

RoHS Compliant Product
A Suffix of "-C" specifies halogen & lead-free

DESCRIPTIONS

The SMS123 is N-Channel enhancement MOS Field Effect 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, load switch and level shift.

MECHANICAL DATA

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage

APPLICATION

- DC-DC converter circuit
- Load Switch

MARKING

B123

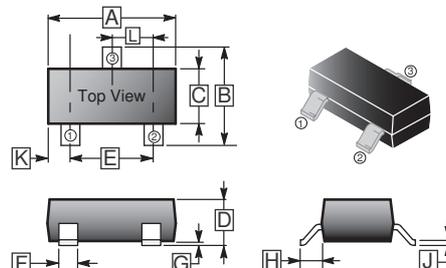
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

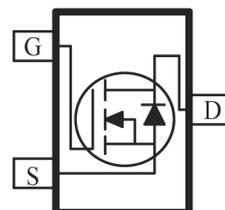
MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain – Source Voltage	V_{DS}	100	V
Gate – Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	I_D	0.17	A
Pulsed Drain Current ($t_p=10\mu\text{s}$)	I_{DM}	0.68	A
Continuous Source-Drain Diode Current	I_S	0.17	A
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient ¹	$R_{\theta JA}$	357	$^\circ\text{C} / \text{W}$
Lead Temperature for Soldering Purposes (1/8" from case for 10s)	T_L	260	$^\circ\text{C}$
Operating Junction & Storage Temperature Range	T_J, T_{STG}	150, -55~150	$^\circ\text{C}$

SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.09	0.18
B	2.10	2.65	H	0.35	0.65
C	1.20	1.40	J	0.08	0.20
D	0.89	1.17	K	0.6 REF.	
E	1.78	2.04	L	0.95 BSC.	
F	0.30	0.50			



ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise specified)

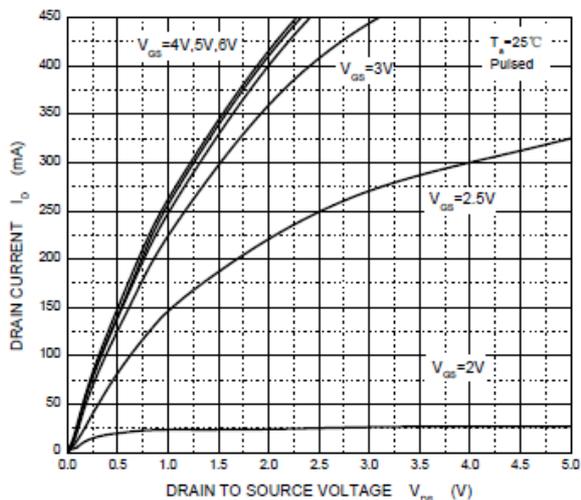
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	100	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS}=100V, V_{GS}=0V$
		-	-	10	nA	$V_{DS}=20V, V_{GS}=0V$
Gate-Source Leakage	I_{GSS}	-	-	10	μA	$V_{DS}=0V, V_{GS}= \pm 20V$
Gate-Threshold Voltage ²	$V_{GS(TH)}$	1	1.6	2.8	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Drain-Source On Resistance ²	$R_{DS(ON)}$	-	-	6	Ω	$V_{GS}=10V, I_D=0.17A$
		-	-	10		$V_{GS}=4.5V, I_D=0.17A$
Forward Transfer conductance ²	g_{FS}	80	-	-	mS	$V_{DS}=10V, I_D= 0.17A$
Body-Drain Diode Ratings						
Diode Forward On-Voltage	V_{SD}	-	-	1.3	V	$I_S=340mA, V_{GS}=0V$
Dynamic Characteristics						
Input Capacitance	C_{ISS}	-	29	41	pF	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1MHz$
Output Capacitance	C_{OSS}	-	10	14		
Reverse Transfer Capacitance	C_{RSS}	-	2	2.8		
Switching Characteristics ³						
Total Gate Charge	$Q_{G(TOT)}$	-	1.4	-	nC	$V_{DS}=10V,$ $V_{GS}=10V,$ $I_D=0.22A$
Gate-to-Source Charge	Q_{GS}	-	0.15	-		
Gate-to-Drain Charge	Q_{GD}	-	0.2	-		
Turn-on Delay Time	$T_{d(ON)}$	-	8	-	nS	$V_{DD}=30V,$ $I_D=0.28A,$ $V_{GS}=10V,$ $R_{GEN}=50\Omega$
Rise Time	T_r	-	8	-		
Turn-off Delay Time	$T_{d(OFF)}$	-	13	-		
Fall Time	T_f	-	16	-		

Notes:

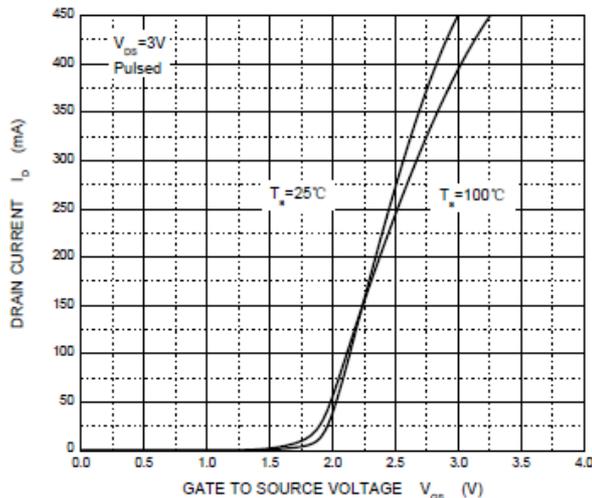
1. Surface mounted on FR4 Board using the minimum recommended pad size.
2. Pulse Test : Pulse width=300 μs , duty cycle $\leq 2\%$
3. Switching characteristics are independent of operating junction temperature.

CHARACTERISTIC CURVES

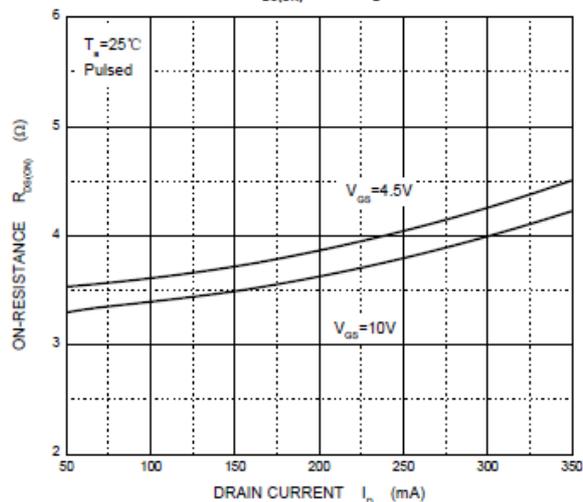
Output Characteristics



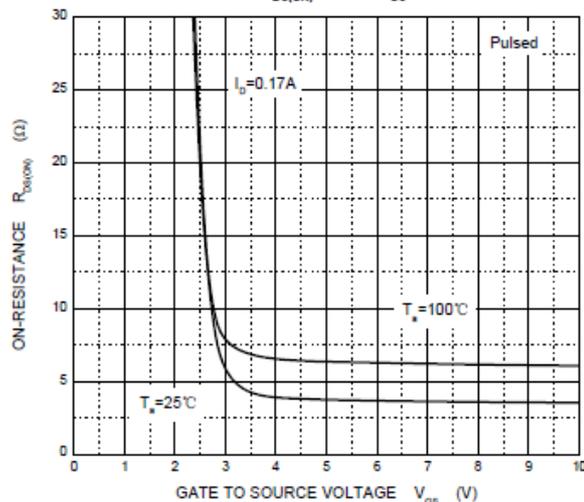
Transfer Characteristics



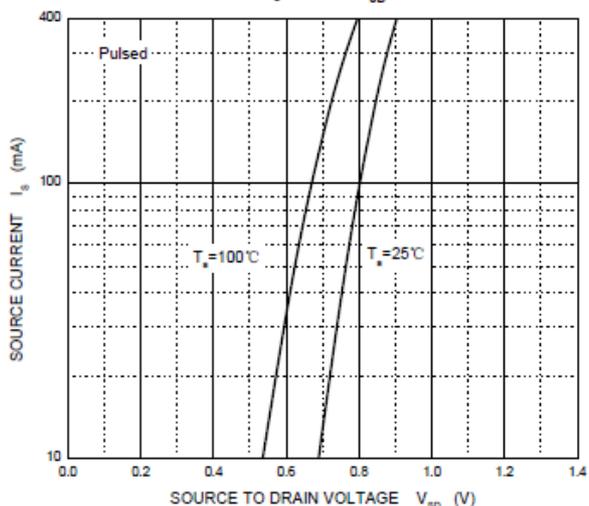
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage

