

Description

The TX5N10SI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 100V$ $I_D = 5A$

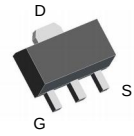
$R_{DS(ON)} < 125m\Omega$ @ $V_{GS}=10V$

Application

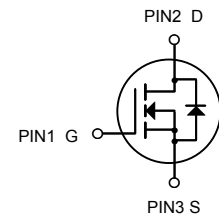
Battery protection

Load switch

Uninterruptible power supply



SOT89-3L



N-Channel MOSFET

Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise specified)

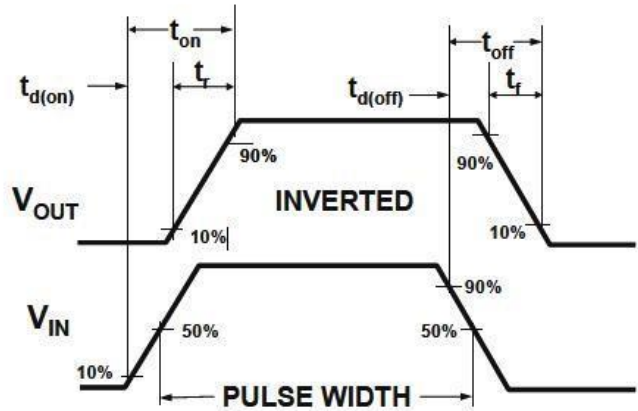
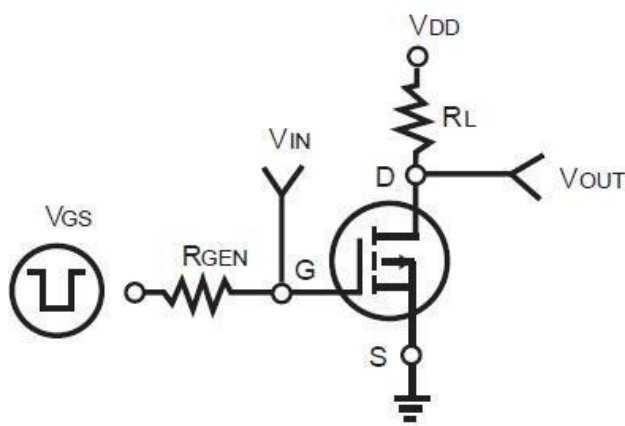
Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 25	V
$I_D@T_A=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	5	A
$I_D@T_A=70^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	3.1	A
I_{DM}	Pulsed Drain Current ²	20	A
$P_D@T_A=25^\circ C$	Total Power Dissipation ⁴	9.3	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) ¹	13.5	$^\circ C/W$

Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V,V _{GS} =0V			100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V,V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =250μA	1	1.5	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D = 10A		114	125	mΩ
		V _{GS} =4.5V, I _D =-5A		120	135	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V,V _{GS} =0V, f=1.0MHz		690		pF
C _{oss}	Output Capacitance			120		pF
C _{rss}	Reverse Transfer Capacitance			90		pF
Switching Times						
t _{d(on)}	Turn-on Delay Time	V _{DD} =15V,I _D =1A,R _L =15 V _{GS} =10V,R _G =2.5		11		nS
t _r	Turn-on Rise Time			7.4		nS
t _{d(off)}	Turn-Off Delay Time			35		nS
t _f	Turn-Off Fall Time			9.1		nS
Q _g	Total Gate Charge	V _{DS} =15V,I _D =10A V _{GS} =10V		15.5		nC
Q _{gs}	Gate-Source Charge			3.2		nC
Q _{gd}	Gate-Drain Charge			4.7		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)				20	A
V _{SD}	Forward on Voltage ^(Note 1)	V _{GS} =0V,I _S =2A			0.8	V

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Switch Time Test Circuit and Switching Waveforms:



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Output Characteristics

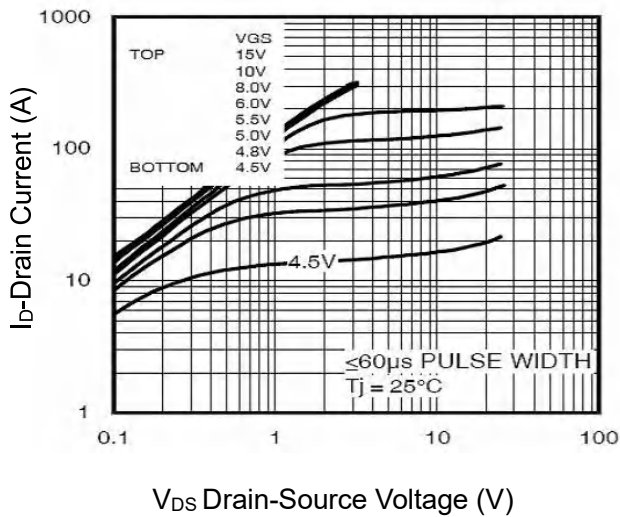


Figure2. Transfer Characteristics

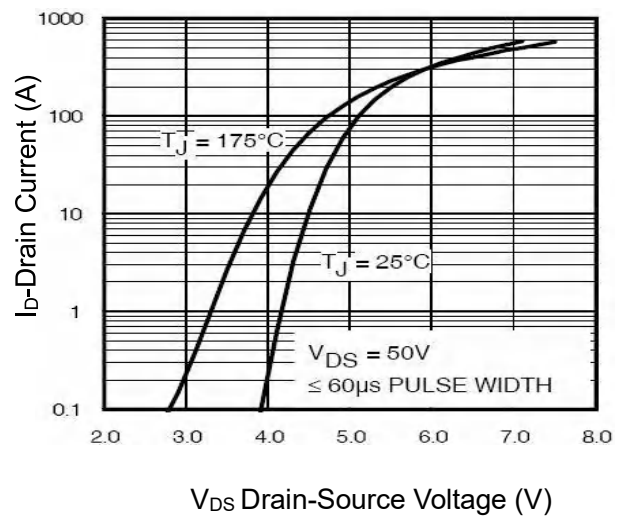


Figure3. BVDSS vs Junction Temperature

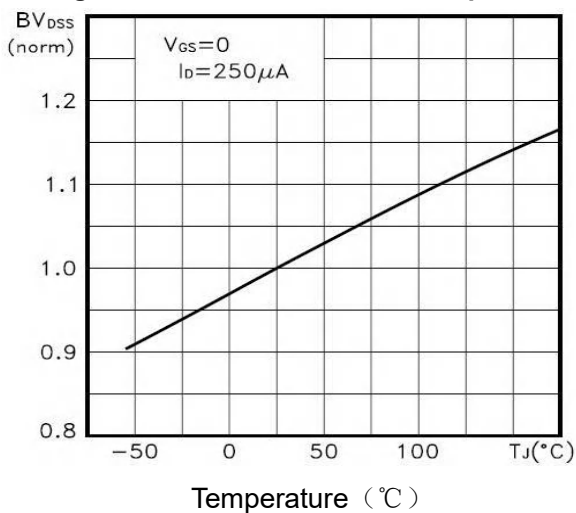


Figure4. I_D vs Junction Temperature

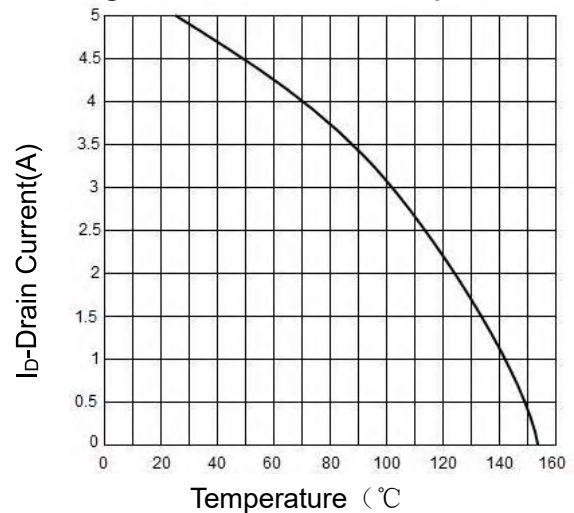


Figure5. VGS(th) vs Junction Temperature

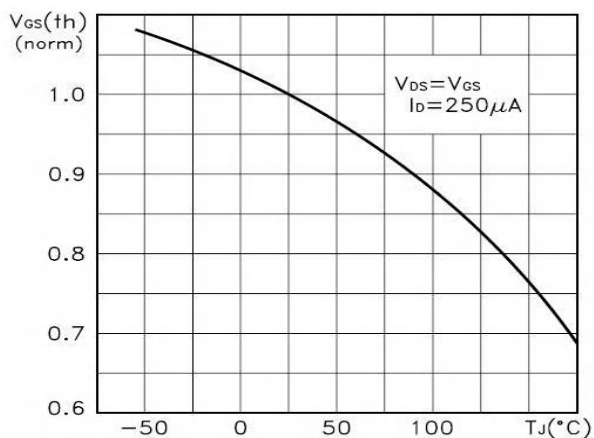


Figure6. Rdson Vs Junction Temperature

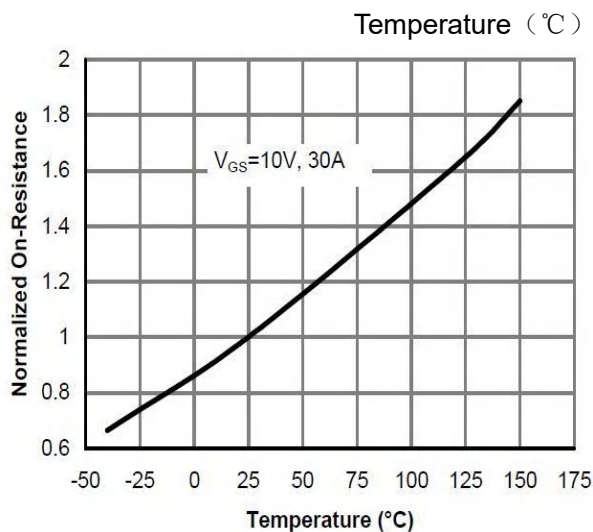


Figure7. Gate Charge

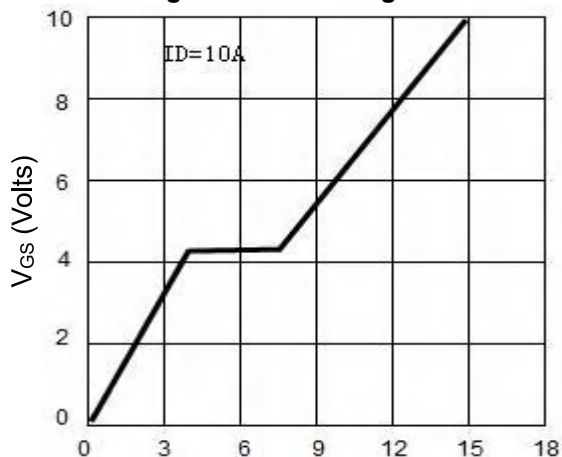


Figure8. Capacitance vs Vds

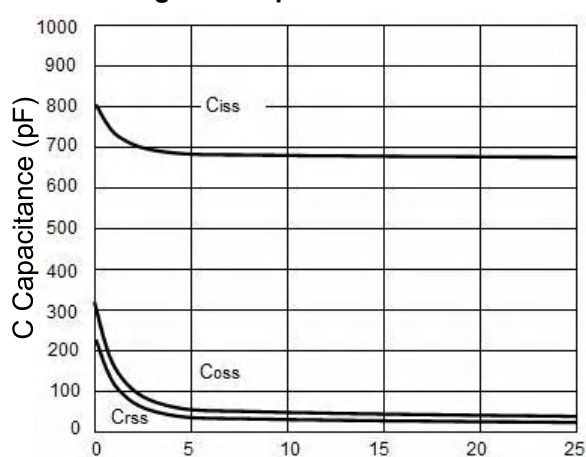


Figure9. Source- Drain Diode Forward

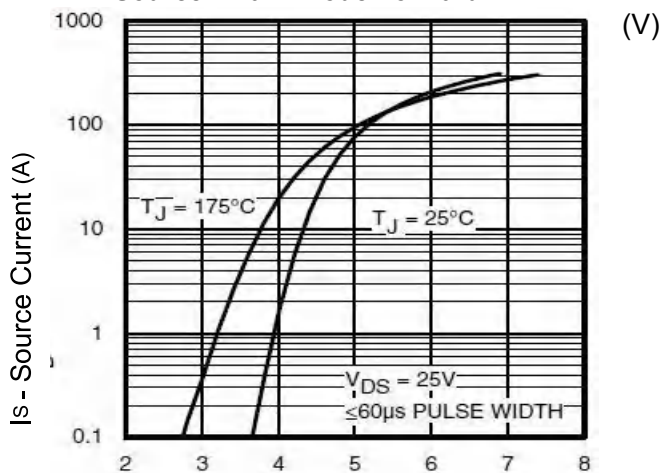


Figure10. Safe Operation Area

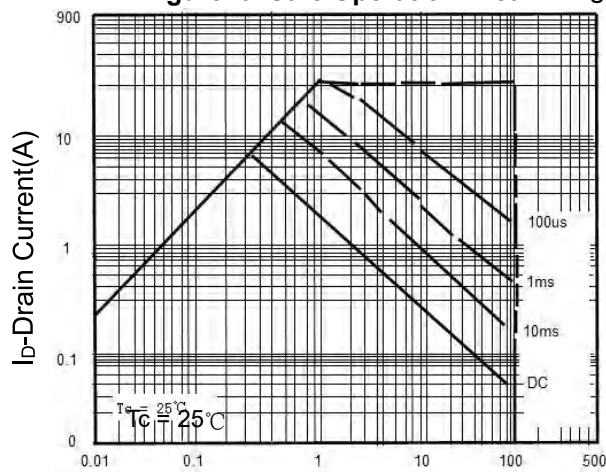
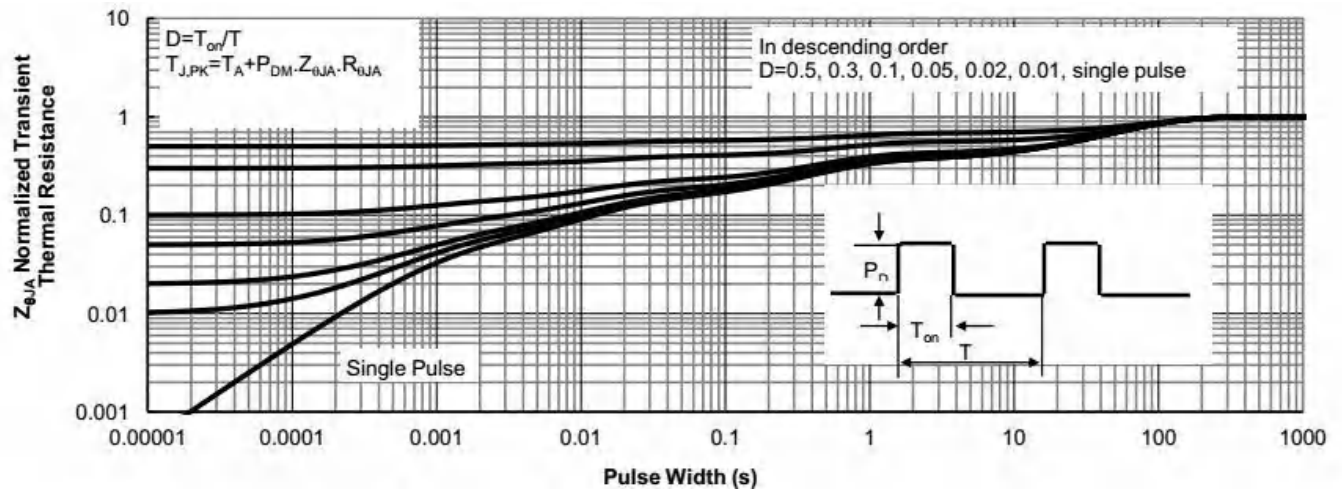
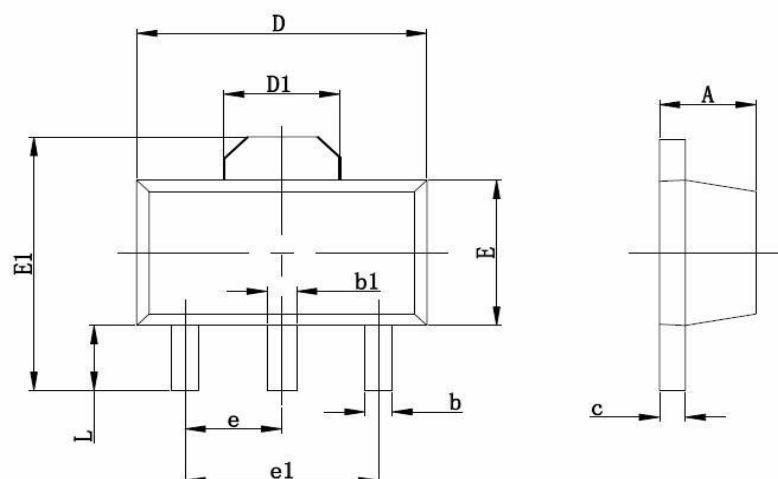




Figure11. Normalized Maximum Transient Thermal Impedance



SOT89-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047

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