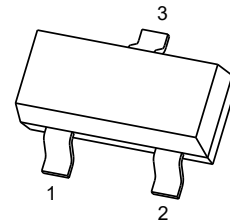


Digital Transistors (NPN Built-in Resistors)

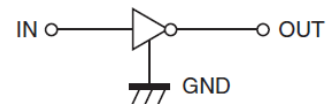
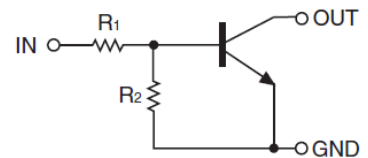
Feature

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit).
- The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input.They also have the advantage of almost completely eliminating parasitic effects.
- Only the on/off conditions need to be set for operation, making device design easy.



SOT-23

1. IN
2. GND
3. OUT



• Equivalent Circuit

Absolute Maximum Rating ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{CC}	Supply Voltage	50	V
V_{IN}	Input Voltage	-5~+12	V
I_O	Output Current	100	mA
P_D	Power Dissipation	200	mW
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-55~+150	$^{\circ}\text{C}$

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

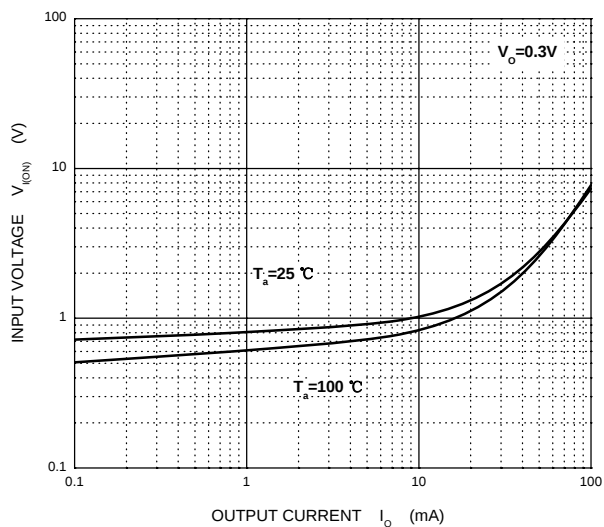
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input voltage	$V_{I(off)}$	$V_{CC}=5V, I_O=100\mu A$	0.3			V
	$V_{I(on)}$	$V_O=0.3V, I_O=20mA$			3	V
Output voltage	$V_{O(on)}$	$I_O/I_I=10mA/0.5mA$		0.1	0.3	V
Input current	I_I	$V_I=5V$			3.8	mA
Output current	$I_{O(off)}$	$V_{CC}=50V, V_I=0$			0.5	μA
DC current gain	G_I	$V_O=5V, I_O=10mA$	33			
Input resistance	R_1		1.54	2.2	2.86	k Ω
Resistance ratio	R_2/R_1		3.6	4		
Transition frequency	f_T	$V_O=10V, I_O=5mA, f=100MHz$		250		MHz

Ordering Information

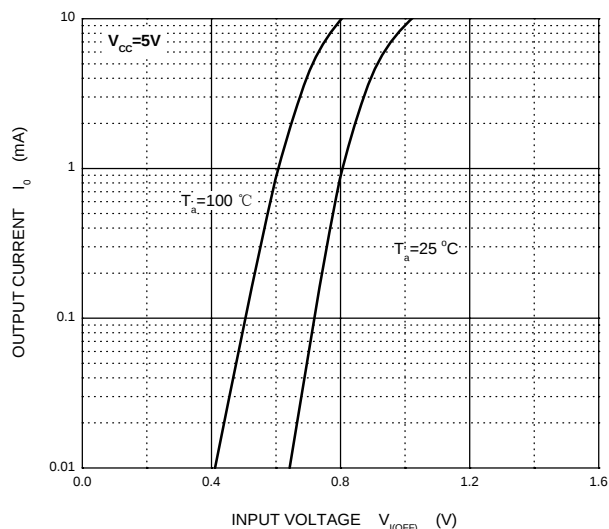
Part Number	Marking	Package	Packing Method	Pack Quantity
DTC123YCA	62	SOT-23	Reel	3000pcs/Reel

Typical Characteristics

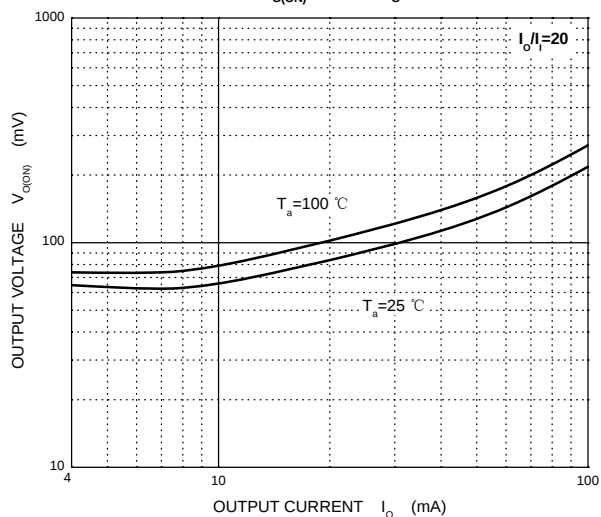
ON Characteristics



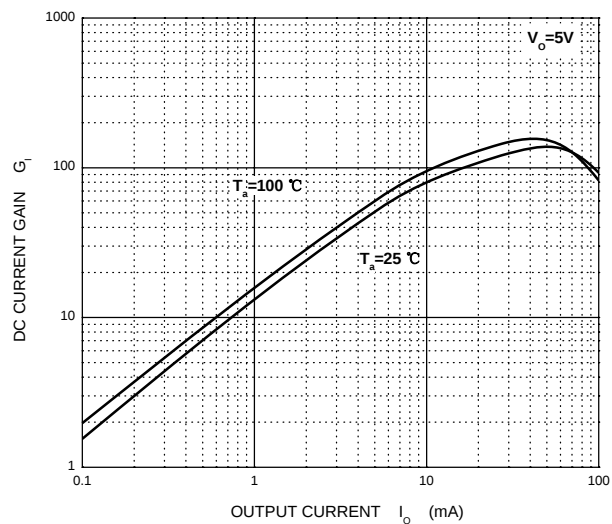
OFF Characteristics



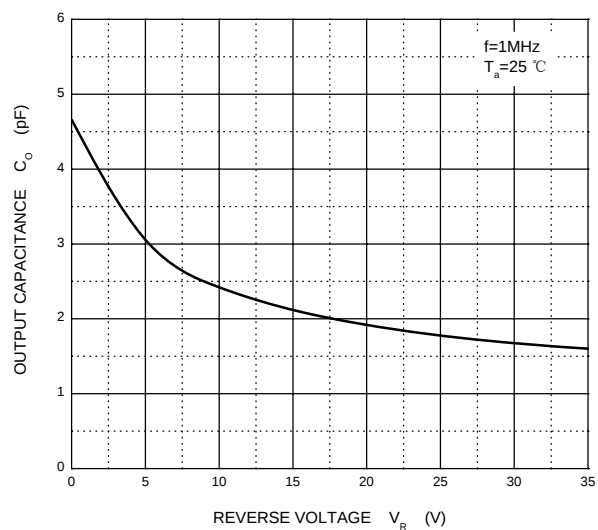
$V_{O(ON)}$ — I_O



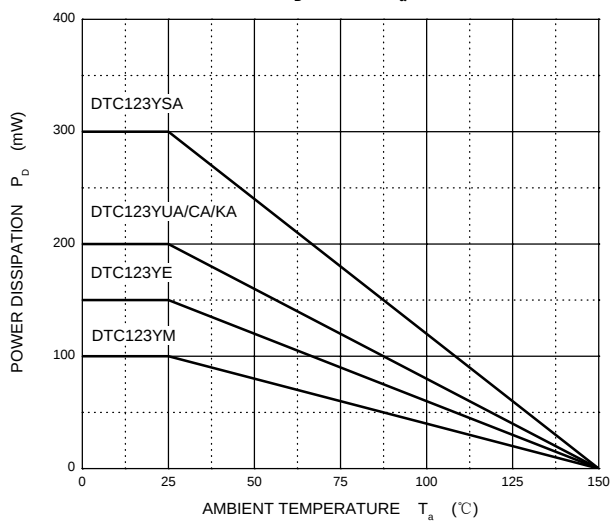
G_I — I_O



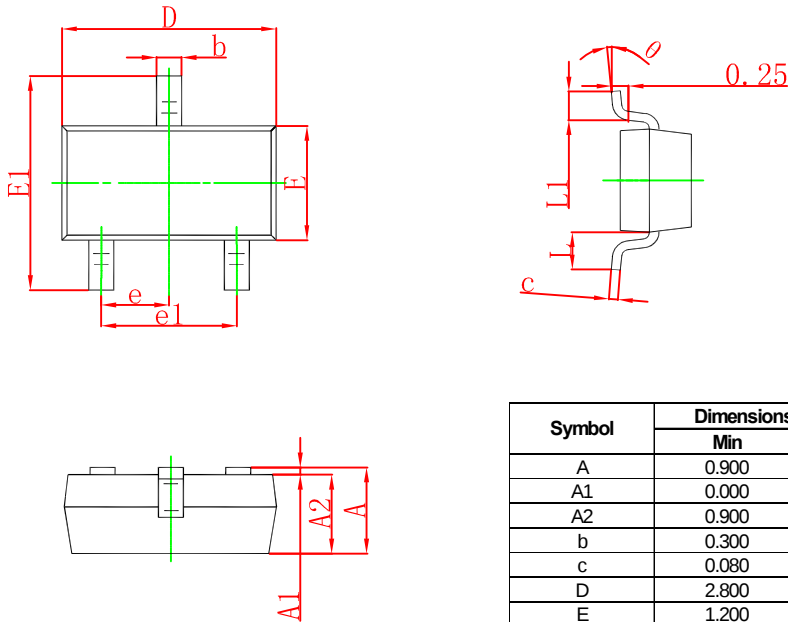
C_O — V_R



P_D — T_a

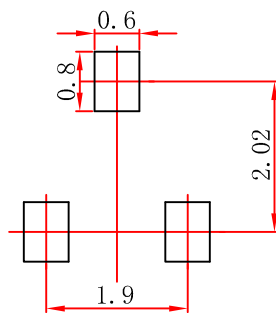


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.