FeelTech DM40C KitI (Model ATK-PTDM40_9)

FeelTech DM40C KitI 3-in-1 Multimeter Oscilloscope Signal Generator User Manual

Brand: FeelTech | Model: DM40C KitI (ATK-PTDM40_9)

1. Introduction

The FeelTech DM40C KitI is a versatile handheld digital tool integrating a multimeter, an oscilloscope, and a signal generator into a single compact device. Designed for automotive and general electronic testing, it offers high precision measurements, waveform analysis, and signal output capabilities. This manual provides essential information for the safe and effective operation of your DM40C KitI.

2. Safety Information

Before using the DM40C KitI, please read and understand all safety instructions. Failure to follow these instructions may result in electric shock, fire, or damage to the device or other equipment.

- Always ensure the device is in good working condition before use.
- Do not exceed the maximum input ratings for voltage, current, or other parameters.
- Use only the provided test leads and accessories.
- Avoid contact with live circuits. Always assume circuits are live until proven otherwise.
- Do not operate the device in wet environments or in the presence of explosive gases or fumes.
- Refer to the CAT IV 600V and CAT III 1000V ratings on the input terminals.

3. Package Contents

Verify that all items listed below are present in your package:

- 1 x DM40C Digital Multimeter (including bracket and ordinary PVC sleeve)
- 1 x Pair of MP01 Universal Multimeter Probes (red and black)
- 1 x USB Type-C Cable (1.2m)

Special Features	DM40A	DM40B	DM40C
Maximum display(Range)	39999	49999	59999
AUTO	✓	✓	✓
TRMS	✓	✓	✓
Frequency (Freq Response)	10KHz		
AC+DC		✓	✓
Duty cycle measure	5%~95%		
Data hold(HOLD)	✓	✓	✓
Relative measurement (RLE)	✓	✓	✓
Extreme value measurement (Max/Min)	✓	✓	✓
Trend Chart(WAVE)	✓	✓	✓

Figure 3.1: Contents of the DM40C KitI package. Shown are the DM40C digital multimeter, a pair of universal multimeter probes, and a USB Type-C charging cable.

4. Product Overview

The DM40C KitI combines three essential functions for electronic testing and analysis:

- **Multimeter:** Features 4 5/6 high-precision, 60000 (MAX) count, and a standard 5ppm REF for accurate measurements of voltage, current, resistance, capacitance, frequency, duty cycle, and temperature.
- **Oscilloscope:** Equipped with a 10-bit ADC, 50M sampling rate, 10M bandwidth, and a vertical resolution of 10 bits. It offers a storage depth of 64Kpcs and vertical sensitivity from 10mV to 10V/div (x1).
- **Signal Generator:** Capable of generating sine wave, triangular wave, and sawtooth wave signals from 1Hz to 50KHz with an amplitude range of 0.5V to 3.0V.

Figure 4.1: Front view of the DM40C, showcasing its display and input terminals.

Figure 4.2: Overview of the DM40's combined functionalities: Multimeter, Oscilloscope, and Signal Generator, emphasizing 4 5/6 high precision and oscilloscope specifications.

4.1 Display and Interface

The DM40C features a 3.5-inch multi-touch IPS screen (480x320 resolution) providing rich colors and a clear display for all measurements and waveform visualizations.

Figure 4.3: The 3.5-inch multi-touch IPS screen of the DM40C, offering a clear and interactive user interface.

4.2 Measurement Capabilities

The device supports various advanced measurement functions:

- **T-RMS/AC+DC/Trend Chart:** Measures True RMS with high accuracy, simultaneously measures AC and DC components for complex signals, and displays measurement data periodically with a 3-speed adjustable time base (160ms/320ms/640ms).
- **Multi-functional Diode:** Offers 4-stage voltage drop measurement and resistor measurement. Diode measure thresholds are <0.02V (long beep), <0.45V (two short beeps), <0.75V (short beep), <1.5V (three short beeps). Resistor measure tests resistors within 1KΩ with 1% accuracy.
- **Continuity Measure:** Quick measure less than 1μs.
- **Automatic Measurement:** Auto mV/V gear measure (DC: 0.01mV~1000V, AC: 0.01mV~750V) and Auto uA/mA/A gear measure (0.01uA~10A) without needing to switch modes and sockets.

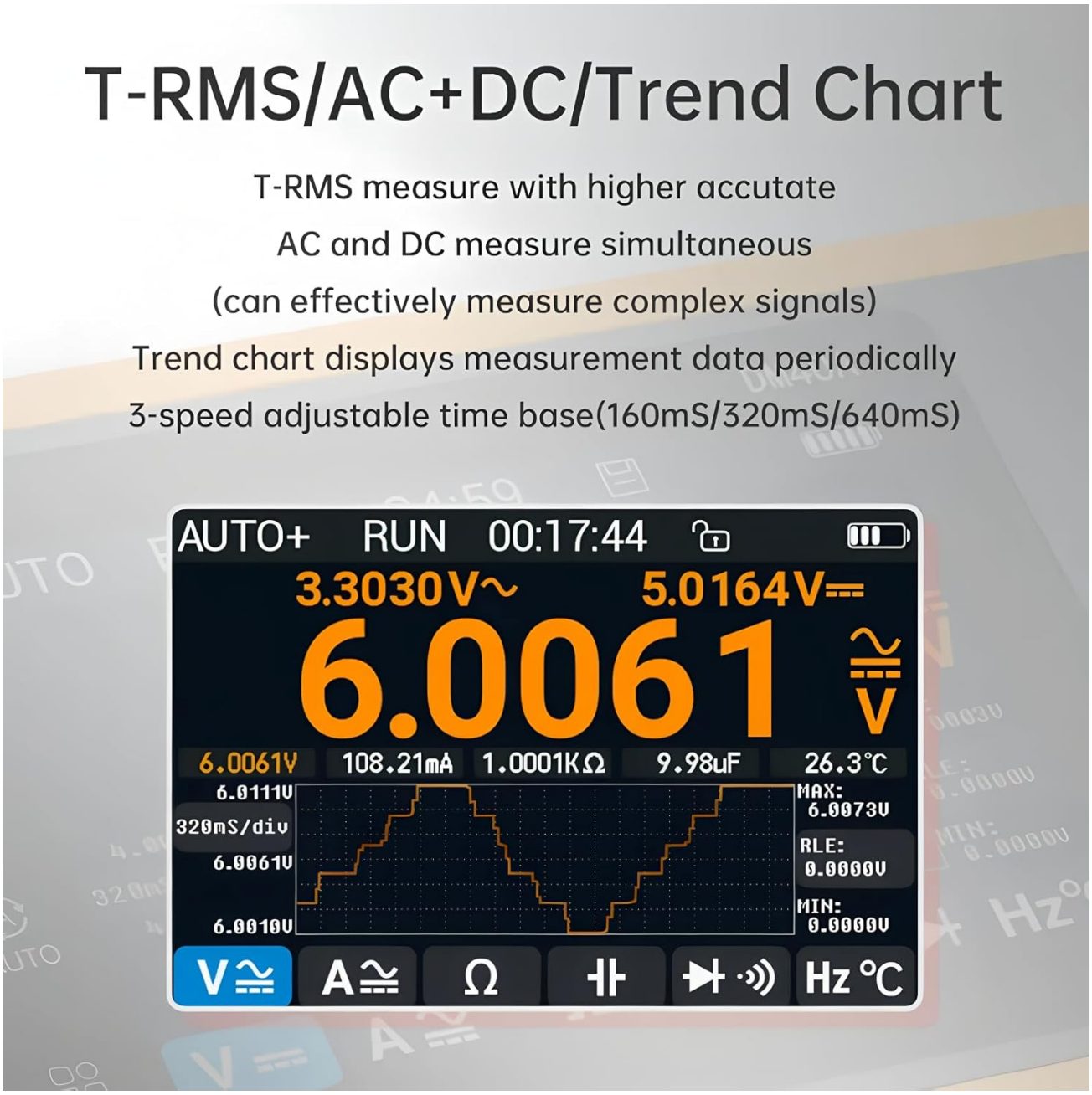


Figure 4.4: The DM40C displaying a trend chart, illustrating its T-RMS, AC+DC, and periodic data display capabilities.

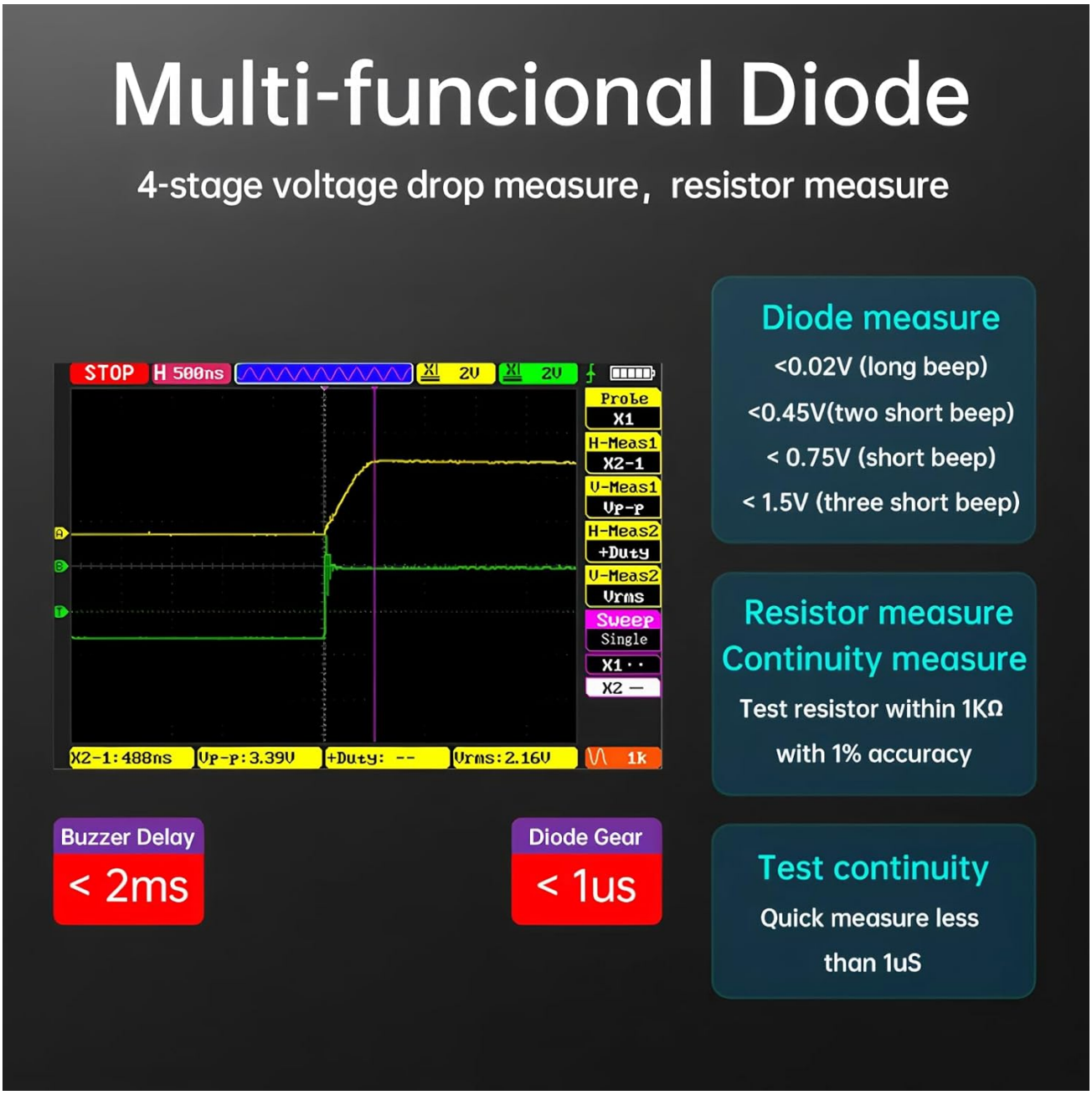


Figure 4.5: Detailed view of the DM40C's multi-functional diode and continuity measurement features, including voltage drop thresholds and resistor test accuracy.

Figure 4.6: The DM40C in automatic measurement mode, simplifying voltage and current readings without manual range selection.

DM40C digital multimeter
(including bracket+ordinary PVC sleeve)

MP01 Universal multimeter probes
(one pair)

USB cable Type-C
1.2m

Figure 4.7: A typical measurement screen on the DM40C, displaying voltage, frequency, and a waveform.

5. Setup

Follow these steps for initial setup of your DM40C KitI:

1. **Charging:** Connect the provided USB Type-C cable to the device and a suitable USB power adapter (not included) to charge the internal battery. The battery indicator on the screen will show charging status.
2. **Probe Connection:** For multimeter and oscilloscope functions, connect the red test lead to the VΩHz°C/A/mA/uA input terminal and the black test lead to the COM terminal. Ensure connections are firm.
3. **Power On:** Press and hold the power button (usually located on the side or top) until the screen illuminates.
4. **Initial Settings:** The device will typically power on in Multimeter mode. You can navigate through modes and settings using the on-screen menu and touch controls.

6. Operating Instructions

6.1 Multimeter Mode

To use the multimeter functions:

1. Select the Multimeter icon from the main menu or press the dedicated Multimeter button if available.
2. Choose the desired measurement function (e.g., DC Voltage, AC Voltage, Resistance, Diode, Continuity) using the on-screen interface.
3. Connect the test leads to the circuit under test according to the specific measurement type. For voltage, connect in parallel; for current, connect in series.
4. Read the measurement value displayed on the screen. The auto-ranging feature will typically select the appropriate range.

6.2 Oscilloscope Mode

To use the oscilloscope functions:

1. Select the Oscilloscope icon from the main menu.
2. Connect the test leads to the signal source.
3. Adjust the **Time Scale** (horizontal axis) to view the desired number of cycles.
4. Adjust the **Vertical Scale** (voltage per division) to fit the waveform within the screen.
5. Set the **Trigger Type** (Rising/Falling edge) and **Trigger Level** to stabilize the waveform display.
6. Use the measurement cursors (if available) to analyze specific points on the waveform.

6.3 Signal Generator Mode

To use the signal generator functions:

1. Select the Signal Generator icon from the main menu.
2. Choose the desired **Waveform** type (Sine, Triangular, Sawtooth).
3. Set the **Frequency** within the range of 1Hz to 50KHz.
4. Adjust the **Amplitude** between 0.5V and 3.0V.
5. Connect the output of the signal generator to the circuit or device requiring the test signal.

7. Maintenance

Proper maintenance ensures the longevity and accuracy of your DM40C KitI:

- **Cleaning:** Use a soft, dry cloth to clean the device. Do not use abrasive cleaners or solvents.
- **Storage:** Store the device in a cool, dry place away from direct sunlight and extreme temperatures.
- **Battery:** Recharge the battery regularly, especially if the device will not be used for an extended period, to maintain battery health.
- **Calibration:** For professional applications, periodic calibration by qualified personnel is recommended to ensure continued accuracy.

8. Troubleshooting

If you encounter issues with your DM40C KitI, refer to the following common problems and solutions:

- **Device does not power on:** Ensure the battery is charged. Connect the USB-C cable and attempt to power on while charging.
- **Inaccurate readings:** Check test lead connections. Ensure the correct measurement function is selected. Verify the circuit under test is within the device's specifications.

- **No waveform displayed in Oscilloscope mode:** Check probe connections. Adjust Time Scale, Vertical Scale, and Trigger Level settings. Ensure the signal source is active.
- **Screen unresponsive:** Attempt a soft reset by holding the power button for an extended period (e.g., 10-15 seconds) until the device restarts.

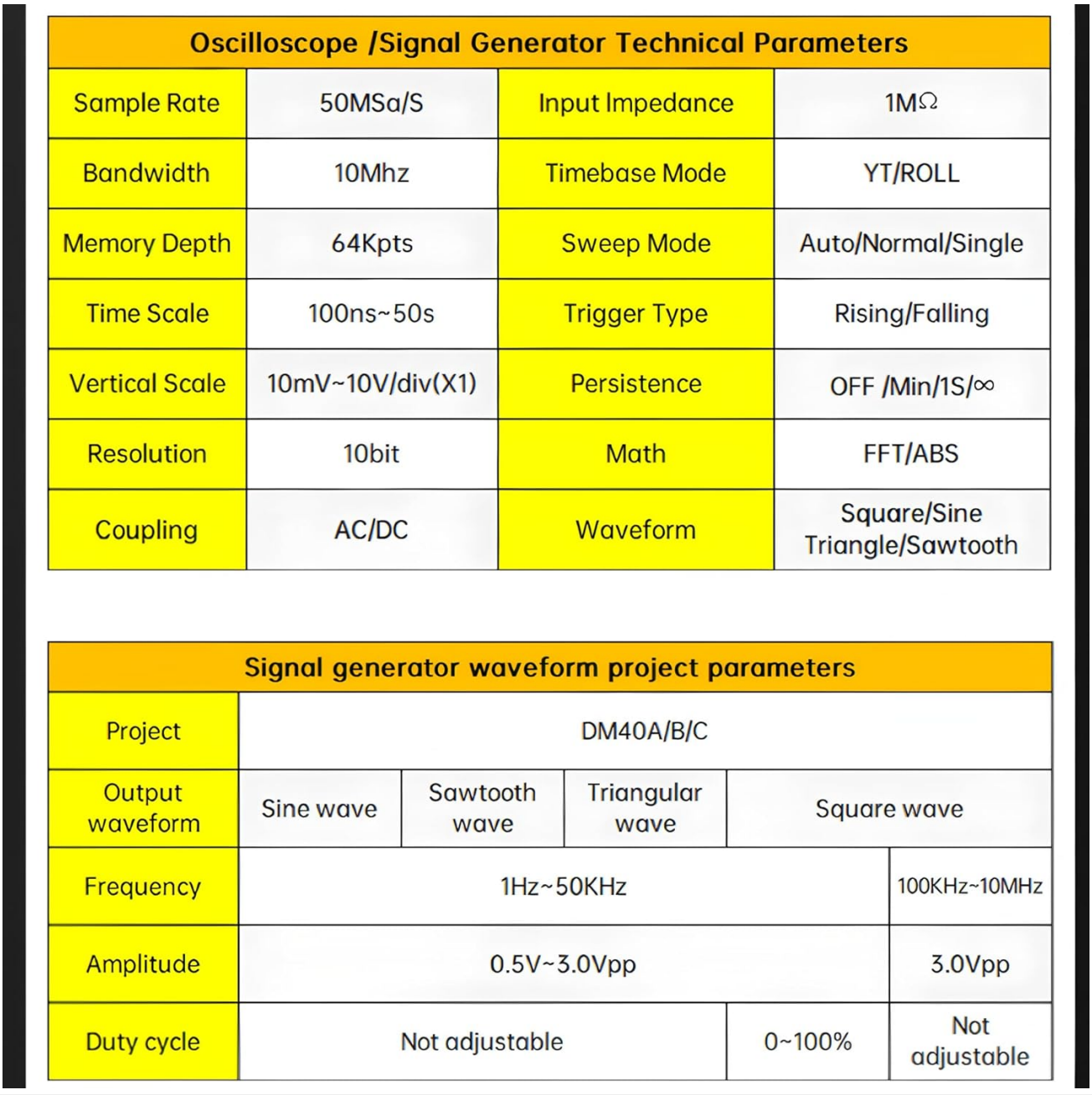
If problems persist, contact customer support for further assistance.

9. Specifications

The following tables detail the general and functional specifications of the FeelTech DM40C KitI.

General Specifications

Feature	Value
Item Model Number	ATK-PTDM40_9
Package Dimensions	11.81 x 9.84 x 7.87 inches
Item Weight	1 Kilogram (2.2 Pounds)
Manufacturer	ALIENTEK
Specification Met	CE, RoHS
EU Spare Part Availability Duration	1 Years



Oscilloscope /Signal Generator Technical Parameters			
Sample Rate	50MSa/S	Input Impedance	1MΩ
Bandwidth	10Mhz	Timebase Mode	YT/ROLL
Memory Depth	64Kpts	Sweep Mode	Auto/Normal/Single
Time Scale	100ns~50s	Trigger Type	Rising/Falling
Vertical Scale	10mV~10V/div(X1)	Persistence	OFF /Min/1S/∞
Resolution	10bit	Math	FFT/ABS
Coupling	AC/DC	Waveform	Square/Sine Triangle/Sawtooth

Signal generator waveform project parameters					
Project	DM40A/B/C				
Output waveform	Sine wave	Sawtooth wave	Triangular wave	Square wave	
Frequency	1Hz~50KHz				100KHz~10MHz
Amplitude	0.5V~3.0Vpp				3.0Vpp
Duty cycle	Not adjustable			0~100%	Not adjustable

Figure 9.1: Detailed comparison of DM40 series models and technical specifications for the oscilloscope and signal generator functions.

9.1 Oscilloscope / Signal Generator Technical Parameters

Parameter	Value	Parameter	Value
Sample Rate	50MSa/S	Input Impedance	1MΩ
Bandwidth	10Mhz	Timebase Mode	YT/ROLL
Memory Depth	64Kpts	Sweep Mode	Auto/Normal/Single
Time Scale	100ns~50s	Trigger Type	Rising/Falling
Vertical Scale	10mV~10V/div(x1)	Persistence	OFF / Min/1S/∞
Resolution	10bit	Math	FFT/ABS
Coupling	AC/DC	Waveform	Square/Sine Triangle/Sawtooth

9.2 Signal Generator Waveform Project Parameters (DM40A/B/C)

Project	Output Waveform	Frequency	Amplitude	Duty Cycle
DM40A/B/C	Sine wave	1Hz~50KHz	0.5V~3.0Vpp	Not adjustable
	Sawtooth wave			Not adjustable
	Triangular wave	1Hz~50KHz	0.5V~3.0Vpp	0~100%
DM40A/B/C	Square wave	100KHz~10MHz	3.0Vpp	Not adjustable

10. Warranty and Support

The FeelTech DM40C KitI comes with a standard manufacturer's warranty. Please refer to the product packaging or the seller's terms for specific warranty duration and conditions. For technical support, troubleshooting assistance, or warranty claims, please contact your point of purchase or the manufacturer directly. Keep your purchase receipt as proof of purchase.