

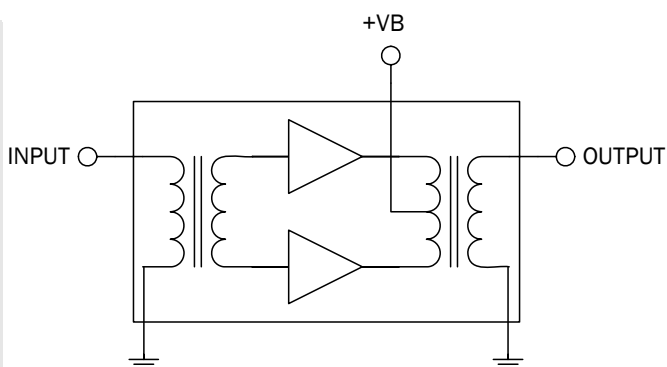


### Product Description

The R3005250L is a hybrid reverse amplifier. The part employs a silicon die. It has extremely low distortion and superior return loss performance. The part also provides optimal reliability with low noise and is well suited for 5 MHz to 300 MHz CATV amplifiers for reverse channel systems.

#### Optimum Technology Matching® Applied

- ☐ GaAs HBT
- ☐ GaAs MESFET
- ☐ InGaP HBT
- ☐ SiGe BiCMOS
- ☐ Si BiCMOS
- ☐ SiGe HBT
- ☐ GaAs pHEMT
- ☐ Si CMOS
- ☒ Si BJT
- ☐ GaN HEMT
- ☐ RF MEMS



### Features

- Excellent Linearity
- Superior Return Loss Performance
- Extremely Low Distortion
- Optimal Reliability
- Low Noise
- Unconditionally Stable Under All Terminations
- 25.0dB Typ. Gain at 300MHz
- 140mA Max. at 24VDC

### Applications

- 5 MHz to 300 MHz CATV Amplifier For Reverse Channel Systems

| Parameter                      | Specification |       |       | Unit | Condition                                               |
|--------------------------------|---------------|-------|-------|------|---------------------------------------------------------|
|                                | Min.          | Typ.  | Max.  |      |                                                         |
| <b>Overall</b>                 |               |       |       |      | $V_B = 24V; T_{MB} = 30^{\circ}C; Z_S = Z_L = 75\Omega$ |
| Power Gain                     | 24.5          | 25.0  | 25.5  | dB   | $f = 5MHz$                                              |
|                                | 24.2          | 25.0  | 26.0  | dB   | $f = 300MHz$                                            |
| Slope <sup>[1]</sup>           | -0.3          | 0.0   | 0.5   | dB   | $f = 5MHz$ to $300MHz$                                  |
| Flatness of Frequency Response | -0.3          |       | 0.3   | dB   | $f = 5MHz$ to $300MHz$                                  |
| Input Return Loss              | 20.0          |       |       | dB   | $f = 5MHz$ to $65MHz$                                   |
|                                | 18.0          |       |       | dB   | $f = 65MHz$ to $200MHz$                                 |
|                                | 16.0          |       |       | dB   | $f = 200MHz$ to $300MHz$                                |
| Output Return Loss             | 20.0          |       |       | dB   | $f = 5MHz$ to $65MHz$                                   |
|                                | 18.0          |       |       | dB   | $f = 65MHz$ to $200MHz$                                 |
|                                | 16.0          |       |       | dB   | $f = 200MHz$ to $300MHz$                                |
| Noise Figure                   |               |       | 3.5   | dB   | $f = 5MHz$ to $300MHz$                                  |
| Total Current Consumption (DC) |               | 133.0 | 140.0 | mA   |                                                         |

1. The slope is defined as the difference between the gain at the start frequency and the gain at the stop frequency.

## Absolute Maximum Ratings

| Parameter                           | Rating      | Unit |
|-------------------------------------|-------------|------|
| RF Input Voltage (single tone)      | 65          | dBmV |
| DC Supply Over-Voltage (5 minutes)  | 30          | V    |
| Storage Temperature                 | -40 to +100 | °C   |
| Operating Mounting Base Temperature | -30 to +100 | °C   |

**Caution!** ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

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| Parameter                      | Specification |      |      | Unit | Condition                                         |
|--------------------------------|---------------|------|------|------|---------------------------------------------------|
|                                | Min.          | Typ. | Max. |      |                                                   |
| Distortion data 5MHz to 300MHz |               |      |      |      |                                                   |
| CTB                            |               |      | -68  | dBc  | 7 ch flat; V <sub>0</sub> =50dBmV <sup>[2]</sup>  |
|                                |               |      | -57  | dBc  | 22 ch flat; V <sub>0</sub> =50dBmV <sup>[3]</sup> |
| XMOD                           |               |      | -59  | dBc  | 7 ch flat; V <sub>0</sub> =50dBmV <sup>[2]</sup>  |
|                                |               |      | -48  | dBc  | 22 ch flat; V <sub>0</sub> =50dBmV <sup>[3]</sup> |
| CSO                            |               |      | -70  | dBc  | 7 ch flat; V <sub>0</sub> =50dBmV <sup>[2]</sup>  |
|                                |               |      | -68  | dBc  | 22 ch flat; V <sub>0</sub> =50dBmV <sup>[3]</sup> |
| d <sub>2</sub>                 |               |      | -70  | dBc  | [4]                                               |
| V <sub>0</sub>                 | 60.0          |      |      | dBmV | D <sub>IM</sub> = -60dB <sup>[5]</sup>            |

2. 7 channels, NTSC frequency raster: T7-T13(7.0MHz to 43.0MHz) +50dBmV flat output level.

3. 22 channels, NTSC frequency raster: T7-T13 plus 2-6 (55.25MHz to 83.25MHz) and A-7 (121.25 - 175.25), +50dBmV flat output level.

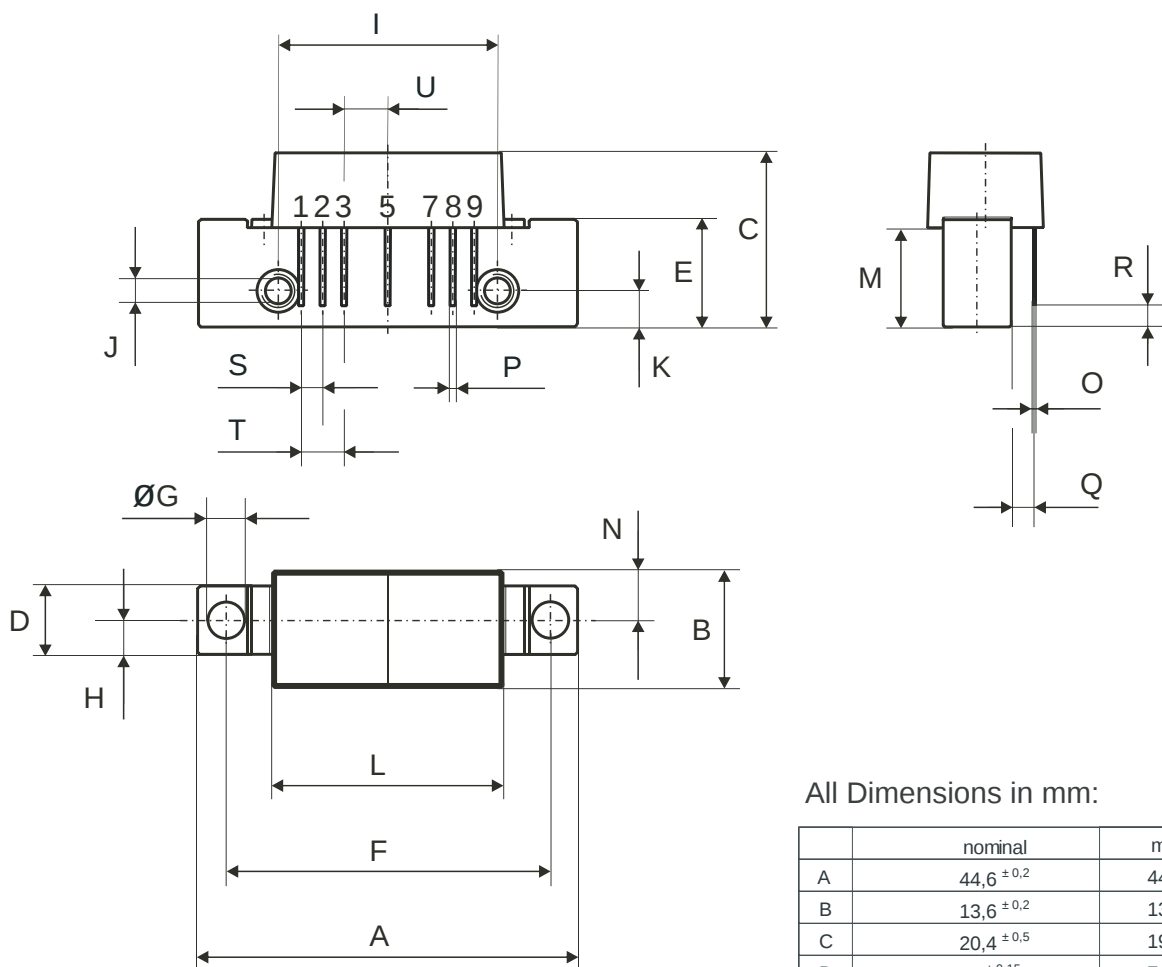
3.  $f_1 = 83.25\text{MHz}$ ;  $V_1 = 50\text{dBmV}$ ;  $f_2 = 109.25\text{MHz}$ ;  $V_2 = 50\text{dBmV}$ ;  $f_{\text{TEST}} = f_1 + f_2 = 192.5\text{MHz}$ .

4.  $f_1 = 187.25\text{MHz}$ ;  $V_1 = 50\text{dBmV}$ ;  $f_2 = 194.25\text{MHz}$ ;  $V_2 = V_1 - 6\text{dB}$ ;  $f_3 = 196.25\text{MHz}$ ;  $V_3 = V_1 - 6\text{dB}$ ;  $f_{\text{TEST}} = f_1 + f_2 - f_3 = 185.25\text{MHz}$ , according to DIN45004B.

Composite Second Order (CSO) - The CSO parameter (both sum and difference products) is defined by the NCTA.

Composite Triple Beat (CTB) - The CTB parameter is defined by the NCTA.

Cross Modulation (XMOD) - Cross modulation (XMOD) is measured at baseband (selective voltmeter method), referenced to 100% modulation of the carrier being tested.

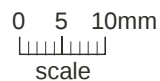


All Dimensions in mm:

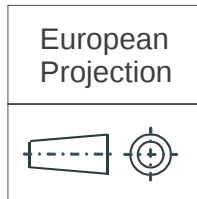
|   | nominal             | min   | max   |
|---|---------------------|-------|-------|
| A | 44,6 $\pm 0,2$      | 44,4  | 44,8  |
| B | 13,6 $\pm 0,2$      | 13,4  | 13,8  |
| C | 20,4 $\pm 0,5$      | 19,9  | 20,9  |
| D | 8 $\pm 0,15$        | 7,85  | 8,15  |
| E | 12,6 $\pm 0,15$     | 12,45 | 12,75 |
| F | 38,1 $\pm 0,2$      | 37,9  | 38,3  |
| G | 4 $^{+0,2}_{-0,05}$ | 3,95  | 4,2   |
| H | 4 $\pm 0,2$         | 3,8   | 4,2   |
| I | 25,4 $\pm 0,2$      | 25,2  | 25,6  |
| J | UNC 6-32            | -     | -     |
| K | 4,2 $\pm 0,2$       | 4,0   | 4,4   |
| L | 27,2 $\pm 0,2$      | 27,0  | 27,4  |
| M | 11,6 $\pm 0,5$      | 11,1  | 12,1  |
| N | 5,8 $\pm 0,4$       | 5,4   | 6,2   |
| O | 0,25 $\pm 0,02$     | 0,23  | 0,27  |
| P | 0,45 $\pm 0,03$     | 0,42  | 0,48  |
| Q | 2,54 $\pm 0,3$      | 2,24  | 2,84  |
| R | 2,54 $\pm 0,5$      | 2,04  | 3,04  |
| S | 2,54 $\pm 0,25$     | 2,29  | 2,79  |
| T | 5,08 $\pm 0,25$     | 4,83  | 5,33  |
| U | 5,08 $\pm 0,25$     | 4,83  | 5,33  |

Pinning:

|       |     |     |     |   |   |   |   |        |
|-------|-----|-----|-----|---|---|---|---|--------|
| 1     | 2   | 3   | 4   | 5 | 6 | 7 | 8 | 9      |
| INPUT | GND | GND | +VB |   |   |   |   | OUTPUT |



Notes:



# R3005250L