

TEST METHOD (GT-9772A)

1.1 HANDSET

1. Instrument for Test

- 1) MULTIMETER
- 2) AC VOLT METER (ACVM)
- 3) AUDIO FREQUENCY GENERATOR (600ohm OUTPUT)
- 4) STORAGE OSCILLOSCOPE
- 5) TELEPHONE ANALYZER
or 20Hz RING GENERATOR with ADJUSTABLE OUTPUT LEVEL
- 6) FREQUENCY COUNTER
- 7) DISTORTION METER
- 8) RF STANDARD SIGNAL GENERATOR (SSG)
- 9) RF VOLT METER
- 10) MODULATION METER
- 11) SINAD METER
- 12) SPECTRUM ANALYZER

2. Standard Test Condition

1) STANDARD VOLTAGE

(1) BASESET UNITAC 230V \pm 10%, 50Hz

(2) HANDSET UNITDC 3.9 \pm 0.1V

2) TEMPERATURE25 \pm 5°C

3) TX FREQUENCY

CHANNEL	BASESET TX	HANDSET TX
1 / 21	904.0125/ 904.5125 MHz	814.0125/ 814.5125 MHz
2 / 22	904.0375/ 904.5375 "	814.0375/ 814.5375 "
3 / 23	904.0625/ 904.5625 "	814.0625/ 814.5625 "
4 / 24	904.0875/ 904.5875 "	814.0875/ 814.5825 "
5 / 25	904.1125/ 904.6125 "	814.1125/ 814.6125 "
6 / 26	904.1375/ 904.6375 "	814.1375/ 814.6375 "
7 / 27	904.1625/ 904.6625 "	814.1625/ 814.6625 "
8 / 28	904.1875/ 904.6875 "	814.1875/ 814.6875 "
9 / 29	904.2125/ 904.7125 "	814.2125/ 814.7125 "
10 / 30	904.2375/ 904.7375 "	814.2375/ 814.7375 "
11 / 31	904.2625/ 904.7625 "	814.2625/ 814.7625 "
12 / 32	904.2875/ 904.7875 "	814.2875/ 814.7875 "
13 / 33	904.3125/ 904.8125 "	814.3125/ 814.8125 "
14 / 34	904.3375/ 904.8375 "	814.3375/ 814.8325 "
15 / 35	904.3625/ 904.8625 "	814.3625/ 814.8625 "
16 / 36	904.3775/ 904.8875 "	814.3775/ 814.8875 "
17 / 37	904.4125/ 904.9125 "	814.4125/ 814.9125 "
18 / 38	904.4375/ 904.9375 "	814.4375/ 814.9375 "
19 / 39	904.4625/ 904.9625 "	814.4625/ 814.9625 "
20 / 40	904.4875/ 904.9875 "	814.4875/ 814.9875 "

4) STANDARD MODULATION 1KHz, \pm 2KHz DEVIATION



5) STANDARD RF INPUT 60dBuV

6) STANDARD AUDIO FREQUENCY 1KHz

7) TELEPHONE LINE IMPEDANCE 600 Ω

8) STANDARD LPF 15KHz

3. Register of Handset

- 1) Press [HOLD] button above 3 sec in Base.
 - BEEP tone is heard.
- 2) Input any 3 digits as a PASSWORD.[DIAL 0~9]
- 3) Input Intercom number.(1 digit,[DIAL 1~3])
- 4) Press [HOLD] button.
- 5) Press [] button above 3 sec in Handset.
 - BEEP tone is heard.
- 6) Input the 4 digits(password 3 digits and Intercom No. 1 digit) pressed in Base.[DIAL 0~9]
- 7) Press [] button.
 - If it completed register, BEEP tone is heard.
 - Keep the wait state

※ NOTE

1. After it input number in Base, you must input number within 30 sec in Handset.
 - If it passed 30 sec, BEEP tone is heard.
 - Keep the wait state.
2. If a call is received **while** registering, register is stop.
Then, ring in Base only.

4. Entering TEST MODE

1) Handset

(1) Entering TEST MODE

A. When the power is off.

- Press dial button [3],[6],[9] and turn the power on simultaneously.

B. When the power is on.

- Short TEST and GND terminal.

(2) Function and Operation Mode

A. TEST MODE 1 : Talk mode

- TEST MODE → [1] → [TALK] → Channel No.(2 digits)
- [0] BTN : RX MUTE ON/OFF

B. TEST MODE 2 : DATA receiving mode

- TEST MODE → [2] → [TALK] → Channel No.(2 digits)

C. TEST MODE 3 : ID No. confirmation mode

- TEST MODE → [3]

D. TEST MODE 4 : DATA transmitting mode

- TEST MODE → [4] → [TALK] → Channel No.(2 digits)

E. TEST MODE 5 : ID No. entering mode

- TEST MODE → [5] → ID No.(6 digits)

F. TEST MODE 7 : Test for LED

G. TEST MODE 8 : Test for Button operation

* [TALK] Button : Channel selection

* [REDIAL] Button : Test mode is initialized.

2) Base

(1) Entering TEST MODE

A. When the power is off.

- Press dial button [3],[6],[9] and turn the power on simultaneously.
(BEEP tone is heard)

B. When the power is on.

- Press dial button [3],[6],[9] and press [RESET] BTN simultaneously.
Then, release pressing the dial buttons after 2 sec.

(2) Function and Operation Mode

A. TEST MODE 1 : Talk mode

- TEST MODE → [1] → [SPK] → Channel No.(2 digits)
- [0] BTN : RX MUTE ON/OFF

B. TEST MODE 2 : DATA receiving mode

- TEST MODE → [2] → [SPK] → Channel No.(2 digits)

C. TEST MODE 3 : ID No. confirmation mode

- TEST MODE → [3]
- LED is blinking.

D. TEST MODE 4 : DATA transmitting mode

- TEST MODE → [4] → [SPK] → Channel No.(2 digits)

E. TEST MODE 5 : ID No. entering mode

- TEST MODE → [5] → ID No.(6 digits)
- BEEP tone is heard.(3 times)

F. TEST MODE 6 : continuous DATA transmitting mode

G. TEST MODE 7 : Test for LED

H. TEST MODE 8 : Test for Button operation

* [SPK] button : Channel selection

* [REDIAL] button : Test mode is initialized.

5. Test for Handset

1) Preparation

- (1) Adjust the voltage of power supply to DC 3.9V.
- (2) Press dial button [3],[6],[9] and turn the power on simultaneously.
- (3) Press dial button [1] → [TALK] → [2] → [1] to set channel 21 in test mode 1.
 - * Disassemble the antenna.

2) Adjustment of Tx Frequency

- (1) Connect 50 Ω coaxial cable to antenna part of RF board.
- (2) Connect the coaxial cable to Freq. Counter and adjust the Trimmer to within 814.5125MHz \pm 1KHz.

3) Check Tx Power

- (1) Connect the coaxial cable to RF Power Meter.
- (2) Check that RF power is 8 \pm 1mW.

4) Check SPURIOUS

- (1) Set the spectrum analyzer to REF. LEVEL = +15dBm, START = 100MHz, STOP = 1GHz, RESOLUTION BANDWIDTH = 30KHz.
- (2) Connect coaxial cable to spectrum analyzer and check the spurious is above 55dBc.
- (3) Set the spectrum analyzer to REF. LEVEL = +15dBm, START = 1GHz, STOP = 6GHz, RESOLUTION BANDWIDTH = 30KHz.
- (4) Check the spurious is above 50dBc.

5) Adjustment of Tx Voice Deviation

- (1) Adjust the power of Audio Analyzer to 1KHz, 10mVrms.
- (2) Press dial [0] button. Connect Audio Analyzer to Mic through AC coupling and adjust RV1 that the frequency deviation is 2.0 \pm 0.3kHz and check the distortion factor is below 5%.

6) Test for Tx Data Deviation

- (1) Remove Freq. Generator and press [REDIAL] → [4] → [TALK] → Channel No. (2 digits) to transmit data.
- (2) Check the data deviation is 2~5KHz.

7) Adjustment of Rx Sensitivity

- (1) Press [REDIAL] button to return Test Mode.
- (2) Press [1] → [TALK] → [2] → [1] to set the channel 21 in Test Mode.
- (3) Set the RF output power is -47dBm(60dBuV), the frequency is 904.5125MHz, audio frequency is 1KHz, and FM modulation is 2kHz of SSG.
- (4) Connect to coaxial cable.
- (5) Connect the AC Volt Meter to each part of receiver and adjust RV2 of K/P board that level of each receiver part is 70 ± 5 mVrms.
In this time, check the distortion factor is below 5%.
- (6) Decrease the output power of SSG to confirm that 12dB SINAD point is below -107dBm.

8) Adjustment of Carrier Detect

- (1) Adjust RV of RF module that the LED of Talk is on when the output of SSG is up 0 dB more than Rx sensitivity(12dB SINAD point).
- (2) Check that the LED of Talk is off when the output of SSG is decreased -2dB and it is on when the output of SSG is increased 1 to 3dB.

9) You need not adjust Dx Alarm.

10) Entering ID No.

- (1) set the Test Mode 5.
- (2) Beep tone is heard 2 times when pressing ID No.(6 digits) and Intercom No.(1 digit).

11) Test for Low Battery

- (1) Turn the power supply switch off/on.
- (2) Decrease the voltage to check that the point which Beep tone is heard below DC 3.4 ± 0.1 V .

6. Test for Base

1) Preparation

- (1) Press dial button [3],[6],[9] and supply voltage(12V/500mA) simultaneously. or press dial button [3],[6],[9] and [RESET] button. Then, release the dial button after 2 sec.
- (2) Press dial button [1] → [SPK] → [2] → [1] to set channel 21 in Test Mode.
 - * Disassemble the Antenna terminal.

2) Adjustment of Tx Frequency

- (1) Connect 50 Ω coaxial cable to antenna part of RF board.
- (2) Connect the coaxial cable to Freq. Counter and adjust Trimmer to within 904.5125MHz \pm 1KHz.

3) Check Tx power

- (1) Connect coaxial cable to RF Power Meter.
- (2) Check that RF power is 8 \pm 1mW.

4) Check Spurious

- (1) Set the Spectrum Analyzer to REF LEVEL = +15dBm, START = 100MHz, STOP = 1GHz, RESOLUTION BANDWIDTH = 30KHz.
- (2) Connect coaxial cable to Spectrum Analyzer and check the spurious is above 55dBc.
- (3) Set the Spectrum Analyzer to REF LEVEL = +15dBm, START = 1GHz, STOP = 6GHz, RESOLUTION BANDWIDTH = 30KHz.
- (4) Check the spurious is above 50dBc.

5) Adjustment of Tx Voice Deviation

- (1) Press dial button [0] for Rx mute on.
- (2) Feed DC 48V to tel. line.
- (3) Adjust output of Audio Analyzer to 1KHz, 312mVrms when it is not loaded to tel. line and connect it. Adjust RV1 that the frequency deviation is 2.3 \pm 0.3kHz(@ 30mA Loop Current) and check the distortion factor is below 5%.

6) Test for Tx data Deviation

- (1) After testing 5, remove Audio Freq. Generator and press [REDIAL] → [6] → [SPK] → Channel No.(2 digits) to transmit data.
- (2) Check the data deviation is 2 ~ 5KHz.

7) Adjustment of Rx Sensitivity

- (1) Press [REDIAL] button to return Test Mode.
- (2) Press [1] → [SPKP] → [2] → [1] to set the channel 21 in Test Mode.
- (3) Set the output power is -47dBm(60dBuV), the frequency is 814.5125MHz, audio frequency is 1KHz and FM modulation is 2KHz of SSG.
- (4) Connect to coaxial cable.
- (5) After connectting 600Ω dummy to each part of receiver, connect AC Volt Meter and adjust RV2 of main board that level of each receiver part is $640 \pm 20\text{mVrms}$. In this time, check the distortion factor is below 5%.

8) Adjustment of Carrier Detect

- (1) Adjust RV of RF module that the LED of OUT is blinking when the output of SSG is up 3 dB more than Rx sensitivity(12dB SINAD point).
- (2) Check that the LED of OUT is off when the output of SSG is decreased -2dB and it is on when the output of SSG is increased 1 to 3dB.

9) You need not adjust Dx Alarm.

10) Entering ID No.

- (1) set the Test Mode 5.
- (2) Confirmation tone(BEEP) is heard 2 times when pressing ID No. (6digits)

11) Test for Ring

- (1) Set the normal mode by entering power to base and handset.
- (2) Adjust ring output Telephone Analyzer to 20Hz, 38Vrms and connect base to tel. line.
- (3) Check the ring is occurred in Ringer of handset when the output of ring is started in Telephone Analyzer.

1.2 Automatic Answering Machine

1. Instrument for Test

- 1) MULTIMETER
- 2) AC VOLT METER (ACVM)
- 3) AUDIO FREQUENCY GENERATOR (600 Ω OUTPUT)
- 4) STORAGE OSCILLOSCOPE
- 5) TELEPHONE ANALYZER
or 20Hz RING GENERATOR with ADJUSTABLE OUTPUT LEVEL
- 6) FREQUENCY COUNTER
- 7) DISTORTION METER
- 8) DC 48V TEL-LINE FEEDING JIG
- 9) STOP WATCH
- 10) TEST TELEPHONE with DTMF DIALING

2. Standard Test Condition

- 1) STANDARD LINE VOLTAGE AC 230V \pm 10%
- 2) TEMPERATURE 25 \pm 5 $^{\circ}$ C
- 3) AUDIO FREQUENCY 1KHz
- 4) TELEPHONE LINE IMPEDANCE 600 Ω
- 5) TELEPHONE LINE INPUT -10dBv(No load)
- 6) TELEPHONE LINE LOOP CURRENT 30mA
- 7) TELEPHONE LINE VOLTAGE 48 \pm 5V
- 8) All output of power measure at each terminal of 8 Ω speaker.
(If it is tel. line, measure after each part of tel. line connect 600 Ω load.)

3. Automatic Answering Machine Part

1) Entering and Operation method in TAD Test Mode

- (1) Press dial button [3],[6],[9] and turn the power on simultaneously.
or press dial button [3],[6],[9] and press [RESET] BTN simultaneously.
Then, release pressing the dial button after 2 sec.

(2) Function of each button in TAD Test Mode

- [OUT] BTN : ICM Recording(it is heard in SPK), OUT LED check VOX
- [REC] BTN : USER OGM Recording
- [PLY/STP] BTN : ICM Replay → SPK, CO outgoing
- [BELL] BTN : DTMF TEST
(Press dial button [1]→ [5]→ [9]→ [0] then, SPK outgoing)
- [PAGER] BTN : FIXED OGM Replay → SPK, CO outgoing
* Each button operate Toggle.

2) Measurement of Automatic Answering Circuit

(1) Fixed OGM Replay

A. Outgoing in tel. line

- Press [PAGER] button in Test Mode, then replay Fixed OGM.
- Check the level is below -15dBm outgoing tel. line.
(each of tel. line connect @ 600Ω)
- Press [PAGER] button to stop outgoing message.

B. Replay in SPK

- Press [PAGER] button in Test Mode, then replay Fixed OGM.
- Check replaying the level in SPK.
- Press [PAGER] button to stop outgoing message.

(2) Recording Measurement of User OGM

- Press [REC] button in Test Mode and record in User OGM Recording Mode.
- After adjusting output of Audio Freq. Generator is 1KHz, 4mVrms,
connect Audio Freq. Generator to Mic through 100uF capacitor.
- Press [REC] button to stop record of message.

(3) Replay Measurement of User OGM

A. Outgoing to tel. line

- Press [PLY] button in Test Mode, then it is User OGM Replay Mode.
- Check the level is below -15dBm outgoing to tel. line.
(each of tel. line connect @ 600 Ω)
- Press [PLY] button to stop replay message.

B. Replay in SPK

- Press [PLY] button in Test Mode, then it is User OGM Replay Mode.
- Measure level replaying in SPK.
- Press [PLY] button to stop replay message.

(4) Recording Measurement of ICM

- Press [PLY] button in Test Mode, then it is ICM Recording Mode.
- Feed DC 48V to tel. line.
- After adjusting output of Audio Signal Generator is 1KHz, 312mVrms, connect Audio Signal Generator to tel. line through 100uF capacitor.
- Check VOX of OUT LED.
- Press [OUT] button to stop record of message.

(5) Replay Measurement of ICM

A. Outgoing to tel. line

- Press [PLY] button in Test Mode, then it is ICM Recording Mode.
- Check the level is below -15dBm outgoing to tel. line.
(each of tel. line connect @ 600 Ω)
- Press [PLY] button to stop outgoing message.

B. Replay in SPK

- Press [PLY] button in Test Mode, then it is User ICM Replay Mode.
- Measure level replaying in SPK.
- Press [PLY] button to stop replay message.