

## FEATURES

- | Generation V Technology

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- | Ultra Low On-Resistance

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- | Low Profile (<1.1mm)

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- | Available in Tape and Reel

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- | Fast Switching

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## APPLICATION

- | Case: SOT-23

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- | Case Material: Molded Plastic. UL flammability

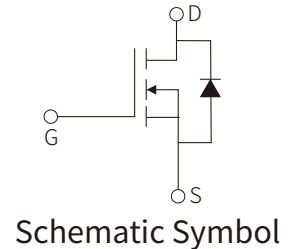
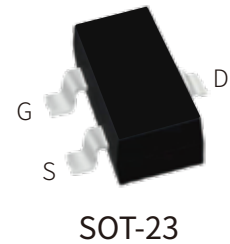
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- | Classification Rating: 94V-0

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## 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	$V_{DS}$	30	V
Drain Current-Continuous	$I_D$	1.2	A
Drain Current-Continuous	$I_D$	0.93	A
Pulsed Drain Voltage	$I_{DM}$	7.3	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Total Power Dissipation	$P_D$	540	mW
Peak Dipde Recovery dv/dt(note 2)	dv/dt	5.0	V/ns
Linear Derating Factor		4.3	mW/ $^{\circ}\text{C}$
Junction-to-Ambient(note 4)	$R_{\theta JA}$	230	$^{\circ}\text{C}/\text{W}$
Storage temperature	$T_{STG}$	-55 to 150	$^{\circ}\text{C}$

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS} / \Delta T_J$	Reference to 25, I <sub>D</sub> =1mA		0.029		V/°C
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V			1.0	μA
		V <sub>DS</sub> =24V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			25	μA
Gate-to-Source Forward Leakag	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0			V
Static Drain-Source On-Resistance(Note3)	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =0.91A			0.25	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.46A			0.40	Ω
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.46A	0.87			S
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz, See Fig.5		85		pF
Output Capacitance	C <sub>oss</sub>			34		
Reverse Transfer Capacitance	C <sub>rss</sub>			15		
Turn-On Delay Time	t <sub>d(on)</sub>	R <sub>D</sub> =16Ω, R <sub>G</sub> =6.2Ω V <sub>DD</sub> =15V, I <sub>D</sub> =0.91A		3.9		ns
Turn-On Rise Time	t <sub>r</sub>			4.0		
Turn-Off Delay Time	t <sub>d(off)</sub>			9.0		
Turn-Off Fall Time	t <sub>f</sub>			1.7		
Diode forward voltage (note 2)	V <sub>SD</sub>	I <sub>S</sub> =0.91A, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C			1.2	V
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =24V, I <sub>D</sub> =0.91A		3.3	5.0	nC
Gate Source Charge	Q <sub>gs</sub>			0.48	0.72	
Gate Drain Charge(note 2)	Q <sub>gd</sub>			1.1	1.7	
Diode forward current(Body Diode)	I <sub>S</sub>	MOSFET symbol showing the integral rever p-n junction diod 			0.54	A
Pulsed Source Curren (Body Diode)(note 1)	I <sub>SM</sub>				7.3	
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =0.91A dI/dt=100A/us, T <sub>J</sub> =25°C		26	40	ns
Reverse Recovery Charge(note 3)	Q <sub>rr</sub>			22	32	nC

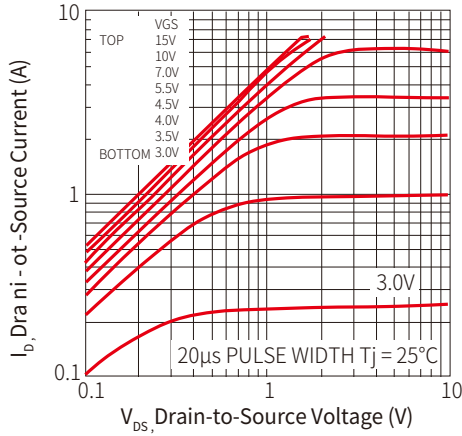
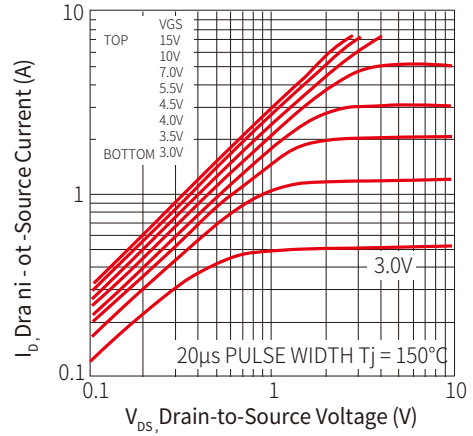
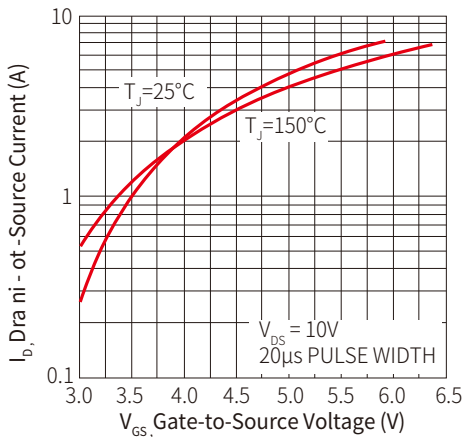
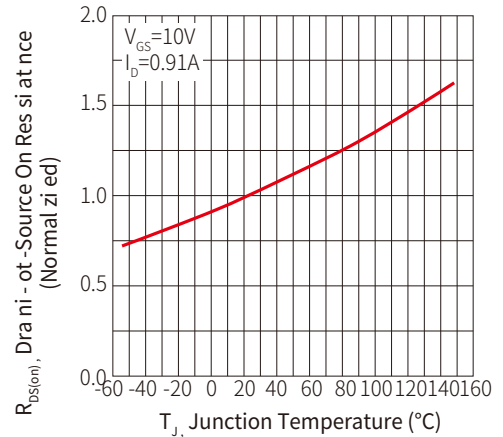
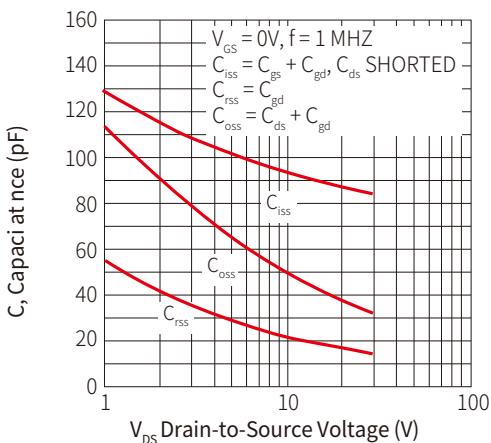
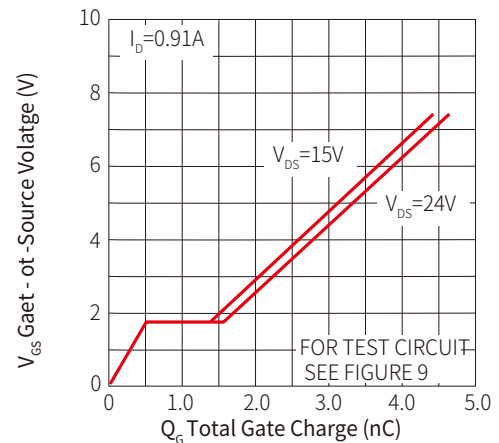
Note:1. Repetitive rating; pulse width limited by max. junction temperature

Note:2. I<sub>SD</sub> ≤ 0.91A, di/dt ≤ 120A/us, V<sub>DD</sub> ≤ V<sub>(BR)DSS</sub>, T<sub>J</sub> ≤ 150°C

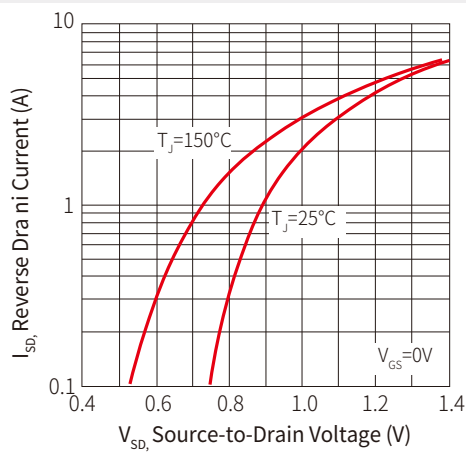
Note:3. Pulse width ≤ 300μs, Duty cycle ≤ 2%

Note:4. Surface mounted on FR-4 board t ≤ 5sec

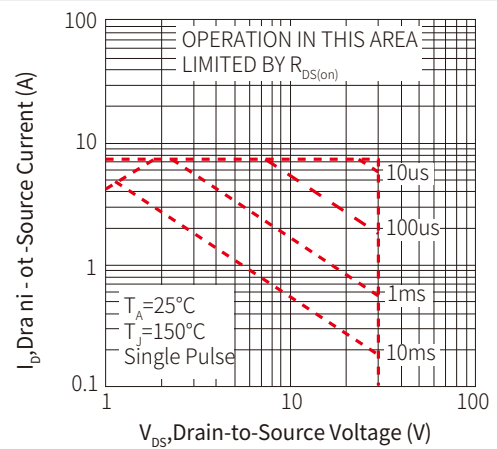
# PARAMETER CHARACTERISTIC CURVE

**Fig 1: Typical Output Characteristics**

**Figure 2: Typical Output Characteristics**

**Figure 3: Typical Transfer Characteristics**

**Figure 4: Normalized On-Resistance Vs. Temperature**

**Figure 5: Typical Capacitance Vs. Drain-to-Source Voltage**

**Figure 6: Typical Gate Charge Vs. Gate-to-Source Voltage**


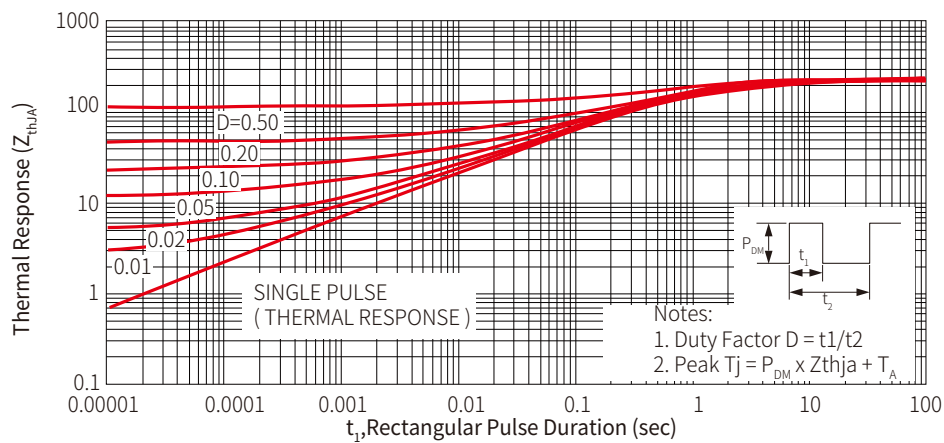
**Figure 7: Typical Source-Drain Diode Forward Voltage**



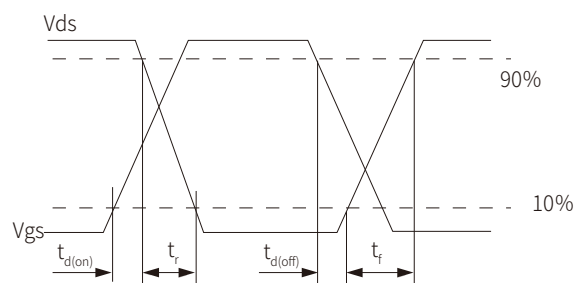
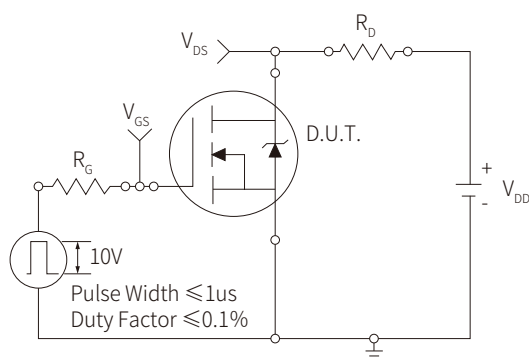
**Figure 8: Maximum Safe Operating Area**



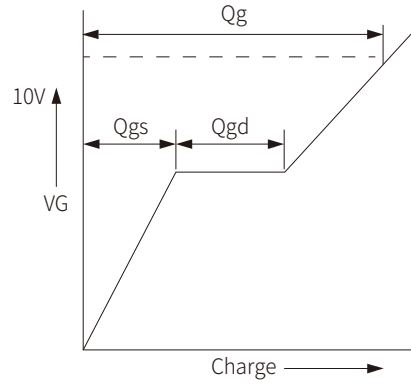
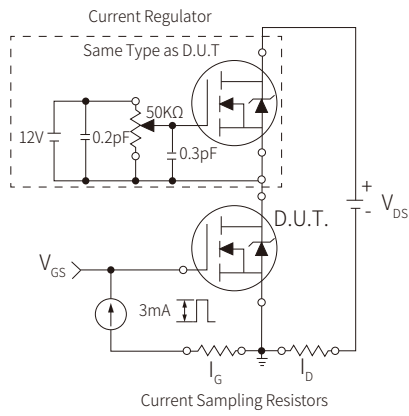
**Figure 9: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient**



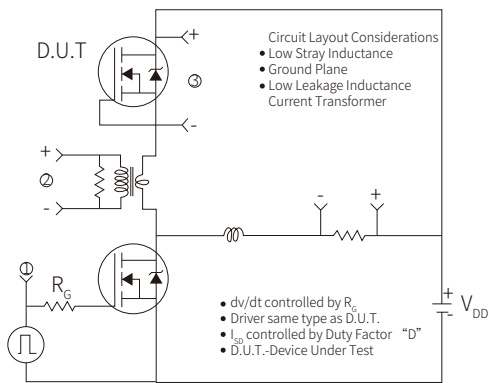
**Figure 10: Switching Time Test Circuit & Waveforms**



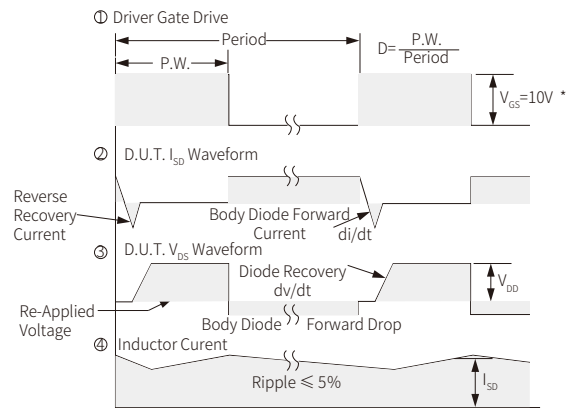
**Figure 11: Basic Gate Charge Waveform & Test Circuit**



**Figure 12: For N-Channel HEXFETS**

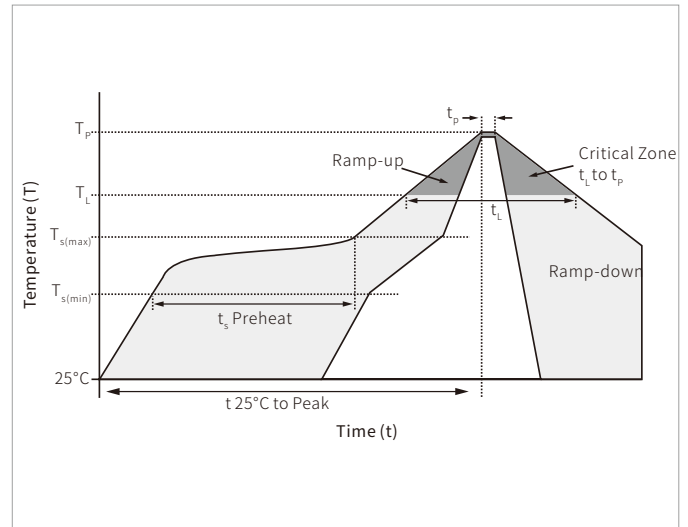


\*  $V_{GS}=5V$  for Logic Level Devices

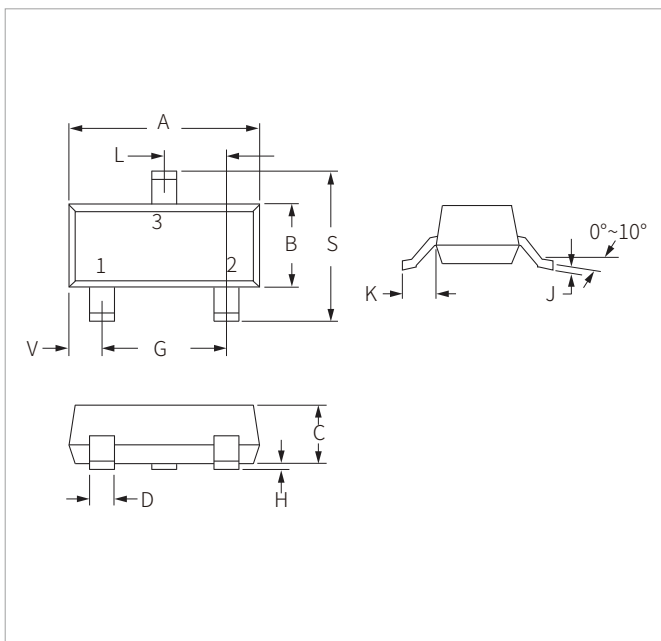


## SOLDERING PARAMETERS

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) ( $t_t$ )	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

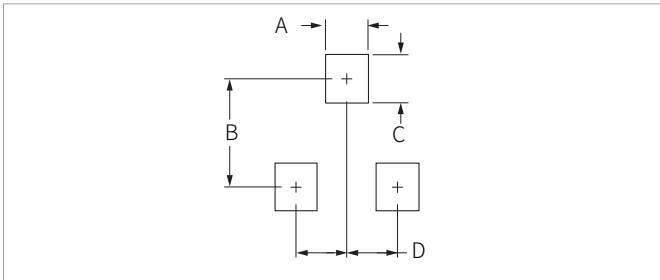


## SOT-23 PACKAGE INFORMATION



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
SNM2803S	SOT-23	3000PCS	7"

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**Customer Service**

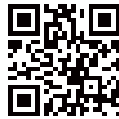
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