

500mA / 40V Digital transistors (with built-in resistors)

DTD123TK

● 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)

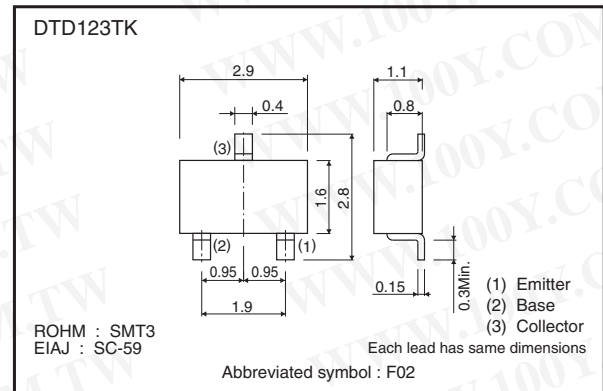
● Packaging specifications

Package	SMT3
Packaging type	Taping
Code	T146
Basic ordering unit (pieces)	3000
Part No.	DTD123TK
	○

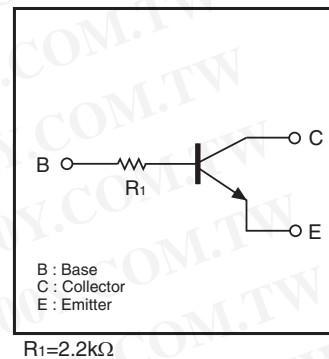
● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
		DTD123TK	
Collector-base voltage	V _{CB0}	50	V
Collector-emitter voltage	V _{CE0}	40	V
Emitter-base voltage	V _{EB0}	5	V
Collector current	I _c	500	mA
Collector power dissipation	P _c	200	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

● Dimensions (Unit : mm)



● Inner circuit



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● Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	50	—	—	V	I _C =50μA
Collector-emitter breakdown voltage	BV _{CEO}	40	—	—	V	I _C =1mA
Emitter-base breakdown voltage	BV _{EBO}	5	—	—	V	I _E =50μA
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 =50m/2.5mA
DC current transfer ratio	h _{FE}	100	250	600	—	V _{CE} =5V, I _C =50mA
Input resistance	R _i	1.54	2.2	2.86	kΩ	—
Transition frequency	f _t *	—	200	—	MHz	V _{CE} =10V, I _E =-50mA, f=100MHz

* Characteristics of built-in transistor

● Electrical characteristic curves

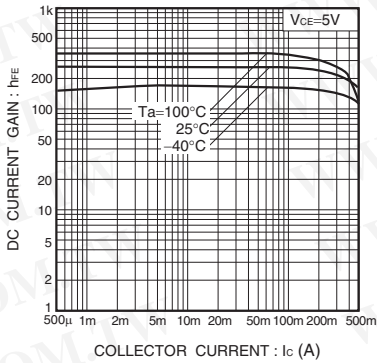


Fig.1 DC current gain vs. collector current

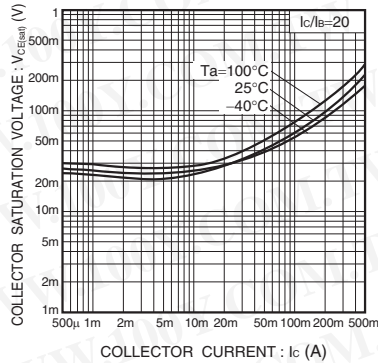


Fig.2 Collector-emitter saturation voltage vs. collector current

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