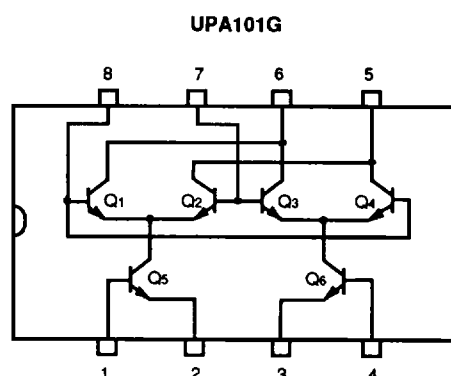


FEATURES

- **BUILT-IN ULTRAHIGH FREQUENCY MULTIPLIER:**
(9 GHz Single Transistors)
- **OUTSTANDING h_{FE} LINEARITY**
- **SMALL PACKAGE**
- **TAPE AND REEL PACKAGING OPTION AVAILABLE**

CONNECTION DIAGRAM (Top View)



DESCRIPTION

This Silicon MMIC transistor array contains six (6), 9 GHz bipolar transistors. Applications include a multiplier, double balanced mixer, phase detector, or AGC circuit.

NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

PART NUMBER PACKAGE OUTLINE			UPA101G G08		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
ICBO	Collector Cut-off Current at $V_{CB} = 5\text{ V}$, $I_E = 0$ (All transistors)	μA			1.0
IEBO	Emitter Cut-off Current at $V_{EB} = 1\text{ V}$, $I_C = 0$ (Q5 and Q6)	μA			1.0
h_{FE}	Direct Current Amplification, $V_{CE} = 3\text{ V}$, $I_C = 1\text{ mA}$ (Q5 and Q6)		40	100	250
h_{FE1}/h_{FE2}	Direct Current Amplification Ratio, $V_{CE} = 3\text{ V}$, $I_C = 1\text{ mA}$, (Q5 and Q6)		0.9	1.0	1.1
CEB	Emitter to Base Capacitance at $V_{EB} = 0$, $f = 1\text{ MHz}$	pF		1.4	2.8
f_{T1}	Gain Bandwidth Product at $V_{CE} = 3\text{ V}$, $I_C = 10\text{ mA}$	GHz		9	
RTH	Thermal Resistance, Single Transistor Whole device	$^\circ\text{C/W}$ $^\circ\text{C/W}$			40 25

Note:

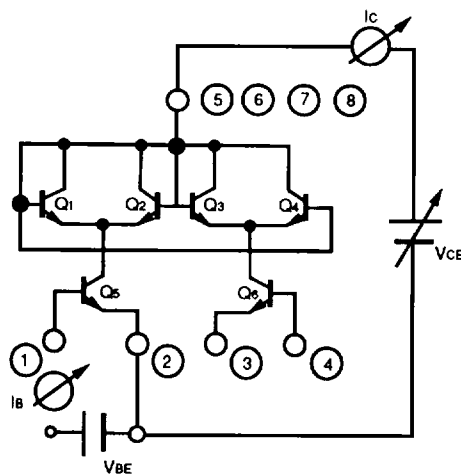
1. Measured by installing a single transistor in a Micro-X package; the value shown is a reference value.

ABSOLUTE MAXIMUM RATINGS¹ ($T_A = 25^\circ\text{C}$)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CB0}	Collector to Base Voltage ²	V	15
V_{CE0}	Collector to Emitter Voltage ²	V	6
V_{EB0}	Emitter to Base Voltage ²	V	2.5
I_C	Collector Current ²	mA	40
P_T	Total Power Dissipation	mW	350
T_J	Junction Temperature	$^\circ\text{C}$	125
T_{STG}	Storage Temperature	$^\circ\text{C}$	-55 to +125

Note:

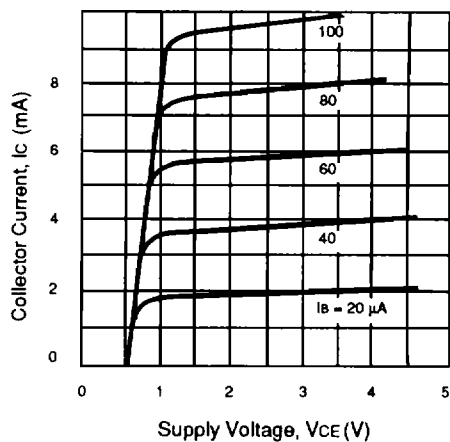
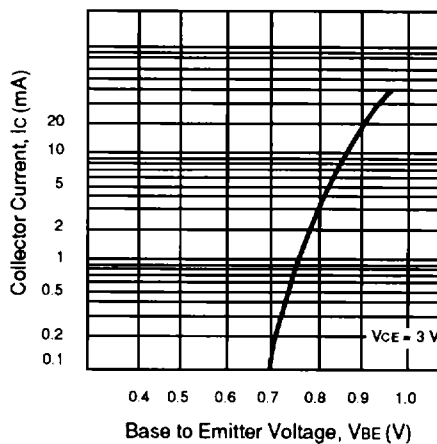
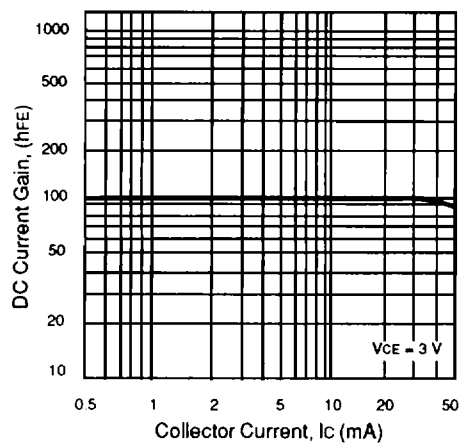
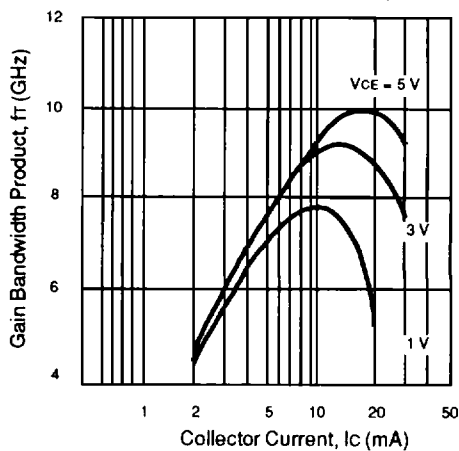
1. Operation in excess of any one of these conditions may result in permanent damage.
2. Absolute maximum ratings for each transistor.

TEST CIRCUIT SCHEMATIC*(For Electrical Characteristics Measurements excluding f_T)

*See Performance Characteristics for voltage.

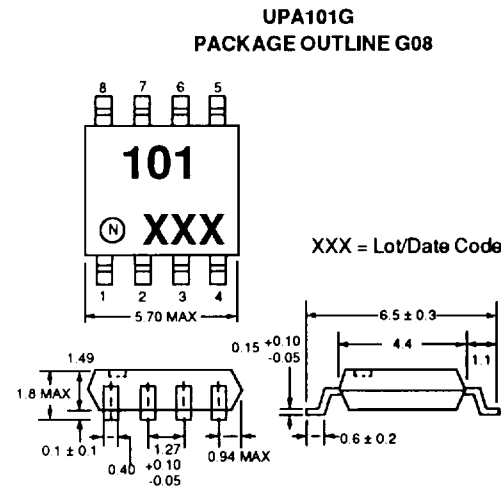
TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)

See Test Circuit Schematic

**COLLECTOR CURRENT vs.
PIN 5 TO PIN 2 VOLTAGE****COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE****DC CURRENT GAIN vs.
COLLECTOR CURRENT****GAIN BANDWIDTH PRODUCT vs.
COLLECTOR CURRENT**

UPA101G

OUTLINE DIMENSIONS (Units in mm)



See Connection Diagram for description of leads.

ORDERING INFORMATION

PART NUMBER	QUANTITY
UPA101G-E1	2500/REEL