NEC

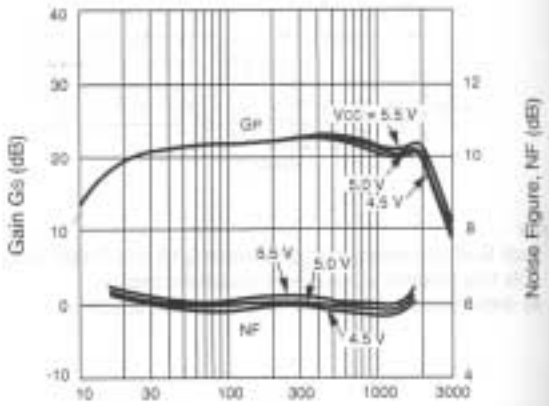
2 GHz MEDIUM POWER BROADBAND SILICON MMIC AMPLIFIER

UPC1678G UPC1678GV

FEATURES

- **HIGH OUTPUT POWER:** +18 dBm P_{SAT}
- **EXCELLENT FREQUENCY RESPONSE:** 2.0 GHz TYP at 3 dB Down
- **HIGH POWER GAIN:** 23 dB TYP at 500 MHz
- **SINGLE SUPPLY VOLTAGE:** 5 V
- **AVAILABLE IN TAPE AND REEL**

NOISE FIGURE AND GAIN vs. FREQUENCY AND VOLTAGE



DESCRIPTION

The UPC1678 is a silicon monolithic integrated circuit designed as a wide-band amplifier covering the HF to UHF bands. The device features high output power, 18 dBm TYP, high gain, 23 dB TYP and operates from a single 5 volt supply. The UPC1678 is available in two package styles: 8 pin SOP and SSOP packages.

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

ELECTRICAL CHARACTERISTICS (T_A = 25°C, V_{CC} = +5 V, f = 500 MHz, Z_L = Z_S = 50 Ω)

PART NUMBER PACKAGE OUTLINE			UPC1678G, GV G08, S08		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I_{CC}	Circuit Current at No Input Signal	mA	40	49	60
G_S	Small Signal Gain	dB	21	23	25
f_{3dB}	Upper Limit Operating Frequency at 3 dB down below the Gain at 100 MHz	MHz	1700	2000	
P_{SAT}	Saturated Output Power	dBm	15.5	17.5	
NF	Noise Figure	dB		6	
RL_{IN}	Input Return Loss	dB	11	14	
RL_{OUT}	Output Return Loss	dB	1	4	
ISOL	Isolation	dB	30	35	

ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CC}	Power Supply Voltage	V	-0.5 to 6.0
P_{IN}	Input Power	dBm	+10
P_T	Total Power Dissipation[2] UPC1678G, GV	mW	330
T_{OP}	Operating Temperature UPC1678G, GV	°C	-45 to +85
T_{STG}	Storage Temperature UPC1678G, GV	°C	-55 to +150

Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on 50 x 50 x 1.6 mm glass epoxy PWB at T_A = +85°C.

RECOMMENDED OPERATING CONDITIONS

SYMBOLS	CHARACTERISTICS	UNITS	MIN	TYP	MAX
V_{CC}	Supply Voltage	V	4.5	5.0	5.5
T_{OP}	Operating Temperature	°C	-40	+25	+85

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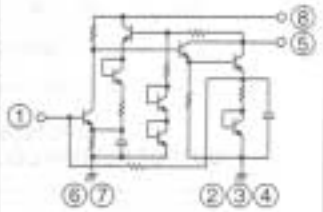
PIN DESCRIPTIONS

Pin No.	Pin Name	Applied Voltage (V)	Description	Internal Equivalent Circuit
1	Input	–	Signal input pin. An internal matching circuit, configured with resistors, enables 50 Ω connection over a wide bandwidth. A multi-feedback circuit is designed to cancel the deviations of h_{FE} and resistance. This pin must be coupled to the signal source with a blocking capacitor.	
5	Output	4.5 to 5.5	Signal output pin. Connect an inductor between this pin and V_{CC} to supply current to the internal output transistors.	
8	V_{CC}		Power supply pin. This pin should be externally equipped with a bypass capacitor to minimize ground impedance.	
2 3 4 6 7	GND	0	Ground pins. These pins should be connected to system ground with minimum inductance. Ground pattern on the board should be formed as wide as possible. All the ground pins must be connected together with wide ground pattern to minimize impedance difference.	