

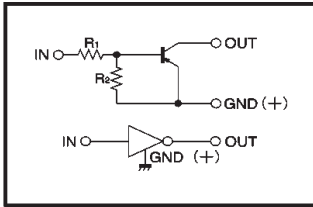
# Digital transistors (built-in resistors)

DTA144WE / DTA144WUA / DTA144WKA / DTA144WSA

**●Features**

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on / off conditions need to be set for operation, making device design easy.
- 4) Higher mounting densities can be achieved.

**●Circuit schematic**



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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.8	V	$V_{CC} = -5V, I_o = -100 \mu A$
	$V_{I(on)}$	-4	—	—		$V_o = -0.3V, I_o = -2mA$
Output voltage	$V_{O(on)}$	—	-0.1	-0.3	V	$I_o = -10mA, I_i = -0.5mA$
Input current	$I_i$	—	—	-0.16	mA	$V_i = -5V$
Output current	$I_{O(off)}$	—	—	-0.5	$\mu A$	$V_{CC} = -50V, V_i = 0V$
DC current gain	$G_i$	56	—	—	—	$I_o = -5mA, V_o = -5V$
Input resistance	$R_1$	32.9	47	61.1	k $\Omega$	—
Resistance ratio	$R_2/R_1$	0.37	0.47	0.57	—	—
Transition frequency	$f_T$	—	250	—	MHz	$V_{CE} = -10V, I_E = 5mA, f = 100MHz$ *

\* Transition frequency of the device.

(94S-579-144W)

**●Absolute maximum ratings (Ta=25°C)**

Parameter	Symbol	Limits	Unit
Supply voltage	$V_{CC}$	-50	V
Input voltage	$V_i$	-40~+10	V
Output current	$I_o$	-30	mA
	$I_{C(Max)}$	-100	
Power dissipation	DTA144WE	150	mW
	DTA144WUA / DTA144WKA	200	
	DTA144WSA	300	
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55~+150	°C

**●Package, marking, and packaging specifications**

Part No.	DTA144WE	DTA144WUA	DTA144WKA	DTA144WSA
Package	EMT3	UMT3	SMT3	SPT
Marking	76	76	76	—
Packaging code	TL	T106	T146	TP
Basic ordering unit (pieces)	3000	3000	3000	5000

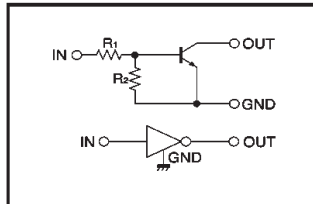
# Digital transistors (built-in resistors)

DTC144WE / DTC144WUA / DTC144WKA / DTC144WSA

**●Features**

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on / off conditions need to be set for operation, making device design easy.
- 4) Higher mounting densities can be achieved.

**●Circuit schematic**



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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	0.8	V	$V_{CC} = 5V, I_o = 100 \mu A$
	$V_{I(on)}$	4	—	—		$V_o = 0.3V, I_o = 2mA$
Output voltage	$V_{O(on)}$	—	0.1	0.3	V	$I_o = 10mA, I_i = 0.5mA$
Input current	$I_i$	—	—	0.16	mA	$V_i = 5V$
Output current	$I_{O(off)}$	—	—	0.5	$\mu A$	$V_{CC} = 50V, V_i = 0V$
DC current gain	$G_i$	56	—	—	—	$I_o = 5mA, V_o = 5V$
Input resistance	$R_1$	32.9	47	61.1	k $\Omega$	—
Resistance ratio	$R_2/R_1$	0.37	0.47	0.57	—	—
Transition frequency	$f_T$	—	250	—	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$ *

\* Transition frequency of the device.

**●Absolute maximum ratings (Ta=25°C)**

Parameter	Symbol	Limits	Unit
Supply voltage	$V_{CC}$	50	V
Input voltage	$V_i$	-10~+40	V
Output current	$I_o$	30	mA
	$I_{C(Max)}$	100	
Power dissipation	DTC144WE	150	mW
	DTC144WUA / DTC144WKA	200	
	DTC144WSA	300	
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55~+150	°C

**●Package, marking, and packaging specifications**

Part No.	DTC144WE	DTC144WUA	DTC144WKA	DTC144WSA
Package	EMT3	UMT3	SMT3	SPT
Marking	86	86	86	—
Packaging code	TL	T106	T146	TP
Basic ordering unit (pieces)	3000	3000	3000	5000

(94S-701-C144W)