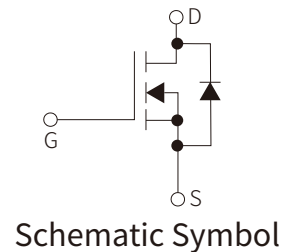


## FEATURES

- | High Density Cell Design For Low  $R_{DS(On)}$
- | Voltage Controlled Small Signal Switch
- | Rugged and Reliable
- | High Saturation Current Capability
- | Lead free product is acquired



## APPLICATION

- | Direct logic-level interface: TTL/CMOS
- | Drivers: relays, solenoids, lamps
- | hammers, display, memories, etc.
- | Battery operated systems
- | Solid-state relays

## APPROVALS

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

## ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ )

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Continuous Drain Current	$I_D$	2.3	A
Continuous Source-Drain Current(Diode Conduction)	$I_S$	0.6	A
Power Dissipation	$P_D$	0.35	W
Operating Junction	$T_J$	150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 to 150	$^{\circ}\text{C}$
Thermal Resistance from Junction to Ambient ( $t \leq 5s$ )	$R_{\theta JA}$	357	$^{\circ}\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =10μA	20			V
Gate-source leakage <sup>a</sup>	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	uA
Gate-source threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =50μA	0.65	0.95	1.2	V
Drain-source on-state resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.5A		0.055	0.085	Ω
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.1A		0.070	0.125	Ω
Forward tranconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =2.5A		8		S
Diode forward voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> =0.94A, V <sub>GS</sub> =0V		0.76	1.2	V
<b>Dynamic</b>						
Input capacitance <sup>b</sup>	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz		300		pF
Output capacitance <sup>b</sup>	C <sub>oss</sub>			120		pF
Reverse transfer capacitance <sup>b</sup>	C <sub>rss</sub>			80		pF
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.5A		4.0	10	nC
Gate-source charge	Q <sub>gS</sub>			0.65		nC
Gate-drain charge	Q <sub>gD</sub>			1.5		nC
<b>Switching<sup>b</sup></b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, V <sub>GEN</sub> =4.5V I <sub>D</sub> =2.5A, R <sub>G</sub> =6Ω, R <sub>L</sub> =5.5Ω		7	15	ns
Rise Time	t <sub>r</sub>			55	80	ns
Turn-Off Delay Time	t <sub>d(off)</sub>			16	60	ns
Fall yime	t <sub>f</sub>			10	25	ns

Notes:

a. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

b. These parameters have no way to verify.

# PARAMETER CHARACTERISTIC CURVE

Figure 1: Output Characteristics

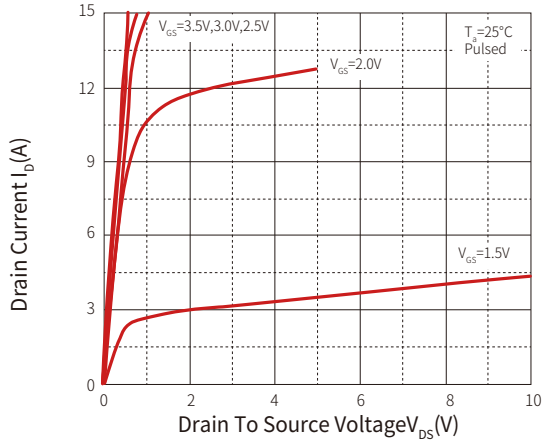


Figure 2: Transfer Characteristics

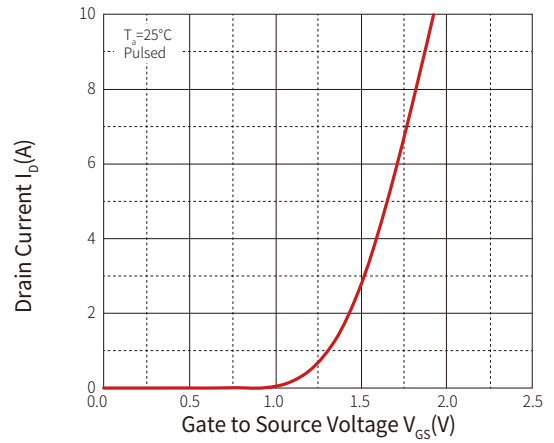


Figure 3:  $R_{DS(ON)}$  -  $I_D$

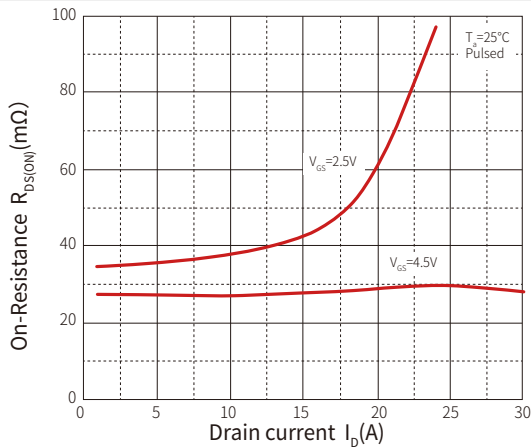
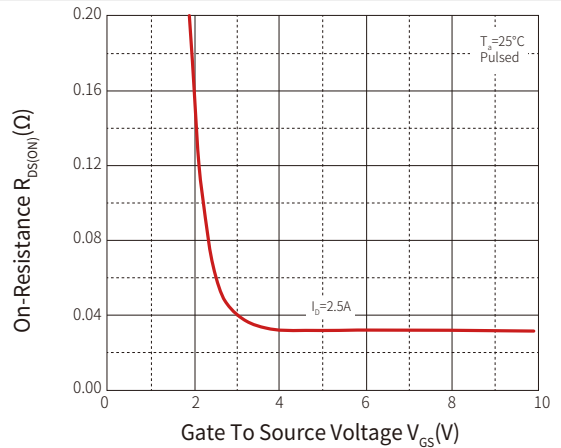
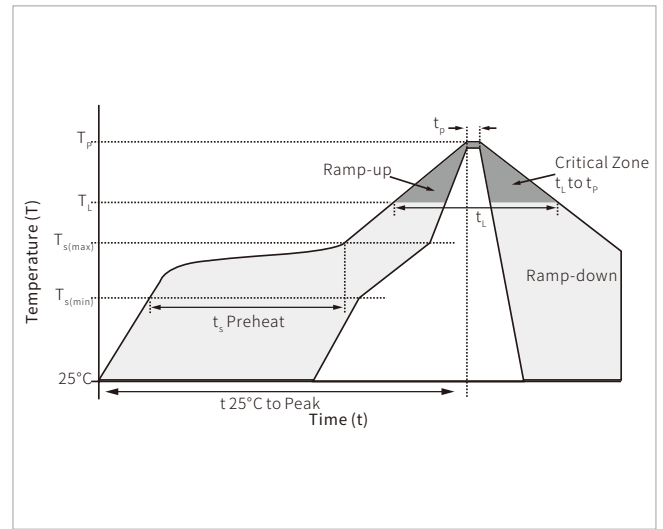


Figure 4:  $R_{DS(ON)}$  -  $V_{GS}$

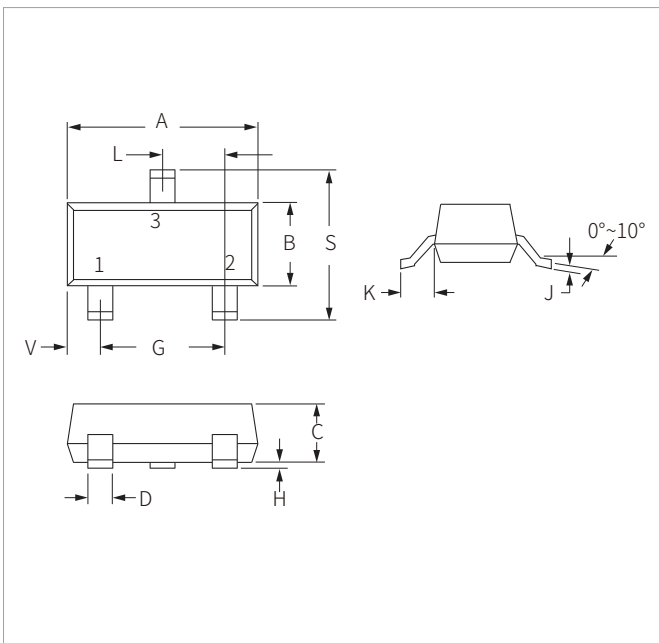


## SOLDERING PARAMETERS

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

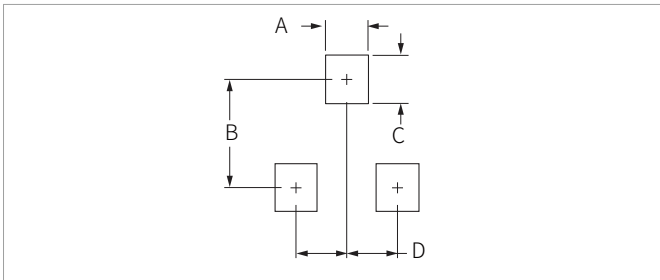


## SOT-23 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.80	3.05	0.110	0.120
B	1.20	1.40	0.047	0.055
C	0.90	1.15	0.035	0.045
D	0.37	0.50	0.015	0.020
G	1.75	2.05	0.069	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	2.65	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
SNM2302	SOT-23	3000PCS	7"

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