R&S®M3AR RADIO FAMILY

VHF/UHF transceiver for ATC and secure airborne communications

R&S®MR6000A Software Defined Radio

Product Flyer
Version 02.00

ROHDE&SCHWARZ

Make ideas real

AT A GLANCE

VHF/UHF transceiver for ATC and secure airborne communications – safety meets security. The software defined, multiband-capable airborne transceiver R&S®MR6000A is a member of the R&S®M3AR product family. Its excellent characteristics make it suitable for applications in military and civil environments including all types of airborne platforms such as helicopters, transport aircraft, jets and unmanned aerial vehicles (UAV).

The R&S®MR6000A covers the frequency range from 30 MHz to 400 MHz and supports the NATO frequency hopping methods (TRANSEC) HAVE QUICK and SATURN. Integrated NATO encryption (COMSEC) is available as an option to protect voice and data transmissions against eavesdropping. The transceiver is interoperable with the NATO KY-58 and KY-100 encryption devices as well as the ELCRODAT 4-2 from Rohde&Schwarz.

The proprietary Rohde&Schwarz R&S®SECOS waveform combines TRANSEC and COMSEC functionality in a single waveform and is also available for the R&S®MR6000A.

Accommodated in a housing that complies with the ARINC 600 standard (3MCU), the R&S®MR6000A provides interfaces for connecting external devices such as an automatic direction finder (ADF), a LINK 11 data terminal set (DTS), an improved data modem (IDM) or an external encryption device, e.g. the R&S®MMC3000. The transceiver can be operated continuously with full transmit power even at ambient temperatures of up to +71°C.

The transceiver supports various standards such as ED-23B, ICAO Annex 10, STANAG 4204 and STANAG 4205 for fixed frequency/ATC operation, STANAG 4246 for HAVE QUICK and STANAG 4372 for SATURN EPM/ECCM communications as well as STANAG 5511 and MIL-STD-188-203-1A for LINK 11 operation.

To ensure that safety requirements for the complete air-craft are met, the transceiver has been developed in accordance with civil avionic standards (DO-178B and DO-254, both level C). The R&S®MR6000A also provides high robustness against cosmic radiation.

Key facts

► Frequency range from 30 MHz to 400 MHz
► Control via MIL-STD-1553B data bus or RS-485 serial interface
► Powerful built in test equipment (BITE): power-up BIT, continuous BIT and initiated BIT
► Suitable for jet and propeller aircraft, helicopters and unmanned aerial vehicles (UAV)
► Excellent RF performance

BENEFITS AND KEY FEATURES

Reference platforms (extract)
▶ Fixed wing: Panavia Tornado; Airbus A400M; Saab 2000; Lockheed P-3 Orion
▶ Rotary wing: Airbus UH TIGER, NH 90, H145M; Sikorsky CH-53; Agusta Westland AW-101

Waveforms
▶ HAVE QUICK in line with STANAG 4246
▶ SATURN in line with STANAG 4372 (including optional requirements such as SATURN voice/data relay)
▶ R&S®SECOS (TRANSEC and COMSEC)

Frequency range
▶ 30 MHz to 88 MHz
▶ 108 MHz to 118 MHz, receive mode only
▶ 118 MHz to 174 MHz
▶ 225 MHz to 400 MHz

Receiver sensitivity
▶ AM sensitivity: ≤ –105 dBm, 10 dB (S+N)/N
▶ FM sensitivity: ≤ –113 dBm, 10 dB (S+N)/N

Embedded filters
▶ FM immunity (frequency band from 88 MHz to 108 MHz)
▶ HF (frequency range from 2.5 MHz to 30 MHz)
▶ Cosite (in-band/out-of-band)

Guard receiver
▶ Guard receiver 1: 40.5 MHz, 121.5 MHz and 243 MHz (dedicated or scan mode)
▶ Guard receiver 2: 156.525 MHz (DSC, channel 70) or 156.8 MHz (channel 16, only available on R&S®XM6523D transceiver)

Transmit output power
▶ AM: ≥ 20 W
▶ FM/MSK: ≥ 30 W
▶ Power modes: high, medium, low

GPS
▶ Interface in line with ICD-GPS-060

Environmental specifications
▶ Temperature range, fully specified: –40 °C to +71 °C
▶ Temperature range, storage: –54 °C to +95 °C
▶ Tests performed in line with MIL-STD-810E

Electromagnetical specifications
▶ Tests performed in line with MIL-STD-461C/D, MIL-STD-462/462D

Power input
▶ 28 V DC nominal power supply
▶ Steady state voltage, momentary undervoltage operation and abnormal surge voltage in line with DO-160D Section 16

Reliability, calculated in line with MIL-HDBK-217F
▶ ARW and AUF, +25 °C: > 3000 h
▶ AUC, +25 °C: > 4900 h

Applicable civil standards
▶ Fixed frequency: ED-23B, ICAO Annex 10, ARINC 716-11
▶ Avionics development: DO-178B Level C, DO-254 DAL C (not R&S®XM6523D transceiver)

Designation	Type
R&S®MR6000A (extract of available equipment)	
ARINC 600 housing, remote control	
Frequency bands: 30 MHz to 88 MHz, 108 MHz to 174 MHz, 225 MHz to 400 MHz; EPM (ECCM): fixed frequency; interfaces: RS-485, MIL-STD-1553B trafo coupling; fill interface; audio output: 600 Ω; with GRX2 guard receiver 156.525 MHz	R&S®XM6023
Frequency bands: 30 MHz to 88 MHz, 108 MHz to 174 MHz, 225 MHz to 400 MHz; EPM (ECCM): HAVE QUICK I/II; interfaces: RS-485, MIL-STD-1553B trafo coupling; fill interface; audio output: 600 Ω; with GRX2 guard receiver 156.525 MHz	R&S®XM6123
Frequency bands: 30 MHz to 88 MHz, 108 MHz to 174 MHz, 225 MHz to 400 MHz; EPM (ECCM): R&S®SECOS 5/16 voice and data; interfaces: RS-485, MIL-STD-1553B trafo coupling; fill interface; audio output: 600 Ω; with GRX2 guard receiver 156.8 MHz	R&S®XM6523D
Frequency bands: 30 MHz to 88 MHz, 108 MHz to 174 MHz, 225 MHz to 400 MHz; EPM (ECCM): SATURN (enhanced functionality – with additional STANAG 4372 options), HAVE QUICK I/II; interfaces: RS-485, MIL-STD-1553B trafo coupling; fill interface; audio output: 600 Ω; with GRX2 guard receiver 156.525 MHz	R&S®XM6923
Frequency bands: 30 MHz to 88 MHz, 108 MHz to 174 MHz, 225 MHz to 400 MHz; EPM (ECCM): SATURN, HAVE QUICK I/II; COMSEC: embedded NATO; interfaces: RS-485, MIL-STD-1553B trafo coupling; fill interface; audio output: 600 Ω; with GRX2 guard receiver 156.525 MHz	R&S®XM6923L

Rohde & Schwarz

The Rohde & Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks & cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.
www.rohde-schwarz.com

Sustainable product design

► Environmental compatibility and eco-footprint
► Energy efficiency and low emissions
► Longevity and optimized total cost of ownership

Certified Quality Management	Certified Environmental Management
ISO 9001	ISO 14001

Certified Quality Management	Certified Quality Management
AQAP-2110	EN 9100

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