

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

DTC124TM / DTC124TE / DTC124TUA / DTC124TKA

● 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.

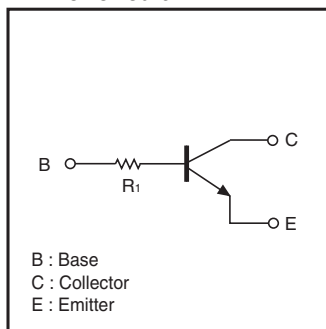
● Structure

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

● Dimensions (Unit : mm)

DTC124TM ROHM : VMT3 Abbreviated symbol : 05 (1) Base (2) Emitter (3) Collector	DTC124TE ROHM : EMT3 EIAJ : SC-75A Abbreviated symbol : 05 (1) Emitter (2) Base (3) Collector
DTC124TUA ROHM : UMT3 EIAJ : SC-70 Abbreviated symbol : 05 (1) Emitter (2) Base (3) Collector Each lead has same dimensions	DTC124TKA ROHM : SMT3 EIAJ : SC-59 Abbreviated symbol : 05 (1) Emitter (2) Base (3) Collector Each lead has same dimensions

● Inner circuit



$R_1 = 22k\Omega$

● Packaging specifications

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

● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits				Unit
		DTC124TM	DTC124TE	DTC124TUA	DTC124TKA	
Collector-base voltage	V _{CBO}	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		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_{CE0}	50	—	—	V	$I_C=1mA$
Emitter-base breakdown voltage	BV_{EB0}	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

● Electrical characteristic curves

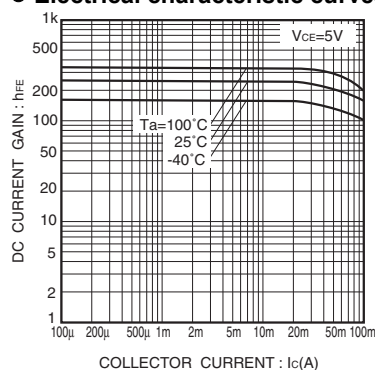


Fig.1 DC current gain vs. collector current

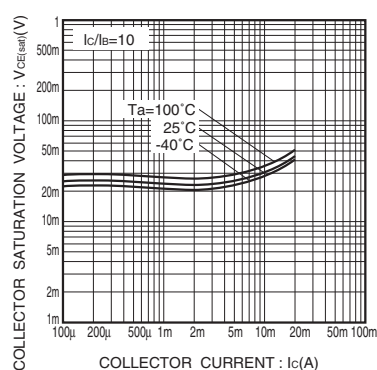


Fig.2 Collector-emitter saturation voltage vs. collector current

Notes

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