Digital transistors (built in resistor)

DTC114TE / DTC114TUA / DTC114TKA
DTC114TCA / DTC114TSA

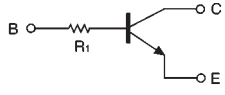
●Features

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 device design easy.

●Structure

NPN digital transistor
(With single built in resistor)

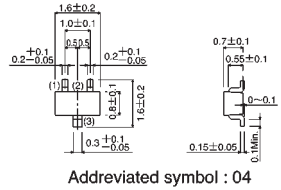
●Equivalent circuit



B : Base
C : Collector
E : Emitter

●External dimensions (Units: mm)

DTC114TE

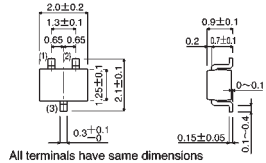


ROHM : EMT3

Addreviated symbol : 04

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

DTC114TUA



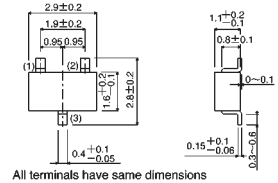
ROHM : UMT3
EIAJ : SC-70

All terminals have same dimensions

Addreviated symbol : 04

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

DTC114TKA



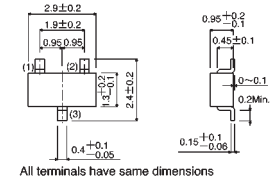
ROHM : SMT3
EIAJ : SC-59

All terminals have same dimensions

Addreviated symbol : 04

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

DTC114TCA



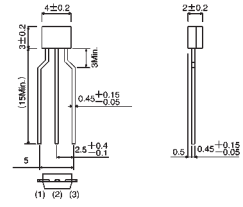
ROHM : SST3

All terminals have same dimensions

Addreviated symbol : 04

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

DTC114TSA



ROHM : SPT
EIAJ : SC-72

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

(96-311-C114T)

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits(DTC114T□)					Unit
		E	UA	KA	CA	SA	
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			300	mW
Junction temperature	Tj	150					℃
Storage temperature	Tstg	−55～+150					℃

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	50	—	—	V	I_C=50 μA
Collector-emitter breakdown voltage	BV_{CEO}	50	—	—	V	I_C=1mA
Emitter-base breakdown voltage	BV_{EBO}	5	—	—	V	I_E=50 μA
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=10mA/1mA
DC current transfer ratio	h_{FE}	100	300	600	—	V_{CE}=5V, I_C=1mA
Input resistance	R_1	7	10	13	kΩ	—
Transition frequency	f_T	—	250	—	MHz	V_{CE}=10V, I_E=−5mA, f=100MHz ✻

✻ Transition frequency of the device

●Packaging specifications

	Package	EMT3	UMT3	SMT3	SST3	SPT
	Packaging type	Taping	Taping	Taping	Taping	Taping
	Code	TL	T106	T146	T116	TP
Part No.	Basic ordering unit (pieces)	3000	3000	3000	3000	5000
DTC114TE		○	—	—	—	—
DTC114TUA		—	○	—	—	—
DTC114TKA		—	—	○	—	—
DTC114TCA		—	—	—	○	—
DTC114TSA		—	—	—	—	○

●Electrical characteristic curves

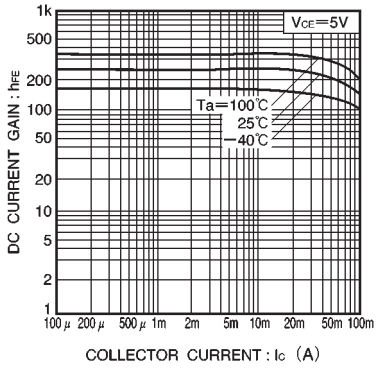


Fig.1 DC current gain vs. collector current

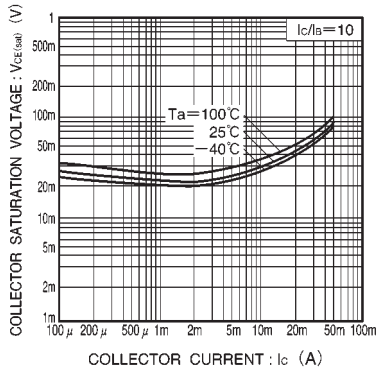


Fig.2 Collector-emitter saturation voltage vs. collector current