

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

DTC125TUA / DTC125TKA / DTC125TSA

●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.

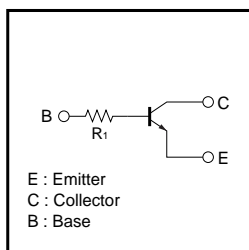
●Structure

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

●Packaging specifications

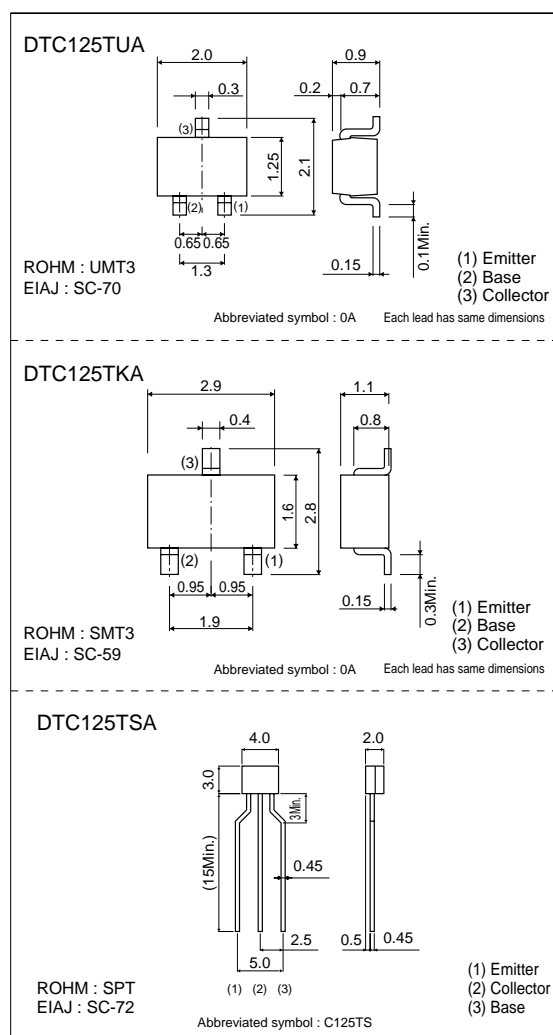
Part No.	Package	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping
	Code	T106	T146	TP
	Basic ordering unit (pieces)	3000	3000	5000
DTC125TUA		○	—	—
DTC125TKA		—	○	—
DTC125TSA		—	—	○

●Equivalent circuit



R₁=200kΩ

●External dimensions (Unit : mm)



DTC125TUA / DTC125TKA / DTC125TSA

Transistors

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V _{CB0}	50	V
Collector-emitter voltage	V _{CE0}	50	V
Emitter-base voltage	V _{EBO}	5	V
Collector current	I _c	100	mA
Collector power dissipation	P _c	200	mW
		300	
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 =50μA
Collector-emitter breakdown voltage	BV _{CE0}	50	-	-	V	I _c =1mA
Emitter-base breakdown voltage	BV _{EBO}	5	-	-	V	I _E =50μA
Collector cutoff current	I _{cB0}	-	-	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 =0.5mA, I _B =0.05mA
DC current transfer ratio	h _{FE}	100	250	600	-	I _c =1mA, V _{CE} =5V
Input resistance	R ₁	140	200	260	kΩ	-
Transition frequency	f _r *	-	250	-	MHz	V _{CE} =10V, I _E =-5mA, f=100MHz

* Characteristics of built-in transistor

●Electrical characteristic curves

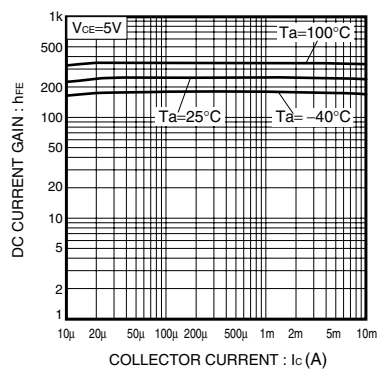


Fig.1 DC current gain vs. Collector current

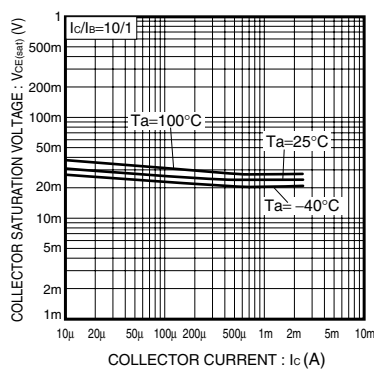


Fig.2 Collector-Emitter saturation voltage vs. Collector current

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