

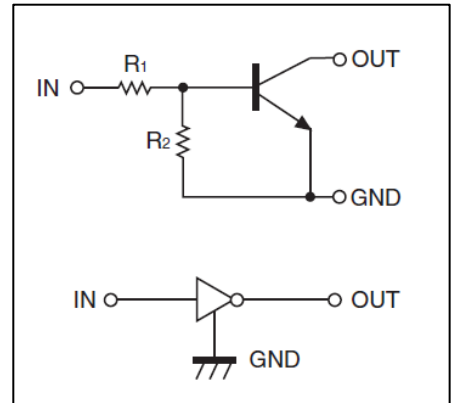
Digital Transistors (Built-in Resistors)

DIGITAL TRANSISTOR (NPN)

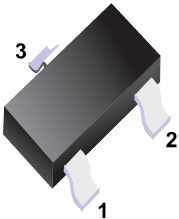
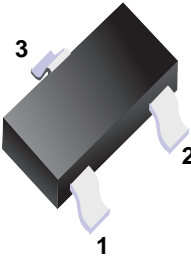
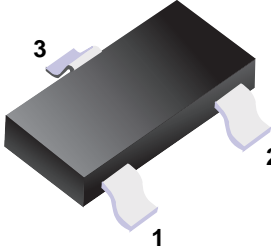
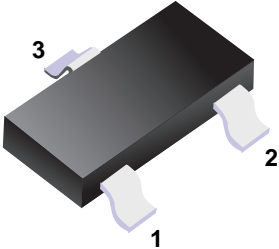
FEATURES

- ◆ 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

• **Equivalent Circuit**



PIN CONNECTIONS and MARKING

<p>DTC144EE</p>  <p>SOT-523</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 26</p>	<p>DTC144EUA</p>  <p>SOT-323</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 26</p>
<p>DTC144EKA</p>  <p>SOT23-3L</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 26</p>	<p>DTC144ECA</p>  <p>SOT-23</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 26</p>

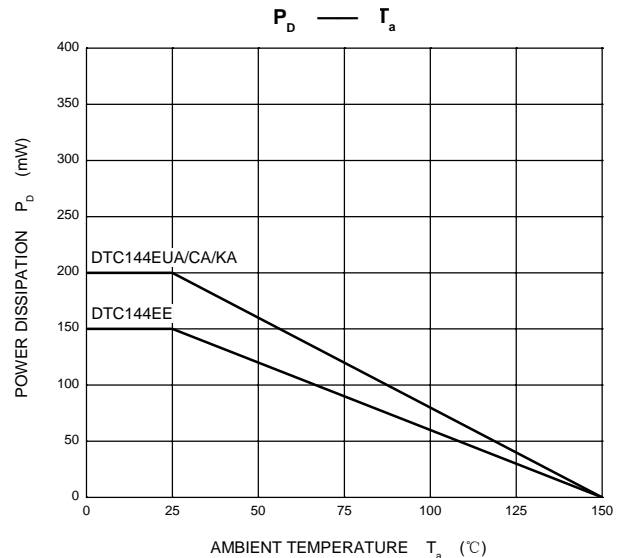
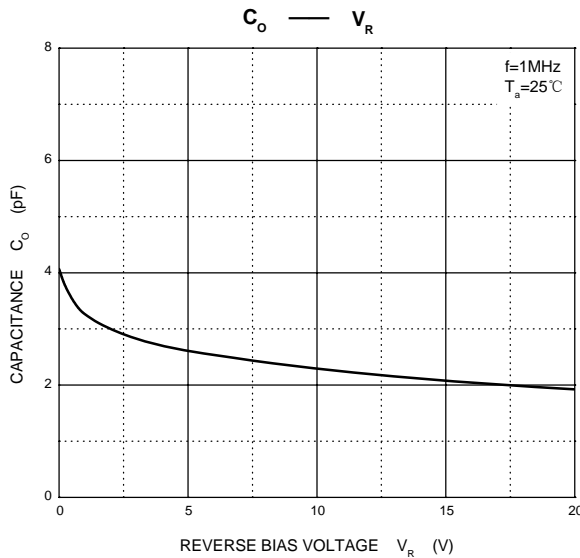
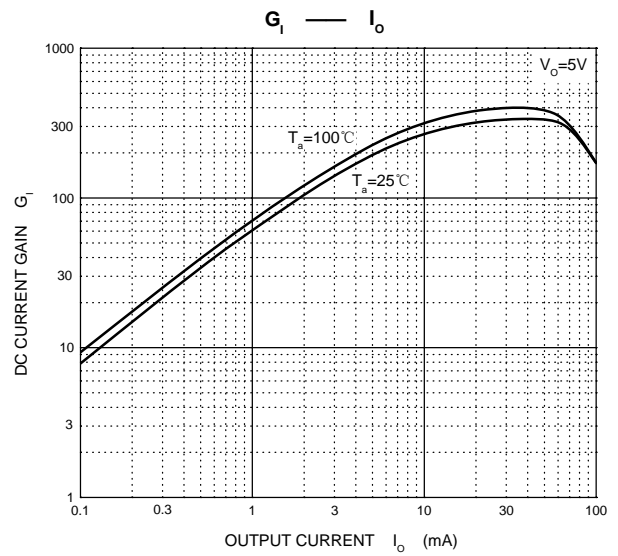
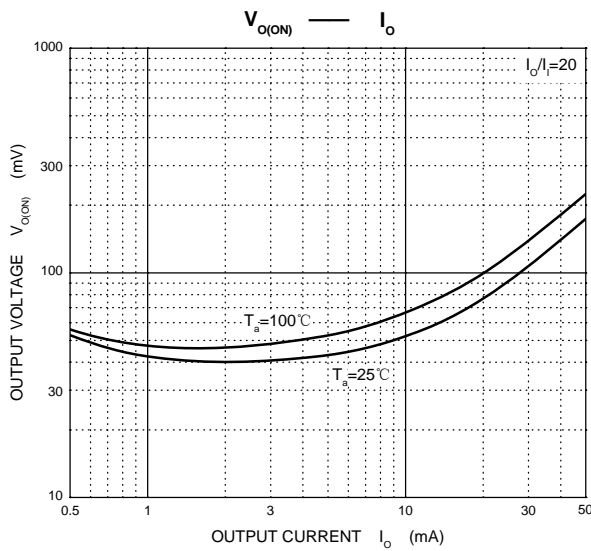
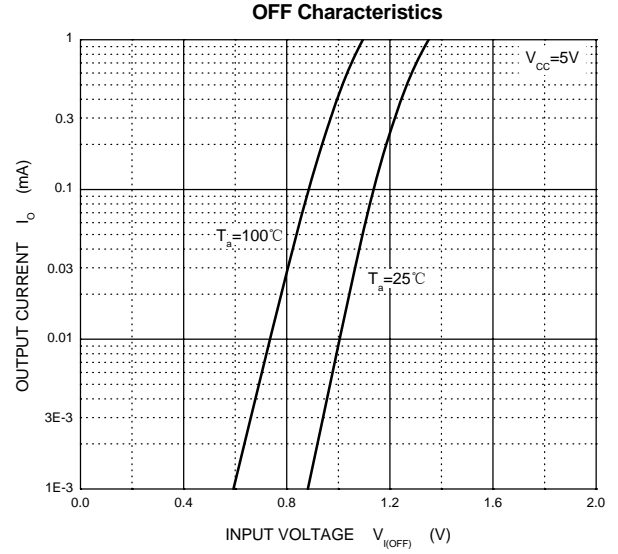
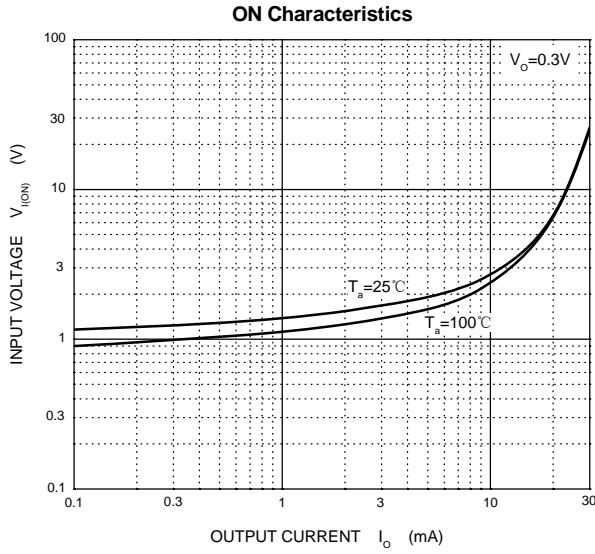
MAXIMUM RATINGS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

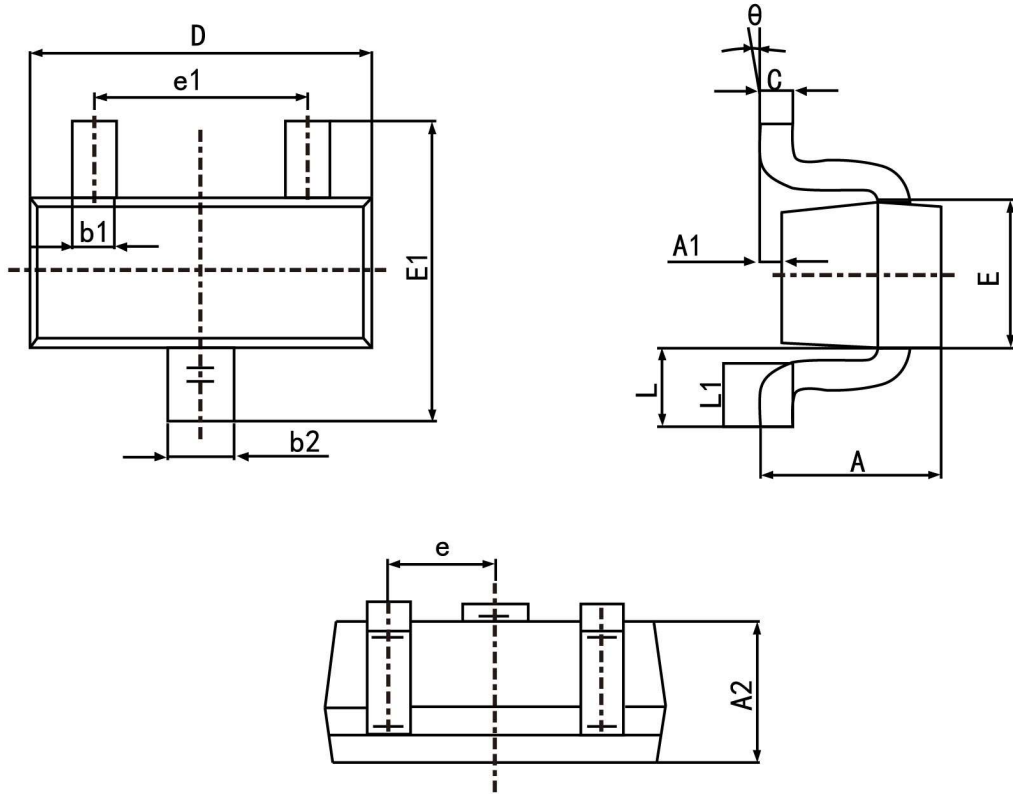
Symbol	Parameter	Limits(DTC144E□)				Unit
		E	UA	CA	KA	
V_{CC}	Supply Voltage	50				V
V_{IN}	Input Voltage	-10~+40				V
I_o	Output Current	30				mA
I_{CM}	Peak Collector Current	100				mA
P_D	Power Dissipation	150	200	200	200	mW
T_j	Junction Temperature	150				$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55~+150				$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input voltage	$V_{I(off)}$	$V_{CC}=5V, I_o=100\mu A$	0.5			V
	$V_{I(on)}$	$V_o=0.3V, I_o=2mA$			3	V
Output voltage	$V_{O(on)}$	$I_o/I_i=10mA/0.5mA$			0.3	V
Input current	I_i	$V_i=5V$			0.18	mA
Output current	$I_{O(off)}$	$V_{CC}=50V, V_i=0$			0.5	μA
DC current gain	G_i	$V_o=5V, I_o=5mA$	68			
Input resistance	R_i		32.9	47	61.1	$k\Omega$
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





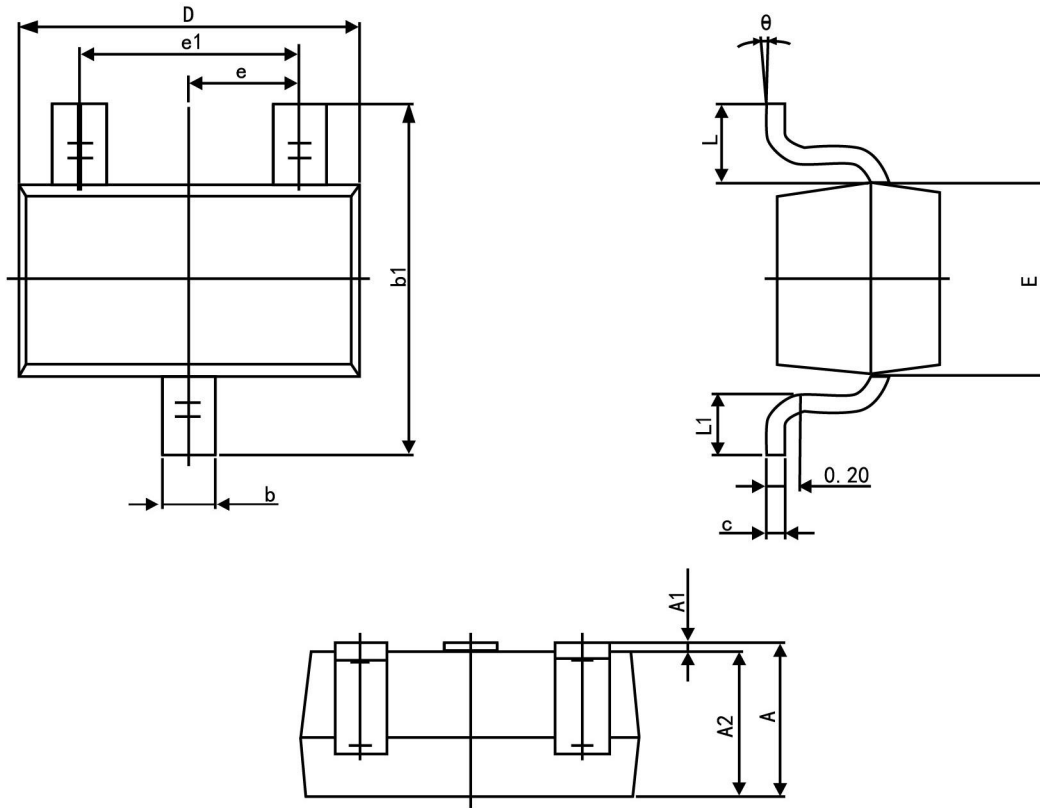
Symbol	Dimension in Millimeters	
	Min	Max
A	0.700	0.900
A1	0.000	0.100
A2	0.700	0.800
b1	0.150	0.250
b2	0.250	0.350
c	0.100	0.200
D	1.500	1.700
E	0.700	0.900
E1	1.450	1.750
e	0.500	TYP.
e1	0.900	1.100
L	0.400 REF.	
L1	0.260	0.460
θ	0°	8°

Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT-523	Tape/Reel,7" reel	3000	EIA-481-1

Package Outline

SOT-323



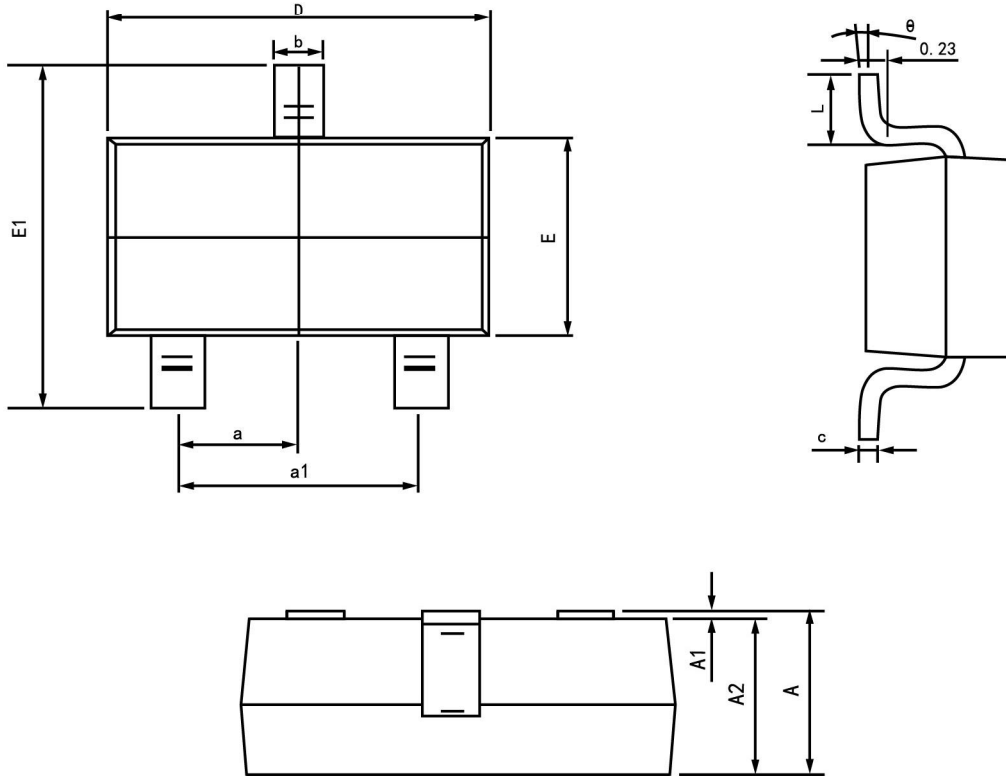
Symbol	Dimension in Millimeters	
	Min	Max
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.200	0.400
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP.	
e1	1.200	1.400
L	0.525 REF.	
L1	0.260	0.460
θ	0°	8°

Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT-323	Tape/Reel,7"reel	3000	EIA-481-1

Package Outline

SOT23-3L



Symbol	Dimension in Millimeters	
	Min	Max
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 (Basic)	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°

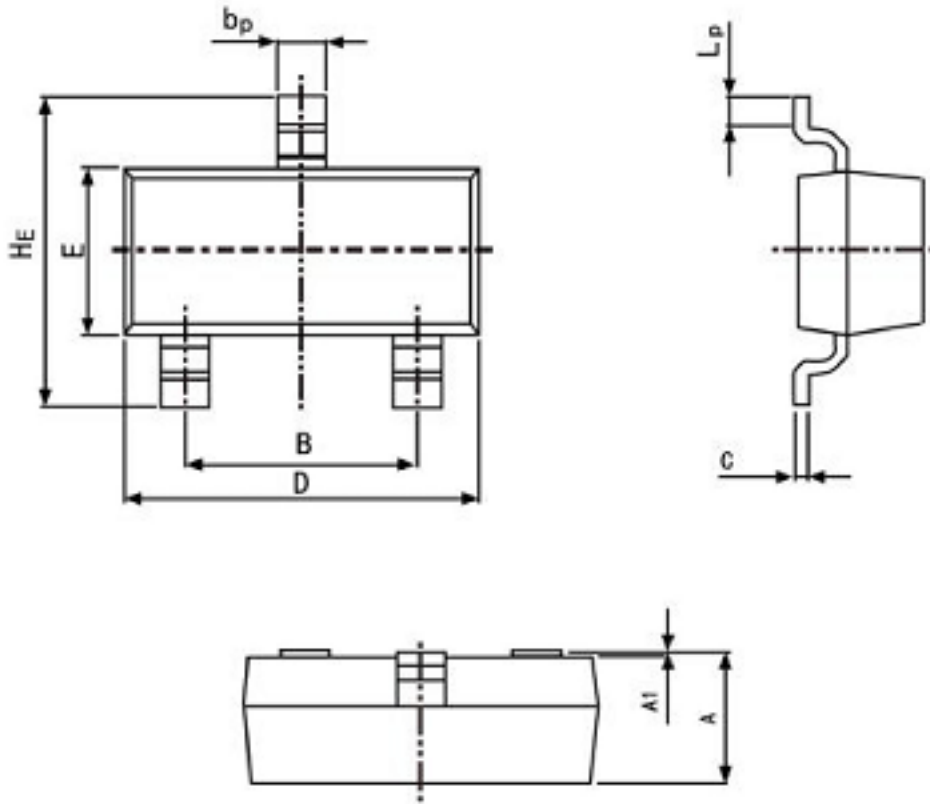
Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT23-3L	Tape/Reel,7" reel	3000	EIA-481-1

Package Outline

SOT-23

Plastic surface mounted package; 3 leads



Symbol	Dimension in Millimeters	
	Min	Max
A	0.95	1.40
B	1.78	2.04
b_p	0.35	0.50
C	0.08	0.19
D	2.70	3.10
E	1.20	1.65
HE	2.20	3.00
A_1	0.100	0.013
L_p	0.20	0.50

Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT-23	Tape/Reel,7"reel	3000	EIA-481-1