Hedgehog
Multifunction, multichannel software-defined radio

Electronic Systems
Hedgehog multifunction, multichannel SDR

Hedgehog is a software-defined radio (SDR) designed for unprecedented agility, frequency range, and wide instantaneous bandwidth. Its radio frequency (RF) front-end is a collection of general-purpose Microwave Array Technology for Reconfigurable Integrated Circuits transceivers, or MATRICs™ transceivers, that can be reconfigured for integration into a variety of systems. Digitization and processing is provided by the Xilinx radio frequency system on a chip (RFSoC). This first integration of the MATRICs transceiver with an RFSoC delivers unrivaled tuning ability in a low size, weight, and power device. Its extremely agile frequency hopping capabilities provide endless functionality, and unique protection from hacking, jamming, and interception.

Rapid reconfiguration and on-the-fly adaptation

The reconfigurable hardware is less expensive and time consuming to develop than traditional application-specific chips, making it an ideal prototyping device for many different purposes across a multitude of platforms and missions, including communications, radar, electronic warfare, geolocation, and signals intelligence.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max # of Rx channels</td>
<td>4-8</td>
</tr>
<tr>
<td>Max # of Tx channels</td>
<td>4-8</td>
</tr>
<tr>
<td>Min Tx/Rx isolation</td>
<td>40 dB</td>
</tr>
<tr>
<td>Output data rate</td>
<td>112 – 224 Gbps</td>
</tr>
<tr>
<td>Reference frequency</td>
<td>20 – 200 MHz</td>
</tr>
<tr>
<td>Operating frequency range</td>
<td>20 MHz – 40 GHz</td>
</tr>
<tr>
<td>Instantaneous bandwidth per channel</td>
<td>2 GHz</td>
</tr>
</tbody>
</table>

Hedgehog module metrics

Key features and benefits

- Nanosecond switching times enable users to complete multiple functions more rapidly.
- Integration of RFSoC gives the ability to digitize signals at up to 2 GHz of instantaneous bandwidth per channel, improving situational awareness.
- Low phase noise frequency generators allow tuning from 0-40 GHz giving access to millimeter wave bands.
- Two form factors of the board are available with either 4 or 16 channels, permitting greater scalability.
- Low size, weight, and power form factor provides greater platform integration and functionality.

For more information contact:
BAE Systems
John Knag
T:  603 885 3748
E: john.knag@baesystems.com
W:  www.baesystems.com

The effort depicted is funded by the Defense Advanced Research Projects Agency (DARPA). The views, opinions and/or findings expressed are those of the author and should not be interpreted as representing the official views or policies of the Department of Defense or the U.S. Government.

Disclaimer and copyright
This document gives only a general description of the product(s) and service(s) and, except where expressly provided otherwise, shall not form any part of any contract. From time to time, changes may be made in the products or the conditions of supply.

BAE SYSTEMS is a registered trademark of BAE Systems plc. ©2019 BAE Systems. All rights reserved.
CS-19-A35-01-Hedgehog