

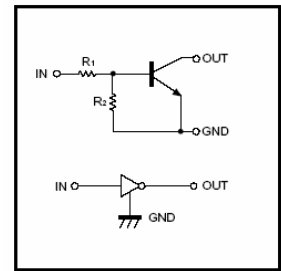


Digital Transistors (Built-in Resistors)

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.

External dimensions (Units: mm)

<p>DTC144EM</p> <p>SOT-723</p> <p>Abbreviated symbol : 26</p> <p>(1) IN (2) GND (3) OUT</p>	<p>DTC144EUA</p> <p>SOT-323</p> <p>All terminals have same dimensions</p> <p>Abbreviated symbol : 28</p> <p>(1) GND (2) IN (3) OUT</p>
<p>DTC144EE</p> <p>SOT-523</p> <p>Abbreviated symbol : 26</p> <p>(1) GND (2) IN (3) OUT</p>	<p>DTC144EKA</p> <p>SOT-23-3L</p> <p>All terminals have same dimensions</p> <p>Abbreviated symbol : 28</p> <p>(1) GND (2) IN (3) OUT</p>
<p>DTC144ECA</p> <p>SOT-23</p> <p>Each lead has same dimensions</p> <p>Abbreviated symbol : 26</p> <p>(1) GND (2) IN (3) OUT</p>	<p>DTC144ESA</p> <p>TO-92S</p> <p>(1) GND (2) OUT (3) IN</p>

Absolute maximum ratings(Ta=25°C)

Parameter	Symbol	Limits (DTC144E□)						Unit
		M	E	UA	CA	KA	SA	
Collector-base voltage	$V_{(BR)CBO}$	50						V
Collector-emitter voltage	$V_{(BR)CEO}$	50						V
Emitter-base voltage	$V_{(BR)EBO}$	5						V
Collector current	I_c	100						mA
Collector Power dissipation	P_C	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	$I_o/I_f=10mA/0.5mA$
Input current	I_i			0.18	mA	$V_i=5V$
Output current	$I_{o(off)}$			0.5	μA	$V_{CC}=50V, V_i=0$
DC current gain	G_i	68				$V_o=5V, I_o=5mA$
Input resistance	R_1	32.9	47	61.1	K Ω	
Resistance ratio	R_2/R_1	0.8	1	1.2		
Transition frequency	f_T		250		MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz$

Typical Characteristics

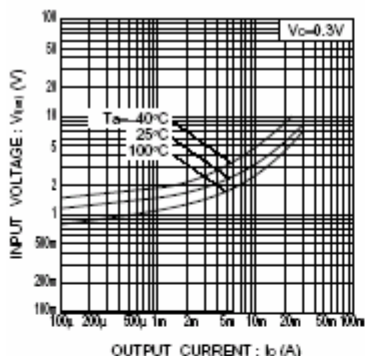


Fig.1 Input voltage vs. output current (ON characteristics)

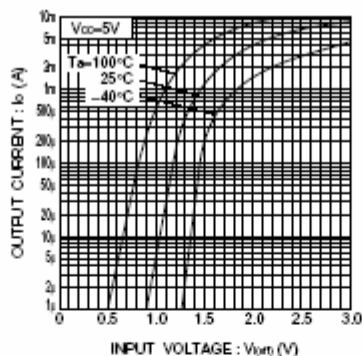


Fig.2 Output current vs. input voltage (OFF characteristics)

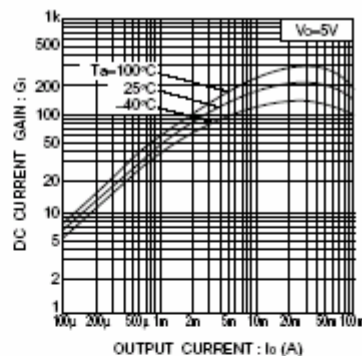


Fig.3 DC current gain vs. output current

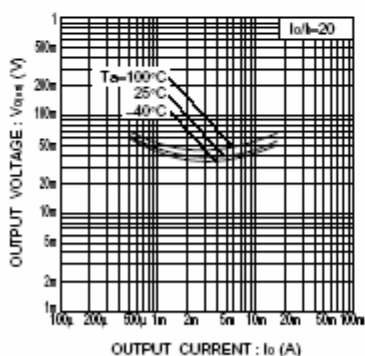


Fig.4 Output voltage vs. output current