



## 150 W HF Power Amplifier R&S®VK 3150



**ROHDE & SCHWARZ**



The Power Amplifier R&S®VK3150 increases the HF output power of the R&S®MR3000 manpack radios to 150 W PEP or 100 W average. The R&S®VK3150 provides medium-power/medium-range communications links. Typical applications include mobile or base station installations for general-purpose HF SSB voice and data communications.

Continuous coverage is provided over the 1.5 MHz to 30 MHz frequency range. The power amplifier section is of broadband design and fully supports frequency-agile operation modes (automatic link establishment, slow frequency hopping).

When used with the automatic HF Antenna Tuning Unit R&S®FK3150, the output of the R&S®VK3150 is automatically matched to most rod and whip antennas and requires no special operator procedures.

Built-in self-test features permit operators or maintenance personnel to fully check the transceiver and associated power amplifier performance down to the module level. Fault conditions are displayed on the transceiver's front-panel display.

The RF drive requirements for full 150 W PEP or 100 W average are  $-2$  dBm ( $\pm 3$  dB) from the associated receiver-transmitter. The manpack radios R&S®MR3000 therefore acts as an exciter for the power amplifier, avoiding the disadvantages of transceiver/booster solutions with respect to unwanted emissions.

The HF power amplifier is mounted separately on an independent shockmount with room for proper air flow. This provides additional flexibility when installing tactical radio systems into vehicles.

The R&S®VK3150 uses rugged tactical packaging and meets the same environmental specifications for temperature, shock, vibration, and submersibility as the rest of the R&S®M3TR family components.

## Prepared for multiband operation

An R&S®M3TR HF system can be easily upgraded to multiband operation. The R&S®M3TR's serial control bus allows combinations of transceivers with up to two external amplifiers. By adding a VHF/UHF Power Amplifier R&S®VT3050 and an appropriate antenna, the system can be extended to a frequency range of 1.5 MHz to 512 MHz.

## Interfaces

- ◆ RCB<sub>m</sub> (radio control bus) to interchange control signals with the associated manpack transceiver
- ◆ RCB<sub>out</sub> to interchange control signals with the optional associated system components (e.g. antenna tuner)
- ◆ Input RF connector for the RF signal from/to the associated manpack
- ◆ Output RF connector (N type, to antenna tuner or broadband antenna)
- ◆ Connector for DC power input
- ◆ Connector for DC power output for a fan

## Modules

The amplifier consists of the following modules:

- ◆ Power amplifier board
- ◆ Harmonic filter
- ◆ Amplifier control unit
- ◆ AC/DC converter
- ◆ MW filter (optional)

## Specifications

Operating frequency range	1.5 MHz to 30 MHz transmission 1.5 MHz to 30 MHz bypassed for reception 1.5 MHz to 30 MHz with highpass filter for MW frequency band attenuation (optional)
Hops/s	≤10 at 1.5 MHz to 30 MHz
RF input power	-2 dBm ±3 dB operating +13 dBm max. (non-destructive)
Input impedance	50 Ω
Input return loss	14 dB
RF output power into 50 Ω	150 W PEP ±0.5 dB at 1.5 MHz to 30 MHz 100 W CW ±0.5 dB at 1.5 MHz to 30 MHz no duty cycle with shockmount at +45 °C no duty cycle with blower unit at +55 °C
Load mismatch VSWR <2.4 VSWR ∞	output power 100 W PEP or CW reduced power output power 10 W PEP or CW
VSWR protection	protection up to infinite VSWR, open and short circuit
Adjustable power levels 150 W, 100 W 75 W, 50 W, 30 W, 20 W, 10 W	±0.5 dB ±1 dB
Harmonics suppression	>45 dB, >60 dB typ. at 100 W into 50 Ω
Signal-to-noise ratio	>150 dBc referred to 1 Hz measuring bandwidth, Δf > 1 MHz at 100 W
Spurious attenuation	>70 dB, 80 dB typ. at 100 W into 50 Ω at amplifier output, Δf >30 kHz
Intermodulation distortion (for control with two tones of the same level (Δf = 1 kHz))	>32 dB referred to PEP, 38 dB typ. at 100 W output power on a 50 W load
Frequency switching	≤4.5 ms
Receive-to-transmit switching time	≤4.5 ms to reach at least 90% of rated power after receiving command from RCB
Transmit-to-receive switching time	≤4.5 ms
Nominal DC input voltage	+19 V to +33 V DC
Current consumption	<28 A max. at 19 V DC <20 A max. at 26.5 V DC <1.5 A RX at 26.5 V DC
TEST CM – continuous monitoring	input RF presence output RF value overcurrent high temperature and dissipation control (warning, reduction output power) VSWR >2.3 power reduction
BITE <sup>1)</sup> PBITE RF protections	power-on BITE to check output power without radiation open and short circuit and any value of VSWR overvoltage 75 V EMF at power amplifier output lightning protection in external R&S®FK 3150

Temperature range	acc. to MIL-STD-810E method 501.3 and 502.3 Fully specified temperature range -25 °C to +55 °C Operating temperature range -40 °C to +70 °C Storage temperature range -40 °C to +85 °C
Temperature shock	acc. to MIL-STD-810E meth. 503.3, cat. A1
Vibration with shockmount	acc. to MIL-STD-810E method 514.4, cat. 8, ground mobile, 5 Hz to 500 Hz (20 Hz to 350 Hz, 0.02 g <sup>2</sup> /Hz 20 Hz to 5 Hz, -6 dB/octave 350 Hz to 500 Hz, -6 dB/octave)
Shock with shockmount	acc. to MIL-STD-810E method 516.4 proc. I, functional shock for ground equipment, crossover frequency 45 Hz, 40 g, 6 ms to 9 ms
EMI	acc. to MIL-STD-461E class A (harmonics, spurious and transmission frequency excluded) CE102, CE106, CS101, CS114, RE102, RS103
Bench handling	acc. to MIL-STD-810E method 516.4, proc. VI
Leakage (immersion)	1 m during 2 h, acc. to MIL-STD-810E method 512.3, proc. I
Humidity	acc. to MIL-STD-810E method 507.3, proc. III
Salt fog	acc. to MIL-STD-810E method 509.3, proc. I
Sand and dust	acc. to MIL-STD-810E method 510.3, proc. I
Low pressure (altitude)	acc. to MIL-STD-810E method 500.3, proc. I + II 5000 m above sea level at <+35 °C
Solar radiation	acc. to MIL-STD-810E method 505.3, proc. II
Icing/freezing rain	acc. to MIL-STD-810E method 521.1, proc. I
Fungus	acc. to MIL-STD-810E method 508.4
Mounting position	all positions allowed
MTBF	28000 h
MTTR	<40 min
Colour	RAL6014 (green), RAL9005 (black) for heat sink
Dimensions (W × H × D) With shockmount	205 mm × 205 mm × 325 mm
Weight With shockmount	11.2 kg

<sup>1)</sup> PBITE and BITE are commanded and their sequence controlled by the R&S®M3TR radio.

## Ordering information

Order designation	Type	Order No.
150 W HF Power Amplifier	R&S®VK 3150	6118.0301.02
<b>Recommended extras</b>		
Shockmount	R&S®KS 3000V	6099.6104.02
Blower Unit	R&S®KL 3000V	6118.0101.02
HF Antenna Tuning Unit	R&S®FK 3150	6095.5855.02
HF Vehicular Antenna	R&S®HV 3011	6099.7600.02



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