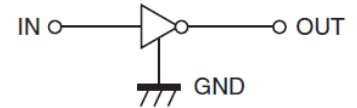
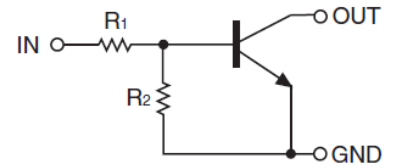




## DTC144EM/DTC144EE/DTC144EUA DTC144EKA /DTC144ECA/DTC144ESA

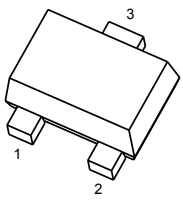
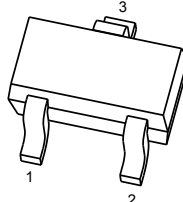
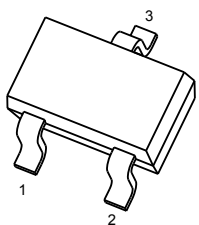
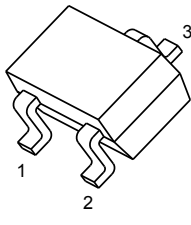
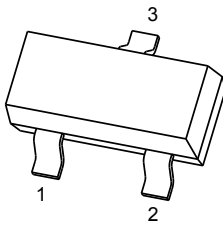
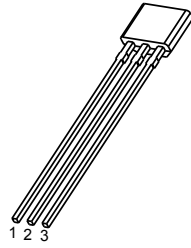
DIGITAL TRANSISTOR (NPN)



### 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

<b>DTC144EM</b> 	<b>SOT-723</b> 1. IN 2. GND 3. OUT	<b>DTC144EE</b> 	<b>SOT-523</b> 1. IN 2. GND 3. OUT
<b>DTC144EUA</b> 	<b>SOT-323</b> 1. IN 2. GND 3. OUT	<b>DTC144EKA</b> 	<b>SOT-23-3L</b> 1. IN 2. GND 3. OUT
<b>DTC144ECA</b> 	<b>SOT-23</b> 1. IN 2. GND 3. OUT	<b>DTC144ESA</b> 	<b>TO-92S</b> 1. GND 2. OUT 3. IN



## ORDERING INFORMATION

Part Number	MARKING	Package	Packing Method	Pack Quantity
DTC144EM	26	SOT-723	Reel	8000pcs/Reel
DTC144EE	26	SOT-523	Reel	3000pcs/Reel
DTC144EUA	26	SOT-323	Reel	3000pcs/Reel
DTC144EKA	26	SOT-23-3L	Reel	3000pcs/Reel
DTC144ECA	26	SOT-23	Reel	3000pcs/Reel
DTC144ESA	C144	TO-92S	Bulk	1000pcs/Bag
DTC144ESA-TA	C144	TO-92S	Tape	3000pcs/Box

## MAXIMUM RATINGS(Ta=25°C unless otherwise noted)

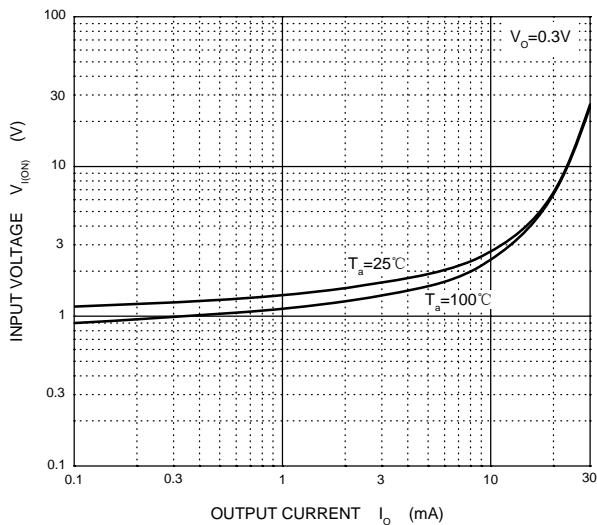
Symbol	Parameter	Limits(DTC144E□)						Unit
		M	E	UA	CA	KA	SA	
V <sub>CC</sub>	Supply Voltage	50						V
V <sub>IN</sub>	Input Voltage	-10~+40						V
I <sub>O</sub>	Output Current	30						mA
I <sub>CM</sub>	Peak Collector Current	100						mA
P <sub>D</sub>	Power Dissipation	100	150	200	200	200	300	mW
T <sub>J</sub> , T <sub>stg</sub>	Operation Junction and Storage Temperature Range	-55~+150						°C

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

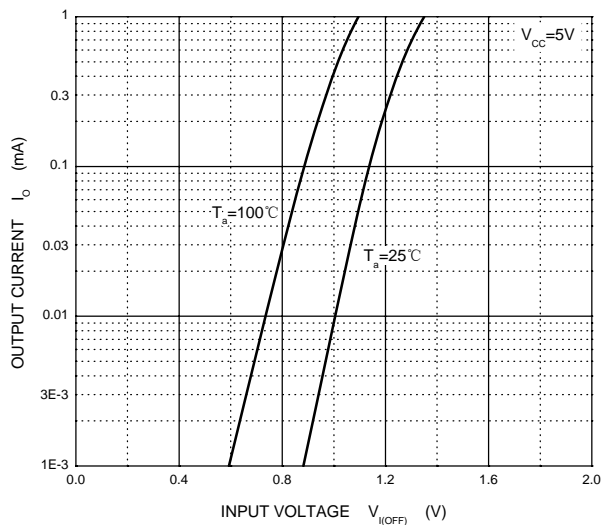
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input voltage	V <sub>I(off)</sub>	V <sub>CC</sub> =5V, I <sub>O</sub> =100μA	0.5			V
	V <sub>I(on)</sub>	V <sub>O</sub> =0.3V, I <sub>O</sub> =2mA			3	V
Output voltage	V <sub>O(on)</sub>	I <sub>O</sub> /I <sub>I</sub> =10mA/0.5mA			0.3	V
Input current	I <sub>I</sub>	V <sub>I</sub> =5V			0.18	mA
Output current	I <sub>O(off)</sub>	V <sub>CC</sub> =50V, V <sub>I</sub> =0			0.5	μA
DC current gain	G <sub>I</sub>	V <sub>O</sub> =5V, I <sub>O</sub> =5mA	68			
Input resistance	R <sub>1</sub>		32.9	47	61.1	kΩ
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>		0.8	1	1.2	
Transition frequency	f <sub>T</sub>	V <sub>O</sub> =10V, I <sub>O</sub> =5mA, f=100MHz		250		MHz



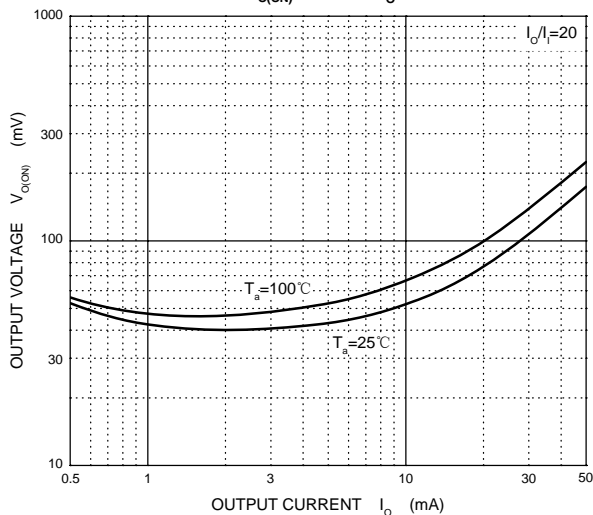
**ON Characteristics**



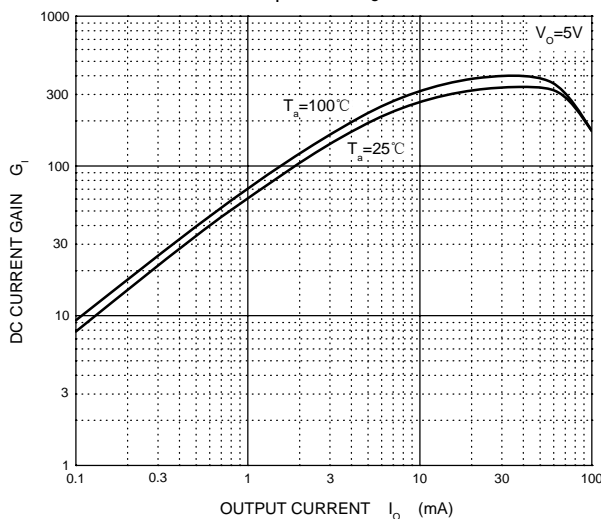
**OFF Characteristics**



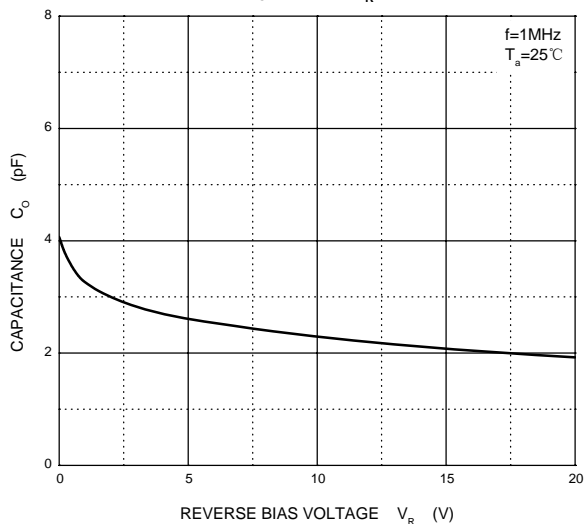
**$V_{O(ON)} - I_O$**



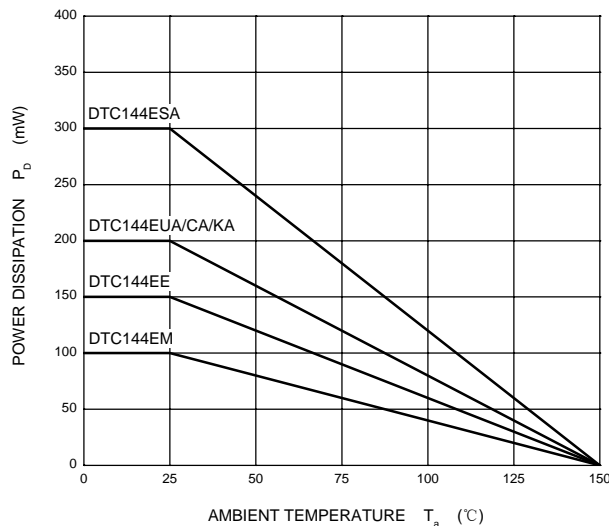
**$G_1 - I_O$**



**$C_O - V_R$**

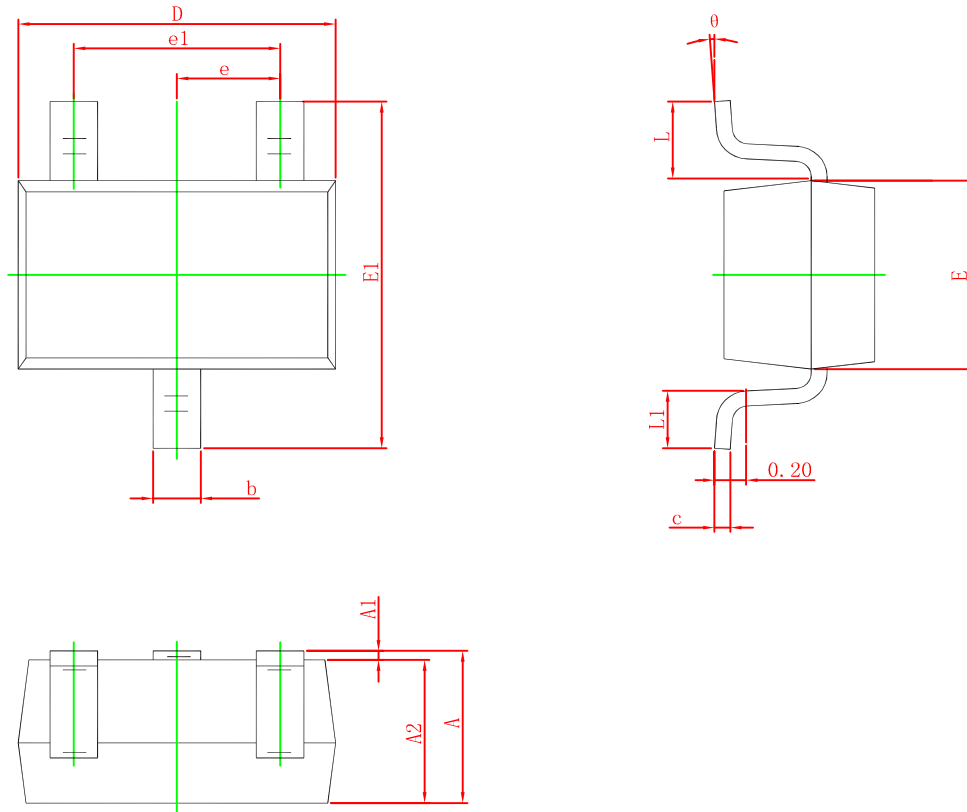


**$P_D - T_a$**





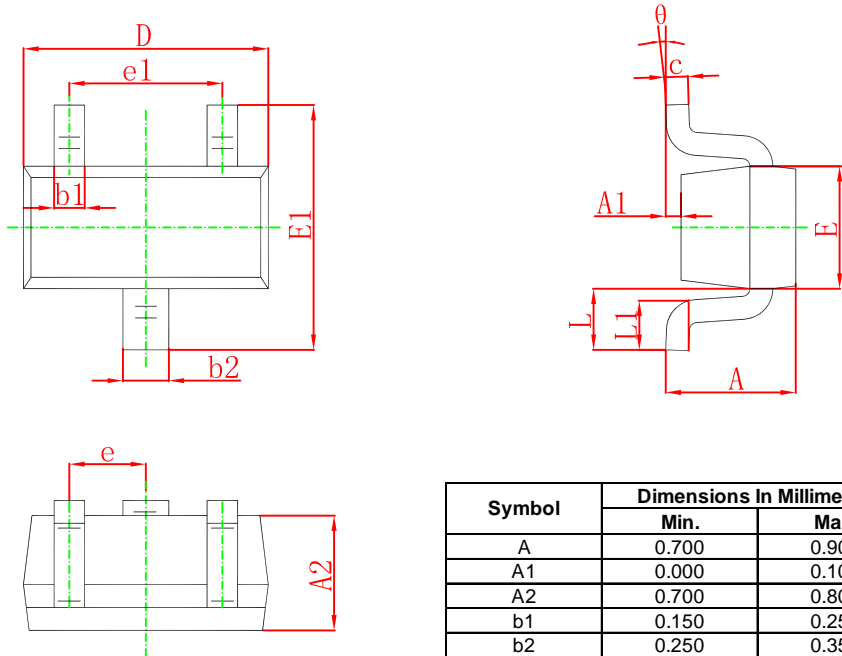
## SOT-323 PACKAGE OUTLINE DIMENSIONS



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
$\theta$	0°	8°	0°	8°

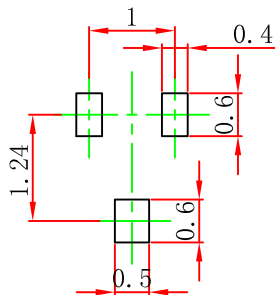


### SOT-523 Package Outline Dimensions



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:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.