GME11D22 OUTDOODR DTV 200W

TRANSMITTER MANUAL

1. Overview

GME11D22 Outdoor 200W The transmitter is an all solid state digital TV transmitter, equipped with a dedicated cabinet. The structural design of the cabinet fully considers the characteristics of the outdoor environment. In the structural design, the cabinet shell adopts a double-layer and sealed design, and special heat dissipation ports are added around it; There is a cooling fan installed at the back door of the cabinet. The entire cabinet adopts a double-layer structure design, which can fully play the functions of waterproofing, heat radiation prevention, dust prevention, etc; And there are special bolt rods fixed to the ground on the base of the cabinet, and anti-theft locks are added to the cabinet doors. This model has a small footprint and compact structure, making it easy to install and use. It is mainly used in outdoor low-power digital TV transmitter equipment.

The GME11D22 outdoor 200W digital transmitter realizes the conversion from input TS transmission stream to RF signal of any specified frequency in UHF, and amplifies the signal to 200W.

The working parameters of the transmitter can be controlled through the built-in controller of the modulator, and can also be controlled through remote control software.

The whole machine is equipped with a high-efficiency axial flow fan built into the back door of the cabinet, which has a long service life, low noise, and large airflow.

1.1 System character

- The structural design fully considers the outdoor usage environment, anti-theft, heat-resistant, waterproof, etc.
- Supports DTMB, DVB-T2, and DVB-T standards.
- Adopting the sixth generation LDMOS power transistor.
- The transmitter can be remotely controlled through the Ethernet port.
- Equipped with pre distortion correction function.
- The power amplifier has overload, overheating, and overexcitation alarm functions as well as automatic protection functions.
- All protection settings and loop settings are set using software, which is convenient and fast.
- Air cooling method: forced air cooling.

1.2 System structure

- The whole machine adopts a separate structure of modulator and power amplifier, with convenient and flexible configuration, compact structure, and easy installation and use;
- Adopting a modular design with building blocks, transportation and installation are very convenient;
- The overall heat dissipation method is air cooling;
- The whole machine is made of corrosion-resistant materials to adapt to different usage environments;
- The whole machine has a small floor area, compact structure, and is easy to install and place.

1.2.1 Front layout diagram of transmitter

The GME11D22 transmitter consists of three parts : a digital modulator, a power amplification unit, and a main control unit.

The size of the chassis is:900mm（D）* 600mm（W）* 1200mm（H）

2 Technical specifications of the whole machine

No.	content		parameters
1	frequency		UHF 470~702MHz
2	Output power		200W
3	Frequency accuracy	MFN	±10Hz
		SFN	±1Hz
	Frequency stability	When using internal reference sources:$\leqslant 1\times10^{-7}$	
		When using external reference sources:$\leqslant 1\times10^{-10}$	
4	Single frequency network mode frequency adjustment step size		1Hz
5	shoulder	+4.2MHz	≤-38dB
		-4.2MHz	≤-38dB
6	Unevenness within the belt	Fc±3.591MHz	±0.5dB
7	MER		≥32dB

8	Phrase noise	100Hz	＜-75dBc/Hz
		1KHz	＜-85dBc/Hz
		10KHz	＜-95dBc/Hz
		100KHz	＜-110dBc/Hz

3. System working principle

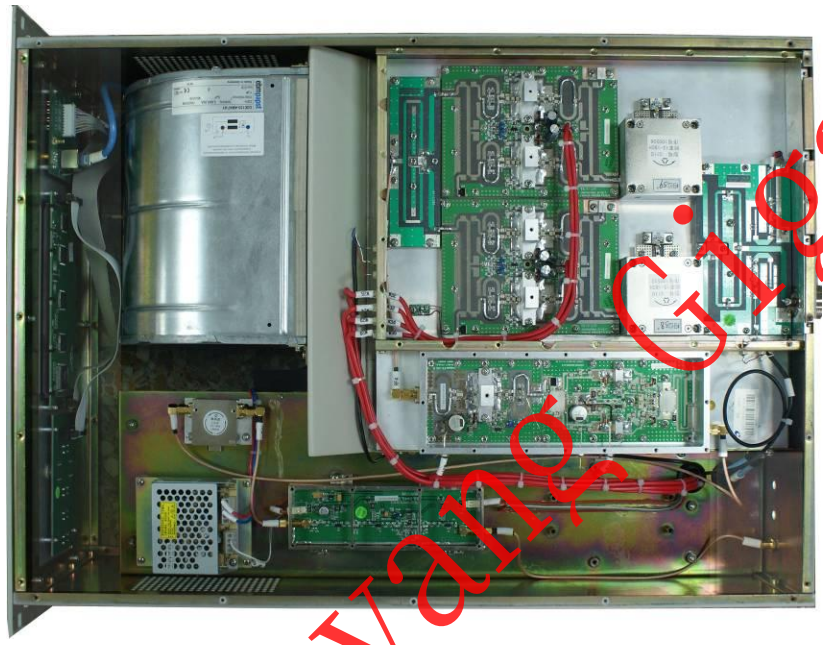


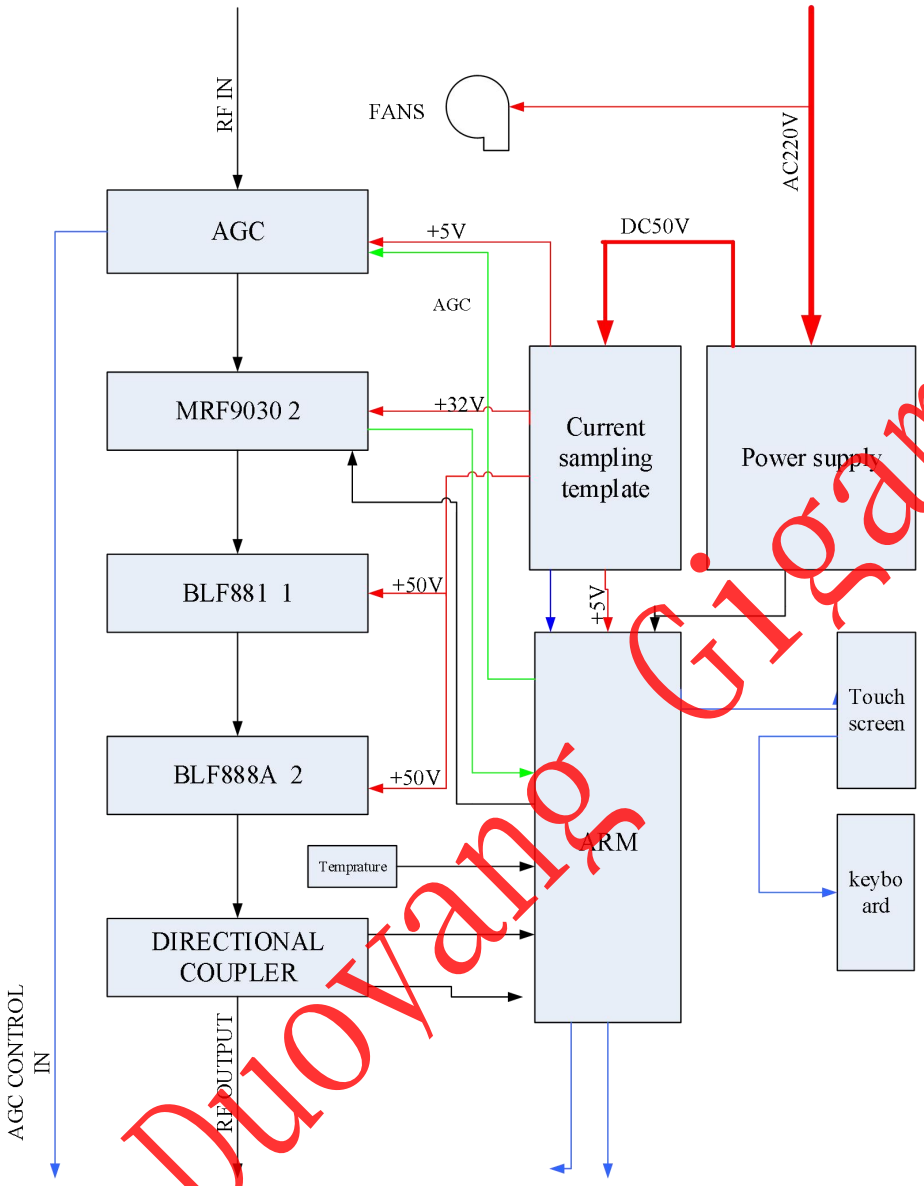
Figure Top view of the internal amplifier module

3.2.2 Principle block diagram and explanation of power amplifier unit

- A single final power amplifier board consists of two LDMOS field-effect transistors. Each field-effect transistor and its associated input-output matching circuit form a single transistor amplifier. Two single tube amplifiers and a 90 ° orthogonal bridge form a set of final power amplifier boards. Two sets of identical final power amplifier boards are combined by an in-phase two synthesizer for power synthesis, resulting in an output power greater than 200W.
- The 200W power amplifier module is a broadband power amplifier with good linearity, strong consistency, and interchangeable use.
- The input and output matching networks of LDMOS field-effect transistor amplifiers are equipped with balanced unbalanced converters with microstrip line structures.

Because LD MOS field-effect transistors are push-pull type transistors that require balanced input and output, and usually power transmission uses unbalanced cables or microstrip, conversion is required.

- The field-effect transistor adopts a voltage bias method, and its gate bias voltage is formed by the secondary stabilization treatment of the drain voltage. After the+50VDC drain voltage of the field-effect transistor is stepped down by a 2kΩ resistor, stabilized by 78L12 and adjusted by potentiometers RW1 and RW2, the static gate bias value can be achieved.
- All orthogonal electric bridges used for power synthesis are coupled strip line structures, and the power load at the isolated end is a microstrip type 50 Ω load. If one amplifier fails, the balanced amplifier will lose balance, and the isolated load will bear a portion of the unbalanced power.
    - The monitoring board samples, stores, A/D converts, and processes the working parameters of the power amplifier, and transmits them to the main control unit for monitoring through the RS485 interface. It also has self-protection control and status indication functions for over excitation, overload, and overheating.



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3.2.3 Power amplifier monitoring system

The monitoring of the power amplifier is the central monitoring unit of the transmitter, responsible for coordinating the operation of the entire monitoring system and providing communication interfaces to the outside world.