

**Product Features**

- GaAs Power Doubler
- Extremely Low Distortion
- Guaranteed Broadband Power Gain
- Heat Sink 99.9% Copper, & Gold Plated
- Excellent Thermal Conductivity
- Single Supply Voltage @ 24V
- Low DC Power Consumption
- Optimal Reliability

**Applications**

- CATV Trunk Amplifier
- Optical Drive Amplifier



Package Type : SOT-115J

**Description**

Hybrid Power Doubler amplifier for CATV Systems up to 870MHz in frequency.

This hybrid amplifier module operates with a single voltage supply of 24V(DC), and use GaAs MMIC technology.

**Electrical Specifications @  $V_{CC} = 24V$ ;  $T_{case} = 25^{\circ}C$ ;  $Z_S = Z_L = 75\Omega$** 

| PARAMETER                      | UNIT | MIN  | TYP | MAX  | SYMBOL    | CONDITION         |
|--------------------------------|------|------|-----|------|-----------|-------------------|
| Operating Frequency            | MHz  | 45   | -   | 870  | $f_o$     | -                 |
| Power Gain                     | dB   | 18.0 | -   | 19.0 | $G_p$     | f = 45 MHz        |
|                                |      | 19.0 | -   | 20.5 |           | f = 870 MHz       |
| Slope Cable Equivalent         | dB   | -    | 1.0 | -    | SL        | f = 45 ~ 870 MHz  |
| Flatness of Frequency Response | dB   | -    | -   | 0.5  | FL        | f = 45 ~ 870 MHz  |
| Input Return Loss              | dB   | 20.0 | -   | -    | $S_{11}$  | f = 45 ~ 80 MHz   |
|                                |      | 20.0 | -   | -    |           | f = 80 ~ 160 MHz  |
|                                |      | 19.0 | -   | -    |           | f = 160 ~ 320 MHz |
|                                |      | 18.0 | -   | -    |           | f = 320 ~ 640 MHz |
|                                |      | 18.0 | -   | -    |           | f = 640 ~ 870 MHz |
| Output Return Loss             | dB   | 20.0 | -   | -    | $S_{22}$  | f = 45 ~ 80 MHz   |
|                                |      | 20.0 | -   | -    |           | f = 80 ~ 160 MHz  |
|                                |      | 19.0 | -   | -    |           | f = 160 ~ 320 MHz |
|                                |      | 18.0 | -   | -    |           | f = 320 ~ 640 MHz |
|                                |      | 18.0 | -   | -    |           | f = 640 ~ 870 MHz |
| Noise Figure                   | dB   | -    | 5.1 | -    | F         | f = 45 MHz        |
|                                |      | -    | 5.7 | -    |           | f = 550 MHz       |
|                                |      | -    | 6.2 | -    |           | f = 750 MHz       |
|                                |      | -    | 6.6 | -    |           | f = 870 MHz       |
| Total Current Consumption (DC) | mA   | 380  | 400 | 420  | $I_{tot}$ | -                 |

**Distortion** @  $V_{CC} = 24V$ ;  $T_{case} = 25^{\circ}C$ ;  $Z_S = Z_L = 75\Omega$

| PARAMETER                         | UNIT | MIN | TYP | MAX | SYMBOL | CONDITION                        |
|-----------------------------------|------|-----|-----|-----|--------|----------------------------------|
| Frequency                         | MHz  | 45  | -   | 870 | f      | -                                |
| Composite Triple Beat             | dBc  | -   | -65 | -61 | CTB    | 135 channel flat; $V_o = 44dBmV$ |
| Cross Modulation                  | dBc  | -   | -66 | -63 | XMOD   | 135 channel flat; $V_o = 44dBmV$ |
| Composite Second Order Distortion | dBc  | -   | -70 | -65 | CSO    | 135 channel flat; $V_o = 44dBmV$ |

**Note**

135 Channels, NTSC frequency raster: 55.25MHz ~ 859.25MHz, 44dBmV flatted Output level.

CTB, XMOD, CSO definitions follow NCTA definition.

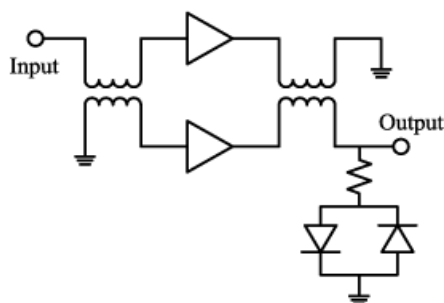
### Absolute Maximum Ratings

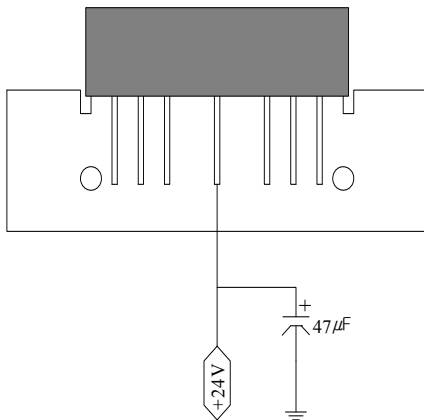
| PARAMETER                           | UNIT        | MIN | MAX | SYMBOL    | CONDITION   |
|-------------------------------------|-------------|-----|-----|-----------|-------------|
| RF Input Voltage                    | dBmV        | -   | 70  | $V_i$     | Single Tone |
| DC Supply Over Voltage              | V           | -   | 28  | V         | 5 minutes   |
| Storage Temperature                 | $^{\circ}C$ | -40 | 100 | $T_{stg}$ | -           |
| Operating Mounting Base Temperature | $^{\circ}C$ | -20 | 100 | $T_{mb}$  | -           |

### Quick Reference Data

| PARAMETER                      | UNIT | MIN  | MAX  | SYMBOL    | CONDITION      |
|--------------------------------|------|------|------|-----------|----------------|
| Power Gain                     | dB   | 18.0 | 19.0 | $G_p$     | f = 50 MHz     |
|                                |      | 19.0 | 20.5 |           | f = 870 MHz    |
| Total Current Consumption (DC) | mA   | -    | 420  | $I_{tot}$ | $V_{cc} = 24V$ |

### Functional Diagram



**Note for Correct Use**

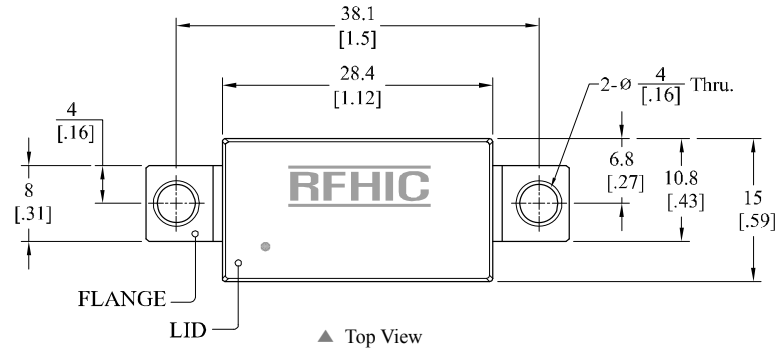
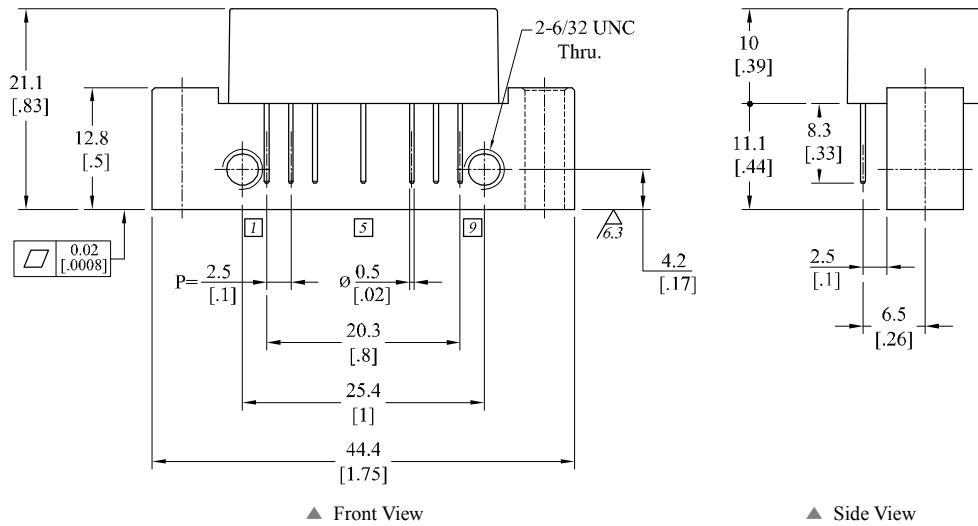
1. On the power input port (Pin#5), 47uF/35V capacitor GND is recommended.
2. The heat sink of CATV Hybrids is to be mounted in direct contact with the metal case of the equipment. Heat conducting grease should be applied to the module/equipment interface and the unit tightly secured.
3. Put the power off before adjusting in/output matching of the system.
4. The unit must have a common ground with the equipment and the analyzer.
5. Pay close attention to the input voltage not to over power the hybrid.
6. The space between bottom of socket and the tip of the lead is recommended to have space of 2mm+ to protect the pin
7. Do not open the plastic cover to change the matching inside the hybrid. Once opened, RFHIC will not be responsible for the hybrid.

**ESD Protection**

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices. Some of the precautions recommended are;

- Person at a workbench should be earthed via a wrist strap and a resistor.
- All mains-powered equipment should be connected to the mains via an earth-leakage switch.
- Equipment cases should be grounded.
- Relative humidity should be maintained between 40% and 50%.
- An ionizer is recommended.
- Keep static materials, such as plastic envelopes and plastic trays etc. away from the workbench.

## Package Dimensions (Type: SOT-115J)

\* Unit: mm[inch] | Tolerance:  $\pm 0.2$ [.008]

| Pin Description |          |        |          |        |           |
|-----------------|----------|--------|----------|--------|-----------|
| Pin No          | Function | Pin No | Function | Pin No | Function  |
| 1               | RF Input | 4      | -        | 7      | GND       |
| 2               | GND      | 5      | Vcc      | 8      | GND       |
| 3               | GND      | 6      | -        | 9      | RF Output |

**Revision History**

| Part Number | Release Date | Version | Modification | Data Sheet Status |
|-------------|--------------|---------|--------------|-------------------|
| 2F8719DS    | 2012.9.5     | 5.4     | -            | -                 |
|             |              |         |              |                   |
|             |              |         |              |                   |

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