



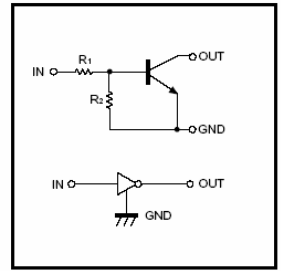
## Digital transistors (built-in resistors)

### DTC144EM/DTC144EE/DTC144EUA

### DTC144ECA/DTC144EKA/DTC144ESA

DIGITAL TRANSISTOR (NPN)

●Equivalent circuit



### FEATURES

1. Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit)
2. 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
3. Only the on/off conditions need to be set for operation, making device design easy

### Pb-Free package is available

RoHS product for packing code suffix "G"

Halogen free product for packing code suffix "H"

### PIN CONNENCTIONS AND MARKING

<p>DTC144EE</p> <p>1.IN 2.GND 3.OUT</p> <p>SOT-523      Abbreviated symbol: 26</p>	<p>DTC144EUA</p> <p>1.IN 2.GND 3.OUT</p> <p>SOT-323      Abbreviated symbol: 26</p>
<p>DTC144EKA</p> <p>1.IN 2.GND 3.OUT</p> <p>SOT-23-3L      Abbreviated symbol: 26</p>	<p>DTC144ECA</p> <p>1.IN 2.GND 3.OUT</p> <p>SOT-23      Abbreviated symbol: 26</p>
<p>DTC144ESA</p> <p>1.GND 2.OUT 3.IN</p> <p>TO-92S</p>	<p>DTC144EM</p> <p>1.IN 2.GND 3.OUT</p> <p>SOT-723      Abbreviated symbol: 26</p>

**Absolute maximum ratings(Ta=25°C)**

Parameter	Symbol	Limits (DTC144E )						Unit
		M	E	UA	CA	KA	SA	
Supply voltage	$V_{CC}$	50						V
Input voltage	$V_{IN}$	-10~40						V
Output current	$I_O$	30						mA
	$I_{C(MAX)}$	100						
Power dissipation	$P_d$	100	150	200		300		mW
Junction temperature	$T_j$	150						°C
Storage temperature	$T_{stg}$	-55~150						°C

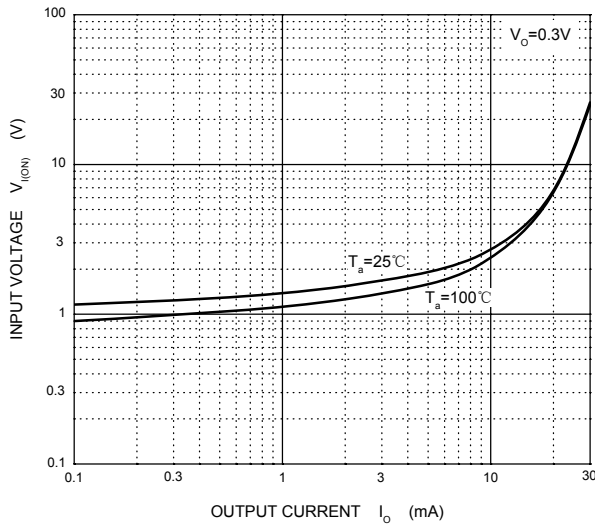
**Electrical characteristics (Ta=25°C)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Input voltage	$V_{I(off)}$	0.5			V	$V_{CC}=5V, I_O=100\mu A$
	$V_{I(on)}$			3		$V_O=0.3V, I_O=2mA$
Output voltage	$V_{O(on)}$			0.3	V	$I_O/I_I=10mA/0.5mA$
Input current	$I_I$			0.18	mA	$V_I=5V$
Output current	$I_{O(off)}$			0.5	$\mu A$	$V_{CC}=50V, V_I=0$
DC current gain	$G_1$	68				$V_O=5V, I_O=5mA$
Input resistance	$R_1$	32.9	47	61.1	K $\Omega$	
Resistance ratio	$R_2/R_1$	0.8	1	1.2		
Transition frequency	$f_T$		250		MHz	$V_O=10V, I_O=5mA, f=100MHz$

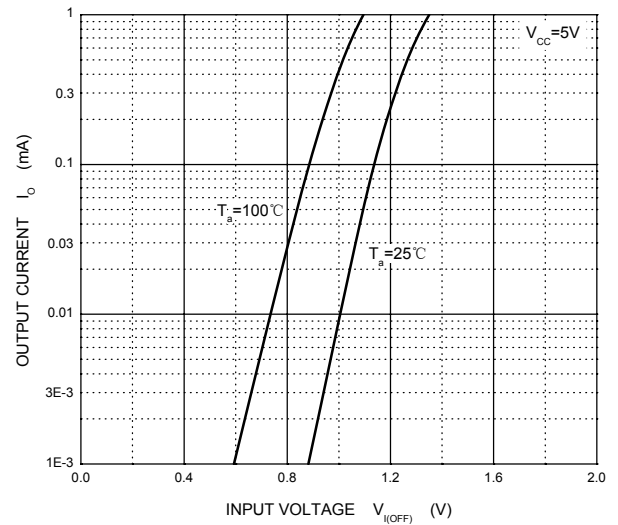
# Typical Characteristics

# DTC144EUA

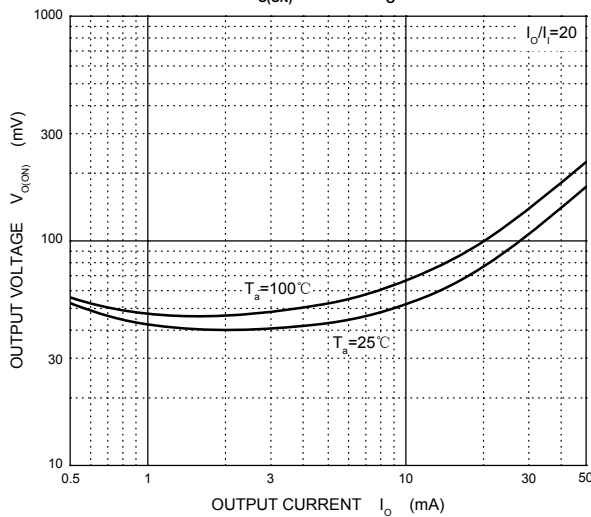
ON Characteristics



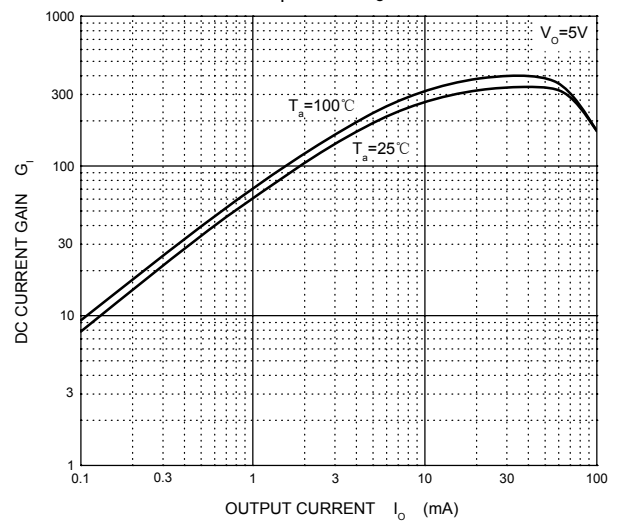
OFF Characteristics



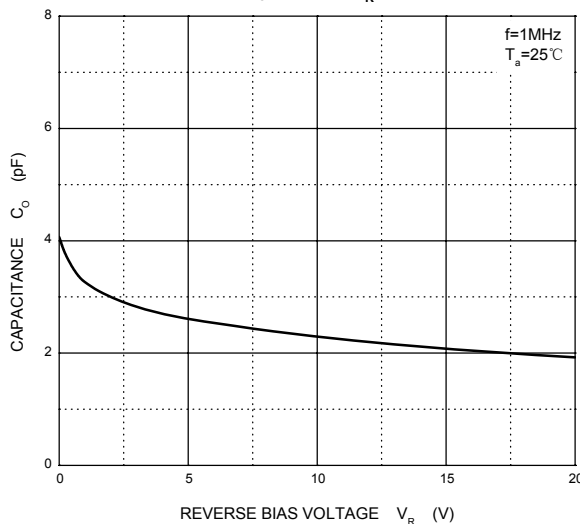
$V_{O(ON)}$  —  $I_O$



$G_1$  —  $I_O$



$C_O$  —  $V_R$



$P_D$  —  $T_a$

