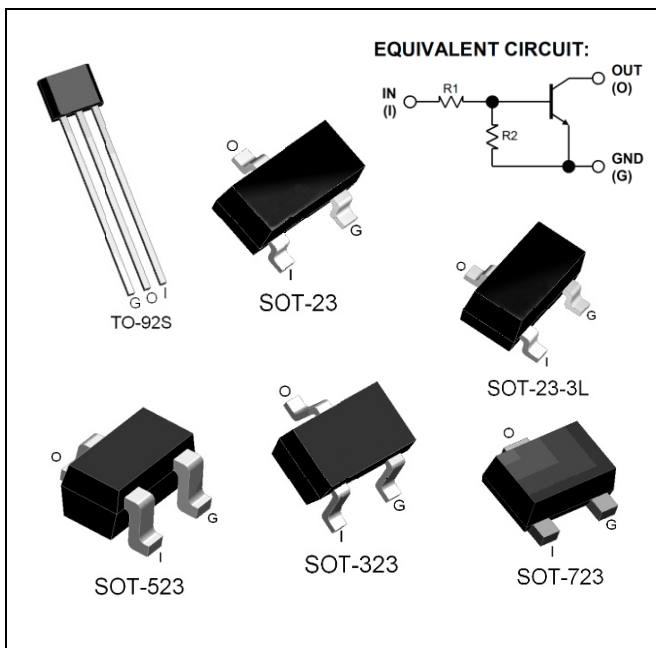


## DIGITAL TRANSISTORS NPN Silicon with Built-in Resistors



### 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
DTC144E□-7T3R	SOT-723	Tape Reel	26
DTC144E□-5T3R	SOT-523	Tape Reel	
DTC144E□-3T3R	SOT-323	Tape Reel	
DTC144E□-T3R	SOT-23	Tape Reel	
DTC144E□-T3LR	SOT-23-3L	Tape Reel	
DTC144E□-T92SB	TO-92S	Tape Box	DTC144E 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	$R_{\theta JA}$	1250	$^{\circ}\text{C}/\text{W}$
		833	
		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. <sup>(Note 4)</sup>

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		$V_{CC}$	50	V
Input Voltage		$V_{IN}$	-5 ~ +40	V
Output Current		$I_O$	30	mA
		$I_{C(MAX)}$	100	
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.

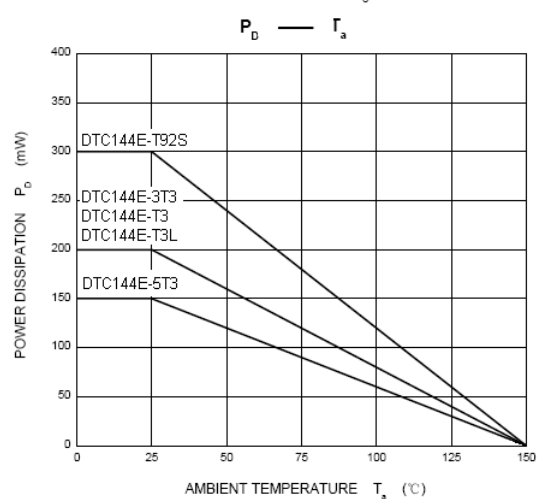
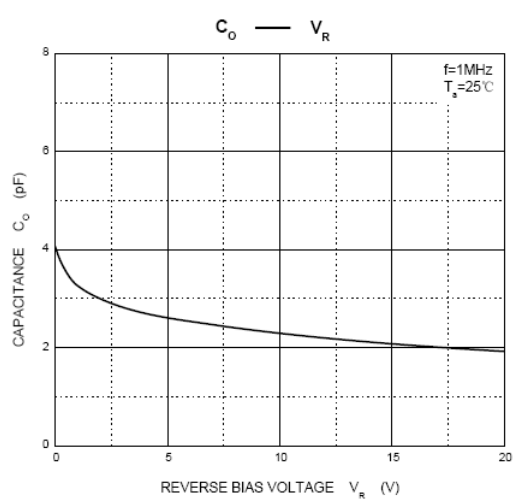
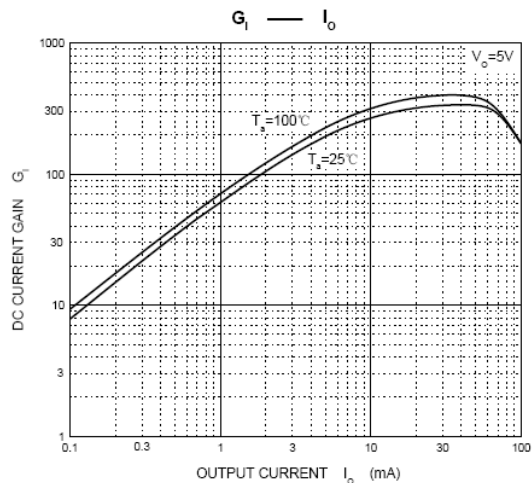
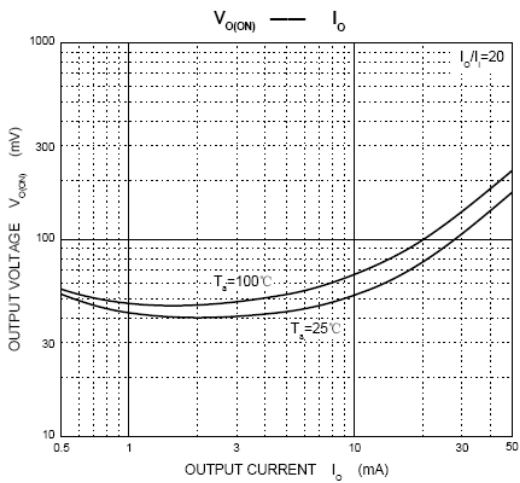
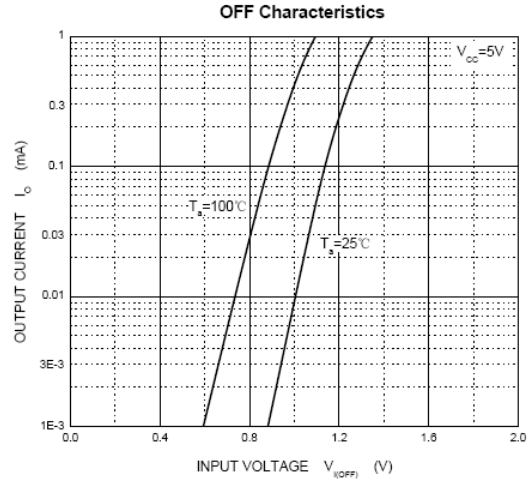
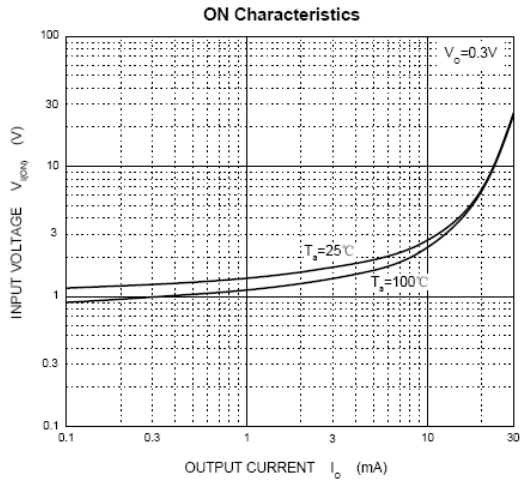
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	$V_{I(off)}$	$V_{CC} = 5V, I_O = 100\mu\text{A}$	0.5			V
	$V_{I(on)}$	$V_O = 0.3V, I_O = 2\text{mA}$			3	
Output Voltage	$V_{O(on)}$	$I_O/I_I = 10\text{mA}/0.5\text{mA}$			0.3	V
Input Current	$I_I$	$V_I = 5V$			0.18	mA
Output Current	$I_{O(off)}$	$V_{CC} = 50V, V_I = 0V$			0.5	$\mu\text{A}$
DC Current Gain	$G_I$	$V_O = 5V, I_O = 5\text{mA}$	68			-
Input Resistance	R1		32.9	47	61.1	k $\Omega$
Resistance Ratio	R2/R1		0.8	1.0	1.2	-
Transition Frequency <sup>(Note 4)</sup>	$f_T$	$V_O = 10V, I_O = 5\text{mA}, f = 100\text{MHz}$		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.



**PHYSICAL DIMENSION**

Unit : Inch (Millimeter)

