

Description

The SX15P10Y 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

$V_{DS} = -100V$ $I_D = -15A$

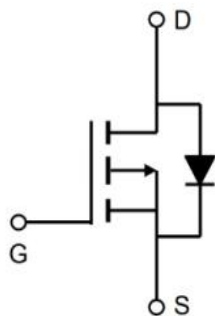
$R_{DS(ON)} < 185m\Omega$ @ $V_{GS}=10V$

Application

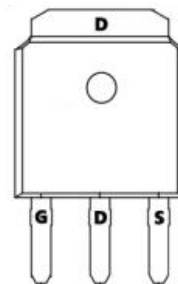
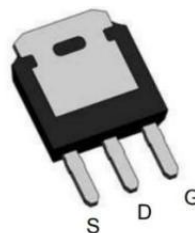
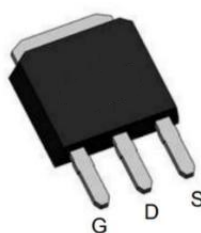
Brushless motor

Load switch

Uninterruptible power supply



TO-251S-3L



Absolute Maximum Ratings ($T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, V_{GS} @ -10V ¹	-15	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, V_{GS} @ -10V ¹	-12	A
I_{DM}	Pulsed Drain Current ²	-45	A
EAS	Single Pulse Avalanche Energy ³	56	mJ
I_{AS}	Avalanche Current	-15	A
$P_D @ T_c=25^\circ C$	Total Power Dissipation ⁴	50	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 ¹	62.5	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.5	$^\circ C/W$

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

Symbol	Parameter	Test Condition	Min.	Typ	Max.	Units
BVDSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-100	-	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = -80V, V _{GS} = 0V	-	-	1	μA
IGSS	Gate to Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-	-2.5	V
RDS(on)	Static Drain-Source On-Resistance ^{note1}	V _{GS} = -10V, I _D = -2A	-	145	185	mΩ
		V _{GS} = -4.5V, I _D = -1A	-	170	200	
Ciss	Input Capacitance	V _{DS} = -50V, V _{GS} = 0V, f = 1.0MHz	-	1545	-	pF
Coss	Output Capacitance		-	37	-	pF
Crss	Reverse Transfer Capacitance		-	25	-	pF
Qg	Total Gate Charge	V _{DD} = -50V, I _D = -2A, V _{GS} = -10V	-	27	-	nC
Qgs	Gate-Source Charge		-	5.3	-	nC
Qgd	Gate-Drain("Miller") Charge		-	3.2	-	nC
td(on)	Turn-On Delay Time	V _{DS} = -50V, I _D = -2A R _G =4.5Ω, R _L =25Ω V _{GEN} = -10V	-	10	-	ns
t _r	Turn-On Rise Time		-	27	-	ns
td(off)	Turn-Off Delay Time		-	288	-	ns
t _f	Turn-Off Fall Time		-	88	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-18	A
VSD	Drain to Source Diode Forward Voltage ^{note1}	V _{GS} = 0V, I _S = -2A	-	-	-1.3	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _{sd} = -6A, di/dt = 100A/μs	-	40	-	nS
Q _{rr}	Reverse Recovery Charge		-	28	-	nC

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is V_{DD} = -72V, V_{GS} = -10V, L=0.1mH, I_{AS} = -15A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

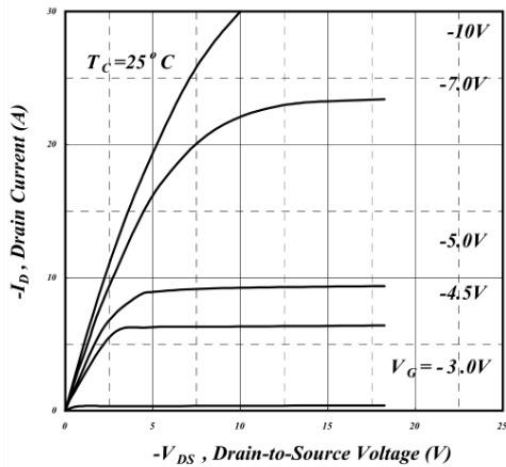


Fig 1. Typical Output Characteristics

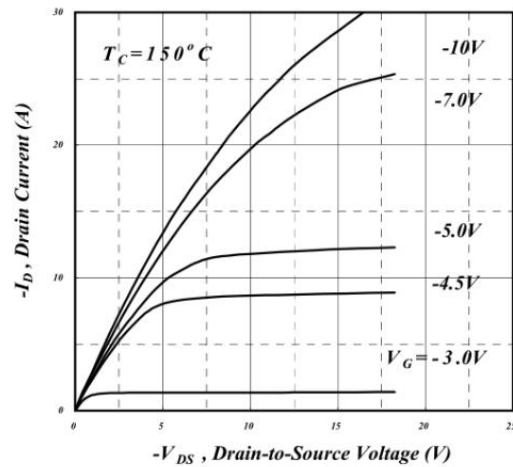


Fig 2. Typical Output Characteristics

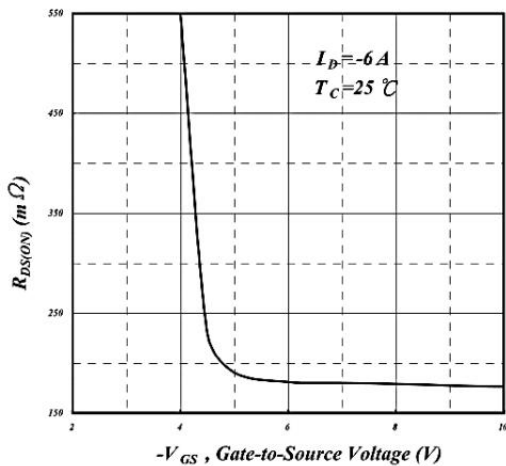


Fig 3. On-Resistance v.s. Gate Voltage

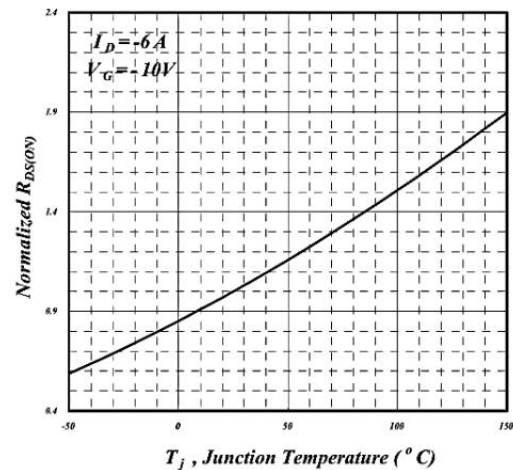


Fig 4. Normalized On-Resistance v.s. Junction Temperature

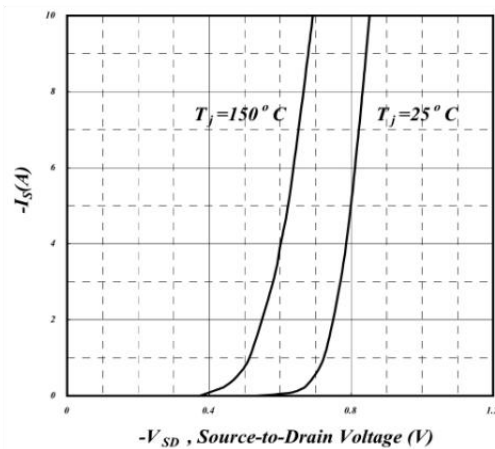


Fig 5. Forward Characteristic of Reverse Diode

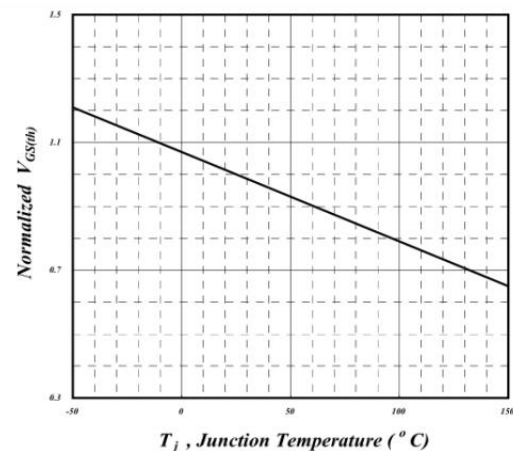


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Typical Characteristics

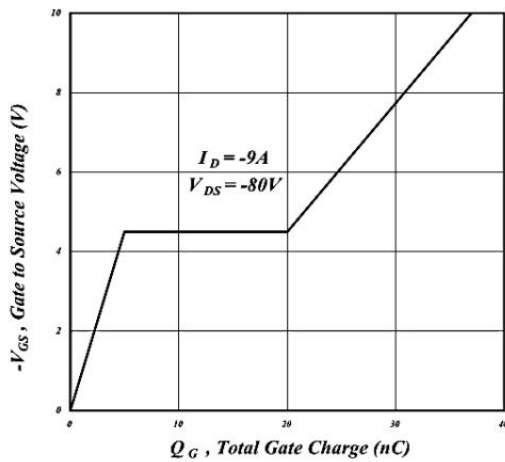


Fig 7. Gate Charge Characteristics

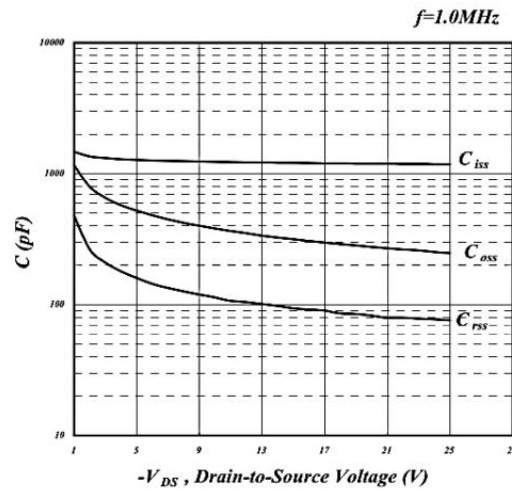


Fig 8. Typical Capacitance Characteristics

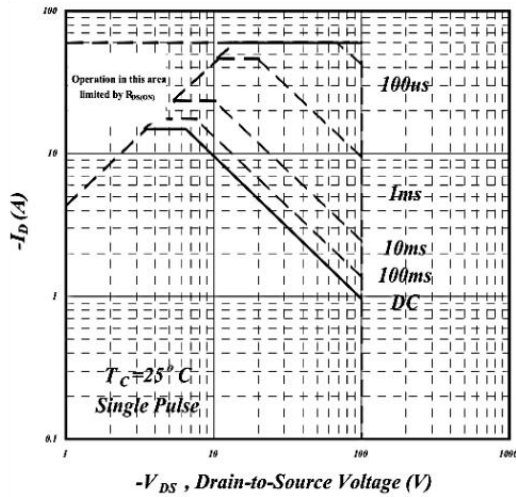


Fig 9. Maximum Safe Operating Area

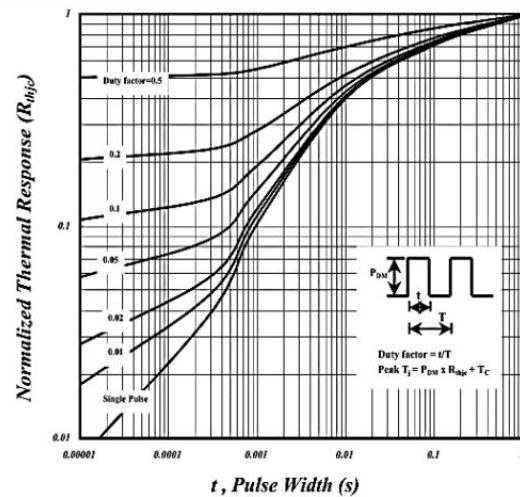


Fig 10. Effective Transient Thermal Impedance

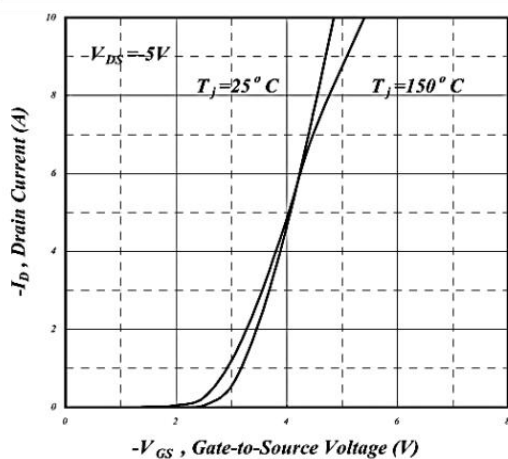


Fig 11. Transfer Characteristics

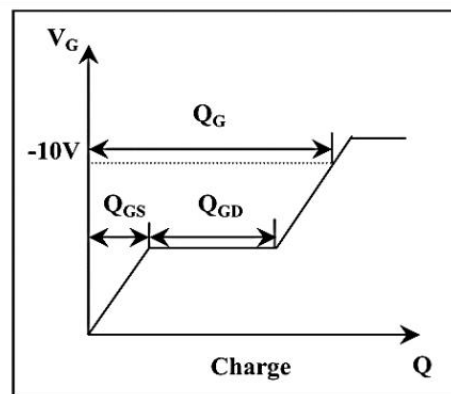
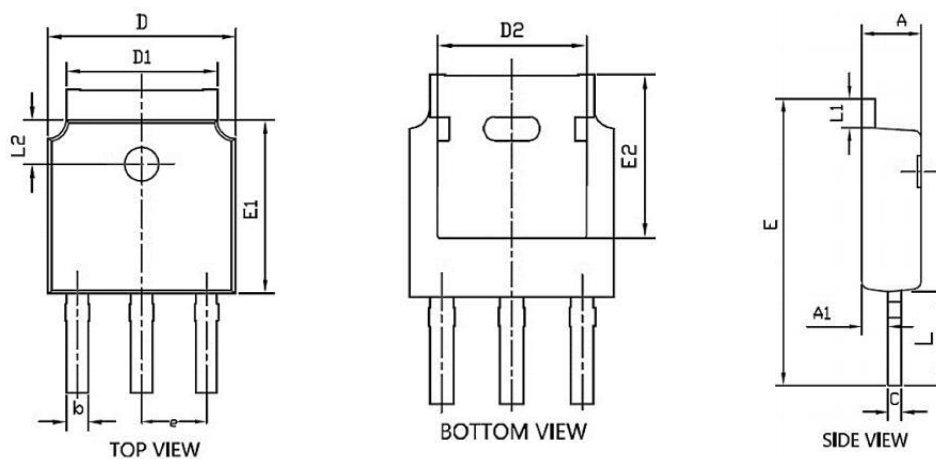


Fig 12. Gate Charge Waveform

Package Mechanical Data-TO-251S-3L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	2.2	2.3	2.4
A1	0.9	1.0	1.1
b	0.66	0.76	0.86
C	0.46	0.52	0.58
D	6.50	6.6	6.7
D1	5.15	5.3	5.45
D2	4.6	4.8	4.95
E	10.4	----	11.5
E1	6.0	6.1	6.2
E2	5.400REF		
e	2.286BSC		
L	3.5	4.0	4.3
L1	0.9	---	1.27
L2	1.4	---	1.9

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-251S-3L		4000