



Department of Electrical Engineering  
Indian Institute of Technology, Delhi  
Hauz Khas, New Delhi 110016

NIQ no. IITD/EE/RP02235/source

Due Date: 7.4.2014, 5 PM

**Notice inviting quotations for  
a 40 GHz analog signal source**

Sealed quotations are invited for a 40 GHz analog signal source. The required specifications are given below. The purchase will be made through a two part bidding process. Technical and Financial bids have to be made separately. Complete technical information should be provided along with the Technical bid. Please refer to the last page on Terms and Conditions for details on how and when to submit Technical and Financial bids.

**Required Specifications**

1. The unit should have a frequency range from 100 kHz to at least 40 GHz.
2. A mechanical attenuator should be included within the unit to control the output amplitude level within a minimum range of -100 dBm to +5 dBm.
3. The error in the output level should be less than 1 dB.
4. Frequency accuracy: The output should be accurate to 0.1 ppm over a temperature range from 0°C to 50°C. The output frequency should not change more than 0.001 ppm after a day of continuous use.
5. Phase noise: The unit should have a phase noise lower than the following. All of the following are single-side-band phase noise measured at an offset of 20 kHz, over a bandwidth of 1 Hz.

Center frequency	Phase noise
100 MHz	$\leq -140$ dBc
1 GHz	$\leq -120$ dBc
10 GHz	$\leq -100$ dBc
40 GHz	$\leq -88$ dBc

6. Wideband noise: The unit should have wide-band noise lower than the following. All of the following are at maximum output power, measured over a bandwidth of 1 Hz at an offset of 30 MHz.

Output frequency	Noise
$15 \text{ MHz} \leq f \leq 6 \text{ GHz}$	$\leq -140 \text{ dBc}$
$6 \text{ GHz} \leq f \leq 20 \text{ GHz}$	$\leq -135 \text{ dBc}$
$20 \text{ GHz} \leq f \leq 40 \text{ GHz}$	$\leq -130 \text{ dBc}$

7. Harmonics in the output should be at levels less than -50 dBc for frequencies greater than 150 MHz.
8. It should be possible to have frequency and levels in a list and set them in a very short period of time. It should be possible to dwell at a given frequency for upto 1 milli-second.
9. The unit should be able to perform amplitude, frequency and phase modulation.
10. There should be a reference frequency of 10 MHz to which the unit should be able to lock to.
11. For remote control, the unit should be LXI/VXI or USBTMC compliant.
12. The RF output should be 2.4 mm type.
13. Warranty of 3 years.

## Terms and Conditions

1. Please submit the TECHNICAL and FINANCIAL bids in separate sealed envelopes. Mark the two envelopes clearly as “Technical Bid” and “Financial Bid” respectively. Both the sealed envelopes should be sent in a single sealed envelope, clearly marked as “Quotation for a 40 GHz analog signal source”. The quote should reach the following address on or before **7.4.2014, 5 PM**.

Dr. S. Chatterjee, IV-201  
Department of Electrical Engineering  
IIT Delhi, Hauz Khas  
New Delhi, 110016
2. Please quote prices for FOB and CIF, New Delhi, inclusive of all taxes and duties.
3. Quote should be in Indian Rupees for agents of Indian manufacturers, or in foreign currency, for agents of foreign manufacturers, and needs to be valid for at least three months.
4. Attach all the technical literature and a list of similar installations done in India.
5. If the quote is being submitted by a representative of the manufacturer, a valid agency-ship or dealership certificate authorizing the agent to quote to IIT Delhi on behalf of the manufacturers should be enclosed.
6. Either the Indian agent on behalf of the principal/OEM, or the principal/OEM can bid, but both cannot bid simultaneously.
7. Complete set of manuals for the operation of the equipment should be given.
8. Clearly specify the installation requirements - such as space, power, frequency, environment etc.
9. If the item quoted is proprietary in nature, please enclose proprietary certificate from the principals stating, “Certified that \_\_\_\_\_ is a proprietary item of M/s \_\_\_\_\_ and no other manufacturer makes this item.”
10. Please attach a signed and stamped compliance chart for the specifications. The format of the compliance chart is attached to this document.
11. Please specify all of your terms and conditions clearly, including delivery period.
12. Mode of payment for purchases in foreign currency are through irrevocable letter of credit, or preferably, **through wire transfer on delivery**. Only bank charges within India are payable by IIT Delhi, all bank charges outside India are the responsibility of the seller. For purchases in INR, payment is on delivery.
13. The Institute reserves the right to accept or reject any or all quotations without assigning any reasons thereof.

**Prof. B. Bhaumik**  
(Chairperson, purchase committee)