

RXR6644

Eclipse SIGINT Products



The **RXR6644**, is a quad-channel wideband tuner and digital receiver operating in the HF, VHF, and UHF bands between 100 kHz and 6 GHz. Its analog tuners and digital receiver motherboard are integrated in a rugged, conduction-cooled 6U VPX module. Leveraging the RF and digital assemblies common to the entire line of R6000 receivers, the RXR6644 reduces manufacturing costs and improves production. It is designed for use in embedded applications where size, weight, and power (SWaP) are important factors.

The RXR6644 is a member of the R6000 line of receivers from BAE Systems' Eclipse Signals Intelligence (SIGINT) products. BAE Systems has been developing and manufacturing high-performance tuners, digital receivers, time/frequency reference modules, antenna distribution modules and complete hardware suites for the SIGINT market for more than 20 years.

Key features and benefits

- Four wideband RF inputs per 6U 1 inch VPX slot improves channel density
- Increased tune range of each RF channel provides wider spectral coverage per VPX slot
- Maximum instantaneous IF bandwidth enables wider spectral coverage per RF channel
- 6U VPX form-factor offers more board space than 3U modules, supporting higher density FPGAs for back-end filtering and digital signal processing applications
- Up to three Xilinx Kintex Ultrascale 60 FPGAs may be populated on the receiver motherboard providing the system integrator a trade-off between module cost and considerable user-defined processing resources
- Sub-octave pre-selectors decrease intermodulation products, improving dynamic range and overall system performance
- Adherence to open standards such as VITA-65 OpenVPX, VITA-48 VPX REDI and VITA-67 blind-mate RF ensure interoperability with other sub-system components, reducing integration and life-cycle management costs

RXR6644 specifications

Radio frequency (RF)

Tuning frequency range	100 kHz to 6 GHz
RF tuning resolution	1 MHz via first LO
RF tune speed	Consult factory
Analog IF bandwidth	Selectable 80/10 MHz (80/40, 60/10, 60/40 MHz optionally available)
Input impedance	50 ohms
VSWR	Less than 2.5:1
Preselection 100kHz to 90 MHz	Bypass, 100 kHz-20 MHz, 20-30 MHz and 30-90MHz
90MHz to 6 GHz	Suboctave preselectors
Max input level	+ 24 dBm
Image rejection	> 80 dB
IF rejection	> 80 dB
LO re-radiation	< -90 dBm
Noise figure	14 dB typical (8 dB with pre-amp selected)
Third order intercept In-band of final IF (IIP3) Out of band	+ 3 dBm minimum, + 5 dBm typical +24 dBm minimum, +30 dBm typical at 0 dB attenuation, two tone
Second order intercept	+45 dBm minimum, +50 dBm typical
Single tone SFDR	> 83 dB with tone at -1 dBFS
Internal spurious	< -110 dBm typical
Coherency	Daisy chain distribution of first and second LOs for N channel

External reference

(Recommended minimum performance specifications)

Frequency	10 MHz +/- 5 PPM or better
Amplitude	0 dBm +/- 3 dBm
Harmonics	-20 dBc maximum
Non-harmonic spurious	-80 dBc maximum
Source VSWR	1.5:1 (reference to 50 ohms)

Digital specifications

Wideband data	16-bit real or 32-bit complex at selected sample rate
Filtered narrowband	16-bit IQ serial at sample rate determined by selected bandwidth
Output sample rate	Set by selected re-sampler (10, 80, 40 and 12.8 cMSPS)
Narrowband DDCs	32 narrowband DDCs each accessible by either RF channel (bandwidths >1.2 MHz may reduce this number)
Gain control	AGC and MGC modes Attenuation range 45 dB with 1 dB steps Fast attack Slow decay Freeze Dump-attack freeze Manual setting (MGC)
Demodulation	AM, FM, USB, LSB, CW OOK, uLaw or aLaw TDM output
Delay memory	250 MB per input channel
Sync I/O	Daisy chained distribution optional
Timing coherency	A/D sample coherency provided by LO daisy chaining

Mechanical/environmental specifications

Size	6U-160 VPX 1 inch pitch
Weight	3.6 pounds
Power	150 Watts minimum, 200 Watts maximum Power dissipation most highly determined by FPGA utilization
Cooling	Conduction cooled to siderails or air cooled
Operating temperature	System integrator must ensure rail temperatures remain between -20 and +70 degrees Celsius

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