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just great reliability.

#### World Headquarters

39 Grand Canyon Lane  
San Ramon,  
CA 94583 USA

#### President

Frank Martens

#### Phone

925.901.0103

#### Fax

925.901.0403

#### Peninsula Engineering

Solutions, inc. may  
change specifications as  
necessary to meet  
industry requirements.

Website [www.peninsulaengineering.com](http://www.peninsulaengineering.com)

Email [fmartens@peninsulaengineering.com](mailto:fmartens@peninsulaengineering.com)

# RF-6000E/EW Repeater

Microwave Repeater Systems

## Applications

- Low-cost, highly reliable 6-GHz microwave through repeater for extending range of or clearing obstructed microwave radio paths.
- Excellent performance with analog, digital, or video microwave radios; channel capacity to 2400 FDM, 2016 PCM (3 DS3 or 135/140 Mb/s) or multiple video.
- Compatible with any manufacturer's 6-GHz radio terminal.
- Solar power compatible -- economical in thin routes and remote locations.

## Features

- RF output power up to +28 dBm analog, +21 dBm digital.
- Power consumption only 2.3 amperes at 12 Vdc for regular-power-duplex operation.
- Solar powered, ac powered, or powered by primary cells.
- Compact and lightweight -- ideally suited for remote sites that do not have access roads or commercial power.
- Environmentally protected aluminum, weathertight, lockable cabinet. No extra environmental shelter required in most installation. Suitable for use at unimproved sites anywhere in the world -- Alaska to Saudi Arabia.
- Internally protected duplex, frequency diversity, and three-way or "Y junction" configurations available.
- Only one active element per channel, the internally redundant linear amplifier.
- AGC/ALC provided to correct input fades and reduce overload.
- In the case of single duplex configuration, amplifiers can be replaced without disrupting service.
- RMAS-100 Alarm system (optional) can remotely monitor repeater.
- Equipped with directional couplers for in-service RF output power measurements.
- No frequency conversion -- received signal is filtered, amplified, and re-radiated.
- Very reliable, greater than 85,000 hours MTBF for duplex.
- Available as a self-contained RF repeater for use with customer-furnished antenna and power equipment or as a complete package including repeater, antenna, electric panels, battery charger and batteries.

# RF-6000E/EW Repeater

## Technical Summary

### General

	Output Power Options*	
	Power Level 1	Power Level 2 (HP)
Frequency Range	5.925 to 7.125 GHz	5.925 to 7.125 GHz
Nominal Gain	40 dB (10 dB AGC/ALC)	40 dB (15 dB AGC/ALC)
Maximum Gain	50 dB ( 0 dB AGC/ALC)	55 dB ( 0 dB AGC/ALC)
AGC/ALC (Nominal Gain = 40 dB)	10 dB down fade, 5 dB up fade	15 dB down fade, 5 dB up fade
Noise Figure	8 dB	8 dB
3rd Order Intercept	+34 dBm	+38 dBm

\* 1 Refer to Gain-Power-Noise Figure Table (p5-6) for individual power and configuration options

2 For those repeaters configured with different power levels at different frequency channels, please refer to the appropriate specifications.

### Antenna Connections

Return Loss	26 dB min.
Antenna Ports	CPR-137G Waveguide
Waveguide Type	WR-137, EW 52, EW 63 WC 205, WC 166

Frequency Plan	RF-6000E	RF-6000EW
Frequency Range	5925-7125 MHz	6400-7125 MHz
Channel Bandwidth	30 MHz, 1 dB	40 MHz, 1 dB
T-R Spacing	80 MHz, min.	100 MHz, min.
T-T Spacing (1+1, 2+1 or 3+1) on common feeders	57 MHz, min.	80 MHz, min.

Channel Response	RF-6000E	RF-6000EW
Amplitude	$\pm 0.5$ dB, fo $\pm 15$ MHz	$\pm 0.5$ dB, fo $\pm 20$ MHz
Group Delay(Non-equalized)	0.065 nSec/(MHz) <sup>2</sup>	Not Available
Group Delay(Equalized)	4 nSec p-p.,fo 15 MHz	4 nSec p-p.,fo $\pm 20$ MHz

### Power Requirements

Nominal Voltage	+13.5 Vdc
Voltage Range	+11 to +16 Vdc
Polarity	Negative Ground

### Current:

#### General

One Frequency-Channel of Power Level 1 Option : 1.15 Amperes max.

One Frequency-Channel of Power Level 2 Option : 1.65 Amperes max.

#### Both direction Power Level 1 (LP)

RF-6000E, EW-01 Duplex	2.3	A
RF-6000E, EW-02 Duplex, FD	4.6	A
RF-6000E, EW-03 One-Way	1.15	A
RF-6000E, EW-11 Duplex, Delay-Equ	2.3	A
RF-6000E, EW-12 Duplex, FD, Delay-Equ	4.6	A
RF-6000E, EW-13 One-Way, Delay-Equ	1.15	A
RF-6000E, EW-15 (2+1) Delay-Equ	6.9	A
RF-6000E, EW-16 (3+1), Delay-Equ	9.2	A

#### One Direction Power Level 1 (HP), One Direction Power Level 2 (LP)

RF-6000E, EW-21 Duplex	3.1	A
RF-6000E, EW-22 Duplex, FD	6.2	A
RF-6000E, EW-31 Duplex, Delay-Equ	3.1	A
RF-6000E, EW-32 Duplex, FD, Delay-Equ	6.2	A
RF-6000E, EW-35 (2+1), Delay-Equ	9.3	A
RF-6000E, EW-36 (3+1), Delay-Equ	12.4	A

#### Both direction Power Level 2 (HP)

RF-6000E, EW-41 Duplex, HP	3.9	A
RF-6000E, EW-42 Duplex, FD, HP	7.8	A
RF-6000E, EW-43 One-Way, HP	1.95	A
RF-6000E, EW-51 Duplex, Delay-Equ, HP	3.9	A
RF-6000E, EW-52 Duplex, FD, Delay-Equ, HP	7.8	A
RF-6000E, EW-55 (2+1) Delay-Equ, HP	11.7	A
RF-6000E, EW-56 (3+1), Delay-Equ, HP	15.6	A

## RF-6000E/EW Repeater

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### FCC Data

FCC ID:	EK2A201*
FCC Emission Designator	Booster
Power Output:	0.01~0.25W adjustable (Level 1) 0.02~0.63W adjustable (Level 2)
Frequency Range:	5925~7125 MHz
Frequency Stability:	Amplifier**
Modulating Frequency:	Dependent on Terminal Equipment

\* The RF-6000E and RF-6000EW series are FCC approved for use with any 6-GHz radio equipment.

\*\* The repeater does not have any frequency determining components; therefore, for FCC data, frequency stability is shown as amplifier. The actual frequency stability is a function of the associated end terminal radio equipment.

### Environmental Conditions

Housing	Weather Tight Aluminum
Ambient Temperature	-40 °C to +60 °C
Relative Humidity	90% (housing internal) 100% (housing external)
Altitude	15000 ft (5000 m)

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### Reliability (Single channel duplex)

MTBF	85,000 hours
MTTR	30 minutes

Dimensions:	One to Four Frequency Channels	Five to Eight Frequency Channels
Height, including feeder manifold	28.5 in (724 mm)	46.5 in (1181 mm)
Width, including vent hoods	27.5 in (699 mm)	27.5 in (699 mm)
Depth, including feeder manifold	20.0 in (508 mm)	20.0 in (508 mm)

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Weight:	Model	(pound/kg)
	One-Way	40/18
	Duplex	50/23
	Duplex, Freq. Diversity	70/32
	Duplex, 2+1	100/46
	Duplex, 3+1	120/55

## RF-6000E/EW Repeater

### Gain - Power - Noise Figure Table

RF-6000E /EW-XX

FOR FM/FSK/MSK\*

RF-6000E /EW OPTION	FREQUENCY CHANNEL	LINEAR GAIN MIN. dB	AGC/ALC ON *		NOISE FIGURE dB
			POWER INPUT dBm	POWER OUTPUT dBm	
RF-6000E/EW-01	F1, F2	52.8	-14.6	+25.4	6.6
RF-6000E/EW-02	F1, F4	52.5	-14.9	+25.1	6.6
	F2, F3	52.5	-14.6	+25.4	6.9
RF-6000E/EW-03	F1	53.2	-14.4	+25.6	6.4
RF-6000E/EW-11	F1, F2	50.0	-16.0	+24.0	8.0
RF-6000E/EW-12	F1, F4	49.7	-16.3	+23.7	8.0
	F2, F3	49.7	-16.0	+24.0	8.3
RF-6000E/EW-13	F1	50.4	-15.8	+24.2	7.8
RF-6000E/EW-15	F1, F6	49.4	-16.6	+23.4	8.0
	F2, F5	49.4	-16.0	+24.0	8.6
	F3, F4	49.4	-16.3	+23.7	8.3
RF-6000E/EW-16	F1, F8	49.1	-16.9	+23.1	8.0
	F2, F7	49.1	-16.0	+24.0	8.9
	F3, F6	49.1	-16.6	+23.4	8.3
	F4, F5	49.1	-16.3	+23.7	8.6
RF-6000E/EW-21	F1	52.8	-14.6	+25.4	6.6
	F2	57.8	-10.6	+29.4	6.6
RF-6000E/EW-22	F1	52.5	-14.6	+25.1	6.6
	F2	57.5	-10.9	29.4	6.9
	F3	52.5	-14.6	+25.4	6.9
	F4	57.5	-10.9	+29.1	6.6
RF-6000E/EW-31	F1	50.0	-16.0	+24.0	8.0
	F2	55.0	-12.0	+28.0	8.0
RF-6000E/EW-32	F1	49.7	-16.3	+23.7	8.0
	F2	54.7	-12.0	+28.0	8.3
	F3	49.7	-16.0	+24.0	8.3
	F4	54.7	-12.3	+27.7	8.0

## RF-6000E/EW Repeater

RF-6000E /EW OPTION	FREQUENCY CHANNEL	LINEAR GAIN MIN. dB	AGC/ALC POWER INPUT dBm	ON * POWER OUTPUT dBm	NOISE FIGURE dB
RF-6000E/EW-35	F1	49.4	-16.6	+23.4	8.0
	F2	54.4	-12.0	+28.0	8.6
	F3	49.4	-16.3	+23.7	8.3
	F4	54.4	-12.3	+27.7	8.3
	F5	49.4	-16.0	+24.0	8.6
	F6	54.4	-12.6	+27.4	8.0
RF-6000E/EW-36	F1	49.1	-16.9	+23.1	8.0
	F2	54.1	-12.0	+28.0	8.9
	F3	49.1	-16.6	+23.4	8.3
	F4	54.1	-12.3	+27.7	8.6
	F5	49.1	-16.3	+23.7	8.6
	F6	54.1	-12.6	+27.4	8.3
	F7	49.1	-16.0	+24.0	8.9
	F8	54.1	-12.9	+27.1	8.0
RF-6000E/EW-41	F1, F2	57.8	-10.6	+29.4	6.6
RF-6000E/EW-42	F1, F4	57.5	-10.9	+29.1	6.6
	F2, F3	57.5	-10.6	+29.4	6.9
RF-6000E/EW-43	F1	58.2	-10.4	+29.6	6.4
RF-6000E/EW-51	F1, F2	55.0	-12.0	+28.0	8.0
RF-6000E/EW-52	F1, F4	54.7	-12.6	+27.7	8.0
	F2, F3	54.7	-12.0	+28.0	8.3
RF-6000E/EW-53	F1	55.4	-11.8	+28.2	7.8
RF-6000E/EW-55	F1, F6	54.4	-12.6	+27.4	8.0
	F2, F5	54.4	-12.0	+28.0	8.6
	F3, F4	54.4	-12.3	+27.7	8.3
RF-6000E/EW-56	F1, F8	54.1	-12.9	+27.1	8.6
	F2, F7	54.1	-12.0	+28.0	8.9
	F3, F6	54.1	-12.6	+27.4	8.3
	F4, F5	54.1	-12.3	+27.7	8.6

## RF-6000E/EW Repeater

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\*For Other Modulation, Please Refer to the Following Table:

MODULATION	POWER BACKOFF
	dB
FM/FSK/MSK	0
4PSK	-2
16QAM	-6
64 QAM	-10
QPR3/9QPRS	-5
QPR7/49QPRS	-6
QPR9	-7

Peninsula Engineering Solutions, inc. may change performance specifications where necessary to meet industry requirement.