



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

SMA3101 — Silicon MMIC Wideband Amplifier

Features

- High Gain : $G_p=25\text{dB typ. @1GHz}$
- Wideband response : $f_u=3.0\text{GHz}$
- Low current : $I_{CC}=10\text{mA typ.}$
- Port impedance : input/output 50Ω

Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|-----------|------------|-------------|------------------|
| Supply Voltage | V_{CC} | | 6 | V |
| Circuit Current | I_{CC} | | 25 | mA |
| Allowable Power Dissipation | P_D | | 280 | mW |
| Operating Temperature | T_{opr} | | -40 to +85 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ\text{C}$ |

Recommended Operating Condition at $T_a=25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|-------------------------------|-----------|------------|---------|-----|-----|------------------|
| | | | min | typ | max | |
| Supply Voltage | V_{CC} | | 4.5 | 5 | 5.5 | V |
| Operating Ambient Temperature | T_{opr} | | -40 | +25 | +85 | $^\circ\text{C}$ |

Marking : LA

Note) Pay attention to handling since it is liable to be affected by static electricity due to the high frequency process adopted.

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<http://semicon.sanyo.com/en/network>

SMA3101

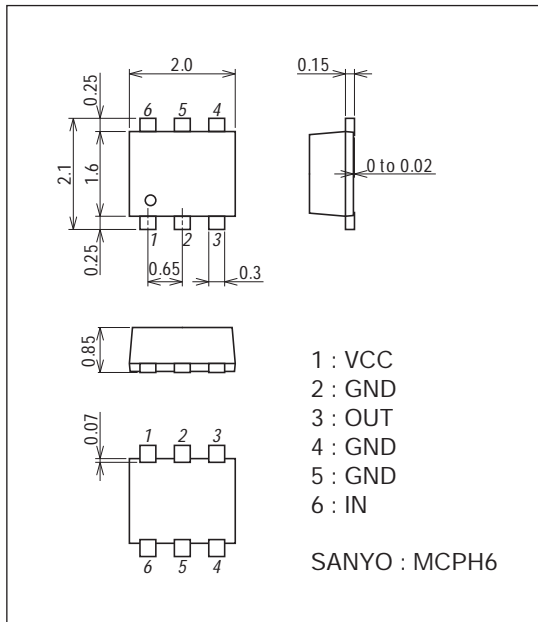
Electrical Characteristics at $T_a=25^{\circ}\text{C}$, $V_{CC}=5\text{V}$, $Z_s=Z_L=50\Omega$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|-----------------------------------|-------------------|---|---------|------|------|------|
| | | | min | typ | max | |
| Circuit Current | I_{CC} | | 7.1 | 10.0 | 12.6 | mA |
| Power Gain | G_p | $f=1\text{GHz}$ | 21.5 | 25.0 | 28.5 | dB |
| | | $f=2.2\text{GHz}$ | 21.5 | 25.5 | 28.5 | |
| Isolation | ISL | $f=1\text{GHz}$ | 33.0 | 38.0 | | dB |
| | | $f=2.2\text{GHz}$ | 31.0 | 36.0 | | |
| Input Return Loss | RLin | $f=1\text{GHz}$ | 11.0 | 16.0 | | dB |
| | | $f=2.2\text{GHz}$ | 12.0 | 21.0 | | |
| Output Return Loss | RLout | $f=1\text{GHz}$ | 10.0 | 18.5 | | dB |
| | | $f=2.2\text{GHz}$ | 8.0 | 12.0 | | |
| Noise Figure | NF | $f=1\text{GHz}$ | | 4.0 | 5.3 | dB |
| | | $f=2.2\text{GHz}$ | | 4.0 | 5.3 | |
| Gain 1dB Compression Output Power | $P_o(1\text{dB})$ | $f=1\text{GHz}$ | -5.0 | -2.0 | | dBm |
| | | $f=2.2\text{GHz}$ | -7.0 | -4.0 | | |
| Upper Limit Operating Frequency | f_u | 3dB down below flat gain at $f=1\text{GHz}$ | | 3.0 | | GHz |

Package Dimensions

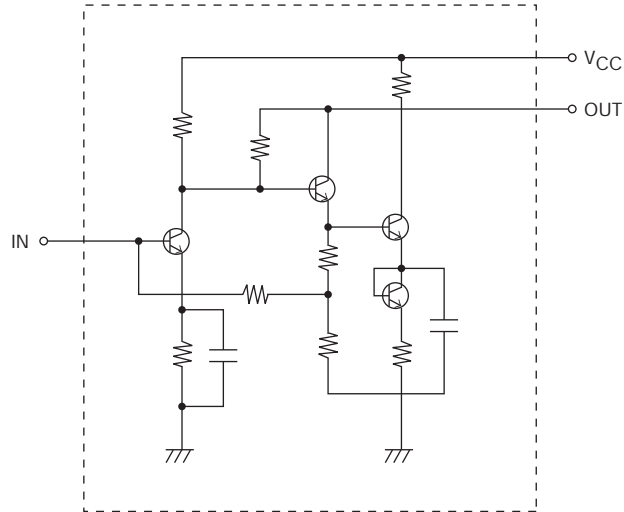
unit : mm (typ)

7022A-018



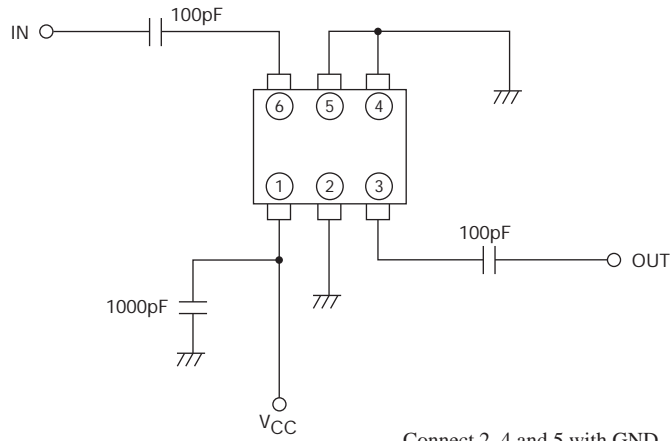
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Equivalent Circuit



IT14496

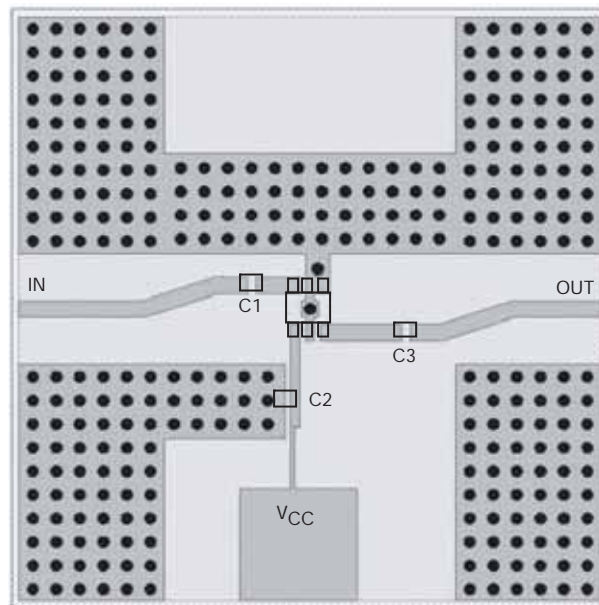
Test Circuit



Connect 2, 4 and 5 with GND.

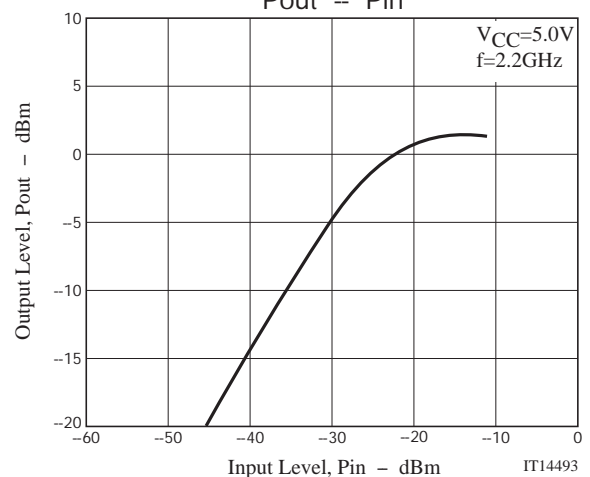
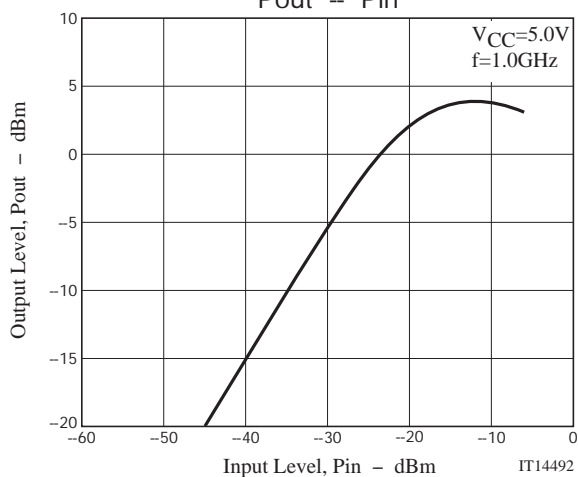
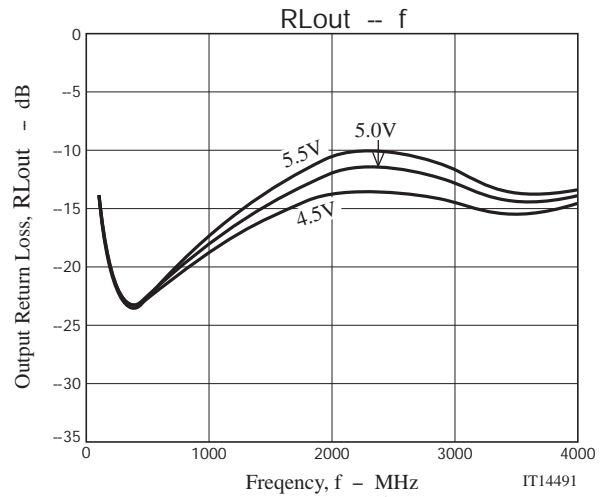
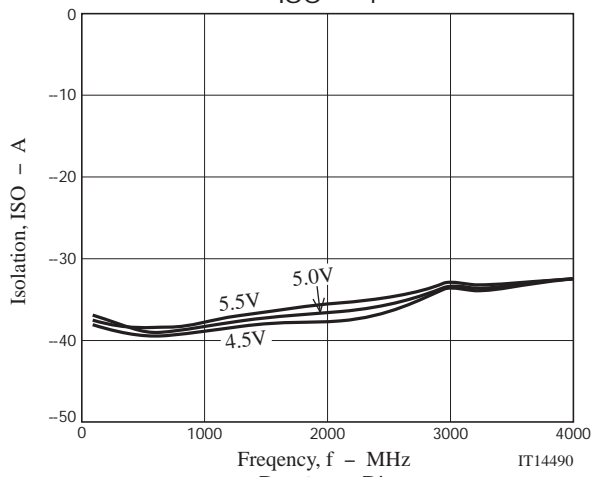
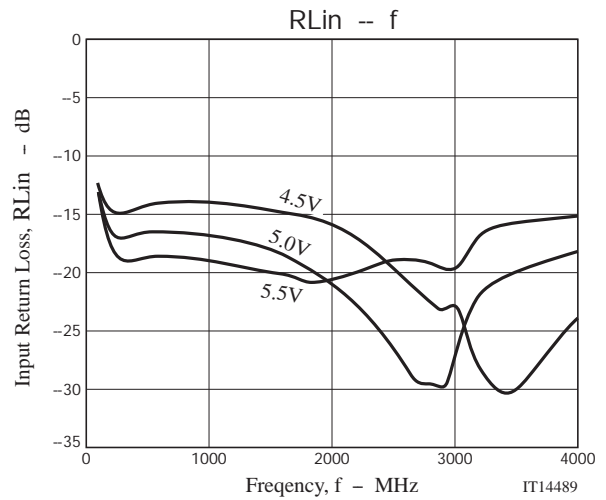
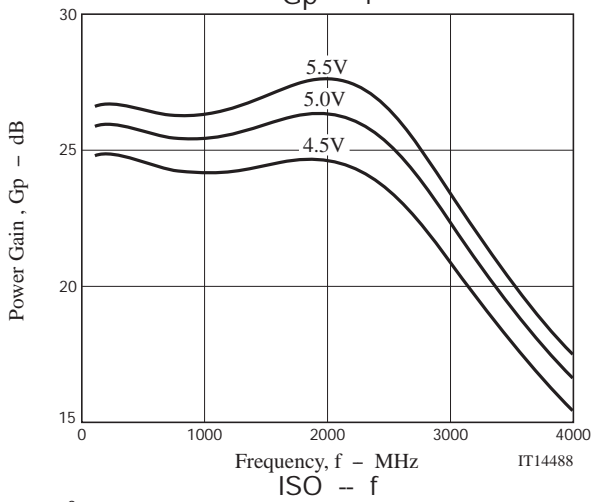
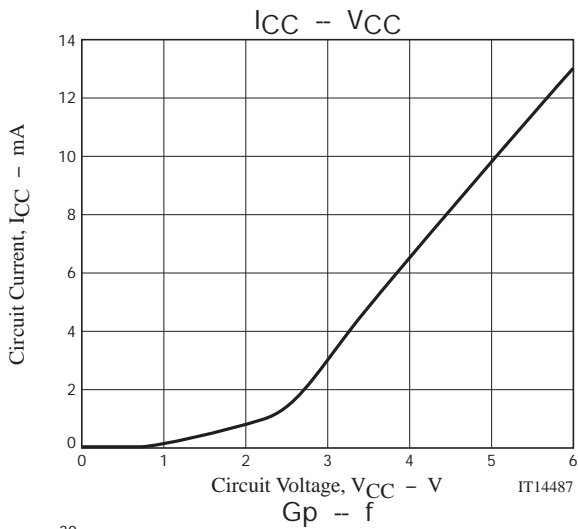
IT14497

Design of the Evaluation Board



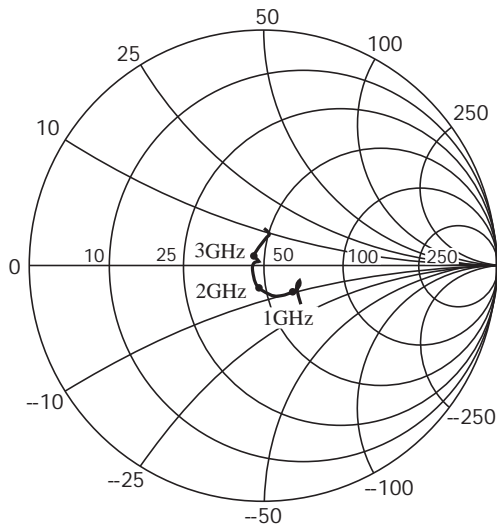
| Symbol | Value |
|--------|--------|
| C1, C3 | 100pF |
| C2 | 1000pF |

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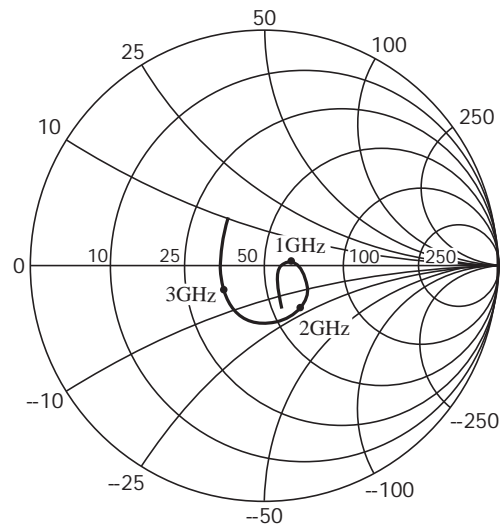


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S Parameter
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