

ThinkRF R5500

Real-Time Spectrum Analyzer

“Board-Level” Mechanical Integration Guide

The ThinkRF R5500 Real-Time Spectrum Analyzer is designed for OEM product integration. The R5500 board may be integrated into a larger OEM hardware product solution. This document sets out guidelines for the integration.

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Associated Documents

This document references the following associated mechanical assembly drawings:

- 39-0056_R5500-408B EMBEDDED_Rev-01.pdf

And the following mechanical design drawings and manufacturing files:

- 39-0056_R5500-408B EMBEDDED_Rev-01.pdf
- 23-0277_R5500 408B HEAT SPREADER_Rev-01.pdf
- 23-0277_R5500-408B HEAT SPREADER_Rev-01.step

Overview and Limitations

The base models of the R5500 family of products include the 100 MHz to 8 GHz R5500-408, the 18 GHz R5500-418 and the 27 GHz R5500-427. All of these base models have a receiver/digitizer printed-circuit board assembly (PCBA). The R5500 model also includes an additional down-converter PCBA.

ThinkRF typically provides the PCBAs within a chassis that is actively cooled by redundant blower fans. Cooling is achieved in that the receiver/digitizer PCBA is mounted and thermally connected to a machined heat-spreader. The heat-spreader is then cooled by air-convection via the fans in a manner such that the moving air does not enter the inside of the chassis.

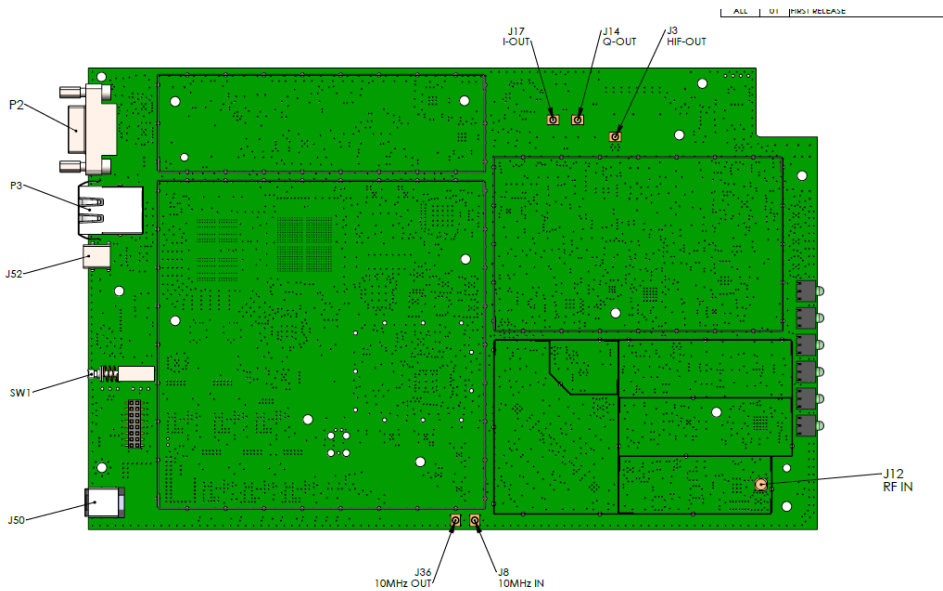


Figure 1: Board Level product

ThinkRF also provides a “board – level” product for mechanical integration and that is passively cooled. Figure 1 is an illustration of the board and figure 2 is an excerpt from the *33-0048_MOTHERBOARD CONNECTORS_REV-01_Rev-01.pdf* file and illustrates the connector layout on the board.



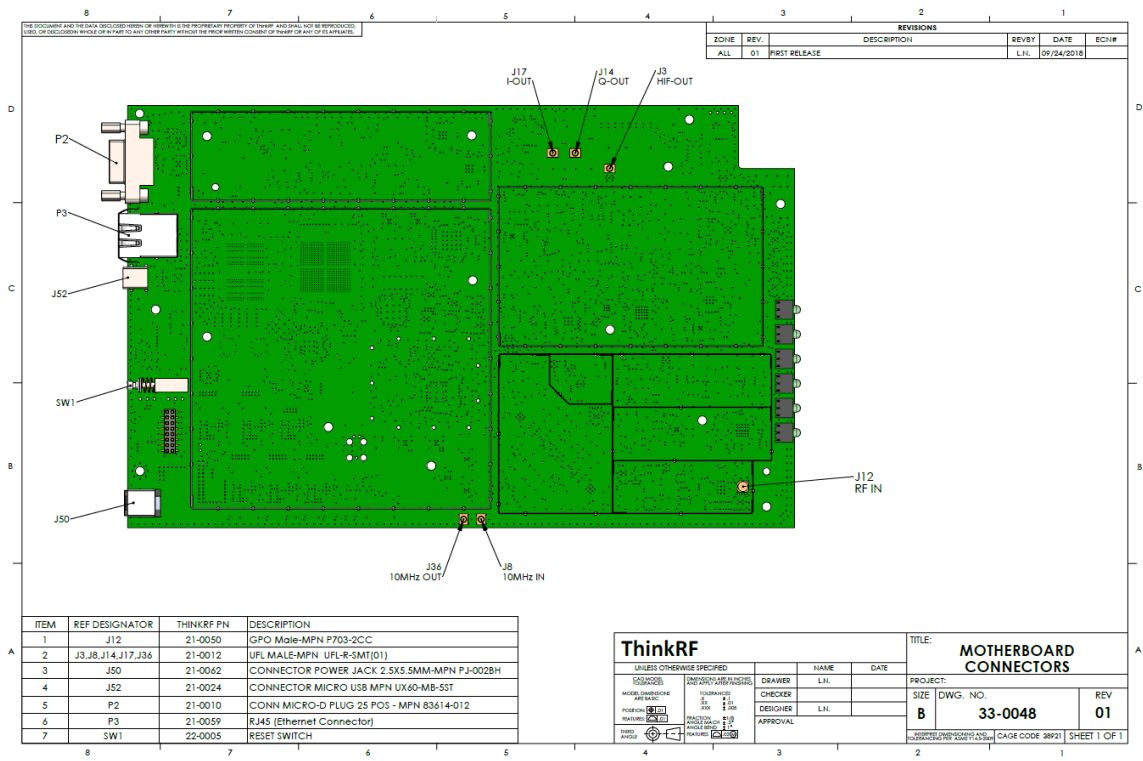


Figure 2: Connector layout and description

Importantly note that the passively cooled board only supports the receiver/digitizer PCBA and thus only supports the 100 MHz to 8 GHz R5500 base model configuration. The 8 GHz Preselection Filter (incorporated in the R5500P), and the 18 GHz and 27 GHz down-converter daughter-board PCBAs are not supported in the board level product.

Heat Dissipation Considerations

The R5500 embedded chassis is designed to appropriately deal with dissipation of the heat generated by the PCBA under normal operation. Any integration of the embedded chassis needs to respect these considerations.

Under normal operation the R5500 PCBA consumes and needs to dissipate approximately 15-20 watts of power. The R5500 is designed to dissipate this heat via conduction through its heat spreader top surface and without the need for integrated mechanical fans. It will dissipate heat adequately if it is appropriately located and/or mounted, whether on the desktop or in a rack, cabinet or enclosure, and done so with consideration of the manner in which it dissipates heat.

Heat sensors on the R5500's PCBA may be queried to ensure that the unit is operating



properly. The heat sensors can be queried via the R5500's web console at <http://ip-address/status.html>.

The heat sensors should read a PCBA surface temperature of approximately 60 degrees Celsius when the R5500 is being fully exercised (capturing data continuously), and is mounted appropriately considering heat dissipation, and the ambient air temperature around the chassis is 20 degrees Celsius. The PCBA surface temperature will rise proportionally with a rise in ambient air temperature and should be approximately 40 degrees Celsius above the ambient air temperature under normal operation. Under these circumstances, the R5500 is designed to operate in an ambient air temperature up to 50 degrees Celsius.

Mounting and Heat Dissipation

The R5500 board level product is designed to be mounted in a cabinet or enclosure. Do not mount the R5500 in exposure to direct sunlight.

Referencing "*39-0056_R5500-408B EMBEDDED_Rev-01.pdf*", "*23-0277_R5500 408B HEAT SPREADER_Rev-01.pdf*" the R5500 has an indication of suitable mounting holes.

Referring to the previous section, the R5500 uses a machined aluminum heat-spreader to conduct heat from the bottom surface of the PCBA.

When mounted in a rack, cabinet or enclosure, one must decide on whether to cool the R5500 by air convection across the heat spreader or via heat conduction by mounting the product such that the top surface of the heat spreader is next to an appropriate heat conducting surface.



R5500-408B Physical Dimensions

Figure 3 replicates the information from page 3 of “39-0056_R5500-408B EMBEDDED_Rev-01.pdf”.

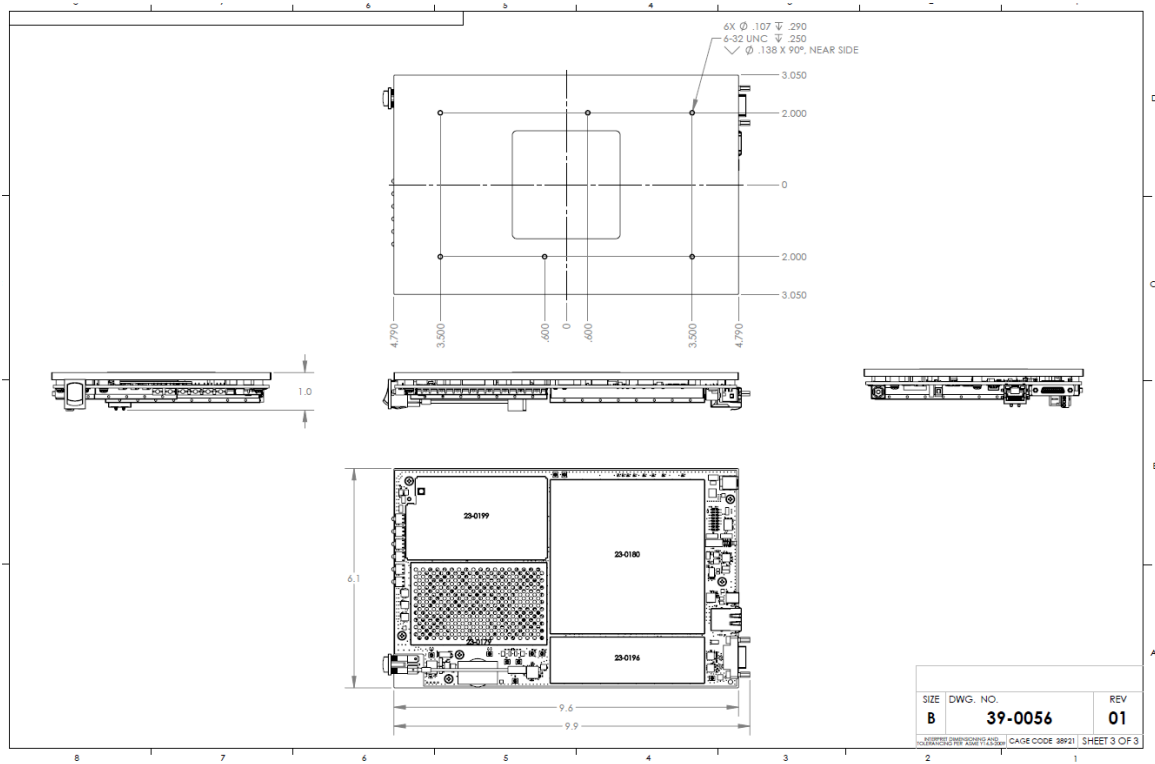


Figure 3: R5500-408B Physical Dimensions

Contact us for more information

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