TNM03K100KX

N-Channel Enhancement Mode Power MOSFET

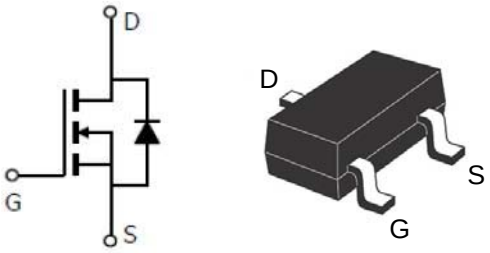
● Features

V_{DS}= 100V
I_D= 2A
$R_{DS(ON)}$≤ 240mΩ(V_{GS}=10V)

● General Description

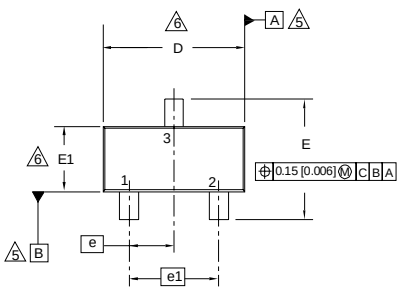
The TNM03K100K uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is SOT23, which accords with the RoHS standard.

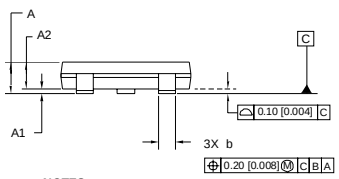
● Pin Configurations



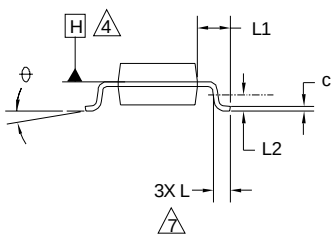
● Package Information

SOT23

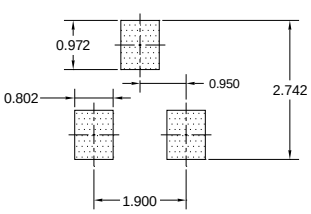




NOTES:



Recommended Footprint



DIMENSIONS				
SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.89	1.12	0.035	0.044
A1	0.01	0.10	0.0004	0.004
A2	0.88	1.02	0.035	0.040
b	0.30	0.50	0.012	0.020
c	0.08	0.20	0.003	0.008
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E1	1.20	1.40	0.047	0.055
e	0.95	BSC	0.037	BSC
e1	1.90	BSC	0.075	BSC
L	0.40	0.60	0.016	0.024
L1	0.54	REF	0.021	REF
L2	0.25	BSC	0.010	BSC
θ	0	8	0	8

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	100	V
Gate Source Voltage	V_{GSS}	±20	V
Drain Current (Continuous) *AC	I_D	2	A
Drain Current (Pulse) *B	I_{DM}	5	A
Power Dissipation	P_D	1.25	W
Operating Temperature/ Storage Temperature	T_J/T_{STG}	-55~175	°C

- **Thermal Characteristics**

Parameter	Symbol	Ratings	Unit
Thermal Resistance ,Junction-to-Ambient	$R_{\theta JA}$	100	°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	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V，V_{GS}=0V	--	--	1	uA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}，I_{DS}=250uA	1.2	--	2.5	V
Gate Leakage Current	I_{GSS}	V_{GS}=±20V，V_{DS}=0V	--	--	±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS}=10V，I_D=2A	--	--	240	mΩ
Forward Transconductance	gfs	I_{SD}=1A，V_{DS}=5V	1	--	--	S
Total Gate Charge	Q_g	V_{GS}=10V，V_{DD}=50V，I_D=1.3A	--	5.2	--	nC
Gate- Source Charge	Q_{gs}		--	0.75	--	nC
Gate- Drain Charge	Q_{gd}		--	1.4	--	nC
Tum-on Delay Time	$t_{d(on)}$	V_{GS}=10V，V_{DD}=50V，I_D=1.3A R_L=39Ω，R_{GEN}=1Ω	--	6	--	ns
Turn-on Rise Time	t_r		--	10	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	10	--	ns
Turn-off Fall Time	t_f		--	6	--	ns
Input Capacitance	C_{iss}	V_{GS}=0V，V_{DS}=50V，f=1MHZ	--	190	--	pF
Output Capacitance	C_{oss}		--	22	--	pF
Reverse Transfer Capacitance	C_{rss}		--	13	--	pF

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I_S	V_G=V_D=0V , Force Current	--	--	2	A
Diode Forward Voltage	V_{SD}	I_{SD}=1.3A，V_{GS}=0V	--	--	1.2	V

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 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

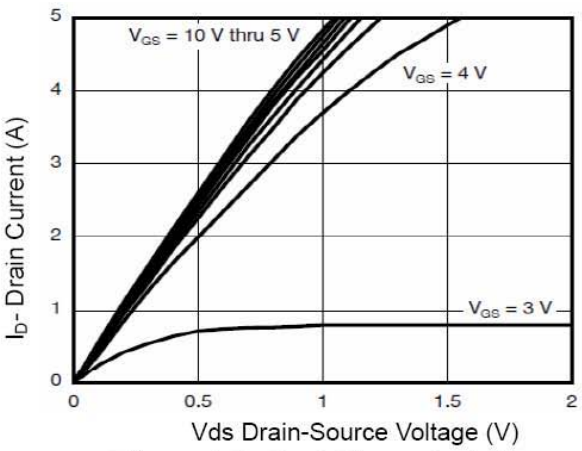


Figure 1 Output Characteristics

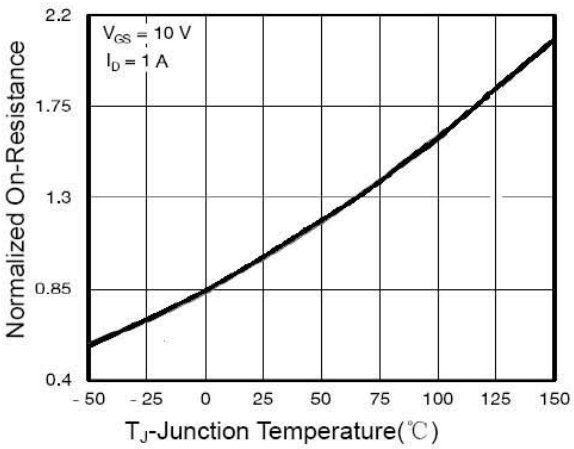


Figure 4 Rdson-JunctionTemperature

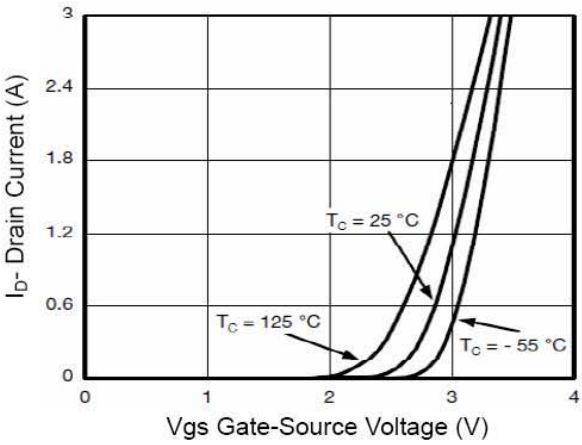


Figure 2 Transfer Characteristics

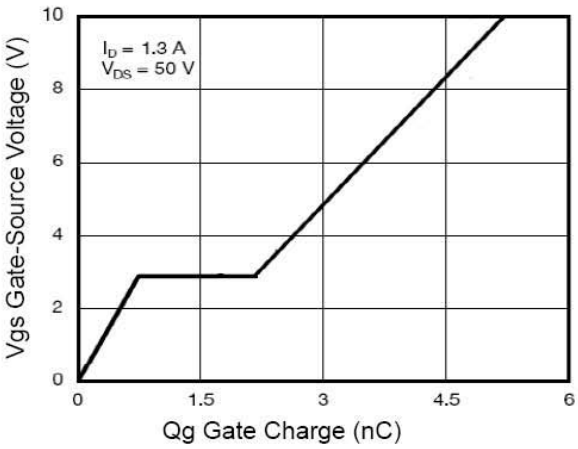


Figure 5 Gate Charge

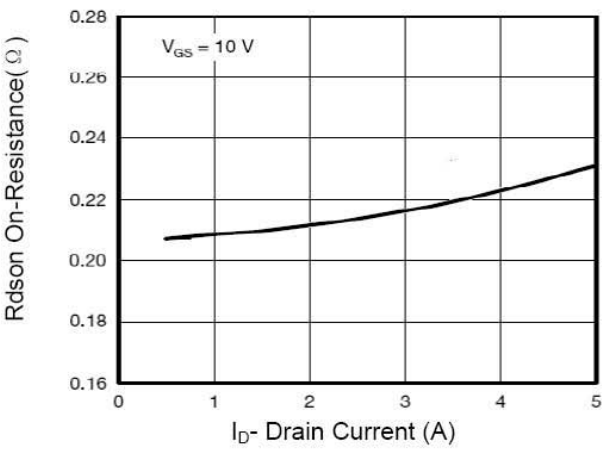


Figure 3 Rdson- Drain Current

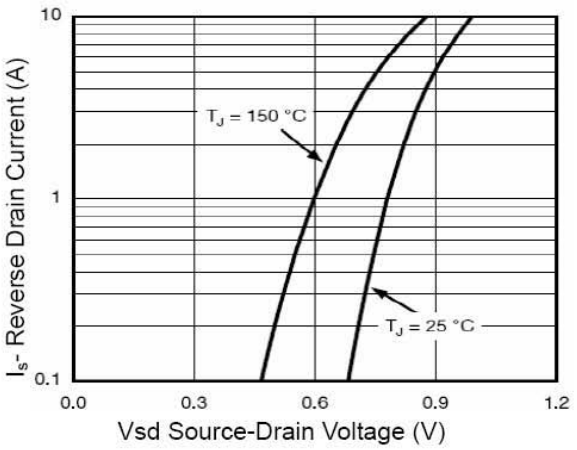


Figure 6 Source- Drain Diode Forward

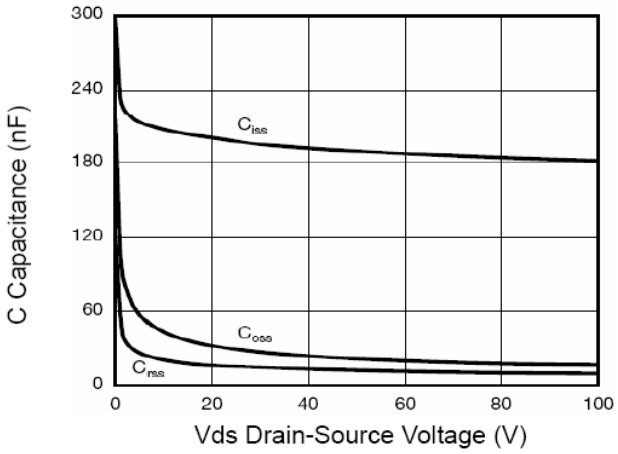


Figure 7 Capacitance vs Vds

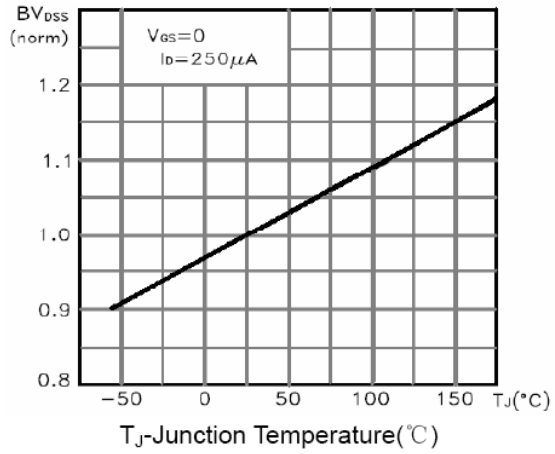


Figure 9 BV_{DSS} vs Junction Temperature

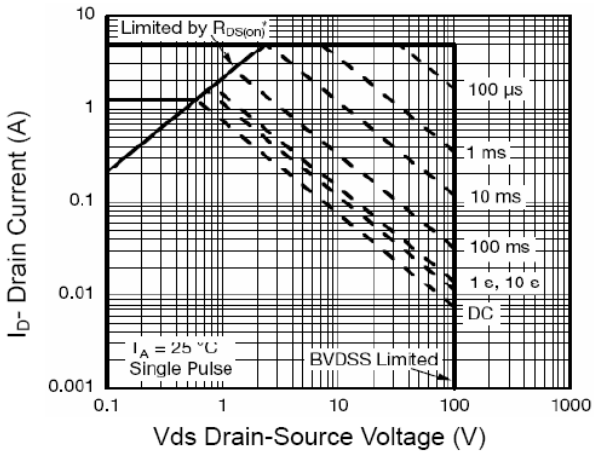


Figure 8 Safe Operation Area

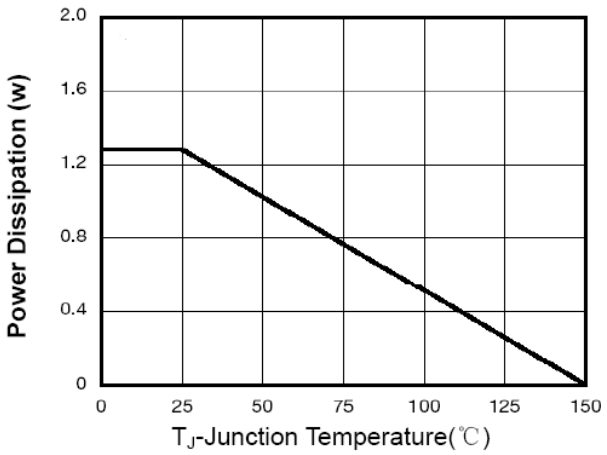


Figure 10 Power De-rating

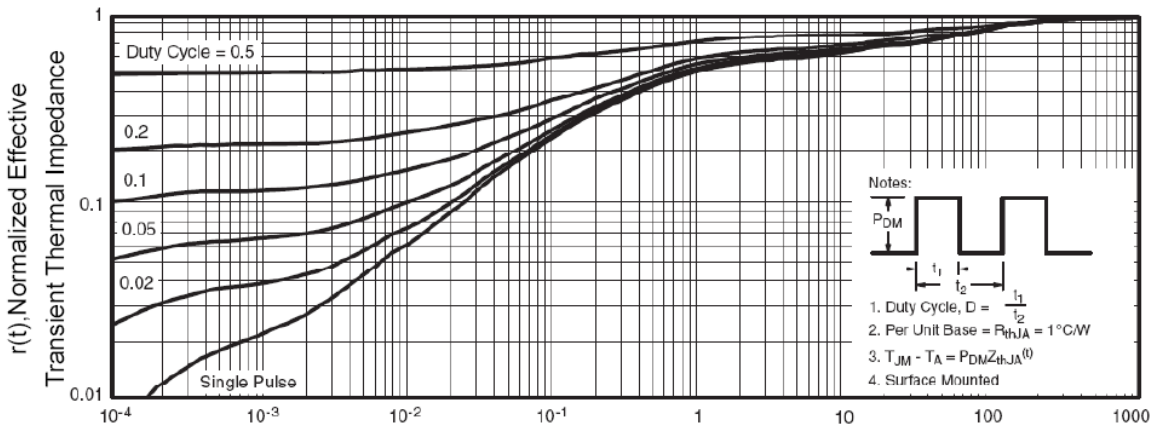
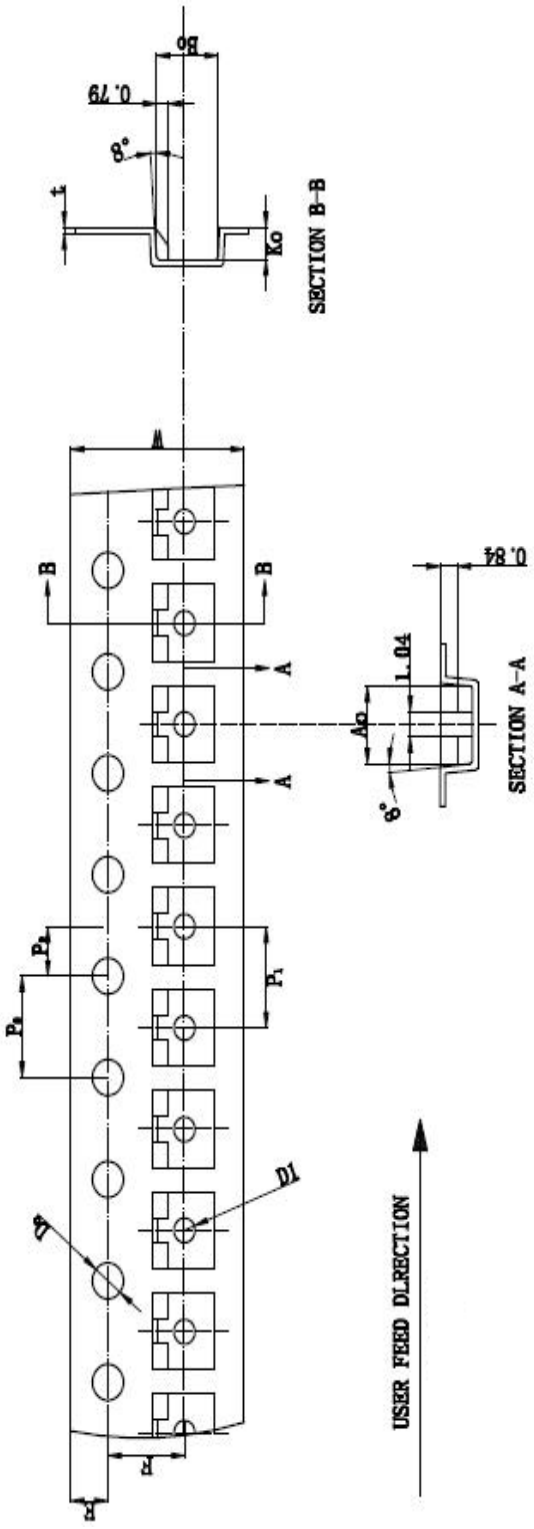


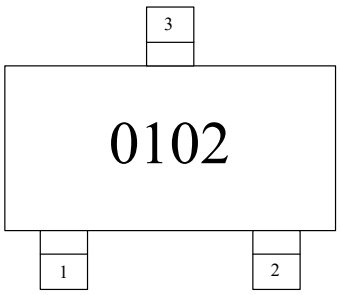
Figure 11 Normalized Maximum Transient Thermal Impedance

Tape and Reel Specification



W	P	E	F	D	D1	Po	Po10	P2	A0	B0	K0	T
8.00	4.00	1.75	3.50	1.50	1.00	4.00	40.00	2.00	3.15	2.77	1.22	0.20
+0.3/−0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.05	±0.1	±0.1	±0.1	±0.02

Marking Codes



Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TNM03K100KX	100V	3,000	7 Inch