Description

The SX20N06BD 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} = 60V I_D =20A

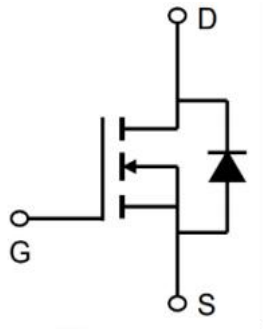
$R_{DS(ON)}$ <48mΩ @ V_{GS}=10V

Application

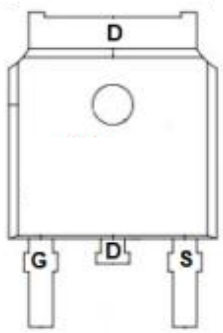
LED lamp

Load switch

Uninterruptible power supply



TO-252-3L



Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	60	V
VGSS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	20	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	11.8	A
IDM	Pulsed Drain Current	60	A
IAS	Avalanche Current	9.8	A
EAS	Single Pulsed Avalanche Energy	9.3	mJ
P_D@T_C=25℃	Power Dissipation	24	W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +175	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	62	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	6.3	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	65	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V,	-	-	1.0	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	1.2	1.6	2.5	V
RDS(on)	Static Drain-Source on-Resistance	V_{GS}=10V, I_D=15A	-	38	48	mΩ
		V_{GS}=4.5V, I_D=10A	-	45	63	mΩ
Ciss	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	825	-	pF
Coss	Output Capacitance		-	49	-	pF
Crss	Reverse Transfer Capacitance		-	41	-	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=4.5A, V_{GS}=10V	-	14	-	nC
Qgs	Gate-Source Charge		-	2.9	-	nC
Qgd	Gate-Drain("Miller") Charge		-	5.2	-	nC
td(on)	Turn-on Delay Time	V_{DS}=30V,I_D=2A, R_L=6.7Ω,R_G=3Ω, V_{GS}=10V	-	5	-	ns
tr	Turn-on Rise Time		-	2.6	-	ns
td(off)	Turn-off Delay Time		-	16.1	-	ns
t_f	Turn-off Fall Time		-	2.3	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	15	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	60	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=15A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	T_J=25℃,I_F=15A, dI/dt=100A/μs	-	35	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	53	-	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 .The EAS data shows Max. rating .

3、The test cond ≦ 300us duty cycle ≦ 2%, duty cycle ition is TJ =25℃, VDD =48V, VG =10V, RG =25Ω, L=0.1mH, IAS =9.8A

4、The power dissipation is limited by 175℃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

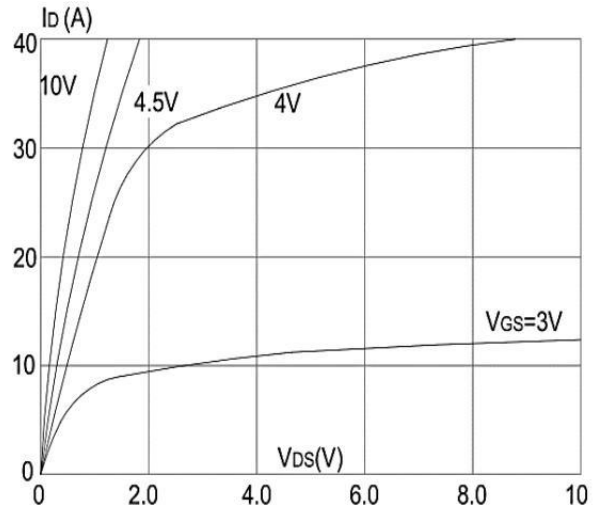


Figure1: Output Characteristics

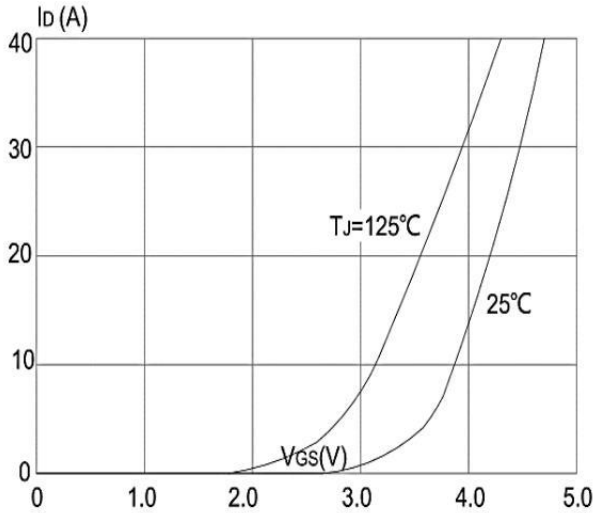


Figure 2: Typical Transfer Characteristics

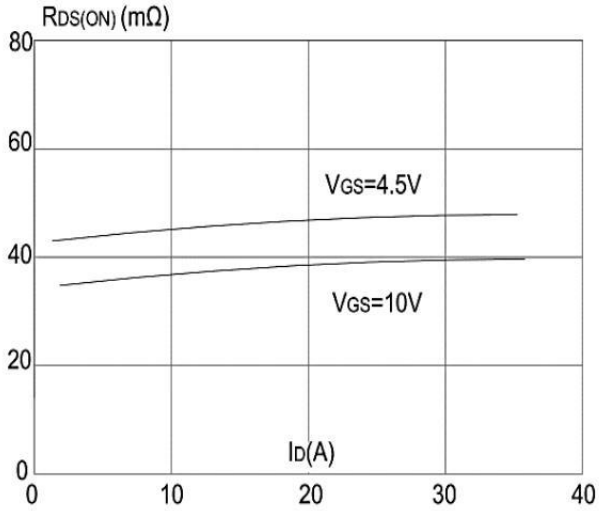


Figure 3:On-resistance vs. Drain Current

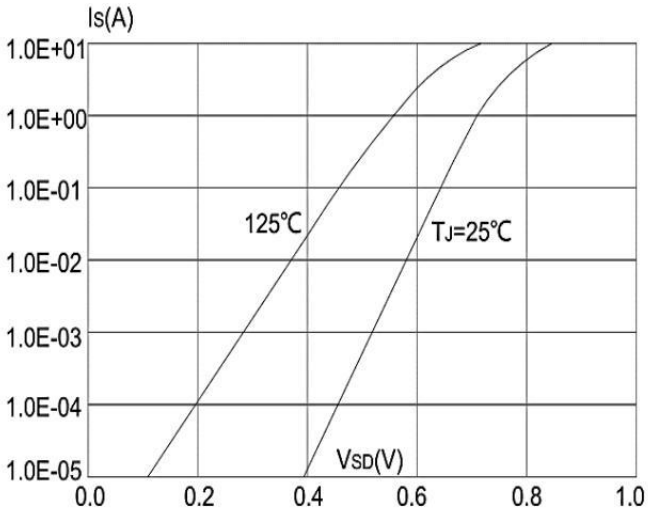


Figure 4: Body Diode Characteristics

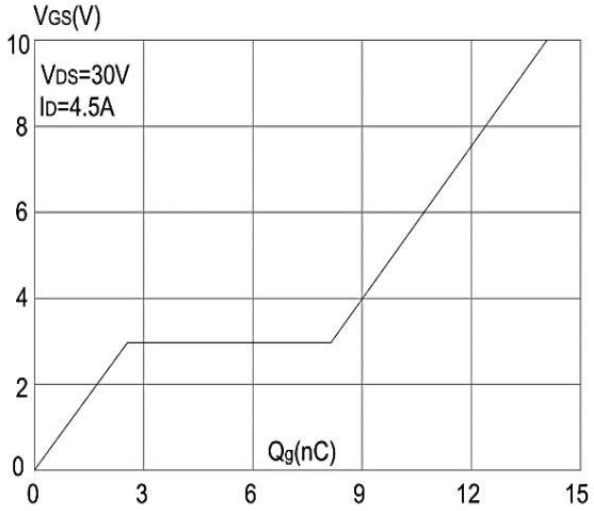


Figure 5: Gate Charge Characteristics

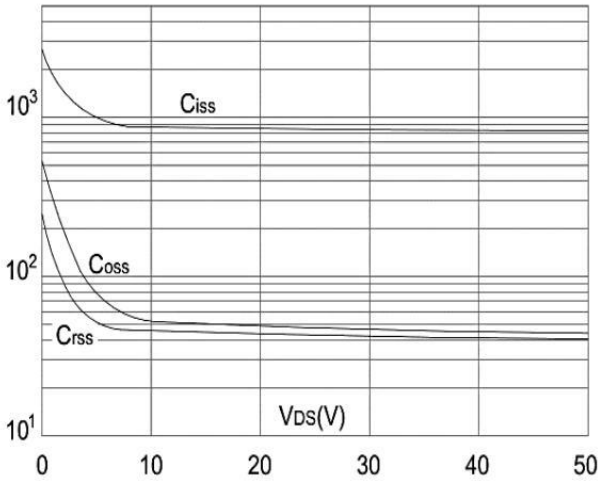


Figure 6: Capacitance Characteristics

Typical Characteristics

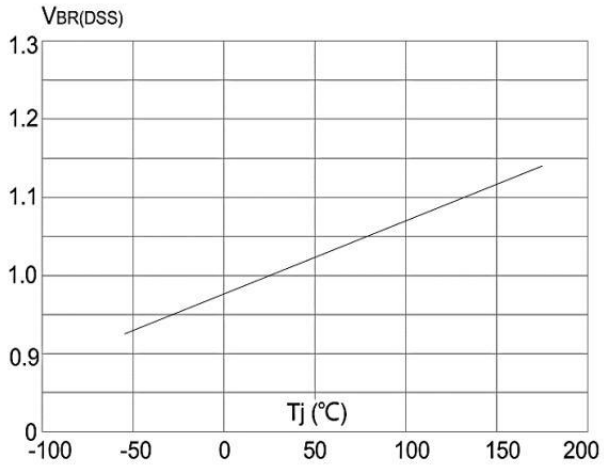


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

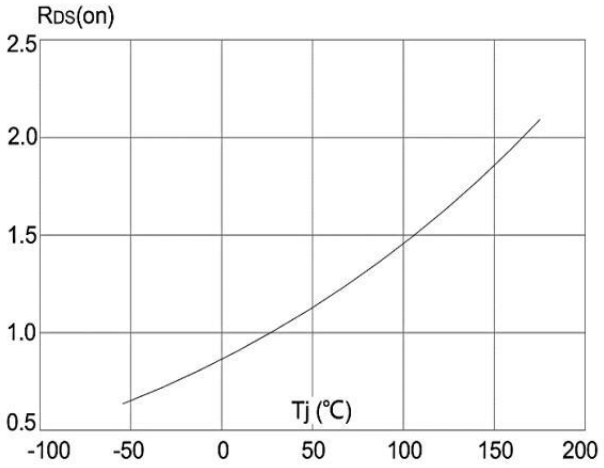


Figure 8: Normalized on Resistance vs. Junction Temperature

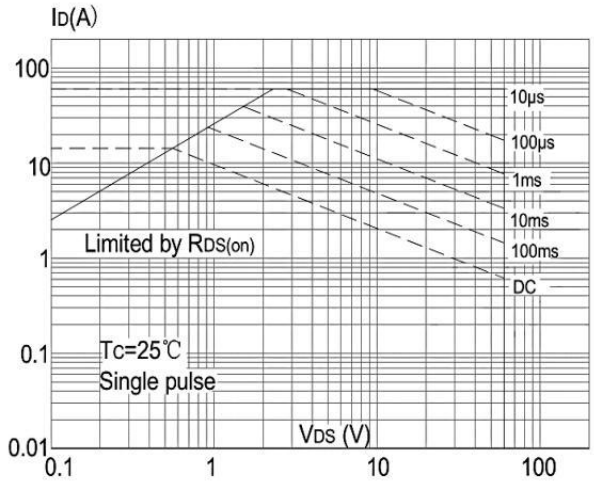


Figure 9: Maximum Safe Operating Area vs. Ambient Temperature

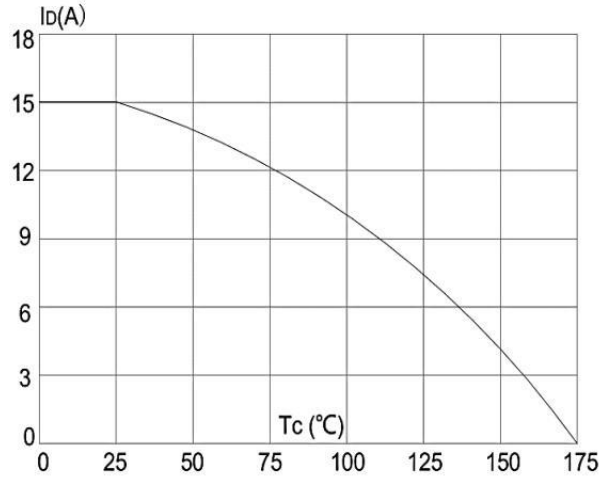


Figure 10: Maximum Continuous Drain Current

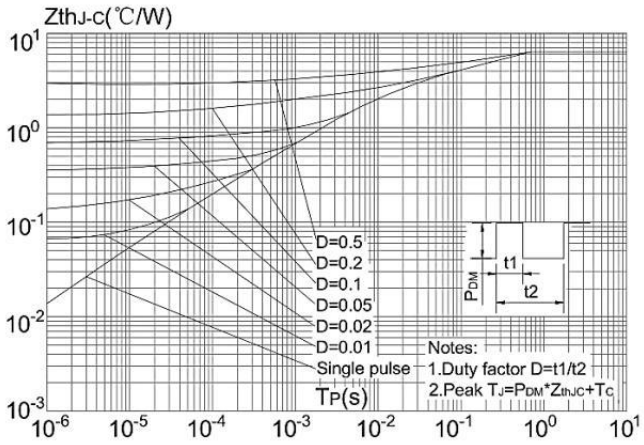
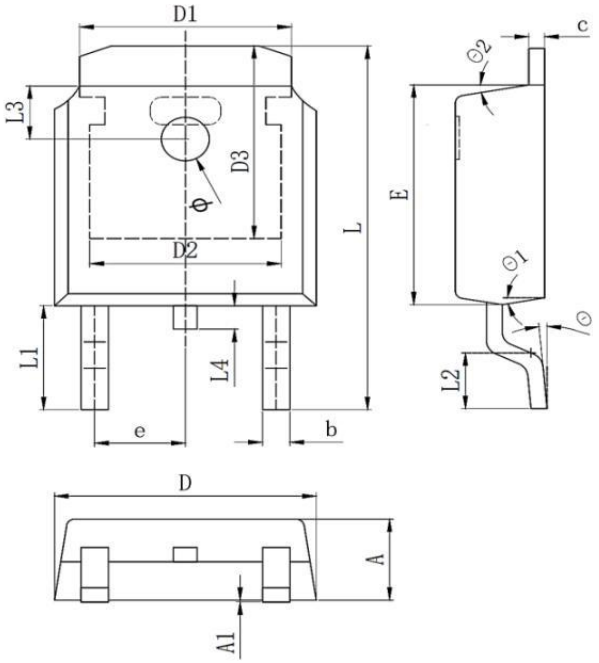


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Mechanical Data-TO-252-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	2.1	2.3	2.5
A1	0	0.064	0.128
b	0.64	0.75	0.86
c	0.45	0.52	0.6
D	6.4	6.6	6.8
D1		5.33REF	
D2		4.83REF	
D3		5.25REF	
E	5.9	6.1	6.3
e		2.286TYP	
L	9.8	10.1	10.4
L1		2.888REF	
L2	1.4	1.5	1.7
L3		1.65REF	
L4	0.6	0.8	1
φ	1.1	1.2	1.3
θ	0°		10°
θ1	5°		10°
θ2	5°		10°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-252-3L		2500