Digital transistors (built-in resistors)
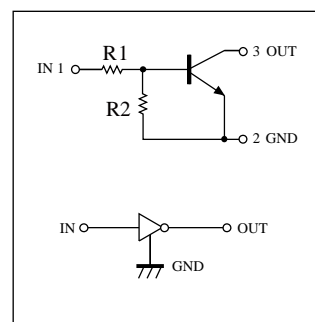
- **Features**

1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see the 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.

SC-89

- **Device Marking and Ordering Information**

Device	Marking	Shipping
DTC505T1G	8M	3000/Tape&Reel
DTC505T3G	8M	10000/Tape&Reel

- **Abaolute maximum ratings** $(T_A = 25°C)$

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	-5~+12	V
Output current	I_O	100	mA
	$I_{C(Max)}$	100	
Power dissipation	Pd	150	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	−55~+150	°C

- **Electrical characteristics** $(T_A = 25°C)$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	0.5	V	$V_{CC} = 5V$, $I_O = 100μA$
	$V_{I(on)}$	1.1	–	–		$V_O = 0.3V$, $I_O = 5mA$
Output voltage	$V_{O(on)}$	–	0.1	0.3	V	$I_O/I_I = 5mA/0.25mA$
Input current	I_I	–	–	3.6	mA	$V_I = 5V$
Output current	$I_{O(off)}$	–	–	0.5	μA	$V_{CC} = 50V$, $V_I = 0V$
DC current gain	G_I	80	–	–	–	$V_O = 5V$, $I_O = 10mA$
Input resistance	R_1	1.54	2.2	2.86	kΩ	–
Resistance ratio	R_2/R_1	17	21	26	–	–
Transition frequency	f_T	–	250	–	MHz	$V_{CE} = 10V$, $I_E = -5mA$, $f = 100MHz$ *

* Transition frequency of the device

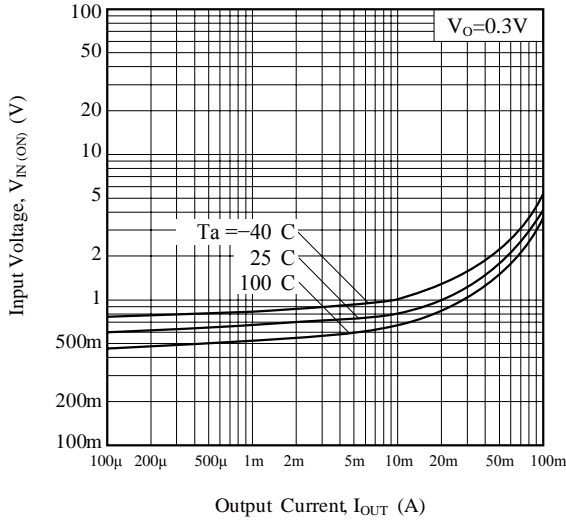• **Electrical characteristic curves**

Fig.1 Input Voltage vs. Output Current
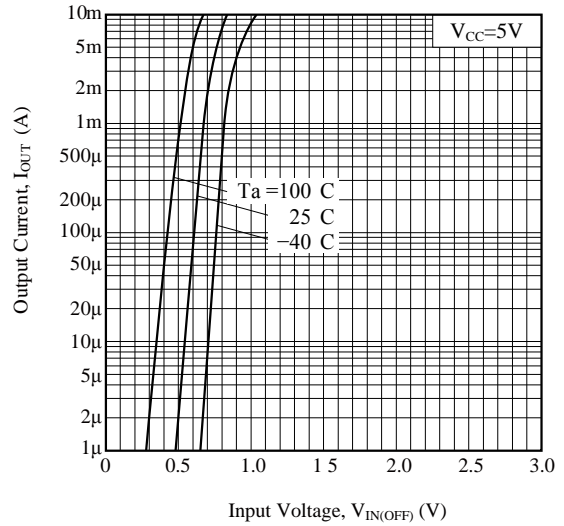(ON Characteristics)

Fig.2 Output Current vs. Input Voltage
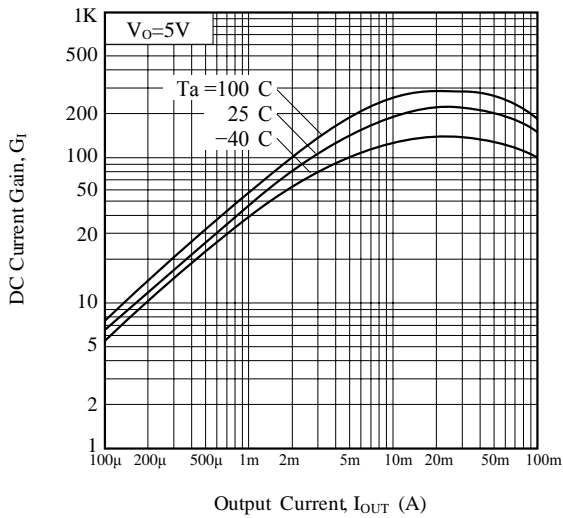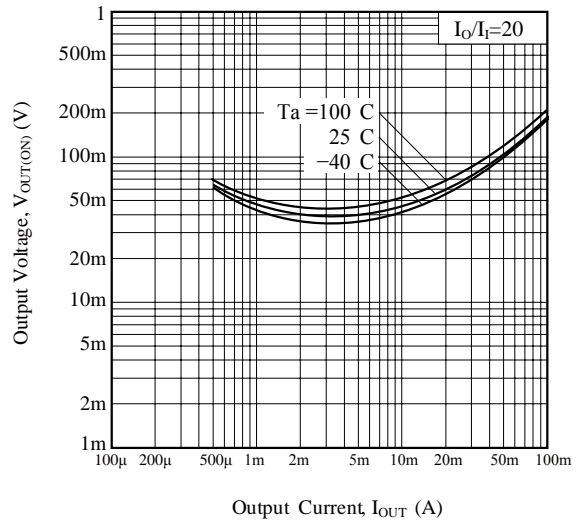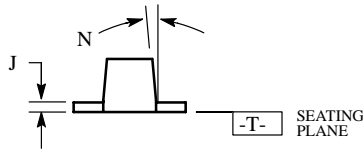(OFF Characteristics)
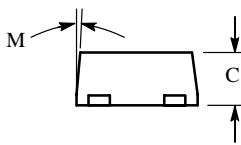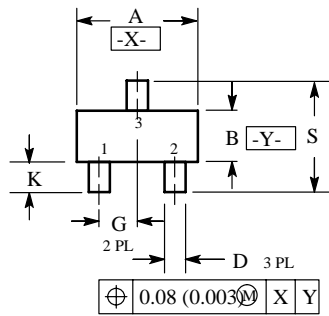

Fig 3 DC Current Gain vs. Output Current
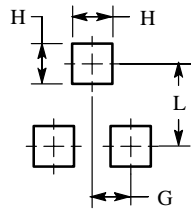

Fig.4 Output Voltage vs. Output Current

SC−89

NOTES:
1 DIMENSIONING AND TOLERANCING PER ANSI Y14 5M, 1982
2 CONTROLLING DIMENSION: MILLIMETERS
3 MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL
4 463C-01 OBSOLETE, NEW STANDARD 463C-02

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1 50	1 60	1 70	0 059	0 063	0 067
B	0 75	0 85	0 95	0 030	0 034	0 040
C	0 60	0 70	0 80	0 024	0 028	0 031
D	0 23	0 28	0 33	0 009	0 011	0 013
G	0 50BSC			0 020BSC		
H	0 53RBF			0 021RBF		
J	0 10	0 15	0 20	0 004	0 006	0 008
K	0 30	0 40	0 50	0 012	0 016	0 020
L	1 10RBF			0 043RBF		
M	-	-	10°	-	-	10°
N	-	-	10°	-	-	10°
S	1 50	1 60	1 70	0 059	0 063	0 067

RECOMMENDED PATTERN
OF SOLDER PADS