

### Description

The SX70N10T 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

$V_{DS} = 100V$   $I_D = 70A$

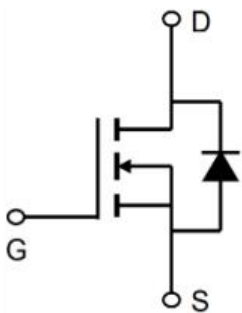
$R_{DS(ON)} < 25m\Omega @ V_{GS}=10V$

### Application

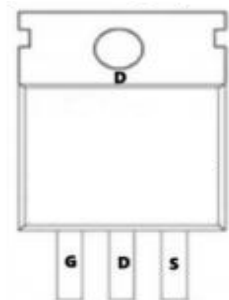
Automotive lighting

Load switch

Uninterruptible power supply



TO-263-3L



### Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_C=25^\circ C$	Drain Current, $V_{GS} @ 10V$	70	A
$I_D @ T_C=100^\circ C$	Drain Current, $V_{GS} @ 10V$	56	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	210	A
$E_{AS}$	Single Pulse Avalanche Energy	110	mJ
$P_D @ T_C=25^\circ C$	Total Power Dissipation	90	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Maximum Thermal Resistance, Junction-ambient	62.5	$^\circ C/W$
$R_{\theta JC}$	Maximum Thermal Resistance, Junction-case	1.4	$^\circ C/W$

**Electrical Characteristics@T<sub>J</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	100	110	---	V
RDS(ON)	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V , I <sub>D</sub> =30A	---	18	25	mΩ
VGS(th)	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2.0	3.0	4.0	V
IDSS	Drain-Source Leakage Current	V <sub>DS</sub> =80V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =80V , V <sub>GS</sub> =0V , T <sub>J</sub> =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	---	---	±100	nA
gfs	Forward Transconductance	V <sub>DS</sub> =5V , I <sub>D</sub> =30A	---	31	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz	---	1.9	3.8	Ω
Q <sub>g</sub>	Total Gate Charge (10V)	V <sub>DS</sub> =80V , V <sub>GS</sub> =10V , I <sub>D</sub> =30A	---	27.6	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	11.4	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	7.9	---	
Td(on)	Turn-On Delay Time	V <sub>DD</sub> =50V , V <sub>GS</sub> =10V , R <sub>G</sub> =3.3Ω, I <sub>D</sub> =30A	---	16.5	---	ns
T <sub>r</sub>	Rise Time		---	35	---	
Td(off)	Turn-Off Delay Time		---	17.5	---	
T <sub>f</sub>	Fall Time		---	12	---	
Ciss	Input Capacitance	V <sub>DS</sub> =15V , V <sub>GS</sub> =0V , f=1MHz	---	1890	---	pF
Coss	Output Capacitance		---	268	---	
Crss	Reverse Transfer Capacitance		---	67	---	
IS	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	58	A
ISM	Pulsed Source Current <sup>2,5</sup>		---	---	130	A
VSD	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25°C	---	---	1.2	V
trr	Reverse Recovery Time	IF=30A , dI/dt=100A/μs , T <sub>J</sub> =25°C	---	22	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge		---	20	---	nC

**Note :**

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 20Z copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is VDD=72V,VGS=10V,L=0.1mH,IAS=40A
- 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

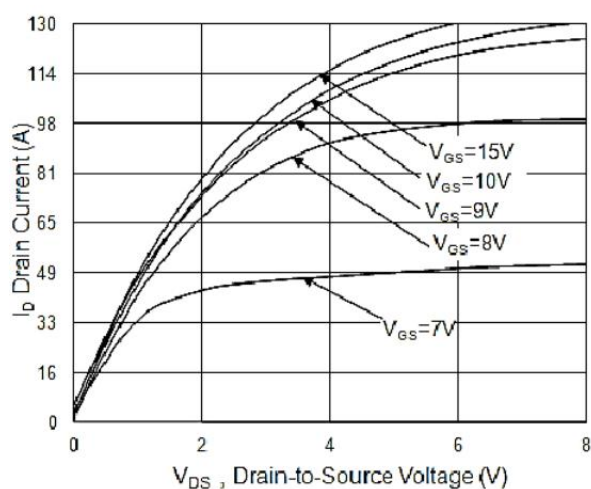


Fig.1 Typical Output Characteristics

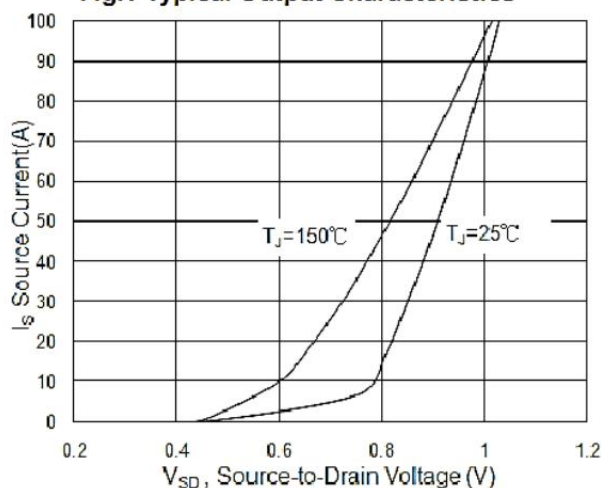


Fig.3 Forward Characteristics of Reverse

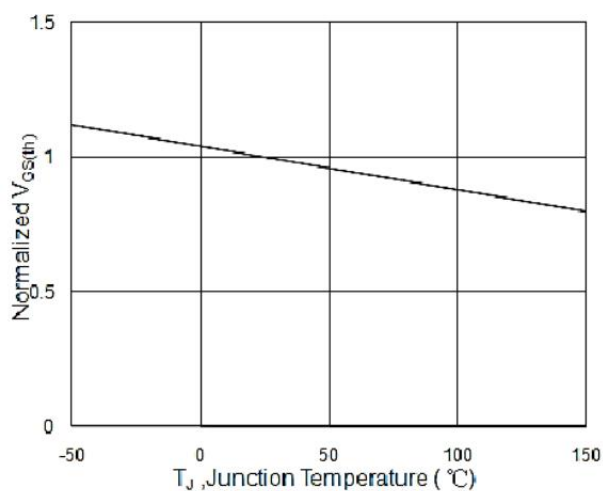


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

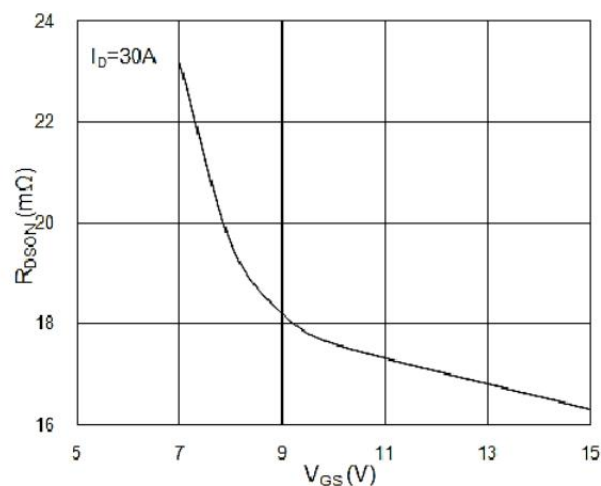


Fig.2 On-Resistance v.s Gate-Source

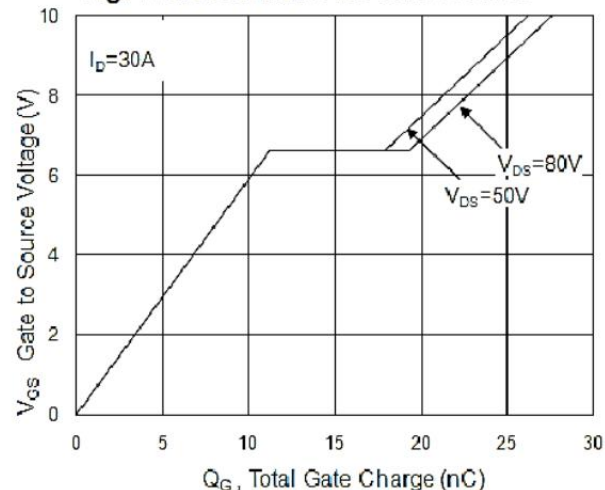


Fig.4 Gate-Charge Characteristics

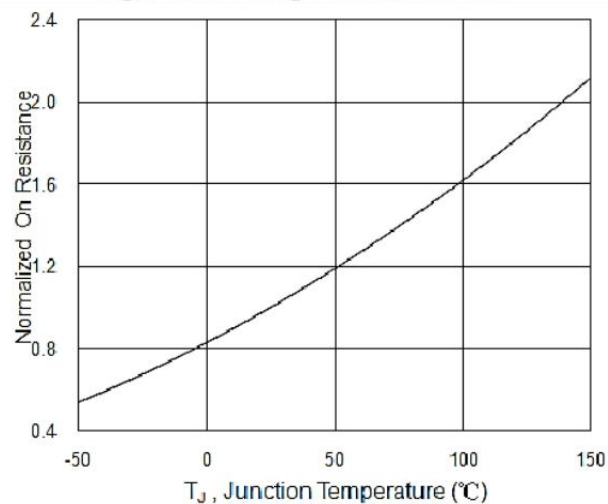
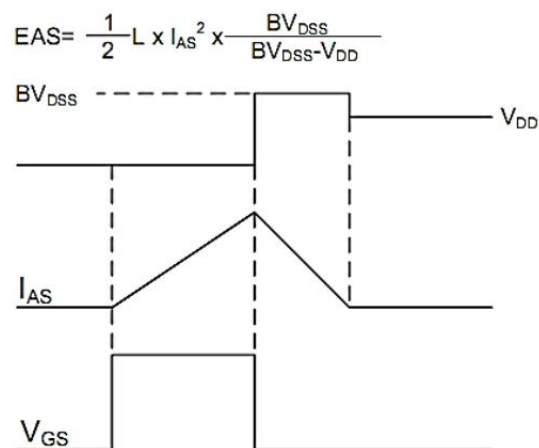
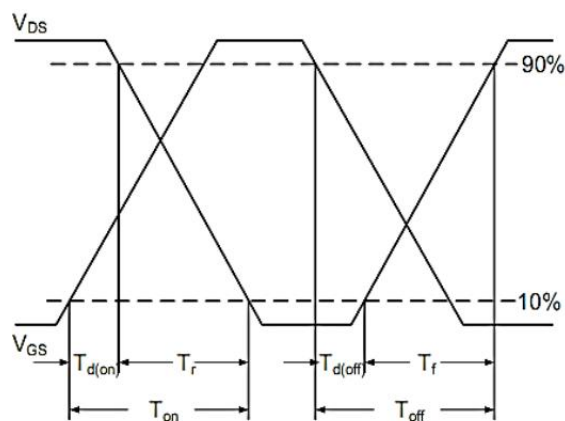
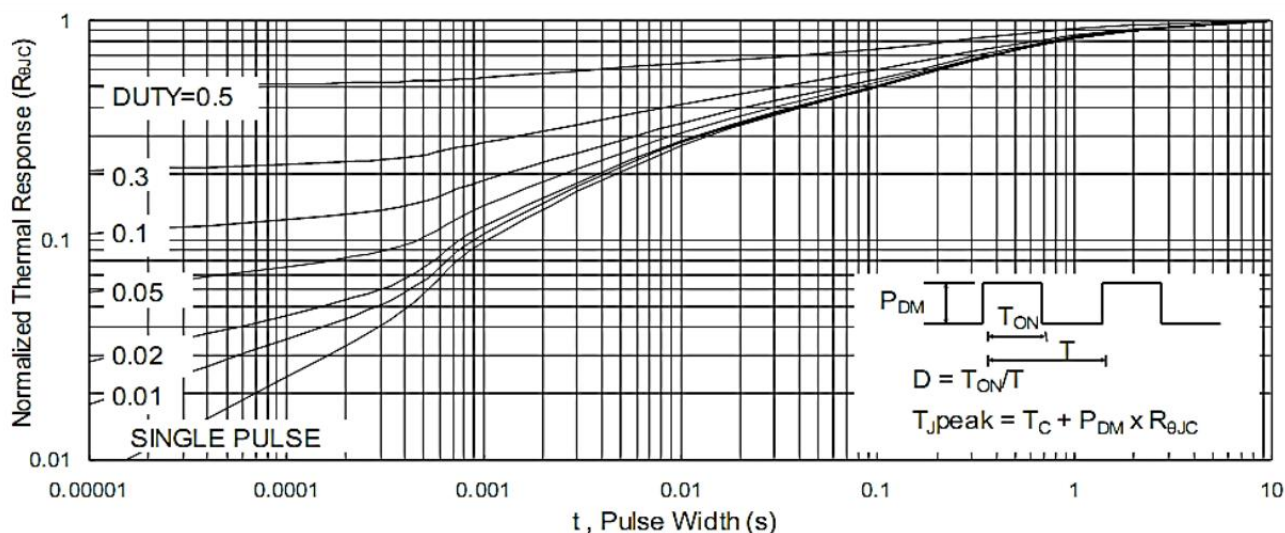
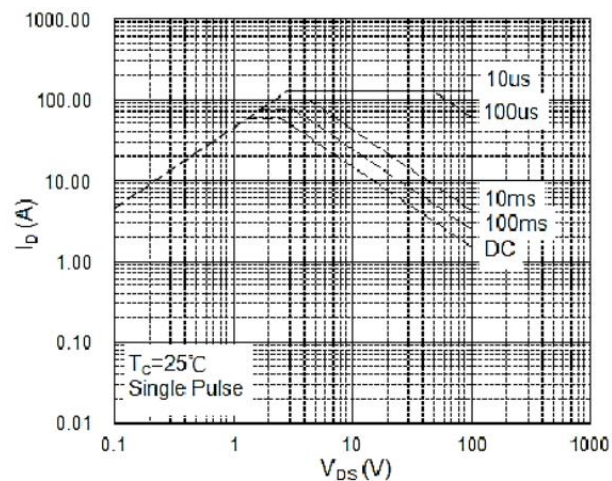
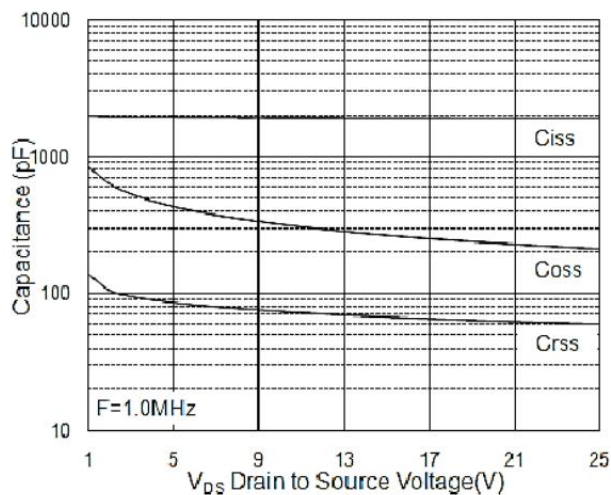
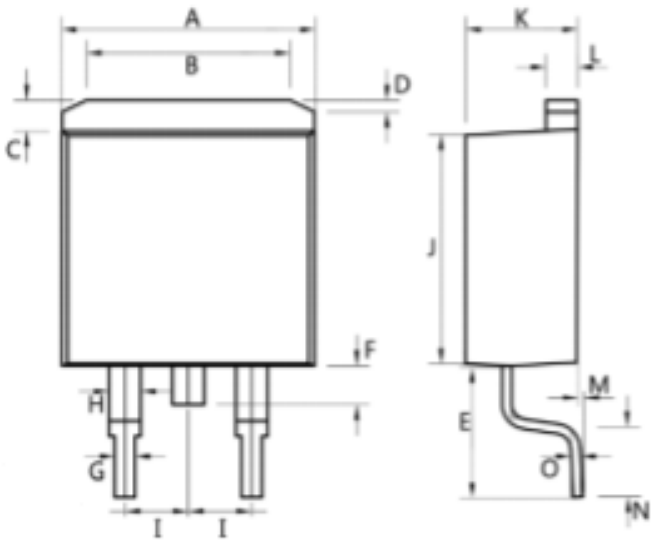


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$

## Typical Characteristics



Package Mechanical Data- TO-263-3L



Dim.	Min.	Max.
A	10.0	10.5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-263-3L		800