20V N-Channel Enhancement Mode MOSFET

Description

The SX60N02BD uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

V_{DS}=20V I_D=60A

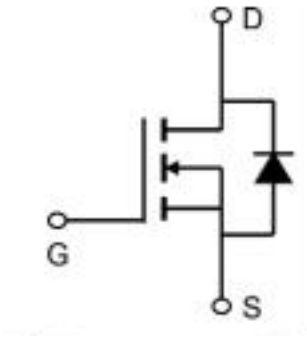
$R_{DS(ON)}$ < 6.5mΩ @ V_{GS}=4.5V （Type：4.8mΩ)

Application

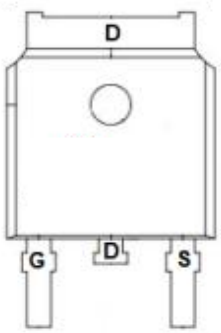
Battery protection

Load switch

Uninterruptible power supply



TO-252-3L



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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	20	V
VGSS	Gate-Source Voltage	±12	V
ID@TA=25℃	Continuous Drain Current, VGS @ 4.5V	60	A
ID@TA=70℃	Continuous Drain Current, VGS @ 4.5V	39	A
IDM	Pulsed Drain Current note1	200	A
EAS	Single Pulsed Avalanche Energy note2	47.6	mJ
PD@TA=25℃	Power Dissipation	37	W
RθJC	Thermal Resistance, Junction to Case	4	℃/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +175	℃

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	20	24	-	V
IDSS	Zero Gate Voltage Drain Current	VDS=20V, VGS=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	VDS=0V, VGS=±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	0.5	0.7	1.2	V
RDS(on)	Static Drain-Source on-Resistance note3	VGS=4.5V, ID=30A	-	4.8	6.5	mΩ
		VGS=2.5V, ID=20A	-	8.2	10	
Ciss	Input Capacitance	VDS=10V, VGS=0V, f = 1.0MHz	-	1832	-	pF
Coss	Output Capacitance		-	289	-	pF
Crss	Reverse Transfer Capacitance		-	271	-	pF
Qg	Total Gate Charge	VDS=10V, ID=30A, VGS=4.5V	-	23	-	nC
Qgs	Gate-Source Charge		-	4.5	-	nC
Qgd	Gate-Drain("Miller") Charge		-	7.3	-	nC
td(on)	Turn-on Delay Time	VDS=10V, ID=30A, RGEN=3Ω, VGS =4.5V	-	15	-	ns
tr	Turn-on Rise Time		-	37	-	ns
td(off)	Turn-off Delay Time		-	52	-	ns
tf	Turn-off Fall Time		-	21	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	60	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	210	A
VSD	Drain to Source Diode Forward Voltage	VGS = 0V, IS=25A	-	-	1.2	V

Notes:

1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2、The test condition is, VDD=10V, VG=4.5V, L=0.5mH, RG=25Ω, IAS=13.8A

3、The data tested by pulsed Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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

Typical Characteristics

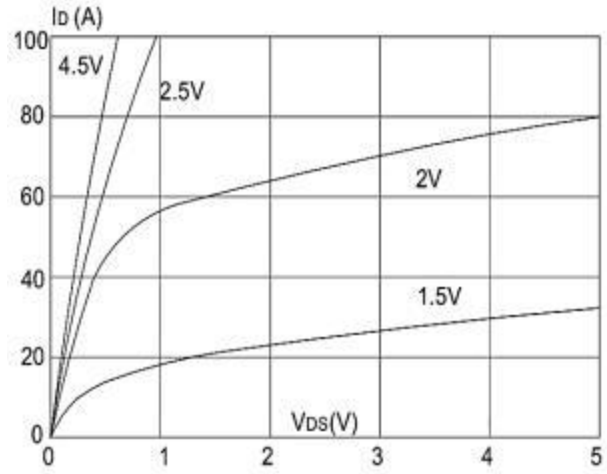


Figure1: Output Characteristics

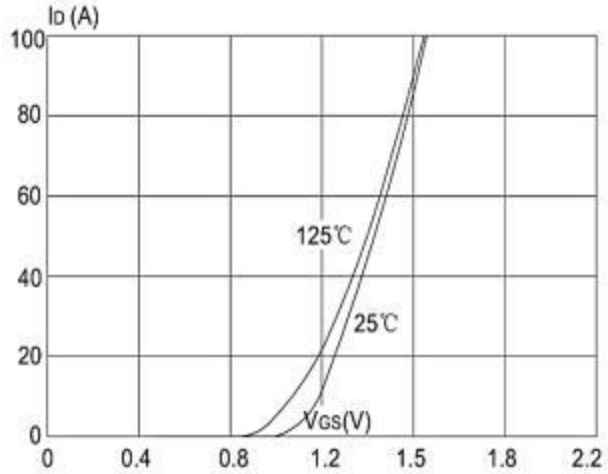


Figure 2: Typical Transfer Characteristics

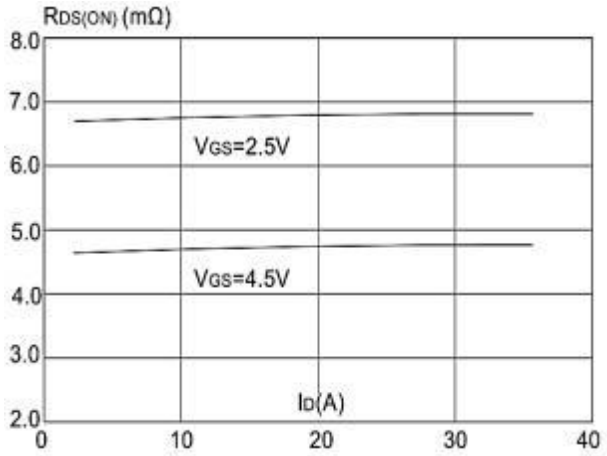


Figure 3:On-resistance vs. Drain Current

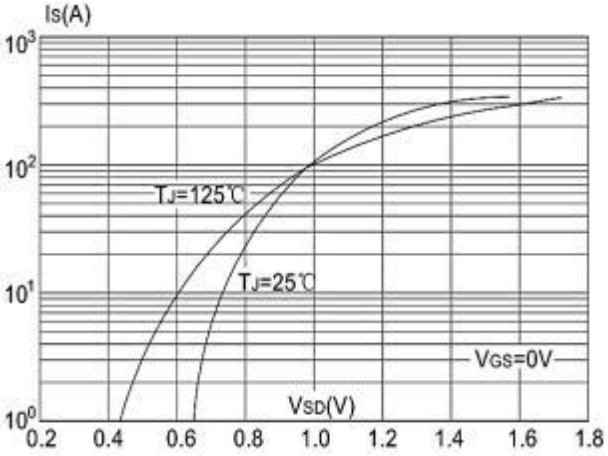


Figure 4: Body Diode Characteristics

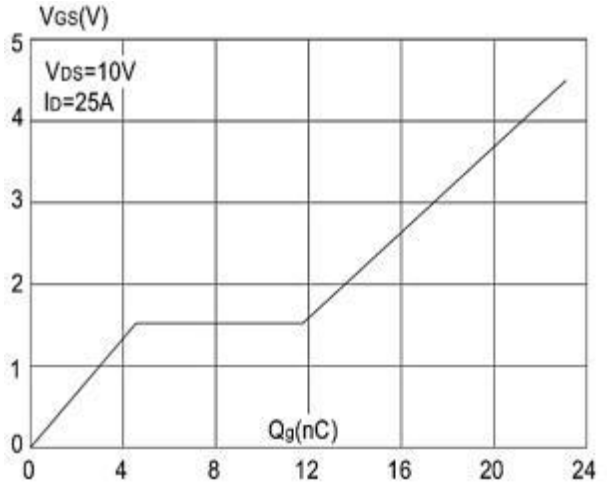


Figure 5: Gate Charge Characteristics

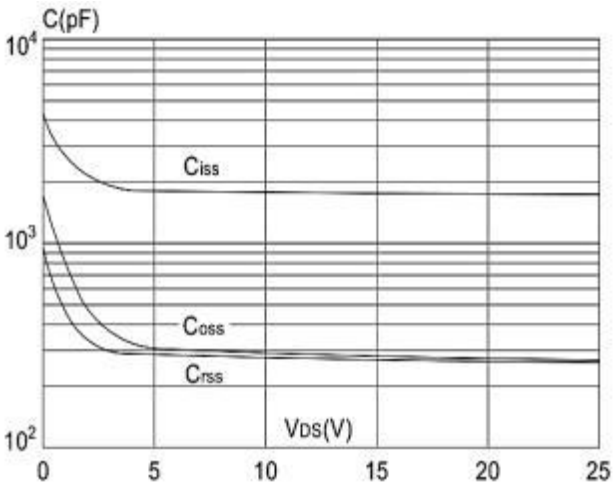


Figure 6: Capacitance Characteristics

Typical Characteristics

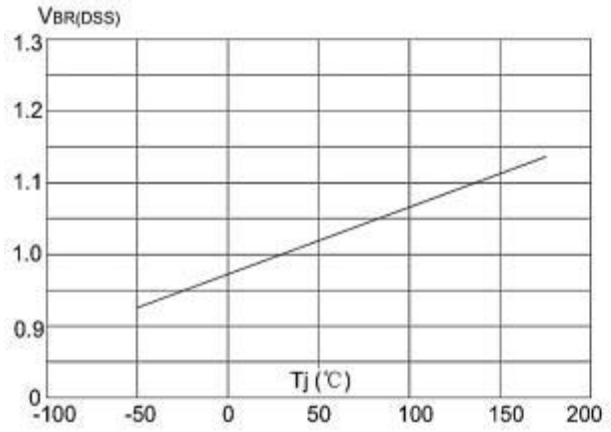


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

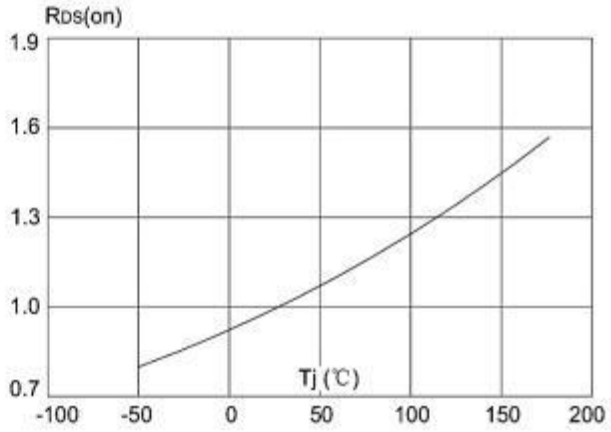


Figure 8: Normalized on Resistance vs Junction Temperature

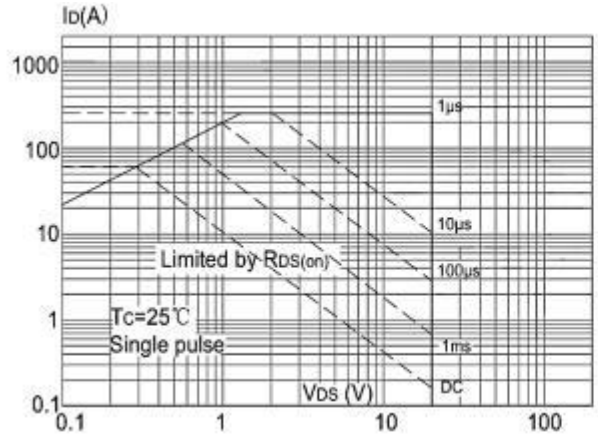


Figure 9: Maximum Safe Operating Area

Current

Temperature

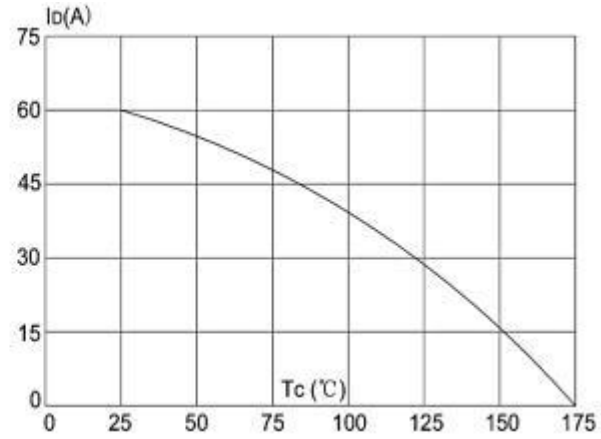


Figure 10: Maximum Continuous Drain vs. Case

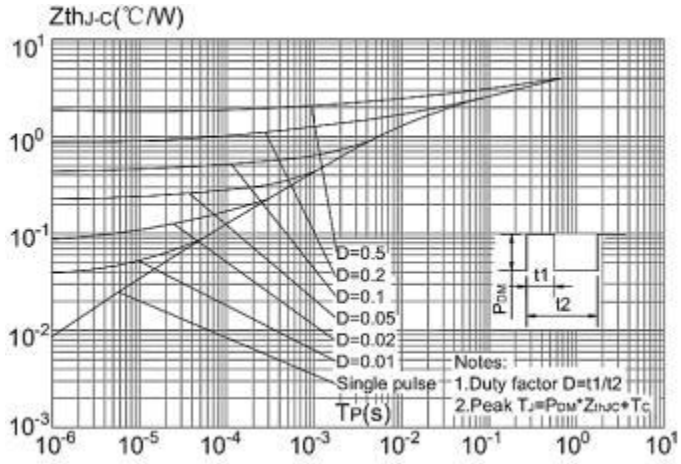
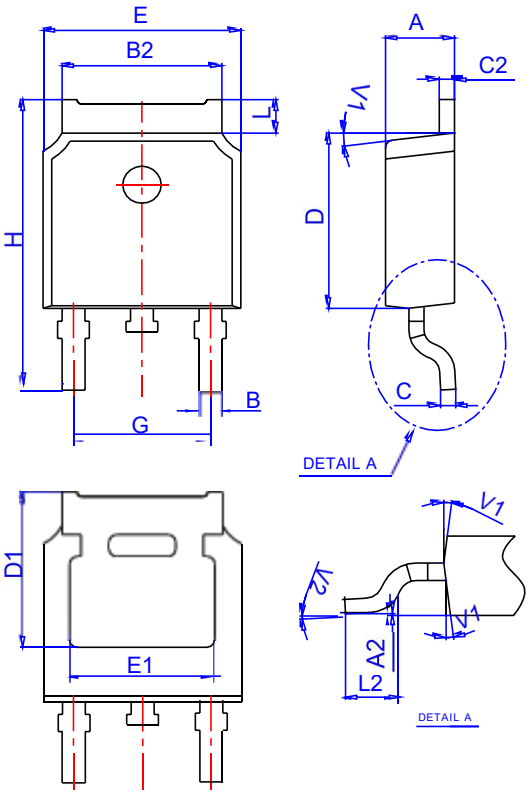


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data:TO-252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Package Marking and Ordering Information

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