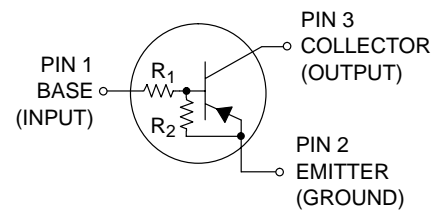


# Bias Resistor Transistors

## PNP Silicon Surface Mount Transistors with Monolithic Bias Resistor Network

This new series of digital transistors is designed to replace a single device and its external resistor bias network. The BRT (Bias Resistor Transistor) contains a single transistor with a monolithic bias network consisting of two resistors; a series base resistor and a base-emitter resistor. The BRT eliminates these individual components by integrating them into a single device. The use of a BRT can reduce both system cost and board space. The device is housed in the SOT-23 package which is designed for low power surface mount applications.

- Simplifies Circuit Design
- Reduces Board Space
- Reduces Component Count
- The SOT-23 package can be soldered using wave or reflow. The modified gull-winged leads absorb thermal stress during soldering eliminating the possibility of damage to the die.
- Pb-Free



### MAXIMUM RATINGS (T<sub>A</sub> = 25 C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	50	Vdc
Collector-Emitter Voltage	V <sub>CEO</sub>	50	Vdc
Collector Current	I <sub>C</sub>	100	mAdc

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation T <sub>A</sub> = 25 C Derate above 25 C	P <sub>D</sub>	230 (Note 1) 338 (Note 2) 1.8 (Note 1) 2.7 (Note 2)	mW C/W
Thermal Resistance – Junction-to-Ambient	R <sub>θJA</sub>	540 (Note 1) 370 (Note 2)	C/W
Thermal Resistance – Junction-to-Lead	R <sub>θJL</sub>	264 (Note 1) 287 (Note 2)	C/W
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	C

1. FR-4 @ Minimum Pad
2. FR-4 @ 1.0 x 1.0 inch Pad

### ORDERING INFORMATION

Device	Marking	Shipping
DTA205LT1G	A6M	3000/Tape&Reel



# DTA205

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector-Base Cutoff Current ( $V_{CB} = 50\text{ V}$ , $I_E = 0$ )	$I_{CBO}$	–	–	100	nAdc
Collector-Emitter Cutoff Current ( $V_{CE} = 50\text{ V}$ , $I_B = 0$ )	$I_{CEO}$	–	–	500	nAdc
Emitter-Base Cutoff Current ( $V_{BE} = 6.0\text{ V}$ )	$I_{EBO}$	–	–	0.2	mAdc
Collector-Base Breakdown Voltage ( $I_C = 10\ \mu\text{A}$ , $I_E = 0$ )	$V_{(BR)CBO}$	50	–	–	Vdc
Collector-Emitter Breakdown Voltage (Note 3) ( $I_C = 2.0\text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	50	–	–	Vdc

### ON CHARACTERISTICS (Note 3)

DC Current Gain ( $V_{CE} = 10\text{ V}$ , $I_C = 5.0\text{ mA}$ )	$h_{FE}$	80	–	–	
Collector-Emitter Saturation Voltage ( $I_C = 10\text{ mA}$ , $I_B = 1\text{ mA}$ )	$V_{CE(sat)}$	–	–	0.25	Vdc
Output Voltage (on) ( $V_{CC} = 5.0\text{ V}$ , $V_B = 2.5\text{ V}$ , $R_L = 1.0\text{ k}\Omega$ )	$V_{OL}$	–	–	0.2	Vdc
Output Voltage (off) ( $V_{CC} = 5.0\text{ V}$ , $V_B = 0.25\text{ V}$ , $R_L = 1.0\text{ k}\Omega$ )	$V_{OH}$	4.9	–	–	Vdc
Input Resistor	$R_1$	1.54	2.2	2.86	$\text{k}\Omega$
Resistor Ratio	$R_1/R_2$	0.038	0.047	0.056	

3. Pulse Test: Pulse Width < 300  $\mu\text{s}$ , Duty Cycle < 2.0%

## TYPICAL ELECTRICAL CHARACTERISTICS

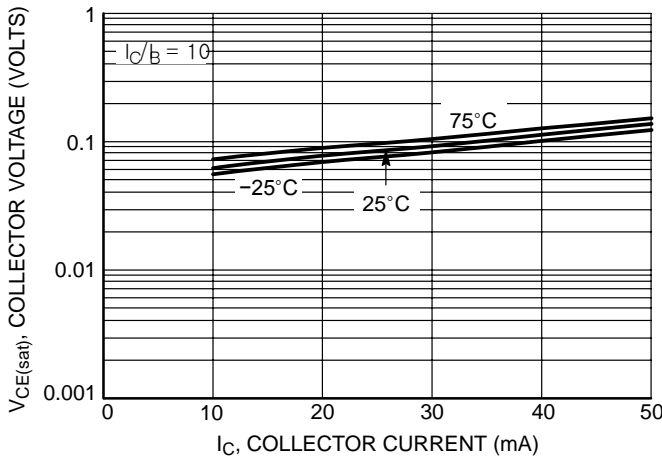


Figure 1.  $V_{CE(sat)}$  versus  $I_C$

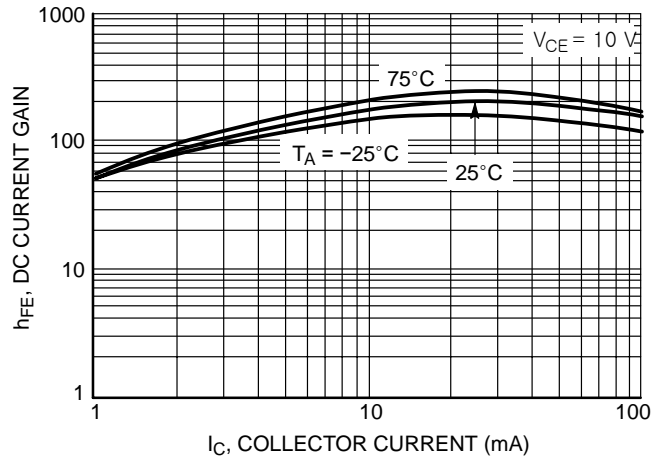


Figure 2. DC Current Gain

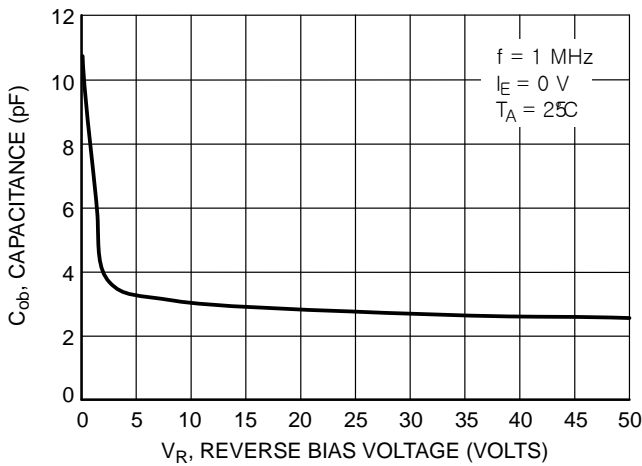


Figure 3. Output Capacitance

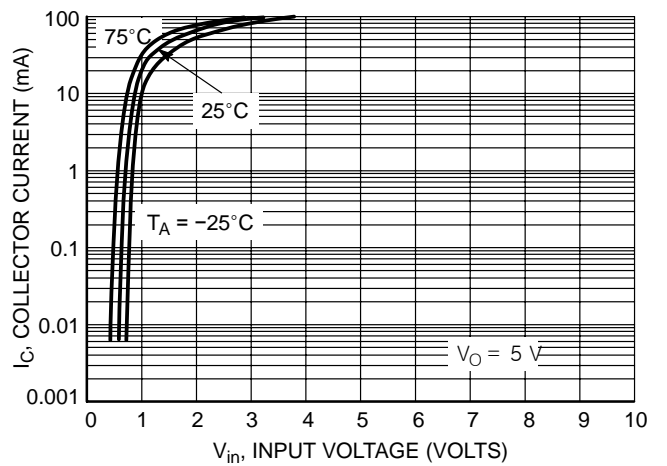


Figure 4. Output Current versus Input Voltage

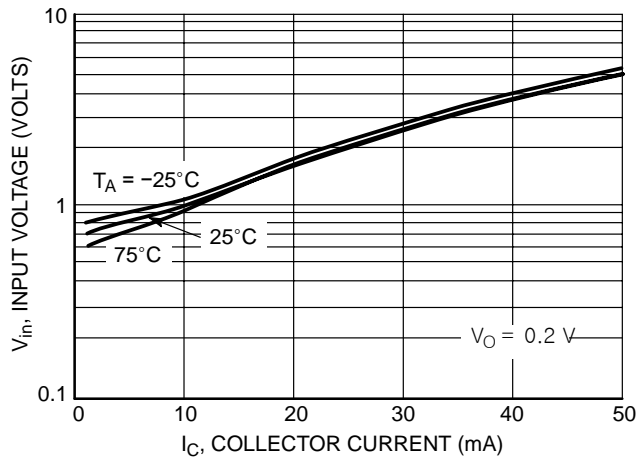
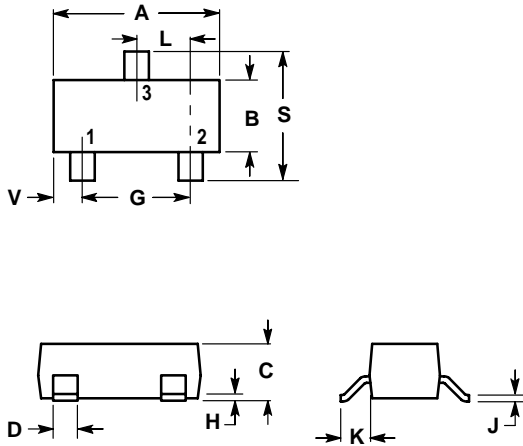


Figure 5. Input Voltage versus Output Current

## SOT-23



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

- P N 1. ANODE  
 2. NO CONNECTION  
 3. CATHODE

