

Description

The SX2320MI 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

$V_{DS} = 20V$ $I_D = 8A$

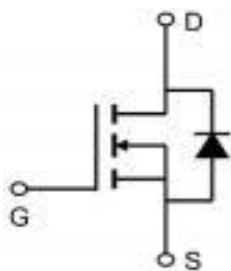
$R_{DS(ON)} < 12m\Omega$ @ $V_{GS}=4.5V$

Application

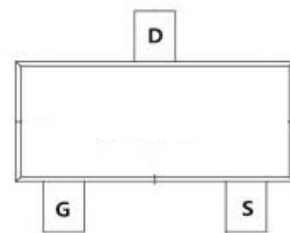
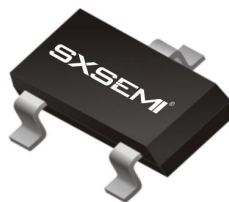
3.3V MCU Drive

Load switch

Uninterruptible power supply



SOT-23-3L



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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	20	V
VGSS	Gate-Source Voltage	± 12	V
$I_{D@TA=25^\circ C}$	Continuous Drain Current, $V_{GS} @ 4.5V$	8	A
$I_{D@TA=70^\circ C}$	Continuous Drain Current, $V_{GS} @ 4.5V$	4.5	A
IDM	Pulsed Drain Current ^{note1}	24	A
EAS	Single Pulsed Avalanche Energy ^{note2}	18	mJ
PD@TA=25°C	Power Dissipation	12	W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +175	°C
RθJA	Thermal Resistance Junction-Ambient ¹	125	°C/W
RθJC	Thermal Resistance, Junction to Case	3.8	°C/W

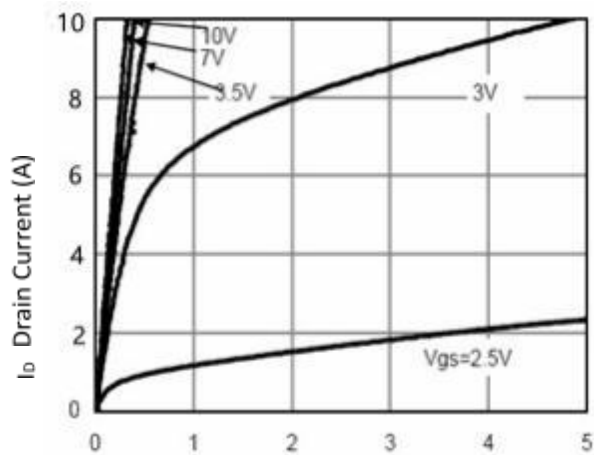
Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	20	22	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V	-	-	1	μA
IGSS	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.5	0.65	1.2	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =6A	-	8.5	12	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =2.5V, I _D =3A	-	10	15	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A	10	-	-	S
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, F=1.0MHz		625		PF
C _{oss}	Output Capacitance			162		PF
C _{rss}	Reverse Transfer Capacitance			105		PF
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =10V R _L =0.5Ω, R _{GEN} =3Ω	-	4.5	-	nS
t _r	Turn-on Rise Time		-	9.2	-	nS
t _{d(off)}	Turn-Off Delay Time		-	18.7	-	nS
t _f	Turn-Off Fall Time		-	3.3	-	nS
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =10V, I _D =20A		15		nC
Q _{gs}	Gate-Source Charge			1.8		nC
Q _{gd}	Gate-Drain Charge			2.8		nC
V _{SD}	Diode Forward Voltage (Note 3)	V _{GS} =0V, I _S =25A	-	-	1.2	V
I _S	Diode Forward Current (Note 2)		-	-	25	A
t _{rr}	Reverse Recovery Time	T _J = 25°C, I _F = 20A di/dt = 100A/μs	-	18	-	nS
Q _{rr}	Reverse Recovery Charge		-	9.5	-	nC
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

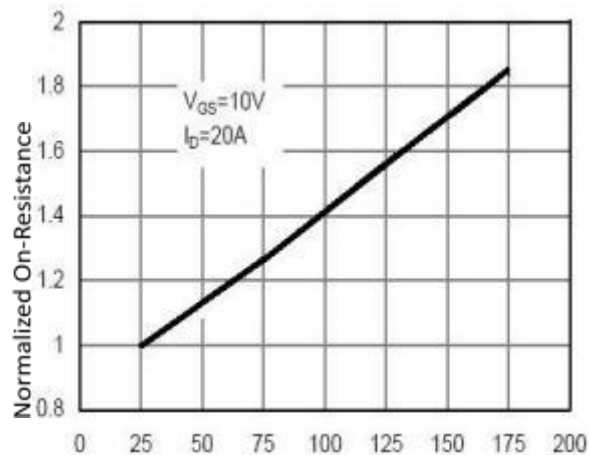
Note :

- 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 ≤ 300us , duty cycle ≤ 2%
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

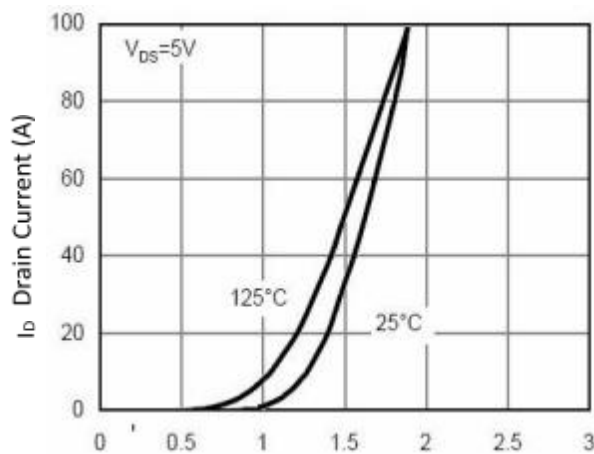
Typical Characteristics



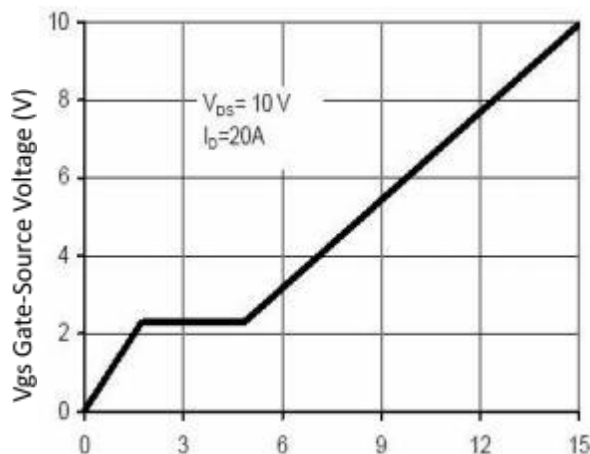
V_{ds} Drain-Source Voltage (V)
Figure 1 Output Characteristics



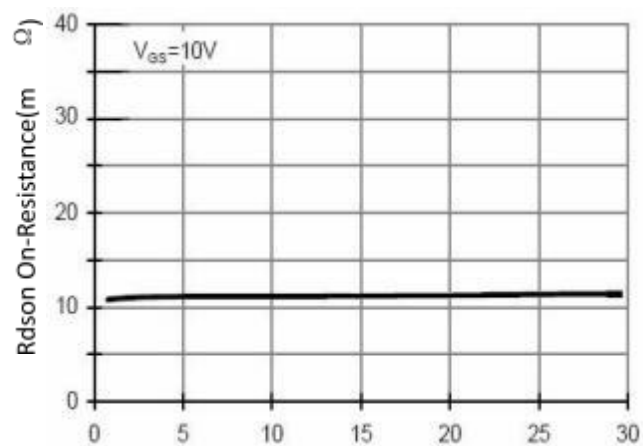
T_J-Junction Temperature(°C)
Figure 4 Rdson-Junction Temperature



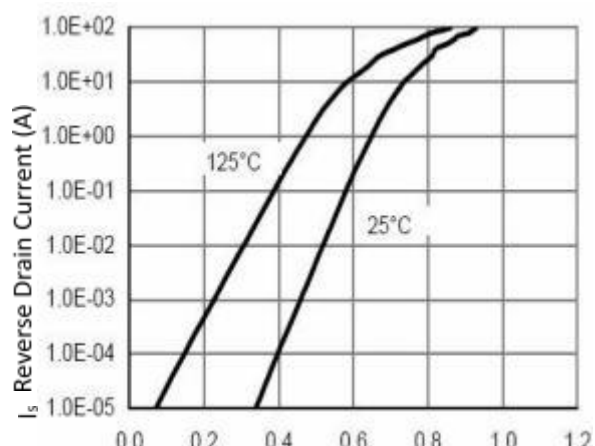
V_{gs} Gate-Source Voltage (V)
Figure 2 Transfer Characteristics



Q_g Gate Charge (nC)
Figure 5 Gate Charge

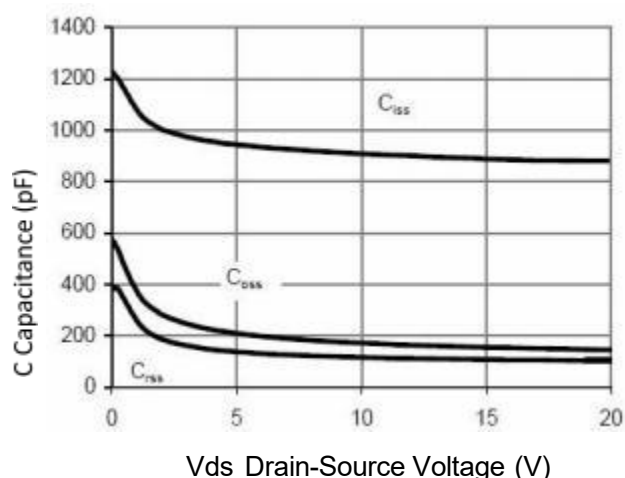


I_D- Drain Current (A)
Figure 3 Rdson- Drain Current

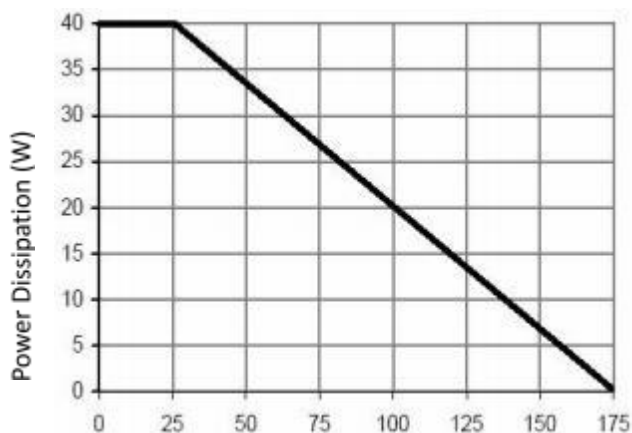


V_{sd} Source-Drain Voltage (V)
Figure 6 Source- Drain Diode Forward

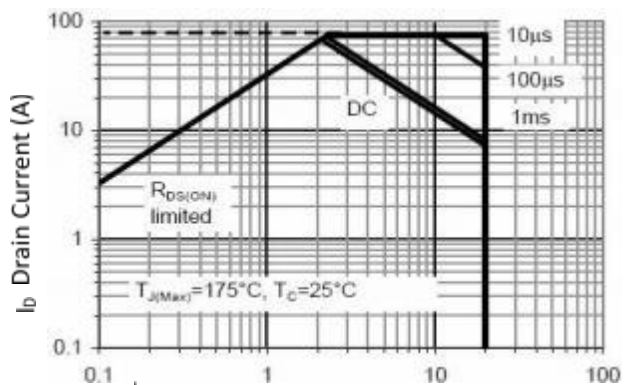
Typical Characteristics



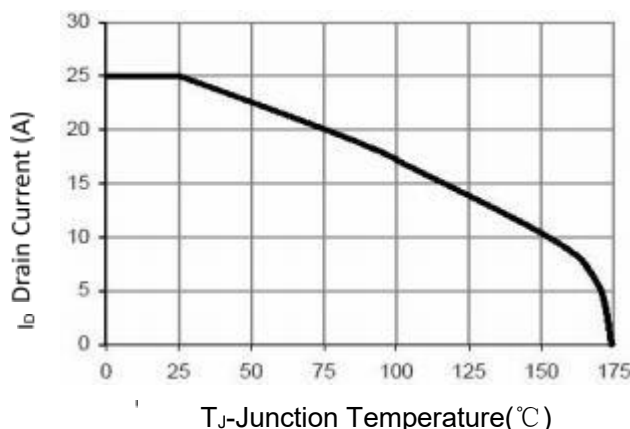
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



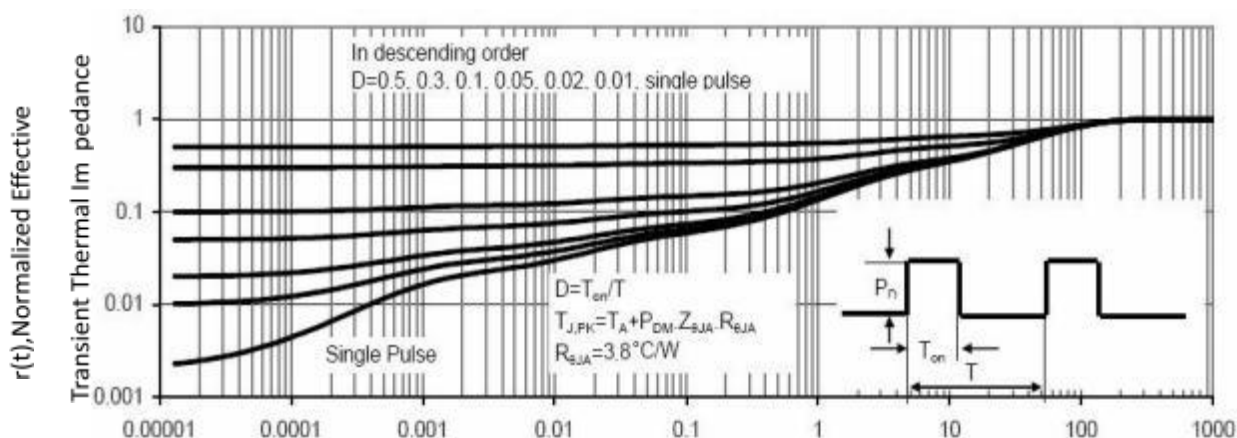
Tj-Junction Temperature(°C)
Figure 9 Power De-rating



Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area

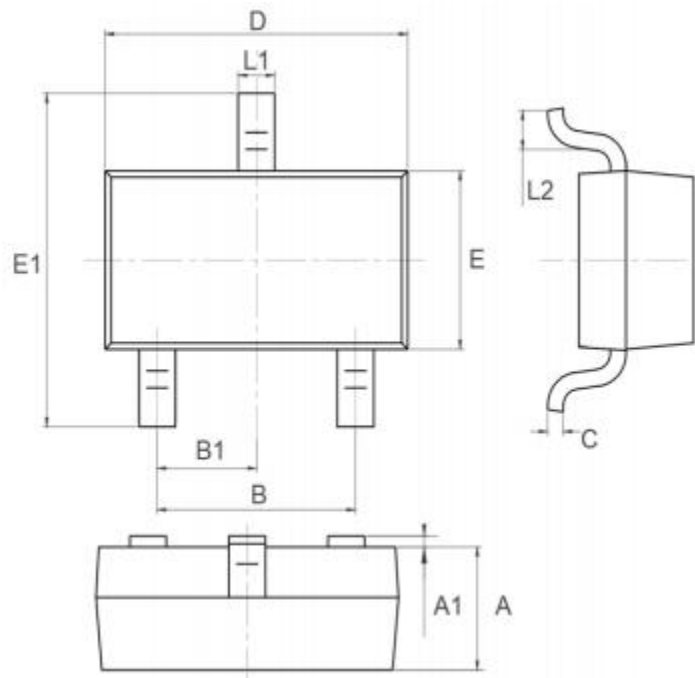


Tj-Junction Temperature(°C)
Figure 10 Current De-rating



Square Wave Pulse Duration(sec)
Figure 11 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data- SOT23-3L-Single



Symbol	Dim in mm		
	Min	Typ	Max
A	1	1.1	1.2
A1	0	0.05	0.1
B	1.8	1.9	2
B1	0.95TYP		
C	0.1	0.15	0.2
D	2.82	2.92	3.02
E	1.5	1.6	1.7
E1	2.65	2.8	2.95
L1	0.3	0.4	0.5
L2	0.3	0.45	0.6

Package Marking and Ordering Information

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