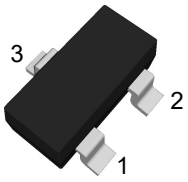
TN2301PSA

P-Channel Enhancement Mode Power MOSFET

SOT-23

Product Summary

- V_{DS}= -20V,I_D= -2.3A
- $R_{DS(on)}$< 110mΩ @V_{GS}= -4.5V
- $R_{DS(on)}$< 140mΩ @V_{GS}= -2.5V



(Top View)

Pin	Description
1	Gate
2	Source
3	Drain

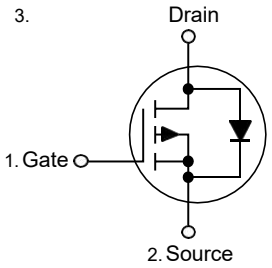
Features

⌘ TrenchFET Power MOSFET

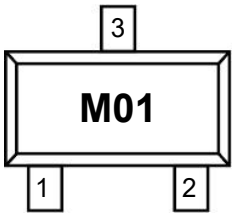
Application

⌘ Load Switch for Portable Devices
⌘ DC/DC Converter

Schematic Diagram



Marking Code



Absolute Maximum Ratings

(Ta=25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current (T_J=150℃)	I_D	-2.3	A
Pulsed Drain Current	I_{DM}	-1	
Continuous Source-Drain Diode Current	I_S	-0.72	
Maximum Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient(t≤5s)	$R_{\theta JA}$	357	℃/W
Operation Junction and Storage Temperature Range	T_J,T_{stg}	-5 ~+150	℃

Electrical Characteristics

(Ta=25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-2			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.	-0.65	-	
Gate-source leakage	I_{GSS}	V_{DS} =0V, V_{GS} =±12V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} =-20V, V_{GS} =0V			-	μA
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-2.3A		102	110	mΩ
		V_{GS} =-2.5V, I_D =-2.0A		126	140	
Forward transconductance [a]	g_{fs}	V_{DS} =-5V, I_D =-2.3A		4.0		S
Dynamic[b]						
Input capacitance	C_{iss}	V_{DS} =-10V,V_{GS} =0V,f =1MHz		405		pF
Output capacitance	C_{oss}			75		
Reverse transfer capacitance	C_{rss}			55		
Total gate charge	Q_g	V_{DS} =-10V,V_{GS} =-4.5V,I_D =-2.3A		5.5	10	nC
		V_{DS} =-10V,V_{GS} =-2.5V,I_D =-2.3A		3.3	6	
Gate-source charge	Q_{gs}			0.7		
Gate-drain charge	Q_{gd}			1.3		
Gate resistance	R_g	f =1MHz		6.0		Ω
Turn-on delay time	$t_{d(on)}$	V_{DD}=-10V, R_L=10Ω, I_D =-1A, V_{GEN}=-4.5V,Rg=1Ω		11	20	ns
Rise time	t_r			35	60	
Turn-off delay time	$t_{d(off)}$			30	50	
Fall time	t_f			10	20	
Drain-source body diode characteristics						
Continuous source-drain diode current	I_S	T_C=25℃			-1.	A
Pulse diode forward current [a]	I_{SM}				-1	
Body diode voltage	V_{SD}	I_S=-0.7A		-0.	-1.	V

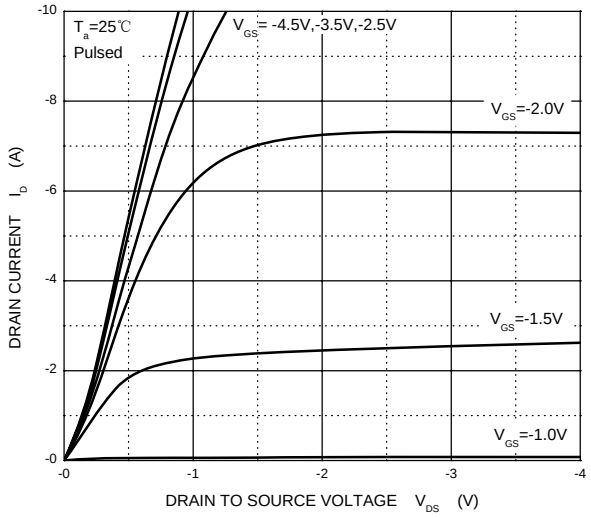
Notes :

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

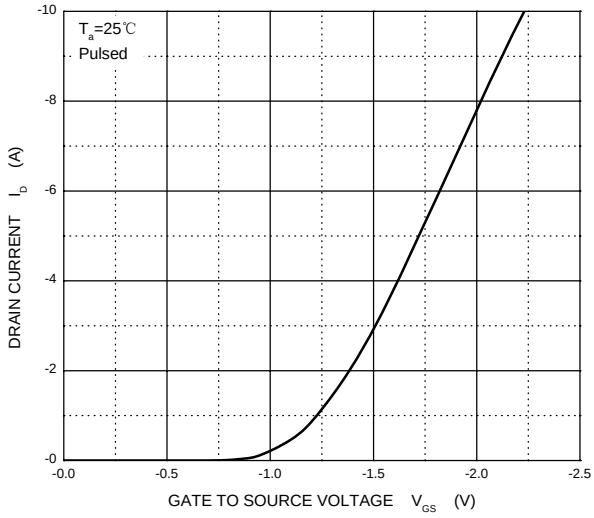
b.Guaranteed by design, not subject to production testing.

Typical Characteristic Curves

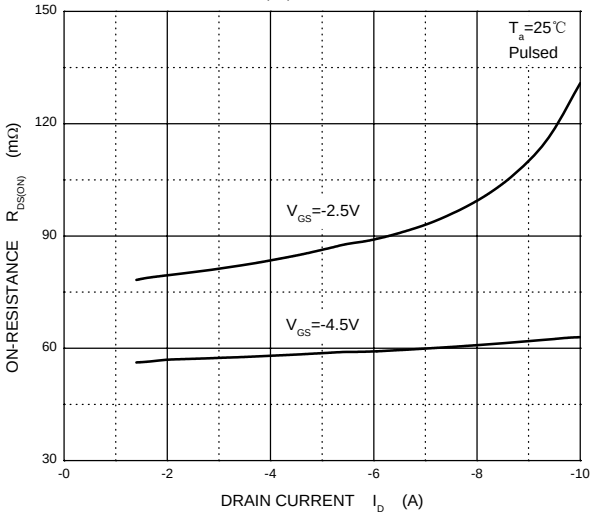
Output Characteristics



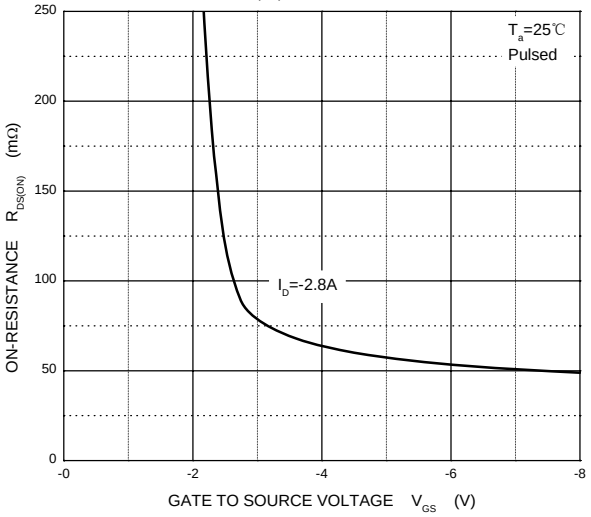
Transfer Characteristics



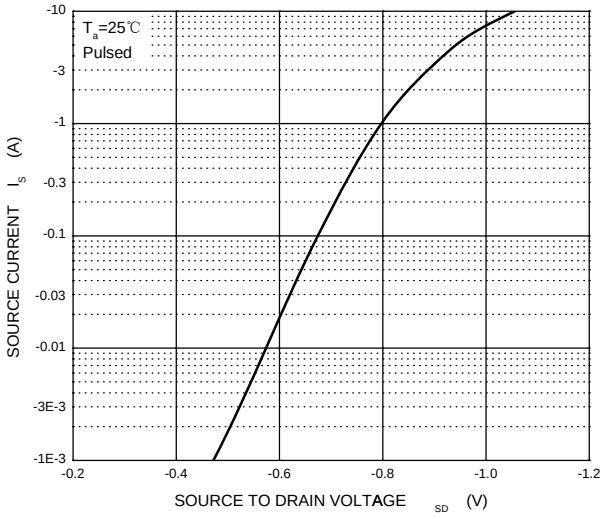
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



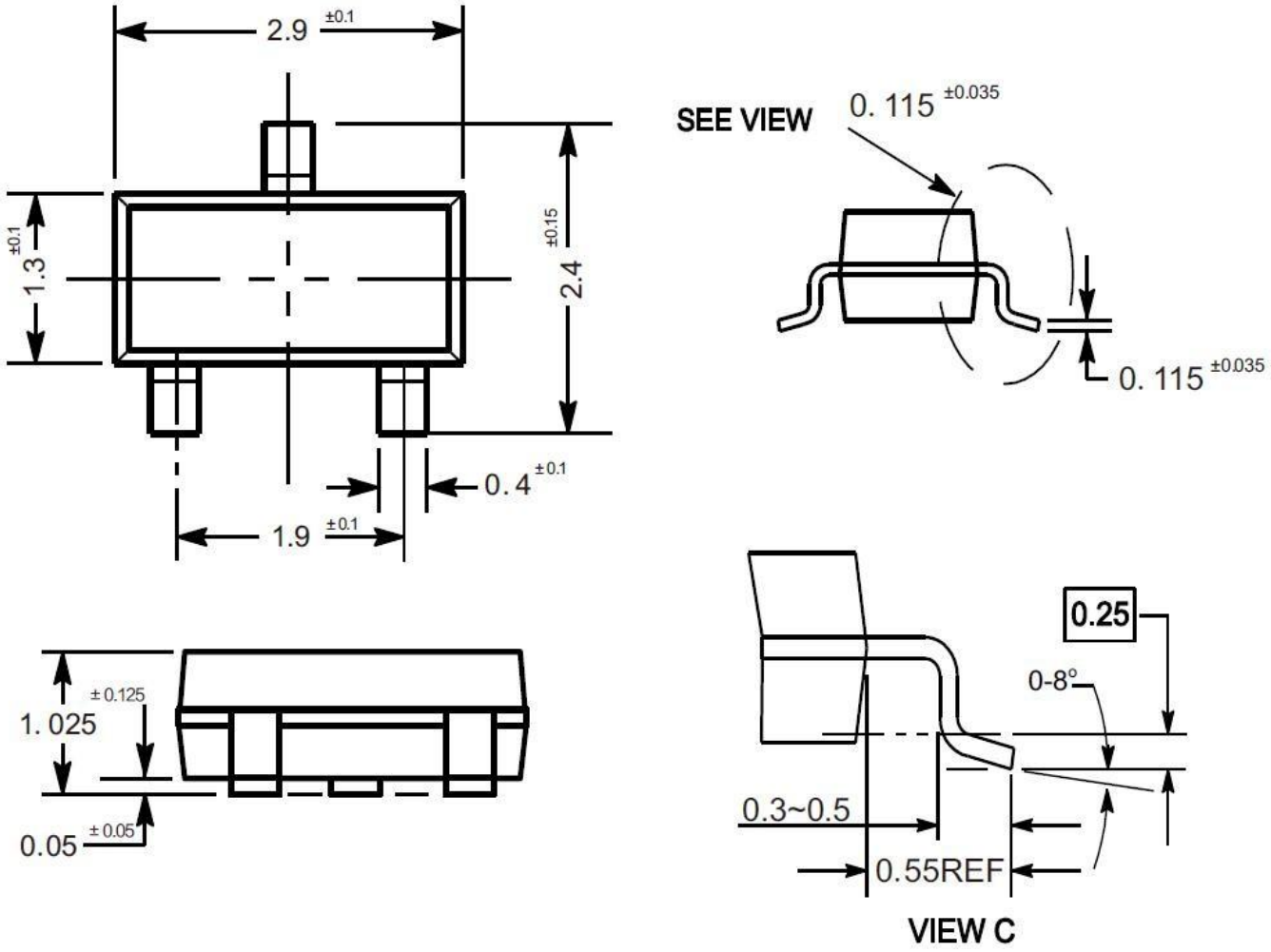
I_S — V_{SD}



Package Outline

SOT-23

Dimensions in mm

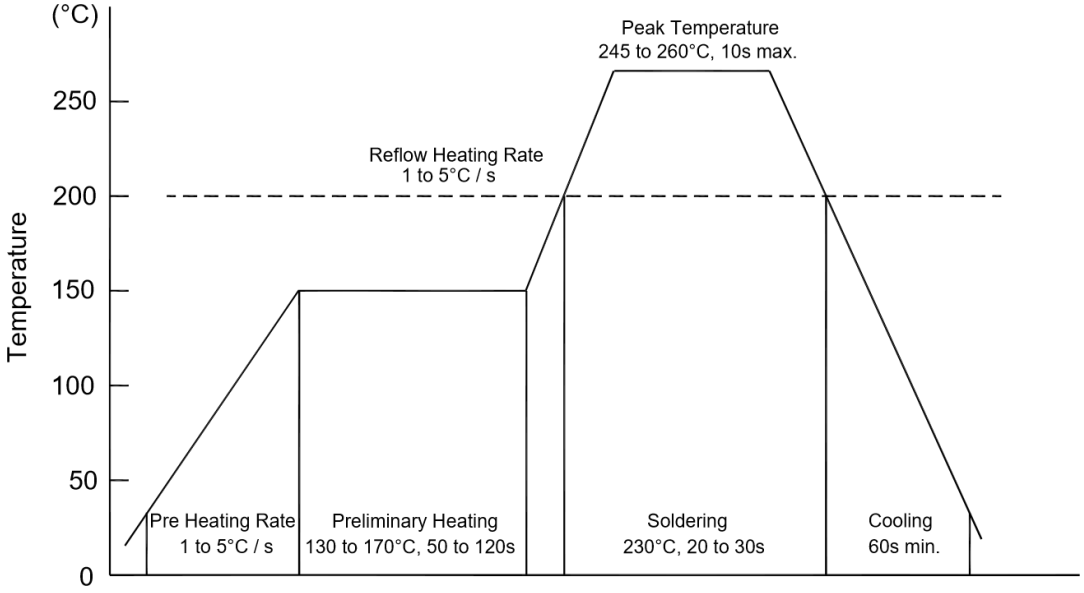


Ordering Information

Device	Package	Shipping
TN2301PSA	SOT-23	3,000PCS/Reel&7inches

Conditions of Soldering and Storage

◆ Recommended condition of reflow soldering



Recommended peak temperature is over 245°C. If peak temperature is below 245°C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

◆ Conditions of hand soldering

- Temperature: 300°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

- **Temperature**

  5 to 40°C

- **Humidity**

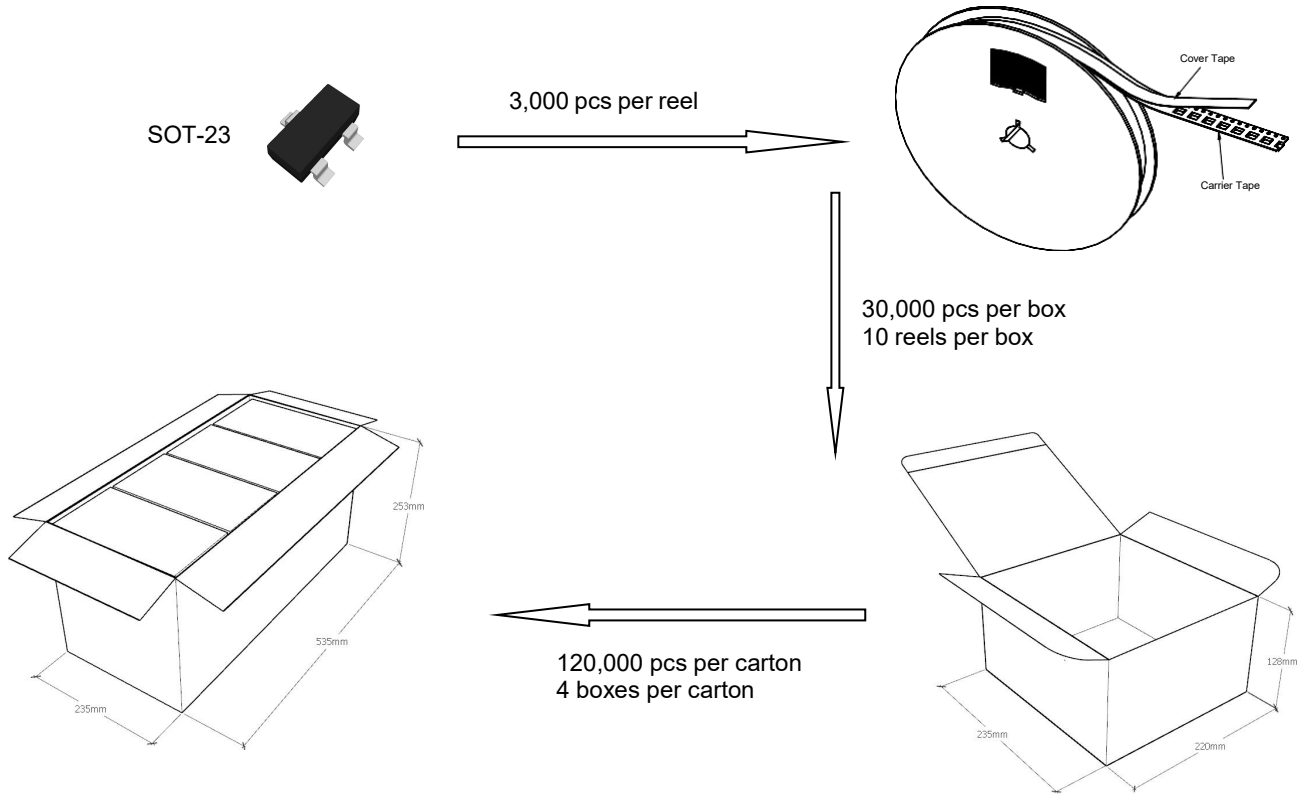
  30 to 80% RH

- **Recommended period**

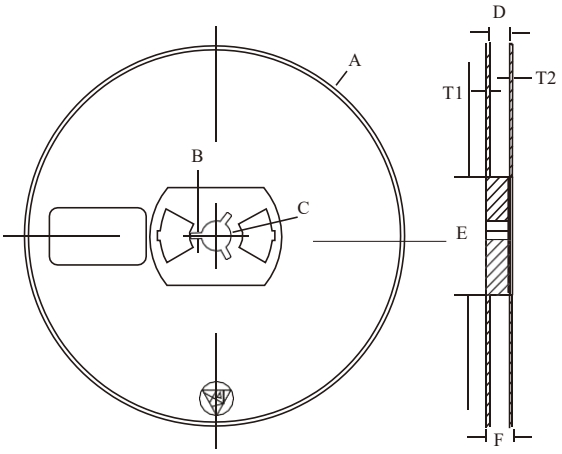
  One year after manufacturing

Package Specifications

- The method of packaging

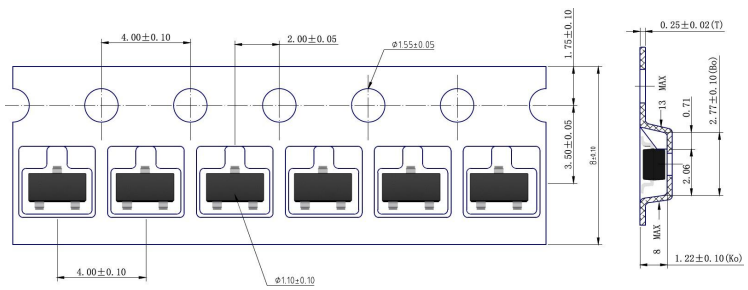


◆ Embossed tape and reel data



Symbol	Value (unit: mm)
A	Ø 177.8±1
B	2.7±0.2
C	Ø 13.5±0.2
E	Ø 54.5±0.2
F	12.3±0.3
D	9.6+2/-0.3
T1	1.0±0.2
T2	1.2±0.2

Reel (7")



Contact Information

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

For additional information, please contact your local Sales Representative.

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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Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

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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