



प्रसार भारती
(भारत का लोक सेवा प्रसारक)

कार्यालय: अपर महानिदेशक अभियन्ता (उ.क्षे.)
आकाशवाणी एवं दूरदर्शन

आठवां तल, सूचना भवन, सी.जी.ओ. कॉम्प्लेक्स, नई दिल्ली 110003

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E-Mail dirpur@gmail.com

दिनांक: 08.07.2024

Subject: Supply of 100W Digital compatible VHF FM Solid States MOSFET technology based broadcast PA cum transmitter at AIR Ukhimath & AIR Bhatwari

1. Bidders are requested to offer their feedback on the **Draft Tender** Specification of the upcoming tender.
2. Bidders are requested to provide information about percentage of Make in India content in the proposed requirement as per latest and updated DPIIT guidelines.
3. Bidders are requested to submit budgetary quote of the proposed requirements.
4. Bidders are requested to submit the above detail on or before due date by e-mail to dirpur@gmail.com or at following address.

R.K. Singh
Assistant Director (Engg.)
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Specification for: Supply of 100W Digital compatible VHF FM Solid States MOSFET technology based broadcast PA cum transmitter at AIR Ukhimath & AIR Bhatwari.

Due Date to offer Comments: 13.07.2024

Enclosed:

1. Budgetary Quotation form for Supply of 100W Digital compatible VHF FM Solid States MOSFET technology based broadcast PA cum transmitter at AIR Ukhimath & AIR Bhatwari.
2. Specification for Supply of 100W Digital compatible VHF FM Solid States MOSFET technology based broadcast PA cum transmitter at AIR Ukhimath & AIR Bhatwari.

R.K. Singh

Assistant Director (Engg.)
For Add. Director General (NZ)

**Technical Specifications
for
Supply of 100 W VHF FM Solid-State MOSFET Technology Based Power Amplifier
for 100 W FM Broadcast Transmitter**

1.INTRODUCTION:

This Specification is for **Supply of 100 W RF VHF FM Solid-State MOSFET Technology Based Power Amplifier for 100 W FM Broadcast Transmitter** to be installed at AIR Stations under North Zone.

2.TECHNICAL SPECIFICATIONS :

2.1 RF Power Amplifier (PA):

2.1.1 The Power Amplifier (PA) should be an integral part of the 100 W Digital Compatible VHF FM Solid-State MOSFET technology based Broadcast Transmitter. The Power Amplifier (PA) shall be of wide band design for operation in the entire VHF frequency band of 88 MHz to 108 MHz without tuning / change of components. The PA shall be rugged in design and will consist of MOSFET device incorporated in a separate amplifier board. The PA shall be provided with RF monitor located on Front Panel to monitor output RF Power.

2.1.2 The PA shall have built in protection against high Reflected Power (Short and Open loads). PA shall also be protected against, over current, over temperature, overdrive and airflow failure.

2.2 Protection System:

Adequate protection system should be provided to safe guard the system from damage under fault conditions. The protection system should be fast acting to safe guard the system and components. Following are the typical requirements in this regard:

2.2.1 Protection against over loads, transients, severe fluctuation/variation in power supply, any other malfunctioning etc. for transmitter.

2.2.2 Protection against over temperature on heat sinks.

2.2.3 Protection against blower failure and less volume of cooling air.


2.2.4 Protection against high VSWR including open and short conditions at output.


2.2.5 Immediate power fold back under severe/damaging fault conditions of VSWR and temperature. The power of transmitter should automatically come down to a suitable safe

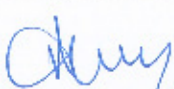
3. TECHNICAL PARAMETERS OF THE 100 W RF POWER AMPLIFIER FOR A 100 W FM TRANSMITTER:

3.1 GENERAL:

3.1.1	Frequency Range	88 MHz to 108 MHz
3.1.2	Nominal Frequency deviation	±75 kHz (peak)
3.1.3	Maximum Frequency Deviation	±100 kHz (peak)
3.1.4	Frequency Setting	Direct from front panel in 10 kHz steps
3.1.5	Class of Emission	180KF8E
3.1.6	Stereo transmissions	Pilot tone system
3.1.7	Pre-emphasis	0, 50 µs (selectable).


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राजेश कुमार / Rajesh Kumar
उप महानिदेशक (प्रशा.) / DDG (Admin.)
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3.2 INPUTS

3.2.1	Modulating input signal	Exciter should accept Analog Mono, Analog Stereo (left and right) AES/EBU. It should be capable for Mono and Stereo Broadcast using pilot tone system.
3.2.2	Input impedance (Analog)	10 k Ω or greater (for Mono) 10 k Ω or greater (for Stereo)
	Input Impedance (AES/EBU)	110 Ω
3.2.3	Analog and AES/EBU input Level for ± 75 kHz (peak) Deviation	ANALOG AUDIO INPUT: Input Level Adjustable from -6 dBu to +6 dBu. AES/EBU AUDIO INPUT: Input Level Adjustable from -12 dBFS to 0 dBFS

3.3 RF OUTPUT

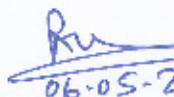
3.3.1	Output power (RF)	≥ 100 W (Max. 110 W)
3.3.2	Output Impedance	50 Ω . (Unbalanced)
3.3.3	Output connector	N (F) connect (Rear)
3.3.4	Permissible VSWR	a. 1.5: 1 with full power (auto shutdown at >1.8); b. Automatic power reduction beyond 1.5:1. Details of power fold back characteristics to be provided by the tenderer. c. Transmitter should be protected for short and open circuit conditions.
3.3.5	Harmonic and Spurious Signal Suppression.	Within the limits as per Radio Regulations & ITU-R Recommendations. The actual values are to be indicated.
3.3.6	Maximum Frequency Tolerance	As per ITU-R
3.3.7	Synchronous AM S/N Ratio referenced to 100% AM modulation at 400 Hz, 50 μ s Pre-emphasis with FM modulation at ± 75 kHz deviation.	Better than 50 dB
3.3.8	Asynchronous AM S/N Ratio unweighted, referenced to 100% AM modulation at 400 Hz, 50 μ s Pre-emphasis and without FM modulation.	Better than 60 dB
3.3.9	Overall efficiency	≥ 55 %

3.4 MONO OPERATION:

3.4.1	FM S/N Ratio at ± 75 kHz Deviation (30 Hz to 15 kHz), rms, unweighted	Better than 70 dB
3.4.2	Total Harmonic Distortion plus Noise (THD+N)	Better than 0.2 %
3.4.3	Amplitude response (30 Hz to 15 kHz)	Better than ± 0.2 dB
3.4.4	Inter Modulation Distortion (IMD) SMPTE(60 Hz/7 kHz, 4:1)	Better than 0.1 %

3.5 STEREO OPERATION:


3.5.1	Stereo Separation (30 Hz to 15 kHz)	Better than 50 dB
3.5.2	Linear Cross Talk referred to 100% modulation (30 Hz to 15 kHz)	Better than 50 dB


06-05-2024

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कार्यालय अवर महानिदेशक (अभि.) (उ.सेवा) / O/o ADG (E) (N.Z.)


6/5/2024
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Akashvani & Doordarshan, 8th Floor, Sochra Bhawan, CGO Complex, New Delhi-110003

3.5.3	Non-linear Cross Talk referred to 100 % modulation	Better than 50 dB
3.5.4	FM S/N Ratio at ± 75 kHz Deviation (L or R) (30 Hz to 15 kHz) rms, unweighted	Better than 70 dB
3.5.5	Total Harmonic Distortion Plus Noise (THD + N) (L or R)	Better than 0.2 %
3.5.6	Inter Modulation Distortion IMD SMPTE (L or R) (60 Hz/7 kHz, 4:1)	Better than 0.1 %
3.5.7	Amplitude Response (L or R) (30 Hz to 15 kHz)	Better than ± 0.2 dB
3.5.8	Pilot Tone Stability	As per ITU-R Rec.

3.6 WIDEBAND COMPOSITE OPERATION:

3.6.1	FM S/N Ratio at ± 75 kHz deviation, rms, unweighted 30 Hz to 15 kHz	Better than 70 dB
3.6.2	Total Harmonic Distortion Plus Noise (THD+N) 30 Hz to 15 kHz	Better than 0.2 %
3.6.3	Amplitude response (30 Hz to 80 kHz)	Better than ± 0.5 dB

3.7 POWER SUPPLY INPUT:

3.7.1	Operating voltage	AC Single Phase : 230 Volts ± 10 %
3.7.2	Frequency	50 Hz ± 4 %

3.8 AMBIENT/ENVIRONMENTAL CONDITIONS:

3.8.1	Temperature	0 °C to 45 °C
3.8.2	HAMSL	Max upto 3500 m from mean sea level
3.8.3	Relative Humidity	Max. 95% non-condensing

4. BILL OF MATERIALS (BOM):

Sl.No.	Items	Quantity	Consignee
1	100 W RF Power Amplifier Unit MOSFET Technology based for FM Transmitter	4	DE/DDE, All India Radio, Dehradun

5. PRE-DISPATCH INSPECTION AND MEASUREMENT REPORT:

The agency/supplier will manage for pre-dispatch inspection and measurement report of the Power Amplifier Unit along with its all accs. Items at the factory/lab of the agency/supplier at the cost of the agency/supplier through the authorized engineer of All India Radio (Akashvani) Office immediately after receipt of the supply order. Necessary action shall be taken by the O/o ADG(E-NZ), All India Radio (Akashvani) & Doordarshan Office, New Delhi to send the engineer for the pre-dispatch inspection and measurement at the work place (factory/lab) of agency/supplier. The cost related to the tour/visit of the engineer from the All India Radio (Akashvani) shall be borne by the All India Radio (Akashvani) Office.

6. TECHNICAL MANUAL:

A technical manual of the Power Amplifier system with details of the modules, circuit diagram, testing and measurements, troubleshooting, technical spares etc. may be provided 2 sets along with each unit for the operation and technical maintenance purpose.

7. LIST OF THE RECOMMENDED TECHNICAL SPARES AND QUOTATION:

Module and item-wise details may be given.

8. GENERAL TERMS AND CONDITIONS:

8.1 CATEGORY OF PRODUCTS: Make in India products.


8.2 EXPERIENCE: Minimum 5 years experience in broadcasting equipments supply and dealing.


8.3 WARRANTY: 2 Years from date of supply of the items at the site.

8.4 PERFORMANCE BANK GUARANTEE: 5% of the tender's agreement (order cost) value, may be released after the warrantee.


06.05.2024
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6/5/2024
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BILL OF MATERIAL (BOM)

Sl. No.	Description of items/works	Qty.	Make & Model	Unit	Unit Price	Amount	GST	Total Amount
1.	100 W RF Power Amplifier Unit MOSFET Technology based for AM Transmitter FOR DE/DDE, All India Radio, Dehradun (UK).	4 Nos.						

