

# Introduction of Si/SiGe MMICs

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Compound Semiconductor Devices Division  
Discrete and IC Operations Unit  
NEC Electronics Corporation

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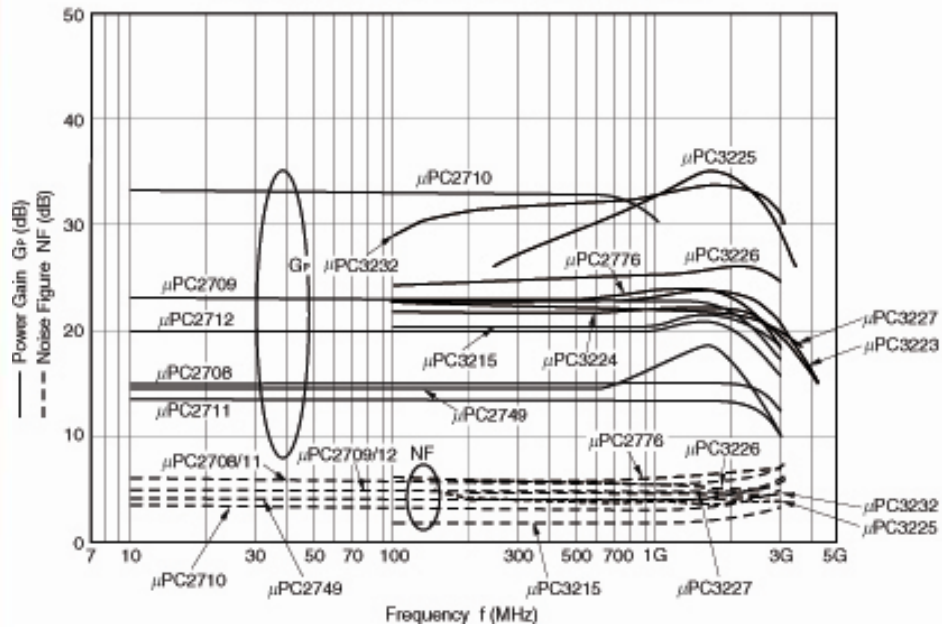
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- 3. Prescalers Page54 to 61**

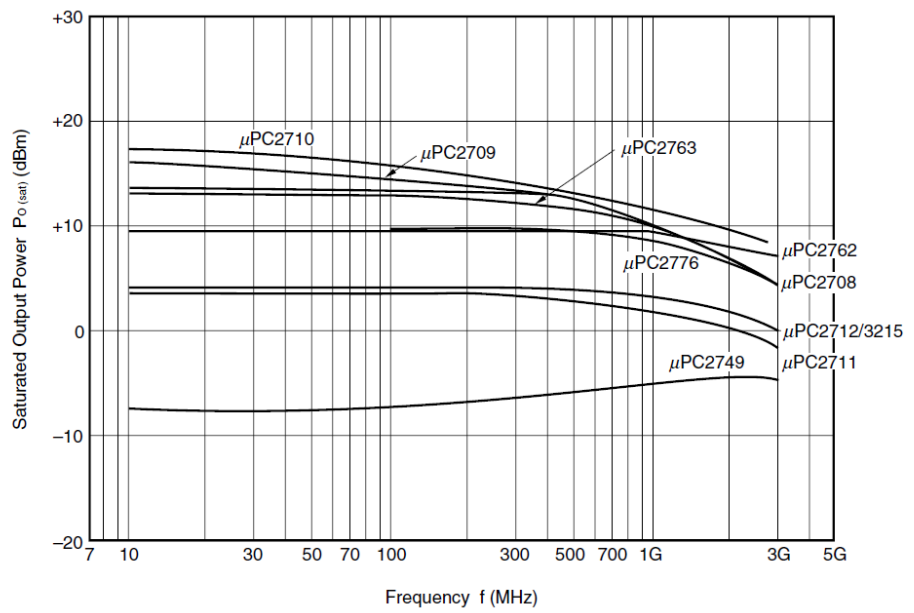
# Amplifiers

# 5V-Bias Amplifier Series Line-up

POWER GAIN, NOISE FIGURE vs. FREQUENCY



SATURATED OUTPUT POWER vs. FREQUENCY



# 5V-Bias Amplifier Series Line-up

Part No.	I <sub>cc</sub> (mA)	G <sub>P</sub> (dB)	NF (dB)	P <sub>o(sat)</sub> (dBm)	P <sub>o(1dB)</sub> (dBm)	OIP <sub>3</sub> (dBm)	ΔG <sub>P</sub> (dB)
uPC2708TB	26.0	15.0(1.0GHz)	6.5(1.0GHz)	+10.0(1.0GHz)	-	-	0.8
uPC2709TB	25.0	23.0(1.0GHz)	5.0(1.0GHz)	+11.5(1.0GHz)	-	-	1.0
uPC2710TB	22.0	33.0(1.0GHz)	3.5(1.0GHz)	+13.5(1.0GHz)	-	-	0.8
uPC2711TB	12.0	13.0(1.0GHz)	5.0(1.0GHz)	+1.0(1.0GHz)	-	-	0.8
uPC2712TB	12.0	20.0(1.0GHz)	4.5(1.0GHz)	+3.0(1.0GHz)	-	-	0.8
uPC2776TB	25.0	23.0(1.0GHz)	6.0(1.0GHz)	+8.5(1.0GHz)	-	-	1.0
uPC3215TB	14.0	20.5(1.5GHz)	2.3(1.5GHz)	+3.5(1.5GHz)	+1.5(1.5GHz)	+10.0(1.5GHz)	1.0
uPC3223TB	19.0	23.0(1.0GHz) 23.0(2.2GHz)	4.5(1.0GHz) 4.0(2.2GHz)	+12.0(1.0GHz) +9.0(2.2GHz)	+6.5(1.0GHz) +5.0(2.2GHz)	+17.8(1.0GHz) +14.8(2.2GHz)	1.8
uPC3224TB	9.0	21.5(1.0GHz) 21.5(2.2GHz)	4.3(1.0GHz) 4.3(2.2GHz)	+4.0(1.0GHz) +1.5(2.2GHz)	-3.5(1.0GHz) -5.5(2.2GHz)	+7.0(1.0GHz) +5.5(2.2GHz)	1.6
uPC3225TB	24.5	32.5(1.0GHz) 33.5(2.2GHz)	3.7(1.0GHz) 3.7(2.2GHz)	+15.5(1.0GHz) +12.5(2.2GHz)	+9.0(1.0GHz) +7.0(2.2GHz)	+21.0(1.0GHz) +16.0(2.2GHz)	2.5
uPC3226TB	15.5	25.0(1.0GHz) 26.0(2.2GHz)	5.3(1.0GHz) 4.9(2.2GHz)	+13.0(1.0GHz) +9.0(2.2GHz)	+7.5(1.0GHz) +7.5(2.2GHz)	+20.0(1.0GHz) +15(2.2GHz)	1.0
uPC3227TB	4.8	22.0(1.0GHz) 22.0(2.2GHz)	4.7(1.0GHz) 4.6(2.2GHz)	-1.0(1.0GHz) -3.5(2.2GHz)	-6.5(1.0GHz) -8.0(2.2GHz)	+4.0(1.0GHz) +1.5(2.2GHz)	0.4
uPC3232TB	26.0	32.8(1.0GHz) 33.8(2.2GHz)	4.0(1.0GHz) 4.1(2.2GHz)	+15.5(1.0GHz) +12.0(2.2GHz)	+11.0(1.0GHz) +8.5(2.2GHz)	+23.5(1.0GHz) +18(2.2GHz)	1.0

# High Gain Wide Band SiGe Amplifier

NEC

## uPC3232TB

In Mass Production

### Concept

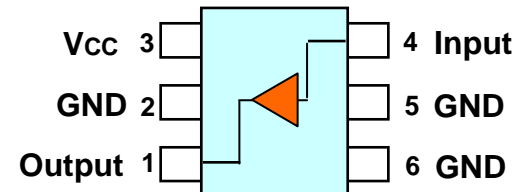
- Wide Band and High Gain

### Application

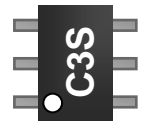
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{cc} = 26\text{mA TYP. (@}V_{cc} = +5\text{V)}$
- freq. = 0.25GHz to 3.0GHz
- GP = 32.8dB TYP./ 30dB MIN. (@f=1GHz)
- Gain Flatness (p-p) :  $\Delta GP = 1.0\text{B TYP.}$
- $P_{O(1dB)} : +11.0/+8.5\text{dBm TYP. @ } f = 1\text{GHz}/2.2\text{GHz}$
- $P_{O(sat)} : +15.5/+12.0\text{dBm TYP. @ } f = 1\text{GHz}/2.2\text{GHz}$
- $RL_{in}/RL_{out} : 10/12\text{dB MIN. @ } f = 2.2\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Medium Output Power Si Amplifier

NEC

## uPC3223TB

In Mass Production

### Concept

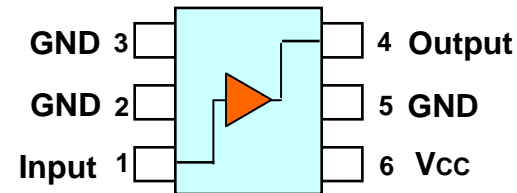
- Medium Output Power and Low Current

### Application

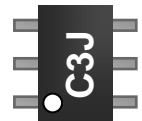
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 19.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 23\text{dB TYP.}@f = 1.0\text{GHz}/2.2\text{GHz}$
- Gain Flatness :  $\Delta G_P = 0.9\text{dB TYP.}@f = 0.1 \text{ to } 2.2\text{GHz}$
- $P_{O(1\text{dB})} : +6.5\text{dBm}/+5.0\text{dBm TYP.}@f = 1.0\text{GHz}/2.2\text{GHz}$
- $P_{O(\text{sat})} : +12.0\text{dBm}/+9.0\text{dBm TYP.}@f = 1.0\text{GHz}/2.2\text{GHz}$
- NF :  $4.5\text{dB}/4.0\text{dB TYP.}@f = 1.0\text{GHz}/2.2\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Wide Band Si Amplifier

NEC

## uPC3224TB

In Mass Production

### Concept

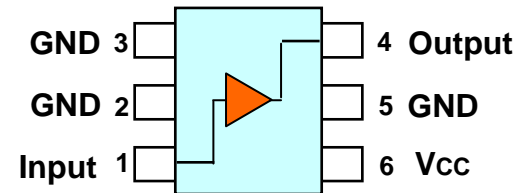
- Wide Band width and Low Current

### Application

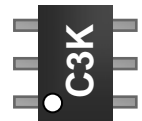
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 9.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 21.5\text{dB TYP.}@f = 1.0\text{GHz}/2.2\text{GHz}$
- Gain Flatness :  $\Delta G_P = 0.8\text{dB TYP.}@ f = 0.1 \text{ to } 2.2\text{GHz}$
- $P_{O(1\text{dB})} : -3.5\text{dBm}/-5.5\text{dBm TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- $P_{O(\text{sat})} : +4.0\text{dBm}/+1.5\text{dBm TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- NF :  $4.3\text{dB TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )



# High Gain Medium Output Power SiGe Amplifier

## uPC3225TB

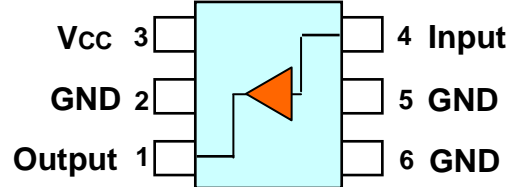
In Mass Production

**Concept**  
 - High Gain and Medium Output Power

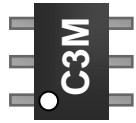
**Application**  
 - IF Amplifier for LNB etc.

**Performance**

- Circuit Current :  $I_{CC} = 24.5\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 32.5\text{dB}/33.5\text{dB TYP.}@f = 0.95\text{GHz}/2.15\text{GHz}$
- Gain Flatness :  $\Delta G_P = 2.5\text{dB TYP.}@ f = 0.95 \text{ to } 2.15\text{GHz}$
- $P_{O(1\text{dB})} : +9.0\text{dBm}/+7.0\text{dBm TYP.}@ f = 0.95\text{GHz}/2.15\text{GHz}$
- $P_{O(\text{sat})} : +15.5\text{dBm}/+12.5\text{dBm TYP.}@ f = 0.95\text{GHz}/2.15\text{GHz}$
- NF : 3.7dB TYP.@  $f = 1.0\text{GHz}/2.2\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
 ( 2.0X1.25mm )

# Medium Output Power SiGe Amplifier

## uPC3226TB

In Mass Production

■ Concept

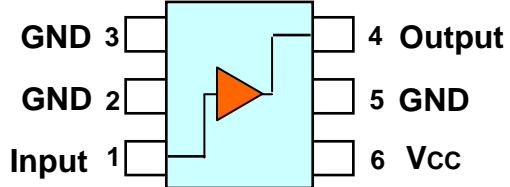
- Medium Output Power and Low Current

■ Application

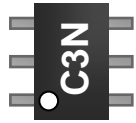
- IF Amplifier for LNB etc.

■ Performance

- Circuit Current :  $I_{CC} = 15.5\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 25.0\text{dB}/26.0\text{dB TYP.}@f = 1.0\text{GHz}/2.2\text{GHz}$
- $P_{O(1\text{dB})} : +7.5\text{dBm}/+5.7\text{dBm TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- $P_{O(\text{sat})} : +13.0\text{dBm}/+9.0\text{dBm TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- NF :  $5.3\text{dB}/4.9\text{dB TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

## uPC3227TB

In Mass Production

### Concept

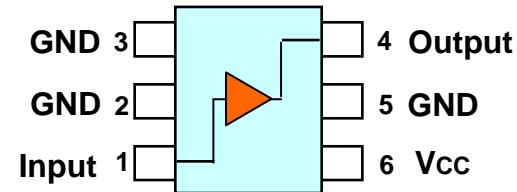
- Wide Band Width and Low Current

### Application

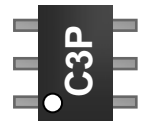
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 4.8\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 22.0\text{dB TYP.}@f = 1.0\text{GHz}/2.2\text{GHz}$
- $P_{O(1\text{dB})} : -6.5\text{dBm}/-8.0\text{dBm TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- $P_{O(\text{sat})} : -1.0\text{dBm}/-3.5\text{dBm TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- NF :  $4.7\text{dB}/4.6\text{dB TYP.}@ f = 1.0\text{GHz}/2.2\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Medium Output Power Si Amplifier

NEC

## uPC2708TB

In Mass Production

### Concept

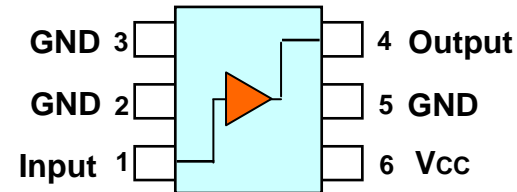
- Medium Output Power

### Application

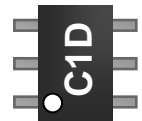
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 26.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 15.0\text{dB TYP.}@f = 1.0\text{GHz}$
- Gain Flatness :  $\Delta G_P = 0.8\text{dB TYP.}@f = 0.1 \text{ to } 2.6\text{GHz}$
- $P_{O(sat)} : +10.0\text{dBm TYP.}@f = 1.0\text{GHz}$
- NF :  $6.5\text{dB TYP.}@f = 1.0\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Medium Output Power Si Amplifier

NEC

## uPC2709TB

In Mass Production

### Concept

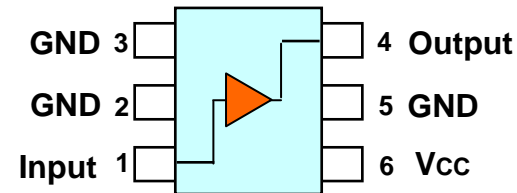
- Medium Output Power

### Application

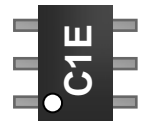
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 25.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 23.0\text{dB TYP.}@f = 1.0\text{GHz}$
- Gain Flatness :  $\Delta G_P = 1.0\text{dB TYP.}@ f = 0.1 \text{ to } 2.15\text{GHz}$
- $P_{O(sat)} : +11.5\text{dBm TYP.}@ f = 1.0\text{GHz}$
- NF :  $5.5\text{dB TYP.}@ f = 1.0\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

## uPC2710TB

In Mass Production

### Concept

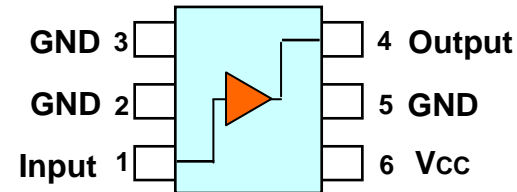
- Medium Output Power

### Application

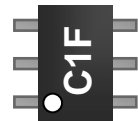
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 22.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 33.0\text{dB TYP.}@f = 0.5\text{GHz}$
- Gain Flatness :  $\Delta G_P = 0.8\text{dB TYP.}@ f = 0.1 \text{ to } 0.6\text{GHz}$
- $P_{O(sat)} : +13.5\text{dBm TYP.}@ f = 0.5\text{GHz}$
- NF :  $3.5\text{dB TYP.}@ f = 0.5\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Wide Band Si Amplifier

## uPC2711TB

In Mass Production

### Concept

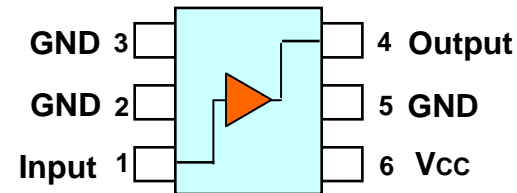
- Wide Band Width and Low Current

### Application

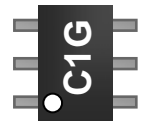
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 12.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 13.0\text{dB TYP.}@f = 1.0\text{GHz}$
- Gain Flatness :  $\Delta G_P = 0.8\text{dB TYP.}@f = 0.1 \text{ to } 2.5\text{GHz}$
- $P_{O(sat)} : +1.0\text{dBm TYP.}@f = 1.0\text{GHz}$
- NF :  $5.0\text{dB TYP.}@f = 1.0\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Wide Band Si Amplifier

NEC

## uPC2712TB

In Mass Production

### Concept

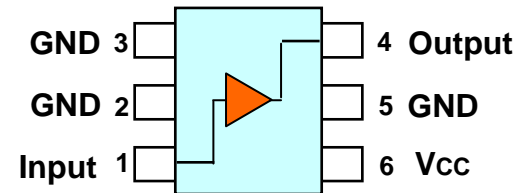
- Wide Band Width and Low Current

### Application

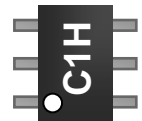
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 12.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 20.0\text{dB TYP.}@f = 1.0\text{GHz}$
- Gain Flatness :  $\Delta G_P = 0.8\text{dB TYP.}@ f = 0.1 \text{ to } 2.0\text{GHz}$
- $P_{O(sat)} : +3.0\text{dBm TYP.}@ f = 1.0\text{GHz}$
- NF :  $4.5\text{dB TYP.}@ f = 1.0\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )



# Medium Output Power Si Amplifier

NEC

## uPC2776TB

In Mass Production

### ■ Concept

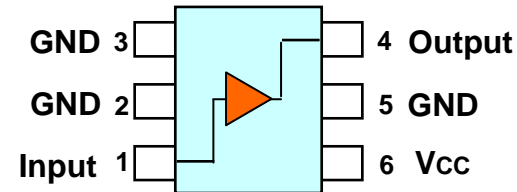
- Wide Band Width and Low Current

### ■ Application

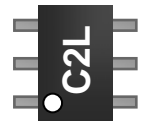
- IF Amplifier for LNB etc.

### ■ Performance

- Circuit Current :  $I_{CC} = 25.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 23.0\text{dB TYP.}@f = 1.0\text{GHz}$
- Gain Flatness :  $\Delta G_P = 1.0\text{dB TYP.}@ f = 0.1 \text{ to } 2.0\text{GHz}$
- $P_{O(\text{sat})} : +8.5\text{dBm TYP.}@ f = 1.0\text{GHz}$
- $P_{o(1\text{dB})} : +6.5\text{dBm TYP.}@ f = 1.0\text{GHz}$
- NF :  $6.0\text{dB TYP.}@ f = 1.0\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Wide Band Si Amplifier

NEC

## uPC3215TB

In Mass Production

### Concept

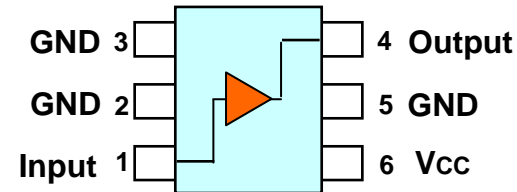
- Wide Band Width and Low Current

### Application

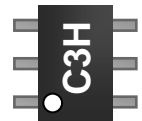
- IF Amplifier for LNB etc.

### Performance

- Circuit Current :  $I_{CC} = 14.0\text{mA TYP.}@V_{CC} = 5.0\text{V}$
- Power Gain :  $G_P = 20.5\text{dB TYP.}@f = 1.5\text{GHz}$
- Gain Flatness :  $\Delta G_P = 1.0\text{dB TYP.}@ f = 0.1 \text{ to } 2.15\text{GHz}$
- $P_{O(sat)} : +3.5\text{dBm TYP.}@ f = 1.5\text{GHz}$
- $P_{O(1dB)} : -1.5\text{dBm TYP.}@ f = 1.5\text{GHz}$
- NF :  $2.3\text{dB TYP.}@ f = 1.5\text{GHz}$
- 6pin Super Mini Mold package (2.0x1.25x0.9mm)



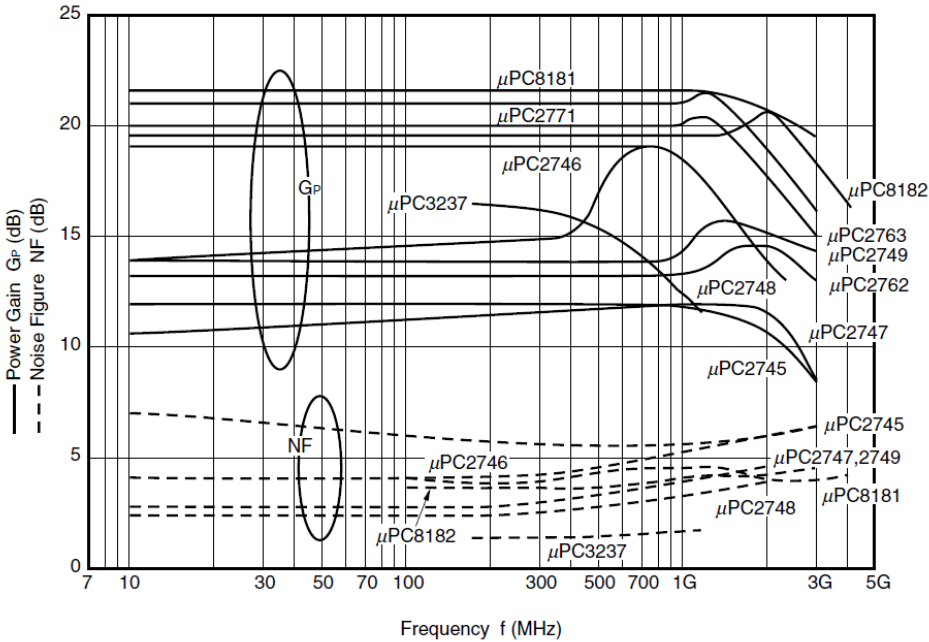
Block Diagram



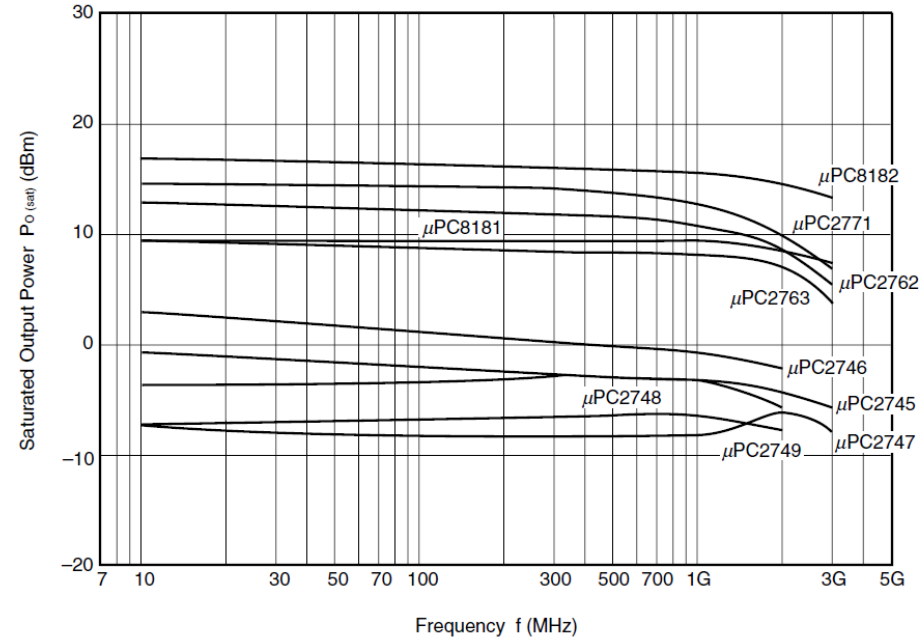
6pin super MM  
( 2.0X1.25mm )

# 3V-Bias Amplifier Series Line-up

POWER GAIN, NOISE FIGURE vs. FREQUENCY



SATURATED OUTPUT POWER vs. FREQUENCY



# 3V-Bias Amplifier Series Line-up

Part No.	I <sub>cc</sub> (mA)	G <sub>p</sub> (dB)	NF (dB)	P <sub>o(sat)</sub> (dBm)	P <sub>o(1dB)</sub> (dBm)	OIP <sub>3</sub> (dBm)	ΔG <sub>p</sub> (dB)
uPC2745TB	7.5	12.0(1.0GHz)	6.0(1.0GHz)	-10.0(1.0GHz)	-	-	-
uPC2746TB	7.5	19.0(1.0GHz)	4.0(1.0GHz)	0(1.0GHz)	-	-	-
uPC2747TB	5.0	12.0(1.0GHz)	3.3(1.0GHz)	-7.0(1.0GHz)	-	-	-
uPC2748TB	5.0	19.0(1.0GHz)	2.8(1.0GHz)	-3.5(1.0GHz)	-	-	-
uPC2749TB	6.0	16.0(1.0GHz)	4.0(1.0GHz)	-6.0(1.0GHz)	-	-	-
uPC2762TB	26.5	13.0(0.9GHz) 15.5(1.9GHz)	6.5(0.9GHz)	+9.0(0.9GHz) +8.5(1.9GHz)	+8.0(0.9GHz) +7.0(1.9GHz)	-	-
uPC2763TB	27.0	20.0(0.9GHz)21 .0(1.9GHz)	5.5(0.9GHz)	+11.0(0.9GHz) +8.0(1.9GHz)	+9.5(0.9GHz) +6.5(1.9GHz)	-	-
uPC2771TB	36.0	21.0(0.9GHz) 21.0(1.5GHz)	6.0(0.9GHz)	+12.5(0.9GHz) +11.0(1.5GHz)	+11.5(0.9GHz) +9.5(1.5GHz)	-	-
uPC8181TB	23.0	19.0(0.9GHz) 21.0(1.9GHz) 21.5(2.4GHz)	4.5(0.9GHz) 4.5(1.9GHz) 4.5(2.4GHz)	+9.5(0.9GHz) +9.5(1.9GHz) +9.0(2.4GHz)	+8.0(0.9GHz) +7.0(1.9GHz) +7.0(2.4GHz)	-	-
uPC8182TB	30.0	21.5(0.9GHz) 20.5(1.9GHz) 20.5(2.4GHz)	4.5(0.9GHz) 4.5(1.9GHz) 5.0(2.4GHz)	+11.0(0.9GHz) +10.5(1.9GHz) +10.0(2.4GHz)	+9.5(0.9GHz) +9.0(1.9GHz) +8.0(2.4GHz)	-	-

# Medium Output Power Si Amplifier

NEC

## uPC8181TB

In Mass Production

### Concept

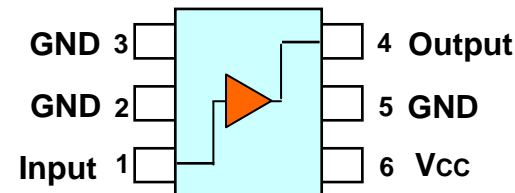
- Medium Output Power and Wide Band Width

### Application

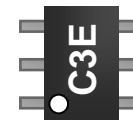
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{CC} = 23.0\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Power Gain :  $G_P = 21.0\text{dB}/22.0\text{dB TYP.}@f = 1.9\text{GHz}/2.4\text{GHz}$
- $P_{O(\text{sat})} : +9.0\text{dBm TYP.}@ f = 1.9\text{GHz}/2.4\text{GHz}$
- $P_{O(1\text{dB})} : +7.0\text{dBm TYP.}@ f = 1.9\text{GHz}/2.4\text{GHz}$
- NF : 4.5dB TYP. @  $f = 1.9\text{GHz}/2.4\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Medium Output Power Si Amplifier

NEC

## uPC8182TB

In Mass Production

### Concept

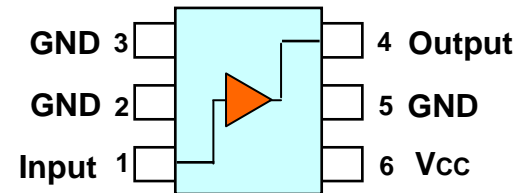
- Medium Output Power and Wide Band Width

### Application

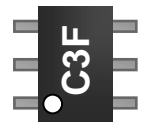
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{cc} = 30.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Power Gain :  $G_P = 20.5\text{dB TYP.}@f = 1.9\text{GHz}/2.4\text{GHz}$
- $P_{O(sat)} : +10.5\text{dBm}/+10.0\text{dBm TYP.}@ f = 1.9\text{GHz}/2.4\text{GHz}$
- $P_{O(1\text{dB})} : +9.0\text{dBm}/+8.0\text{dBm TYP.}@ f = 1.9\text{GHz}/2.4\text{GHz}$
- NF : 4.5dB/5.0dB TYP. @  $f = 1.9\text{GHz}/2.4\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Medium Output Power Si Amplifier

NEC

## uPC2762TB

In Mass Production

### Concept

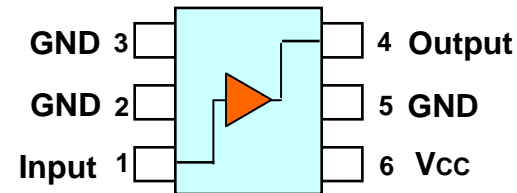
- Medium Output Power and Wide Band Width

### Application

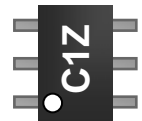
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{CC} = 26.5\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Power Gain :  $G_P = 13.0\text{dB}/15.5\text{dB TYP.}@f = 0.9\text{GHz}/1.9\text{GHz}$
- $P_{O(sat)} : +9.0\text{dBm}/+8.5\text{dBm TYP.}@ f = 0.9\text{GHz}/1.9\text{GHz}$
- $P_{O(1\text{dB})} : +8.0\text{dBm}/+7.0\text{dBm TYP.}@ f = 0.9\text{GHz}/1.9\text{GHz}$
- NF :  $6.5\text{dB}/7.0\text{dB TYP.}@ f = 0.9\text{GHz}/1.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Medium Output Power Si Amplifier

NEC

## uPC2763TB

In Mass Production

### Concept

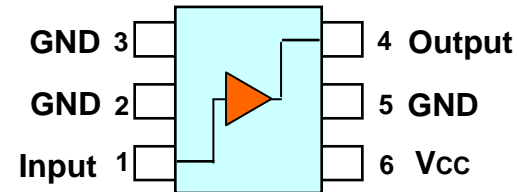
- Medium Output Power and Wide Band Width

### Application

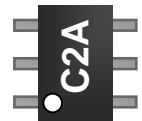
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{CC} = 27.0\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Power Gain :  $G_P = 20.0\text{dB}/21.0\text{dB TYP.}@f = 0.9\text{GHz}/1.9\text{GHz}$
- $P_{O(\text{sat})} : +11.0\text{dBm}/+8.0\text{dBm TYP.}@ f = 0.9\text{GHz}/1.9\text{GHz}$
- $P_{O(1\text{dB})} : +9.5\text{dBm}/+6.5\text{dBm TYP.}@ f = 0.9\text{GHz}/1.9\text{GHz}$
- NF : 5.5dB TYP. @  $f = 0.9\text{GHz}/1.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )



# Medium Output Power Si Amplifier

NEC

## uPC2771TB

In Mass Production

### Concept

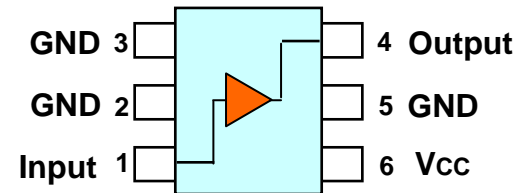
- Medium Output Power and Wide Band Width

### Application

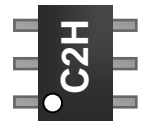
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{CC} = 36.0\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Power Gain :  $G_P = 21.0\text{dB TYP.}@f = 0.9\text{GHz}/1.5\text{GHz}$
- $P_{O(\text{sat})} : +12.5\text{dBm}/+11.0\text{dBm TYP.}@ f = 0.9\text{GHz}/1.5\text{GHz}$
- $P_{O(1\text{dB})} : +11.5\text{dBm}/+9.5\text{dBm TYP.}@ f = 0.9\text{GHz}/1.5\text{GHz}$
- NF : 6.0dB TYP. @  $f = 0.9\text{GHz}/1.5\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Wide Band Si Amplifier

## uPC2745TB

In Mass Production

### Concept

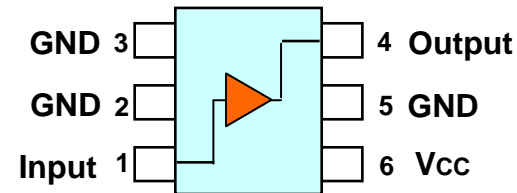
- Wide Band Width and Low Current

### Application

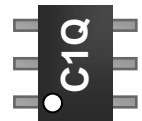
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{CC} = 7.5\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Power Gain :  $G_P = 12.0\text{dB TYP.}@f = 0.5\text{GHz}$
- $P_{O(sat)} : -1.0\text{dBm TYP.}@ f = 0.5\text{GHz}$
- NF :  $6.0\text{dB TYP.}@ f = 0.5\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )



# Wide Band Si Amplifier

NEC

## uPC2747TB

In Mass Production

### Concept

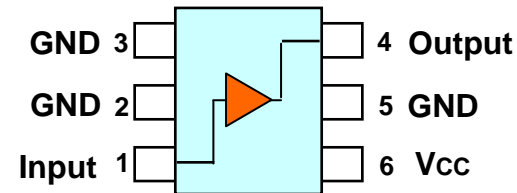
- Wide Band Width and Low Current

### Application

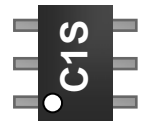
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{CC} = 5.0\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Power Gain :  $G_P = 12.0\text{dB TYP.}@f = 0.9\text{GHz}$
- $P_{O(sat)} : -7.0\text{dBm TYP.}@ f = 0.9\text{GHz}$
- NF :  $3.3\text{dB TYP.}@ f = 0.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Wide Band Si Amplifier

NEC

## uPC2748TB

In Mass Production

### Concept

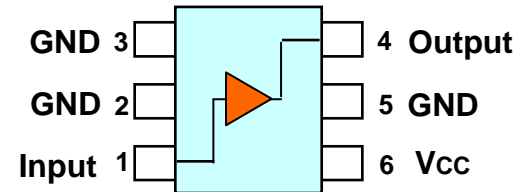
- Wide Band Width and Low Current

### Application

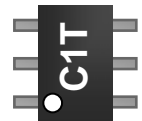
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{CC} = 6.0\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Power Gain :  $G_P = 19.0\text{dB TYP.}@f = 0.9\text{GHz}$
- $P_{O(sat)} : -3.5\text{dBm TYP.}@ f = 0.9\text{GHz}$
- NF :  $2.8\text{dB TYP.}@ f = 0.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Wide Band Si Amplifier

NEC

## uPC2749TB

In Mass Production

### Concept

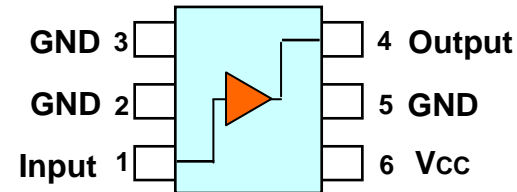
- Wide Band Width and Low Current

### Application

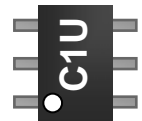
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{CC} = 6.0\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Power Gain :  $G_P = 16.0\text{dB TYP.}@f = 1.9\text{GHz}$
- $P_{O(sat)} : -6.0\text{dBm TYP.}@ f = 1.9\text{GHz}$
- NF :  $4.0\text{dB TYP.}@ f = 1.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Current Amplifier Series Line-up

Part No.	I <sub>CC</sub> (mA)	G <sub>P</sub> (dB)	ISL (dB)	P <sub>O(1dB)</sub> (dBm)
uPC8128TB	2.8	12.5(1.0GHz) 13.0(1.9GHz)	39.0(1.0GHz) 37.0(1.9GHz)	-4.0(1.0GHz) -4.0(1.9GHz)
uPC8151TB	4.2	12.5(1.0GHz) 15.0(1.9GHz)	38.0(1.0GHz) 34.0(1.9GHz)	+2.5(1.0GHz) +0.5(1.9GHz)
uPC8178TB/TK	1.9	11.0(1.0GHz) 11.5(1.9GHz) 11.5(2.4GHz)	39.0(1.0GHz) 40.0(1.9GHz) 38.0(2.4GHz)	-4.0(1.0GHz) -7.0(1.9GHz) -7.5(2.4GHz)
uPC8179TB/TK	4.0	13.5(1.0GHz) 15.5(1.9GHz) 15.5(2.4GHz)	44.0(1.0GHz) 42.0(1.9GHz) 41.0(2.4GHz)	+3.0(1.0GHz) +1.5(1.9GHz) +1.0(2.4GHz)

# Low Current Si Amplifier

## uPC8178TB

In Mass Production

### Concept

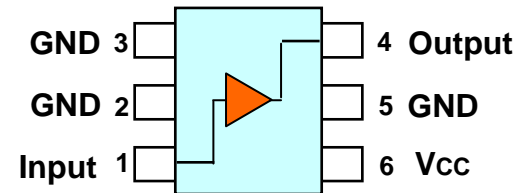
- Low Current and High Isolation

### Application

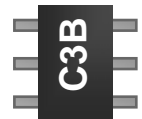
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{cc} = 1.9\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Isolation :  $ISL = 39\text{dB TYP.}@ f = 1.0\text{GHz}$   
 $ISL = 40\text{dB TYP.}@ f = 1.9\text{GHz}$   
 $ISL = 38\text{dB TYP.}@ f = 2.4\text{GHz}$
- Power Gain :  $G_P = 11.0\text{dB TYP.}@f = 1.0\text{GHz}$   
 $G_P = 11.5\text{dB TYP.}@f = 1.9\text{GHz}/2.4\text{GHz}$
- $P_{O(1\text{dB})} : -4.0\text{dBm TYP.}@ f = 1.0\text{GHz}$   
 $-7.0\text{dBm TYP.}@ f = 1.9\text{GHz}/2.4\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )



# Low Current Si Amplifier

## uPC8178TK

In Mass Production

### Concept

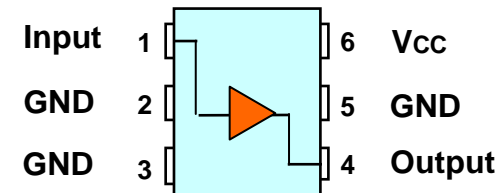
- Low Current and High Isolation

### Application

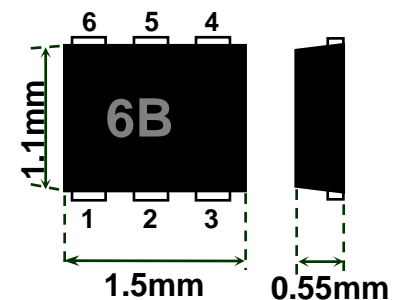
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{cc} = 1.9\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Isolation :  $ISL = 40\text{dB TYP.}@f = 1.0\text{GHz}$   
 $ISL = 41\text{dB TYP.}@f = 1.9\text{GHz}$   
 $ISL = 42\text{dB TYP.}@f = 2.4\text{GHz}$
- Power Gain :  $G_P = 11.0\text{dB TYP.}@f = 1.0\text{GHz}/1.9\text{GHz}/2.4\text{GHz}$
- $P_{O(1\text{dB})}$  :  $-5.5\text{dBm TYP.}@f = 1.0\text{GHz}$   
 $-8.0\text{dBm TYP.}@f = 1.9\text{GHz}/2.4\text{GHz}$
- 6pin Lead Less Mini Mold Package (1.5x1.1x0.55mm)



Block Diagram



# Low Current Si Amplifier

## uPC8179TB

### Concept

- Low Current and High Isolation

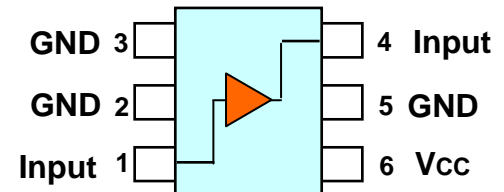
### Application

- General Mobile Comm., etc..

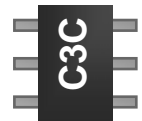
### Performance

- Circuit Current :  $I_{CC} = 4.0\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Isolation :  $ISL = 44\text{dB TYP.}@ f = 1.0\text{GHz}$   
 $ISL = 42\text{dB TYP.}@ f = 1.9\text{GHz}$   
 $ISL = 41\text{dB TYP.}@ f = 2.4\text{GHz}$
- Power Gain :  $G_P = 13.5\text{dB TYP.}@f = 1.0\text{GHz}$   
 $G_P = 15.5\text{dB TYP.}@f = 1.9\text{GHz}/2.4\text{GHz}$
- $P_{O(1dB)}$  :  $+3.0\text{dBm TYP.}@ f = 1.0\text{GHz}$   
 $+1.5\text{dBm TYP.}@ f = 1.9\text{GHz}$   
 $+1.0\text{dBm TYP.}@ f=2.4\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)

In Mass Production



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Current Si Amplifier

NEC

## uPC8179TK

### Concept

- Low Current and High Isolation

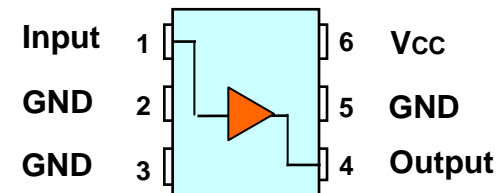
### Application

- General Mobile Comm., etc..

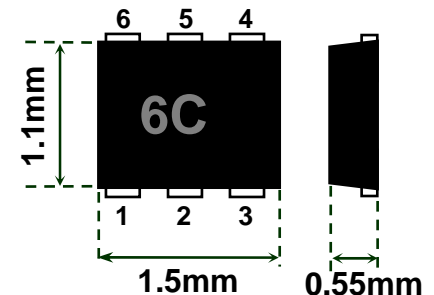
### Performance

- Circuit Current :  $I_{cc} = 4.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Isolation :  $ISL = 43\text{dB TYP.}@ f = 1.0\text{GHz}$   
 $ISL = 42\text{dB TYP.}@ f = 1.9\text{GHz}/2.4\text{GHz}$
- Power Gain :  $GP = 13.5\text{dB TYP.}@f = 1.0\text{GHz}$   
 $GP = 15.5\text{dB TYP.}@f = 1.9\text{GHz}$   
 $GP = 16.0\text{dB TYP.}@f = 2.4\text{GHz}$
- $P_{O(1\text{dB})} : +2.0\text{dBm TYP.}@ f = 1.0\text{GHz}$   
 $+0.5\text{dBm TYP.}@ f = 1.9\text{GHz}/2.4\text{GHz}$
- 6pin Lead Less Mini Mold Package (1.5x1.1x0.55mm)

In Mass Production



Block Diagram



# Low Current Si Amplifier

NEC

## uPC8128TB

### Concept

- Low Current and High Isolation

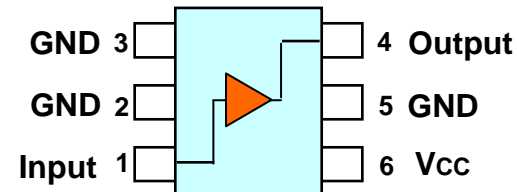
### Application

- General Mobile Comm., etc..

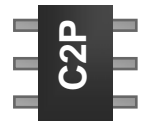
### Performance

- Circuit Current :  $I_{CC} = 2.8\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Isolation :  $ISL = 39\text{dB TYP.}@ f = 1.0\text{GHz}/1.66\text{GHz}$   
 $ISL = 37\text{dB TYP.}@ f = 1.9\text{GHz}$
- Power Gain :  $GP = 12.5\text{dB TYP.}@f = 1.0\text{GHz}$   
 $GP = 13.0\text{dB TYP.}@f = 1.66\text{GHz}/1.9\text{GHz}$
- $P_{O(1\text{dB})} : -4.0\text{dBm TYP.}@ f = 1.0\text{GHz}/1.66\text{GHz}/1.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)

In Mass Production



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Current Si Amplifier

NEC

## uPC8151TB

In Mass Production

### ■ Concept

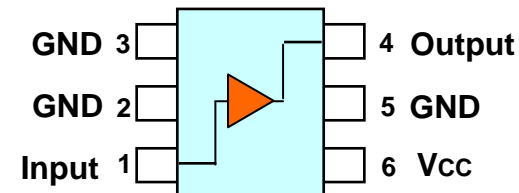
- Low Current and High Isolation

### ■ Application

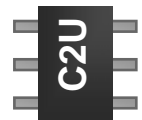
- General Mobile Comm., etc..

### ■ Performance

- Circuit Current :  $I_{cc} = 4.2\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Isolation :  $ISL = 38\text{dB TYP.}@ f = 1.0\text{GHz}$   
 $ISL = 36\text{dB TYP.}@ f = 1.66\text{GHz}$   
 $ISL = 34\text{dB TYP.}@ f = 1.9\text{GHz}$
- Power Gain :  $GP = 12.5\text{dB TYP.}@f = 1.0\text{GHz}$   
 $GP = 15.0\text{dB TYP.}@f = 1.66\text{GHz}/1.9\text{GHz}$
- $P_{O(1\text{dB})} : +2.5\text{dBm TYP.}@ f = 1.0\text{GHz}$   
 $+0.5\text{dBm TYP.}@ f = 1.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Noise Amplifier Series Line-up **NEC**

Part No.	I <sub>cc</sub> (mA)	NF (dB)	G <sub>p</sub> (dB)	IIP3 (dBm)	R.L. <sub>IN</sub> (dB)	Package (mm)	External Components
uPC8211TK	3.5	1.3	18.5	-12	7.5	6pL2MM 1.3x1.5x0.55t	9 (C:5,L:3,R:1)
uPC8215TU	10.0	1.3	27	-15	7	8pL2MM 2.0x2.0x0.5t	6 (C:4,L:2)
uPC8230TU	6.0	0.85	18.5	-5	11	8pL2MM 2.0x2.0x0.5t	5 (C:4,L:1)
uPC8231TK	3.8	0.8	20	-10	10	6pL2MM 1.3x1.5x0.55t	9 (C:5,L:3,R:1)
uPC8232T5N	3.0	0.95	17	-8	10	6pTSON 1.5x1.5x0.4t	5 (C:4,L:1)

# Low Noise SiGe:C Amplifier

## uPC8230TU

In Mass Production

### Concept

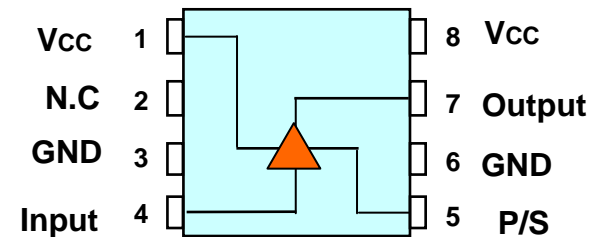
- Very Low Noise and High Gain

### Application

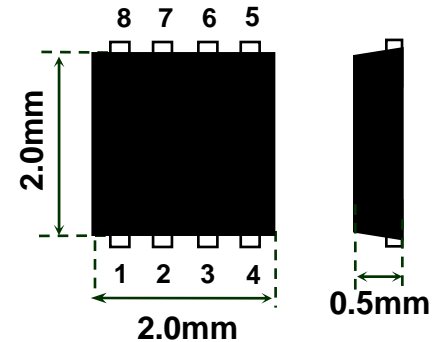
- Low Noise AMP. for GPS ., etc..

### Performance

- Circuit Current :  $I_{cc} = 6.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Noise Figure :  $NF = 0.85\text{dB TYP.}@f = 1.575\text{GHz}$
- Power Gain :  $G_P = 18.5\text{dB TYP.}@f = 1.575\text{GHz}$
- Low Distortion :  $IIP_3 = -5.0\text{dBm TYP.}@f = 1.575\text{GHz}$
- 8pin Lead Less Mini Mold Package (2.0x2.0x0.5mm)



Block Diagram



# Low Noise SiGe:C Amplifier

## uPC8231TK

In Mass Production

### Concept

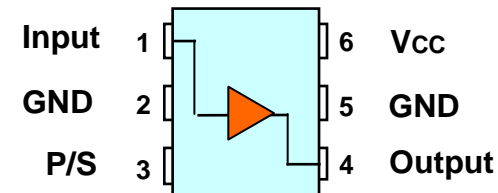
- Very Low Noise and High Gain

### Application

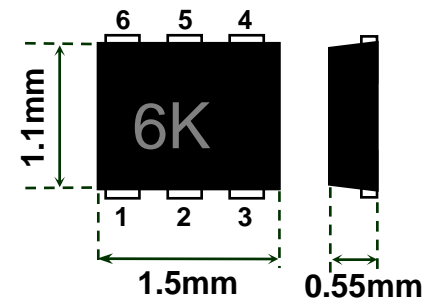
- Low Noise AMP. for GPS ., etc..

### Performance

- Circuit Current :  $I_{cc} = 3.8\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Noise Figure :  $NF = 0.8\text{dB TYP.}@f = 1.575\text{GHz}$
- Power Gain :  $G_P = 20.0\text{dB TYP.}@f = 1.575\text{GHz}$
- Low Distortion :  $IIP_3 = -10.0\text{dBm TYP.}@f = 1.575\text{GHz}$
- 6pin Lead Less Mini Mold Package (1.5x1.1x0.55mm)



Block Diagram





# Low Noise SiGe:C Amplifier

## uPC8232T5N

In Mass Production

### Process Technology

SiGe:C HBT Process (UHS4)

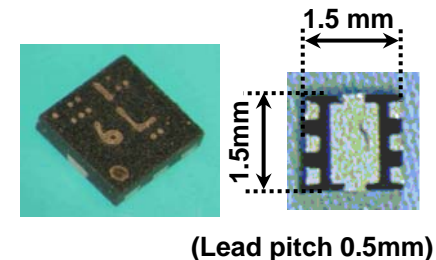
### Application

GPS

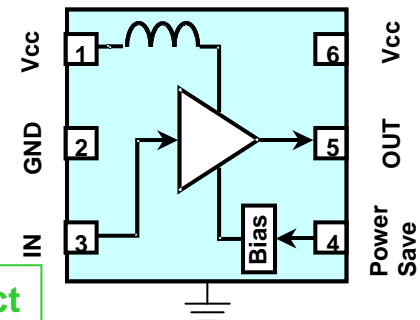
### Features

- Low Noise, Low Current, High Return Loss  
Low Height Package
  - NF: 0.95dB, Gain: 17.0dB, IIP3: -8dBm
  - Input Return Loss(S11) : 10dB
  - Output Return Loss(S22) : 20dB
  - Icc=3mA (@Vcc=3V, f=1.575GHz)
- Built-in Power Save function  
(VPSon: 1.6V~Vcc, VPSoff: 0~0.4V)
- Very robust band gap Regulator on chip  
(Small Vcc & Ta dependence)
- Included output matching network
- Included protection circuits for ESD

Package : 6pin TSON  
(1.5x1.5x0.37mm)



Pin Connections and  
Internal Block Diagram



Pb-Free Product

# Low Noise SiGe Amplifier

## uPC8211TK

In Mass Production

### Concept

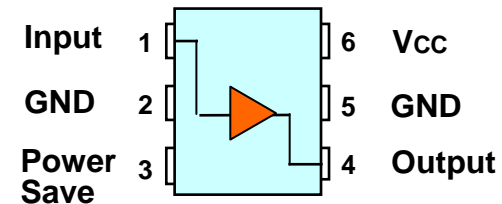
- Low Noise and High Gain
- Power Save Function

### Application

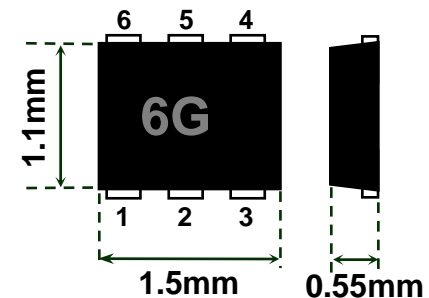
- Low Noise AMP. for GPS ., etc..

### Performance

- Circuit Current :  $I_{CC} = 3.5\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Noise Figure :  $NF = 1.3\text{dB TYP.}@f = 1.575\text{GHz}$
- Power Gain :  $G_P = 18.5\text{dB TYP.}@f = 1.575\text{GHz}$
- $P_{O(1\text{dB})} : -6.0\text{dBm TYP.}@f = 1.575\text{GHz}$
- Low Distortion :  $IIP_3 = -12.0\text{dBm TYP.}@f = 1.575\text{GHz}$
- 6pin Lead Less Mini Mold Package (1.5x1.1x0.55mm)



Block Diagram



# Low Noise SiGe Amplifier

## uPC8215TU

In Mass Production

### Concept

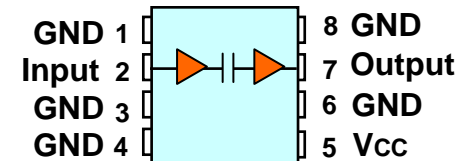
- Low Noise and High Gain

### Application

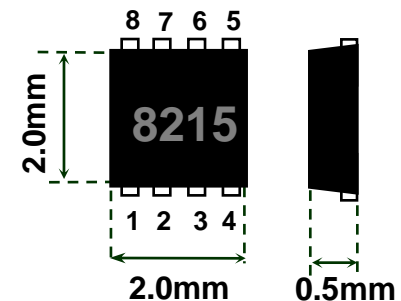
- Low Noise AMP. for GPS ., etc..

### Performance

- Circuit Current :  $I_{cc} = 10.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Noise Figure :  $NF = 1.3\text{dB TYP.}@f = 1.575\text{GHz}$
- Power Gain :  $G_P = 27.0\text{dB TYP.}@f = 1.575\text{GHz}$
- $P_{O(1\text{dB})} : +5.0\text{dBm TYP.}@f = 1.575\text{GHz}$
- Low Distortion :  $OIP_3 = +12.5\text{dBm TYP.}@f = 1.575\text{GHz}$
- 8pin Lead Less Mini Mold Package (2.0x2.0x0.5mm)



Block Diagram



# Mixers

# Mixer Series Line-up

## Up Converter

Part No.	ICC (mA)	fRFout (GHz)	CG (dB)			PO(sat) (dBm)		
			RF=0.9GHz	RF=1.9GHz	RF=2.4GHz	RF =0.9GHz	RF = 1.9GHz	RF=2.4GHz
uPC8106TB	9.0	0.4~2.0	9.0	7.0	-	-2.0	-4.0	-
uPC8172TB	9.0	0.8~2.5	9.5	8.5	8.0	+0.5	0	-0.5
uPC8172TK	9.0	0.8~2.5	9.5	8.5	8.0	+0.5	0	-0.5
uPC8187TB	15.0	0.8~2.5	11.0	11.0	10.0	+4.0	+2.5	+1.0

## Down Converter

Part No.	ICC (mA)	CG (dB)			PO(sat) (dBm)		
		RF =0.9GHz	RF =1.5GHz	RF = 1.9GHz	RF =0.9GHz	RF = 1.5GHz	RF = 1.9GHz
uPC2756TB	6.0	14.0	14.0	-	-8.0	-12.0	-
uPC2757TB	5.6	15.0	15.0	13.0	-3.0	-	-8.0
uPC2758TB	11.0	19.0	18.0	17.0	+1.0	-	-4.0
uPC8112TB	8.5	15.0	13.0	13.0	-2.5	-3.0	-3.0

# Low Distortion Si Up Converter

NEC

## uPC8106TB

### Concept

- Low Current and Wide Band

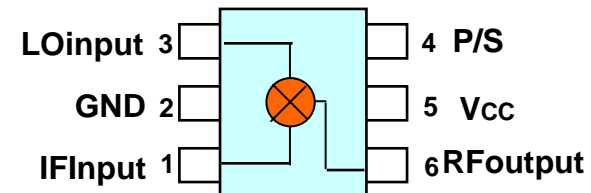
### Application

- Cellular and Cordless Telephone, etc..

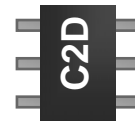
### Performance

- Circuit Current :  $I_{cc} = 9.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Operating Frequency :  $f_{RFout} = 0.4\sim 2.0\text{GHz}$   
 $f_{IFin} = 100\sim 400\text{MHz}$
- Conversion Gain :  $CG = 9.0\text{dB TYP.}@f_{RFout} = 0.9\text{GHz}$   
 $CG = 7.0\text{dB TYP.}@f_{RFout} = 1.9\text{GHz}$
- $P_{O(sat)} : -2.0\text{dBm TYP.}@ f_{RFout} = 0.9\text{GHz}$   
 $-4.0\text{dBm TYP.}@ f_{RFout} = 1.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)

In Mass Production



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Distortion Si Up Converter

NEC

## uPC8172TB

### ■ Concept

- Low Current and Wide Band

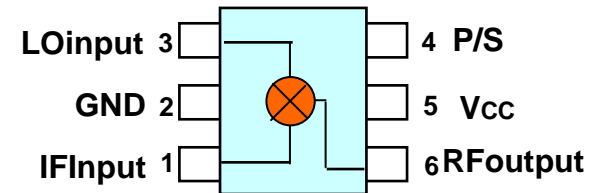
In Mass Production

### ■ Application

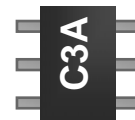
- PCS1900 and WLAN, etc..

### ■ Performance

- Circuit Current :  $I_{cc} = 9.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Operating Frequency :  $f_{RFout} = 0.8\sim 2.5\text{GHz}$   
 $f_{IFin} = 50\sim 400\text{MHz}$
- Conversion Gain :  $CG = 9.5\text{dB TYP.}@f_{RFout} = 0.9\text{GHz}$   
 $CG = 8.5\text{dB TYP.}@f_{RFout} = 1.9\text{GHz}$   
 $CG = 8.0\text{dB TYP.}@f_{RFout} = 2.4\text{GHz}$
- $P_{O(sat)} : +0.5\text{dBm TYP.}@ f_{RFout} = 0.9\text{GHz}$   
 $0\text{dBm TYP.}@ f_{RFout} = 1.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Distortion Si Up Converter

NEC

## uPC8172TK

### Concept

- Low Current and Wide Band

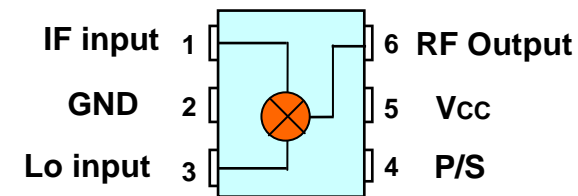
### Application

- WLAN and RF Module, etc..

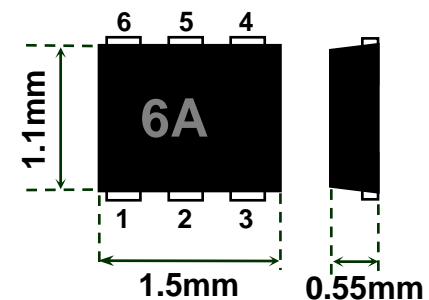
### Performance

- Circuit Current :  $I_{cc} = 9.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Operating Frequency :  $f_{RFout} = 0.8\sim 2.5\text{GHz}$   
 $f_{IFin} = 50\sim 600\text{MHz}$
- Conversion Gain :  $CG = 9.5\text{dB TYP.}@f_{RFout} = 0.9\text{GHz}$   
 $CG = 8.5\text{dB TYP.}@f_{RFout} = 1.9\text{GHz}$   
 $CG = 8.0\text{dB TYP.}@f_{RFout} = 2.4\text{GHz}$
- $P_{O(sat)} : +0.5\text{dBm TYP.}@ f_{RFout} = 0.9\text{GHz}$   
 $0\text{dBm TYP.}@ f_{RFout} = 1.9\text{GHz}$
- 6pin Lead Less Mini Mold Package (1.5x1.1x0.55mm)

In Mass Production



Block Diagram





# Low Distortion Si Up Converter

NEC

## uPC8187TB

### Concept

- Low Current and Wide Band

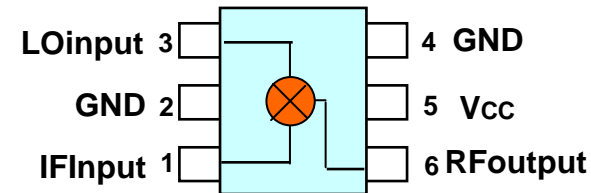
### Application

- TDMA/PCS/CDMA Mobile phone, etc..

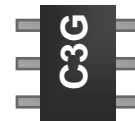
### Performance

- Circuit Current :  $I_{cc} = 15.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Operating Frequency :  $f_{RFout} = 0.8\sim 2.5\text{GHz}$   
 $f_{IFin} = 50\sim 400\text{MHz}$
- Conversion Gain :  $CG = 11.0\text{dB TYP.}@f_{RFout} = 0.83\text{GHz}$   
 $CG = 11.0\text{dB TYP.}@f_{RFout} = 1.9\text{GHz}$   
 $CG = 10.0\text{dB TYP.}@f_{RFout} = 2.4\text{GHz}$
- $P_{O(sat)} : +4.0\text{dBm TYP.}@ f_{RFout} = 0.83\text{GHz}$   
 $+2.5\text{dBm TYP.}@ f_{RFout} = 1.9\text{GHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)

In Mass Production



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Distortion Si Down Converter

NEC

## uPC2756TB

### Concept

- Low Current and Wide Band

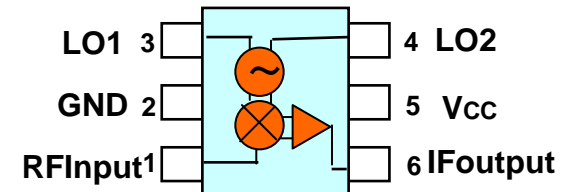
### Application

- WLAN, etc..

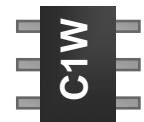
### Performance

- Circuit Current :  $I_{CC} = 6.0\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Operating Frequency :  $f_{RFin} = 0.1\sim 2.0\text{GHz}$   
 $f_{IFout} = 10\sim 300\text{MHz}$
- Conversion Gain :  $CG = 14.0\text{dB TYP.}@f_{IFout} = 150\text{MHz}$   
 $CG = 14.0\text{dB TYP.}@f_{IFout} = 20\text{MHz}$
- $P_{O(sat)} : -8.0\text{dBm TYP.}@ f_{IFout} = 150\text{MHz}$   
 $-12.0\text{dBm TYP.}@ f_{IFout} = 20\text{MHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)

In Mass Production



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Distortion Si Down Converter

NEC

## uPC2757TB

### Concept

- Low Current and Wide Band

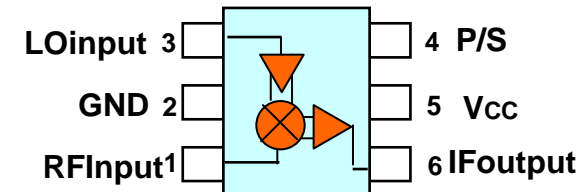
### Application

- Cellular, Cordless Telephone, etc..

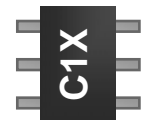
### Performance

- Circuit Current :  $I_{CC} = 5.6\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Operating Frequency :  $f_{RFIn} = 0.1\sim 2.0\text{GHz}$   
 $f_{IFout} = 20\sim 300\text{MHz}$
- Conversion Gain :  $CG = 15.0\text{dB TYP.}@f_{IFout} = 130\text{MHz}$   
 $CG = 13.0\text{dB TYP.}@f_{IFout} = 250\text{MHz}$
- $P_{O(sat)} : -3.0\text{dBm TYP.}@ f_{IFout} = 130\text{MHz}$   
 $-8.0\text{dBm TYP.}@ f_{IFout} = 250\text{MHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)

In Mass Production



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Distortion Si Down Converter

NEC

## uPC2758TB

### Concept

- Low Current and Wide Band

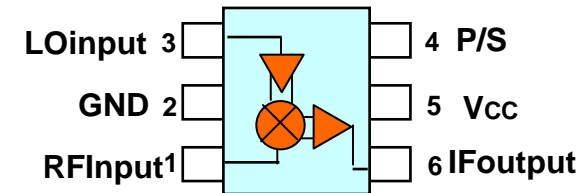
### Application

- Cellular, Cordless Telephone, etc..

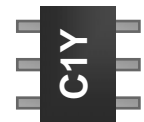
### Performance

- Circuit Current :  $I_{CC} = 11\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Operating Frequency :  $f_{RFIn} = 0.1\sim 2.0\text{GHz}$   
 $f_{IFout} = 20\sim 300\text{MHz}$
- Conversion Gain :  $CG = 19.0\text{dB TYP.}@f_{IFout} = 130\text{MHz}$   
 $CG = 17.0\text{dB TYP.}@f_{IFout} = 250\text{MHz}$
- $P_{O(sat)} : +1.0\text{dBm TYP.}@ f_{IFout} = 130\text{MHz}$   
 $-4.0\text{dBm TYP.}@ f_{IFout} = 250\text{MHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)

In Mass Production



Block Diagram



6pin super MM  
( 2.0X1.25mm )

# Low Distortion Si Down Converter

NEC

## uPC8112TB

### Concept

- Low Current and Wide Band

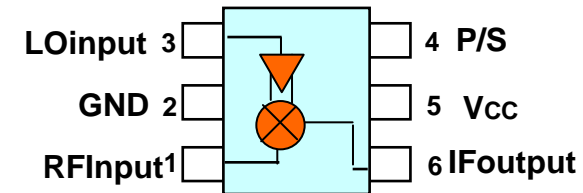
### Application

- Cellular, Cordless Telephone, etc..

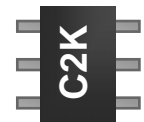
### Performance

- Circuit Current :  $I_{CC} = 8.5\text{mA TYP.}@V_{CC} = 3.0\text{V}$
- Operating Frequency :  $f_{RFIn} = 0.8\sim 2.0\text{GHz}$   
 $f_{IFout} = 100\sim 300\text{MHz}$
- Conversion Gain :  $CG = 15.0\text{dB TYP.}@f_{IFout} = 100\text{MHz}$   
 $CG = 13.0\text{dB TYP.}@f_{IFout} = 230\text{MHz}$
- $P_{O(sat)} : -2.5\text{dBm TYP.}@ f_{IFout} = 100\text{MHz}$   
 $-3.0\text{dBm TYP.}@ f_{IFout} = 230\text{MHz}$
- 6pin Super Mini Mold Package (2.0x1.25x0.9mm)

In Mass Production



Block Diagram

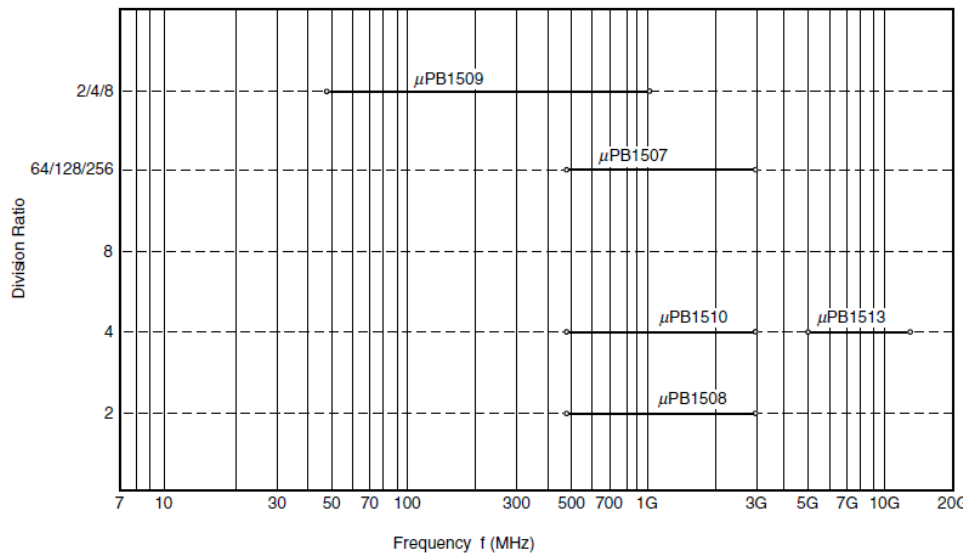


6pin super MM  
( 2.0X1.25mm )

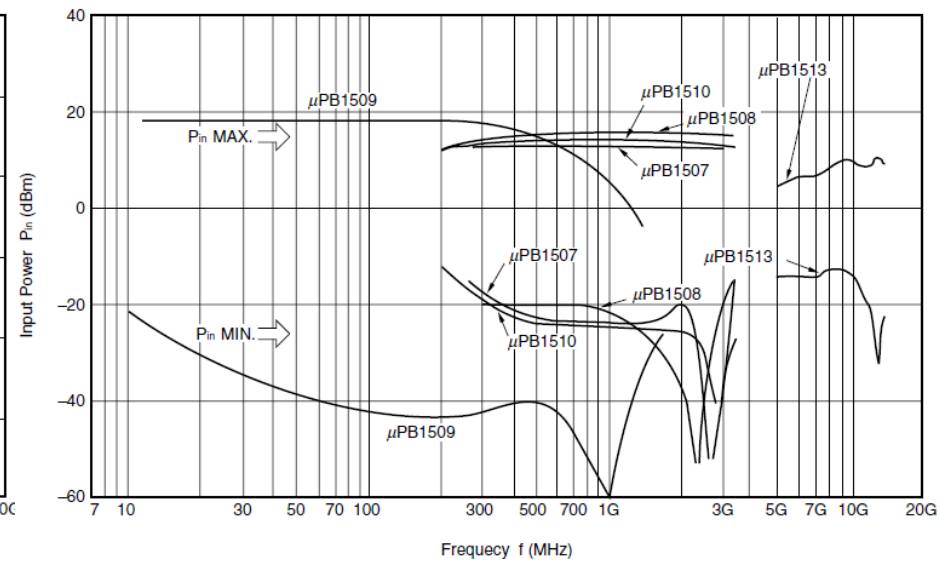
# Prescalers

# Prescaler Series Line-up

DIVISION RATIO vs. FREQUENCY



INPUT POWER vs. FREQUENCY



# Prescaler Series Line-up

Part No.	ICC (mA)	VCC (V)	fin (GHz)	Divide (+)	Application
uPB1507GV	19.0	4.5 to 5.5	0.5 to 3.0	256, 128, 64	3.0GHz Input Divide by 256,128,64 Prescaler IC for BS Tuners
uPB1508GV	12.0	4.5 to 5.5	0.5 to 3.0	2	3.0GHz Input Divide by 2 Prescaler IC for DBS Tuners
uPB1509GV	5.0	2.2 to 5.5	0.05 to 1.0	8, 4, 2	1.0GHz Input Divide by 8,4,2 Prescaler IC for Portable Systems
uPB1510GV	14.0	4.5 to 5.5	0.5 to 3.0	4	3.0GHz Input Divide by 4 Prescaler IC for DBS Tuners
uPB1513TU	48.0	4.5 to 5.5	5.0 to 13.0	4	13GHz Input Divide by 4 Prescaler IC for Satellite Communications



## uPB1507GV

In Mass Production

### Concept

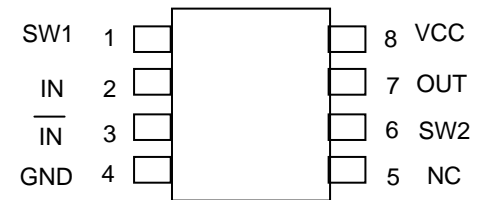
- High Toggle Frequency and Selectable High Division

### Application

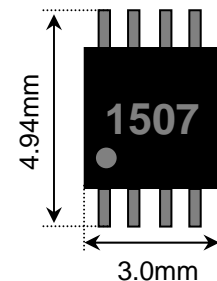
- DBS Tuner and CATV Converter, etc..

### Performance

- Circuit Current :  $I_{cc} = 19.0\text{mA TYP.}@V_{cc} = 5.0\text{V}$
- Operating Frequency :  $f_{in} = 0.5 \text{ to } 3.0\text{GHz}$
- Division :  $\div 256, \div 128, \div 64$
- Output Voltage :  $V_{out} = 1.6\text{VP-P TYP.}$
- Input Power Range :  $-15 \text{ to } +6\text{dBm}@ f = 1.0 \text{ to } 3.0\text{GHz}$   
 $-10 \text{ to } +6\text{dBm}@ f = 0.5 \text{ to } 1.0\text{GHz}$
- 8pin Plastic SSOP Package (175mil)



Pin Connection



8pin SSOP(175mil)

# 3GHz Input Divide By 2 Prescaler

## uPB1508GV

In Mass Production

**Concept**

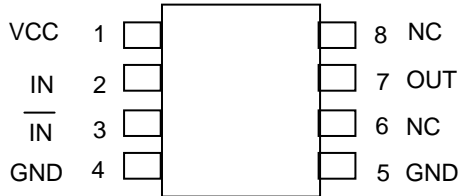
- High Toggle Frequency

**Application**

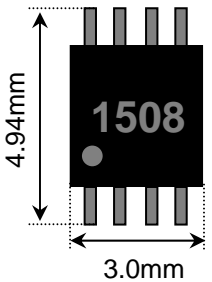
- DBS Tuner and CATV Converter, etc..

**Performance**

- Circuit Current :  $I_{cc} = 12.0\text{mA TYP.}@V_{cc} = 5.0\text{V}$
- Operating Frequency :  $f_{in} = 0.5 \text{ to } 3.0\text{GHz}$
- Division :  $\div 2$
- Output Power :  $P_{out} = -7\text{dBm TYP.}$
- Input Power Range :  $-10 \text{ to } +6\text{dBm}@ f = 2.7 \text{ to } 3.0\text{GHz}$   
 $-15 \text{ to } +6\text{dBm}@ f = 0.5 \text{ to } 2.7\text{GHz}$
- 8pin Plastic SSOP Package (175mil)



Pin Connection



8pin SSOP(175mil)

# 1GHz Input Divide By 8,4,2 Prescaler

## uPB1509GV

In Mass Production

### Concept

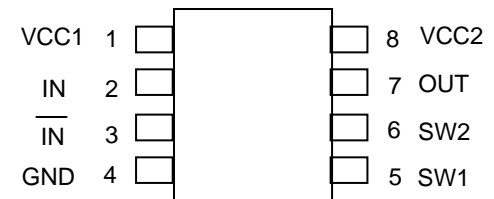
- High Toggle Frequency and Selectable Division

### Application

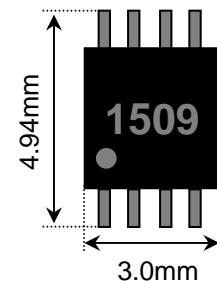
- General Mobile Comm., etc..

### Performance

- Circuit Current :  $I_{cc} = 5.0\text{mA TYP.}@V_{cc} = 3.0\text{V}$
- Operating Frequency :  $f_{in} = 50 \text{ to } 700\text{MHz}@\div 2$   
 $f_{in} = 50 \text{ to } 800\text{MHz}@\div 4$   
 $f_{in} = 50 \text{ to } 1000\text{MHz}@\div 8$
- Division :  $\div 8, \div 4, \div 2$
- Output Voltage :  $V_{out} = 0.3\text{VP-P TYP.}$
- Input Power Range :  $-20 \text{ to } -5\text{dBm}@ f = 50 \text{ to } 1000\text{MHz}$   
 $-20 \text{ to } 0\text{dBm}@ f = 50 \text{ to } 500\text{MHz}$
- 8pin Plastic SSOP Package (175mil)



Pin Connection



8pin SSOP(175mil)

# 3GHz Input Divide By 4 Prescaler

## uPB1510GV

In Mass Production

■ Concept

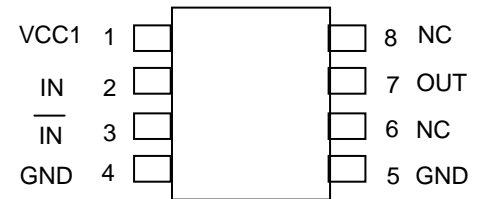
- High Toggle Frequency

■ Application

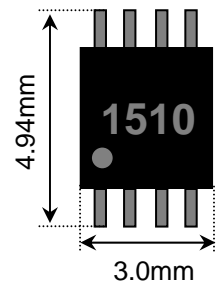
-DBS Tuner and CATV Converter, etc..

■ Performance

- Circuit Current :  $I_{cc} = 14.0\text{mA TYP.}@V_{cc} = 5.0\text{V}$
- Operating Frequency :  $f_{in} = 0.5 \text{ to } 3.0\text{GHz}$
- Division :  $\div 4$
- Output Power :  $P_{out} = -7\text{dBm TYP.}$
- Input Power Range :  $-10 \text{ to } +6\text{dBm}@ f = 2.7 \text{ to } 3.0\text{GHz}$   
 $-15 \text{ to } +6\text{dBm}@ f = 0.5 \text{ to } 2.7\text{GHz}$
- 8pin Plastic SSOP Package (175mil)



Pin Connection



8pin SSOP(175mil)

# 13GHz Input Divide By 4 Prescaler

## uPB1513TU

In Mass Production

### Concept

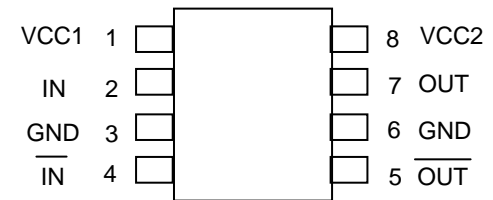
- Very High Toggle Frequency

### Application

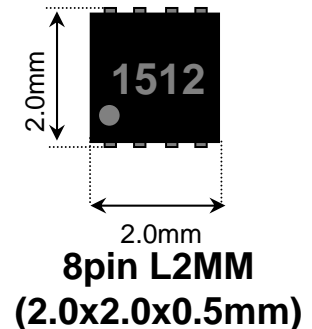
- VSAT Radios, etc..

### Performance

- Circuit Current :  $I_{cc} = 48.0\text{mA TYP.}@V_{cc} = 5.0\text{V}$
- Operating Frequency :  $f_{in} = 5 \text{ to } 13\text{GHz}$
- Division :  $\div 4$
- Output Power :  $P_{out} = -4.0\text{dBm TYP.}$
- Input Power Range :  $-8 \text{ to } -5\text{dBm}@ f = 5 \text{ to } 6\text{GHz}$   
 $-8 \text{ to } 0\text{dBm}@ f = 6 \text{ to } 12\text{GHz}$   
 $-5 \text{ to } 0\text{dBm}@ f = 12 \text{ to } 13\text{GHz}$
- 8pin Leadless Mini Mold Package



Pin Connection



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