DTC123Yxx Series

Digital Transistors (NPN) (Built-in Resistors)

1. Features

- 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 negative biasing of the input.They also have the advantage of almost completely eliminating para sitic effects;
- Only the on/off conditions need to be set for operation, making device design easy.

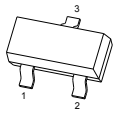
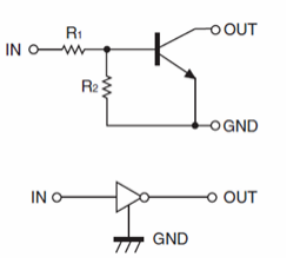
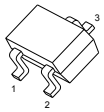
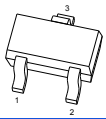
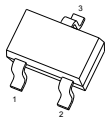
2.MAXIMUM RATINGS (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Limits(DTC123Y xx)						Unit
		M	E	UA	CA	KA	SA	
Supply Voltage	V_{CC}	50						V
Input Voltage	V_{IN}	-5~+12						V
Output Current	I_O	100						mA
Power Dissipation	P_D	100	150	200	200	200	300	mW
Operation Junction and Storage Temperature Range	T_j ,T_{stg}	-55~+150						℃

3. Electrical Characteristics (Ta=25℃unless otherwise specified)

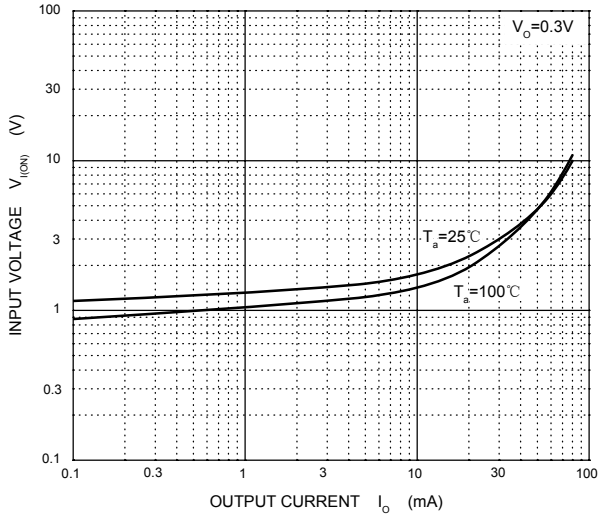
Symbol	Parameter	Condition	Min	Typ	Max	Unit
R_1	Input resistance		1.5	2.2	2.9	kΩ
R_2/R_1	Resistance ratio		3.6	4.5	5.5	
$V_{O(on)}$	Output voltage	I_O/I_I=10mA/0.5mA	—	—	0.3	V
I_I	Input current	V_I=5V	—	—	3.8	mA
$I_{O(off)}$	Output current	V_{CC}=50V, V_I=0	—	—	0.5	μA
G_1	DC current gain	V_O=5V, I_O=10mA	30	—	—	
$V_{I(off)}$	Input voltage	V_{CC}=5V, I_O=100μA	0.3	—	—	V
$V_{I(on)}$		V_O =0.3V, I_O=20mA	—	—	3	V
f_T	Transition frequency	V_O=10V, I_O=5mA , f=100MHz	—	250	—	MHz

4. Pinning information

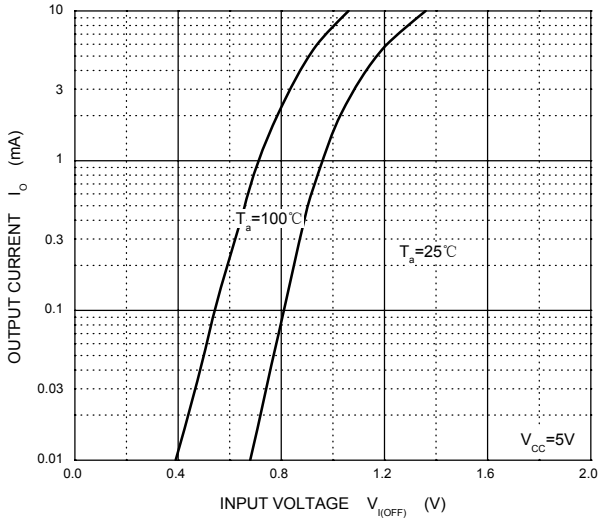
Pin	symbol	Part Number	Simplified outline	Equivalent Circuit	Marking	Package
1	IN	DTC123YCA			62	SOT-23
2	GND					
3	OUT					
1	IN	DTC123YKA			62	SOT-23-3
2	GND					
3	OUT					
1	IN	DTC123YE			62	SOT-523
2	GND					
3	OUT					
1	IN	DTC123YUA			62	SOT-323
2	GND					
3	OUT					

5.Electrical Characteristics Diagrams

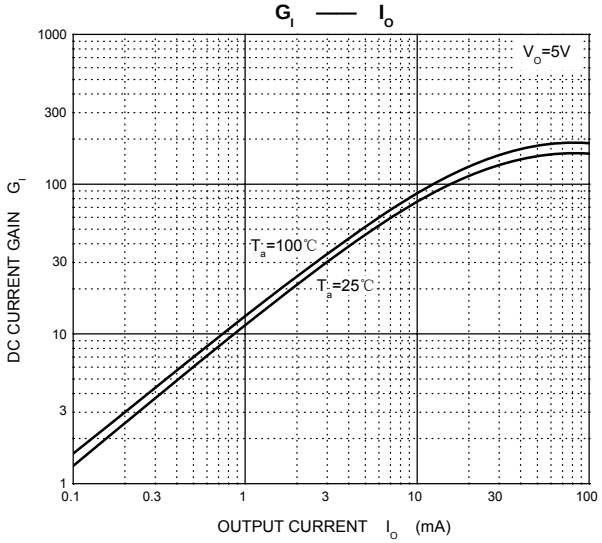
ON Characteristics



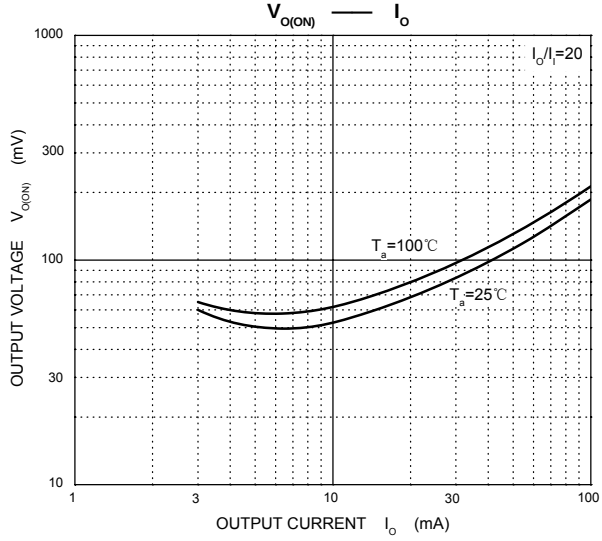
OFF Characteristics



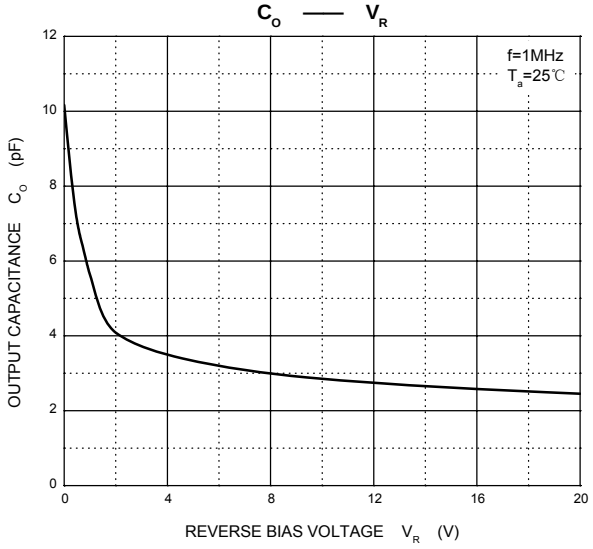
G_I —— I_O



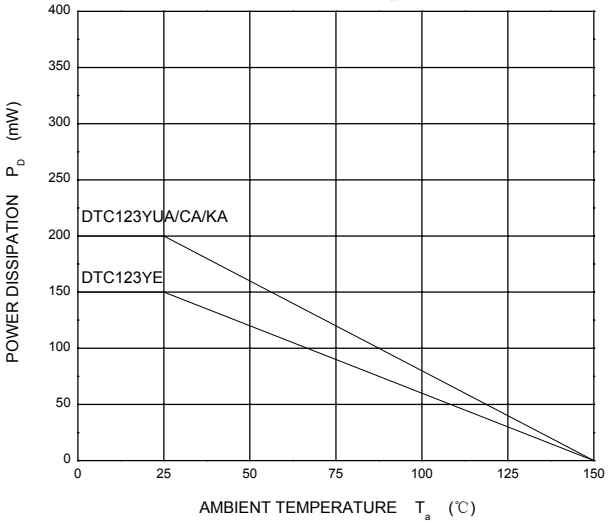
$V_{O(ON)}$ —— I_O



C_O —— V_R

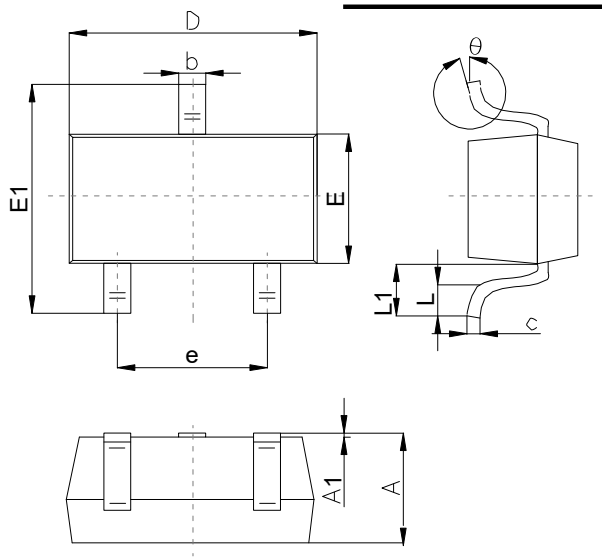


P_D —— T_a



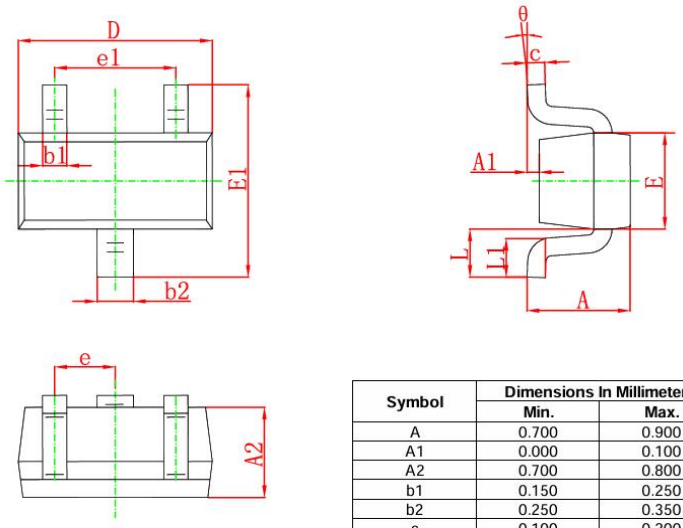
6 . Outline Drawing

SOT-23 Package Outline Dimensions



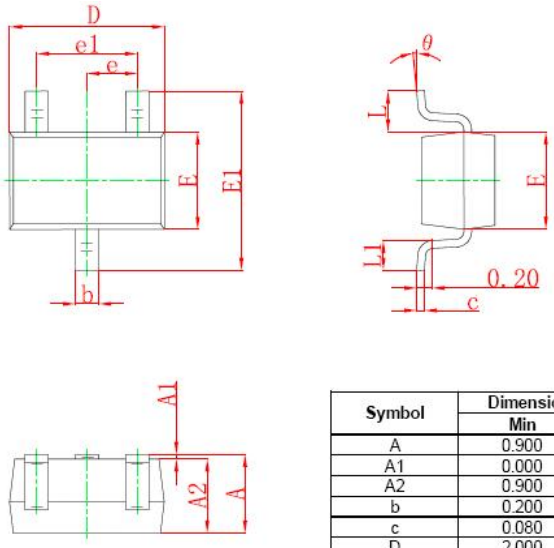
Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.65		1.40
A1	0.00		0.20
b	0.30		0.55
c	0.08		0.20
D	2.70		3.10
E	1.15		1.65
E1	2.10		2.80
e	1.70		2.10
L	0.15		0.50
L1	0.35		0.70
θ	0°		12°

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-323 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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