N-Channel Enhancement Mode Power MOSFET

● Features

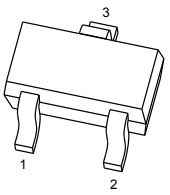
V_{DS}= 20V
I_D= 0.75A
$R_{DS(ON)}$≤ 230mΩ(V_{GS}=4.5V)

● General Description

The TNM01K20FX is N-Channel enhancement MOSFET Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ .with low gate charge. This device is suitable for use in DC-DC conversion , power switch and charging circuit.

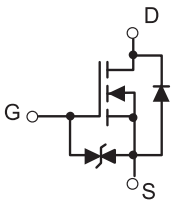
● Pin Configurations

SOT-523

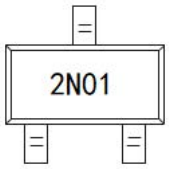


1. GATE
2. SOURCE
3. DRAIN

● Equivalent Circuit



MARKING



● Absolute Maximum Ratings (@TA=25°C unless otherwise noted)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate Source Voltage		V_{GSS}	±10	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	0.75	A
	T_A=100°C		0.3	
Drain Current (Pulse) *B		I_{DM}	1.8	A
Power Dissipation		P_D	0.15	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~155	°C

● Thermal Characteristics

Parameter	Symbol	Ratings	Unit
Thermal Resistance ,Junction-to-Ambient	$R_{\theta JA}$	833	°C/W

- **Electrical Characteristics (@TA=25°C unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V，I_D=250uA	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V，V_{GS}=0V	--	--	1	uA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}，I_{DS}=250uA	0.45	--	1.1	V
Gate Leakage Current	I_{GSS}	V_{GS}=±10V，V_{DS}=0V	--	--	±10	uA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS}=4.5V，I_D=0.55A	--	190	230	mΩ
		V_{GS}=2.5V，I_D=0.45A	--	234	305	mΩ
		V_{GS}=1.8V，I_D=0.35A	--	303	455	mΩ
Total Gate Charge	Q_g	V_{GS}=4.5V，V_{DS}=10V，I_D=1A	--	2	--	nC
Gate- Source Charge	Q_{gs}		--	0.3	--	nC
Gate- Drain Charge	Q_{gd}		--	0.3	--	nC
Tum-on Delay Time	$t_{d(on)}$	**V_{DS}=10V,I_D=500mA, V_{GS}=4.5V,R_G=10Ω**	--	6.6	--	ns
Turn-on Rise Time	t_r		--	4.5	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	16.8	--	ns
Turn-off Fall Time	t_f		--	7.6	--	ns
Input Capacitance	C_{iss}	V_{GS}=0V，V_{DS}=10V，f=1MHZ	--	43	--	pF
Output Capacitance	C_{oss}		--	9	--	pF
Reverse Transfer Capacitance	C_{rss}		--	6	--	pF

- **Reverse Diode Characteristics (@TA=25°C unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I_{SD}	V_G=V_D=0V , Force Current	--	--	3.5	A
Diode Forward Voltage	V_{SD}	I_{SD}=0.35A，V_{GS}=0V	--	--	1.1	V
Reverse Recovery Time	t_{rr}	I_F = 1A di/dt = 100 A/μs	--	9	--	nS
Reverse Recovery Charge	Q_{rr}		--	1	--	nC

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR- 4 board with 2oz. Copper, in a still air environment with TA=25C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature .

C: The current rating is based on the t<10s junction to ambient thermal resistance rating.

- **TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

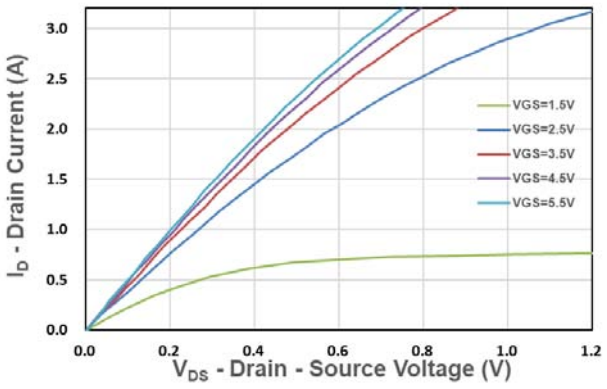


Figure 1. Output Characteristics

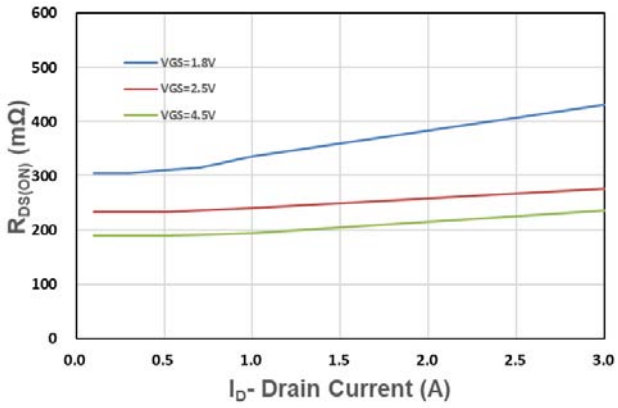


Figure 2. On−Resistance vs. I

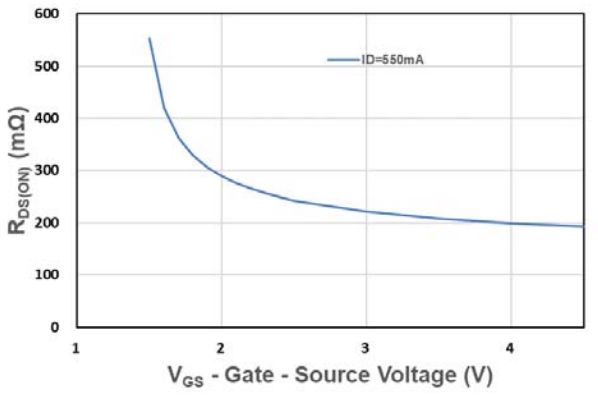


Figure 3. On−Resistance vs. V_{GS}

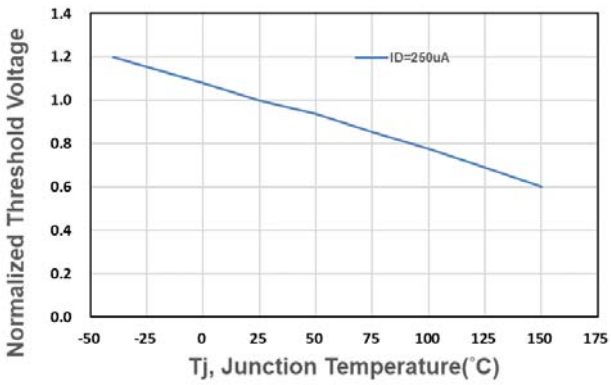


Figure 4. Gate Threshold Voltage

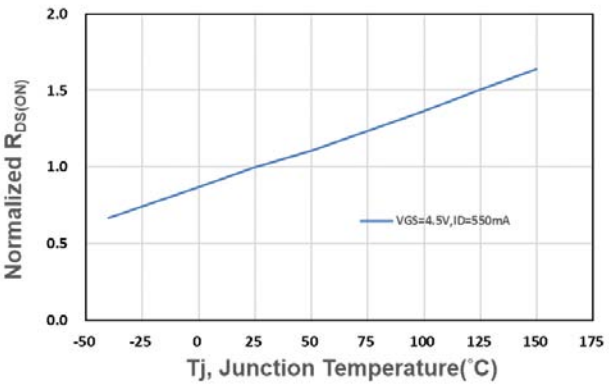


Figure 5. Drain-Source On Resistance

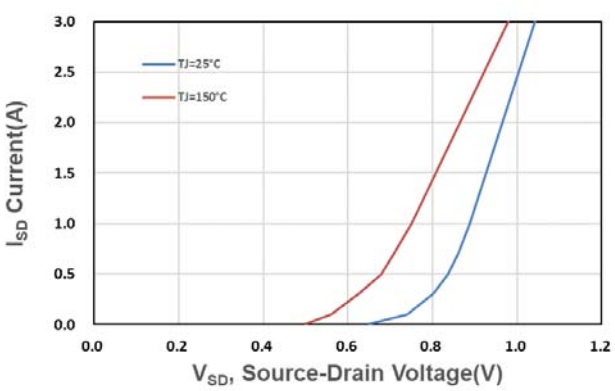
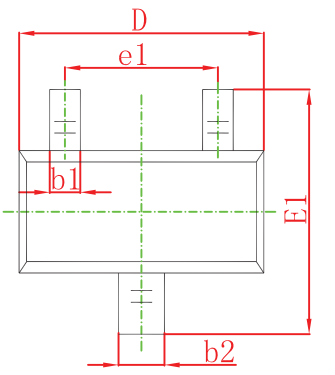
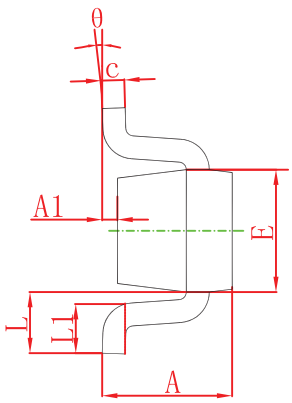
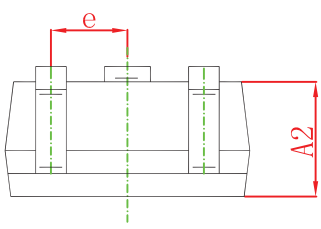


Figure 6. Source-Drain Diode Forward

SOT-523 Package Outline Dimensions

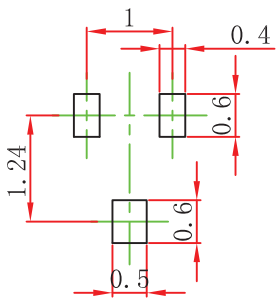






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

SOT-523 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.