

Description

The SX90P01D 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

$V_{DS}=12V$ $I_D=90A$

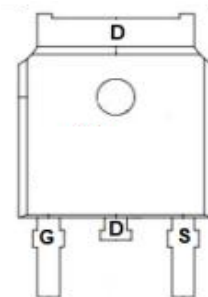
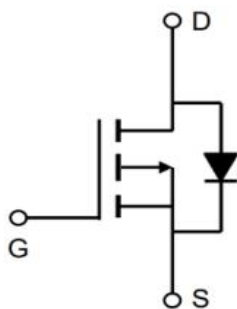
$R_{DS(ON)} < 4.5m\Omega$ @ $V_{GS}=4.5V$

Application

Battery protection

Load switch

Uninterruptible power supply



Absolute Maximum Ratings ($T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-12	V
VGS	Gate-Source Voltage	± 12	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	-90	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	-54	A
IDM	Drain Current – Pulsed ¹	-240	A
IAS	Avalanche Current	50	A
EAS	Single Pulsed Avalanche Energy	560	mJ
TJ, TSTG	Operating and Storage Temperature Range	-55 to 150	$^\circ C$
R θ JA	Thermal Resistance Junction to ambient	62.5	$^\circ C/W$
R θ JC	Thermal Resistance Junction to Case	3	$^\circ C/W$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	VGS=0V , ID=-250uA	-12	-18	---	V
ΔBVDSS/ΔTJ	BVDSS Temperature Coefficient	Reference to 25°C , ID=-1mA	---	-0.008	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance	VGS=-4.5V , ID=-20A	---	3.5	4.5	mΩ
		VGS=-2.5V , ID=-20A	---	4.8	6.0	
VGS(th)	Gate Threshold Voltage	VGS=VDS , ID =-250uA	-0.4	-0.6	-1.0	V
ΔVGS	VGS(th) Temperature Coefficient		---	-3.44	---	mV/°C
IDSS	Drain-Source Leakage Current	VDS=-20V , VGS=0V , TJ=25°C	---	---	-1	uA
		VDS=-16V , VGS=0V , TJ=125°C	---	---	-30	uA
IGSS	Gate-Source Leakage Current	VGS=±12V , VDS=0V	---	---	±500	nA
gfs	Forward Transconductance	VDS=-10V , IS=-3A	---	30	---	S
Qg	Total Gate Charge	VDS=-16V , VGS=-4.5V , ID=-5A	---	149	225	nC
Qgs	Gate-Source Charge		---	14.4	22	
Qgd	Gate-Drain Charge		---	42.8	65	
Td(on)	Turn-On Delay Time	VDD=-15V , VGS=-4.5V , RG=25□ ID=-1A	---	21.2	42	nS
Tr	Rise Time		---	20.6	40	
Td(off)	Turn-Off Delay Time		---	26	52	
Tf	Fall Time		---	400	600	
Ciss	Input Capacitance	VDS=-15V , VGS=0V , F=1MHz	---	6800	---	pF
Coss	Output Capacitance		---	769	---	
Crss	Reverse Transfer Capacitance		---	726	---	
Rg	Gate resistance	VGS=0V, VDS=0V, F=1MHz	---	2.6	---	Ω
IS	Contineous Source Current	Vg=Vd=0V, Force Current	--	--	-90	A
ISM	Pulsed Source Current		--	--	-180	
VSD	Diode Forward Voltage	Vgs=0V Is=1ATj=25°C	--	--	-1	V

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 ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is VDD=8V,VGS=4.5V,L=0.1mH,IAS =50A
- 4、The power dissipation is limited by 150°Cjunction 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

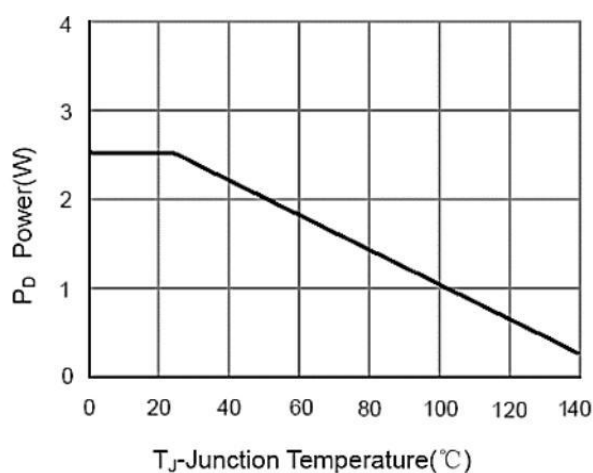


Figure 1 : Power Dissipation

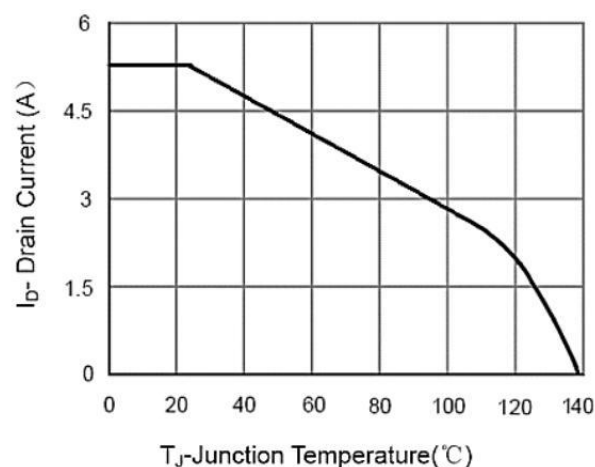


Figure 2 : Drain Current

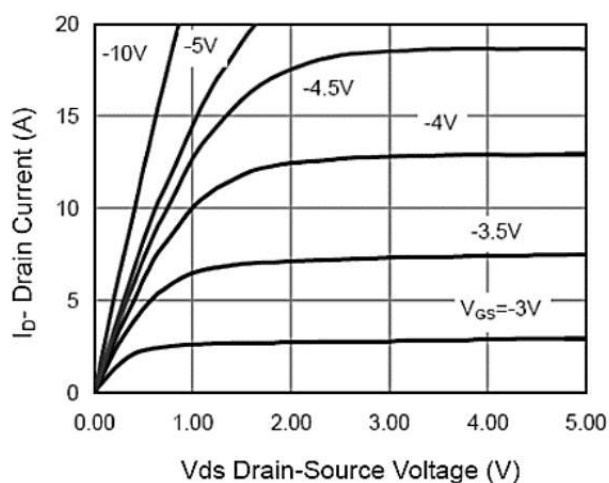


Figure 3 : Output Characteristics

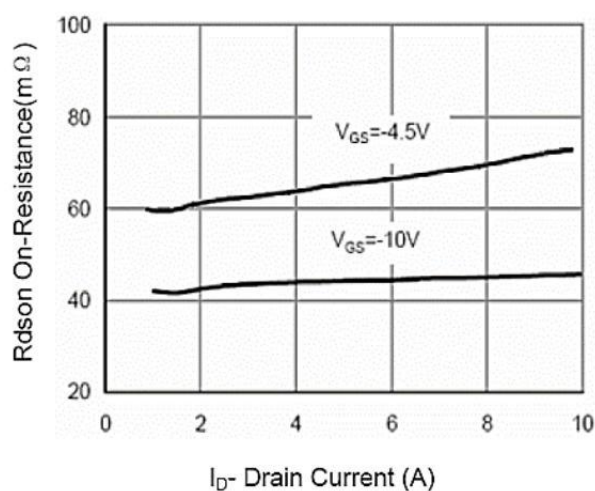


Figure 4 : Drain-Source On-Resistance

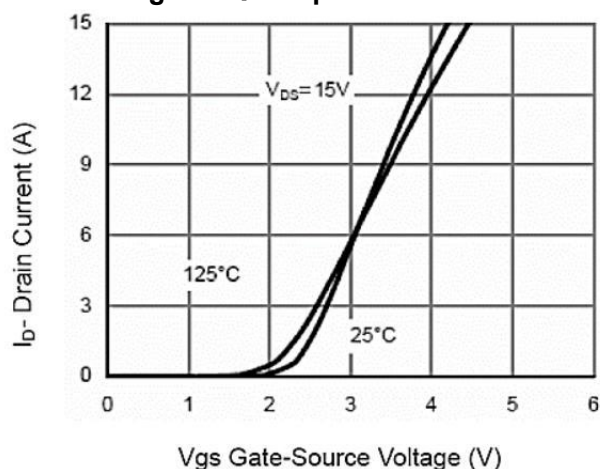


Figure 5 : Transfer Characteristics

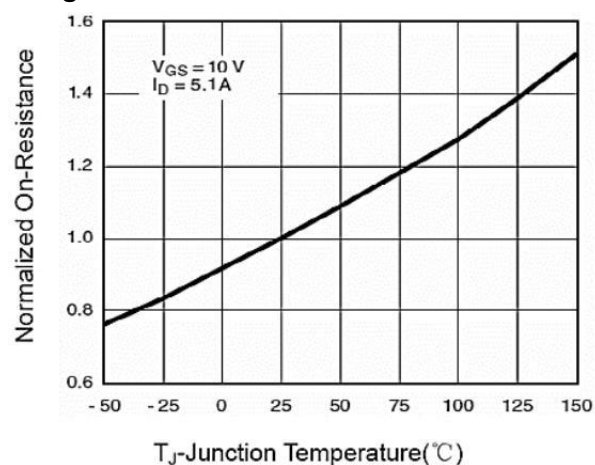


Figure 6 : Drain-Source On-Resistance

Typical Characteristics

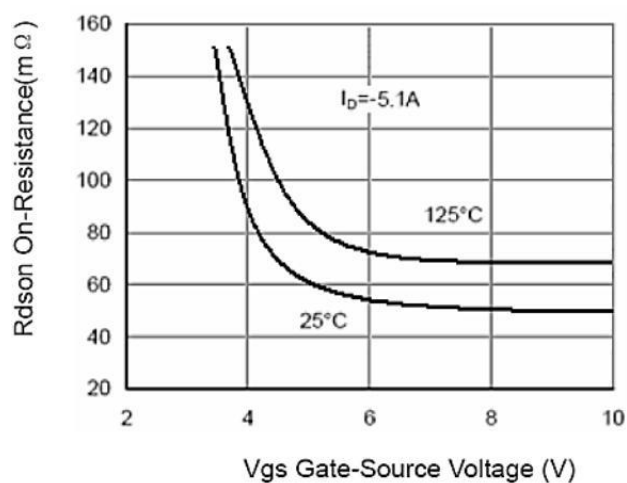


Figure 7 : Rdson vs Vgs

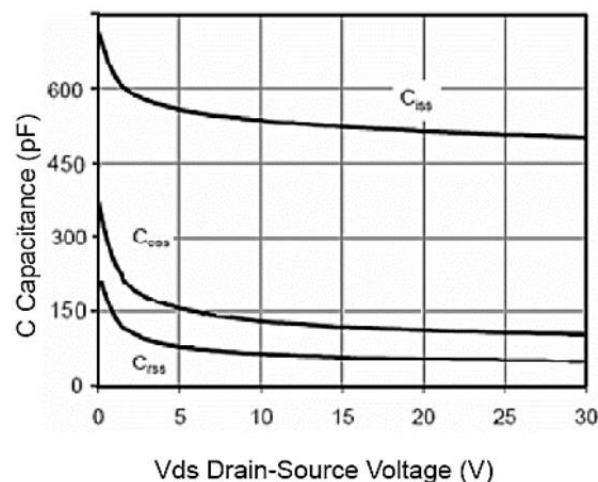


Figure 8 : Capacitance vs Vds

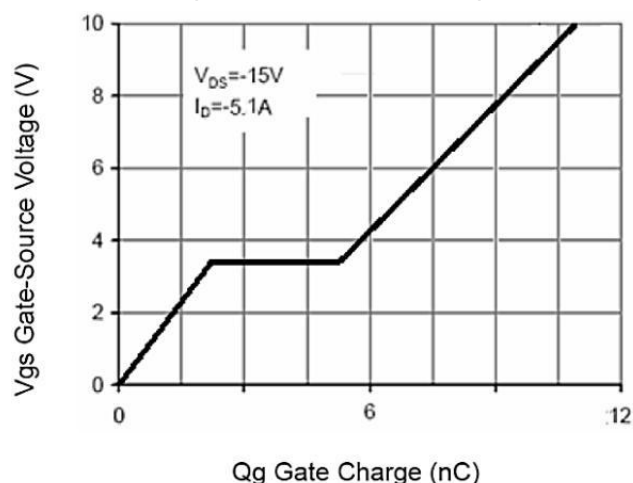


Figure 9 : Gate Charge

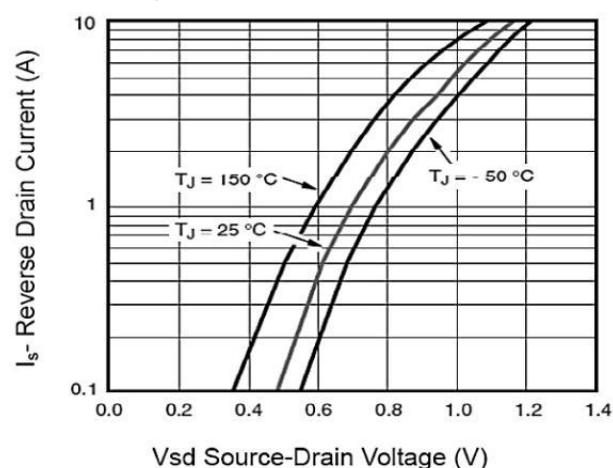


Figure 10: Source-Drain Diode Forward

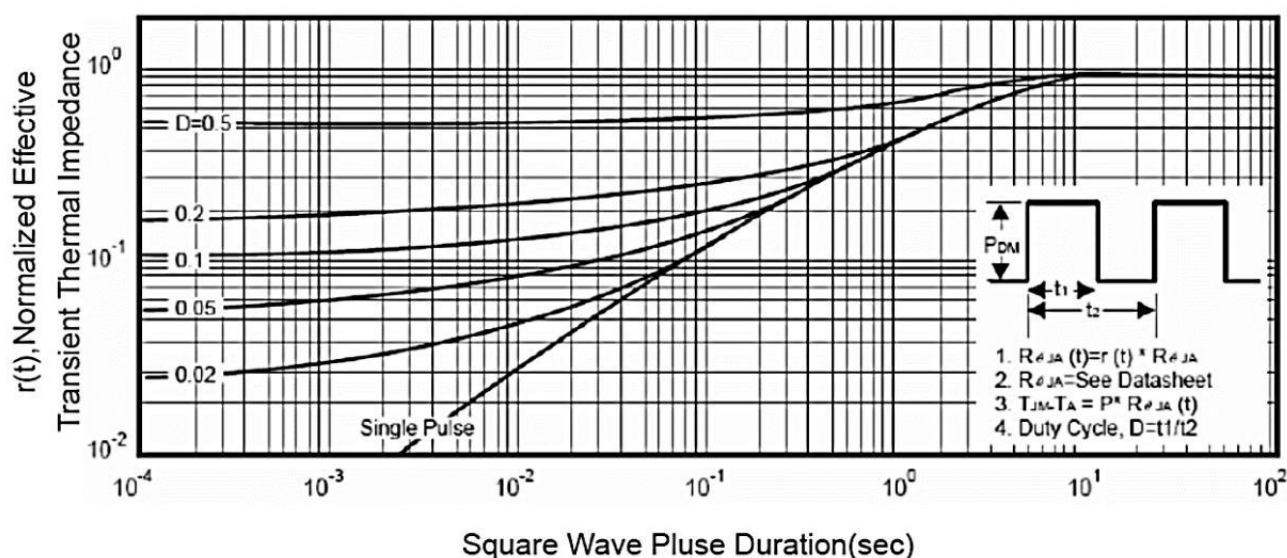
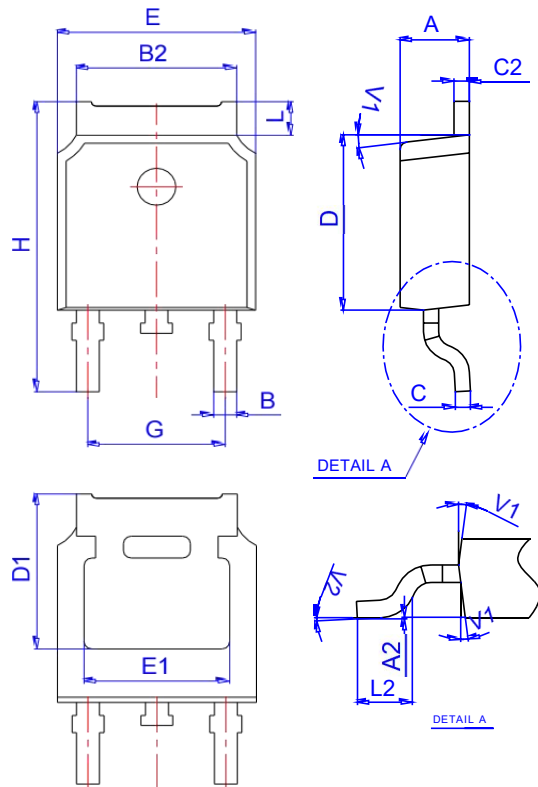


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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