

Description

The SX110N04D 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

$V_{DS} = 40V$ $I_D = 110A$

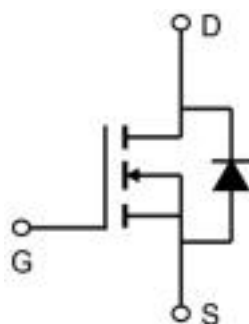
$R_{DS(ON)} < 4.3m\Omega$ @ $V_{GS}=10V$

Application

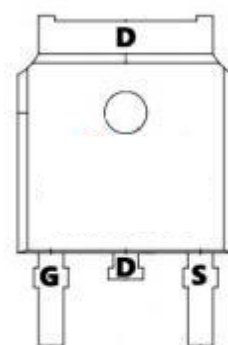
Battery protection

Load switch

Uninterruptible power supply



TO-252-3L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	110	A
$I_D @ T_C=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	78	A
I_{DM}	Pulsed Drain Current ²	440	A
E_{AS}	Single Pulse Avalanche Energy ³	195	mJ
I_{AS}	Avalanche Current	42	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation ⁴	108	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.4	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	40	44	---	V
ΔBVDSS/ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C , I _D =1mA	---	0.052	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =30A	---	3.5	4.3	mΩ
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =4.5V , I _D =20A	---	5.4	7.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5.76	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =40V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =40V , V _{GS} =0V , T _J =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V , I _D =30A	---	42	---	S
Q _g	Total Gate Charge (4.5V)	V _{DS} =48V , V _{GS} =10V , I _D =30A	---	65	---	nC
Q _{gs}	Gate-Source Charge		---	12.5	---	
Q _{gd}	Gate-Drain Charge		---	15	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =30V , V _{GS} =10V , R _G =4.7Ω, I _D =15A	---	12	---	ns
T _r	Rise Time		---	16	---	
T _{d(off)}	Turn-Off Delay Time		---	39	---	
T _f	Fall Time		---	15	---	
C _{iss}	Input Capacitance	V _{DS} =30V , V _{GS} =0V , f=1MHz	---	5595	---	pF
C _{oss}	Output Capacitance		---	411	---	
C _{rss}	Reverse Transfer Capacitance		---	340	---	
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	110	A
I _{SM}	Pulsed Source Current ^{2,5}		---	---	440	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =30A , T _J =25°C	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =30A , dI/dt=100A/μs , T _J =25°C	---	22	---	nS
Q _{rr}	Reverse Recovery Charge		---	11	---	nC

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 20Z copper.
- 2、 The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、 The EAS data shows Max. rating . T_J=25°C , V_{DD}=32V , V_G=10V , R_G=25Ω , L=0.1mH , I_{AS} =42A
- 4、 The power dissipation is limited by 150°C junction 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

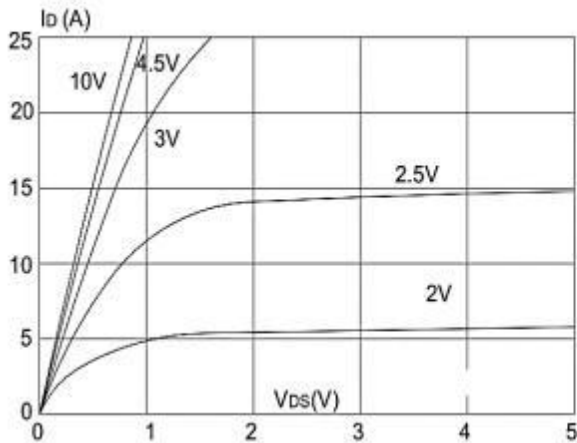


Figure1: Output Characteristics

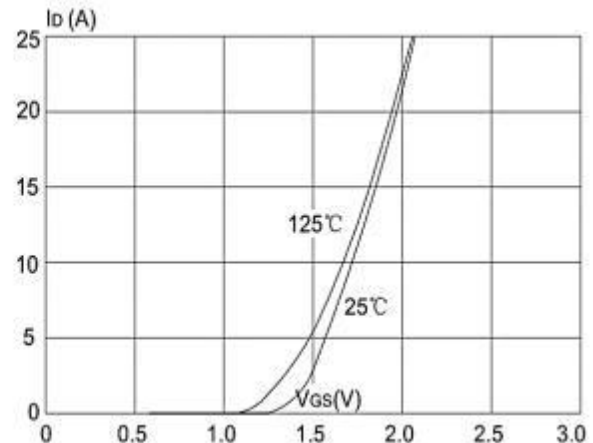


Figure 2: Typical Transfer Characteristics

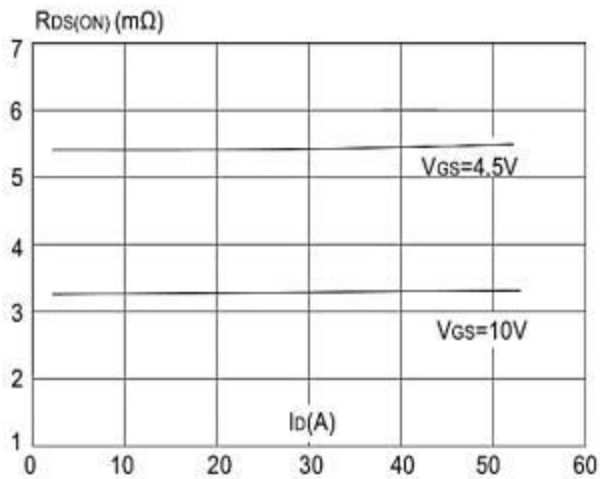


Figure 3: On-resistance vs. Drain Current

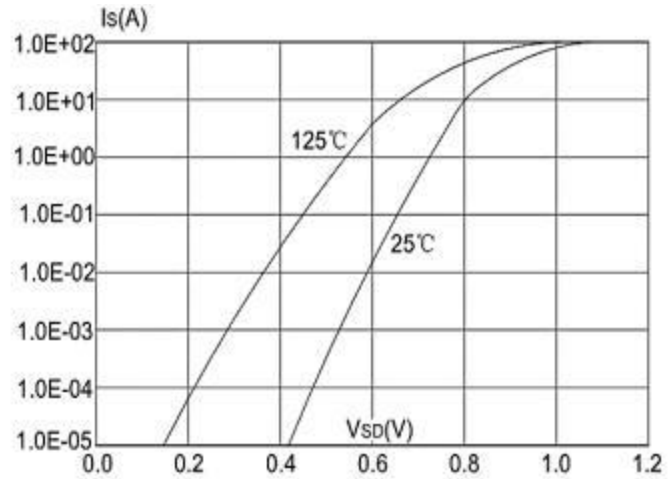


Figure 4: Body Diode Characteristics

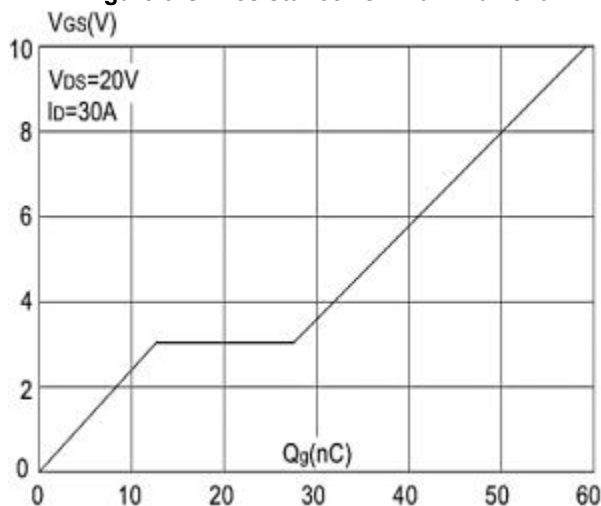


Figure 5: Gate Charge Characteristics

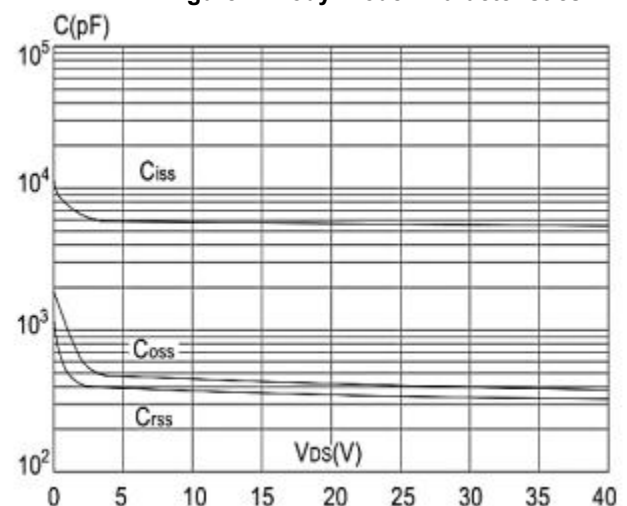


Figure 6: Capacitance Characteristics

Typical Characteristics

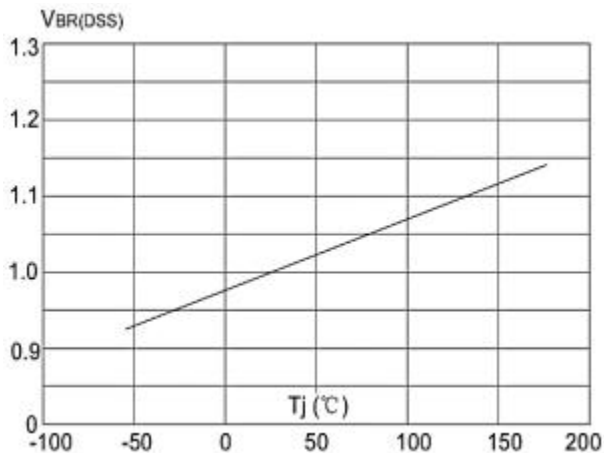


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

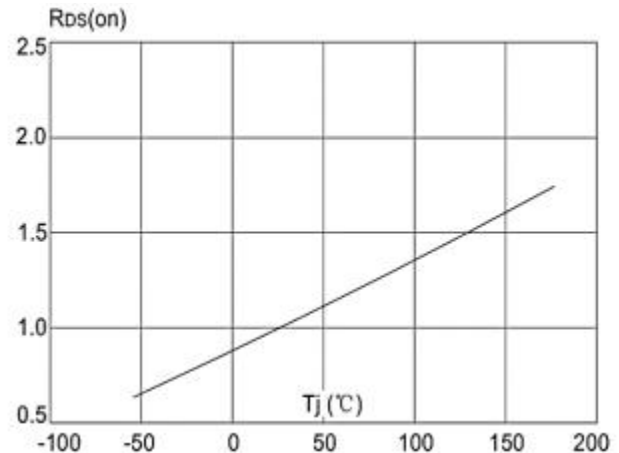


Figure 8: Normalized on Resistance vs. Junction Temperature

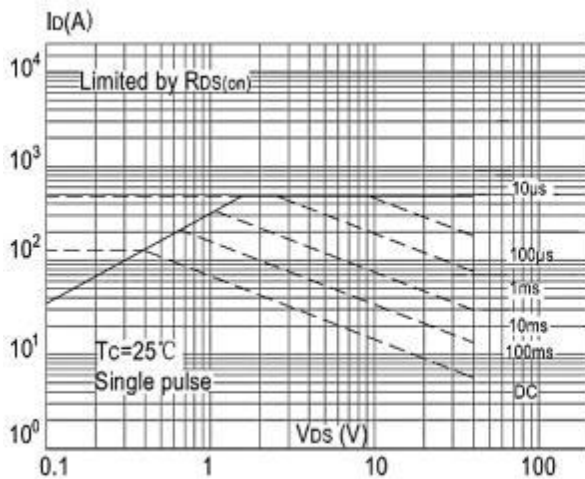


Figure 9: Maximum Safe Operating Area

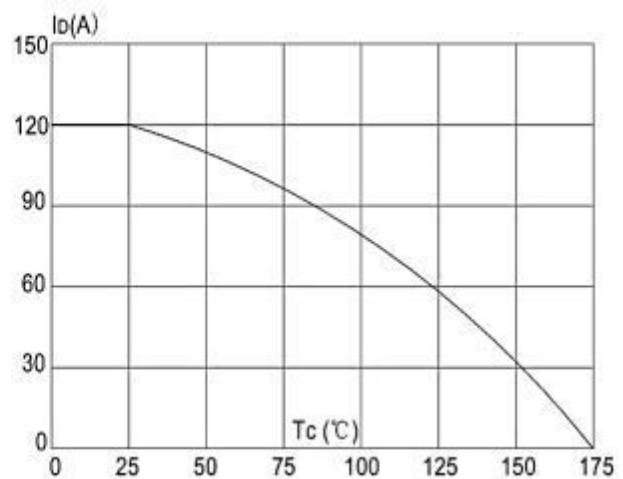


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

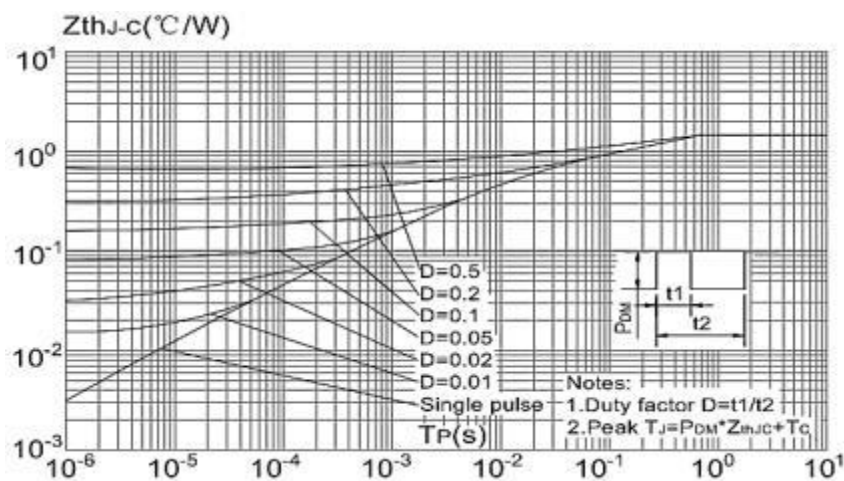
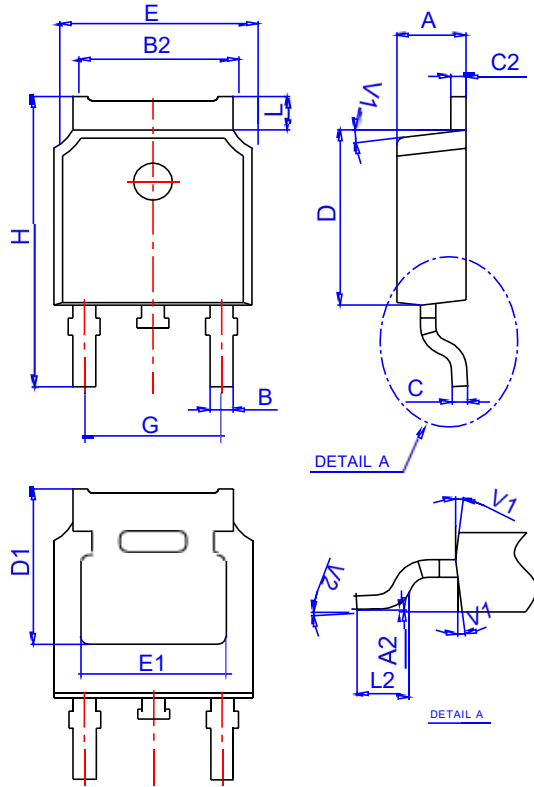


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

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