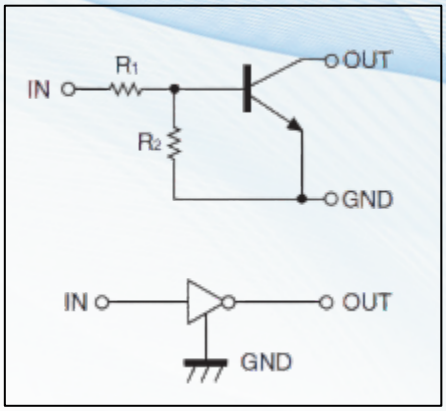
DTC123EM/DTC123EE/DTC123EUA
DTC123EKA /DTC123ECA/DTC123ESA

DIGITAL TRANSISTOR (NPN)

• Equivalent Circuit

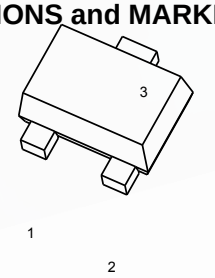


FEATURES

- 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 parasitic effects
- Only the on/off conditions need to be set for operation, making device design easy

PIN CONNENCTIONS and MARKING

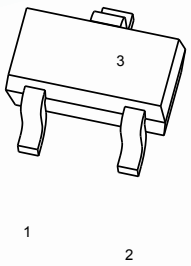
DTC123EM



SOT-723

1. IN
2. GND
3. OUT

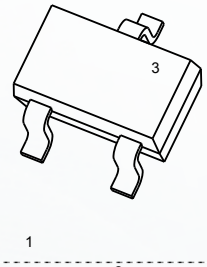
DTC123EE



SOT-523

1. IN
2. GND
3. OUT

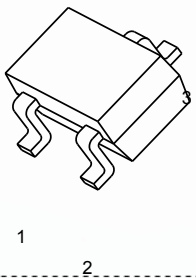
DTC123EUA



SOT-323

1. IN
2. GND
3. OUT

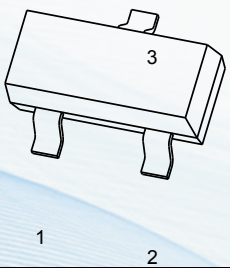
DTC123EKA



SOT-23-3L

1. IN
2. GND
3. OUT

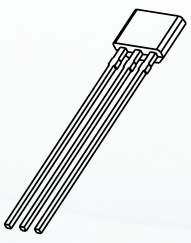
DTC123ECA



SOT-23

1.IN
2.GND
3.OUT

DTC123ESA



TO-92S

1. GND
2. OUT
3. IN

ORDERING INFORMATION

Part Number	MARKING (1)	Package	Packing Method	Pack Quantity
DTC123EM	22	SOT-723	Reel	8000pcs/Reel
DTC123EE	22	SOT-523	Reel	3000pcs/Reel
DTC123EUA	22	SOT-323	Reel	3000pcs/Reel
DTC123EKA	22	SOT-23-3L	Reel	3000pcs/Reel
DTC123ECA	22	SOT-23	Reel	3000pcs/Reel
DTC123ESA	C123 (2) E·XXX	TO-92S	Bulk	1000pcs/Bag
DTC123ESA-TA	C123 (2) E·XXX	TO-92S	Tape	3000pcs/Box

Notes: (1). Solid dot = Green molding compound device, if none, the normal device.
(2). XXX=Code

MAXIMUM RATINGS(Ta=25℃ unless otherwise noted)

Symbol	Parameter	Limits(DTC123E□)						Unit
		M	E	UA	KA	CA	SA	
V_{CC}	Supply Voltage	50						V
V_{IN}	Input Voltage	-10～+12						V
I_O	Output Current	100						mA
P_D	Power Dissipation	100	150	200	200	200	300	mW
T_J,T_{stg}	Operation Junction and Storage Temperature Range	-55～+150						℃

ELECTRICAL CHARACTERISTICS (Ta=25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input voltage	$V_{I(off)}$	V_{CC}=5V,I_O=100μA	0.5			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			0.3	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=20mA	20			
Input resistance	R_1		1.54	2.2	2.86	kΩ
Resistance ratio	R_2/R_1		0.8	1	1.2	
Transition frequency	f_T	V_O=10V,I_O=5mA,f=100MHz		250		MHz

Typical Characteristics – DTC123Ex(@T_A = +25°C, unless otherwise specified.)

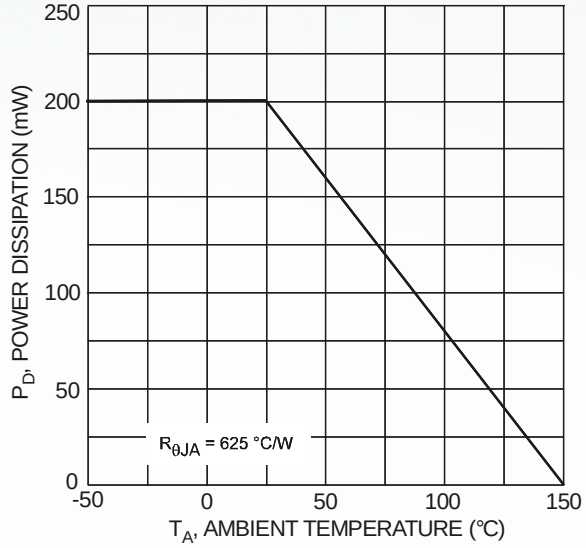


Fig. 1 Power Dissipation vs. Ambient Temperature

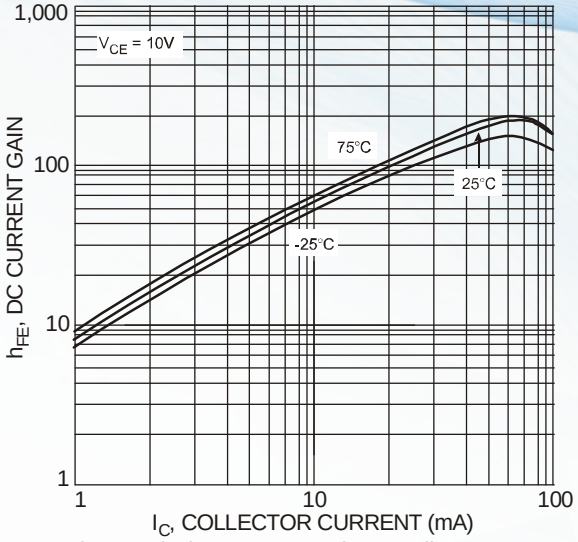


Fig. 2 Typical DC Current Gain vs. Collector Current

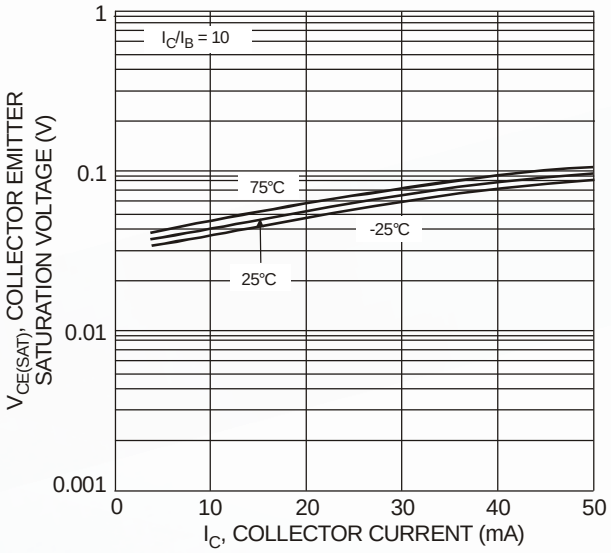


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

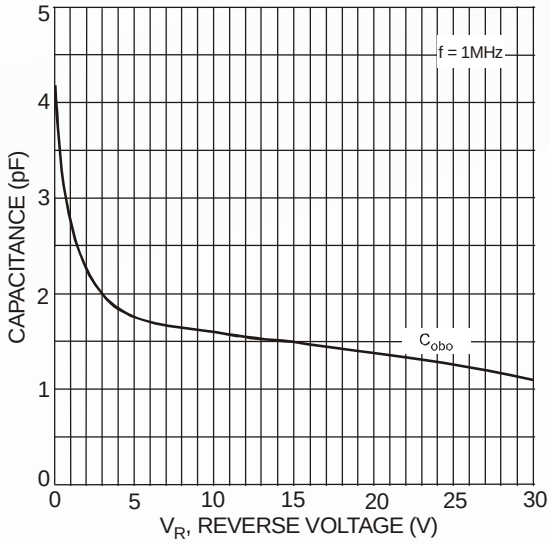


Fig. 4 Typical Capacitance Characteristics

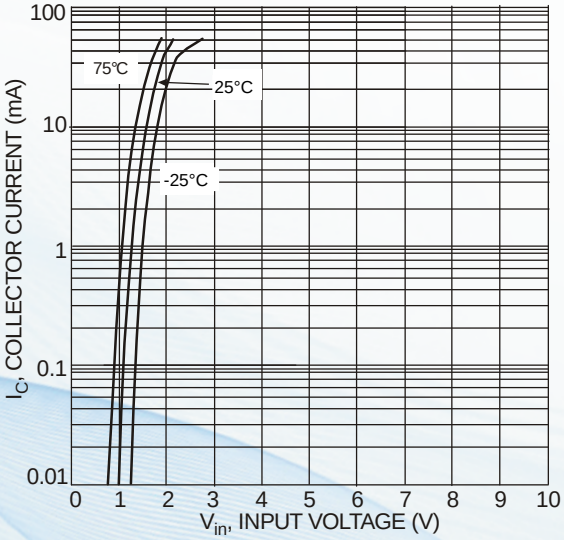


Fig. 5 Collector Current vs. Input Voltage

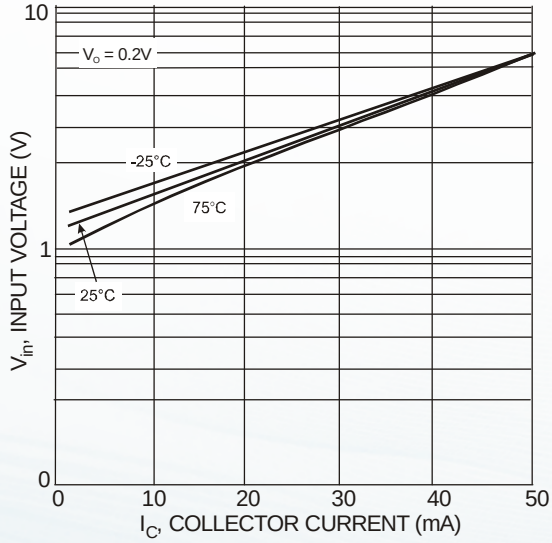
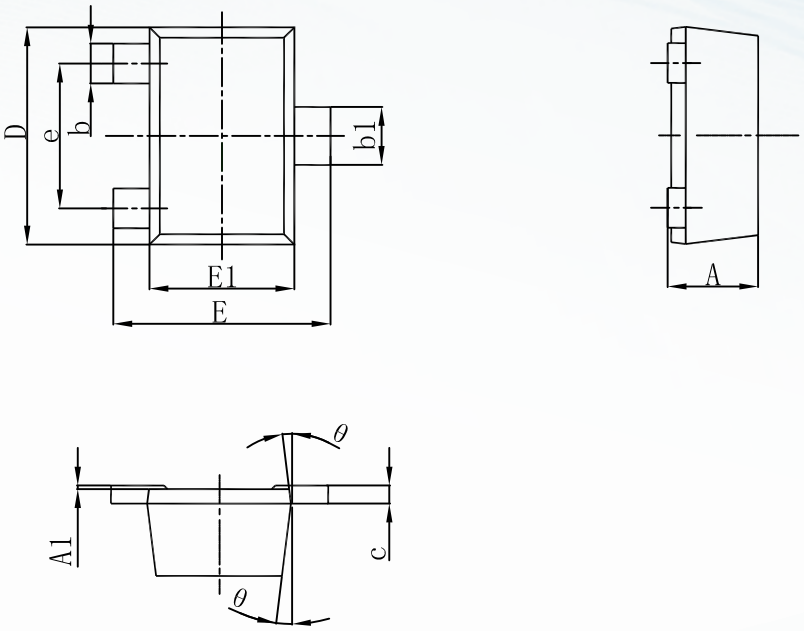


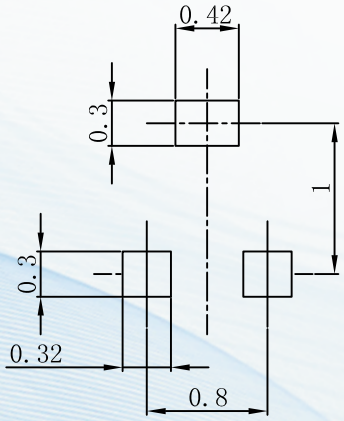
Fig. 6 Input Voltage vs. Collector Current

SOT-723 Package Outline Dimensions



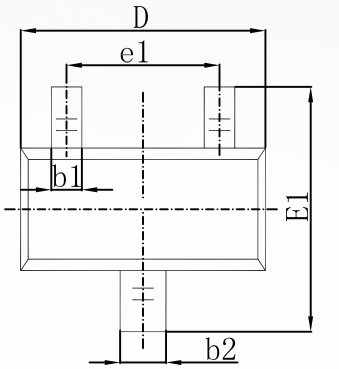
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.500	0.017	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	

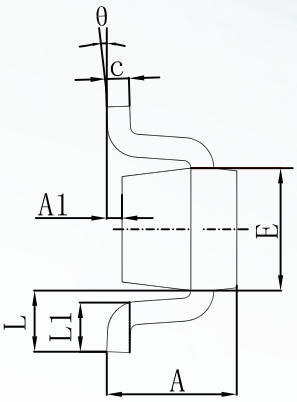
SOT-723 Suggested Pad Layout

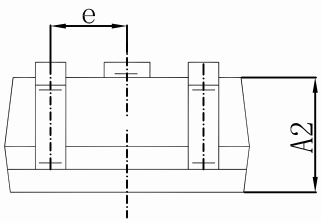


Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

SOT-523 Package Outline Dimensions

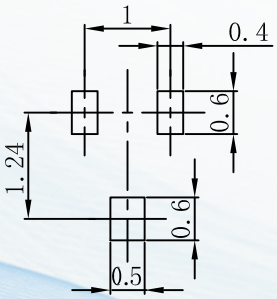






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	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°

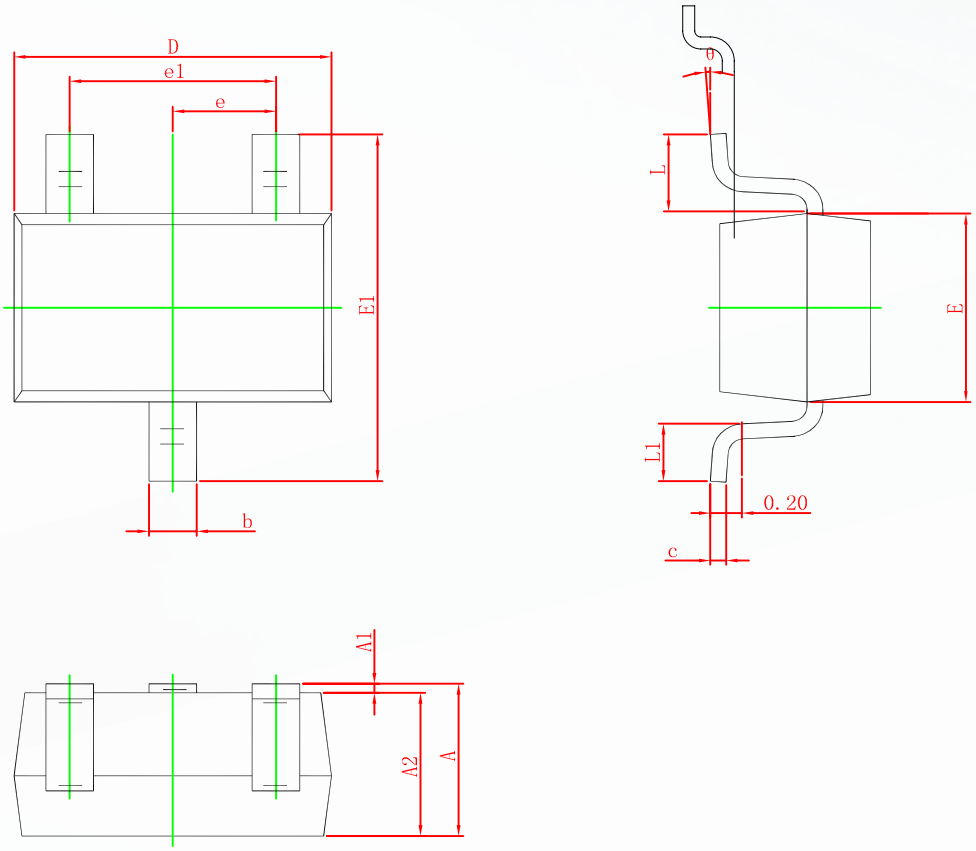
SOT-523 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

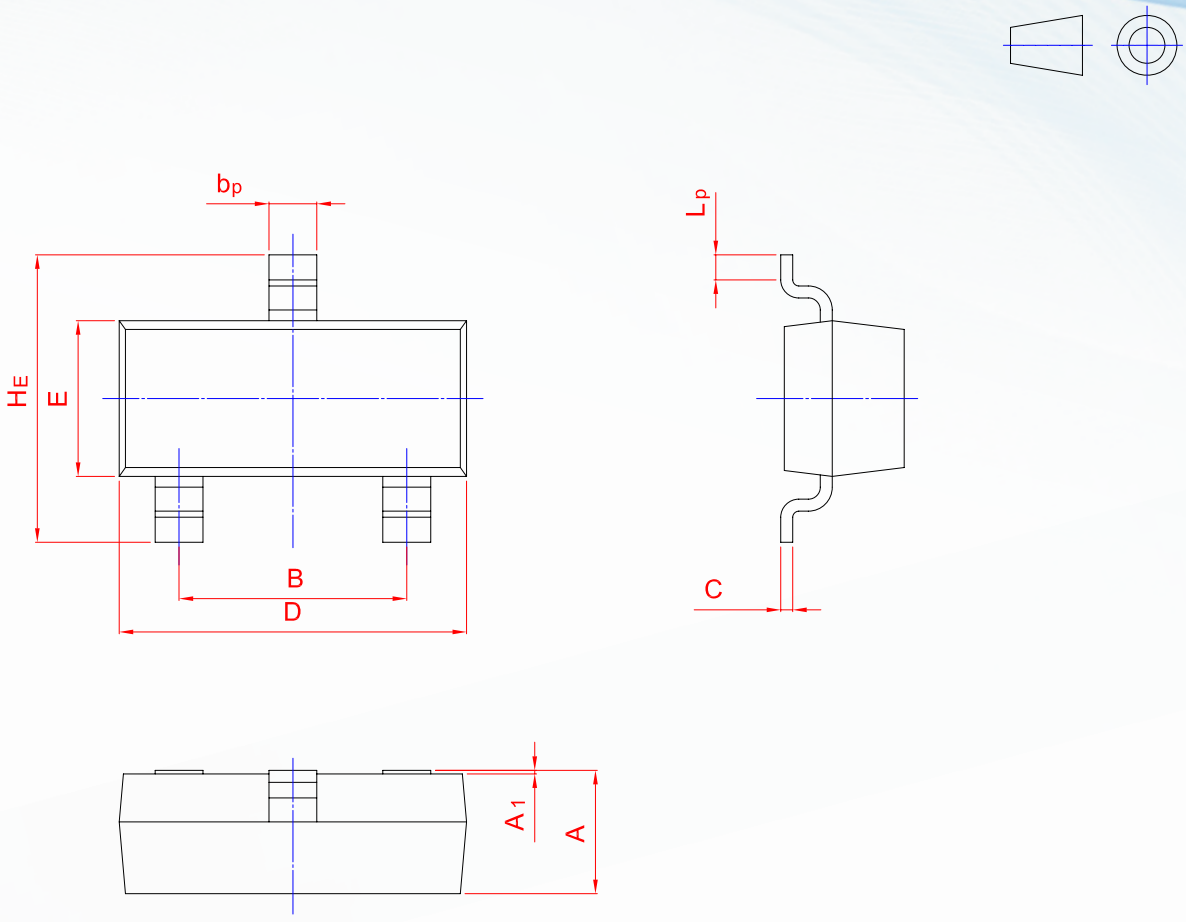
PACKAGE OUTLINE

SOT-323 Package Outline Dimensions



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT-23**



UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20