

Description

The SX90N06D uses advanced trench 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

$V_{DS} = 60V$ $I_D = 90A$

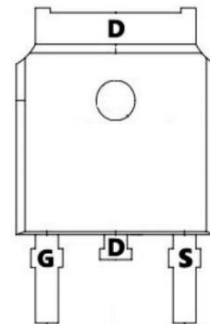
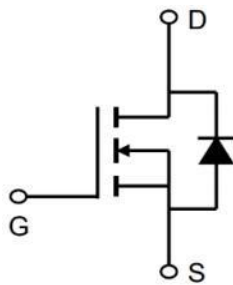
$R_{DS(ON)} < 7.0m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



Absolute Maximum Ratings@ $T_J=25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain source voltage	60	V
V_{GS}	Gate source voltage	± 20	V
I_D	Continuous drain current ¹⁾	90	A
I_{DM}	Pulsed drain current ²⁾	320	A
I_S	Diode forward current	37	A
I_{SP}	Pulsed source current	210	A
P_D	Power dissipation	108	W
EAS	Single pulsed avalanche energy ³⁾	205.4	mJ
T_{stg}, T_J	Operation and storage temperature	-55 to 150	$^\circ C$
$R_{\theta JC}$	Thermal resistance, junction-case	1.4	$^\circ C/W$
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁴⁾	62.5	$^\circ C/W$

Electrical Characteristics (T_J=25°C, 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	64	-	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	2.0	3.0	4.0	V
RDS(on)	Static Drain-Source on-Resistance note	V _{GS} =10V, I _D =30A	-	5.8	7.0	mΩ
Ciss	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1.0MHz	-	4136	-	pF
Coss	Output Capacitance		-	286	-	pF
Crss	Reverse Transfer Capacitance		-	257	-	pF
Qg	Total Gate Charge	V _{DS} =30V, I _D =30A, V _{GS} =10V	-	90	-	nC
Qgs	Gate-Source Charge		-	9	-	nC
Qgd	Gate-Drain("Miller") Charge		-	18	-	nC
td(on)	Turn-on Delay Time	V _{DS} =30V, I _D =30A, R _G =1.8Ω, V _{GS} =10V	-	9	-	ns
t _r	Turn-on Rise Time		-	7	-	ns
td(off)	Turn-off Delay Time		-	40	-	ns
t _f	Turn-off Fall Time		-	15	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	320	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F =30A, dI/dt=100A/μs	-	33	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	46	-	nC

Note :

- 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 .The EAS data shows Max. rating .
- 3、The test cond ≅ 300us duty cycle ≅ 2%, duty cycle ition is T_J =25°C, VDD =35V, V_G =10V, R_G =25Ω, L=0.5mH, I_{AS} =21A
- 4、The power dissipation is limited by 175°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Electrical Characteristics Diagrams

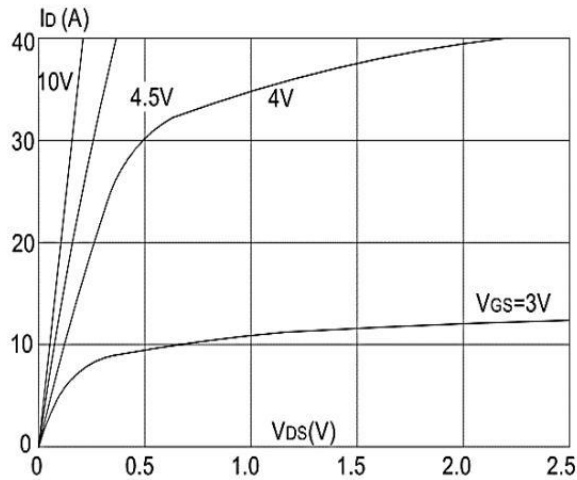


Figure1: Output Characteristics

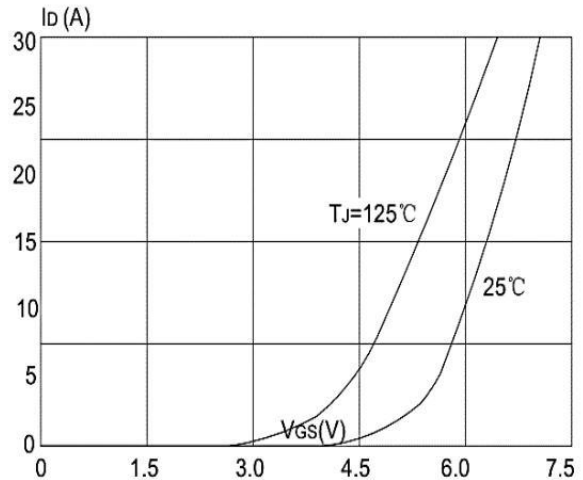


Figure 2: Typical Transfer Characteristics

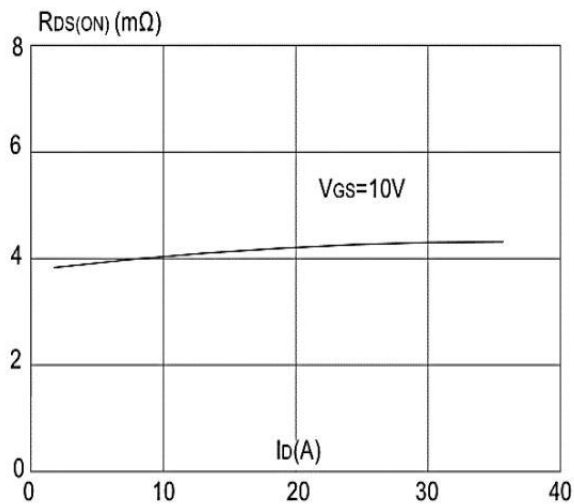


Figure 3: On-resistance vs. Drain Current

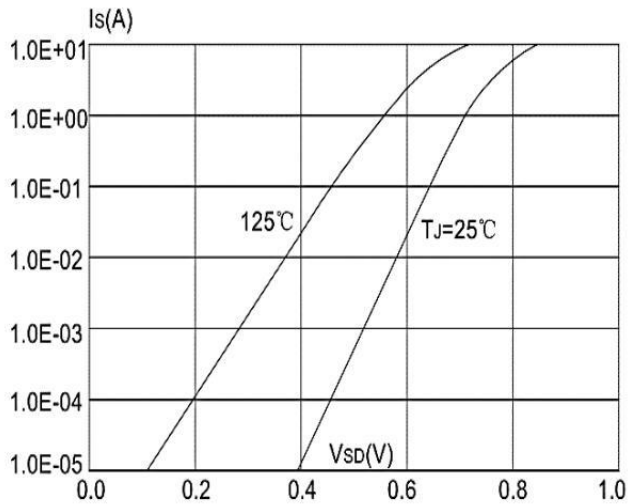


Figure 4: Body Diode Characteristics

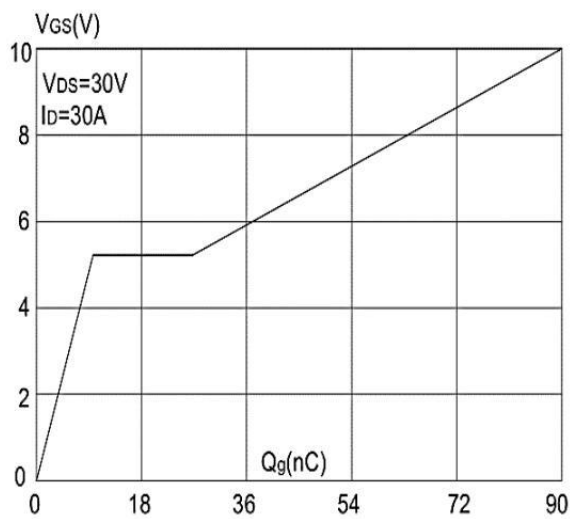


Figure 5: Gate Charge Characteristics

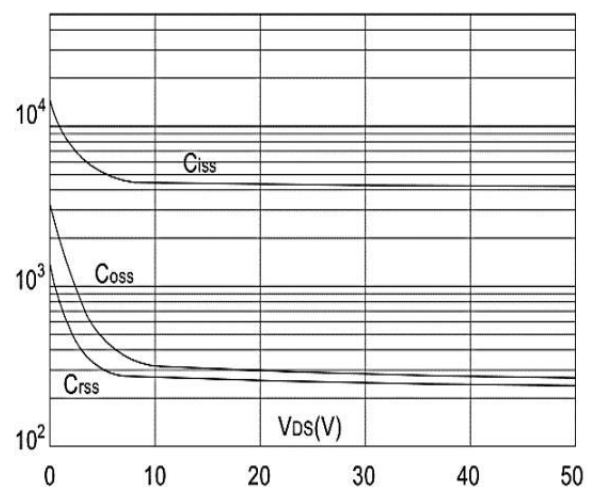


Figure 6: Capacitance Characteristics

Typical Characteristics

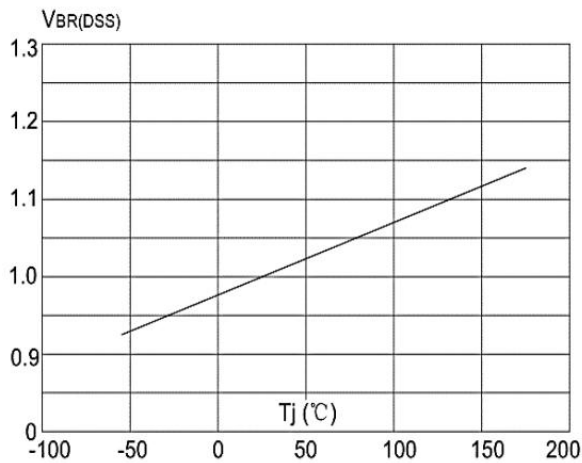


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

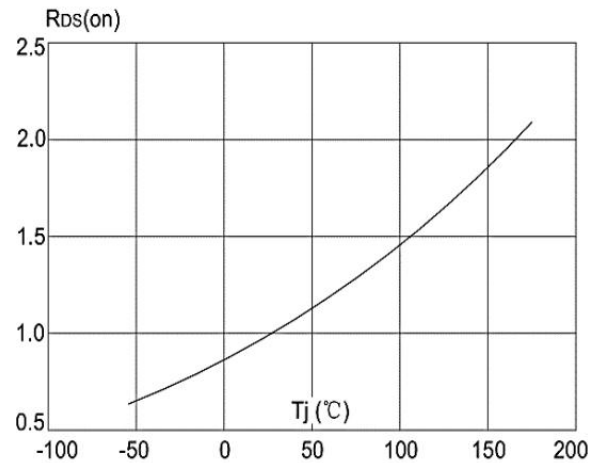


Figure 8: Normalized on Resistance vs. Junction Temperature

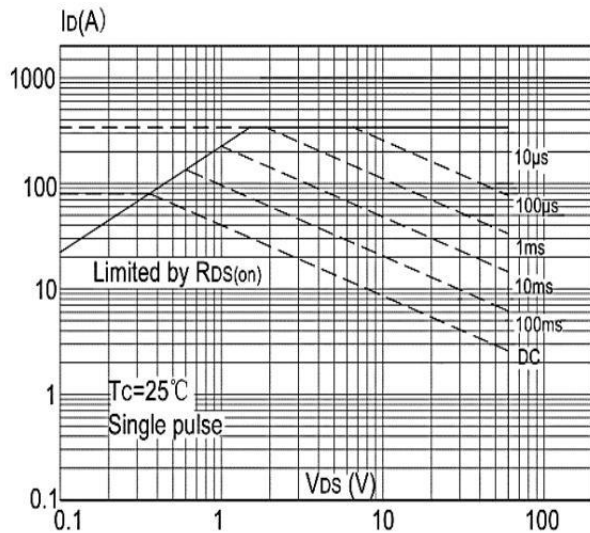


Figure 9: Maximum Safe Operating Area

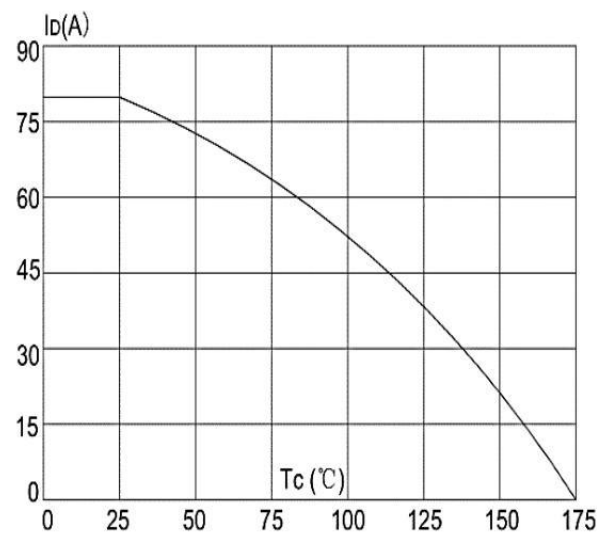


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

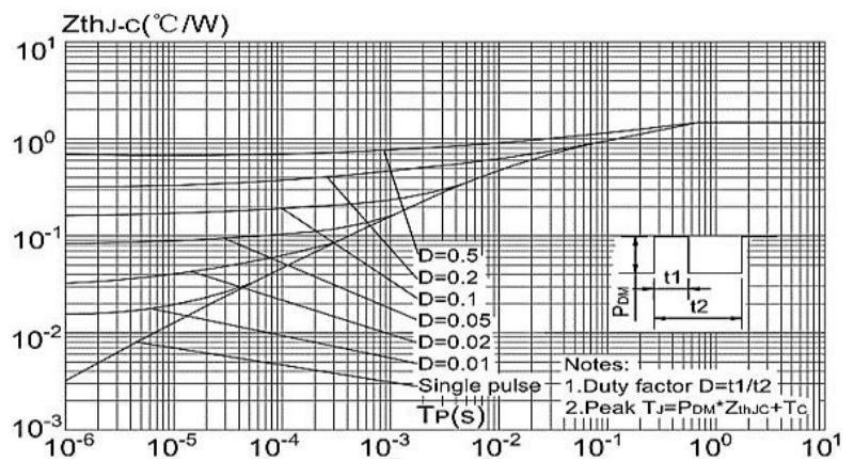
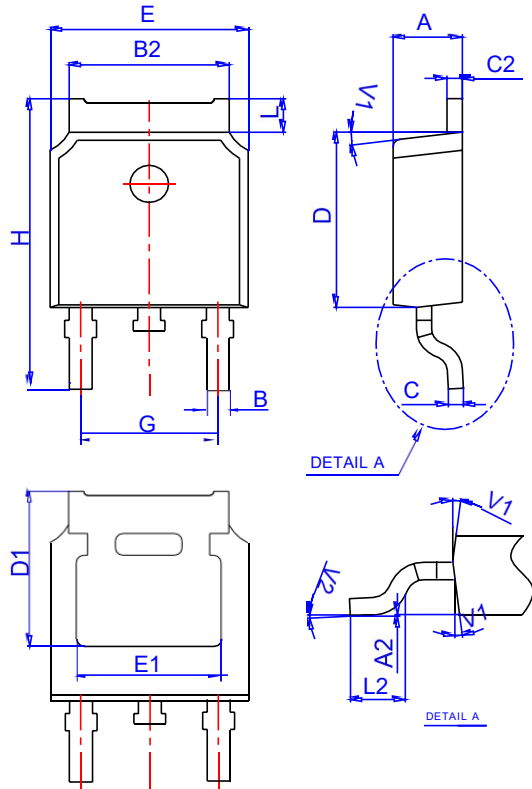


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

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