Digital transistors (built-in resistors)

DTC124EE / DTC124EUA / DTC124EKA
DTC124ECA / DTC124ESA

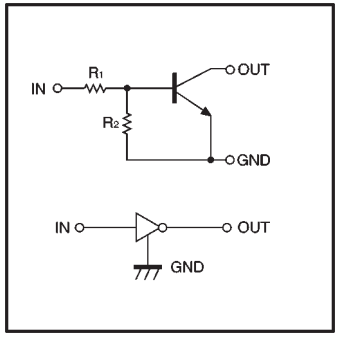
●Features

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.

●Structure

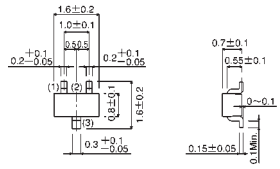
NPN digital transistor
(with built-in resistors)

●Equivalent circuit



●External dimensions (Units: mm)

DTC124EE

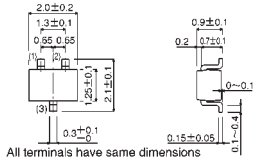


ROHM : EMT3

Addreviated symbol : 25

(1) GND
(2) IN
(3) OUT

DTC124EUA



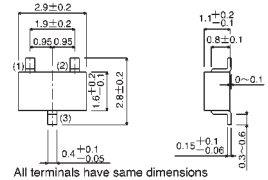
ROHM : UMT3
EIAJ : SC-70

All terminals have same dimensions

Addreviated symbol : 25

(1) GND
(2) IN
(3) OUT

DTC124EKA



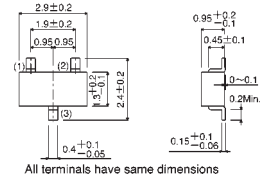
ROHM : SMT3
EIAJ : SC-59

All terminals have same dimensions

Addreviated symbol : 25

(1) GND
(2) IN
(3) OUT

DTC124ECA



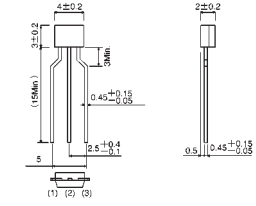
ROHM : SST3

All terminals have same dimensions

Addreviated symbol : 25

(1) GND
(2) IN
(3) OUT

DTC124ESA



ROHM : SPT
EIAJ : SC-72

(1) GND
(2) OUT
(3) IN

(96-323-C124E)

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits(DTC124E□)					Unit
		E	UA	KA	CA	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	Pd	150	200			300	mW
Junction temperature	Tj	150					℃
Storage temperature	Tstg	−55～+150					℃

●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 μA
	$V_{I(on)}$	3	—	—		V_O=0.2V, I_O=5mA
Output voltage	$V_{O(on)}$	—	0.1	0.3	V	I_O/I_I=10mA/0.5mA
Input current	I_I	—	—	0.36	mA	V_I=5V
Output current	$I_{O(off)}$	—	—	0.5	μA	V_{CC}=50V, V_I=0V
DC current gain	G_I	56	—	—	—	V_O=5V, I_O=5mA
Input resistance	R_1	15.4	22	28.6	kΩ	—
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 ✻

✻ Transition frequency of the device

●Packaging specifications

Part No.	Package	EMT3	UMT3	SMT3	SST3	SPT
	Packaging type	Taping	Taping	Taping	Taping	Taping
	Code	TL	T106	T146	T116	TP
	Basic ordering unit (pieces)	3000	3000	3000	3000	5000
DTC124EE		○	—	—	—	—
DTC124EUA		—	○	—	—	—
DTC124EKA		—	—	○	—	—
DTC124ECA		—	—	—	○	—
DTC124ESA		—	—	—	—	○

●Electrical characteristic curves

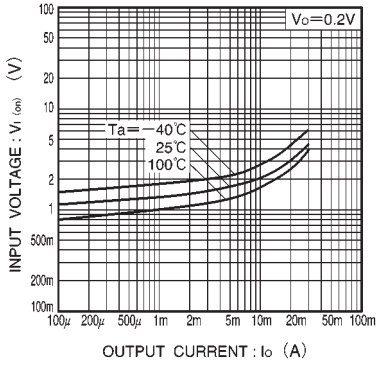


Fig.1 Input voltage vs. output current (ON characteristics)

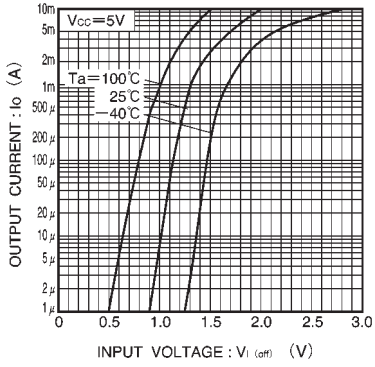


Fig.2 Output current vs. input voltage (OFF characteristics)

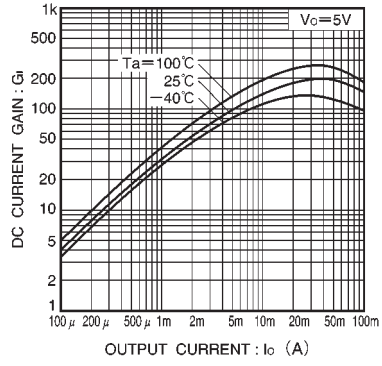


Fig.3 DC current gain vs. output current

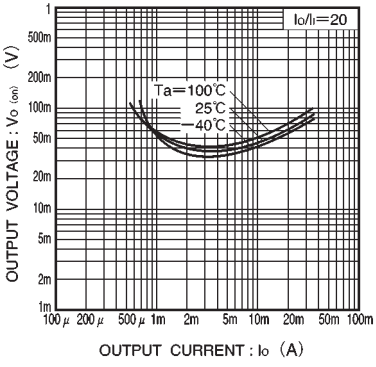


Fig.4 Output voltage vs. output current