

100mA / 50V Digital transistors (with built-in resistor)

DTC124TM / DTC124TE / DTC124TUA / DTC124TKA / DTC124TSA

●Applications

Inverter, Interface, Driver

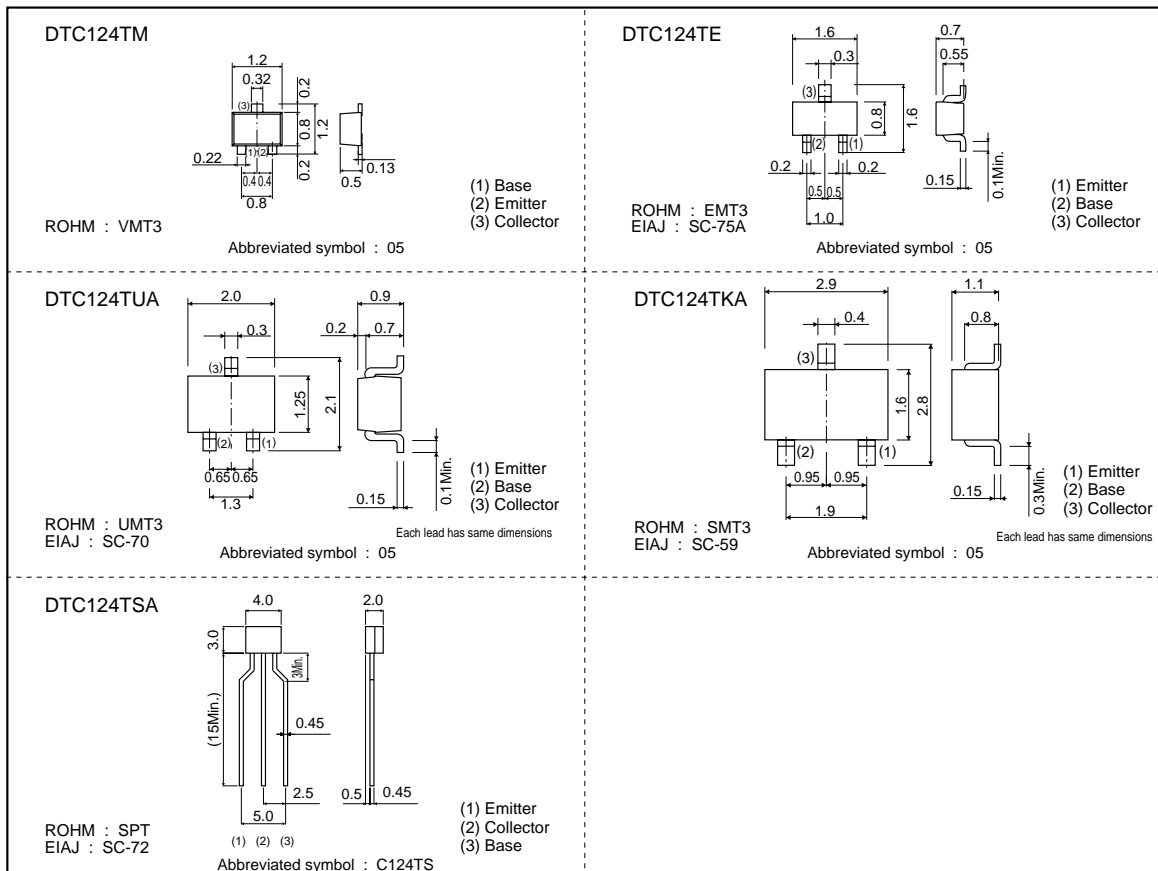
●Features

- 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 the device design easy.

●Structure

NPN epitaxial planar silicon transistor (Resistor built-in type)

●External dimensions (Unit : mm)



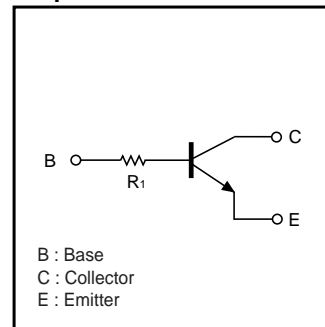
DTC124TM / DTC124TE / DTC124TUA / DTC124TKA / DTC124TSA

Transistors

●Packaging specifications

Part No.	Package	VMT3	EMT3	UMT3	SMT3	SST3
	Packaging type	Taping	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146	TP
	Basic ordering unit (pieces)	8000	3000	3000	3000	5000
DTC124TM		○	–	–	–	–
DTC124TE		–	○	–	–	–
DTC124TUA		–	–	○	–	–
DTC124TKA		–	–	–	○	–
DTC124TSA		–	–	–	–	○

●Equivalent circuit



B : Base
C : Collector
E : Emitter

$R_1=22k\Omega$

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits					Unit
		DTC124TM	DTC124TE	DTC124TUA	DTC124TKA	DTC124TSA	
Collector-base voltage	V_{CB0}	50					V
Collector-emitter voltage	V_{CEO}	50					V
Emitter-base voltage	V_{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 to +150					°C

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CB0}	50	–	–	V	$I_C=50\mu A$
Collector-emitter breakdown voltage	BV_{CEO}	50	–	–	V	$I_C=1mA$
Emitter-base breakdown voltage	BV_{EBO}	5	–	–	V	$I_E=50\mu A$
Collector cutoff current	I_{CBO}	–	–	0.5	μA	$V_{CB}=50V$
Emitter cutoff current	I_{EBO}	–	–	0.5	μA	$V_{EB}=4V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	–	–	0.3	V	$I_C/I_B=5mA/0.5mA$
DC current transfer ratio	h_{FE}	100	250	600	–	$V_{CE}=5V, I_C=1mA$
Input resistance	R_1	15.4	22	28.6	k Ω	–
Transition frequency	f_T *	–	250	–	MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz$

* Characteristics of built-in transistor

Transistors

●Electrical characteristic curves

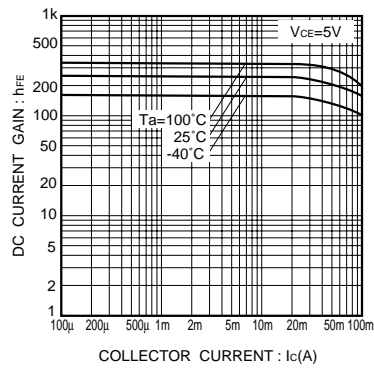


Fig.1 DC current gain vs. collector current

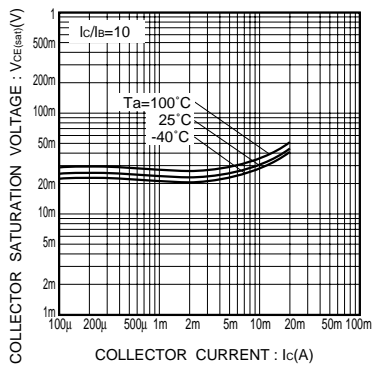


Fig.2 Collector-emitter saturation voltage vs. collector current

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