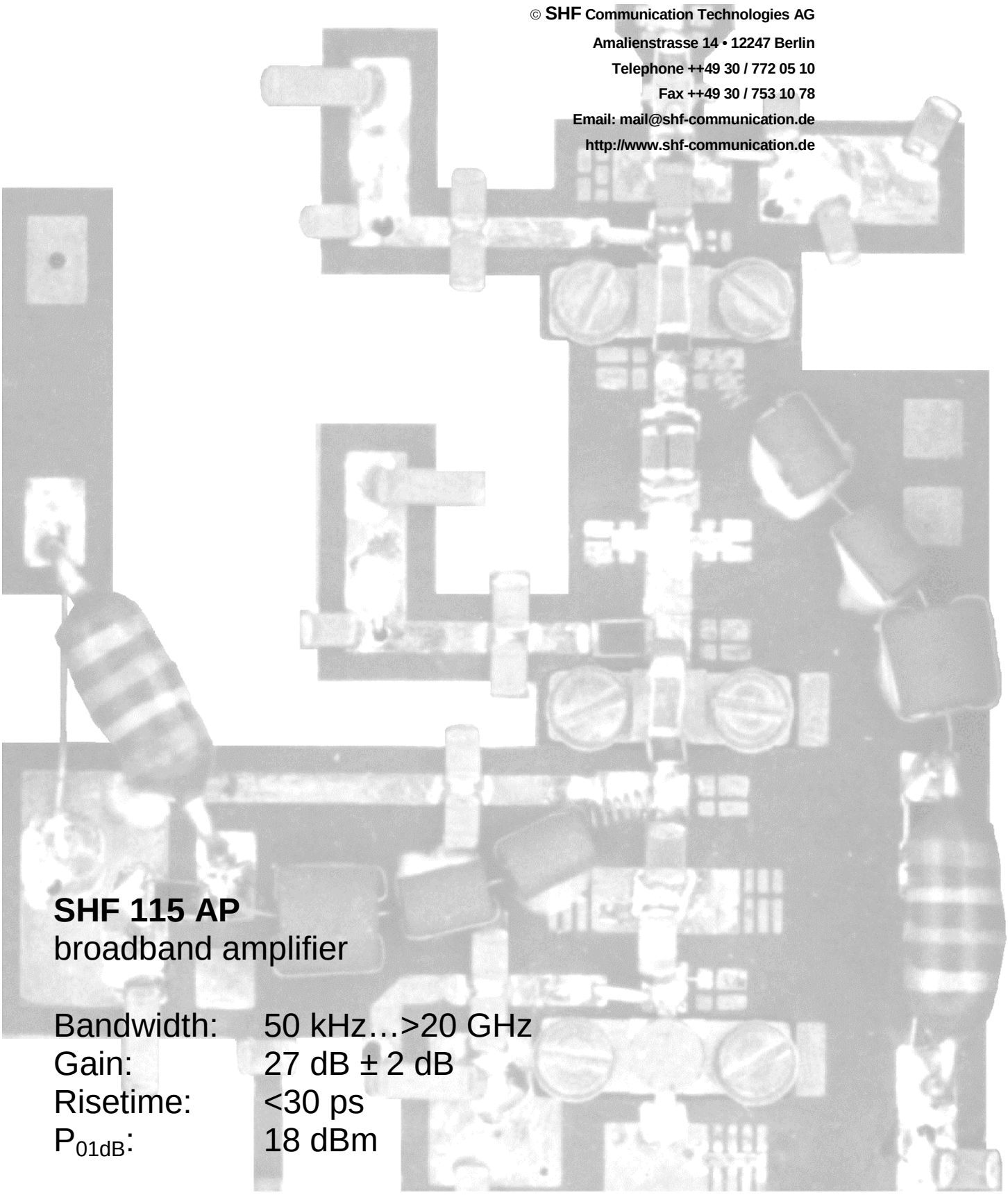
Datasheet
SHF 115 AP
broadband amplifier

© SHF Communication Technologies AG
Amalienstrasse 14 • 12247 Berlin
Telephone ++49 30 / 772 05 10
Fax ++49 30 / 753 10 78
Email: mail@shf-communication.de
http://www.shf-communication.de



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broadband amplifier

Bandwidth:	50 kHz…>20 GHz
Gain:	27 dB ± 2 dB
Risetime:	<30 ps
P_{01dB}:	18 dBm

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Bandwidth	50 kHz…>20 GHz
Gain	27 dB ± 2 dB max. inverting
Gain ripple relative to gain slope	± 1.5 dB typ.
Gain control pin	up to 3 dB gain reduction controlled by 0…–5 V applied voltage
Temperature coefficient	–0.06 dB / °C
Output power at 1 dB compression	17 dBm < 50 kHz…10 MHz, 18 dBm > 10 MHz…< 10 GHz, 17 dBm < 20 GHz
Input load impedance	50 Ω
Input return loss	S_{11}: <–15 dB < 10 GHz, <–12 dB < 15 GHz,<–10 dB < 20 GHz
Output return loss	S_{22}: <–10 dB typ.
Output load impedance	50 Ω
Maximum input power	4 dBm, 1 V_{pp}
Rise time / Fall time	< 30 ps
Noise figure	7 dB > 200 MHz…< 10 GHz, < 20 GHz < 10 dB
Supply voltage	9…15 V, 0.55 A
Input and output connectors	female SMA
Dimensions (L × W × H)	51 × 40 × 16mm + SMA connectors (excluding heatsink)

The SHF 115 AP is a three stage amplifier design using special monolithic microwave integrated circuits (MMICs) inside hermetic carriers to achieve ultra wide bandwidth and low noise performance. The custom made MMIC carrier is optimized for good input return loss between its interior and the 50 Ω outside hybrid technology. The computer optimized broadband circuit is individually tuned for minimum passband ripple to achieve a near Bessel response. A voltage regulator IC makes the amplifier insensitive to overvoltage and line ripple.

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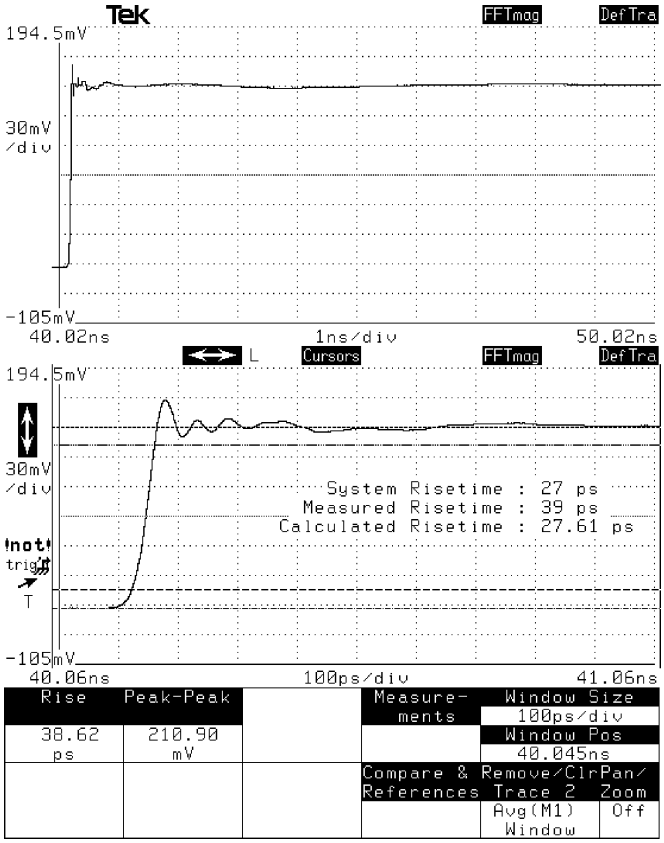
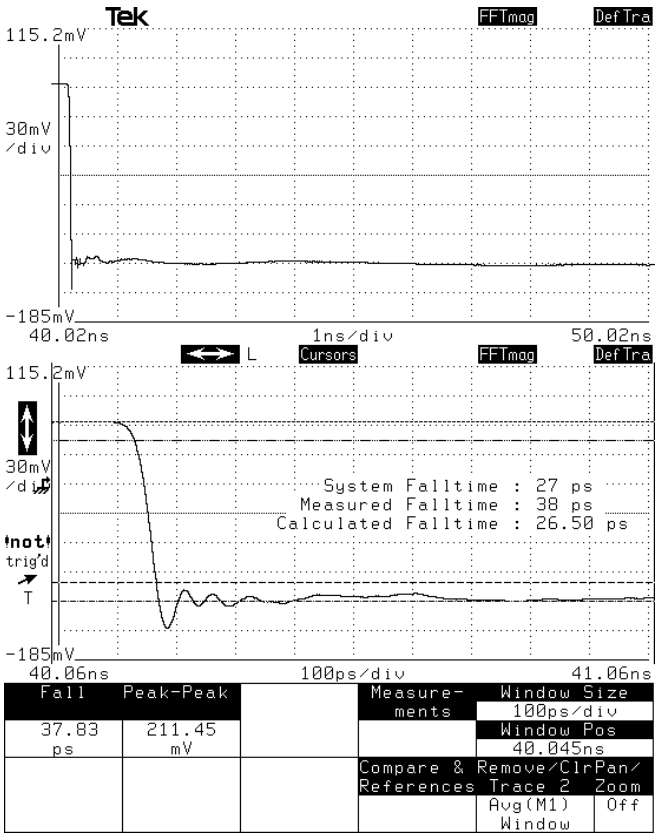
Step response



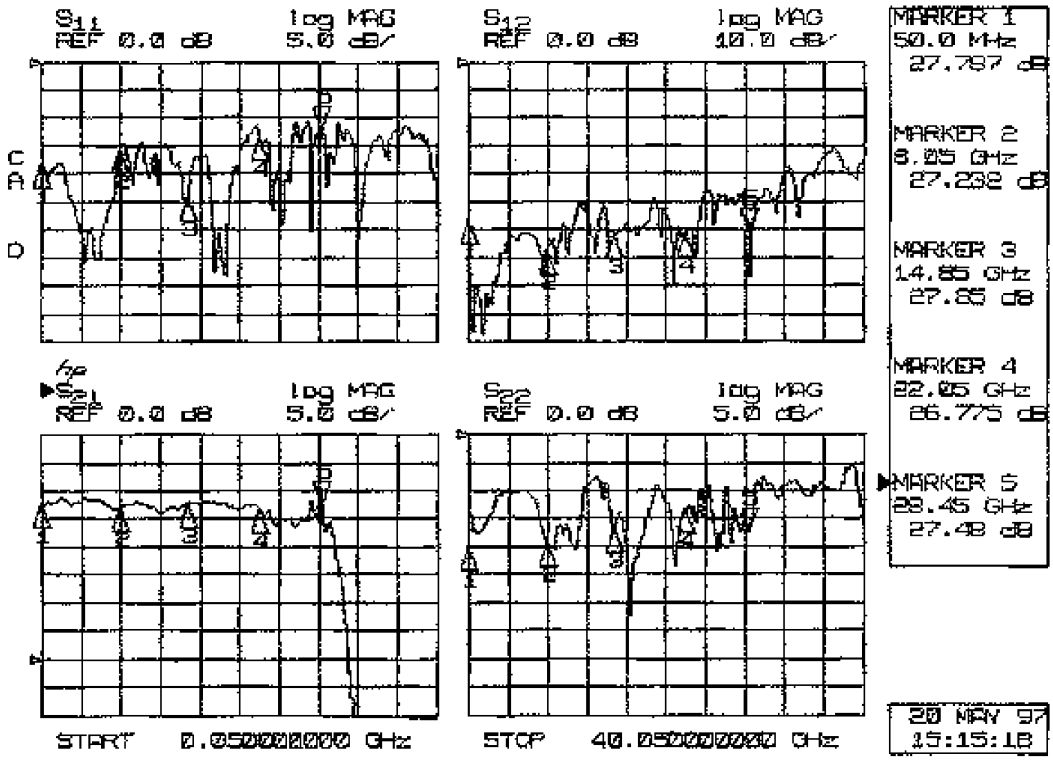


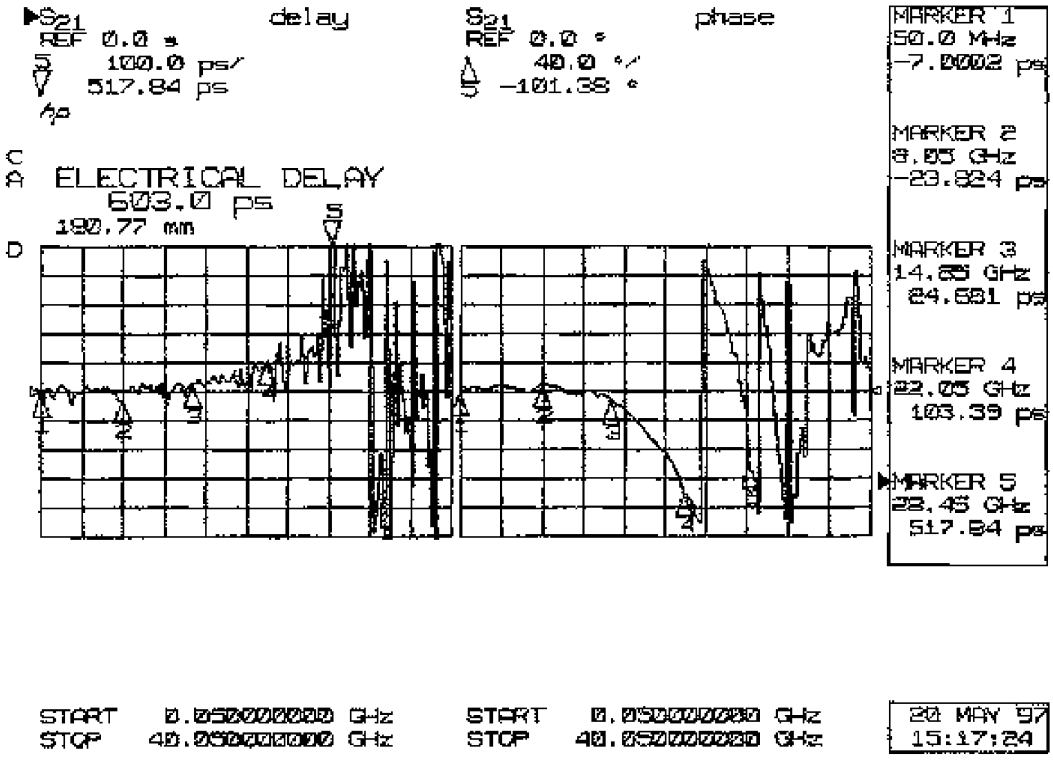
- **Pulse optimized applications**

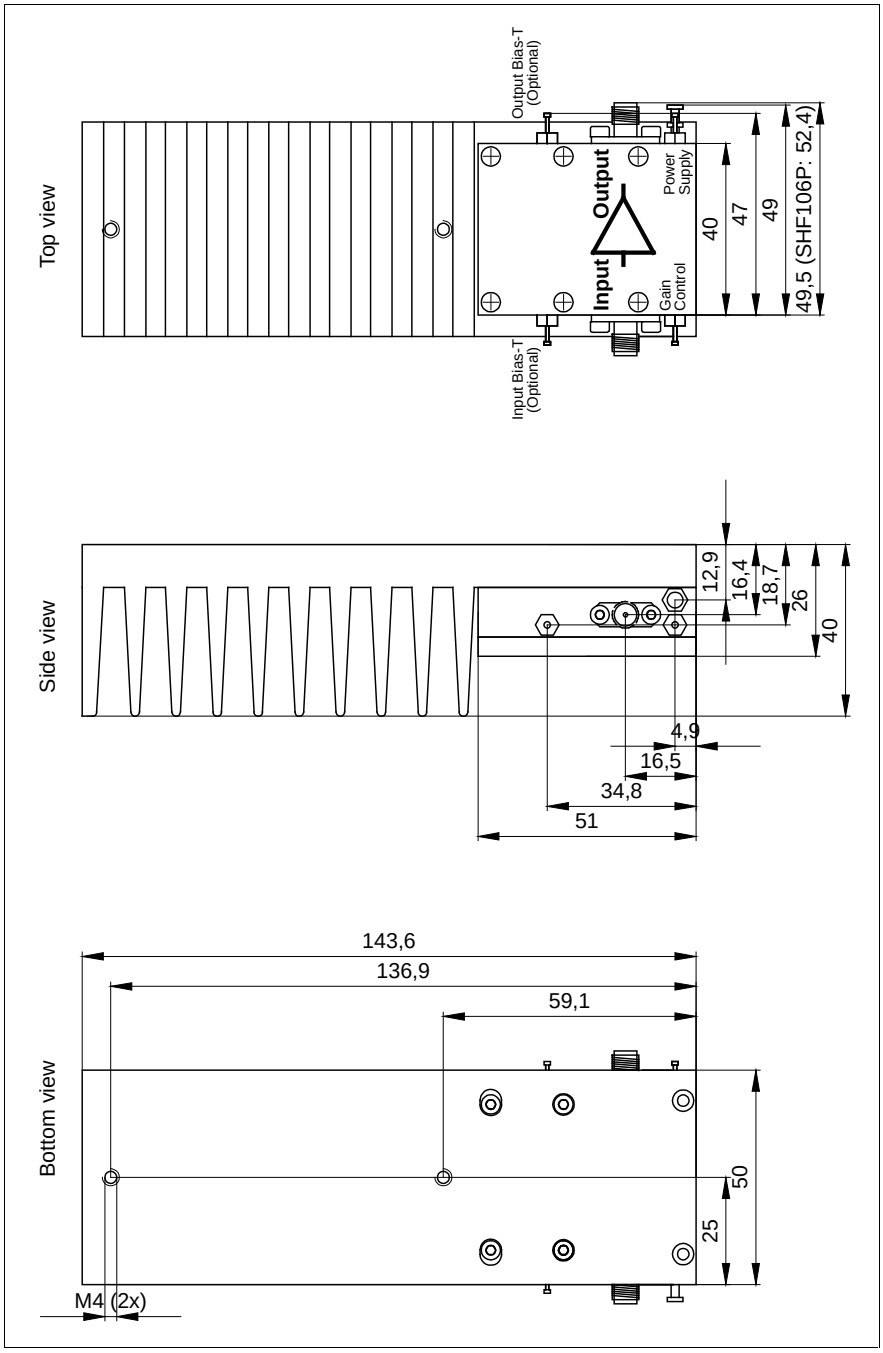
Low overshoot
for data transmission

High bandwidth with
smooth gain roll-off

S-Parameters, group delay and phase response (full gain)







Thermal resistance of heatsink approx. 1.5 K/W

For permanent mounting, remove the heatsink from the amplifier. In that case, ensure that adequate cooling of the amplifier is guaranteed.

To remove the heatsink from the amplifier, unscrew the four screws on the heatsink.

The view of the amplifier without heatsink is shown on the following page.

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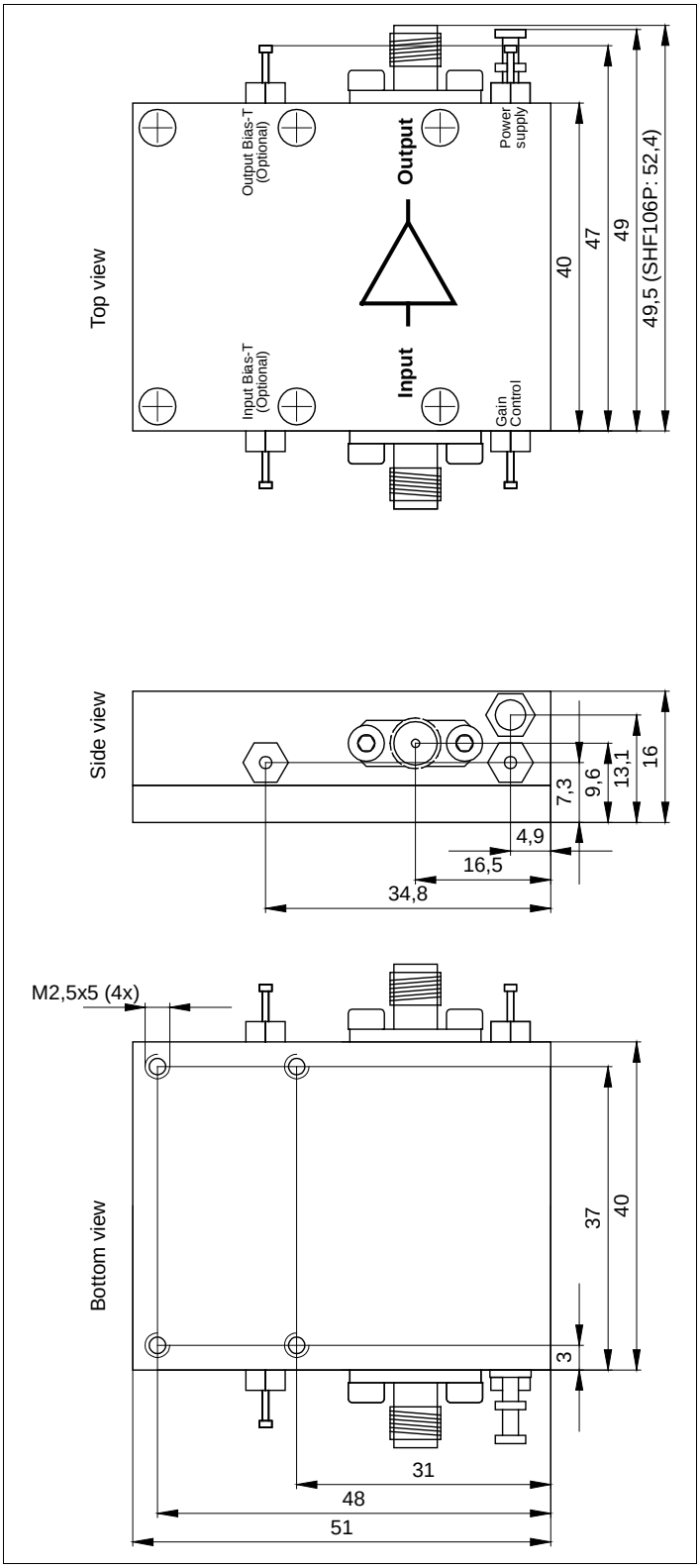
▪ Applications
Optical Communications
High-Speed Pulse Experiments
Satellite Communications
Research and Development
Antenna Measurements
Data Transmission



User Instructions

ATTENTION!

ELECTROSTATIC SENSITIVE GaAs FET AMPLIFIER

1. **To prevent damage through static charge build up, cables should be always discharged before connecting them to the amplifier!**
2. **Attach a 50 Ohm output load BEFORE supplying DC power to the amplifier!**
3. **The supply voltage can be taken from any regular 9 to 15 V, 0.55 A DC power supply and can be connected to the supply feed-through filter via an ON / OFF switch.**
4. **The minimum supply voltage is 9 V. A higher one increases the power dissipation of the internal voltage stabilizer.**
5. **Using a 3 dB or 6 dB input attenuator will result in a 6 dB or 12 dB increase of the input return loss. For minimal degradation of amplifier rise time, these attenuators should have a bandwidth specification of greater 50 GHz (V/ 1.85 mm or 2.4 mm attenuators)!**
6. **An input signal of about 0.25 V_{pp}, equivalent to –8 dBm, will produce the full swing output of 5 V_{pp} .**
7. **Higher input voltages will drive the amplifier's output stage into saturation, leading to waveform peak clipping.**
8. **While using a reflective load, the output voltage has to be reduced to a safe operating level below 5 V_{pp} according to the magnitudes of the reflections.**

   ATTENTION: At frequencies up to 20 GHz, a capacitive load can be transformed to an inductive one through transmission lines! With an output stage driven into saturation this will lead to the immediate destruction of the amplifier (within a few ps)!
9. **The input voltage should never be greater than 1 V_{pp}, equivalent to 4 dBm input power. Without DC power supplied to the amplifier, the input voltage should never be greater than 2 V_{pp}, equivalent to 10 dBm input power.**
10. **Hint: Pulse shape tuning of the amplifier has been performed after warm up at about 40 °C case temperature. Considerably more over- and undershoot will be present at low temperature!**