



**THE DATASHEET OF  
BSS123K-TP**



## Features

- ESD Protected Up To 2KV(HBM)
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

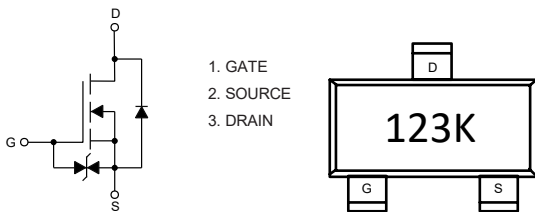
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Thermal Resistance: 160°C/W Junction to Ambient (Note2)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous	$I_D$	$T_A=25^\circ\text{C}$	0.28
		$T_A=100^\circ\text{C}$	0.17
Drain Current-Pulsed(Note3)	$I_{DM}$	1.12	A
Power Dissipation(Note4)	$P_D$	0.78	W

Note:

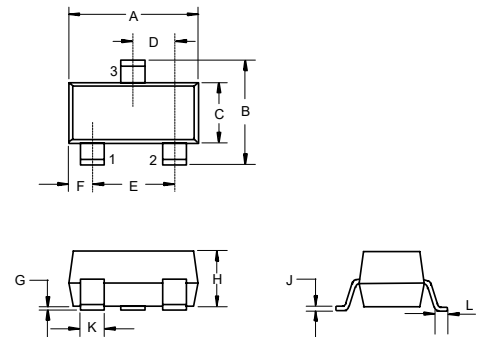
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction-ambient thermal resistance.

## Internal Structure and Marking Code



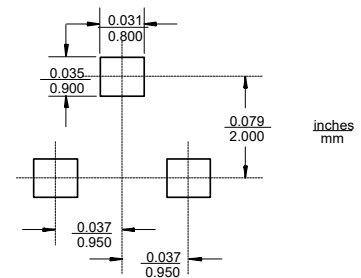
# N-Channel MOSFET

## SOT-23



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.026	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.012	0.020	0.30	0.51	
L	0.007	0.020	0.20	0.50	

### Suggested Solder Pad Layout



**ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)**

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.5	2	2.5	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	$\mu A$
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=0.25A$		3.5	6	$\Omega$
		$V_{GS}=4.5V, I_D=0.2A$		4.1	9	
Gate Resistance	$R_g$	f=1 MHz, Open drain		81		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				0.28	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=0.4A$			1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F=0.1A, dI_F/dt=100A/\mu s$		13		ns
Reverse Recovery Charge	$Q_{rr}$			4		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		32		$\mu F$
Output Capacitance	$C_{oss}$			2.8		
Reverse Transfer Capacitance	$C_{rss}$			1.7		
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=10V, I_D=0.1A$		1.3		nC
Gate-Source Charge	$Q_{gs}$			0.2		
Gate-Drain Charge	$Q_{gd}$			0.4		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50V, V_{GS}=10V$ $R_G=6\Omega, I_D=0.1A$		3		ns
Turn-On Rise Time	$t_r$			3		
Turn-Off Delay Time	$t_{d(off)}$			9		
Turn-Off Fall Time	$t_f$			51		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

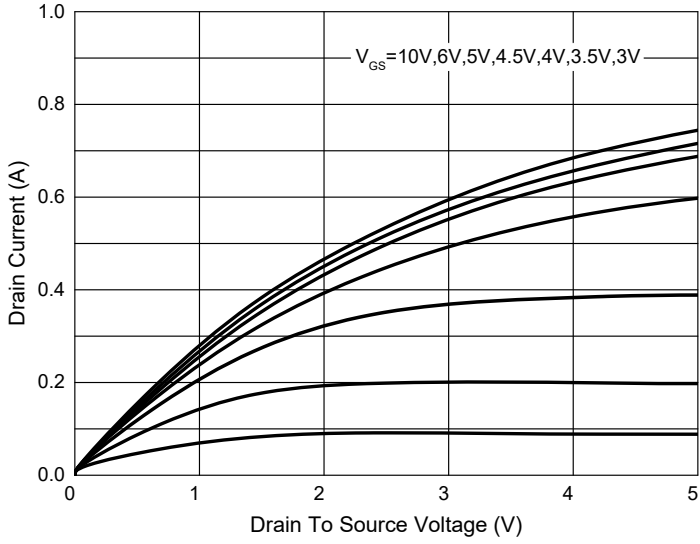


Fig. 2 - Transfer Characteristics

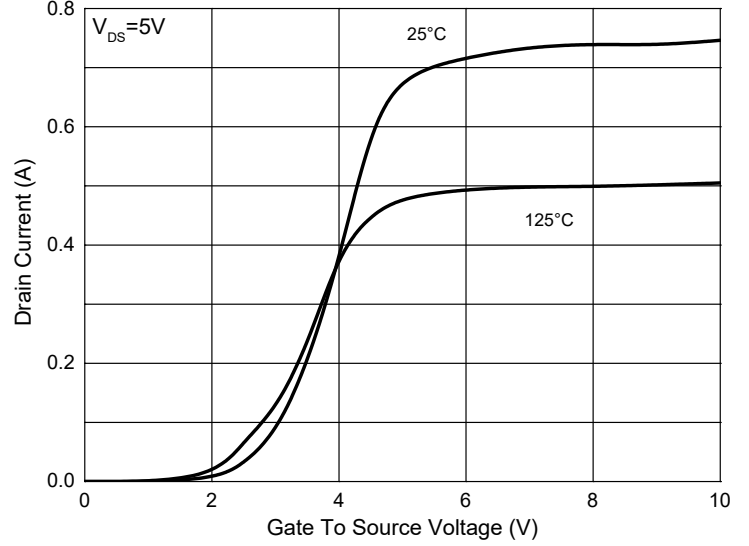


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

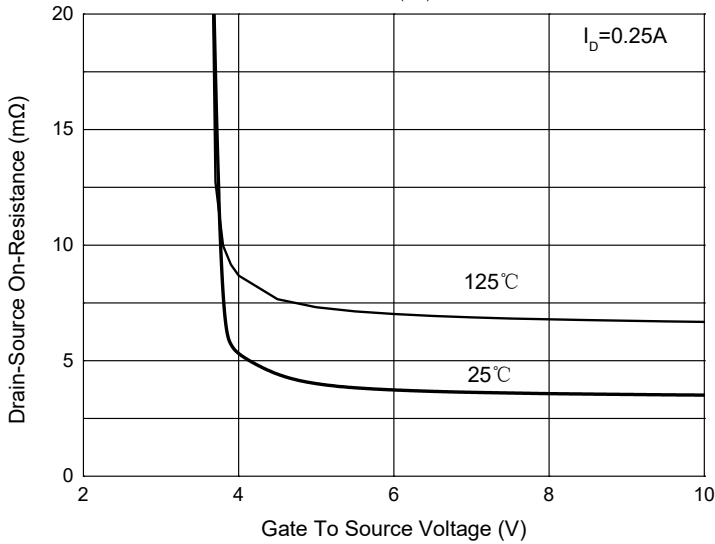


Fig. 4 -  $R_{DS(ON)} - I_D$

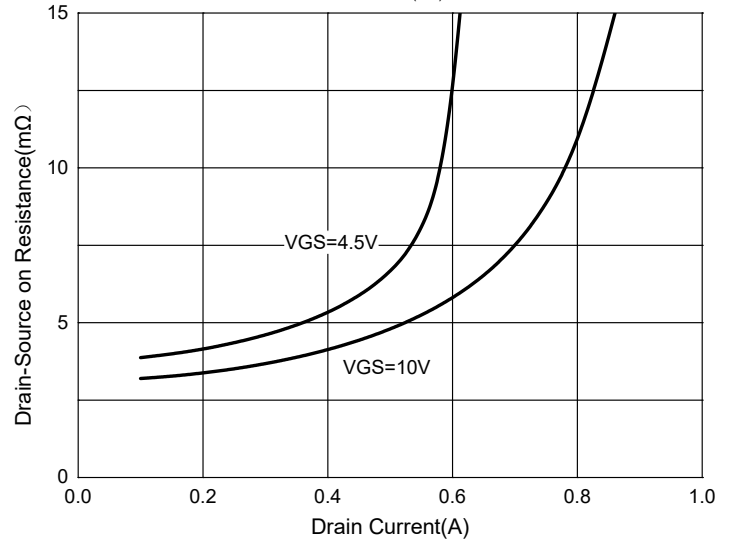


Fig. 5 - Capacitance Characteristics

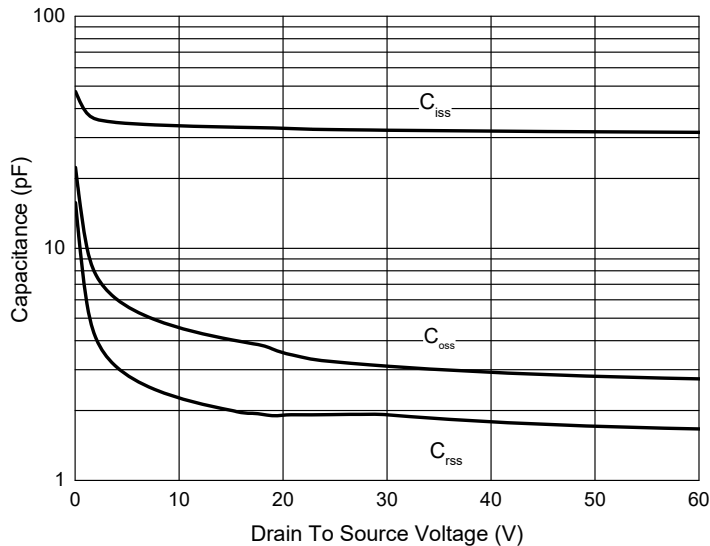
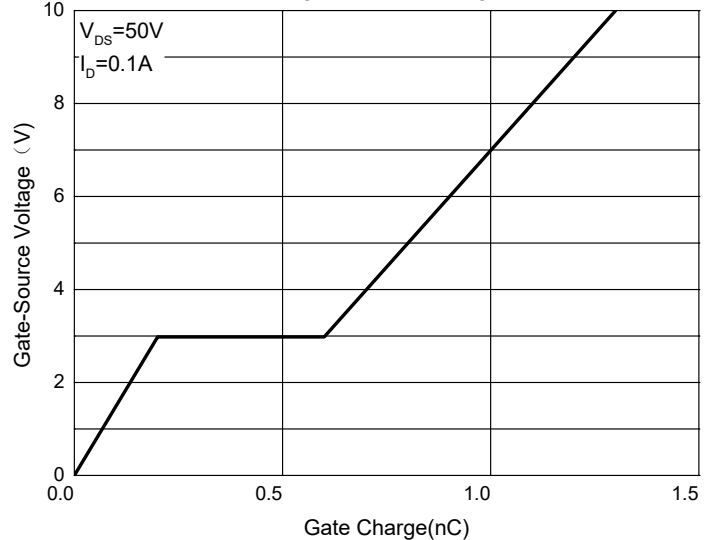


Fig. 6 - Gate Charge



**Curve Characteristics**

Fig. 7 - Normalized Threshold Voltage

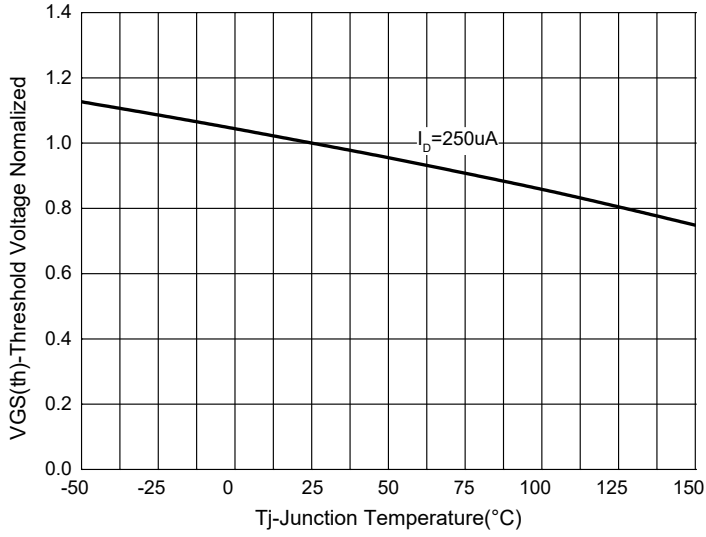


Fig.8-Normalized On Resistance Characteristics

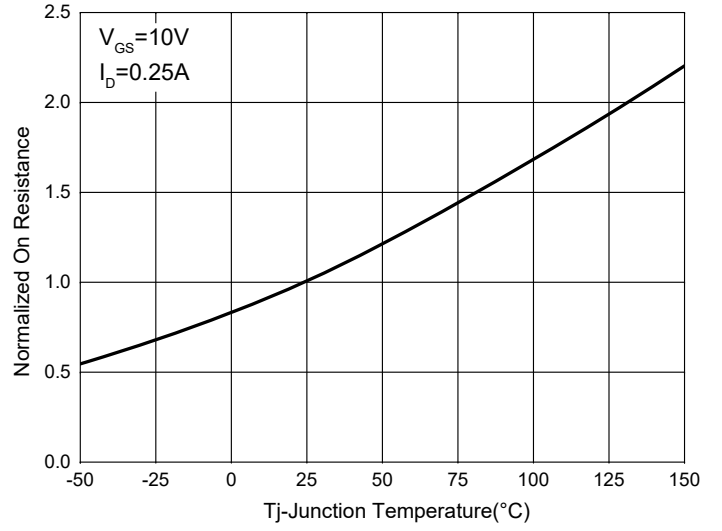


Fig.9 - I<sub>S</sub>-V<sub>SD</sub>

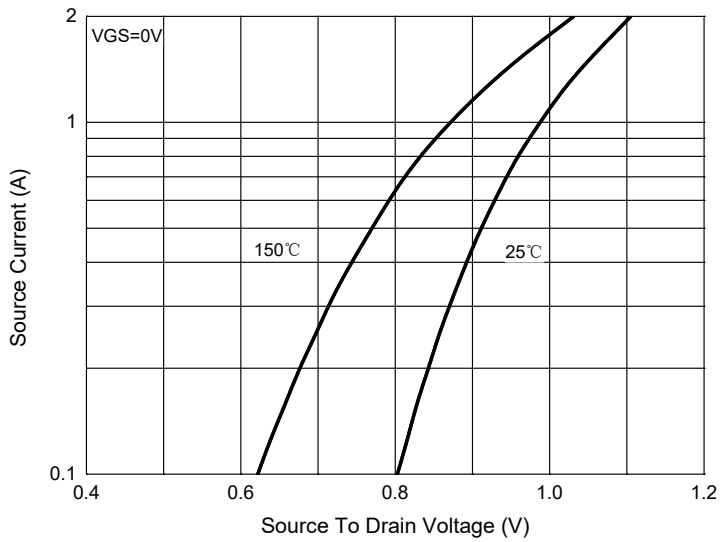


Fig. 10 - Drain Current

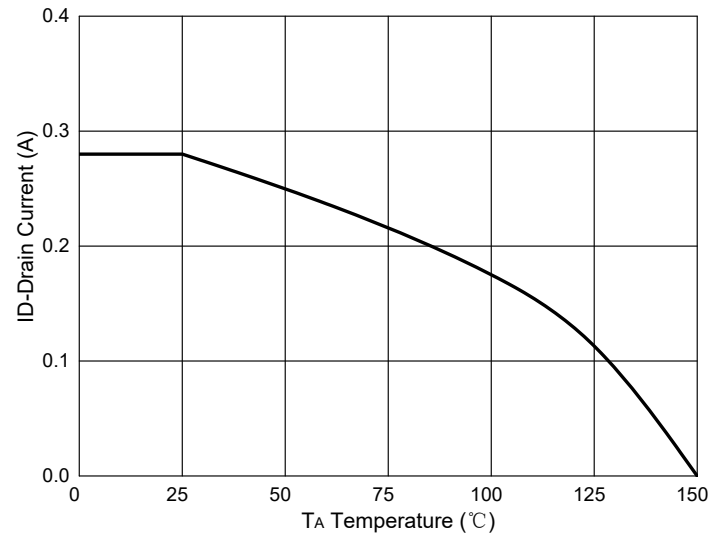
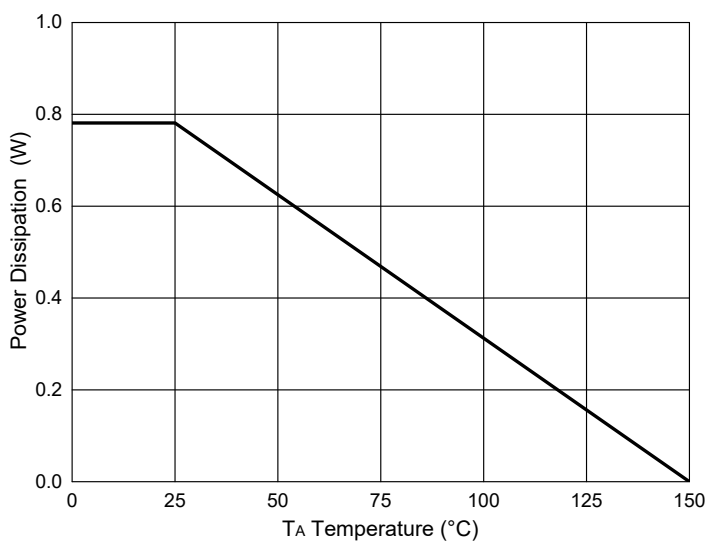


Fig.11-PD Dissipation



**Curve Characteristics**

Fig. 12 - Safe Operation Area

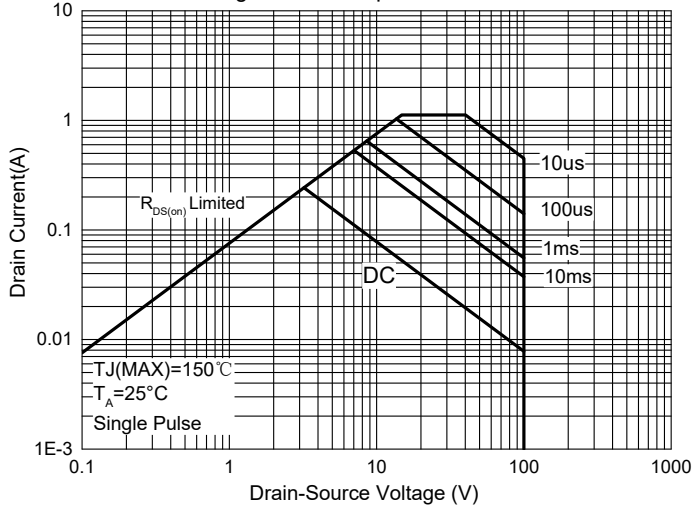
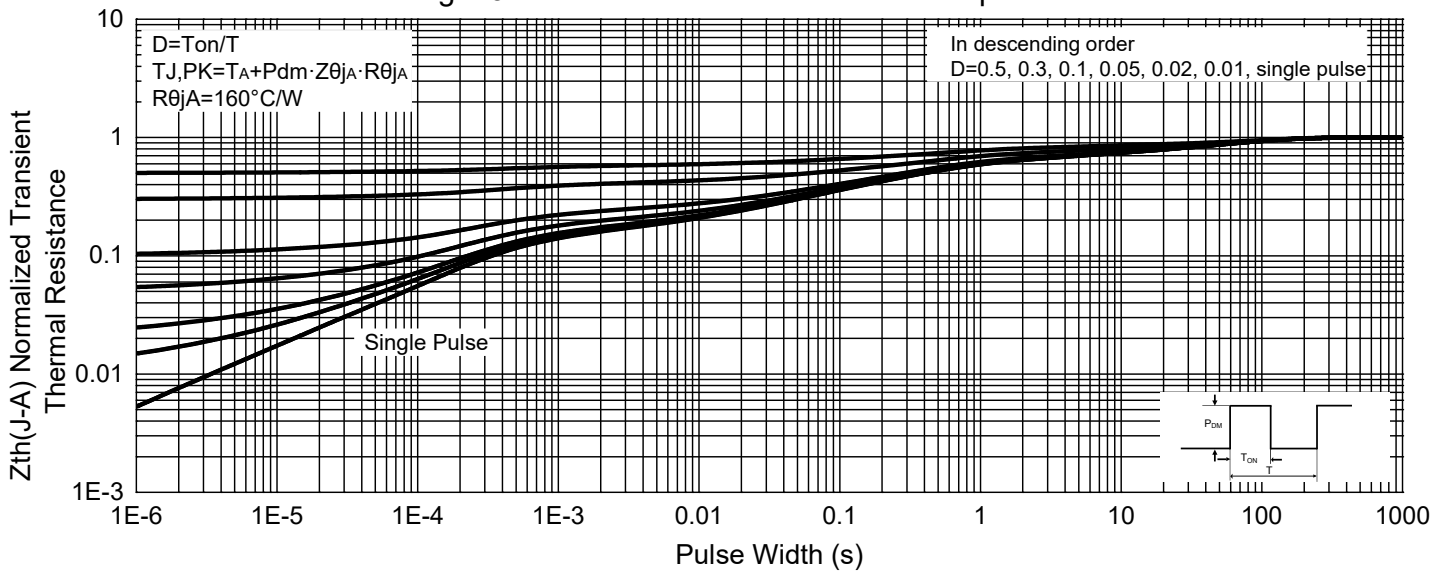


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel

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