

200mA / 50V Digital transistor

(with built-in resistor)

DTC123TKA

●Applications

Inverter, Interface, Driver

●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 the device design easy.
- 4) Higher mounting densities can be achieved.

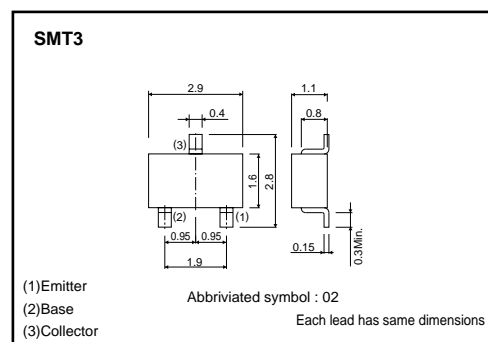
●Structure

NPN epitaxial planar silicon transistor

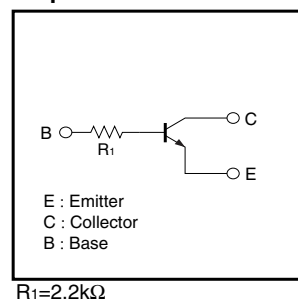
●Packaging specifications

	Package	SMT3
	Packaging type	Taping
	Code	T146
Part No.	Basic ordering unit (pieces)	3000
DTC123TKA		○

●External dimensions (Unit : mm)



●Equivalent circuit



●Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CB0}	50	V
Collector-emitter voltage	V_{CE0}	50	V
Emitter-base voltage	V_{EB0}	5	V
Collector current	I_c	100	mA
Collector Power dissipation	P_c	200	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	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	$I_C/I_B=5mA/0.25mA$
DC current transfer ratio	h_{FE}	100	250	600	–	$I_C=1mA, V_{CE}=5V$
Input resistance	R_1	1.54	2.2	2.86	$k\Omega$	–
Transition frequency	f_T *	–	250	–	MHz	$V_{CB}=10V, I_E=-5mA, f=100MHz$

* Characteristics of built-in transistor.

●Electrical characteristics curves

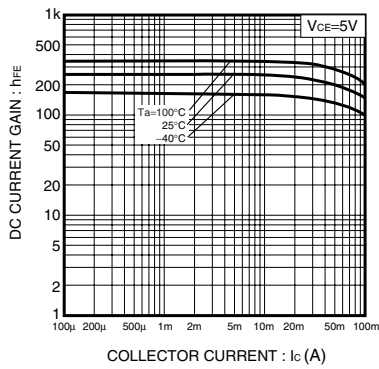


Fig.1 DC Current gain vs. Collector Current

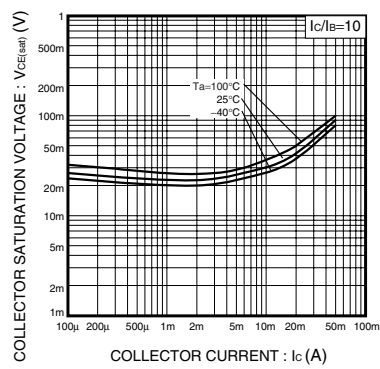


Fig.2 Collector-emitter saturation voltage vs. Collector Current

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