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# SHARP

ELECTRONIC COMPONENTS GROUP  
SHARP CORPORATION

## SPECIFICATION

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REPRESENTATIVE DIVISION

ELECTRONIC COMPONENTS DIV.

OPTICAL DEVICE DIV.

PHOTO VOLTAICS DIV.

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DEVICE SPECIFICATION FOR

LOW NOISE BLOCK DOWNCONVERTER

MODEL No. BSCU86L30

PUBLISHED

APR 22 1996

SHARP CORPORATION  
ELECTRONIC COMPONENTS  
ENGINEERING DEPT

CUSTOMER'S APPROVAL

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General Description

The Dual Pole Low Noise Block Down-Converter is used in combination with an antenna for Ku band, and this converter can receive both Horizontally and Vertically polarized signals.

Attached Reference Materials

1. Outline drawing
2. Block diagram

1. GENERAL SPECIFICATIONS

- 1-1 Input component : Feed-Horn (F/D=0.615 at 11.7GHz)
- 1-2 Receiving frequency range: : 10.70-11.70GHz(LOW Band)  
11.70 -12.75 GHz(High Band)
- 1-3 Local oscillation frequency : 9.75 GHz(Low Band)  
10.60 GHz(High Band)
- 1-4 Output Frequency 950-1950 MHz(Low Band)  
1100 -2150 MHz(High Band)
- 1-5 Output component F-type female connector(with water-proof)
- 1-6 Nominal output impedance 75 Ω
- 1-7 Supply Voltage & Control signals: 11.5-19.0V  
continuous 22kHz(±4kHz)
- 1-8 Power supply system IF output overlapping system
- 1-9 Weight 250g

2. AMBIENT CONDITIONS

- 2-1 Operating temperature -40℃~+60℃
- 2-2 Storage temperature -40℃~+60℃
- 2-3 Humidity 5%~95%RH\*1
- 2-4 Ambient pressure : 1010\*300 hPa

\*Caution:

When a coaxial cable is connected to F-type connector, length of bared core area into the connector should be within 7~11mm.



### 3. ELECTRICAL CHARACTERISTICS

Unless otherwise indicated, each of the following specified values is applicable under normal ambient temperature and humidity conditions.

| No.   | Item                                     | Specification |      |       |      | Condition                   |
|-------|--|---------------|------|-------|------|-----------------------------|
|       |  | Min           | Typ  | Max   | Unit |                             |
| 3-1   | Operating Frequency Band                 |               |      |       |      |                             |
| 3-1-1 | Input Frequency                          | 10.70         |      | 11.70 | GHz  | Low-Band                    |
|       |  | 11.70         |      | 12.75 | GHz  | High-Band                   |
| 3-1-2 | Output Frequency                         | 950           |      | 1950  | GHz  | Low-Band                    |
|       |  | 1100          |      | 2150  | GHz  | High-Band                   |
| 3-2   | Noise figure*1                           |               | 1.3  | 1.5   | dB   | Low-Band @25°C              |
|       |  |               | 1.1  | 1.3   | dB   | High-Band @25°C             |
| 3-3   | Conversion gain                          | 46            |      |       | dB   | Center Freq. at Each Band   |
| 3-4   | Gain Frequency Characteristics           |               | 7.0  |       | dBpp | Low-Band                    |
|       |  |               | 7.0  |       | dBpp | High-Band                   |
|       |  |               | 1.0  |       | dBpp | Within any 26MHz segment    |
| 3-5   | L.O. Frequency and drift                 |               |      |       |      |                             |
| 3-5-1 | L.O. Frequency                           |               | 9.75 |       | GHz  | Low-Band                    |
|       |  |               |      | 10.60 | GHz  | High-Band                   |
| 3-5-2 | Drift associated with Temperature change |               |      | ±3    | MHz  | at -40°C ~ +60°C            |
| 3-6   | L.O. Phase Noise                         |               |      | -50   | dBc  | @1kHz Offset at High-Band   |
|       |  |               |      | -75   | /Hz  | @10kHz Offset at High-Band  |
|       |  |               |      | -95   |      | @100kHz Offset at High-Band |
| 3-7   | 1dB output gain compression              |               | 0    |       | dBm  |                             |
| 3-8   | L.O. Spurious radiation at signal Input  |               |      | -60   | dBm  |                             |
| 3-9   | Image interference suppression ratio     |               | 80   |       | dB   |                             |

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| No.  | Item                               | Specification        |      |                      |               | Condition  |
|------|------------------------------------|----------------------|------|----------------------|---------------|--|
|      |                                    | Min                  | Typ  | Max                  | Unit          |  |
| 3-10 | Cross-Polar Discrimination         | 20                   | 25   |                      | dB            |  |
| 3-11 | Return Loss at Output              |                      | 8    |                      | dB            |  |
| 3-12 | Supply Voltage and Control signals | 11.5<br>16.0<br>18.0 | 22.0 | 14.0<br>19.0<br>26.0 | V<br>V<br>kHz | Ca:Vertical Polarization<br>Cb:Horizontal Polarization<br>Cc:High Band selection |
| 3-13 | Current consumption                |                      | 110  | 130                  | ml            |  |

\*1 The value is applicable under the measurement method of SHARP.  
Measuring accuracy for Noise Figure⇒ ±0.2dB

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#### 4. RELIABILITY TESTING

##### 4-1 Low temperature shelf test ( unpacked condition )

After the test samples are left at  $-30^{\circ}\text{C}$  for 100 hours and then at normal temperature and humidity for 2 hours, normal operation shall be observed without any defects in appearance.

##### 4-2 High temperature and humidity shelf test ( packed condition )

After the test samples are left at  $60^{\circ}\text{C}$  90% RH for 100 hours and then at normal temperature and humidity for 8 hours, normal operation shall be observed without any defects in appearance.

##### 4-3 Heat cycle test ( with current supplied to unpacked component )

The test samples are first subjected to 5 heat cycles, each consisting of three stages ; 2 hours at  $-30^{\circ}\text{C}$  , 20 hours at  $50^{\circ}\text{C}$  and 95% RH, and 2 hours at  $65^{\circ}\text{C}$  . After samples are subsequently left at normal temperature and humidity for 8 hours , normal operation shall be observed in each internal part without any defects in appearance.

##### 4-4 Salt water spray test

After the test samples are left in a shower of salt water ( salt concentration  $5 \pm 1\%$  ) at  $35 \pm 2^{\circ}\text{C}$  for 48 hours, normal operation shall be observed.

##### 4-5 Electrostatic shock test

After discharging 500pF, 15kV surge voltage, stored in a capacitor, 4 times at each of the optionally selected points of the test samples exterior via a  $150\Omega$  resistor connected in series, there shall be component damage without any defects in appearance.

##### 4-6 Lighting resistance test

Lighting resistance test shall be conducted at the non-operative LNB output terminal.

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#### 4-7 Vibration test ( packed condition )

Apply vibration (full amplitude of 1.5mm at 10-30HZ) in specified direction(s) and duration according to as-packaged component weight shown below :

- a) For components weighting 10kg or less, 0.5 hour in each of the X , y and Z-directions.
- b) For those weighting over 10kg but no more than 50kg, 30 minutes in only one direction, along either side of the component packing.

After the test, normal operation shall be observed without any defects in appearance,

#### 4-8 Drop test ( packed condition )

One corner : One optionally selected corner of the plane which constitutes the bottom of the packing.

3 edges : One short and two long edges which define the corner selected for the drop test : start with the shorter edge and follow with the remaining longer ones.

6 planes : Start with the plane of smallest area then follow in order of increasing area.

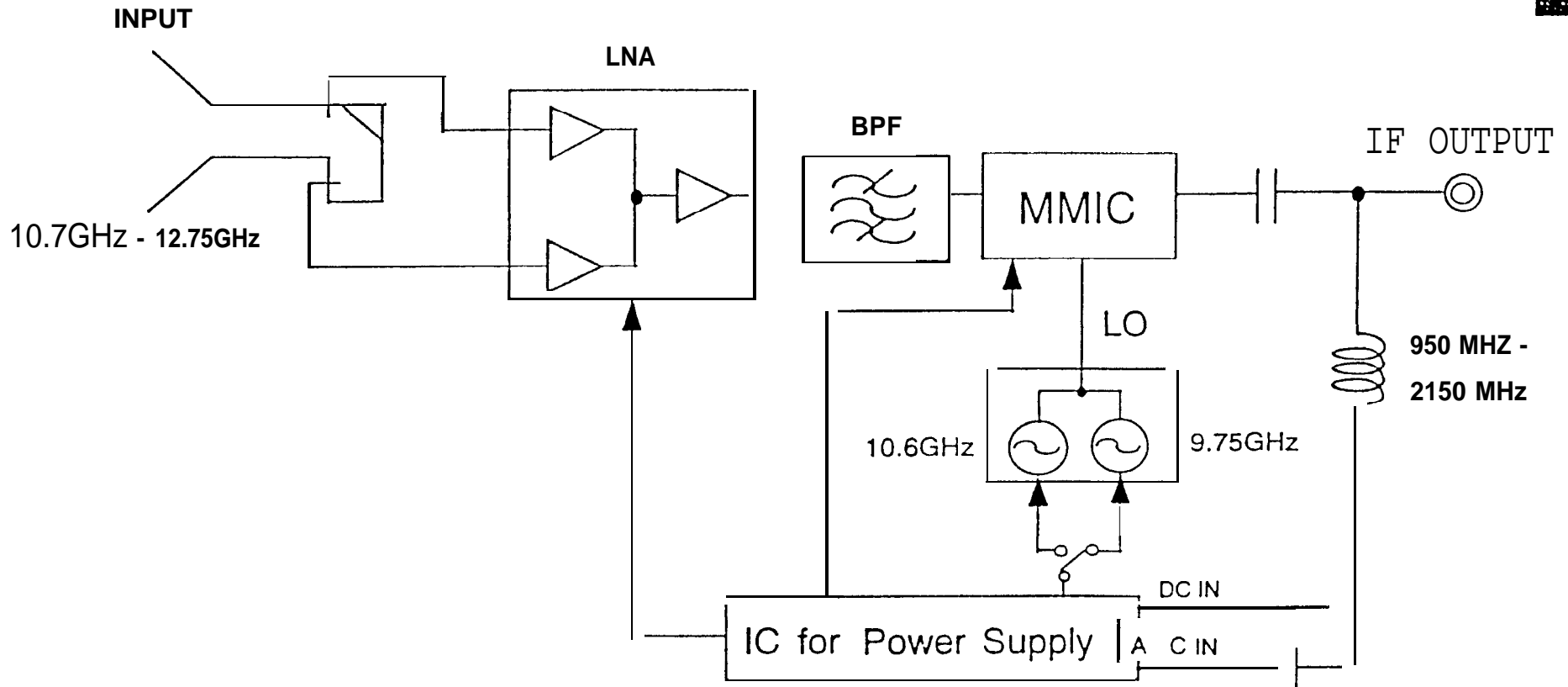
Drop test height : 65cm

After the above drop tests are completed, normal operation shall be observed in each test sample without any defects in appearance.

#### 4-9 Aging test

Subject the test samples to a cyclic aging test in an environment of  $20 \pm 15^{\circ}\text{C}$  ,  $60 \pm 20\% \text{RH}$  , with the source voltage stepped up by 10% of the rated value. Each cycle shall consist of an ON period of 25 minutes duration and an OFF period of 5 minutes duration.

After 500 hours of testing, normal operation shall be observed without any defects in appearance. ( Check at specified measurement check points ( 250 hours and 500 hours after test start ).)



BLOCK DIAGRAM OF UNIVERSAL LNB

