Specification for a High Power RF Amplifier

Inputs (per amp):

- (1) RF input port. SMA, female socket (jack), 50 ohm impedance. Input power level to produce saturated output no less than –5 dBm and no more than +10 dBm.
- (1) GPIB or D-SUB connector for amplifier enable/disable**.**
    - If D-SUB connector is used, logic levels should be **TTL**.
- (1) 240V, 60 Hz AC power through NEMA L6-15R locking receptacle.

Outputs (per amp):

- (1) High-power RF output. N female socket (jack); minimum sustained 200 W CW per channel, 50 ohm impedance. Power levels shall not be capable of exceeding a sustained 250 W CW per channel.
- (1) Low power RF sample port. SMA, female socket (jack), 50 ohm impedance. Maximum power level should be in the range of 0 to 20 dBm.

Control Mechanism/Feedback:

- The amplifier should be capable of being enabled and disabled either through GPIB or TTL logic via the D-SUB connection.
- Low power RF sample port will provide analog feedback.

Form factor:

- This amplifier should be hosted on one 19” EIA rackmount card composing a maximum height of 3 units (5.25”), with a maximum depth of 25”.
- I/O ports may be included on the rear of the amplifier, but ideally should be placed on the front in a faceplate. This amplifier will be used in a weatherproof enclosure and does not need to be covered at all.
- Adequate heat sinks and forced air cooling should be included internally to keep the amplifier within acceptable operating temperature. Adequate external air-conditioning will be provided inside the main enclosure to remove up to 2350W from the enclosure. Two amplifiers will be used in each enclosure, and allowing for other heat-generating components, each amplifier should produce less than 1000W of heat.

Requirements:

- Each amplifier shall produce a sustained minimum of 200 W CW total output power, but less than 250 W CW.
- Amplifier must have protection against open and short loads.
- Amplifier will be driving reflective harmonic filters, so it must have protection against reverse power from the harmonics energy.
- RF specs:
    - BW of 2.8 – 3.8 GHz
    - Harmonic levels of less than –10 dBc.
- The amplifier shall provide a low power RF port for feedback to an external control system. A Schottky diode (or equivalent) should be used as a RF detector to convert this low power RF port to a DC voltage before sending it to the external control system. The Schottky diode must be included in this amplifier bid;

however, it may be internal to this amplifier or simply a standalone coaxial part. The Scottky diode specs:

Schottky detector:

This part converts the RF energy from the low-power RF sample port of the amplifier into a DC voltage.

a) *Quantity:* 4 (1 for each amplifier)

b) *Inputs:* (1) low-power RF input: SMA[*see note in (i) below], female socket (jack) **maximum** input somewhere in the range of 0 to 20 dBm, 50 ohms impedance.

c) *Outputs:* (1) DC voltage. SMA[*see note in (i) below], female socket (jack) with a **maximum** somewhere in the range of 100 mV to 5 V, high impedance load.

d) *Primary power:* None (passive device).

e) *Frequency range:* Input = 2.8 to 3.8 GHz, Output = DC voltage.

f) *Gain:* [no requirements]

g) *Spurious response*: [no requirements]

h) *Harmonics response:* [no requirements]

i) *Form factor:* Must be an in-line connection that can easily fit between two lengths of cable, without being much thicker than a standard SMA cable. If part comes with different connectors than listed above, appropriate adapters must be included in bid.

j) *Additional Requirements:*

- Gain flatness: <= +/- 1 dB.
- Minimum sensitivity of 0.4 mV/μW.
- Field replaceable diode preferred.

Option 1: A low-power reflected port (reverse power), and quantity 4 Schottky detector diodes (1 for each reverse power port) with the specs listed above.

Option 2: An option to buy spare internal DC power supplies along with a quote for a per-unit cost.

Option 3: If the high power RF amplifier is composed of a number of smaller amplifier sub-modules, then an option to buy spares of the amplifier sub-modules along with a quote for a per-unit cost.