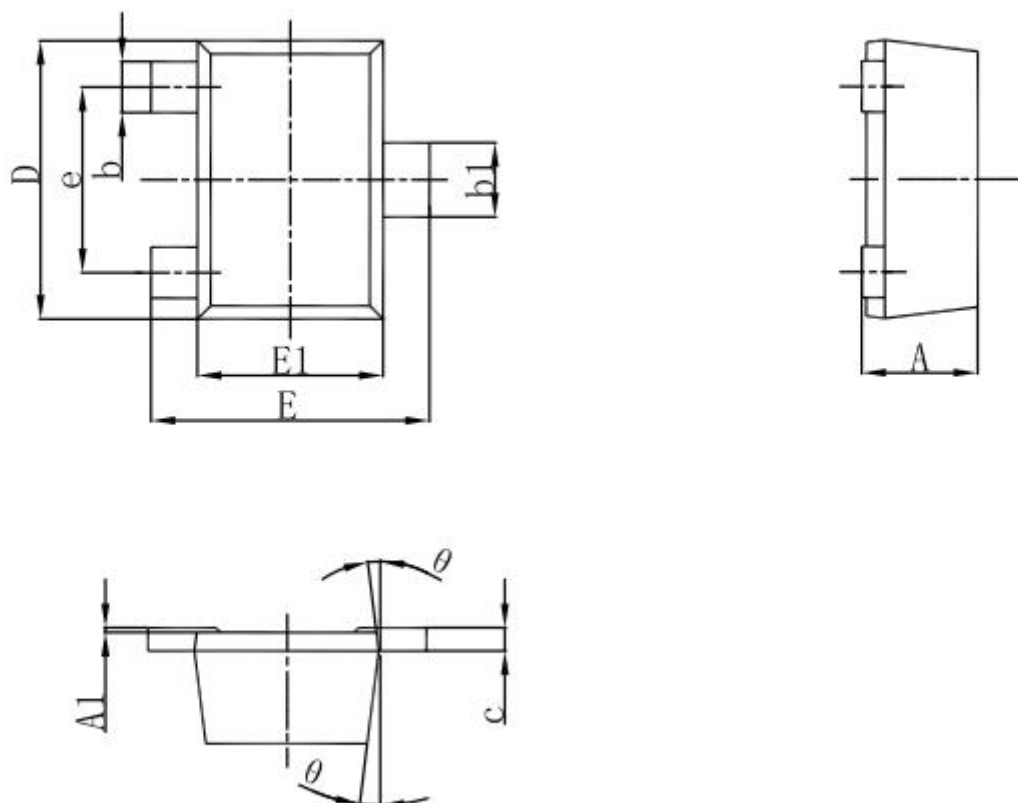
Note:

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} \leq 10s$ 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 $T_{J(MAX)}=150^{\circ}\text{C}$, 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 $T_{J(MAX)}=150^{\circ}\text{C}$.
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 $<300\mu s$ 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 $T_{J(MAX)}=150^{\circ}\text{C}$. 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 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$.
9. The maximum current rating is silicon limited

Typical Characteristics



Packaging information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.500	0.017	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	

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