

Product Summary

- $V_{DS} = -20V, I_D = -0.5A$
- $R_{DS(on)} < 310m\Omega @ V_{GS} = -4.5V$
- $R_{DS(on)} < 520m\Omega @ V_{GS} = -2.5V$

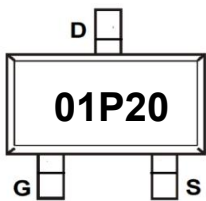
Features

- ESD Protected(HBM) up to 2KV
- Advanced Trench Technology
- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

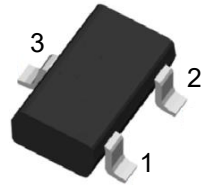
Application

- Battery Operated Systems
- Direct Logic-level Interface:TTL/CMOS
- Solid-State Relays

Marking Code



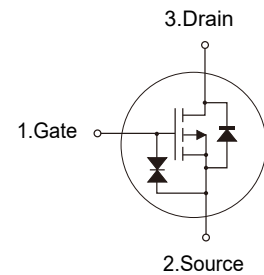
SOT-323



(Top View)

Pin	Description
1	Gate
2	Source
3	Drain

Schematic Diagram



Absolute Maximum Ratings

(Ta=25°C unless otherwise specified)

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		V_{DS}	-20	V
Gate-source Voltage		V_{GS}	± 12	V
Drain Current	$T_A = 25^\circ C$ @ Steady State	I_D	-0.5	A
	$T_A = 70^\circ C$ @ Steady State		-0.2	
Pulsed Drain Current ^A		I_{DM}	-1.5	A
Total Power Dissipation @ $T_A = 25^\circ C$		P_D	0.3	W
Thermal Resistance Junction-to-Ambient ^B		$R_{\theta JA}$	278	$^\circ C / W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ C$

Electrical Characteristics

(T_J=25°C unless o therwise s pecified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =-250μA	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V,V _{GS} =0V,T _C =25℃			-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250μA	-0.4	-0.62	-1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = -4.5V, I _D =-0.5A		250	310	mΩ
		V _{GS} = -2.5V, I _D =-0.5A		300	520	
		V _{GS} = -1.8V, I _D =-0.5A		550	700	
Diode Forward Voltage	V _{SD}	I _S =-0.5A,V _{GS} =0V		-0.5	-1.0	V
Maximum Body-Diode Continuous Current	I _S				-0.5	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-10V,V _{GS} =0V,f=1MHZ		280		pF
Output Capacitance	C _{oss}			43		
Reverse Transfer Capacitance	C _{rss}			30		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-4.5V,V _{DS} =-10V,I _D =-0.5A		3.9		nC
Gate Source Charge	Q _{gs}			0.7		
Gate Drain Charge	Q _{gd}			0.53		
Turn-on Delay Time	t _{D(on)}	V _{GS} =-4.5V,V _{DD} =-10V, I _D =-0.5A, R _{GEN} =2.5Ω		12		ns
Turn-on Rise Time	t _r			76		
Turn-off Delay Time	t _{D(off)}			31		
Turn-off Fall Time	t _f			13		

- A. A.Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
- B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Characteristic Curves

Fig. 1 Output characteristics(Tj = 25 °C)

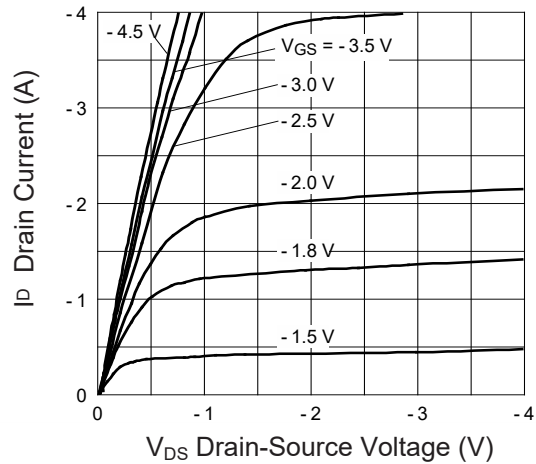


Fig. 2 input characteristics(Tj = 25 °C; VDS = -3 V)

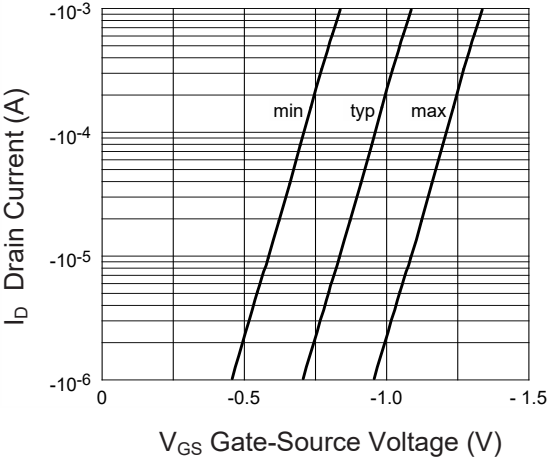


Fig. 3 RDS-IDS(Tj = 25 °C)

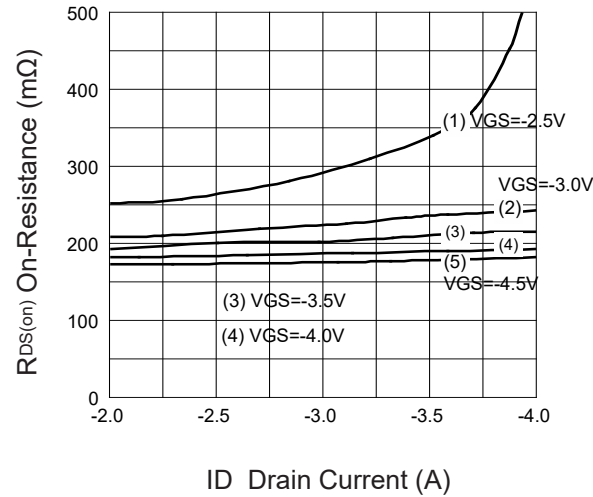


Fig. 4 RDS-VGS(ID = -1 A)

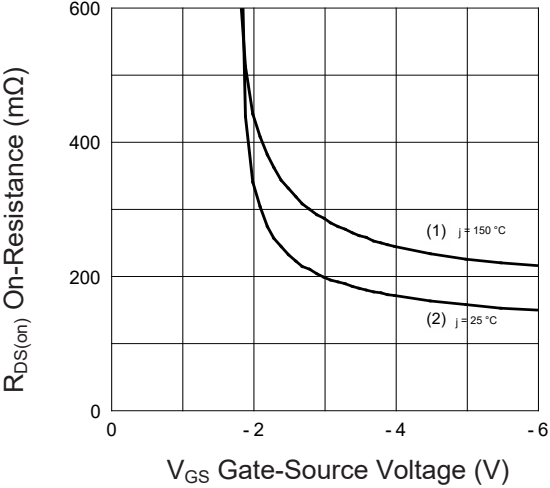


Fig. 5 RDS-VGS(Tj = 25 °C,TJ=150°C)

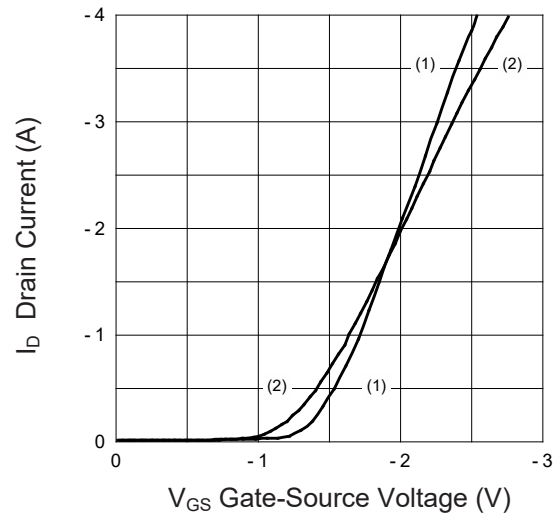


Fig. 6 RDS-Junction Temperature(ID = -1 A)

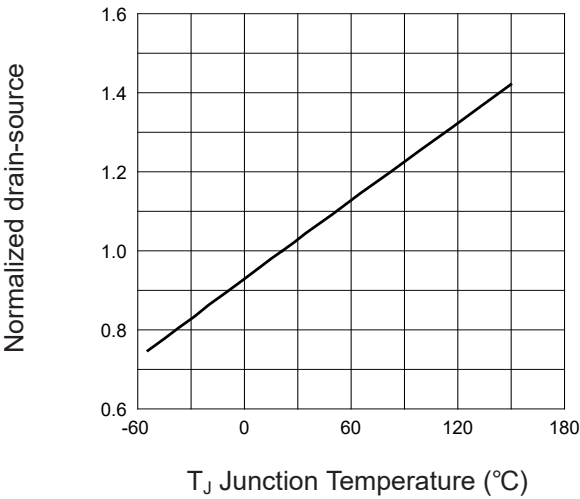


Fig. 7 Gate-source threshold voltage to Junction Temperature
(ID = -0.25 mA; VDS = VGS)

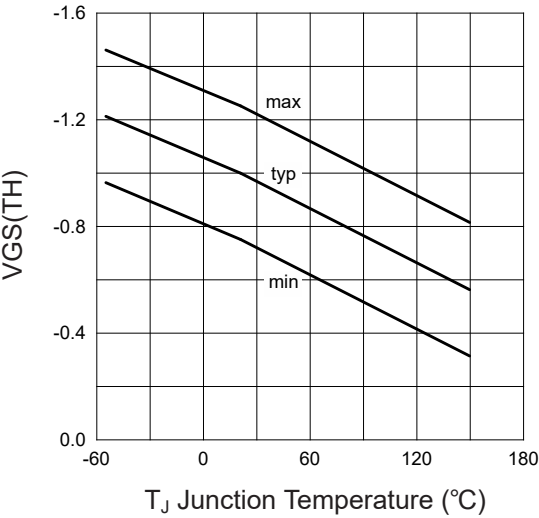


Fig. 8 Capacitance-Drain-Source Voltage
(f = 1 MHz; VGS = 0 V)

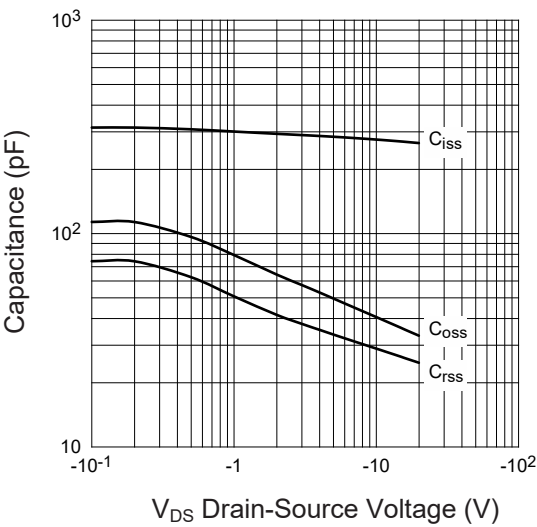


Fig. 9 Gate-source voltage to Gate Charge
(ID = -1.0 A; VDS = -10 V; Tamb = 25 °C)

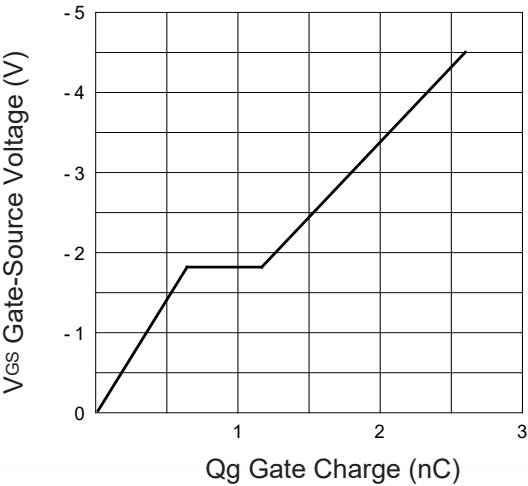


Fig. 10 Gate charge waveform definitions
(ID = -1.0 A; VDS = -10 V; Tamb = 25 °C)

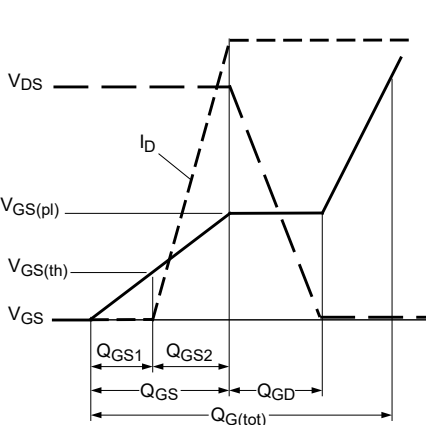
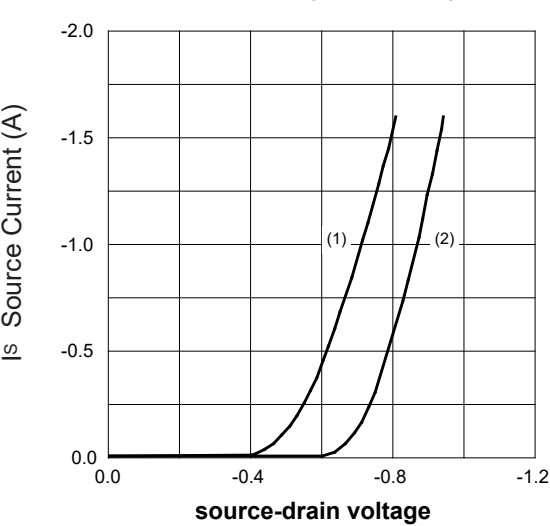


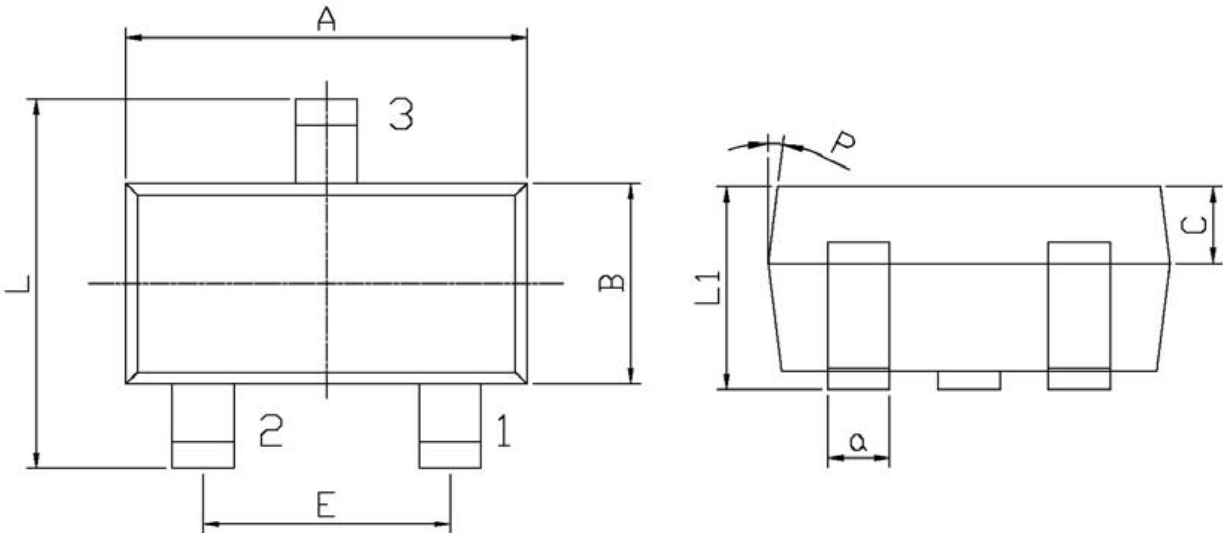
Fig. 11 Gate-source voltage to Gate Charge
(VGS = 0 V; (1) Tj = 150 °C; Tj = 25 °C)



Package Outline

SOT-323

Dimensions in mm



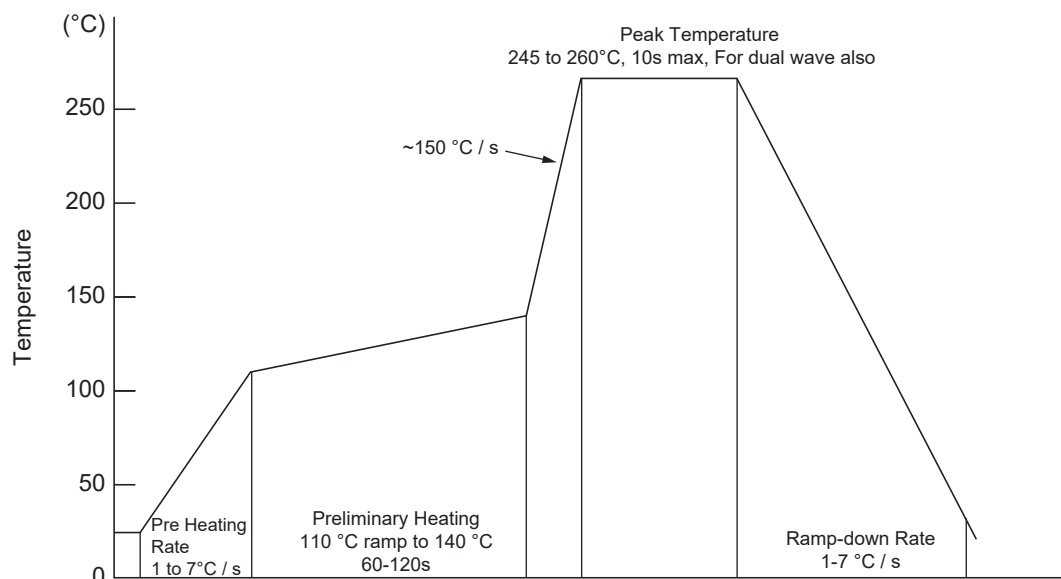
Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	1.95	2.35	C	0.30	0.50
L	2.00	2.20	L1	0.85	1.15
E	1.20	1.40	a	0.20	0.40
B	1.15	1.35	P	7°	

Ordering Information

Device	Package	Shipping
TN01P20KSI	SOT-323	3,000PCS/Reel&7inches

Conditions of Soldering and Storage

◆ Wave Soldering



◆ Conditions of hand soldering

- Temperature: 360°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

- **Temperature**
5 to 40°C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

Contact Information

TANI website: <http://www.tanisemi.com> Email: tani@tanisemi.com

For additional information, please contact your local Sales Representative.



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Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

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The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

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