GME1F32

FM 300W Integrated Transmitter Manual

1.Overview

This product has a simple structure, excellent performance, stable operation, easy maintenance, and the following outstanding features:

1) Adopting fully digital processing encoding and modulation technology, suitable for mass production, with good consistency and stable indicators.

2) The motherboard adopts a brand new direct RF output architecture, with excellent performance, simple and fast frequency adjustment, and good frequency consistency throughout the entire FM frequency band.

3) The FM radio transmitter adopts a brand new full broadband loop scheme, which has precise power detection (power detection error ± 10%, typical value ± 5%) and loop control function throughout the entire FM frequency band.

4) Adopting touch screen display and input operation, the operation is intuitive and simple.

1.1 Complete machine function description

1) Rated output power of FM radio transmitter is 300W;

2) Supports the following FM radio operating modes:

a) Single tone broadcasting;

b) Stereo broadcasting;

c) 3D vocal cord supplementary program broadcasting;

d) Frequency modulation data broadcasting (RDS or SCA). Customization required

3) Supports operating frequency range of 87MHz~108MHz;

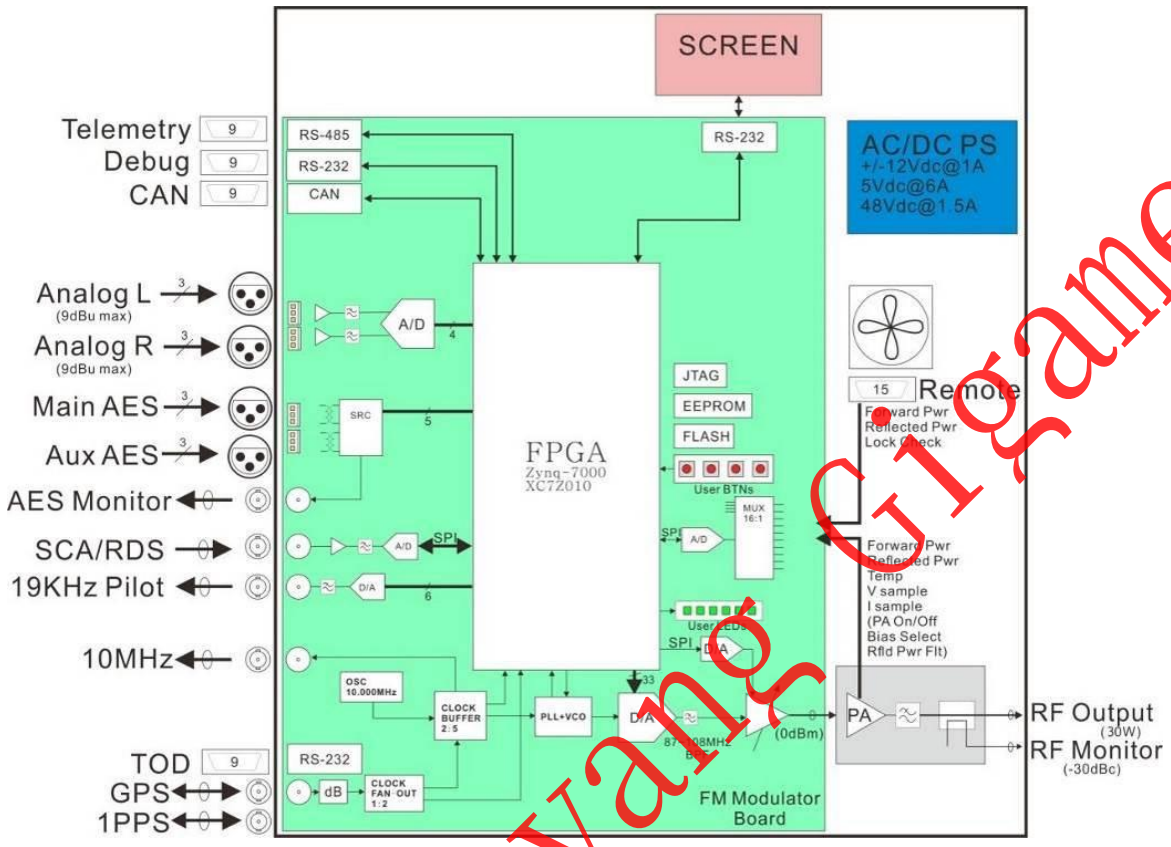
4) Support manual and automatic switching between internal reference clock and external 10M reference clock;

5) Supports analog L/R input, 2-channel AES/EBU input, and manual and automatic switching; Customization required

6) Support AES/EBU monitoring output (to be specified in advance);

8) Supports SCA/RDS input and 19kHz pilot output

1.2 The principle diagram of 300w transmitter



2. Structure and Interface

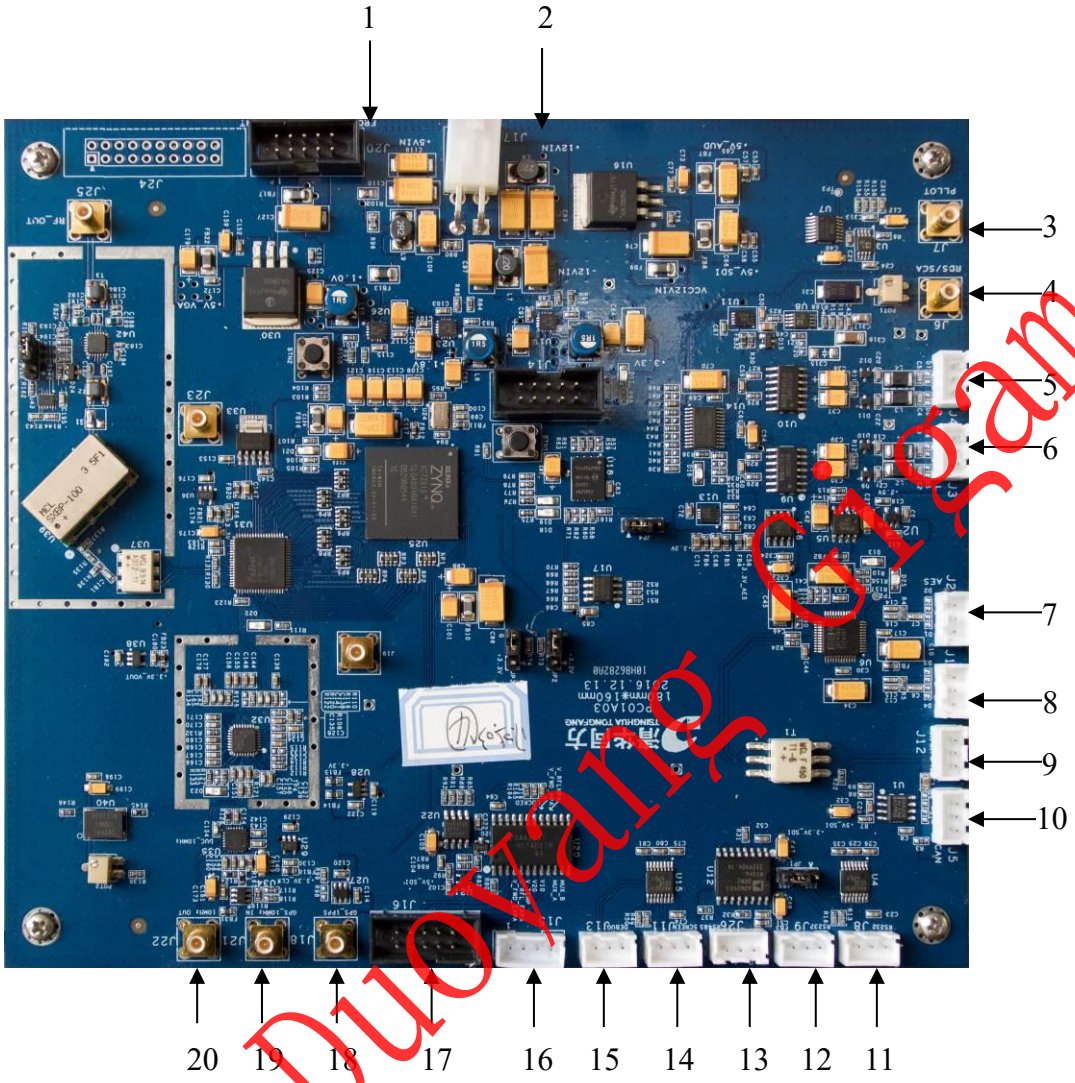
No.	Indicator	Function
1	System alarm	Red：there is some faults of transmitter,you can check on screen.
2	interlock	red：the transmitter is locked
3	power	yellow：the transmitter power is normal
4	RF output	green：RF output is normal
5	System clock unlock	red：system clock is unlocked
6	debug	For debugging the transmitter
7	Touch screen	For user control the transmitter
8	Power switch	ON/OFF

2.1 Back panel of transmitter

Figure 3,the back-panel of 300w FM transmitter

No.	Note	Function
1	AC 220V	AC170~240V，50~60Hz
2	RF output	N Female，Output Impedance 50Ω
3	RS485	Management, configuration, remote control, monitoring、RS485/232，DB9 male（DB9_2：RS485_A/RS232_RXD；DB9_3：RS485_B/ RS232_TXD；DB9_5: Ground）
4	L	XLR female，600Ω balance
5	R	XLR female，600Ω balance

2.2 Encoding Board



No.	Number	Function
1	J20	LED
2	J17	DC Input
3	J7	19KHz pilot output
4	J6	SCA/RDS input
5	J4	Left input
6	J3	Left input
7	J2	Right input
8	J1	Right input
9	J12	AES LOOP

10	J5	CAN BUS
11	J8	RS232
12	J9	RS232
13	J26	RS485
14	J11	RS232 LCD
15	J13	RS232 DEBUG
16	J15	Analog Data
17	J16	Analog Data
18	J18	1pps input
19	J21	10MHz input
20	J22	10MHz output

2.3 PA Module

2.3.1 Technical parameters

1) Frequency: 87MHz~108MHz
2) Power output: 330W
3) Power Gain: ≥54dB(±0.5)
4) Out of band stray:-60dBc
5) In-band flatness: <1dB
6) Load adaptability: 1 minute open circuit test at full load, power amplifier works normally
7) Input and output impedance 50Ω
8) DC: 50V
9) Range of input amplitude: 0dBm±1dB (87-108MHz)

2.3.2Main structure and control protection functions

1) To ensure sufficient gain and power output capability, this power amplifier adopts two-stage amplification, consisting of a 12V powered preamplifier transistor and a 50V powered final field-effect transistor connected in series. The post filter ensures the spurious requirements of the signal. After the filter, a planar coupler is used to sample the forward and reverse power signals, providing voltage signals for power detection and sampling signals for high standing wave protection.

2) This amplifier provides temperature protection external interface: TEMP。 The interface provides temperature indication voltage. When the temperature is greater than 70 ℃, the output voltage is greater than 1.1V. At this time, the CTRI control port needs to provide a high level to achieve overheating protection.

3. Technical parameters

3.1 Parameters

Dimension	500mm(L)*480mm(W)*132mm(H)
Weight	15kg
Temperature	0℃~45℃
relative humidity	≤95%
Atmospheric pressure	86kPa~106kPa

3.2 Electrical parameters

Power supply	170~240VAC，50~60Hz
RF Output	L29-K(DIN7/16),output impedance 50Ω
RF Monitor	BNC-K, Output Impedance50 Ω , <RF output-30dBc
L/R Input	Input Impedance 600Ωbalance，MAX 8dBu
AES Input	Input Impedance 110Ωbalance，AES/EBU
SCA/RDS Input	Input Impedance 10kΩunbalance，MAX 4Vpp

3.3 Technical parameters

General	
Output	0~300W（MAX330W）
Frequency	87~108MHz，1KHz step
Accurate of Frequency	±100Hz

Frequency stability	10^{-6}
Residual radiation	<-65dB
Parasitic amplitude modulation noise	<-60dB
Pilot frequency deviation	±0.05Hz
38kHz residual component in S signal	<-60dB
frequency offset	0~100kHz
pre-emphasis	0~50us
monophonic broadcasting	
Signal to Noise Ratio	>75dB（RMS，50us aggravation, deduplication，75kHz offset）
Frequency response	±0.05dB（No aggravation, no deduplication） ±0.1dB（50us aggravation，50us deduplication）
Distort（THD+N）	<0.05%
Stereo broadcasting	
Signal to Noise Ratio	>75dB（RMS，50usaggravation, deduplication，75kHz offset）
Frequency response	±0.05dB（No aggravation, no deduplication） ±0.1dB（50us aggravation，50us deduplication）
Distort（THD+N）	<0. 5%
Separation degree of left and right channels	>50dB

3.3 Working Status

1) AES input: When the current audio source is selected as AES1 (digital audio signal 1) or AES2 (digital audio signal 2), the feedback AES status is displayed as "normal" or "abnormal". If AES status cannot be detected, display "--";

2) Interlock status: Feedback the status of the primary and backup machine interlock, displaying "locked" or "unlocked";

3) Temperature status: Feedback whether the temperature is overheated, displaying "normal" or "abnormal";

4) Loop status: Feedback the current loop status, displaying "abnormal" in overload or protection states, and "normal" in other states;

5) Display the current and voltage of the amplifier, with current unit in A and voltage unit in V.

3.4 Set Menu

1) Buttons 1-5 are page jump buttons that redirect to the corresponding settings interface. For example, pressing "RF Settings" will redirect to the RF settings interface.

2) Return button, return to the homepage.

3.5 Input set

1) Encoding mode options: Choose between mono output or stereo output.

2) Audio source options:

1) L/R - Manual selection input is L/R audio

2) AES1, AES2- The manual selection input is AES1/AES2 audio,

3) AUTO - Automatically select L/R or AES1. If AES1 is normal, prioritize AES1. If AES1 has no signal, switch to L/R.

4) Switch between secondary channel, SCA and RDS, OFF to close the secondary channel.

Input Settings Page 2:

1) Pilot switch button, switch pilot;

2) Pre emphasis selection: choose whether to enable pre emphasis, 0- do not use, 50 US - use;

3) Frequency offset setting input box: Set audio frequency offset parameters within the range of 0-100KHz. The default factory frequency offset setting is 75KHz.

3.6 RF Set

1) RF switch button, corresponding to switching RF;

2) RF frequency input box, press to pop up the keyboard for entering RF frequency;

3) Reference clock: This is an option, some transmitters have this function.

4) Timer switch enable, turn on/off timer switch (RF) function.

3.7 Power set

1) Positive power display box: displays the current output power value;

2) Reflection power display box: displays the current reflection power value;

3) Power control mode: divided into manual mode and automatic mode

4) Manual setting: Manually set the control value, with a maximum value of 4095, and display the current control value outside the parameter setting box.

5) Power setting: Set the automatic target power value, and the machine will automatically rise/fall to that power for operation.

6) Overload protection: Set the amplifier protection value. If the reflected detection voltage is greater than this value, the machine will enter the protection state.

3.8 System set

1) Primary backup switching: serves as the identification of the current machine as the primary backup machine;

2) Device Address: Set the device address of the all-in-one machine for remote communication via RS485 interface.