

Description

The SX180N10T uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 100V$ $I_D = 180A$

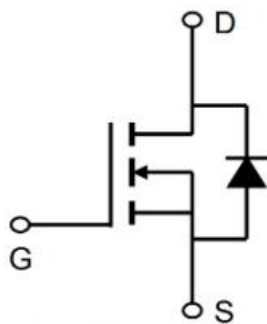
$R_{DS(ON)} < 3.5m\Omega$ @ $V_{GS} = 10V$

Application

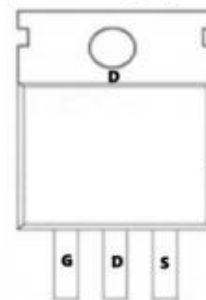
DC/DC Converter

LED Backlighting

Power Management Switches



TO-263-3L



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, $V_{GS} @ 10V$	180	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	125	A
IDM	Pulsed Drain Current	690	A
EAS	Single Pulse Avalanche Energy	726	mJ
IAS	Avalanche Current	53.4	A
$P_D @ T_c = 25^\circ C$	Total Power Dissipation ⁴	390.6	W
TSTG	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	62.5	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	0.4	$^\circ C/W$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	100	111	-	V
IGSS	Gate-body Leakage current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T _J =25°C	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
IDSS	Zero Gate Voltage Drain Current T _J =100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.0	3.0	4.0	V
RDS(on)	Drain-Source on-Resistance ⁴	V _{GS} = 10V, I _D = 20A	-	2.9	3.5	mΩ
gfs	Forward Transconductance ⁴	V _{DS} = 10V, I _D = 20A	-	50	-	S
Ciss	Input Capacitance	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz	-	4797	-	pF
Coss	Output Capacitance		-	900	-	
Crss	Reverse Transfer Capacitance		-	19.1	-	
R _g	Gate Resistance	f=1MHz	-	1.9	-	Ω
Q _g	Total Gate Charge	V _{GS} = 10V, V _{DS} = 50V, I _D = 20A	-	84	-	nC
Q _{gs}	Gate-Source Charge		-	24	-	
Q _{gd}	Gate-Drain Charge		-	27	-	
td(on)	Turn-on Delay Time	V _{GS} = 10V, V _{DD} = 50V, R _G = 3Ω, I _D = 20A	-	21	-	ns
t _r	Rise Time		-	35	-	
td(off)	Turn-off Delay Time		-	49	-	
t _f	Fall Time		-	30	-	
trr	Body Diode Reverse Recovery Time	I _F = 20A, di/dt = 100A/μs	-	71	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	127	-	nC
VSD	Diode Forward Voltage ⁴	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current T _c =25°C		-	-	220	A

Notes:

- 1、The data tested by surface mounted on a 1 inch² 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}=90V, V_{GS}=10V, L=1.0mH, I_{AS}=50A
- 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

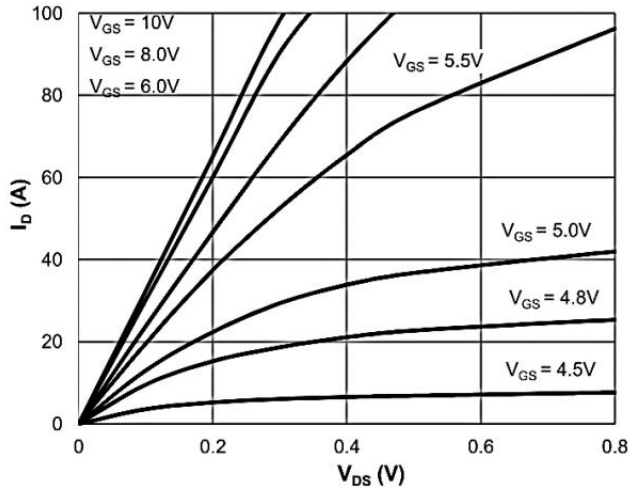


Figure 1: Saturation Characteristics

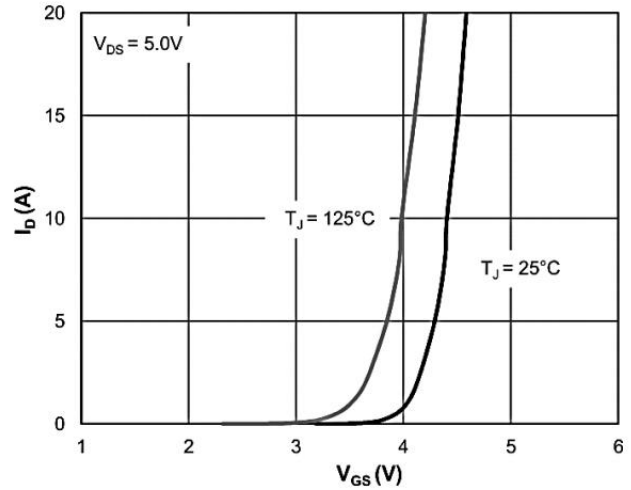


Figure 2: Transfer Characteristics

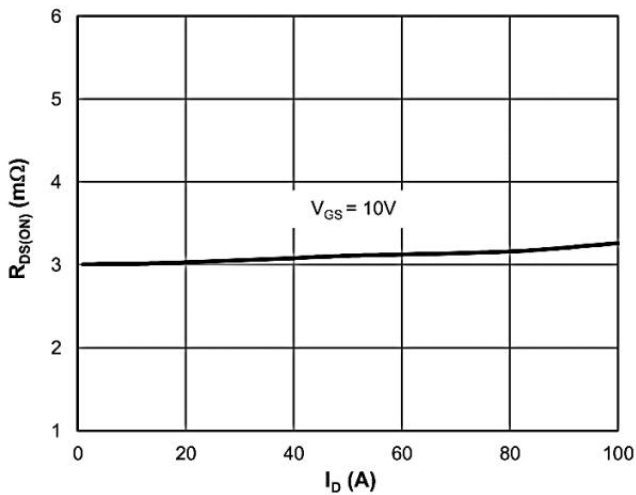


Figure 3: $R_{DS(ON)}$ vs. Drain Current

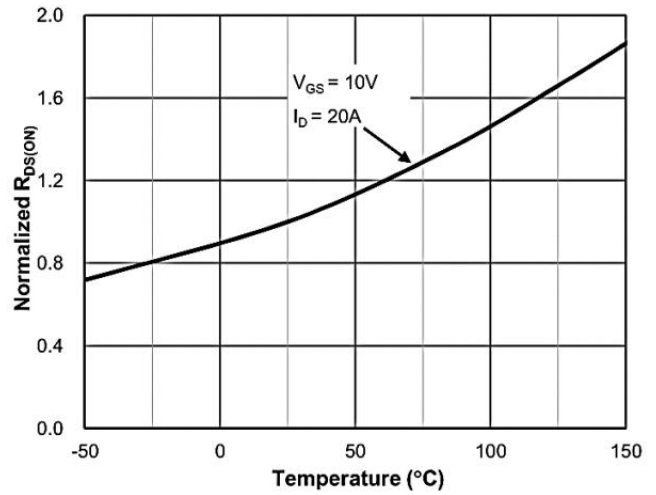


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

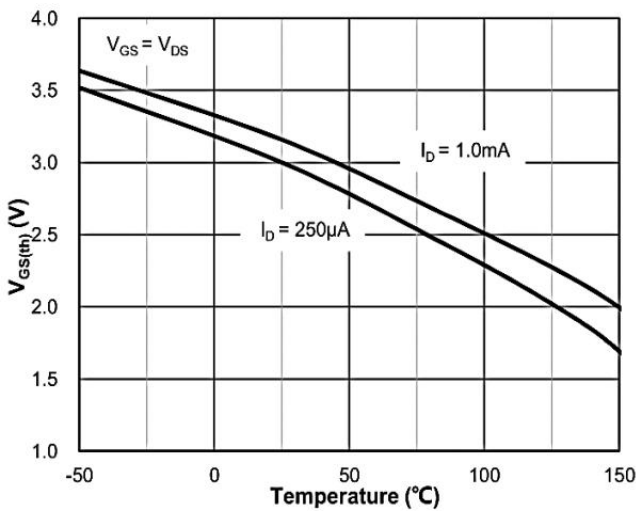


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

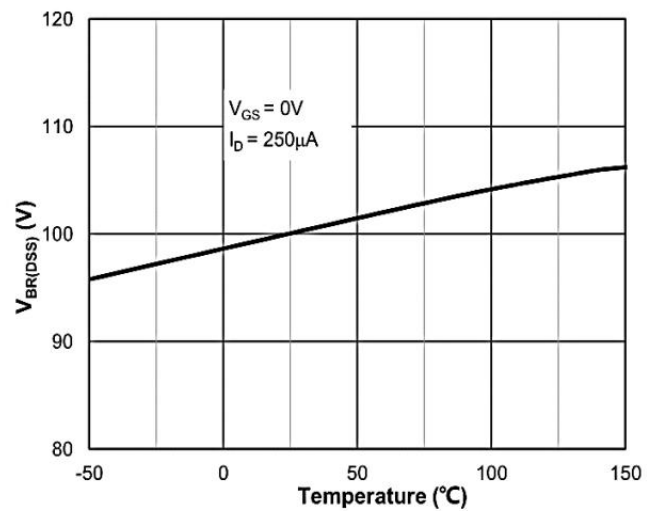


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

Typical Characteristics

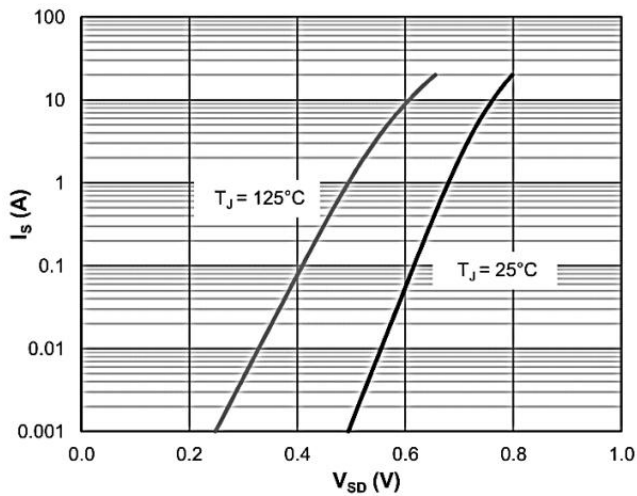


Figure 7: Body-Diode Characteristics

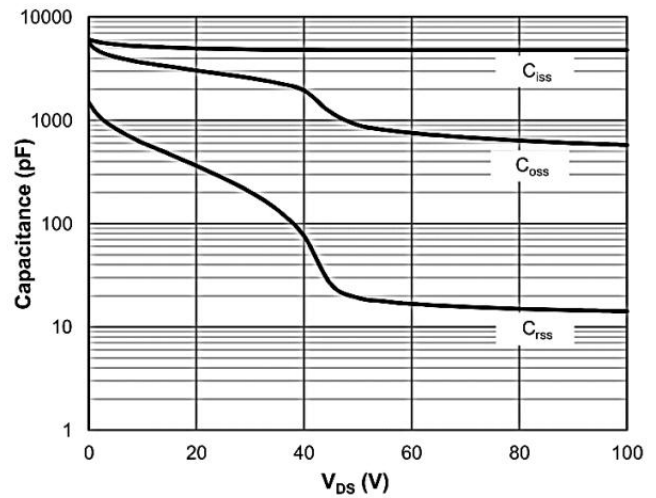


Figure 8: Capacitance Characteristics

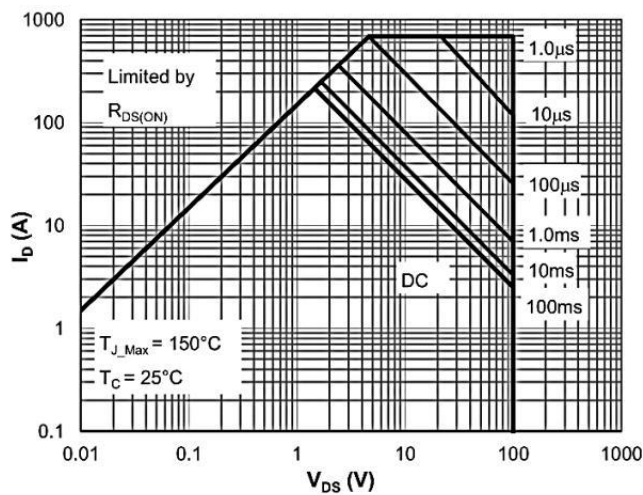


Figure 9: Maximum Safe Operating Area

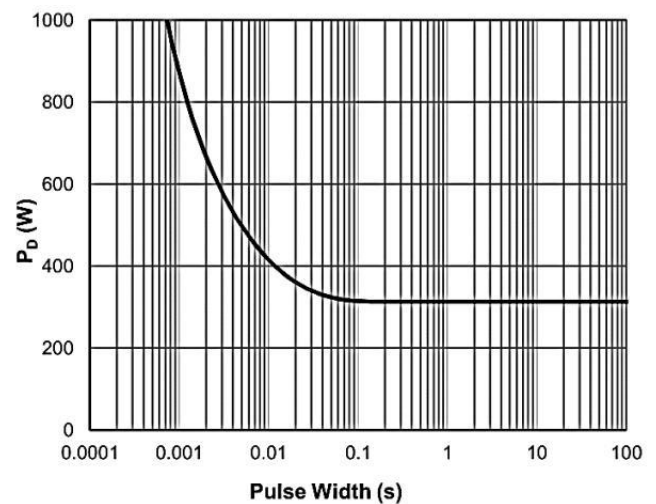


Figure 10: Single Pulse Power Rating, Junction-to-Case

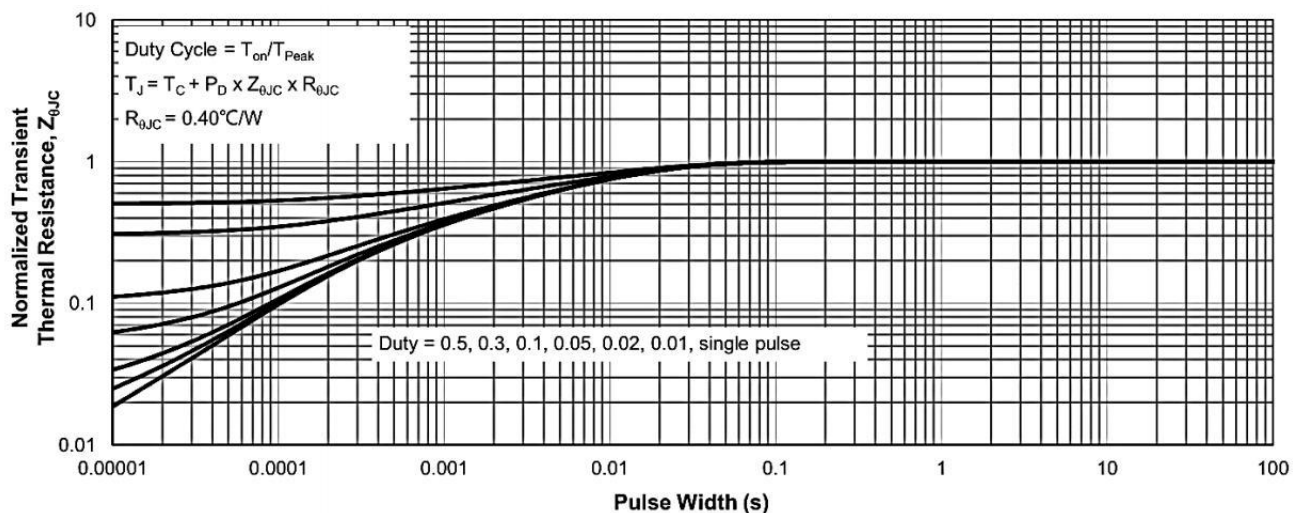
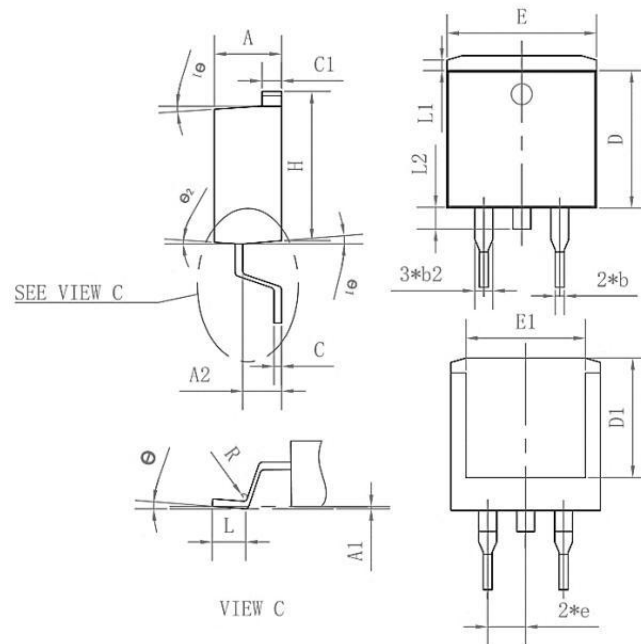


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TO-263-3L



Symbol	Common		
	Mim	mm Nom	Max
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.70
b	0.70	0.80	1.00
b2	1.25	1.36	1.50
C	0.45	0.50	0.65
C1	1.29	1.30	9.40
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
θ1	4°	7°	10°
θ2	0°	3°	6°

Package Marking and Ordering Information

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