TECHNICAL SPECIFICATIONS

A. Application

IPR requires a millimetre wave (W-band) trans-receiver subsystem that shall be used for density fluctuation measurements in tokamak plasma. The W-band trans-receiver subsystem shall have an operating frequency of 90 GHz and an output power of +15 dBm and their associated power supplies and peripheral subassemblies.

B. Specifications

(The Vendor is requested to provide the quantitative values of the asked parameters rather than writing OK/Comply/Yes etc.)

Sr.No.	Parameter	Specification
1.	Transmitter Frequency (GHz)	90
2.	Transmitter Power (dBm)	+15
3.	Receiver Frequency (GHz)	90 ± δ
	δ (Any fixed frequency within, MHz)	100 to 600
4.	Phi (deg)	0 to 180 ° or better
5.	Antenna gain (dB)	23 or better
6.	Low noise amplifier gain (dB)	≥ 20
7.	Low noise amplifier Noise figure (dB)	6 or better
8.	Continuous Variable attenuation / Gain control (dB)	≥ 30
9.	Band pass filter centre frequency (MHz)	600
10.	Output signal (I/Q)	1 Vpp @ 50ohm
11.	IQ Frequency (Any fixed frequency within)	>100 KHz
12.	Output Connectors at the IQ detector	SMA (F) / BNC
13.	Delivery Period	Within 8 months
14.	Warranty/Guaranty	1 year (min)
15.	**Mandatory Spares**	1 MIXER -2 * (Qty : 02 No's) 2 IF LNA * (Qty : 01 No's) *Ref. to circuit Layout attached.
16.	**Standard Accessories**	Vendor should quote for all the accessories i.e., microwave/RF components, inter-connecting waveguides and cables required for system operation, testing and maintenance.
17.	Enclosure	The complete system should be enclosed in a 19" rack mountable

		metal enclosure with provision for connecting a grounding cable so as to avoid interference to the system from external noise sources.
18.	Indicators	The instrument subsystem (its assemblies) should be self-contained and incorporate indicators or status output signals
19.	**POWER SUPPLIES** • The complete subsystem must operate on 230 V AC. • No other power supplies must be required to operate the subsystem i.e. All the necessary DC power supplies required for the operation of all the active components of the system like Oscillators, Amplifier, LNAs, Multipliers, Quartz oscillators etc. must be included.	
20.	**DOCUMENTS REQUIRED** along with the sub system: • Complete specifications of ALL the components along with all the original datasheets and test reports should be provided. All components means including but not limited to Oscillators, Crystal oscillator, amplifiers, multipliers, attenuators, balanced mixer, SSB mixer, IQ mixer, LNAs etc. • Operation / Service manuals must be provided.	

C. Schedule

[1] Vendor should submit the design details along with drawing within 15 days from PO received.
[2] IPR will give the comments/acceptance of the drawing within 15 days after receiving it from the vendor.
[3] After the acceptance of drawing from IPR, vendor can start the fabrication.
[4] The delivery of the system should be within 7 months from the date of approval of drawing.
[5] Proper packing should be done for the shifting of instrument from vendor/factory site to IPR.

D. Pre-despatch tests

The vendor has to submit the following test reports to IPR once they complete the work of system assembly, integration and characterization. Based on these test reports, IPR shall issue a dispatch clearance to the company so that they can ship the consignment to IPR.
The vendor has to submit the following test reports to IPR once they complete the system assembly and integration. The report has to have the following tests

Sr.	Parameter	Specification

No.		
1	System Output Frequencies a) Source 1 b) Source 2 c) δ (Any fixed frequency within)	 90 GHz 90±δ GHz 100 to 600 MHz
2	System Output Power a) Source 1 b) Source 2	 + 15 dBm + 15 dBm
3	Output signal (I/Q)	1 Vpp @ 50 ohm

E. Acceptance tests at IPR

IPR representative shall verify the technical specifications compliance as well as the pre-dispatch tests generated by the vendor at IPR before the acceptance of the system.

Sr. No.	Parameter	Specification
1	System Output Frequencies d) Source 1 e) Source 2 f) δ (Any fixed frequency within)	 90 GHz 90±δ GHz 100 to 600 MHz
2	System Output Power c) Source 1 d) Source 2	 + 15 dBm + 15 dBm
3	Output signal (I/Q)	1 Vpp @ 50 ohm

F. Warranty

Minimum one year from the date of acceptance

Date :- **Bidder's Sign and Seal**