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.

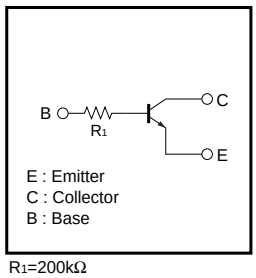
●Structure

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		–	–	○

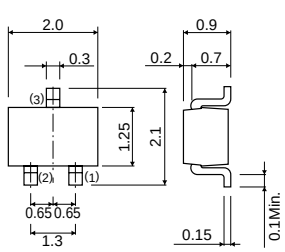
●Equivalent circuit



R_1=200kΩ

●External dimensions (Unit : mm)

DTC125TUA

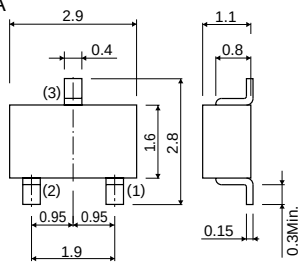


ROHM : UMT3
EIAJ : SC-70

(1) Emitter
(2) Base
(3) Collector

Abbreviated symbol : 0A Each lead has same dimensions

DTC125TKA

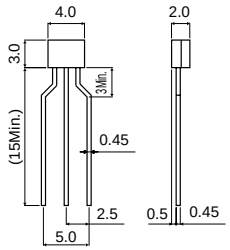


ROHM : SMT3
EIAJ : SC-59

(1) Emitter
(2) Base
(3) Collector

Abbreviated symbol : 0A Each lead has same dimensions

DTC125TSA



ROHM : SPT
EIAJ : SC-72

(1) Emitter
(2) Collector
(3) Base

Abbreviated symbol : C125TS

●**Absolute maximum ratings** (Ta=25°C)

Parameter		Symbol	Limits	Unit
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	DTC125TUA / DTC125TKA	Pc	200	mW
	DTC125TSA		300	
Junction temperature		Tj	150	°C
Storage temperature		Tstg	−55 to +150	°C

●**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}	50	–	–	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=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_T *	–	250	–	MHz	V_{CE}=10V , I_E= −5mA , f=100MHz

* Characteristics of built-in transistor

●**Electrical characteristic curves**

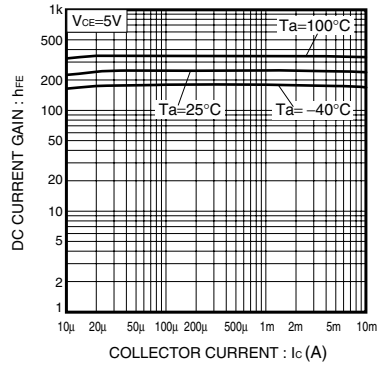


Fig.1 DC current gain vs. Collector current

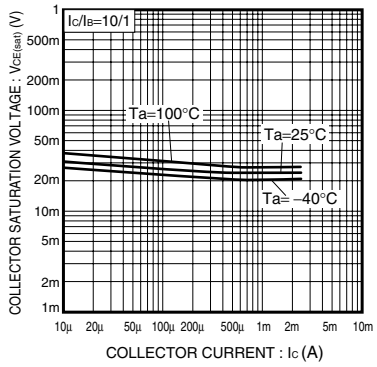


Fig.2 Collector-Emitter saturation voltage vs. Collector current

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