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GuliTech FY6600 30M

GuliTech FY6600 Dual Channel DDS Arbitrary Signal Generator User Manual

Model: FY6600 30M

1. INTRODUCTION

This manual provides detailed instructions for the safe and effective operation, setup, and maintenance of your GuliTech FY6600 Dual Channel DDS Arbitrary Signal Generator. Please read this manual thoroughly before using the device to ensure optimal performance and to prevent damage.

2. PRODUCT OVERVIEW

The GuliTech FY6600 series is a high-performance dual-channel DDS (Direct Digital Synthesis) arbitrary waveform generator. It features a professional 14-bit high-speed D/A chip, a 250MSa/s sampling rate, and an 8192 * 14-bit waveform memory depth, allowing for precise and detailed signal generation. It includes a 2.4-inch TFT color LCD for clear display of waveforms and settings, and offers a wide range of functions including frequency measurement, VCO, and various modulation types.



Figure 2.1: Front view of the GuliTech FY6600 Dual Channel DDS Arbitrary Signal Generator. This image shows the device's display, control buttons, and output terminals.

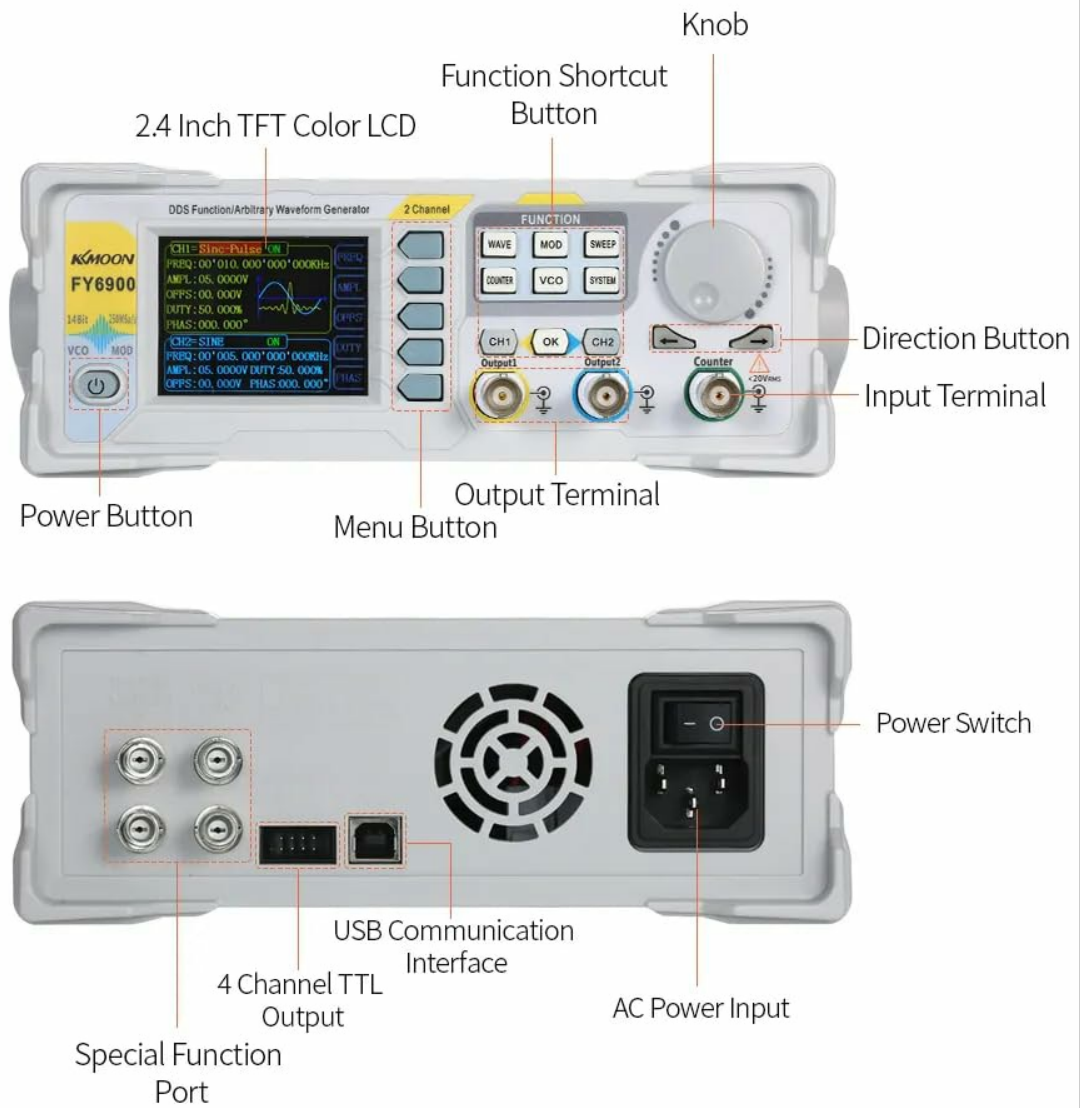


Figure 2.2: Labeled diagram of the GuliTech FY6900 signal generator's front and rear panels. This diagram highlights key components including the 2.4-inch TFT Color LCD, Function Shortcut Buttons, Knob, Direction Button, Input Terminal, Output Terminal, Power Button, Menu Button, Power Switch, USB Communication Interface, 4 Channel TTL Output, AC Power Input, and Special Function Port.

Digital DDS Dual-channel Signal Generator

Display: 2.4 inch TFT Color LCD with 320×240 resolution

Sample Rate: 250MSa/s

Sweep Time: 0.01S~999.99S

Amplitude(VPP): 1mVpp~24Vpp

Waveform Length: 8192 points * 14bits



Figure 2.3: Key features of the Digital DDS Dual-channel Signal Generator. This image displays the 2.4-inch TFT Color LCD with 320x240 resolution, 250MSa/s sample rate, 0.01S-999S sweep time, 1mVpp-24Vpp amplitude, and 8192 points * 14bits waveform length.

3. SETUP

Follow these steps to set up your GuliTech FY6600 signal generator:

1. **Unpacking:** Carefully remove the signal generator and all accessories from the packaging. Verify that all components listed in the packing list are present.
2. **Power Connection:** Connect the provided AC power cord to the AC Power Input port on the rear panel of the device. Plug the other end into a standard electrical outlet.
3. **Power On:** Press the Power Switch located on the rear panel to the 'ON' position. The device's LCD screen should illuminate.
4. **Initial Self-Test:** The device will perform a brief self-test upon startup. Wait for the main interface to appear on the LCD.
5. **Output Connections:** Connect your test leads or oscilloscope probes to the desired output channels (CH1 or CH2) on the front panel. Ensure connections are secure.

4. OPERATING INSTRUCTIONS

4.1 Basic Waveform Generation

1. **Select Channel:** Press the **CH1** or **CH2** button to select the desired output channel. The active channel will be highlighted on the display.
2. **Select Waveform:** Press the **WAVE** button. Use the knob to scroll through available waveforms (Sine, Square, Triangle, Pulse, Arbitrary, etc.) and press **OK** to confirm.
3. **Adjust Frequency:** Use the knob to navigate to the frequency parameter. Rotate the knob to adjust the frequency value. Use the direction buttons to change the digit being adjusted for fine-tuning. Press **OK** to set.
4. **Adjust Amplitude:** Navigate to the amplitude parameter. Rotate the knob to adjust the peak-to-peak amplitude (Vpp). Press **OK** to set.
5. **Enable Output:** Ensure the output for the selected channel is enabled. This is typically indicated by an illuminated LED next to the channel button or an icon on the display.

4.2 Frequency Measurement

The FY6600 can also function as a frequency meter, allowing you to measure external signals.

1. **Connect Input:** Connect the signal to be measured to the **Input Terminal** on the front panel.
2. **Select Measure Function:** Press the **MEAS** button. The display will switch to frequency measurement mode.
3. **Read Measurement:** The measured frequency will be displayed on the screen.

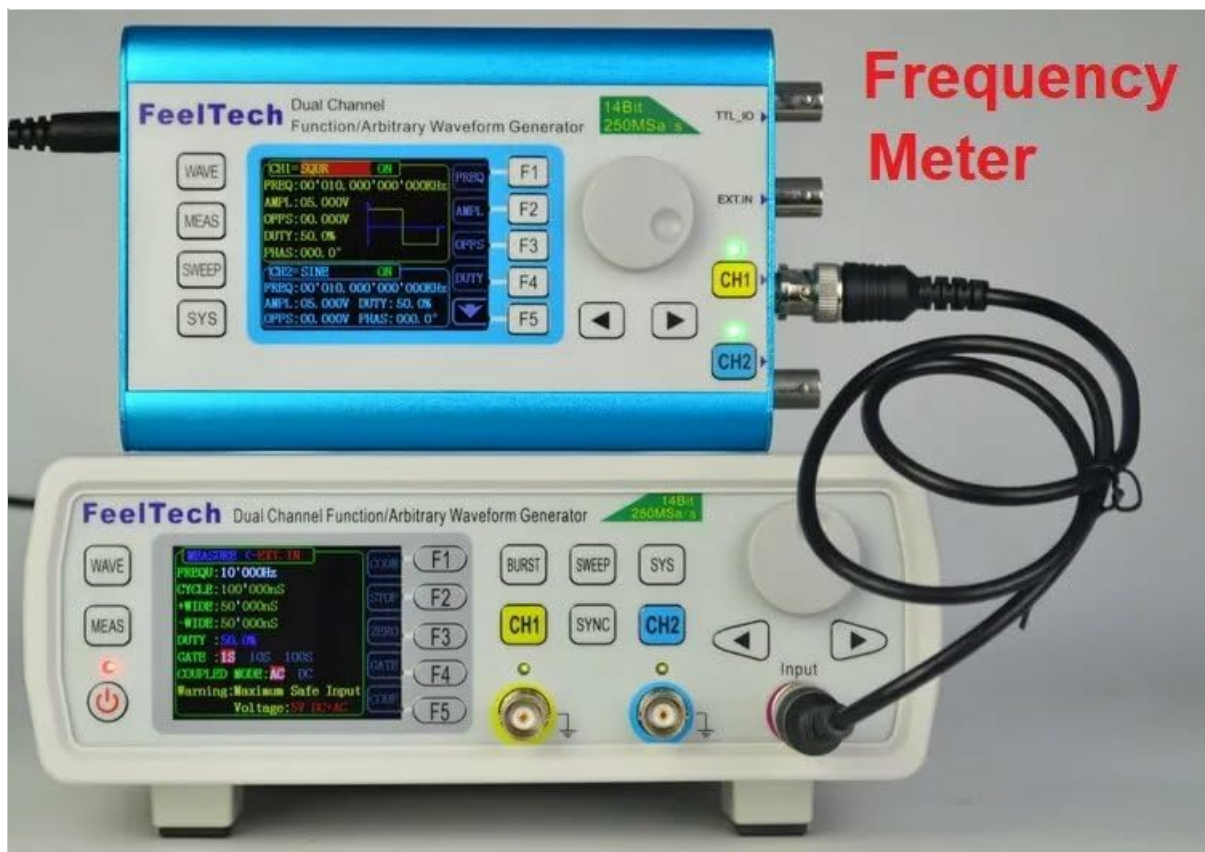


Figure 4.1: The FY6600 unit can function as a frequency meter, as shown here connected to another unit for measurement.

4.3 Dual Channel Operation

The FY6600 features two independent output channels (CH1 and CH2) that can generate different waveforms simultaneously or synchronized.

1. **Independent Control:** Select CH1 or CH2 and configure its waveform, frequency, and amplitude independently using the steps described in Section 4.1.
2. **Synchronization:** Use the **SYNC** button to synchronize the phase or frequency of the two channels if desired. Refer to the on-screen menu for synchronization options.

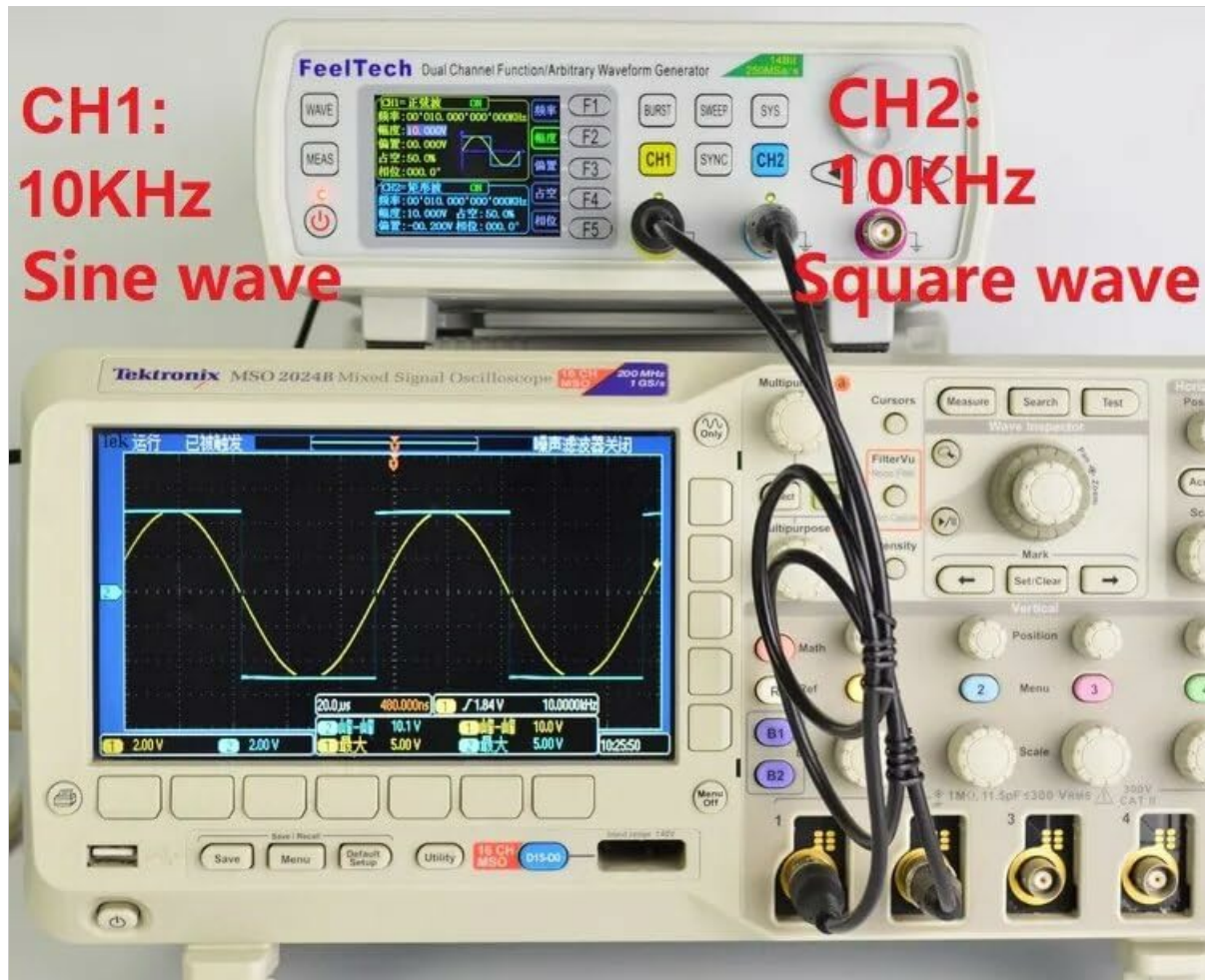


Figure 4.2: Example of dual-channel output: Channel 1 generating a 10KHz sine wave and Channel 2 generating a 10KHz square wave, displayed on an oscilloscope.

4.4 Modulation Functions

The FY6600 supports various modulation types, including AM (Amplitude Modulation).

1. **Select Channel:** Choose the channel you wish to modulate.
2. **Access Modulation Menu:** Press the **MOD** button to enter the modulation settings.
3. **Select Modulation Type:** Use the knob to select the desired modulation type (e.g., AM, FM, PM, FSK, ASK).
4. **Configure Parameters:** Adjust the modulation parameters such as modulation depth, frequency, and waveform using the knob and direction buttons.

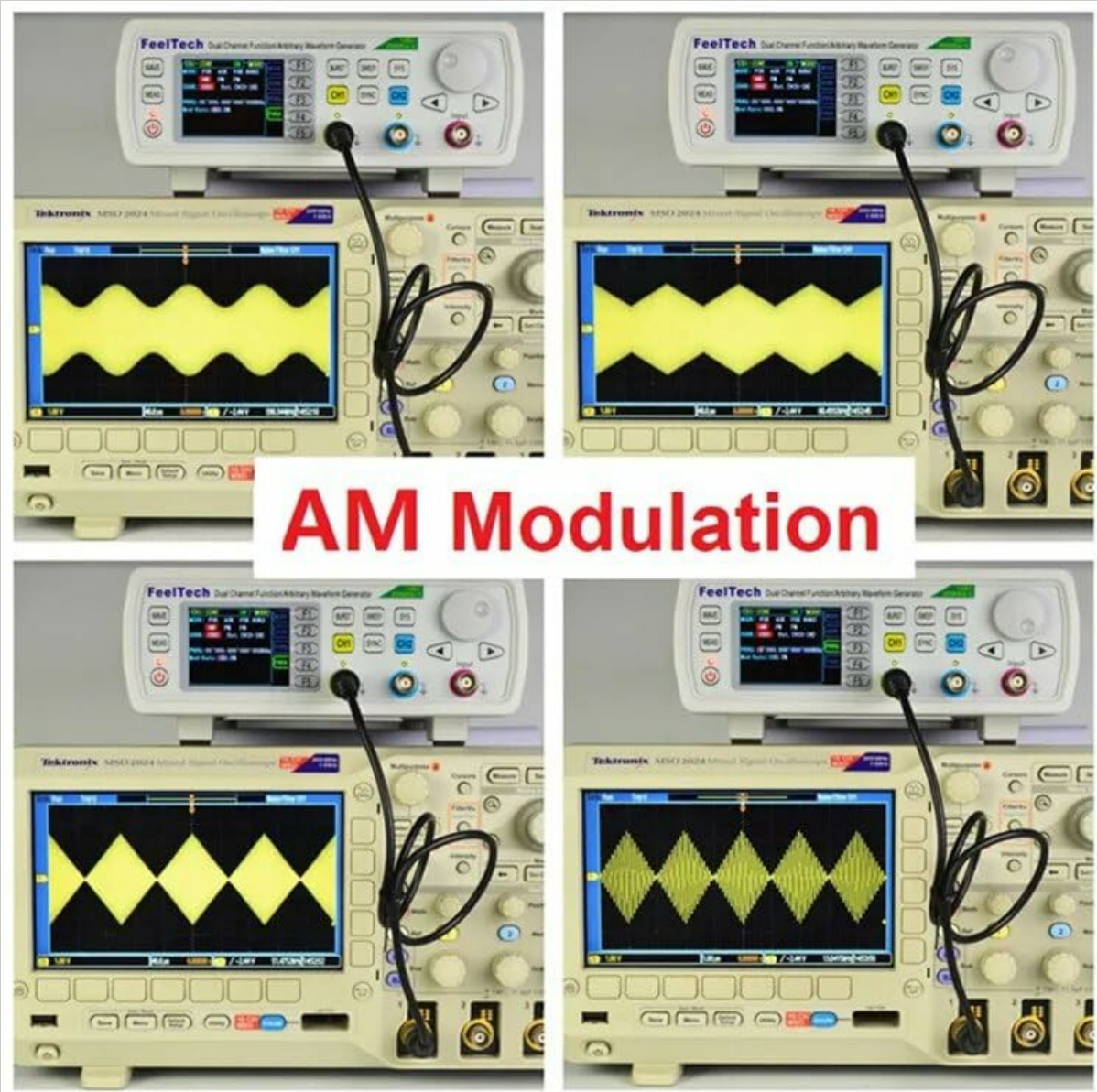


Figure 4.3: Various AM modulation waveforms generated by the FY6600, demonstrating its modulation capabilities as displayed on an oscilloscope.

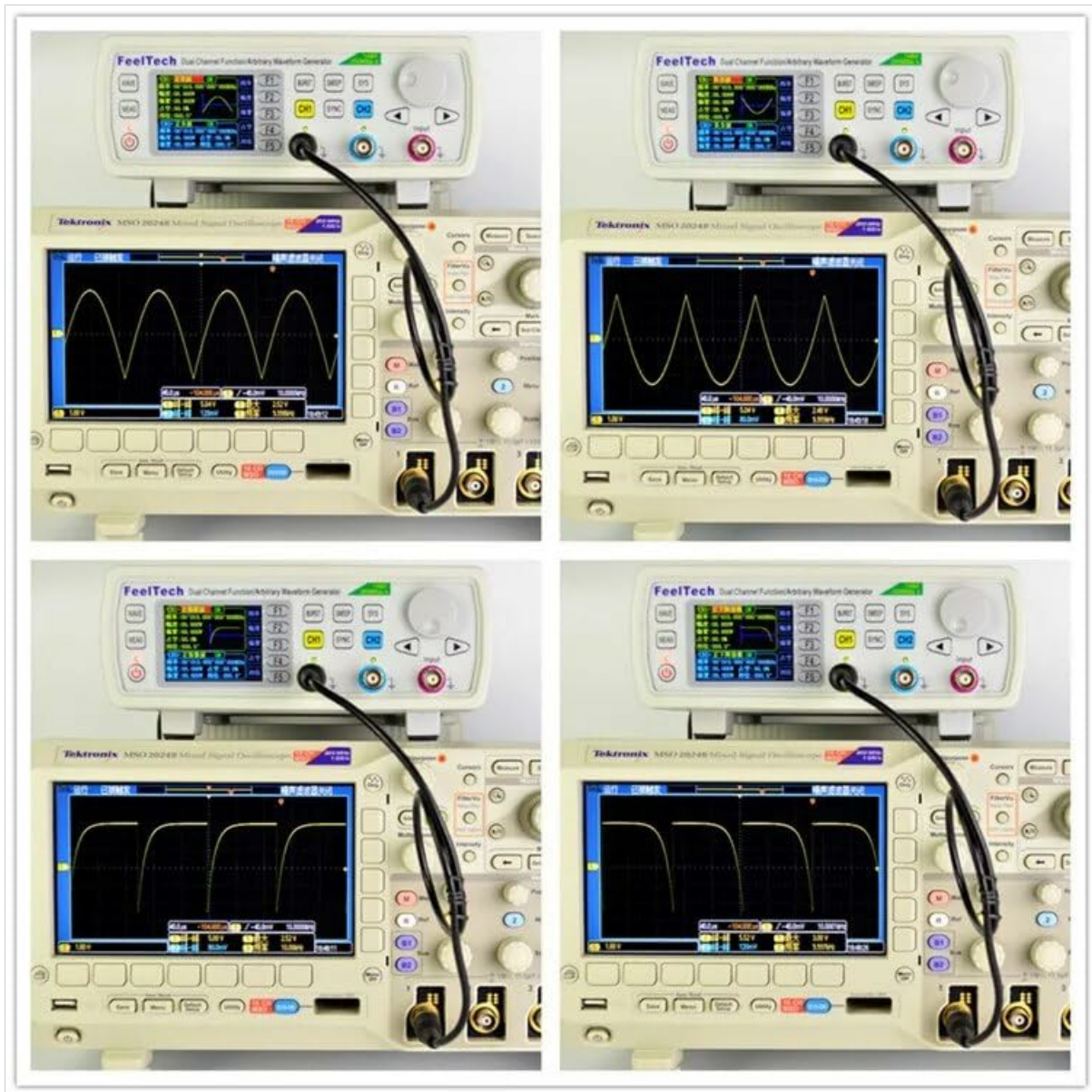


Figure 4.4: Further examples of complex waveforms and modulation types that can be generated by the FY6600, as seen on an oscilloscope.

5. MAINTENANCE

5.1 Cleaning

To maintain the performance and appearance of your device:

- Ensure the device is powered off and disconnected from the power source before cleaning.
- Use a soft, dry cloth to wipe the exterior surfaces.
- For stubborn dirt, slightly dampen the cloth with water or a mild, non-abrasive cleaner. Avoid using harsh chemicals or solvents.
- Do not allow liquids to enter the device.

5.2 Storage

When not in use for extended periods:

- Store the device in a cool, dry place, away from direct sunlight and extreme temperatures.
- Keep it free from dust and moisture.

- It is recommended to store the device in its original packaging or a protective case.

6. TROUBLESHOOTING

This section addresses common issues you might encounter with your FY6600 signal generator.

Problem	Possible Cause	Solution
Device does not power on	Power cord not connected; Power switch off; Faulty power outlet	Ensure power cord is securely connected. Turn power switch to 'ON'. Test power outlet with another device.
No output signal	Output channel not enabled; Incorrect amplitude setting; Faulty connection cable	Verify the selected channel's output is enabled. Check amplitude settings (ensure it's not 0Vpp). Inspect and replace connection cables if necessary.
Incorrect waveform displayed	Wrong waveform selected; Incorrect frequency/amplitude settings; Oscilloscope settings incorrect	Confirm the correct waveform type is selected. Double-check frequency and amplitude parameters. Adjust oscilloscope time base and voltage scale.
Frequency measurement inaccurate	Input signal too weak/strong; Incorrect input connection; External interference	Ensure the input signal is within the device's specified range. Verify the signal is properly connected to the Input Terminal. Minimize external noise sources.

7. TECHNICAL SPECIFICATIONS

The following table details the technical specifications for the GuliTech FY6600 series signal generators.

Frequency				
Model	FY6600-15M	FY6600-30M	FY6600-50M	FY6600-60M
Sine	0~15MHz	0~30MHz	0~50MHz	0~60MHz
Square	0~15MHz	0~25MHz	0~25MHz	0~25MHz
Ramp, Triangle	0~10MHz	0~10MHz	0~10MHz	0~10MHz
Pulse	0~10MHz	0~10MHz	0~10MHz	0~10MHz
TTL/CMOS	0~10MHz	0~10MHz	0~10MHz	0~10MHz
Arbitrary Waveform	0~10MHz	0~10MHz	0~10MHz	0~10MHz
Minimum pulse width Min.	20ns(All models of pulse wave minimum width can reach 20ns)			
Resolution on all frequency range	1μHz (Min. resolution can reach 1μHz on all frequency range to ensure adjusting accuracy under high frequency. For example, it can output 10.000000000001MHz signal).			
Accuracy	±20ppm			
Stability	±1ppm/ 3hours			
Waveform Characteristics				
Waveforms	Sine, Square (Duty Cycle adjustable), Pulse (Pulse width and cycle time can be set accurately), Triangle/Ramp, Sawtooth Wave, CMOS, Four channels TTL, DC, Half wave, Full wave, Positive Step, Inverse Step, Positive Exponent, Inverse Exponent, Lorenz Pulse, Multitone, Noise, ECG, Trapezoidal Pulse, Sinc Pulse, Narrow Pulse, Gauss White Noise, AM, FM, and other 64 sets customer-defined waveform.			
Non-Volatile Storage	Can store 64 user-defined arbitrary waveforms, (8K 14bits) * 64			
Waveform Length	8192 points * 14bits			
Sampling Rate	250MSa/s			
Vertical Resolution	14 bits			
Sine	Harmonic Suppression	≥50dBc(<1MHz); ≥45dBc(1MHz~20MHz);		
	Total Harmonic Distortion	<0.5% (20Hz~20kHz,0dBm)		
Square	Rise/Fall Time	≤7ns (VPP<5V)		
	Overshoot	≤5%		
Sawtooth wave	Duty Cycle	0.1%~99.9% (Resolution 0.1%)		
	Linearity	>99% (0.01Hz~10kHz)		

Figure 7.1: A comprehensive table outlining the technical specifications for different FY6600 models (15M, 30M, 50M, 60M), including frequency ranges for various waveforms, resolution, accuracy, stability, waveform characteristics, storage, sampling rate, vertical resolution, and harmonic suppression.

Feature	Specification (FY6600 30M)
Model	FY6600 30M
Sine Wave Frequency Range	0~30MHz
Square Wave Frequency Range	0~25MHz
Ramp/Triangle Wave Frequency Range	0~10MHz

Feature	Specification (FY6600 30M)
Pulse Wave Frequency Range	0~10MHz
TTL/CMOS Wave Frequency Range	0~10MHz
Arbitrary Waveform Frequency Range	0~10MHz
Minimum Pulse Width	20ns
Frequency Resolution	1 μ Hz
Frequency Accuracy	\pm 20ppm
Frequency Stability	\pm 1ppm/3hours
Waveform Characteristics	Sine, Square (Duty Cycle adjustable), Pulse (Pulse width and cycle time can be set accurately), Triangle/Ramp, Sawtooth Wave, CMOS, Four channels TTL, DC, Half wave, Full wave, Positive Step, Inverse Step, Positive Exponent, Inverse Exponent, Lorenz Pulse, Multitone, Noise, ECG, Trapezoidal Pulse, Sinc Pulse, Narrow Pulse, Gauss White Noise, AM, FM, and other 64 sets customer-defined waveform.
Non-Volatile Storage	Can store 64 user-defined arbitrary waveforms (8K 14bits) * 64
Waveform Length	8192 points * 14bits
Sampling Rate	250MSa/s
Vertical Resolution	14 bits
Sine Harmonic Suppression	\geq 50dBc (<1MHz); \geq 45dBc (1MHz~20MHz)
Sine Total Harmonic Distortion	<0.5% (20Hz~20kHz, 0dBm)
Square Rise/Fall Time	\leq 7ns (VPP<5V)

Feature	Specification (FY6600 30M)
Square Overshoot	≤5%
Square Duty Cycle	0.1%~99.9% (Resolution 0.1%)
Sawtooth Wave Linearity	>99% (0.01Hz~10kHz)

8. WARRANTY AND SUPPORT

GuliTech products are designed for reliability and performance. This product comes with a standard manufacturer's warranty against defects in materials and workmanship. Please refer to the warranty card included with your purchase for specific terms and conditions, including the warranty period and coverage details.

For technical support, troubleshooting assistance, or warranty claims, please contact GuliTech customer service through the retailer where the product was purchased or visit the official GuliTech website for contact information. When contacting support, please have your product model number (FY6600 30M) and purchase date available.