

Description

The SX4N15MI 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

$V_{DS} = 150V$ $I_D = 4A$

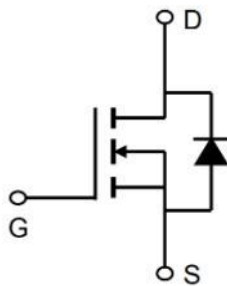
$R_{DS(ON)} < 320m\Omega @ V_{GS}=10V$

Application

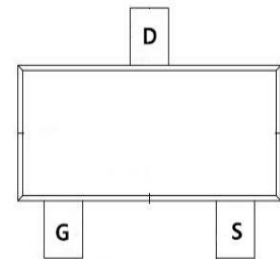
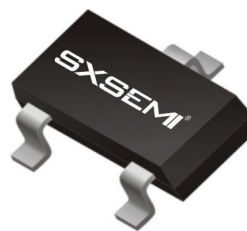
Automotive lighting

Load switch

Uninterruptible power supply



SOT-23-3L



Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Drain Current, $V_{GS} @ 10V$	4	A
$I_D @ T_C=100^\circ C$	Drain Current, $V_{GS} @ 10V$	1.5	A
IDM	Pulsed Drain Current ¹	9	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation	2	W
$P_D @ T_A=25^\circ C$	Total Power Dissipation ³	1.1	W
TSTG	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Maximum Thermal Resistance, Junction-ambient	125	°C/W
$R_{\theta JC}$	Maximum Thermal Resistance, Junction-case	80	°C/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	150	170		V
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	1.2	1.9	3.0	V
IGSS	Gate Leakage Current	VDS=0V, VGS=±20V			±100	nA
IDSS	Zero Gate Voltage Drain Current	VDS=150V, VGS=0V			1	μA
RDS(ON)	Drain-Source On-Resistance	VGS=10V, ID= 7A		280	320	mΩ
RDS(ON)	Drain-Source On-Resistance	VGS=4.5V, ID= 6A		300	380	mΩ
VSD	Diode Forward Voltage	IS=1.8A, VGS=0V		0.8	1.2	V
Qg	Total Gate Charge	VDS=75V, VGS=10V, ID=10A		17.5		nC
Qgs	Gate-Source Charge			4.5		nC
Qgd	Gate-Drain Charge			4.7		nC
Ciss	Input Capacitance	VDS=25V, VGS=0V, f=1MHz		538		pF
Coss	Output Capacitance			55		pF
Crss	Reverse Transfer Capacitance			21		pF
td(on)	Turn-On Delay Time	VDS=75V, RL =10.68Ω, VGEN=10V, RG=6Ω		11.6		ns
tr	Turn-On Rise Time			9.3		ns
td(off)	Turn-Off Delay Time			29.3		ns
tf	Turn-Off Fall Time			3.7		ns

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 power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

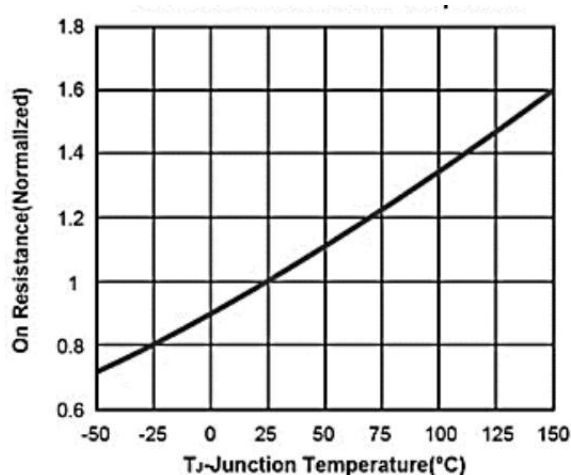


Fig.1 On Resistance Vs Junction Temperature

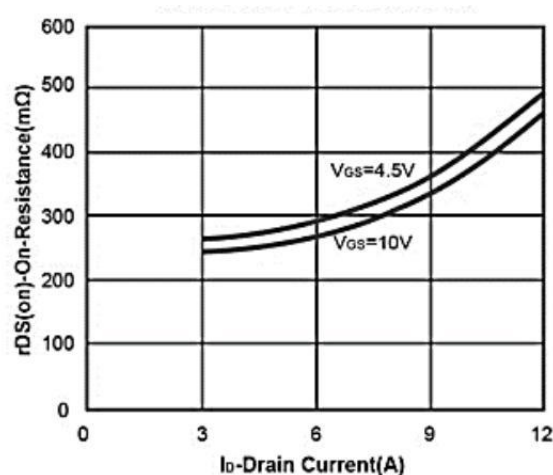


Fig.2 On-Resistance Vs. Drain Current

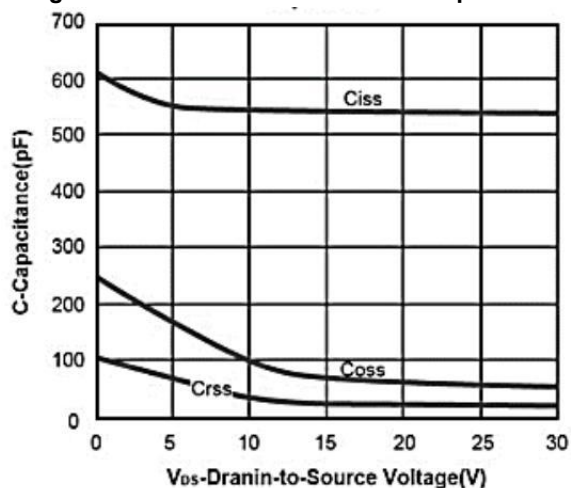


Fig.3 Capacitance

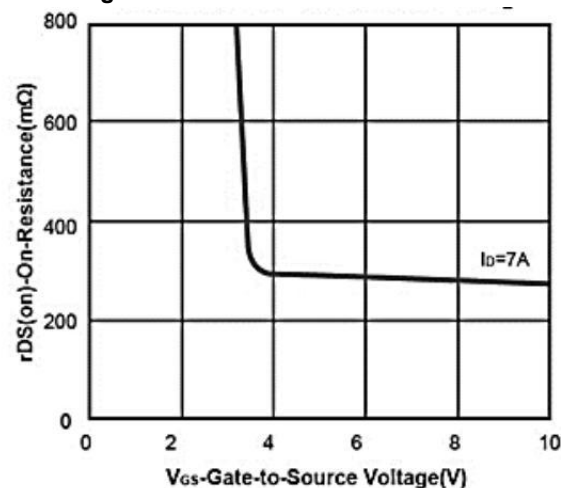


Fig.4 On-Resistance Vs. Gate-to-Source Voltage

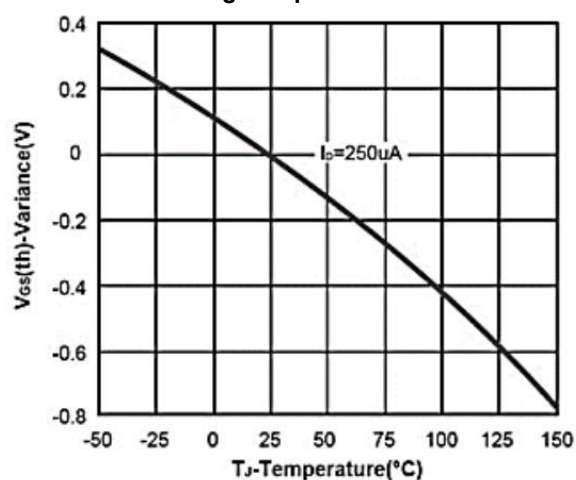


Fig.5 Threshold Voltage

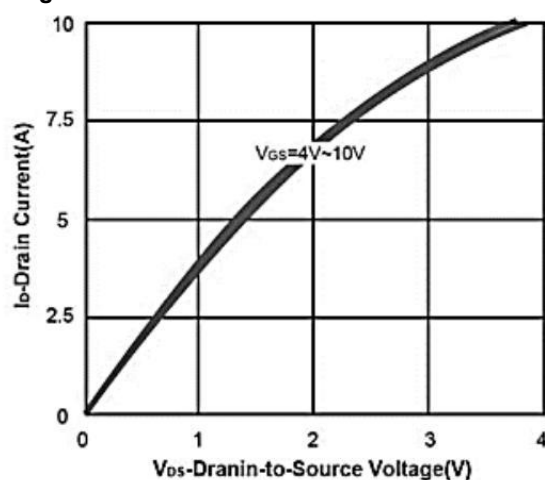


Fig.6 On-Region Characteristics

Typical Characteristics

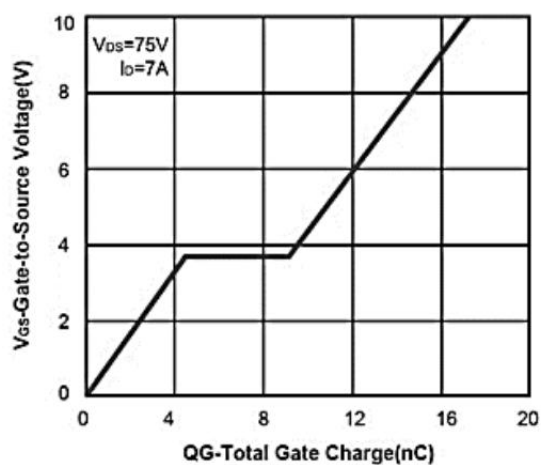


Fig.7 Gate Charge

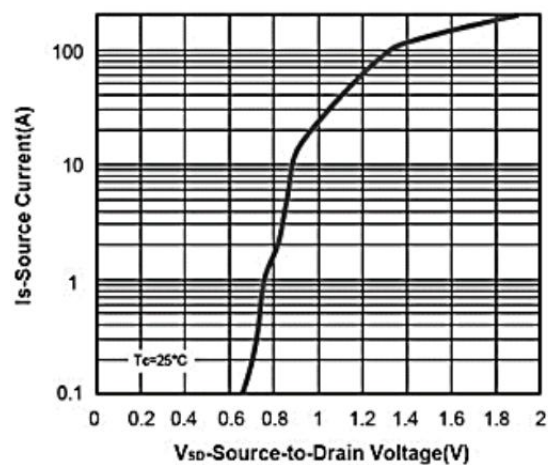


Fig.8 Body-diode Characteristic

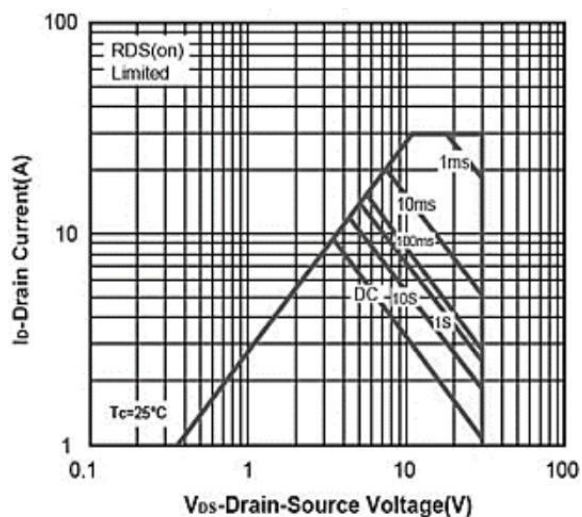


Fig.9 Safe Operating Area

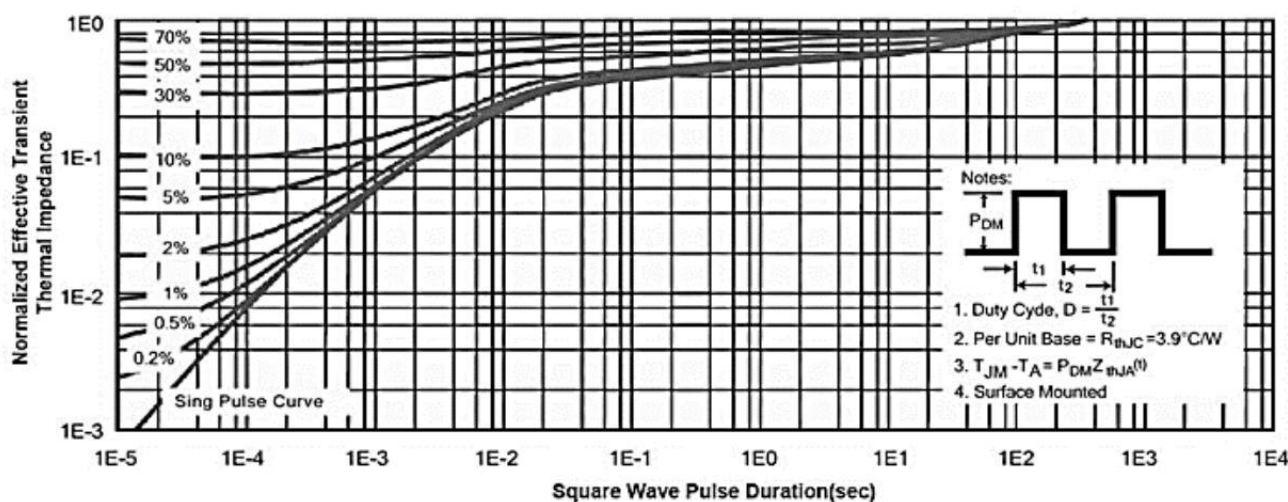
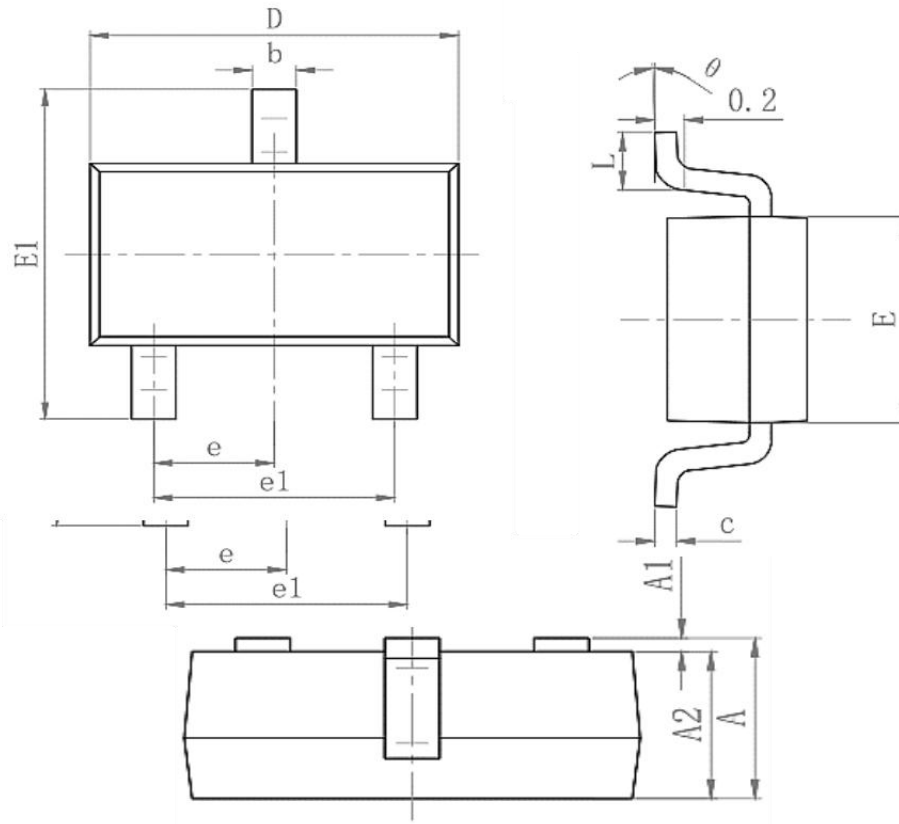


Fig.10 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-SOT23-3-XC-Single



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.25	0.45
c	0.100	0.200
D	2.820	3.020
E	1.5	1.7
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT23-3L		3000