RF2350 - EPM mobile transceiver

Type designation: **RF2350**
PN (RN): **2310.100.40**

RF2350 mobile multiband transceiver with increased resistance against radio-electronic warfare is intended for installation in all tracked and wheeled vehicles and base stations. It is fully compatible with RF20, RF23 and RF2050 in simplex and semi-duplex frequency hopping channel. Depending on the selected frequency band, the transceiver communicates with older RF13 radio system transceivers and with other transceivers complying with STANAG 4204. The transceiver secures data communication in fixed frequency channels according to MIL-STD-188-220 standard (NET modem). Two types of modem can be used for data transmission in frequency hopping channels - P2P and NET. RF2350 transceiver includes a navigation receiver displaying navigation data on a display and transmitting the GPS data via frequency hopping radio channel using G-track service. The transceiver features one U-229/U audio frequency connector (complying with MIL-DTL-55116 standard) to connect standard headsets. Various acoustic devices such as SONETRONICS, CJ COMPONENT PRODUCTS, POWER TIME etc. can be connected to the connector.

The transceiver is manufactured in two versions: 2310.100.40 without the co-site filter and 2310.100.41 with the co-site filter.

The co-site filter allows simultaneous operation of multiple RF2350 transceivers or of one RF2350 transceiver with RF2050 transceiver in one vehicle in 30 MHz to 90 MHz operating band. There must be at least 1.5 m between the recommended types of vehicle antennas and spacing between receiving and transmitting frequencies of at least 10 %. The co-site filter must be used with all transceivers to guarantee compatible operation.

Operating features

a) in all operation modes
- automatic self-test after power-up, with failure indication on the transceiver display (BITE);
- operational data programming from external units - PK20 or PK23;
- simplex or semi-duplex operation;
- emergency erasure of operation data on fixed frequency channels, including encryption unit codes and information for FH networks including TRANSEC and COMSEC keys;
- acoustic signaling switching on/off by transceiver operator;
- transmission of tone calling (1000 ± 200) Hz, in VHF III band (1750 ± 25) Hz;
- display and keypad backlight;
- adjustable display contrast;
- synchronous data transmission;

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• transmission power signaling on the display, transmission signaling by LED on the top panel;
• operation channel signal reception signaling by a LED on the transceiver panel;
• transmitter overheat signaling LED on the transceiver panel with automatic switching to lower power output;
• signaling of active mode with co-site filter (version 2310.100.41);
• optional external cooling box for improved cooling efficiency;
• "reception only" mode, with transmission disabled;
• whisper mode with increased microphone sensitivity and decreased audio volume;
• loud received signal monitoring with volume regulation and LED signaling;
• transceiver remote control via RC20 remote control unit and PRC20 protocol;
• connector configuration for connecting one or two antennas;
• displaying of servicing information – firmware;
• position, velocity and time display on the LCD with external GPS antenna connected;
• easy to control.

b) in fixed frequency mode
• max. 10 presets from the entire frequency range 25 MHz to 145.9875 MHz, fewer preset channels if occupied by FH networks;
• 150 Hz sub-tone squelch or signal squelch (only signal in VHF II);
• voice operation via internal encryption unit compatible with RF13, RF1301, RF20 and RF2050;
• transmission and reception of short encrypted messages – FLASH, with the opposite transceiver identification;
• channel parameter programming from keypad;
• preset channel scanning;
• data transmission according to MIL-STD-188-220 compatible with modem MD13.1;
• operation frequency setting in 6.25 kHz, 8.33 kHz, 25 kHz or 1 MHz steps;
• transmission band for digital voice and data transmission 16 kbit/s according to STANAG 4204, edition 2.

c) in FH operation
• max. 6 network presets;
• operation in frequency range 30.000 MHz to 87.975 MHz;
• secure operation TRANSEC and secret operation COMSEC;
• simplex or semi-duplex operation with frequency hopping;
• selectable frequency hopping operation mode – FH, DFF, FCS and MIX with quick transition to HLC, HLG or HLA;
• communication on the channel with a continuous carrier;
• iso-fixed frequency operation mode without HLC, HLG and HLA monitoring;
• establishing of connection with fixed frequency transceivers through HLC and HLG monitoring;
• 121.500 MHz (HLA) frequency monitoring and transition to HLA with transmission disabled;
• late net entry with synchronization request;
• master transceiver switching depending on the network condition;
• transmission of warning message to all network participants;
• all transceivers authentication request;
• MASTER transceiver selective communication with a selected slave transceiver;
• transmission and reception of short text message, maximum 156 characters;
• preparation, saving and reading of up to 10 short text messages;
• transmission over notification (BREAK IN) by all transceivers;
• INTERLEAVING switching off for close-to-the-limits communication;
• data transmission at adjustable rates – 7100 bit/s, 4800 bit/s and 2400 bit/s (P2P);
• data transmission according to MIL-STD-188-220 (NET);

- CW mode suitable for use with external frequency converters;
- G-track, sending position reports via radio channel;
- own position sending by SMS.

Technical parameters

Frequency range	25.0000 MHz to 145.9875 MHz
Nominal input/output impedance	50 Ω
Frequency ranges	
HF	25.000 MHz to 29.975 MHz
VHF I	30.000 MHz to 108.000 MHz
VHF II	117.975 MHz to 140.000 MHz
VHF III	140.0250 MHz to 145.9875 MHz
Type of modulation	
HF	F3E (FM)
VHF I	F3E (FM)
VHF II	A3E (AM)
VHF III	F3E (FM)
Channel spacing	
HF	25 kHz
VHF I	25 kHz; 12.5 kHz; 6.25 kHz
VHF II	25 kHz; 8.33 kHz
VHF III	25 kHz; 12.5 kHz
Number of operation channels with 25 kHz spacing	
HF	200
VHF I	3121
VHF II	882
VHF III	239
Number of preset channels	10
Number of frequency hopping channels	max. 6
RECEIVER PARAMETERS	

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Sensitivity	
(25-29.975) MHz	0.6 µV
(30-90) MHz with co-site filter/ without co-site filter	0.7 µV/0.5 µV
(90.00625-108) MHz	0.5 µV
(117.975-140) MHz	0.5 µV
(140.025-145.9875) MHz	0.5 µV
Dynamic two-signal selectivity for adjacent channel	min. 57 dB
Suppression of intermediate frequencies	min. 80 dB
Suppression of mirror frequencies	min. 60 dB
Suppression of spurious receptions for detuning > 10 % from operating frequency	min. 70 dB
TRANSMITTER PARAMETERS	
Nominal output power	FM 50 W
Nominal output power	AM 15 W
Reduced output power	FM 5 W
Reduced output power	AM 2 W
Harmonic suppression	min. 60 dB
Spurious suppression at Δf > 25 kHz	min. 70 dB
Time of continuous operation at +50 °C at duty cycle reception : transmission = 1 : 1	without limit
Average ranges in medium undulated terrain at nominal power FF mode (with antenna 2.6 m)	25 km
POWER SUPPLY (according to MIL-STD-1275B)	
Nominal supply voltage	12 VDC or 24 VDC
Limit supply voltage	10 VDC to 33 VDC
Current consumption	
• Transmission - nominal output power	
at 12 V	max. 25 A
at 24 V	max. 12 A
• Reception	max. 1.25 A (12 V)

AUDIO FREQUENCY OUTPUTS/ INPUTS PARAMETERS	
Effectively transmitted frequency band	
narrow band	300 Hz to 3000 Hz
wide band	20 Hz to 11000 Hz
Audio frequency levels of AF connector outputs	
AF1 connector	
narrow band	adjustable level/1 kΩ
wide band	constant level 1000 mV/600 Ω
AF2 connector	
narrow band	adjustable level min. 200 mW/8 Ω
narrow band	constant level min. 775 mV/600 Ω
wide band	constant level 1000 mV/600 Ω
REMOTE connector	
narrow band	constant level min. 775 mV/600 Ω
Audio frequency levels of AF connector inputs	
AF1 connector	
narrow band	3 mV/Δf = 4 kHz
wide band	400 mV/Δf = 4 kHz
AF2 connector	
narrow band (NARROW/LINE)	100 mV/Δf = 4 kHz
wide band	400 mV/Δf = 4 kHz
REMOTE connector	
narrow band (LINE)	100 mV/Δf = 4 kHz
Built-in speaker sound pressure	min. 85 dB at maximum volume
Non-linear distortion factor	max. 10 %
GPS RECEIVER PARAMETERS	
Received frequency	L1 (1575.42 MHz)
Coding	C/A code

Number of channels	50
Horizontal accuracy	2.5 m CEP
Velocity precision	± 0.1 m/s
Time to accuracy acquisition – cold start	40 s
GPS antenna connector type	SMA
GPS ANTENNA PARAMETERS	
Supply voltage for the preamplifier	3.3 V/25 mA
SPECIAL OPERATION MODES PARAMETERS	
Operating frequency range in FH modes	30.000 MHz to 87.975 MHz
Number of monitored frequencies in FH modes	3 (two programmable, third 121.5 MHz)
Frequency hopping modes	
FH	frequency hopping
DFF	digital fixed frequency
FCS	free channel search
MIX	mixed operation FH and FCS
IFF	iso-fixed frequency
CW	continuous wave
Time to initial synchronization	max. 5 s
Time of autonomous synchronization holding	48 h
Synchronization hold when disconnected from power supply	50 s
Minimum number of operation frequencies for FH operation	1
Hopping rate	100 hops/s
MECHANICAL PROPERTIES AND RESISTANCE	
Dimensions [w x h x d]	
• without cooling block	202 mm x 210 mm x 186 mm
• with cooling block	202 mm x 231 mm x 186 mm
Weight	8.5 kg

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Operating temperatures	-40 °C to +70 °C
Mechanical and climatic resistance	according to MIL-STD-810E
EMC	according to MIL-STD-461E
Power requirements	according to MIL-STD-1275B

Documentation

RF2350 operating instructions	2310.010.42
RF2350 short operating instructions	2310.011.42

Set

Type designation	PN (RN)	Name
RF2350	2310.000.42	EPM mobile transceiver set

Accesories

Type designation	PN (RN)	Name
	7007.100.14	Mobile set frame
RF13.3	2022.100.52	Handset
	2026.700.01	Handset holder
	1050.126.02	Power supply cable 3 m
	1050.993.01	Grounding
	2025.500.51	CD for modem configuration
	2036.100.23, 2036.100.24	2.6 m VHF vehicle antenna
	2036.100.45	Vehicle antenna 2.6 m with GPS antenna
	2036.100.84	Vehicle antenna VHF/ UHF 1.3 m

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	2036.100.85	Vehicle antenna VHF 1.6 m
	2036.100.86	Vehicle antenna VHF/ UHF 2.7 m
	2036.100.40	1.88 m VHF vehicle antenna
	2036.100.38	Groundplane antenna
	2036.100.68	Discon antenna
GPA24	2042.100.50	Satellite navigation antenna
	2036.100.39	Antenna mast
	2036.100.70	Telescopic winch driven mast 10 m
PK20	2320.000.02	Fill gun set
PK23	2320.000.42	Fill gun set
RC20	2312.000.01	Remote control unit set
	2328.100.01	Handset
	2328.100.11, 2328.100.12	Headset
RM23	2313.100.40	Handset with control
RM20	2313.100.01	Handset with control
RM1301	2009.100.01	Handheld microphone/speaker
	2310.270.01	Cooling block
	2011.904.01	Antenna cable (3 m)
	2011.904.02	Antenna cable (10 m)
	1050.430.30	Antenna cable 3 m
	1050.430.10	Antenna cable 10 m
	1050.454.02	Antenna cable
	1050.405.02	RF cable
	1050.299.01	PC interconnection cable (USB)
	1050.350.01	Data cable (RS232C)
	1050.993.22	Grounding
	5605002002	High frequency protection 1 GHz 200 V 400 W

5605002003	High frequency protection 6 GHz 180 V 400 W RF headsets

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