

## FEATURES

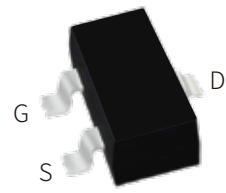
Ultra low on-resistance:  $V_{DS}=40V, R_{DS(ON)} \leq 45m\Omega$

@  $V_{GS}=10V, I_D=3.9A$

For Low power DC to DC converter application

For Load switch application

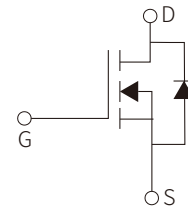
Surface Mount device



SOT-23



Marking



Schematic Symbol

## APPLICATION

Case: SOT-23

Case Material: Molded Plastic. UL flammability

Classification Rating: 94V-0

## APPROVALS

**RoHS** Compliance with 2011/65/EU

**HF** Compliance with IEC61249-2-21:2003

## ABSOLUTE MAXIMUM RATINGS( $T_a=25^\circ C$ )

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	$V_{DS}$	40	V	
Continuous drain current	$I_D$	$T_A=25^\circ C$	3.9	A
		$T_A=70^\circ C$	3.1	A
Continuous Source Current (Diode Conduction)	$I_S$	0.8	A	
Pulsed drain current (Note 1)	$I_{DM}$	16	A	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Power dissipation	$P_D$	1.25	W	
Thermal resistance from Junction to ambient	$R_{\theta JA}$	100	$^\circ C/W$	
Junction temperature	$T_J$	150	$^\circ C$	
Storage temperature	$T_{STG}$	-55 to 150	$^\circ C$	

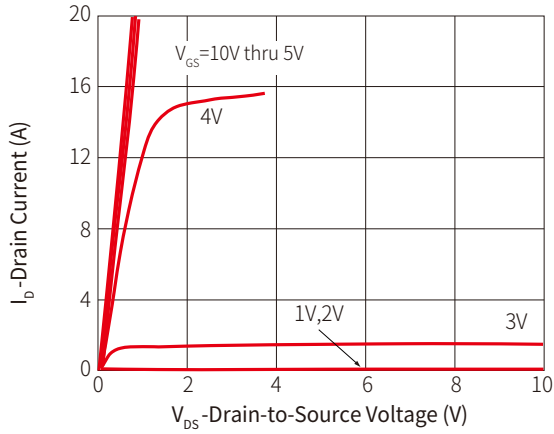
## ELECTRICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$ )

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=32V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage(Note 1)	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1		3	V
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geq 4.5V, V_{GS}=10V$	6			A
Static Drain-Source On-Resistance(Note1)	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.9A$		36	45	m $\Omega$
		$V_{GS}=4.5V, I_D=3.5A$		50	62.5	
Forward Transconductance(Note 1)	$g_{FS}$	$V_{DS}=10V, I_D=3.9A$		11		S
Input capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$		540		pF
Output capacitance	$C_{oss}$			80		
Reverse transfer capacitance	$C_{rss}$			45		
Total Gate Charge	$Q_g$	$V_{DS}=20V, V_{GS}=10V, I_D=3.9A$		10		nC
Gate-Source Charge	$Q_{gs}$			1.6		
Gate-Drain Charge	$Q_{gd}$			2.1		
Turn-On Delay Time	$t_{d(on)}$	$V_{GEN}=10V, I_D=1A$ $V_{DS}=20V, R_{GEN}=6\Omega$ $R_L=20\Omega$		5		ns
Turn-On Rise Time	$t_r$			12		
Turn-Off Delay Time	$t_{d(off)}$			20		
Turn-Off Fall Time	$t_f$			15		
Diode forward voltage(Note 1)	$V_{SD}$	$I_S=1.25A, V_{GS}=0V$		0.8	1.2	V

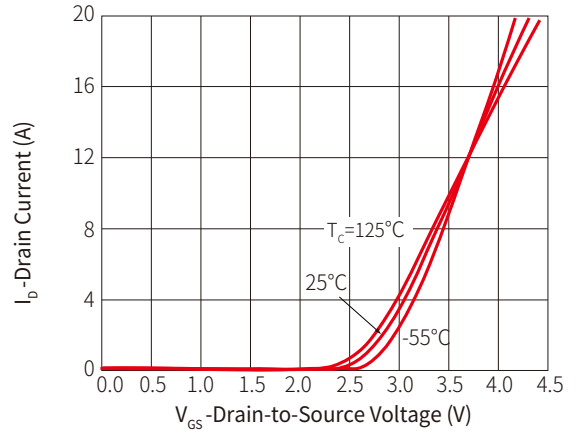
Note:1. Pulse test ; Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$

# PARAMETER CHARACTERISTIC CURVE

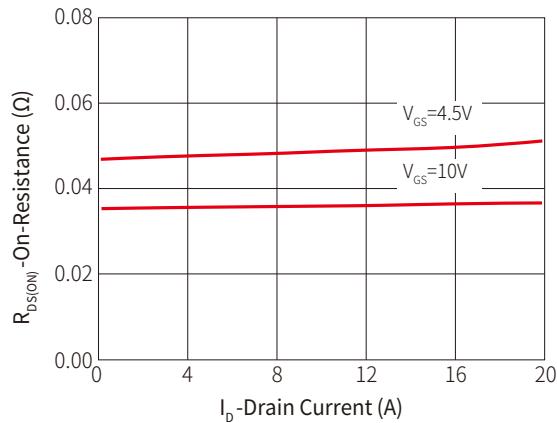
**Fig 1: Output Characteristics**



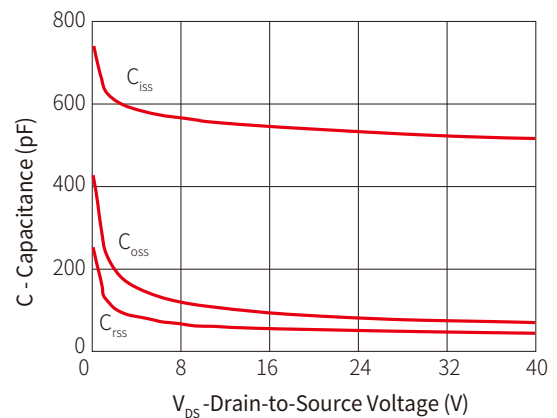
**Figure 2: Transfer Characteristics**



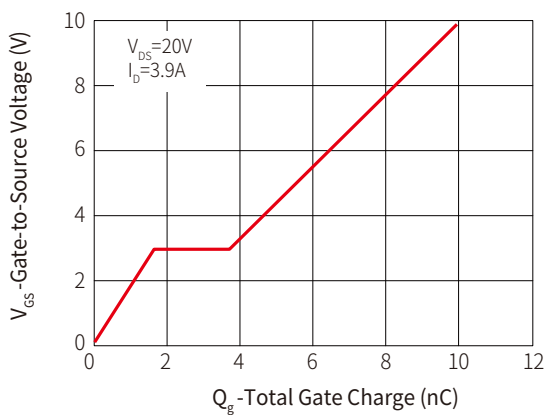
**Figure 3: On-Resistance vs. Drain Current**



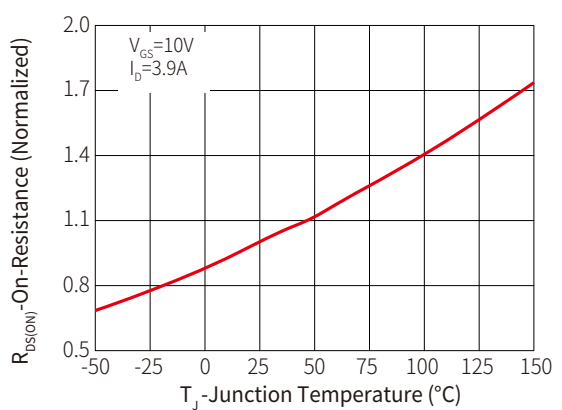
**Figure 4: Capacitance**



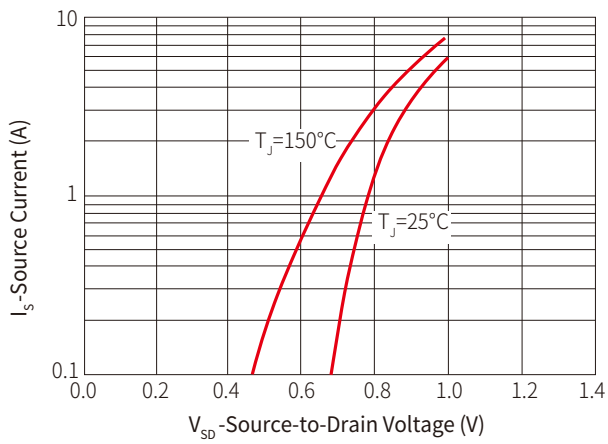
**Figure 5: Gate Charge**



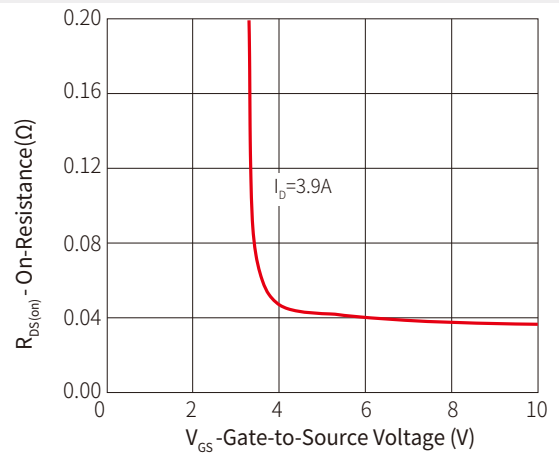
**Figure 6: On-Resistance vs. Junction Temperature**



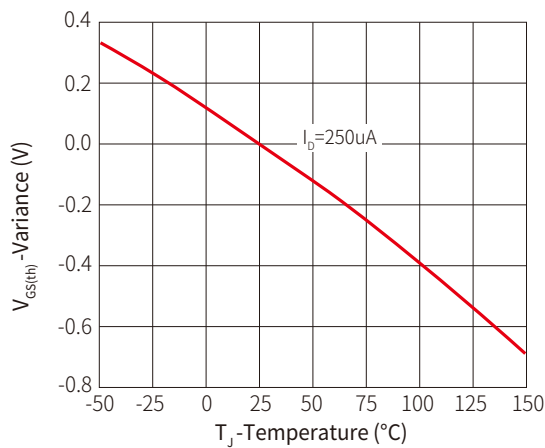
**Figure 7: Source-Drain Diode Forward Voltage**



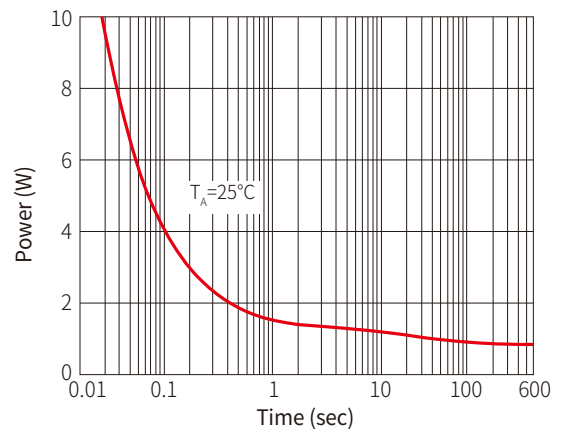
**Figure 8: On-Resistance vs. Gate-to-Source Voltage**



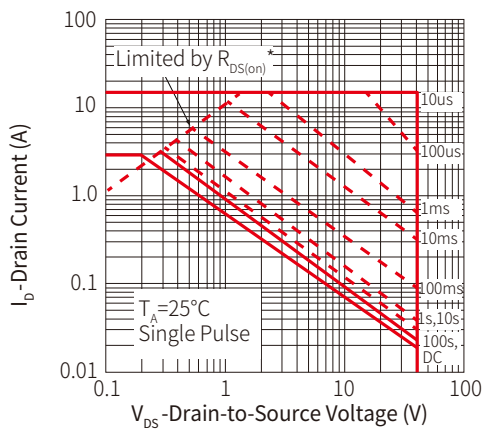
**Figure 9: Threshold Voltage**

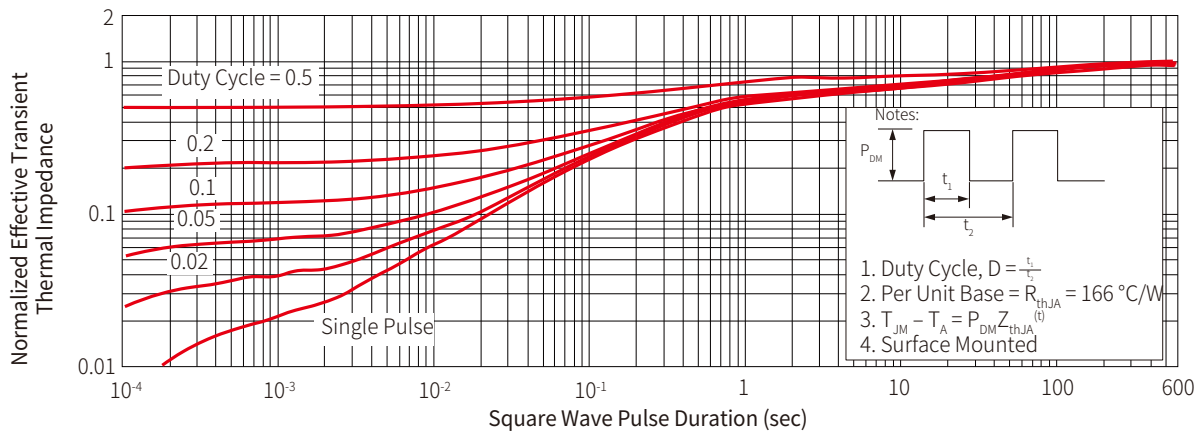


**Figure 10: Single Pulse Power**



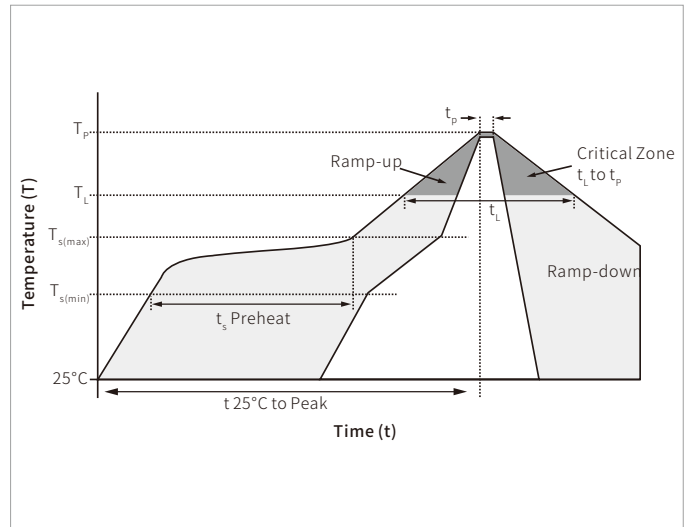
**Figure 11: Safe Operating Area, Junction-to-Case**



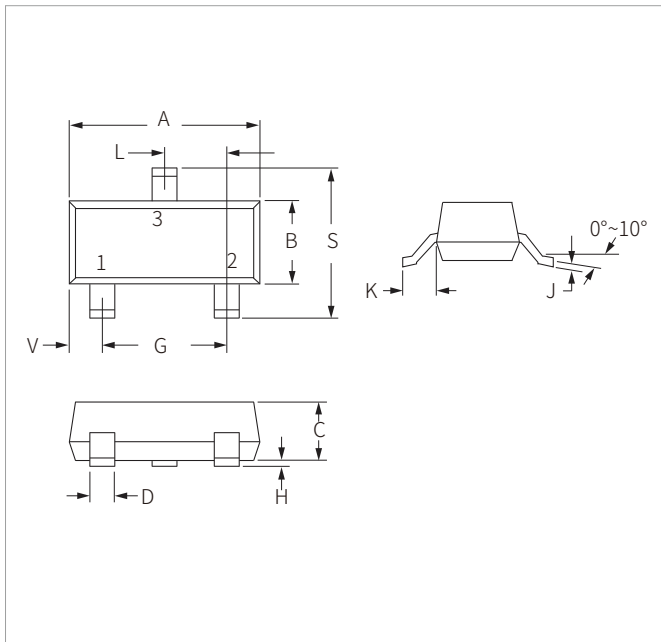
**Figure 12: Normalized Thermal Transient Impedance, Junction-to-Ambient**


## 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) ( $t_r$ )	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

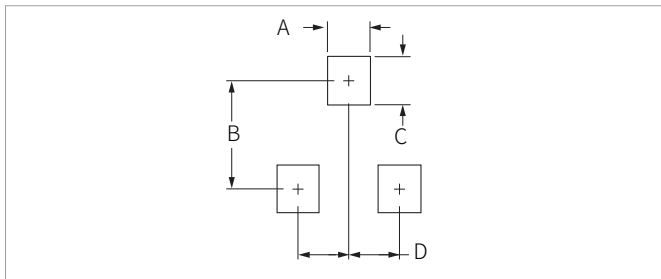


## SOT-23 PACKAGE INFORMATION



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
SNM2318S	SOT-23	3000PCS	7"

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