



50 W VHF/UHF Power Amplifier R&S®VT 3050

Supports continuous operation across the 30 MHz to 512 MHz band with 50 W transmit power



The R&S®VT3050 is a member of the R&S®M3TR family of multiband tactical radio systems. This power amplifier supports continuous operation across the 30 MHz to 512 MHz band with 50 W transmit power. The R&S®VT3050 meets the need for both military voice and data communication in all analog and digital fixed frequency and frequency hopping modes supported by the R&S®MR3000U tactical radio. The amplifier is especially designed for high linearity to cope with the requirements of the R&S®M3TR's high speed radio modem for 72 kbit/s. Furthermore it supports medium to fast frequency hopping (SECOM-V).

The collocation option is available for VHF low (30 MHz to 88 MHz). The co-site filter is factory-installed. Fully automatic operation (controlled from the host transceiver) and rapid tuning capability make pre-/postselector operation virtually transparent to the user.

Operational configuration and BITE/fault status reporting are performed via the transceivers. The R&S®VT3050 uses rugged tactical packaging and meets the same environmental specifications for temperature, shock, vibration, and submersibility of the other R&S®M3TR family components. Operation is fully automatic.

Built-in test equipment (BITE) and diagnostic testing are fully integrated into the transceiver system. The VHF/UHF amplifier is mounted separately with an independent shockmount. This provides additional flexibility when installing tactical radio systems into vehicles.

Prepared for multiband operation

An R&S®M3TR VHF/UHF 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 an HF Amplifier R&S®VK3150 and an appropriate antenna/Antenna Tuning Unit R&S®FK3150, the system can be extended to a frequency range of 1.5 MHz to 512 MHz.

For use with standard VHF and UHF antennas the amplifier features two configurable RF outputs. The frequency that splits the available frequency range of 30 MHz to 512 MHz is user-selectable. Possible settings could be for instance 30 MHz to 108 MHz for the RFlow output leaving 108.025 MHz to 512 MHz for the RF high output.

If a multiband antenna such as the R&S®HK055 is used, the complete range of 30 MHz to 512 MHz can be routed to one of the outputs.

Interfaces

- ◆ RCB_{in} (radio control bus) to interchange control signals with the associated manpack transceiver
- ◆ RCB_{out} to interchange control signals with the optional associated system components (e.g. HF power amplifier)
- ◆ 2 output RF connectors (N type, antenna output)
- ◆ 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
- ◆ Digitally tuned co-site filter (optional)

Specifications

Frequency range	30 MHz to 512 MHz bypass for 1.5 MHz to 30 MHz
Input impedance	50 Ω
Input return loss	14 dB
RF output power at 50 Ω	30 MHz to 512 MHz: 50 W PEP or CW ± 0.8 dB no duty cycle with shockmount at +45 $^{\circ}$ C no duty cycle with blower unit at +55 $^{\circ}$ C
Load mismatch VSWR <2 VSWR <3 VSWR ∞	output power 50 W -1 dB PEP or CW reduced power output power 5 W PEP or CW
VSWR protection	protection up to infinite VSWR, open and short circuit
Adjustable power levels 50 W, 25 W, 10 W, 5 W 2 W, 1 W into 50 W	± 0.8 dB ± 1.5 dB
Harmonics suppression	-60 dBc at 30 MHz to 48 MHz, nom. 50 W into 50 Ω -67 dBc at 48 MHz to 512 MHz, nom. 50 W into 50 Ω
Spurious attenuation	> -80 dBc (power amplifier only), nom. 50 W into 50 Ω at amplifier output, $\Delta f > 30$ kHz
Intermodulation distortion (for control with two tones of the same level ($\Delta f = 1$ kHz))	> 36 dB referred to 50 W PEP on a 50 W load > 32 dB referred to 50 W PEP on a 50 W load at 322 MHz to 512 MHz
Nominal DC input voltage	+19 V to +33 V DC
Current consumption	22 A max. at +19 V DC, 50 W FM, 50 Ω load 15 A max. at +26.5 V DC, 50 W FM, 50 Ω load
TEST CM – continuous monitoring	output RF power (displayed in radio MMI) supply voltages presence overcurrent power amplifier high temperature sensing (warning, reduction output power) output RF forward and reflected high VSWR ($\geq 2:1$) – power reduction overload RX input
BITE PBITE	power-on BITE to check output power temperature
RF protections	open and short circuit and any value of VSWR overcurrent overvoltage 75 V EMF, at RF output lightning protection by external unit (option)

Temperature range	in line with MIL-STD-810E method 501.3 and 502.3
Fully specified temperature range	-25 $^{\circ}$ C to +55 $^{\circ}$ C
Operating temperature range	-40 $^{\circ}$ C to +70 $^{\circ}$ C
Storage temperature range	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Temperature shock	in line with MIL-STD-810E meth. 503.3, cat. A1
Vibration with shockmount	in line with MIL-STD-810E method 514.4, cat. 8, ground mobile, 5 Hz to 500 Hz (20 Hz to 350 Hz, 0.02 g^2 /Hz 20 Hz to 5 Hz, -6 dB/octave 350 Hz to 500 Hz, -6 dB/octave)
Shock with shockmount	in line with MIL-STD-810E meth- od 516.4 proc. I, functional shock for ground equipment, crossover frequen- cy 45 Hz, 40 g, 6 ms to 9 ms
EMI	in line with MIL-STD-461E, class A3 (harmonics, spurious and transmission frequency excluded) CE102, CE106, CS101, CS103, CS104, CS105, CS114, RE102, RS103
Bench handling	in line with MIL-STD-810E method 516.4, proc. VI
Leakage (immersion)	1 m during 2 h, in line with MIL-STD- 810E method 512.3, proc. I
Humidity	in line with MIL-STD-810E method 507.3, proc. III
Salt fog	in line with MIL-STD-810E method 509.3, proc. I
Sand and dust	in line with MIL-STD-810E method 510.3, proc. I
Low pressure (altitude)	in line with MIL-STD-810E method 500.3, proc. I + II 5000 m above sea level at $< +35$ $^{\circ}$ C
Solar radiation	in line with MIL-STD-810E method 505.3, proc. II
Icing/freezing rain	in line with MIL-STD-810E method 521.1, proc. I
Fungus	in line with MIL-STD-810E method 508.4
Mounting position	all positions allowed
MTBF	25000 h
MTTR	> 40 min
Colour	RAL6014 (green), RAL9005 (black) for heat sink
Dimensions (W \times H \times D) with shockmount, max.	205 mm \times 205 mm \times 370 mm
Weight with shockmount	11.9 kg

Ordering information

Order designation	Type	Order No.
50 W VHF/UHF Power Amplifier Without co-site filter	R&S®VT 3050	6118.5503.03
With co-site filter VHF (30 MHz to 88 MHz)		6118.5503.02
Recommended extras		
Shockmount	R&S®KS 3000V	6099.6104.02
Blower Unit	R&S®KL 3000V	6118.0101.02
50 W VHF Vehicular Broadband Antenna	R&S®HV 3015	6098.8803.02
50 W UHF Vehicular Broadband Antenna	R&S®HV 3013	6099.7800.03



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