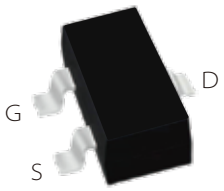
FEATURES

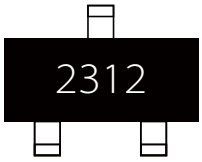
- TrenchFET® Power MOSFET
- 100 % Rg Tested



SOT-23

APPLICATION

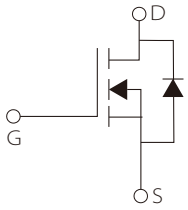
- Case: SOT-23
- DC/DC ConvertersLoad switch
- Load Switch for Portable Applications



Marking

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003



Schematic Symbol

ABSOLUTE MAXIMUM RATINGS(T_a=25℃)

Parameter		Symbol	Max.	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current (TJ = 150 °C)	T_C=25°C	I_D	6[a]	A
	T_C=70°C		5.1	
	T_A=25°C		5[b,C]	
	T_A=70°C		4[b,C]	
Pulsed Drain Current		I_{DM}	20	
Continuous Source-Drain Diode Current	T_C=25°C	I_S	1.75	A
	T_A=25°C		1.04[b,C]	
Maximum Power Dissipation	T_C=25°C	P_D	2.1	W
	T_C=70°C		1.3	
	T_A=25°C		1.25[b,C]	
	T_A=70°C		0.8[b,C]	
Maximum Junction-to-Ambient[b, d]	t ≤ 5 s	R_{thJA}	80-100	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	40-60	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

Notes:
a. Package limited
b. Surface Mounted on 1" x 1" FR4 board.
c. t = 5 s
d. Maximum under steady state conditions is 125 °C/W
e. Based on TC = 25 °C

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS}=0V, I_D=250μA	20			V
V_{DS} Temperature Coefficient	ΔV_{DS} / T_J	I_D=250uA		25		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$ / T_J			-2.6		
Gate-Source Leakage	$V_{GS(th)}$	V_{DS}=V_{GS}, V_{GS}=250uA	0.45		1.0	V
Gate-Source Leakage	I_{GSS}	V_{GS}=±8V ,V_{DS}=0V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V			1	uA
		V_{DS}=20V,V_{GS}=0V,T_J=70°C			10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤5V, V_{GS} =4.5V	20			A
		V_{GS}=4.5V, I_D=5.0A		0.028		
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS}=2.5V, I_D=4.7A		0.042		Ω
		V_{GS}=1.8V, I_D=4.3A		0.050		
Forward Transconductance[a]	g_{fs}	V_{DS}=10V, I_D=5.0A		24		S
Dynamic[b]						
Input capacitance	C_{ISS}	V_{DS} = 10V, V_{GS} = 0V, f=1MHz		865		pF
Output capacitance	C_{OSS}			105		
Reverse Transfer capacitance	C_{rss}			55		
Total Gate Charge	Q_g	V_{DS}=10V,I_D=5.0A,V_{GS}=5V		12	18	nC
		V_{DS}=10V,I_D=5.0A,V_{GS}=4.5V		8.8	14	
Gate-source charge	Q_{gs}			1.1		
Gate-drain charge	Q_{gd}			0.7		
Gate Resistance	R_g	f = 1 MHz	0.5	2.4	4.8	Ω
Turn-on Delay Time	td(on)	V_{DD}=10V,I_D=4A, R_L=2.2Ω V_{GEN}=4.5V, R_g=1Ω		8	16	ns
Rising time	tf			17	26	
Turn-off Delay Time	td(off)			31	47	
Input capacitance	tf			8	16	
Turn-on Delay Time	td(on)	V_{DD}=10V,I_D=4A, R_L=2.2Ω V_{GEN}=5V, R_g=1Ω		5	10	ns
Rising time	tf			13	20	
Turn-off Delay Time	td(off)			21	32	
Input capacitance	tf			6	12	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C=25°C			1.75	A
Pulse Diode Forward Current	I_{SM}				20	
Body Diode Voltage	V_{SD}	I_S=4A, V_{GS}=0V		0.75	1.2	V
Body Diode Reverse Recovery Time	Trr	I_F=4A, T_C=25°C dI_F/dt=100A/us		12	20	ns
Body Diode Reverse Recovery Charge	Qrr			5	10	uC
Reverse Recovery Fall Time	Irrm			7		ns
Reverse Recovery Fall Time	Irrm			5		

Notes:
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 % b. Guaranteed by design, not subject to production testing.

PARAMETER CHARACTERISTIC CURVE

Fig 1: Output Characteristics

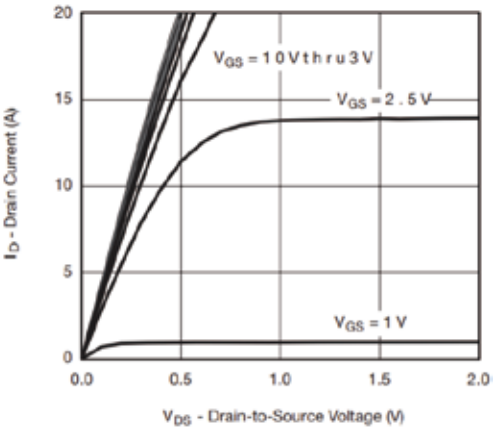


Figure 2: Transfer Characteristics

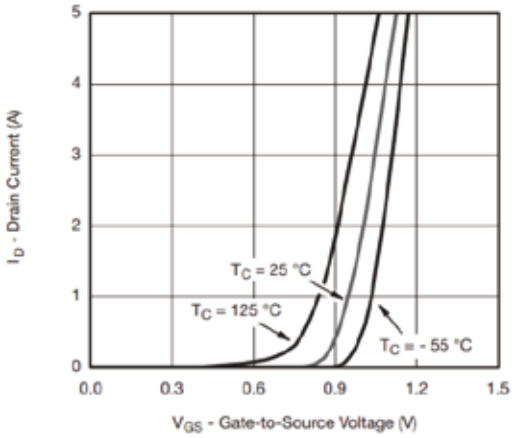


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

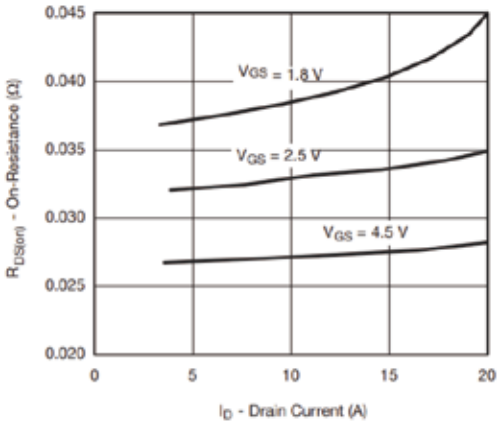


Figure 4: Capacitance

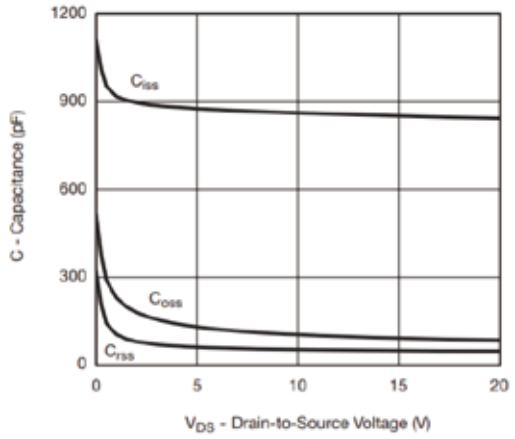


Figure 5: Gate Charge

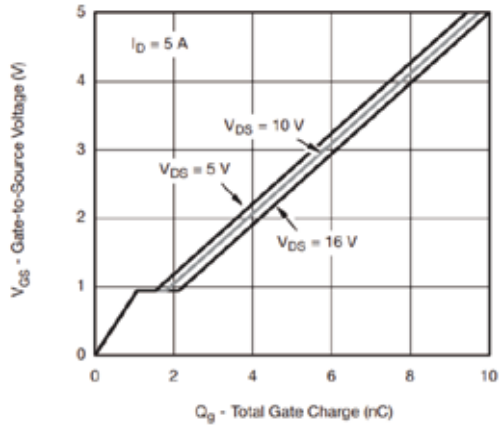


Figure 6: On-Resistance vs. Junction Temperature

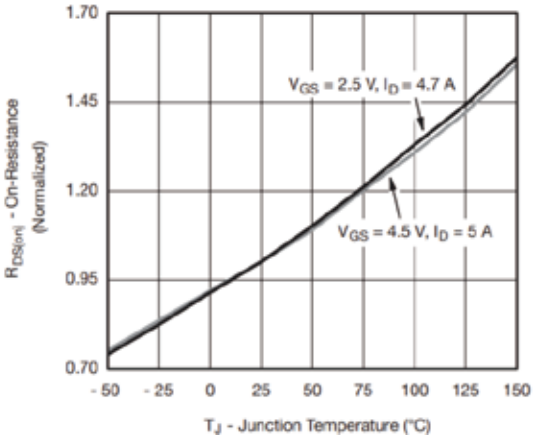


Figure 7: Source-Drain Diode Forward Voltage

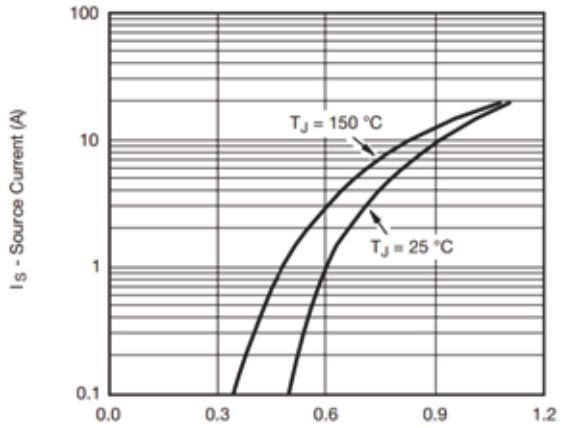


Figure 8: On-Resistance vs. Gate-to-Source Voltage

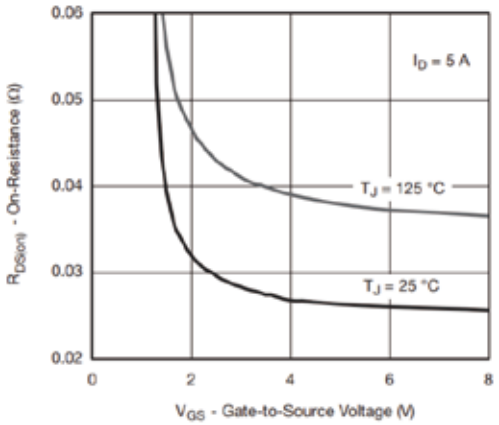


Figure 9: Threshold Voltage

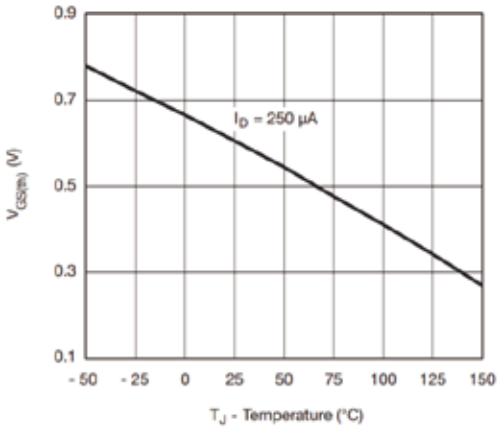


Figure 10: Single Pulse Power (Junction-to-Ambient)

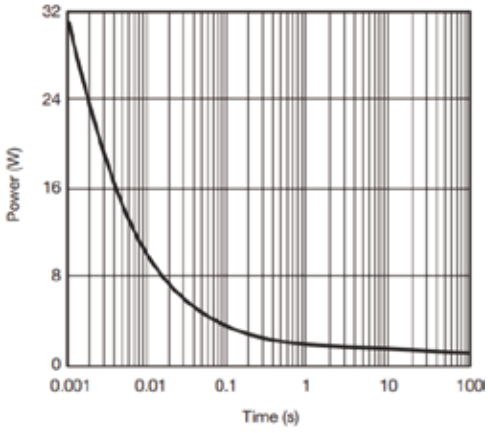


Figure 11: Current Derating*

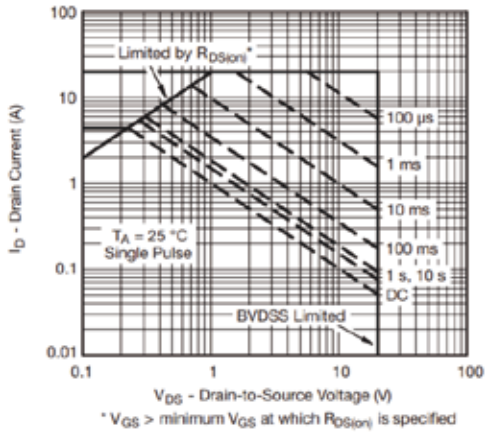


Figure 12: Safe Operating Area, Junction-to-Ambient

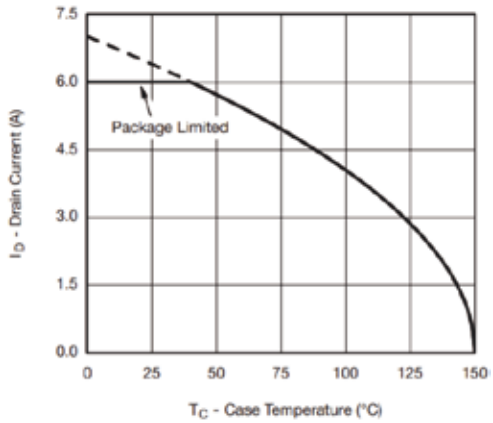


Figure 13: Power Derating, Junction-to-Foot

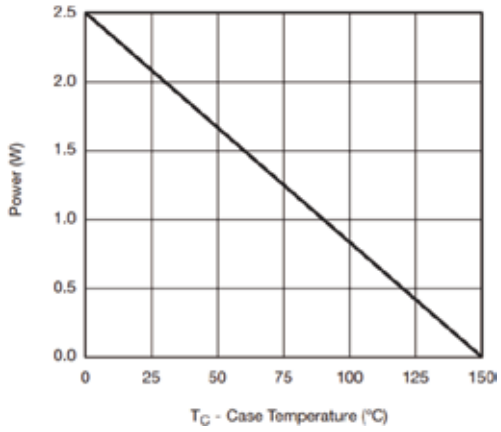


Figure 14: Power Derating, Junction-to-Ambient

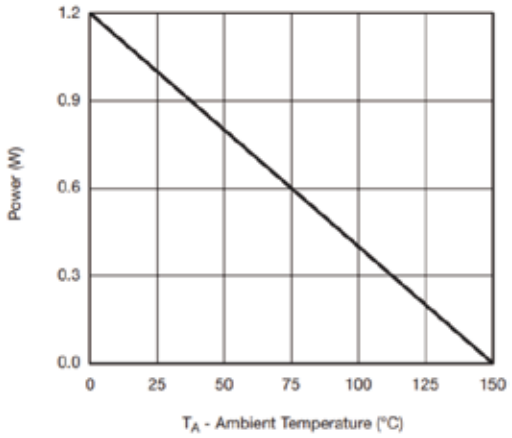


Figure 15: Normalized Thermal Transient Impedance, Junction-to-Ambient

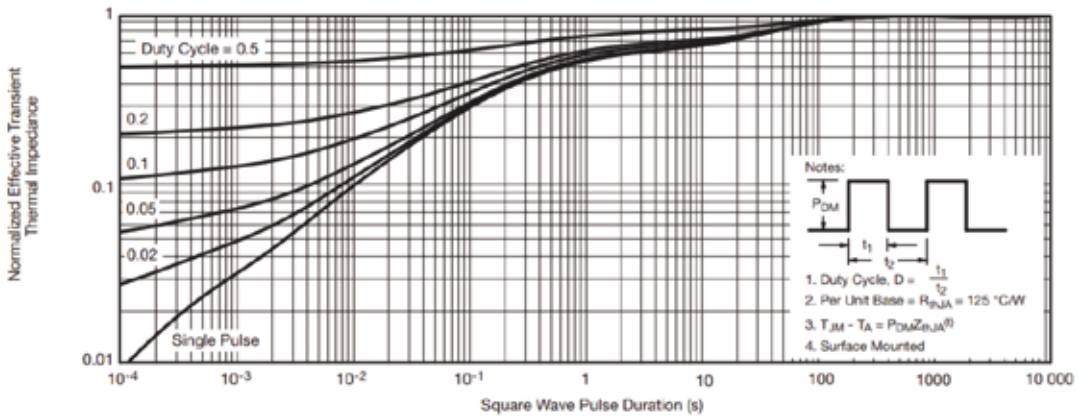
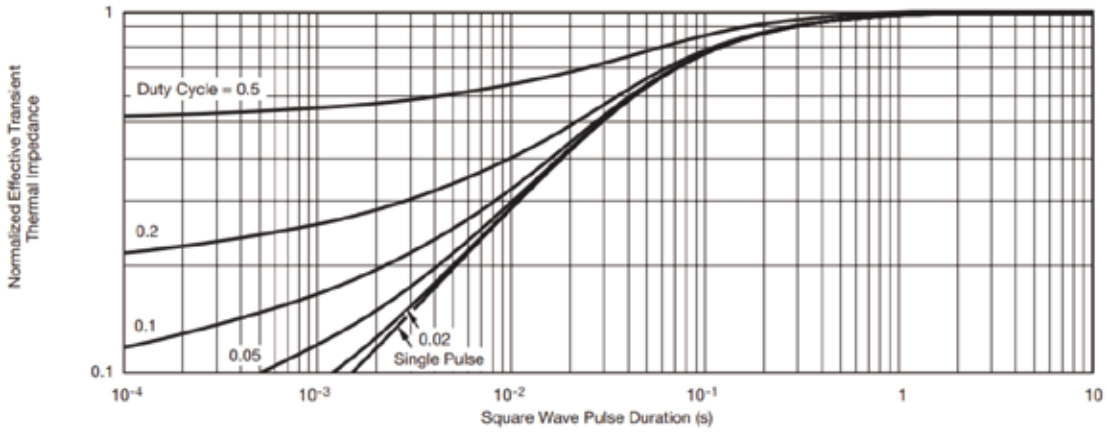
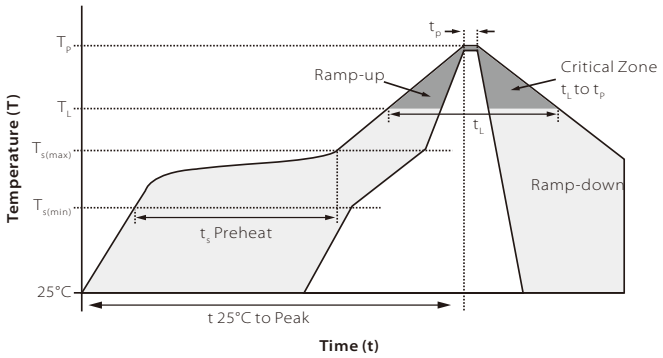


Figure 16: Normalized Thermal Transient Impedance, Junction-to-Foot

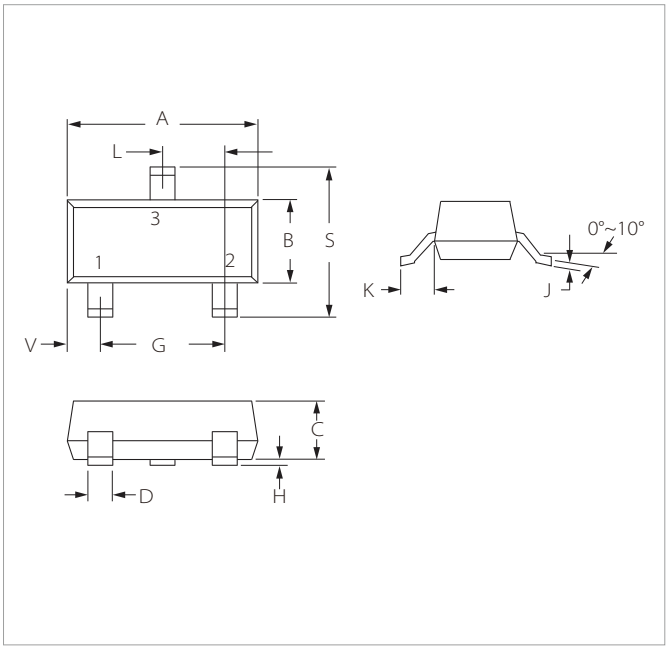


SOLDERING PARAMETERS

Reflow Condition		Lead–free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

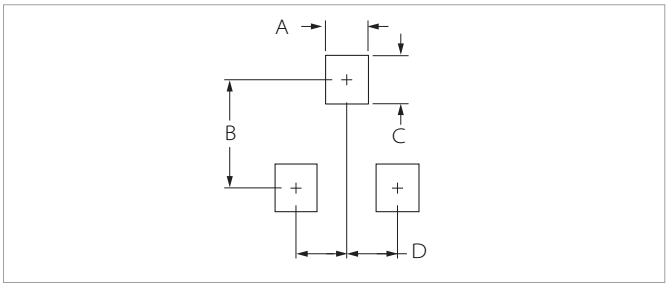


SOT-23 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.80	3.04	0.110	0.120
B	1.20	1.40	0.047	0.055
C	0.89	1.11	0.035	0.044
D	0.37	0.50	0.015	0.020
G	1.78	2.04	0.070	0.081
H	0.01	0.100	0.001	0.004
J	0.085	0.180	0.003	0.007
K	0.35	0.69	0.014	0.029
L	0.89	1.02	0.035	0.040
S	2.10	2.64	0.083	0.104
V	0.45	0.60	0.018	0.024

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.71	0.97	0.028	0.038
B	1.88	2.13	0.074	0.084
C	0.71	0.97	0.028	0.038
D	0.81	1.07	0.032	0.042

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SNM2312S	SOT-23	3000PCS	7″

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Email: fae01@semiware.com

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Ext: 8868
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