

Description

The SX2313MI 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

$V_{DS} = -12V$ $I_D = -8A$

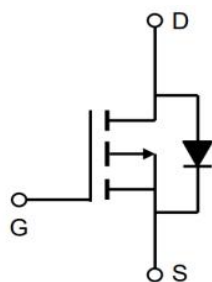
$R_{DS(ON)} < 20m\Omega$ @ $V_{GS}=4.5V$

Application

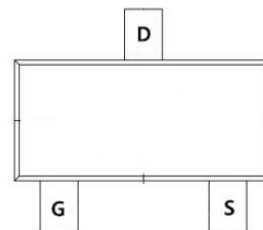
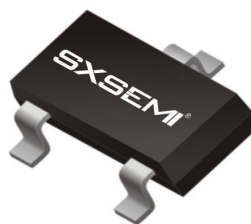
Lithium battery protection

Wireless impact

Mobile phone fast charging



SOT-23-3L



Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-12	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^{\circ}C$	Continuous Drain Current	8.0	A
$I_D@T_A=70^{\circ}C$	Continuous Drain Current	5.3	A
I_{DM}	Pulsed Drain Current ²	40	A
$P_D@T_A=25^{\circ}C$	Total Power Dissipation ³	1	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	125	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ ($t \leq 10s$)	85	$^{\circ}C/W$

Electrical Characteristics (T_c=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	-12	-16	-	V
ΔBVDSS/ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C , I _D =1mA	---	0.029	---	V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-0.4	-0.7	-1.0	V
R _{DS(on)}	Static Drain-Source on-Resistance note2	V _{GS} = -4.5V, I _D = -8A	-	16	20	mΩ
		V _{GS} = -2.5V, I _D = -5A	-	20	25	
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -12V, V _{GS} =0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
C _{iss}	Input Capacitance	V _{DS} = -6V, V _{GS} =0V, f=1.0MHz	-	2700	-	pF
C _{oss}	Output Capacitance		-	680	-	pF
C _{rss}	Reverse Transfer Capacitance		-	590	-	pF
Q _g	Total Gate Charge	V _{DS} = -6V, I _D = -8A, V _{GS} = -4.5V	-	35	-	nC
Q _{gs}	Gate-Source Charge		-	5	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	10	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} = -6V, I _D = -8A, V _{GS} = -4.5V, R _{GEN} =2.5Ω	-	11	-	ns
t _r	Turn-on Rise Time		-	35	-	ns
t _{d(off)}	Turn-off Delay Time		-	30	-	ns
t _f	Turn-off Fall Time		-	10	-	ns
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-16	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-64	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S = -16A	-	-0.8	-1.2	V

Notes:

- 1 、 Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2 、 Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Characteristics

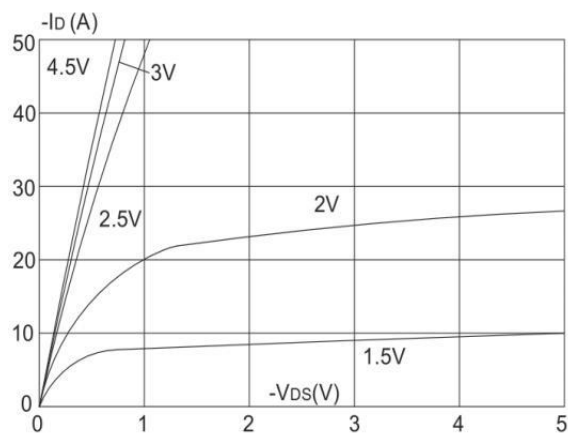


Figure 1: Output Characteristics

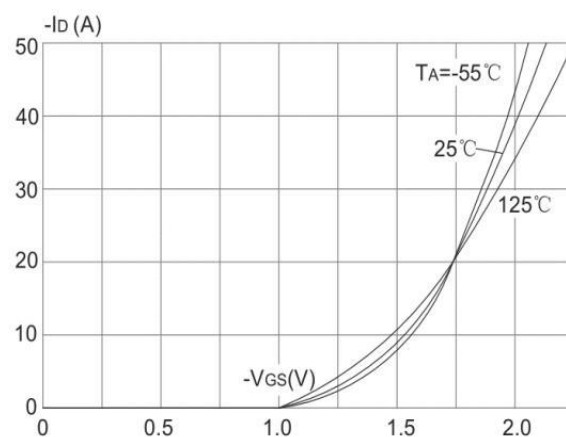


Figure 2: Typical Transfer Characteristics

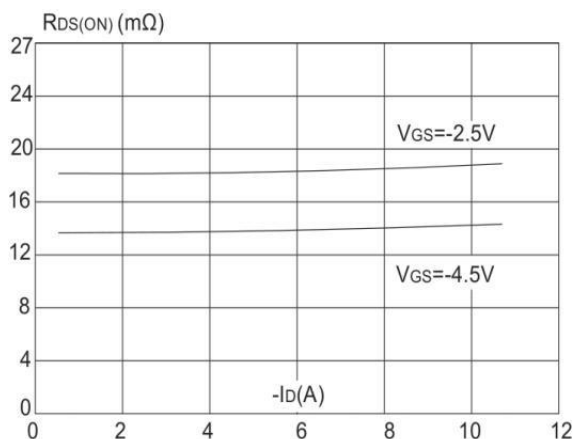


Figure 3: On-resistance vs. Drain Current

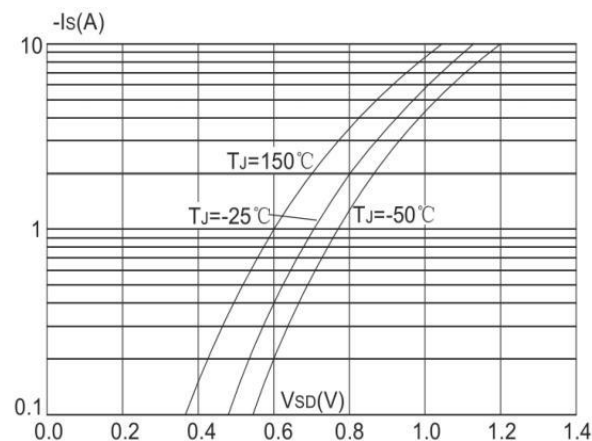


Figure 4: Body Diode Characteristics

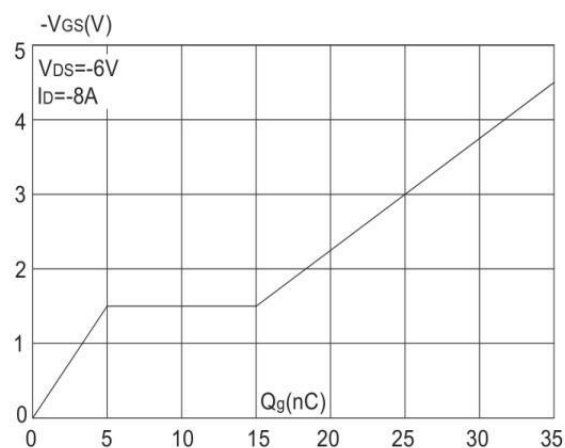


Figure 5: Gate Charge Characteristics

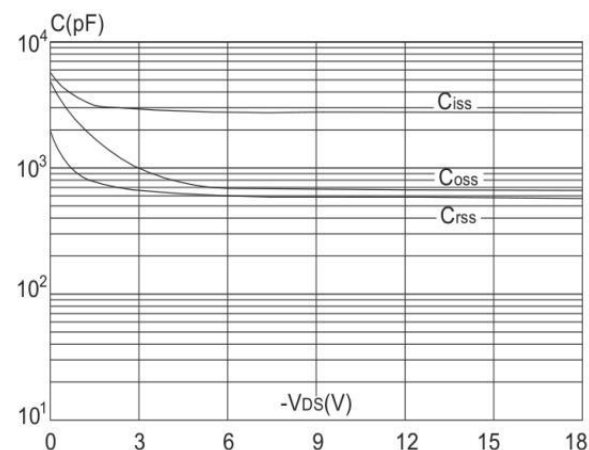


Figure 6: Capacitance Characteristics

Typical Characteristics

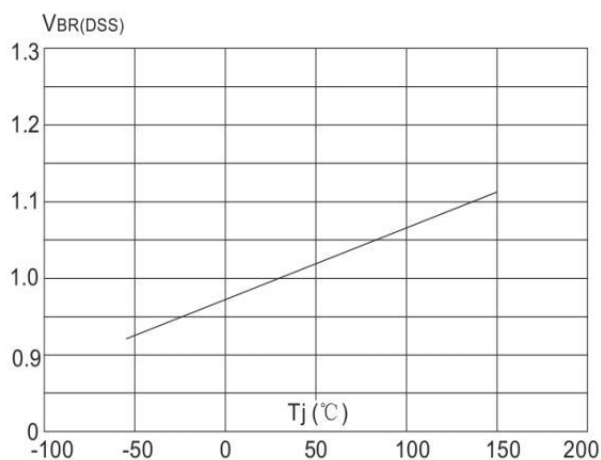


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

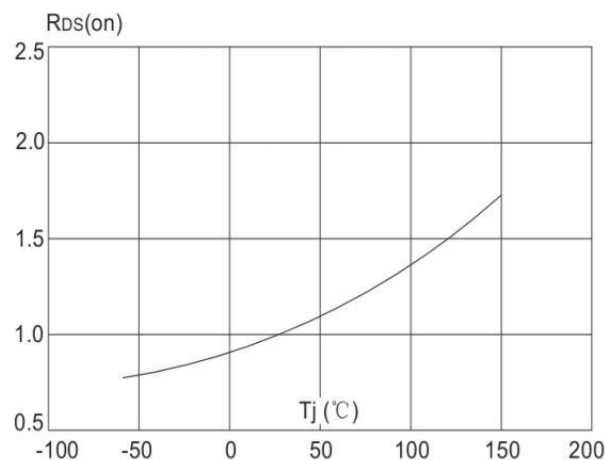


Figure 8: Normalized on Resistance vs. Junction Temperature

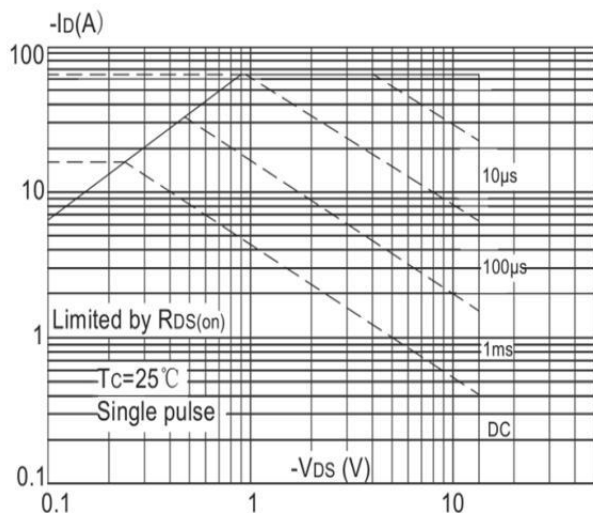


Figure 9: Maximum Safe Operating Area Case Temperature

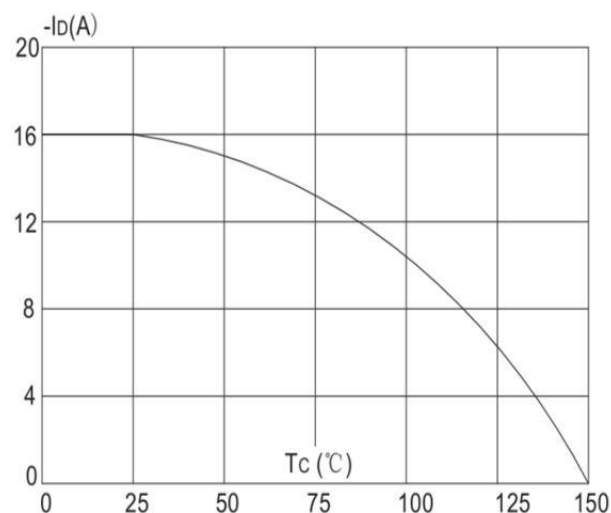


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

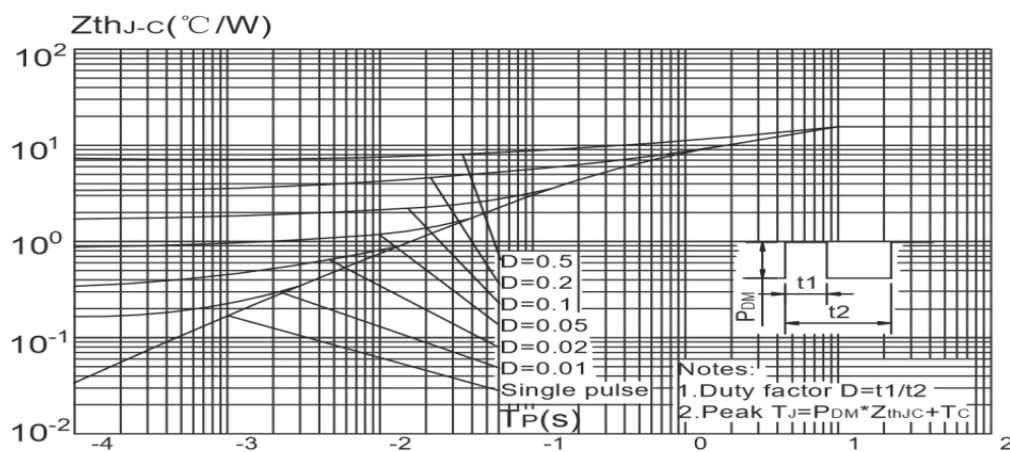
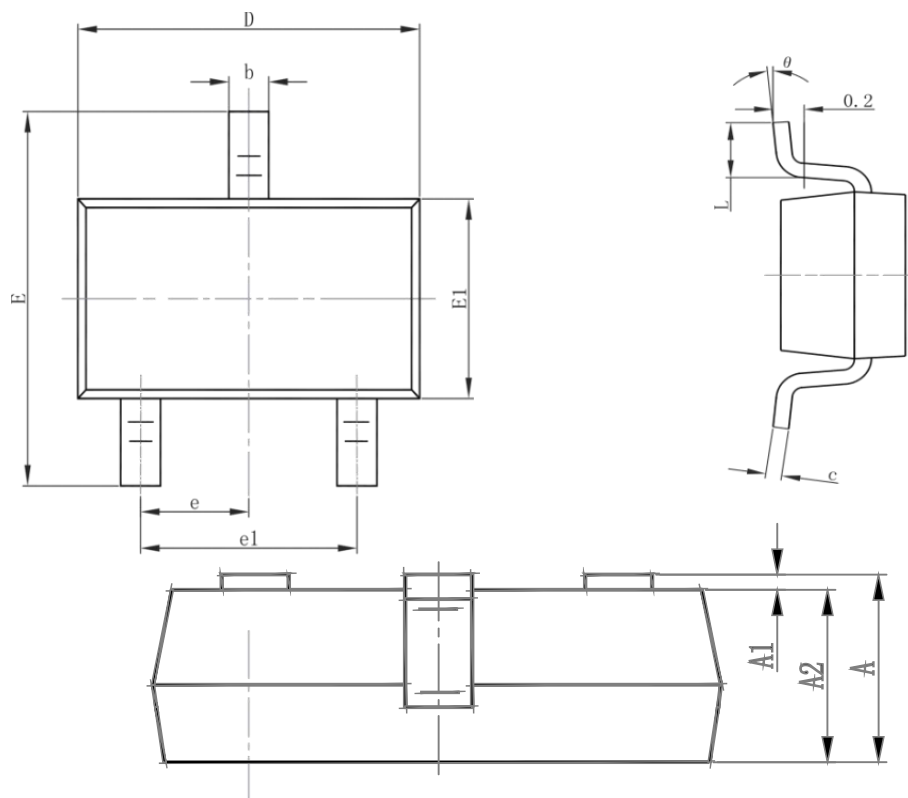


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

MOSFET Package Mechanical Data-SOT23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT-23-3L		3000