

MTP200B

WLAN / BT LE Tester



Introduction

Tescom's MTP200B is a non-signaling test-based WLAN or BT LE (Low Energy) tester. As one-body equipment incorporating both Signal Generator and Signal Analyzer, MTP200B is designed to provide effective and stable performance for generating and analyzing WLAN and BT LE waveforms. It can be effectively used in a mass production for testing the RF performance of products with WLAN and BT LE functions such as smart phones. In addition, the best efficiency can be expected at a lower cost thanks to the simple installation and operation of the product.

- One-body equipment incorporating both Signal Generator and Signal Analyzer
- WLAN waveform generation and analysis
- BT LE waveform generation and analysis
- BT LE Direct Test with a remote control program
- Creation of various WLAN test files using Waveform Creator
- CW Mode supported
- Measurement result display through Color LCD.
- Easy control through frontal keypad without PC
- Remote control through USB Port (USB to Serial) and GPIB
- Easy firmware upgrade through USB Port (USB to Serial)
- Compact, lightweight (Half Rack/2U size)

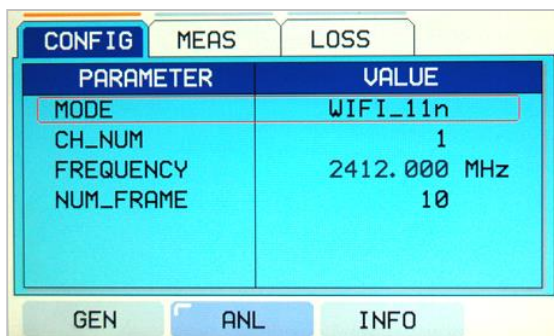
Benefits and Key features

■ WLAN Test System


MTP200B's WLAN Test System provides both Analyzer (ANL) mode and Generator (GEN) mode; WLAN IEEE 802.11 a/g/n standard is supported.

▶ WLAN Analyzer

For signals transmitted by WLAN devices, measurements of RMS EVM, Power, Frequency Error, and Clock Error can be made through MTP200B's Signal Analyzer; the results of the measurements can be readily checked through the built-in LCD without separate connection to PC



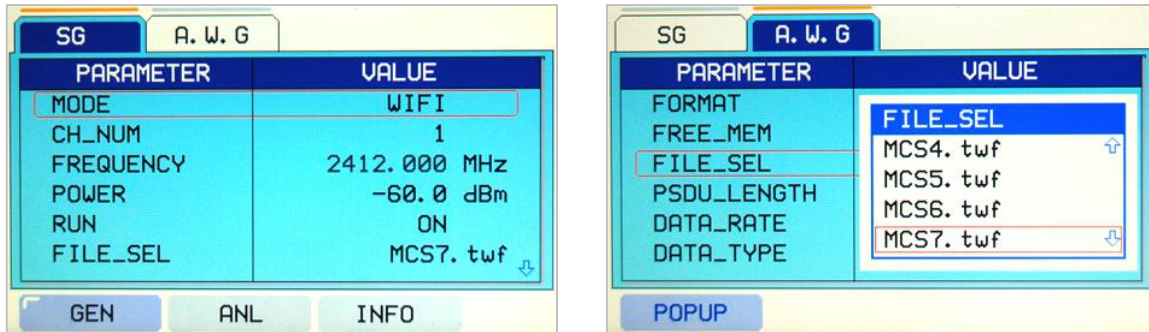
PARAMETER	VALUE
MODE	WIFI_11n
CH_NUM	1
FREQUENCY	2412.000 MHz
NUM_FRAME	10



MEAS	LOSS	MCS7	
RMS EVM [%]	3.0	2.5	2.3
POWER [dBm]	12.6	12.5	12.5
FREQ ERR [kHz]	5.3	5.2	5.2
CLOCK ERR [ppm]	3.9	0.5	0.3
MAX	AUG	MIN	

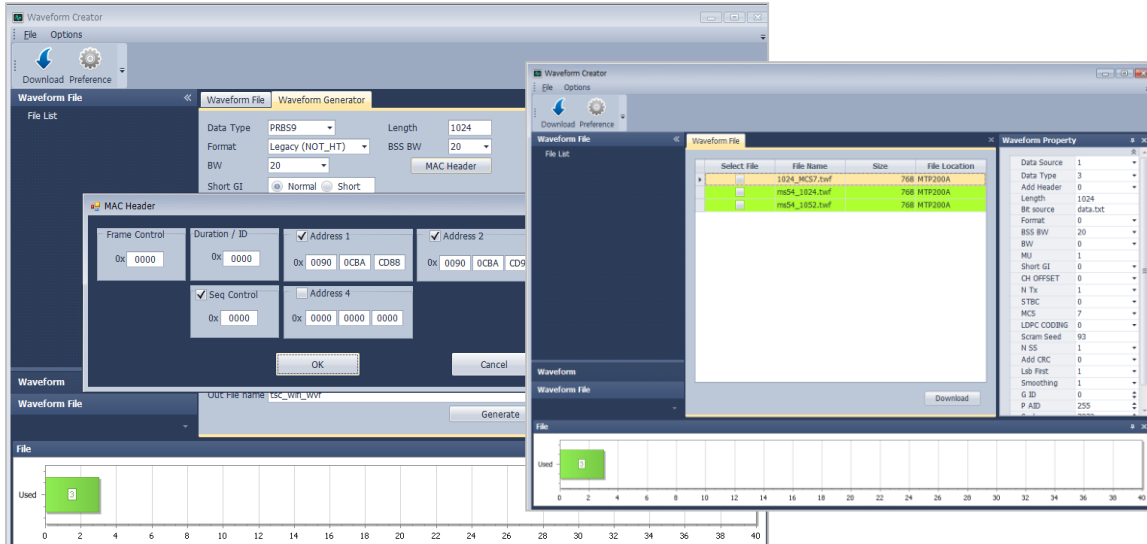
▶ WLAN Generator

MTP200B's Signal Generator can transmit a user-defined WLAN signal to DUT so that the DUT can check its reception performance by checking whether the transmitted signal by MTP200B is successfully received. MTP200B can store up to 40 different user-defined WLAN signals, and the stored information can be readily checked through UI.



▶ Tescom Waveform Creator

Using Tescom Waveform Creator, user can create various WLAN test files by directly editing the parameters related to WLAN 802.11 a/g/n protocol. In addition, the created WLAN test files can be easily downloaded to the equipment.



■ BT LE Test System

MTP200B's BT LE Test system provides a non-signaling-based test for BT LE RF test cases defined by BT LE test standard. In addition, since advertising test mode is supported, it is possible to check the simple RF characteristics of BT LE devices in finished product condition with no separate test mode.

BT LE Direct test is also available in MTP200B by using a remote control program. MTP200B can be simply applied to mass production because the remote control program not only supports the automatic batch measurements for RF test case but also provides pass/fail judgements for the measurement results

▶ BT LE Analyzer

With MTP200B's BT LE Signal Analyzer, Output power, Modulation characteristics, Carrier frequency offset, and drift as defined in the BT LE Transmitter Test Case can be measured by analyzing the signals transmitted by a BT LE devices. Additionally, a function with which Power, Modulation, and Initial carrier frequency offset can be simultaneously tested is provided in advertising mode, making it possible to determine easily whether or not the RF performance of a device can meet the test standard.

CONFIG	MEAS	LOSS
PARAMETER		VALUE
MODE	BT_LE	
CH_NUM	0	
FREQUENCY	2402.000 MHz	
TEST_METHOD	TEST_MODE	
TEST_CASE	POW+MOD+Fc	
NUM_PACKET	1	
GEN	ANL	INFO

CONFIG	MEAS	LOSS	
TEST CASE	MAX	AUG MIN	DATA
POWER dBm	-1.2	-1.9 -2.5	1010
P _{pk} -P _{avg} dB	0.6	0.6 0.6	CH
dF1 kHz			0
dF2 kHz	218.7	218.7 218.7	N_PKT
f _{TX} -f _[n] kHz	-1.3	1.3 -1.3	1
f _[0] -f _[n] kHz	1.0	1.0 1.0	dF2 _{max}
f _[1] -f _[0] kHz	1.0	1.0 1.0	100.0
f _[n] -f _[n-5] kHz	-1.1	1.1 -1.1	
GEN	ANL	INFO	

⊕ BT LE Transmitter Test (TRM-LE) that can be measured with MTP200B

- Output power(TRM-LE/CA/01/C)
- Modulation characteristics(TRM-LE/CA/05/C)
- Carrier frequency offset and drift(TRM-LE/CA/06/C)
- Output power + Modulation characteristics + Initial carrier frequency tolerance (at Advertising test mode)

▶ BT LE Generator

MTP200B's Signal Generator can create and transmit BT LE signal defined in BT LE test standard to DUT so that the DUT can check its reception performance by checking whether the transmitted signal by MTP200B is successfully received.

SG		
PARAMETER	VALUE	
MODE	BT_LE	
CH_NUM	0	
FREQUENCY	2402.000 MHz	
POWER	-5.0 dBm	
RUN	OFF	
BIT_PATTERN	PRBS9	
GEN	ANL	INFO

⊕ BT LE Receiver Tests (RCV-LE) that can be measured with MTP200B

- Receiver sensitivity (RCV-LE/CA/01/C)
- Maximum input signal level (RCV-LE/CA/06/C)

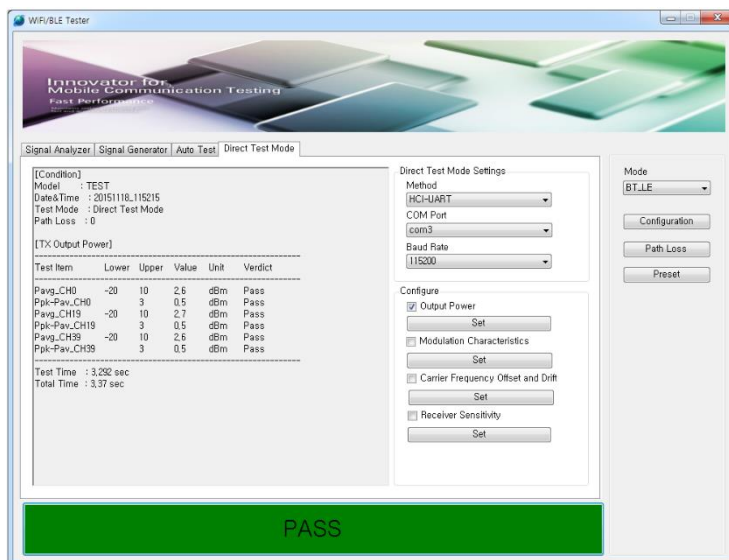
■ Remote Control Interface

With MTP200B's built-in USB to Serial interface, it is possible to control equipment remotely using a USB port in a PC. MTP200B also supports the GPIB interface for remote control. Using the remote commands that provided with the equipment, all functions of the equipment can be operated and user can make an automation program for mass production.

■ WLAN & BT LE Remote Control Program

The measurement can be done more conveniently and easily if a WLAN/BT LE remote control program is used.

- ✦ Carry out automatic measurement of Bluetooth LE RF Test Cases all at once
- ✦ Chip Vendors test Control Software included
- ✦ Easy to change measurement criteria and conditions.
- ✦ Display test results and save test results as an Excel file



■ Firmware Upgrade

For MTP200B, firmware upgrade can be done quickly and easily through PC using a simple upgrade program.

■ Provide a total solution necessary for production lines

Tescom can provide a total solution for production that ranges from the shield box designed for electromagnetic wave shielding, TEM CELL for wireless test and antenna couplers to measurement software programs for production automation to help solving the difficulties involving measurement systems that are complicated and difficult to operate.

Ordering Information

Order No.	Description
MTP200B Basic Model	
B200B-00	WLAN / BT LE Tester, Basic (Hardware only)
S/W Option	
S200-10	WLAN Option
S200-20	BT LE Option

- ⊕ Must choose either S200-10 or S200-20
- ⊕ Full Option (S200-10 + S200-20) is available

Specification

■ General Specification

Generator	
Frequency Range	(1) 2400 ~ 2500 MHz (2) 4900 ~ 5875 MHz
Frequency Accuracy	< ±1.0 ppm/year @ operating temperature
Frequency Resolution	1.0 kHz
Output Power Range	-5.0 dBm ~ -70.0 dBm
Output Power Accuracy	< ±1.0 dB
Output Power Resolution	0.1 dB
VSWR	< 1.4
Harmonics	Out-of-band: < -40.0 dB In-band: < -50.0 dB (100 kHz resolution BW)
Phase Noise	< 1.0 degrees (2.4 GHz < f < 2.5 GHz) < 1.5 degrees (4.9 GHz < f < 6 GHz)

Analyzer	
Frequency Range	(1) 2400 ~ 2500 MHz (2) 4900 ~ 5875 MHz
Frequency Accuracy	< ±1.0 ppm/year @ operating temperature
Input Power Range	+20.0 dBm ~ -50.0 dBm
Input Power Accuracy	< ±1.0 dB
Input Power Resolution	0.1 dB
VSWR	< 1.6

■ WLAN Specification

Standard	
Generator	IEEE 802.11a, IEEE 802.11g, IEEE 802.11n
Analyzer	IEEE 802.11a, IEEE 802.11g, IEEE 802.11n

WLAN Generator	
Frequency Range	(1) 2400 ~ 2500 MHz (2) 4900 ~ 5850 MHz
Frequency Accuracy	< ±1.0 ppm/year @ operating temperature
Output Power Range	-5.0 dBm ~ -70.0 dBm
Output Power Accuracy	< ±1.0 dB
Output Power Resolution	0.1 dB
RMS EVM	* IEEE 802.11a/g (1) < -34.0 dB (2.0 %) (2) < -32.0 dB (2.5 %) * IEEE 802.11n (1) < -32.0 dB (2.5 %) (2) < -30.0 dB (3.2 %)
Center Frequency Error	< ±1.0 ppm
Symbol Clock Error	< ±5.0 ppm
Spectrum Flatness	< +1.0 dB, -2.5 dB

Waveform Creator	
Arbitrary Waveform Files	IEEE 802.11a/g/n Signal

WLAN Analyzer	
Frequency Range	(1) 2400 ~ 2500 MHz (2) 4900 ~ 5850 MHz
Frequency Accuracy	< ±1.0 ppm/year @ operating temperature
Input Power Range	(1) 2400 ~ 2500 MHz : +15.0 dBm ~ -40.0 dBm (2) 4900 ~ 5850 MHz : +12.0 dBm ~ -40.0 dBm
Input Power Accuracy	< ±1.0 dB
Input Power Resolution	0.1 dB
Residual EVM	(1) +15.0 dBm ~ -40.0 dBm: < -32 dB (2.5 %) (2) +12.0 dBm ~ -35.0 dBm: < -32 dB (2.5 %) -35.0 dBm ~ -40.0 dBm: < -30 dB (3.2 %)
Center Frequency Error	< ±1.0 ppm
Symbol Clock Error	< ±5.0 ppm

Modulation Analysis	
Bandwidth	20 MHz

Analysis Modes (802.11 a/g)	6M_BPSK_1/2
	9M_BPSK_3/4
	12M_QPSK_1/2
	18M_QPSK_3/4
	24M_16QAM_1/2
	36M_16QAM_3/4
	48M_64QAM_2/3
	54M_64QAM_3/4
Analysis Modes (802.11 n)	MCS0 (6.5M_BPSK_1/2)
	MCS1 (13M_QPSK_1/2)
	MCS2 (19.5M_QPSK_3/4)
	MCS3 (26M_16QAM_1/2)
	MCS4 (39M_16QAM_3/4)
	MCS5 (52M_64QAM_2/3)
	MCS6 (58.5M_64QAM_3/4)
	MCS7 (65M_64QAM_5/6)
Measured Parameters	RMS EVM (%)
	Power (dBm)
	Center frequency error (kHz)
	Symbol clock error (ppm)
	I/Q Constellation

Channel / Frequency	
Channel / Frequency	(1) 1/2412, 2/2417, 3/2422, 4/2427, 5/2432, 6/2437, 7/2442, 8/2447, 9/2452, 10/2457, 11/2462, 12/2467, 13/2472, 14/2484
	(2) 34/5170, 36/5180, 38/5190, 40/5200, 42/5210, 44/5220, 46/5230, 48/5240, 52/5260, 56/5280, 60/5300, 64/5320, 100/5500, 104/5520, 108/5540, 112/5560, 116/5580, 120/5600, 124/5620, 128/5640, 132/5660, 136/5680, 140/5700, 149/5745, 153/5765, 157/5785, 161/5805, 165/5825

■ BT LE Specification

Standard	
Standard	Bluetooth Core Specification, Version 4.2(Low Energy)

BT LE Generator	
Frequency Range	2400 ~ 2500 MHz
Frequency Accuracy	< ± 1.0 ppm/year @ operating temperature
Output Power Range	-5.0 dBm ~ -70.0 dBm
Output Power Accuracy	< ± 1.0 dB
Output Power Resolution	0.1 dB

BT LE Signal Type	
Signal Type (BT4.0 2 MHz, GFSK Modulation)	ALL_ZEROS
	ALL_ONES
	10101010
	11110000
	PRBS9

BT LE Analyzer	
Frequency Range	2400 ~ 2500 MHz
Frequency Accuracy	< ± 1.0 ppm/year @ operating temperature
Input Power Range	+20.0 dBm ~ -50.0 dBm
Input Power Accuracy	< ± 1.0 dB
Input Power Resolution	0.1 dB

Modulation Analysis	
Analysis Modes	TEST_MODE
	ADVERTISING MODE
Measured Parameters	Power (dBm)
	Frequency deviation df1
	Frequency deviation df2
	Frequency accuracy
	Frequency offset
	Initial frequency drift
	Frequency drift
	Max drift rate
df2 max rate 99.9 %	

Channel / Frequency	
Channel /Frequency	0 / 2402 MHz ~ 39 / 2480 MHz

Remote Control

Port	
USB	USB to Serial (Virtual COM Port)
	USB Driver (Silicon Laboratories CP210x USB to UART Bridge) http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx
GPIB	

Interface



RF Port	
IN/OUT	N Type , 50 Ohm, DC isolated
Reference Port	
IN	BNC Type, 10 MHz, +10 dBm ~ 0 dBm @ 50 Ohm

Miscellaneous

Physical	
Dimension	210(w) x 342(d) x 88(h) mm
Weight	4.1 kg
* Packing Size	350(w) x 460(d) x 170(h) mm
* Packing Weight	Approx. 5.0 kg
* The size or weight of a package may vary on how to pack a package.	
Line Voltage	
Input	100 - 240 VAC, 50 ~ 60 Hz
Power(Typ.)	< 45 W (Typ. 26 W)
AC Current(Typ.)	1.1 A / 115 VAC (Typ. 0.65 A / 230 VAC)
Operation Temperature	
Operation	25 ± 10 °C
Storage	-20 °C ~ +70 °C