

## FEATURES

- | High Density Cell Design For Low  $R_{DS(On)}$
- | Voltage Controlled Small Signal Switch
- | Rugged and Reliable
- | High Saturation Current Capability
- | ESD Protected

## APPLICATION

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

## APPROVALS

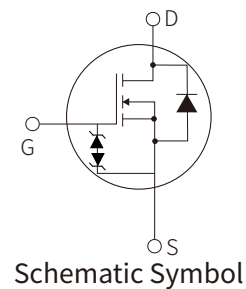
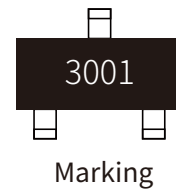
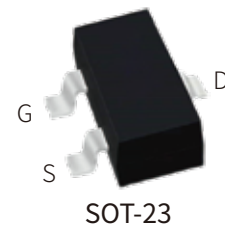
<b>RoHS</b>	Compliance with 2011/65/EU
<b>HF</b>	Compliance with IEC61249-2-21:2003

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	20	V
Drain Current- Pulsed	$I_{DM}^{**}$	3.6	A
Maximum Drain Current - Continuous $T_A=25^{\circ}C$	$I_D^*$	0.9	A
Maximum Drain Current - Continuous $T_A=100^{\circ}C$	$I_D^*$	0.57	A
Gate Threshold Voltage	$V_{GSS}$	$\pm 10$	V
Power Dissipation	$P_{tot}$	0.27	W
Diode Forward Current $T_A=25^{\circ}C$	$I_S$	0.9	A
Maximum Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature Range	$T_{STG}$	-55 to 150	$^{\circ}C$
Maximum Resistance –Junction to Ambient	$R_{\theta JA}^*$	150	$^{\circ}C/W$

**Notes:**

 \* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10$  sec

 \*\* Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ 


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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
<b>Static Characteristics</b>							
Drain-source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	20			V	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	0.5		1	V	
Drain Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V			1	μA	
Drain Leakage Current (T <sub>J</sub> =85°C)					30	μA	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V			±10	μA	
On-State Resistance	R <sub>DS(on)</sub> <sup>a</sup>	V <sub>GS</sub> =4.5V, I <sub>DS</sub> =0.5A		0.19	0.22	Ω	
			V <sub>GS</sub> =2.5V, I <sub>DS</sub> =0.4A		0.27	0.33	Ω
			V <sub>GS</sub> =1.8V, I <sub>DS</sub> =0.3A		0.37	0.48	Ω
<b>Diode Characteristics</b>							
Diode Forward Voltage	V <sub>SD</sub> <sup>a</sup>	I <sub>SD</sub> =0.5A, V <sub>GS</sub> =0V			1.2	V	
<b>Dynamic Characteristics<sup>b</sup></b>							
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, Frequency = 1 MHz		101		pF	
Output capacitance	C <sub>oss</sub>			47		pF	
Reverse transfer capacitance	C <sub>rss</sub>			39		pF	
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =10V, V <sub>GEN</sub> =4.5V R <sub>G</sub> =3.9Ω, R <sub>L</sub> =20Ω, I <sub>DS</sub> =0.5A		68		nS	
Turn-on Rise Time	t <sub>r</sub>			53		nS	
Turn-Off Delay Time	t <sub>d(off)</sub>			105		nS	
Turn-Off Fall Time	t <sub>f</sub>			20		nS	
<b>Gate Charge Characteristics<sup>b</sup></b>							
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>DS</sub> =0.5A		1.02		nC	
Gate-Source Charge	Q <sub>gs</sub>			0.12		nC	
Gate-Drain Charge	Q <sub>gd</sub>			0.15		nC	

**Notes:**

a : Pulse test ; pulse width ≤ 300us, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

# PARAMETER CHARACTERISTIC CURVE

Figure1: Power Dissipation

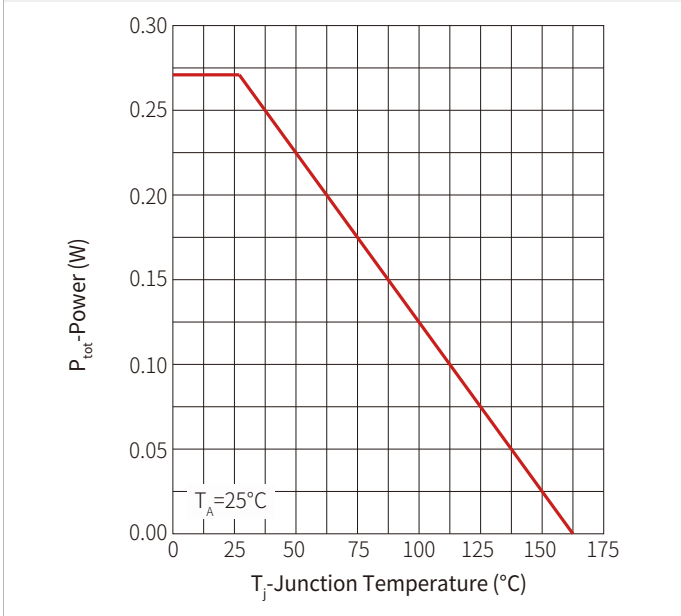


Figure2: Current Capability

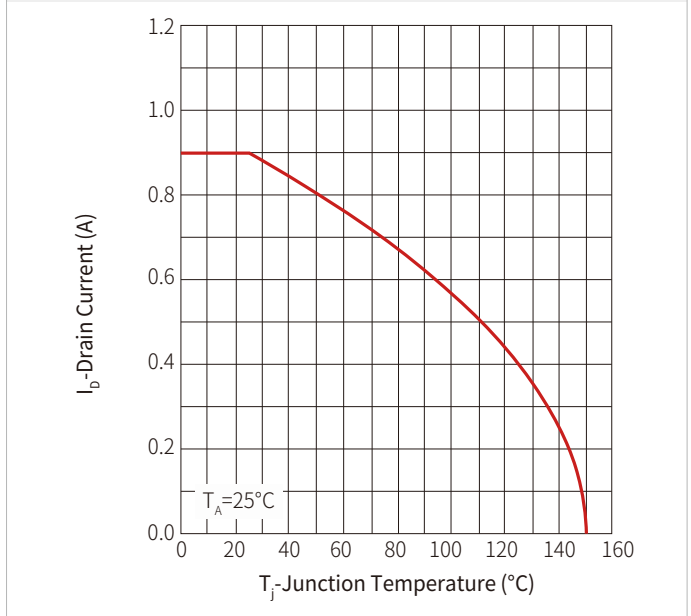


Figure3: Safe Operation Area

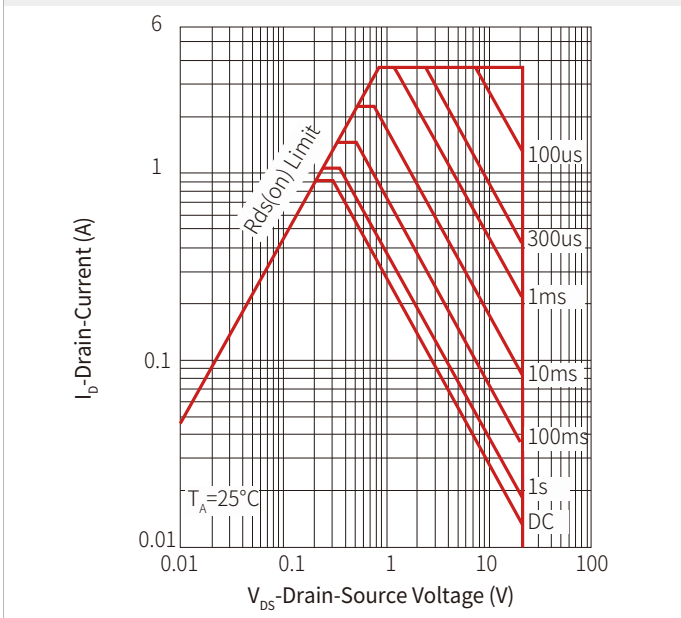


Figure 4: Transient Thermal Impedance

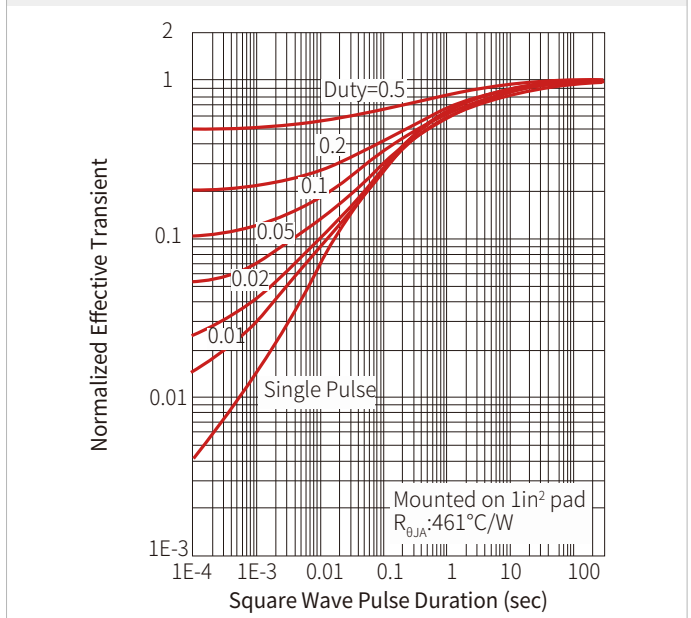


Figure 5: Output Characteristics

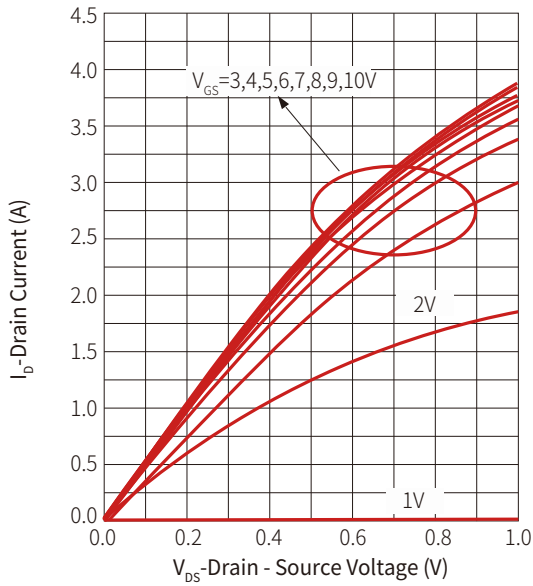


Figure 6: Drain-Source On Resistance

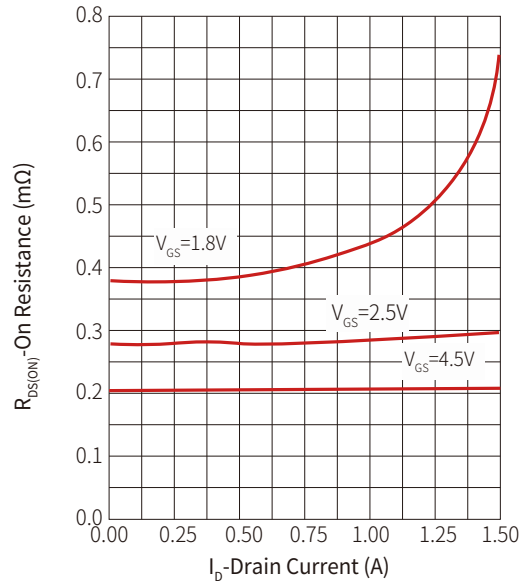


Figure 7: Transfer Characteristics

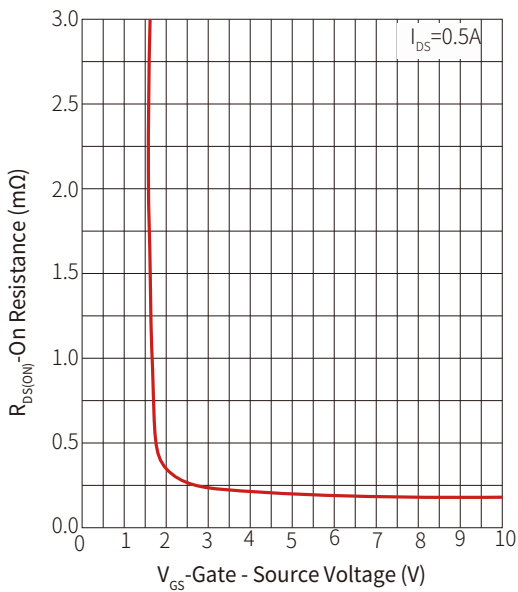


Figure 8: Normalized Threshold Voltage

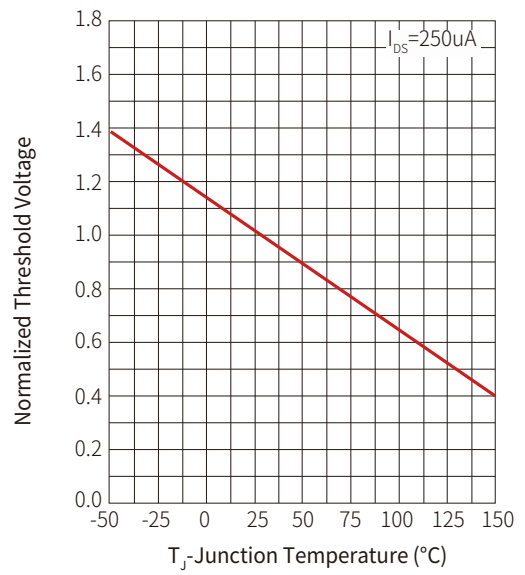


Figure 9: Normalized On Resistance

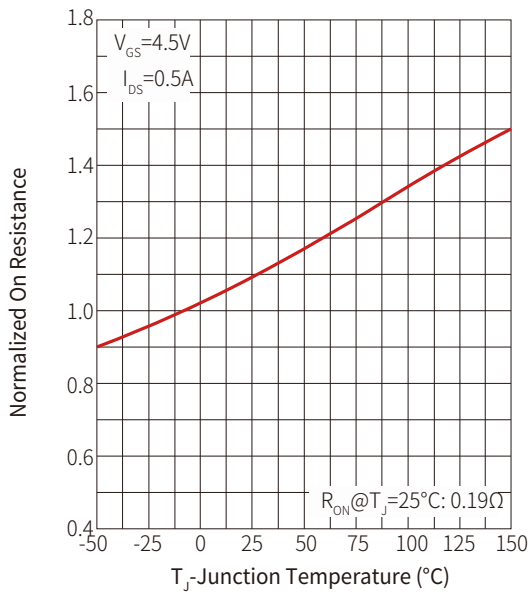


Figure 10: Current Diode Forward

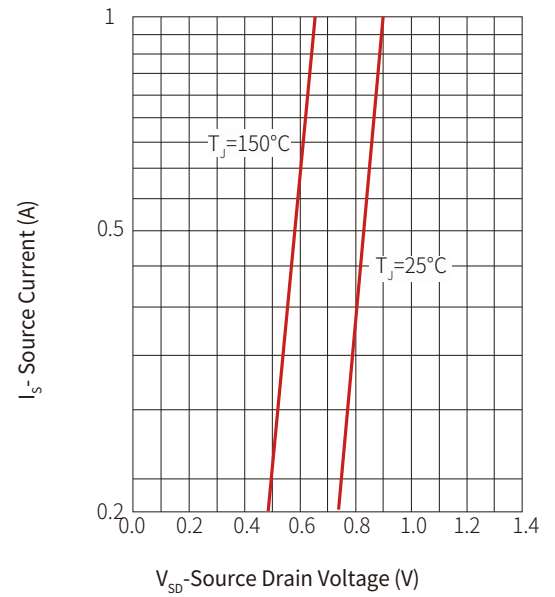


Figure 11: Capacitance

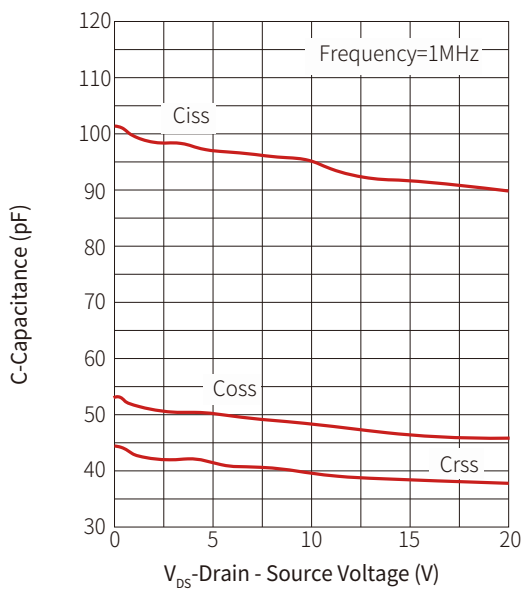
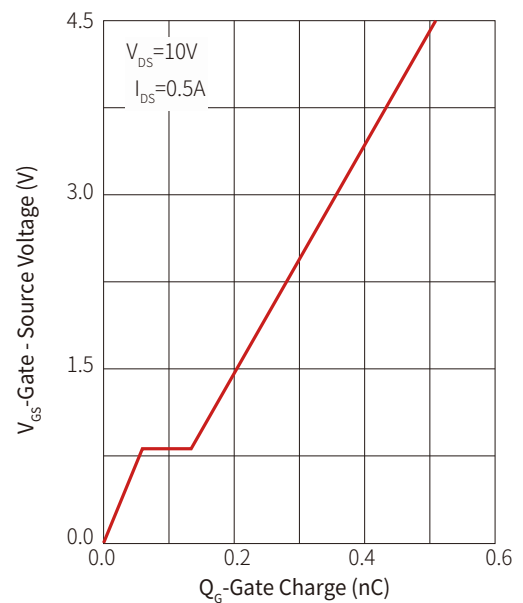
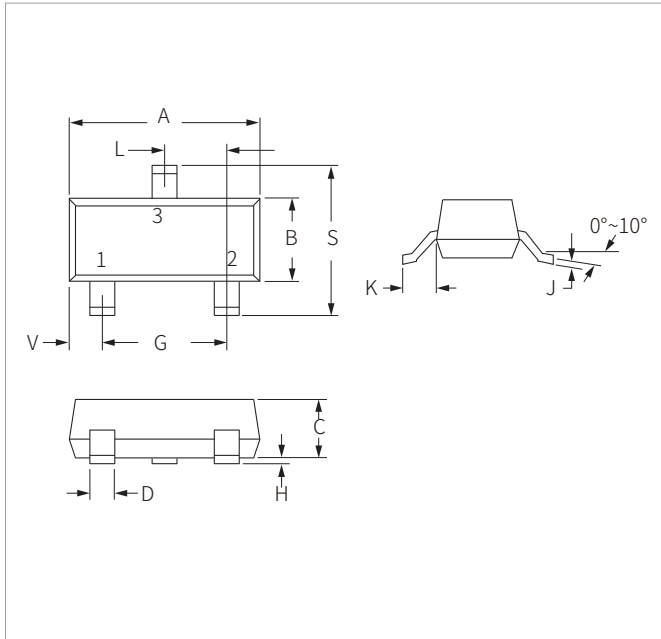


Figure 12: Gate Charge

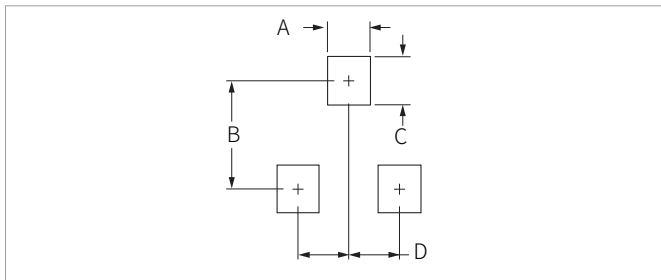


## SOT-23 PACKAGE INFORMATION



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
SNM23T1N02E	SOT-23	3000PCS	7"

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