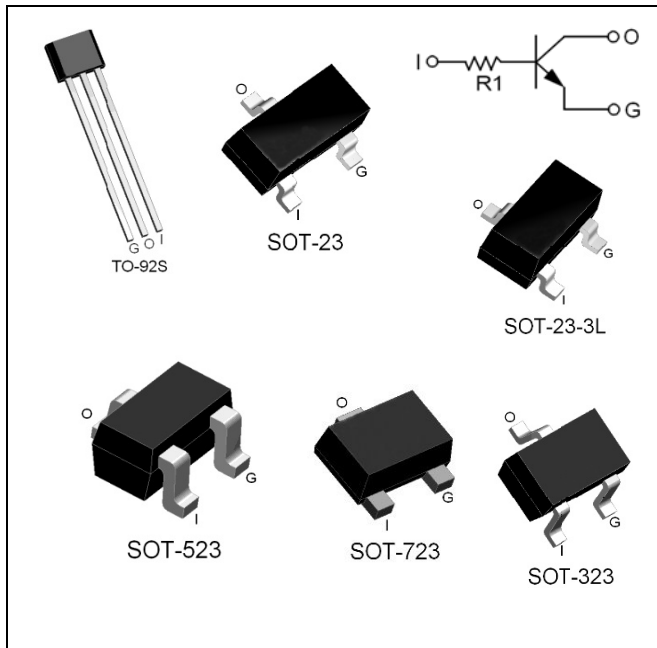


### DIGITAL TRANSISTORS NPN Silicon with Built-in Resistors



#### FEATURES

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see the 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, marking the device design easy.

#### MECHANICAL DATA

- Available in SOT-723, SOT-523, SOT-323, SOT-23, SOT-23-3L and TO-92S Package
- Solderability : MIL-STD-202, Method 208
- Full RoHS Compliance

#### ORDERING INFORMATION

PART NUMBER	PACKAGE	SHIPPING	MARKING CODE
DTC144T□-7T3R	SOT-723	Tape Reel	06
DTC144T□-5T3R	SOT-523	Tape Reel	
DTC144T□-3T3R	SOT-323	Tape Reel	
DTC144T□-T3R	SOT-23	Tape Reel	
DTC144T□-T3LR	SOT-23-3L	Tape Reel	
DTC114T□-T92SB	TO-92S	Tape Box	DTC144T LS yww

#### Notes:

1. □: none is for Lead Free package;  
"G" is for Halogen Free package.
2. Marking Code: yww: y: Year code; ww: Week code.

#### THERMAL DATA

PARAMETER	SYMBOL	VALUES	UNIT
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	833	$^{\circ}\text{C/W}$
		625	
		625	
		625	
		417	

#### Notes:

3.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Measured with device mounted on 1 in<sup>2</sup> FR-4 board with 2 oz copper.

### ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$ , unless otherwise specified. (Note 4)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CBO}$	50	V
Collector-Emitter Voltage		$V_{CEO}$	50	V
Emitter-Base Voltage		$V_{EBO}$	5	V
Collector Current-Continuous		$I_C$	100	mA
Power Dissipation	SOT-723	$P_D$	100	mW
	SOT-523		150	
	SOT-323		200	
	SOT-23		200	
	SOT-23-3L		200	
	TO-92S		300	
Maximum Junction Temperature		$T_J$	150	$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	- 55 ~ +150	$^\circ\text{C}$

#### Notes:

4. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ELECTRICAL CHARACTERISTICS

$T_A = 25^\circ\text{C}$ , unless otherwise noted.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_E = 0, I_C = 50\mu\text{A}$	50			V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_B = 0, I_C = 1\text{mA}$	50			
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_C = 0, I_E = 50\mu\text{A}$	5			V
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 50\text{V}, I_E = 0$			0.5	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 4\text{V}, I_C = 0$			0.5	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 1\text{mA}$	100	300	600	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5\text{mA}, I_B = 0.5\text{mA}$			0.3	V
Input resistor	R1		32.9	47	61.1	$\text{k}\Omega$
Transition Frequency (Note 5)	$f_T$	$V_{CE} = 10\text{V}, I_E = -5\text{mA}, f = 100\text{MHz}$		250		MHz

#### Notes:

5. Characteristics of built-in transistor.

## TYPICAL PERFORMANCE CHARACTERISTICS

All figures are measured at  $T_A = 25^\circ\text{C}$ , unless otherwise noted.

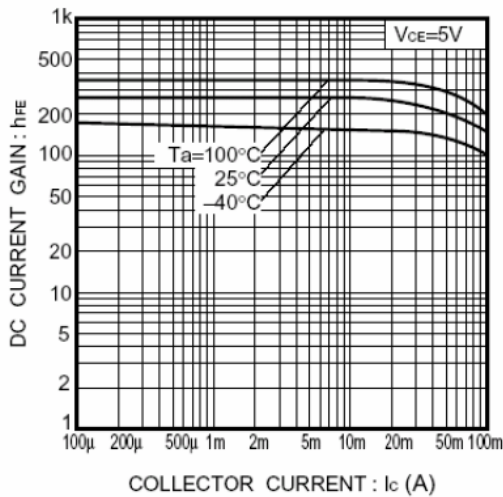


Fig.1 DC current gain vs. collector current

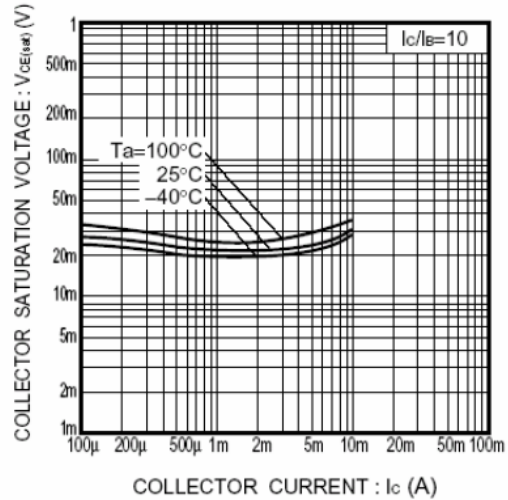


Fig.2 Collector-emitter saturation voltage vs. collector current

## PHYSICAL DIMENSION

Unit : Inch (Millimeter)

