

# **FM TRANSMITTERS TESTS**

- FACTORY TESTS**
- SITE TESTS**

**I. FACTORY TEST (on dummy load)**

**TX s.n.....**  
**Exciter no.....(s.n.....)**  
**Date.....**

## **1.PERFORMANCE**

### **A) OPERATING FREQUENCY**

**Carrier stability: \_\_\_\_\_ better than +/-150Hz**

**Pilot tone stability: \_\_\_\_\_ kHz (19 kHz  $\pm$  1 Hz)**

### **B) FREQUENCY RESPONSE**

**LIMIT: WITHOUT PRE –EMPHASIS: WITHIN  $\pm$  0.2 dB  
0 dB REF LEVEL = 400 Hz @ 75 kHz DEVIATION**

<b>Freq.</b>	<b>Tx @ 75 kHz</b>		
	<b>WITHOUT PRE- EMPHASIS</b>		<b>WITHOUT PRE- EMPHASIS</b>
	<b>LEFT CHANNEL</b>	<b>RIGHT CHANNEL</b>	<b>MONO</b>
30 Hz			
60 Hz			
125 Hz			
1 kHz			
2 kHz			
6 kHz			
10 kHz			
12 kHz			
15 kHz			

**LIMIT:**

**WITH PRE -EMPHASIS: WITHIN  $\pm 0.2$  dB  
0 dB REF LEVEL = 400 Hz @ 75 kHz DEVIATION**

Freq.	Tx @ 75 kHz		
	WITH PRE- EMPHASIS		WITH PRE-EMPHASIS
	LEFT CHANNEL	RIGHT CHANNEL	MONO
30 Hz			
60 Hz			
125 Hz			
1 kHz			
2 kHz			
6 kHz			
10 kHz			
12 kHz			
15 kHz			

### **C) STEREO CROSS TALK**

LIMIT: 30 Hz TO 15 kHz: Linear - BETTER THAN 50 dB  
NonLinear - BETTER THAN 55 dB

FREQUENCY	Tx @ 75 kHz	
	LEFT TO RIGHT	RIGHT TO LEFT
30 Hz		
60 Hz		
125 Hz		
400 Hz		
1 kHz		
2 kHz		
6 kHz		
10 kHz		
12 kHz		
15 kHz		

## D) THD

LIMIT: <0.05% @ 75 kHz DEVIATION

	Tx @ 75 kHz		
FREQUENCY	STEREO		MONO
	LEFT	RIGHT	
30 Hz			
60 Hz			
125 Hz			
400 Hz			
1 kHz			
2 kHz			
6 kHz			
10 kHz			
12 kHz			
15 kHz			

LIMIT: 0.05% @ 100 kHz DEVIATION

	Tx @ 100 kHz		
FREQUENCY	STEREO		MONO
	LEFT	RIGHT	
30 Hz			
60 Hz			
125 Hz			
400 Hz			
1 kHz			
2 kHz			
6 kHz			
10 kHz			
12 kHz			
15 kHz			

## E) INTERMODULATION DISTORSION

LIMIT: better than 0.2%      USING 60Hz/7 kHz TONES,  
4:1, +4dBu

STEREO		MONO
LEFT	RIGHT	
%	%	%

## F) SIGNAL TO NOISE RATIO

LIMIT : BETTER THAN 80 dB (weighted)  
0 dB REF LEVEL = 400 Hz @ 75 kHz DEVIATION RMS DETECTOR

	STEREO		MONO
	LEFT	RIGHT	
WEIGHTED			

## G) AM NOISE

LIMIT: ASYNCHRONOUS: BETTER THAN 55 dB/ Pilot OFF

SYNCHRONOUS: BETTER THAN 50 dB/ Pilot ON

0 dB REF LEVEL = 400 Hz @ 75 kHz DEVIATION

<b>ASYNCHRONOUS</b>	<b>dB</b>
<b>SYNCHRONOUS</b>	<b>dB</b>

## H) HARMONICS AND SPURIOUS OUT OF BAND EMISSION:

(30-87,5 MHz and 137MHz-1GHz)

LIMIT: BETTER THAN 70 dBc

HARMONIC	LEVEL
2 <sup>nd</sup>	
3 <sup>rd</sup>	
4 <sup>th</sup>	
5 <sup>th</sup>	
6 <sup>th</sup>	
7 <sup>th</sup>	
8 <sup>th</sup>	
9 <sup>th</sup>	
10 <sup>th</sup>	

SPURIOUS (frequency)	LEVEL

**I) SPURIOUS EMISSION IN BAND 87,5-137 MHz:**

LIMIT: better than 85 dBc, tx power=10kW  
better than 82 dBc, tx power= 5kW

SPURIOUS (frequency)	LEVEL

**2.METERING**

**A) FWD AND REFLECTED POWER METERING**

<b>FWD PWR</b>		<b>kW</b>
<b>REFL PWR VSWR</b>		<b>W</b>

**TOTAL OPERATING      P.A. CURRENT      .....AMPS**  
**P.A. VOLTAGE      .....VOLTS**

**B) DIAGNOSTIC METERING**

**-to be detailed by supplier according with transmitter architecture for:**

- 1) CURRENTS**
- 2) VOLTAGES**
- 3) TEMPERATURES**



### C) DRIVE

	<b>EXCITER</b>
FWD POWER	WATTS
REF PWR	WATTS
PA	AMPS
PA	VOLTS

### D) POWER CONSUMPTION

**-to be detailed by supplier according with transmitter architecture**

Line 1 \_\_\_\_\_ Volt      Line 1 \_\_\_\_\_ Amps      Line 1 \_\_\_\_\_ Watts  
Line 2 \_\_\_\_\_ Volt      Line 2 \_\_\_\_\_ Amps      Line 2 \_\_\_\_\_ Watts  
Line 3 \_\_\_\_\_ Volt      Line 3 \_\_\_\_\_ Amps      Line 3 \_\_\_\_\_ Watts

TOTAL POWER \_\_\_\_\_ Watts

## **3. ELECTRICAL AND MECHANICAL CHECKS**

- 1. Check for full compliance with technical specification requested.**
- 2. Check of the main parameters stability for the maximum variation of the input voltage.**
- 3. Check of the main parameters in case of switch-off of one , or more power amplifiers .**
- 4. Check of the protections.**
- 5. Check of the main parameters at different operating frequencies.**
- 6. Check of the monitoring equipment.**
- 7. Check for operating RDS System**
- 8. General mechanical checks.**

#### **4. HEAT RUN TEST**

The transmitter will be modulated during 24 hours with audio program on antenna system

<b>Time</b>		<b>Incident Observed</b>

Pass / fail criteria.

After the heat run test check for excessive temperature rise.

#### **5. ACOUSTIC NOISE**

Limit: 65 phones

A compliance certificate will be issued by the producer.

#### **6. PERMISSIBLE ELECTRIC STRAY FIELD STRENGTH**

Limit: less than 10 V/m measured at 1 m in front of the transmitter, during normal operation

A compliance certificate will be issued by the producer.

#### **7. PERMISSIBLE MAGNETIC STRAY FIELD STRENGTH**

Limit: less than 4 A/m measured at 1 m in front of the transmitter, during normal operation

A compliance certificate will be issued by the producer.

**Customer signature**

**Supplier signature**

## **II. SITE TESTS (on dummy load)**

**TX s.n.....**  
**Exciter no.....(s.n.....)**  
**Date.....**

All tests listed under factory tests procedure to be repeated except steps 4 to 7.

**NOTE: IT IS MANDATORY AS THE TENDER TO CONTAINES A DETAILED  
“ACCEPTANCE TESTS PROTOCOL” INCLUDING THE INDIVIDUAL  
PROCEDURE AND TEST EQUIPMENTS USED TO MEASURE AND TESTING  
EACH PARAMETER AND FUNCTIONALITY OF THE TRANSMITTERS.**

### **2 TESTING OF ACCESSORIES**

The associated equipment like Dummy Load shall be tested and inspected as per mutually acceptable Acceptance Test Protocols at the manufacturer’s works as well as at the site.