

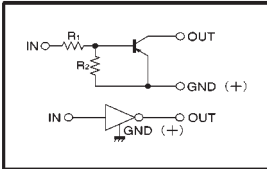
# Digital transistors (built-in resistors)

DTA115EE / DTA115EUA / DTA115EKA / DTA115ESA

### ●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 positive biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on / off conditions need to be set for operation, making device design easy.
- 4) Higher mounting densities can be achieved.

### ●Circuit schematic



### ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.5	V	$V_{CC} = -5V, I_o = -100 \mu A$ $V_o = -0.3V, I_o = -1mA$
	$V_{I(on)}$	-3	—	—		
Output voltage	$V_{O(on)}$	—	-0.1	-0.3	V	$I_o = -5mA, I_i = -0.25mA$
Input current	$I_i$	—	—	-0.15	mA	$V_i = -5V$
Output current	$I_{O(off)}$	—	—	-0.5	$\mu A$	$V_{CC} = -50V, V_i = 0V$
DC current gain	$G_i$	82	—	—	—	$I_o = -5mA, V_o = -5V$
Input resistance	$R_i$	70	100	130	k $\Omega$	—
Resistance ratio	$R_2/R_1$	0.8	1	1.2	—	—
Transition frequency	$f_r$	—	250	—	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$ *

\* Transition frequency of the device.

(94S-522-A115E)

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

Parameter	Symbol	Limits	Unit
Supply voltage	$V_{CC}$	-50	V
Input voltage	$V_i$	-40~+10	V
	$I_o$	-20	mA
Output current	$I_{C(Max)}$	-100	mA
	DTA115EE	150	mW
Power dissipation	DTA115EUA / DTA115EKA	200	
	DTA115ESA	300	
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55~+150	°C

### ●Package, marking, and packaging specifications

Part No.	DTA115EE	DTA115EUA	DTA115EKA	DTA115ESA
Package	EMT3	UMT3	SMT3	SPT
Marking	19	19	19	—
Packaging code	TL	T106	T146	TP
Basic ordering unit (pieces)	3000	3000	3000	5000

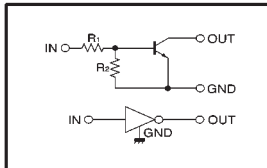
# Digital transistors (built-in resistors)

DTC115EE / DTC115EUA / DTC115EKA / DTC115ESA

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

### ●Circuit schematic



### ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	0.5	V	$V_{CC} = 5V, I_o = 100 \mu A$ $V_o = 0.3V, I_o = 1mA$
	$V_{I(on)}$	3	—	—		
Output voltage	$V_{O(on)}$	—	0.1	0.3	V	$I_o = 5mA, I_i = 0.25mA$
Input current	$I_i$	—	—	0.15	mA	$V_i = 5V$
Output current	$I_{O(off)}$	—	—	0.5	$\mu A$	$V_{CC} = 50V, V_i = 0V$
DC current gain	$G_i$	82	—	—	—	$I_o = 5mA, V_o = 5V$
Input resistance	$R_i$	70	100	130	k $\Omega$	—
Resistance ratio	$R_2/R_1$	0.8	1	1.2	—	—
Transition frequency	$f_r$	—	250	—	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$ *

\* Transition frequency of the device.

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

Parameter	Symbol	Limits	Unit
Supply voltage	$V_{CC}$	50	V
Input voltage	$V_i$	-10~+40	V
	$I_o$	20	mA
Output current	$I_{C(Max)}$	100	mA
	DTC115EE	150	mW
Power dissipation	DTC115EUA / DTC115EKA	200	
	DTC115ESA	300	
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55~+150	°C

### ●Package, marking, and packaging specifications

Part No.	DTC115EE	DTC115EUA	DTC115EKA	DTC115ESA
Package	EMT3	UMT3	SMT3	SPT
Marking	29	29	29	—
Packaging code	TL	T106	T146	TP
Basic ordering unit (pieces)	3000	3000	3000	5000

(94S-644-C115E)