

General Description

The WST3407 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 WST3407 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 Summery

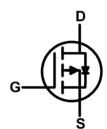
BVDSS	RDSON	ID
-30V	41mΩ	-5.8A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

SOT-23-3L Pin Configuration





Absolute Maximum Ratings

		Rating		
Symbol	Parameter	Parameter 10s Steady State		Units
V_{DS}	Drain-Source Voltage	-30		V
V_{GS}	Gate-Source Voltage	±20		V
I _D @T _C =25℃	Continuous Drain Current, V _{GS} @ -10V ¹ -6.3		-5.8	Α
I _D @T _C =70°C	Continuous Drain Current, V _{GS} @ -10V ¹ -4.5		-3.5	А
I _{DM}	Pulsed Drain Current ²	-20		Α
P _D @T _A =25℃	Total Power Dissipation ³	1.32	1	W
P _D @T _A =70°C	Total Power Dissipation ³ 0.84 0.64		0.64	W
T _{STG}	Storage Temperature Range	-55 to 150		$^{\circ}$
T_J	Operating Junction Temperature Range	-55 to 150		$^{\circ}$

Thermal Data

Symbol	Parameter	Тур.	Max.	Unit
$R_{ heta JA}$	Thermal Resistance Junction-Ambient ¹		125	°C/W
$R_{ heta JA}$	Thermal Resistance Junction-Ambient ¹ (t ≤10s)		95	°C/W
$R_{ heta JC}$	Thermal Resistance Junction-Case ¹		80	°C/W



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

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V_{GS} =0V , I_D =-250uA	-30			V
$\triangle BV_{DSS}/\triangle T_{J}$	BV _{DSS} Temperature Coefficient	Reference to 25 $^{\circ}\!$		-0.023		V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V , I _D =-3A		41	52	mΩ
		V_{GS} =-4.5V , I_D =-2A		62	90	
$V_{GS(th)}$	Gate Threshold Voltage	V V 1 050 A	-1.2	-1.8	-2.5	٧
$\triangle V_{GS(th)}$	V _{GS(th)} Temperature Coefficient	$V_{GS}=V_{DS}$, $I_D=-250uA$		4		mV/℃
	Drain Source Loakage Current	V _{DS} =-24V , V _{GS} =0V , T _J =25℃			-1	uA
I _{DSS}	Drain-Source Leakage Current	V_{DS} =-24V , V_{GS} =0V , T_J =55 $^{\circ}$ C			-5	
I _{GSS}	Gate-Source Leakage Current	V_{GS} = $\pm 20 V$, V_{DS} = $0 V$			±100	nA
gfs	Forward Transconductance	V_{DS} =-5V , I_D =-3A		11		S
Q_g	Total Gate Charge (-4.5V)	V _{DS} =-15V , V _{GS} =-4.5V , I _D =-3A		6.4	9.0	
Q_gs	Gate-Source Charge			2.3	3.2	nC
Q_gd	Gate-Drain Charge			1.9	2.7	1
T _{d(on)}	Turn-On Delay Time			2.8	5.6	
T _r	Rise Time	V_{DD} =-15V , V_{GS} =-10V , R_{G} =3.3 Ω ,		8.4	15.1	
$T_{d(off)}$	Turn-Off Delay Time	I _D =-3A		39	78.0	ns
T _f	Fall Time			6	12.0	
C _{iss}	Input Capacitance			583	816	
Coss	Output Capacitance	V _{DS} =-15V , V _{GS} =0V , f=1MHz		100	140	pF
C _{rss}	Reverse Transfer Capacitance			80	112	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Is	Continuous Source Current ^{1,4}	// =// =0\/ Force Current			-2	Α
I _{SM}	Pulsed Source Current ^{2,4}	$V_G=V_D=0V$, Force Current			-20	Α
V_{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =-1A , T _J =25℃			-1	V
t _{rr}	Reverse Recovery Time			11		nS
Q _{rr}	Reverse Recovery Charge	IF=-3A , dI/dt=100A/µs , T _J =25℃		5.3		nC

Note:

- 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, t<10 sec.
- 2.The data tested by pulsed , pulse width \leq 300us , duty cycle \leq 2%
- 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

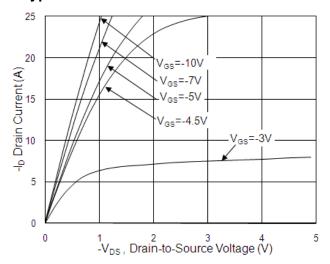


Fig.1 Typical Output Characteristics

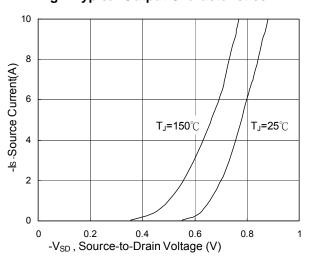


Fig.3 Forward Characteristics of Reverse

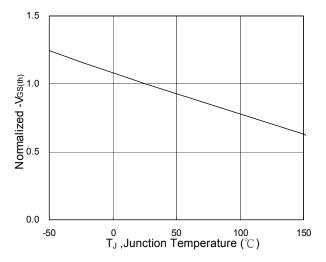


Fig.5 Normalized $V_{\text{GS(th)}}$ vs. T_{J}

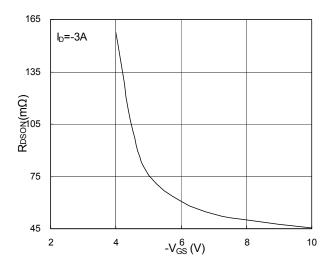


Fig.2 On-Resistance v.s Gate-Source

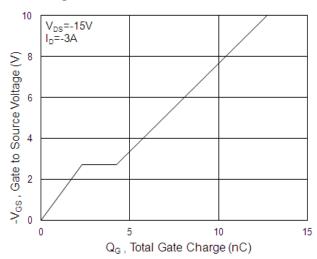


Fig.4 Gate-Charge Characteristics

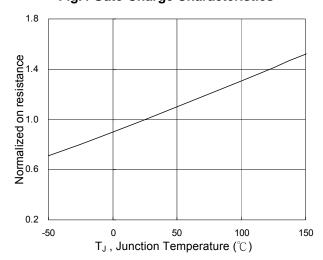
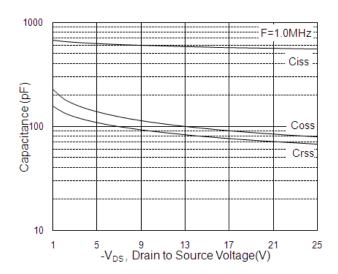


Fig.6 Normalized R_{DSON} vs T_J





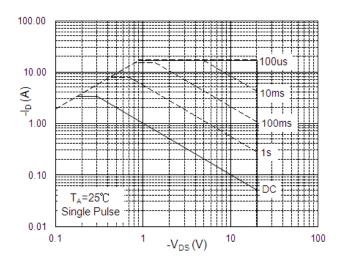


Fig.7 Capacitance

Fig.8 Safe Operating Area

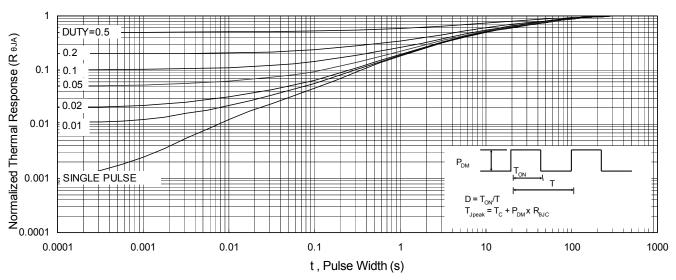
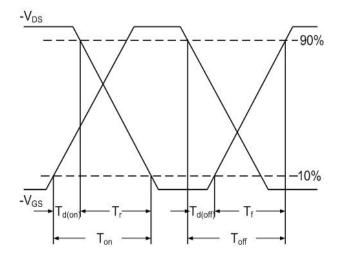


Fig.9 Normalized Maximum Transient Thermal Impedance



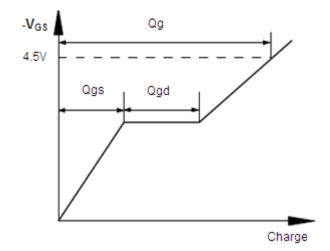


Fig.10 Switching Time Waveform

Fig.11 Gate Charge Waveform



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