Description

The SX60N25T uses advanced **Trench** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as Hight as 12V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

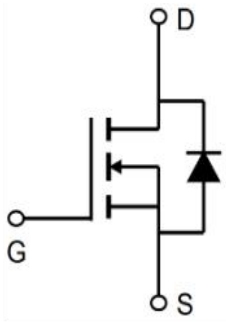
V_{DS} = 250V I_D =60A

$R_{DS(ON)}$ < 33mΩ @ V_{GS}=10V

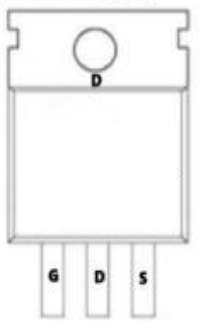
Application

UPS

BLDC



TO-263-3L



Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDSS	Drain-to-Source Voltage	250	V
ID@TA=25℃	Continuous Drain Current VGS @ 10V	60	A
ID@TA=100℃	Continuous Drain Current VGS @ 10V	40	A
IDM	Pulsed Drain Current (pulse width limited by T_{JM})	230	A
VGS	Gate-to-Source Voltage	±30	V
EAS	Single Pulse Avalanche Energy	300	mJ
EAra1	Avalanche Energy, Repetitive	75	mJ
IAR a1	Avalanche Current	45	A
dv/dt[a2]	Peak Diode Recovery dv/dt	5.0	V/ns
PD	Power Dissipation	360	W
TJ , Tstg	Operating Junction and Storage Temperature Range	–55 to 150	℃
TL	Maximum Temperature for Soldering	300	℃
RθJC	Thermal Resistance, Junction-to-Case	0.45	℃/ W
RθJA	Thermal Resistance, Junction-to-Ambient	60	℃/ W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
VDSS	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	250	--	--	V
IDSS	Drain to Source Leakage Current	V_{DS}=250V, V_{GS}=0V,T_a=25℃	--	--	1.0	μA
		V_{DS}=250V, V_{GS}=0V,T_a=125℃	--	--	100	
IGSS(F)	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	100	nA
IGSS(R)	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-100	nA
RDS(ON)	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=35A	--	28	33	mΩ
VGS(TH)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	3.6	--	5.0	V
gfs	Forward Trans conductance	V_{DS}=10V, I_D=35A	100	--	--	S
R_g	Gate Resistance	V_{GS}=0V V_{DS} open f=1.0MHz		1.5		Ω
Ciss	Input Capacitance	V_{GS}=0V V_{DS}=25V f=1.0MHz	--	7000		pF
Coss	Output Capacitance		--	480		pF
Crss	Reverse Transfer Capacitance		--	210		pF
td(ON)	Turn-on Delay Time	I_D=35A, V_{DS}=50V V_{GS}=10V, R_g=2.5Ω	--	45	--	ns
t_r	Rise Time		--	70	--	ns
td(OFF)	Turn-Off Delay Time		--	110	--	ns
tf	Fall Time		--	90	--	ns
Q_g	Total Gate Charge	I_D=35A, V_{DD}=100V V_{GS}=10V	--	200	--	nC
Qgs	Gate to Source Charge		--	28	--	nC
Qgd	Gate to Drain (“Miller”) Charge		--	60	--	nC
ISD	Continuous Source Current (Body Diode)		--	--	58	A
ISM	Maximum Pulsed Current (Body Diode)		--	--	230	A
VSD	Diode Forward Voltage	I_S=35A, V_{GS}=0V	--	--	1.2	V
trr	Reverse Recovery Time	I_S=30A,T_j=25℃, V_{DD}=50V dI$_F$/dt=100A/μs, V_{GS}=0V	--	120	--	ns
Q_{rr}	Reverse Recovery Charge		--	0.55	--	uC

Note：

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、The EAS data shows Max. rating . IAS = 35A, R_G = 25Ω, V_{DD}=50V , V_{GS}=10V, Starting TJ = 25 ºC

3、The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

4、The power dissipation is limited by 150℃junction temperature

5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

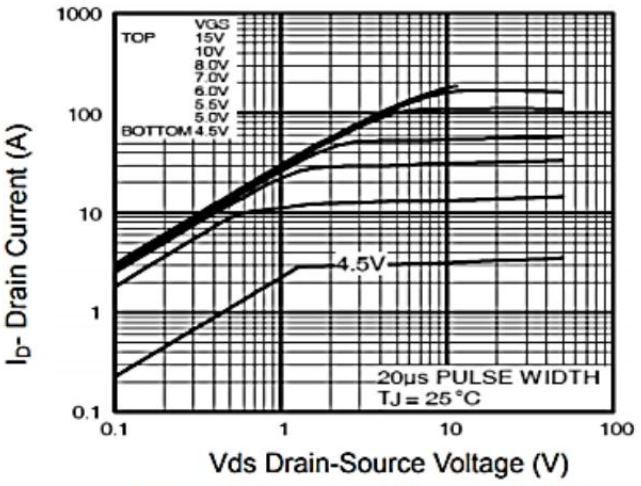


Figure 1 Output Characteristics

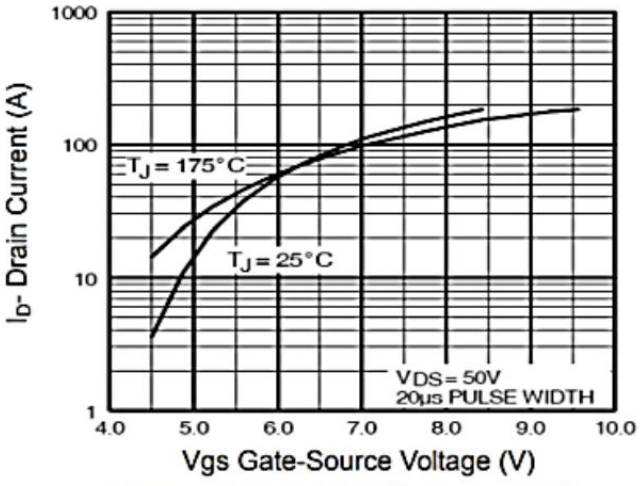


Figure 2 Transfer Characteristics

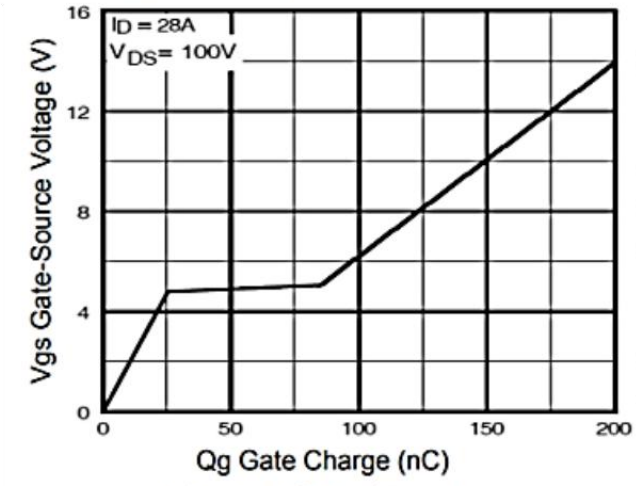


Figure 5 Gate Charge

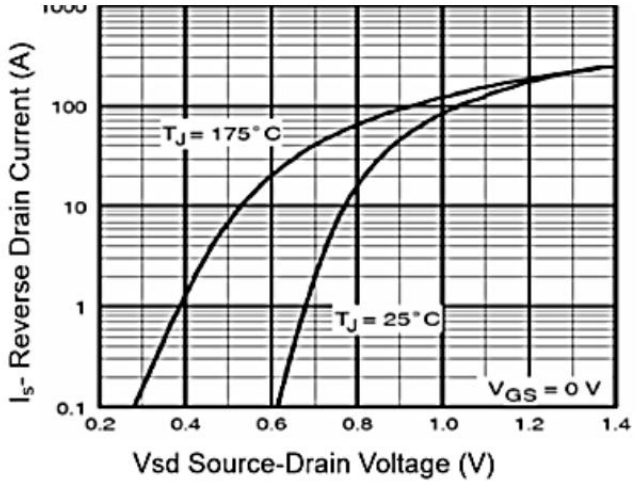


Figure 6 Source- Drain Diode Forward

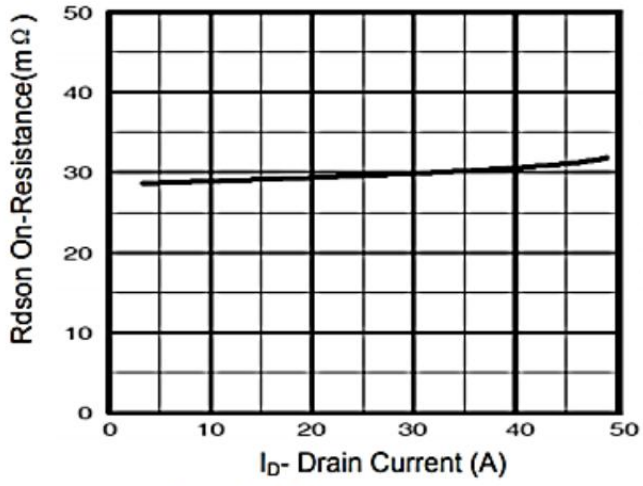


Figure 3 Rdson- Drain Current

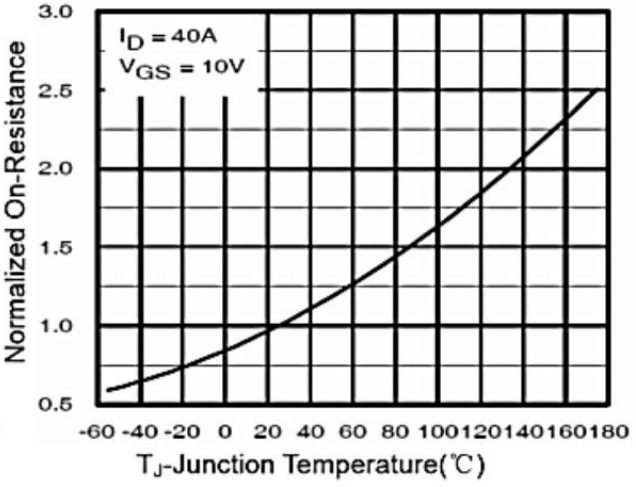


Figure 4 Rdson-JunctionTemperature

Typical Characteristics

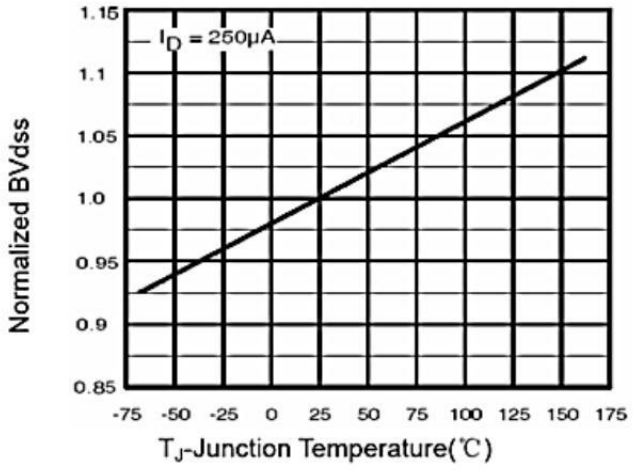


Figure 9 BV_{DSS} vs Junction Temperature

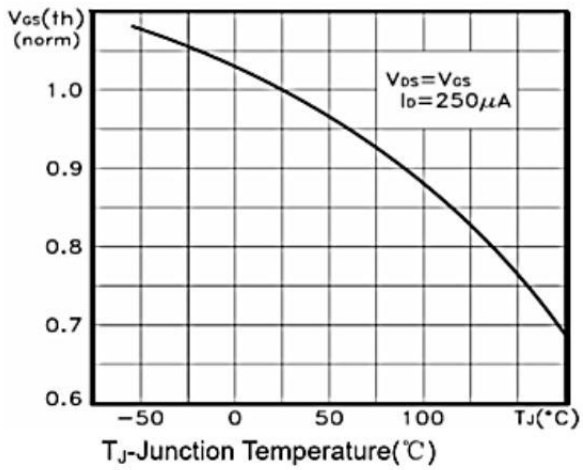


Figure 10 $V_{GS(th)}$ vs Junction Temperature

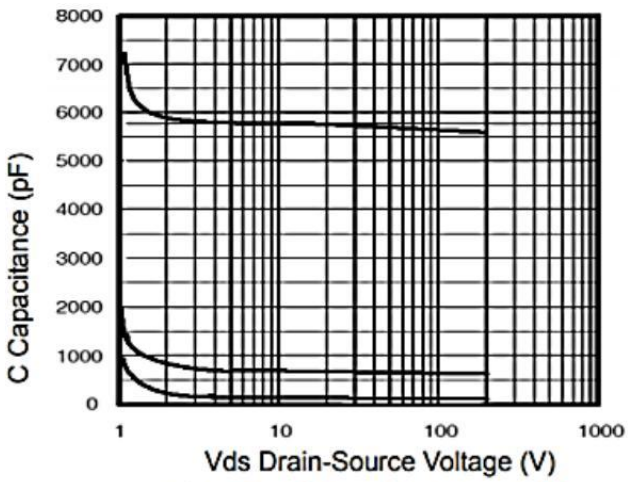


Figure 7 Capacitance vs Vds

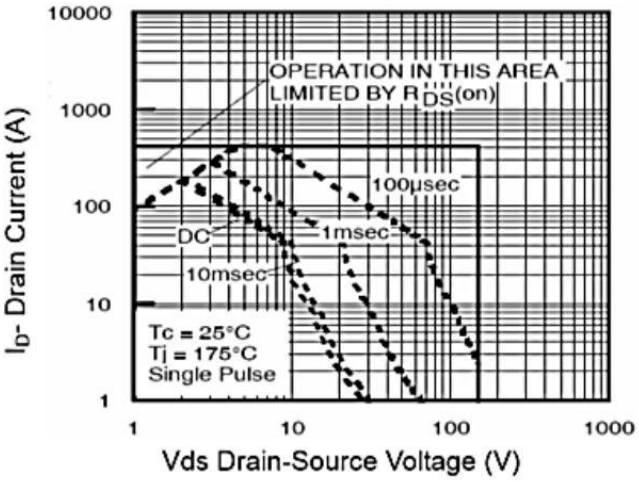


Figure 8 Safe Operation Area

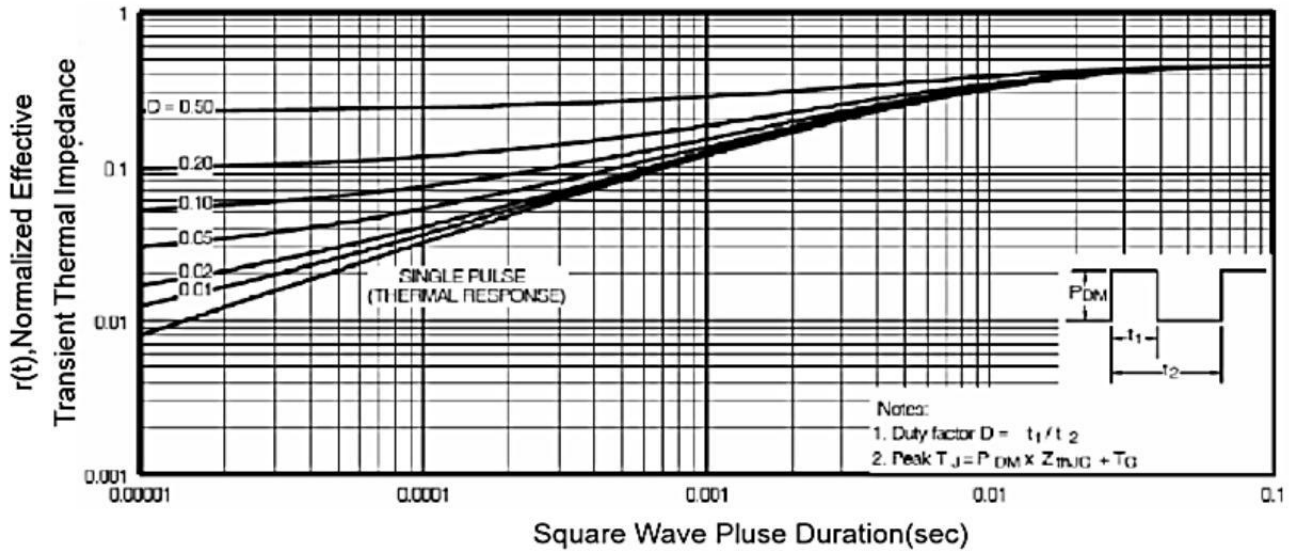
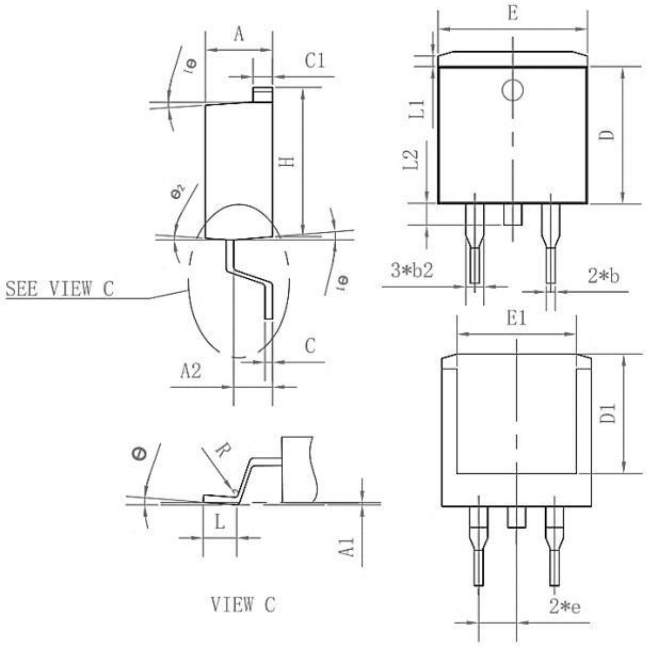


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TO-263-3L-SLK



Symbol	Common		
	mm		
	Mim	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