QBTLTK-P1200 TRANSMITTER TUNE UP PROCEDURE
PERFORMANCE TEST

The procedure in this chapter allows the verification of the electrical performance of QBTLTK-P1200. These tests do not require access to the interior of the instrument.

Recommended test equipment

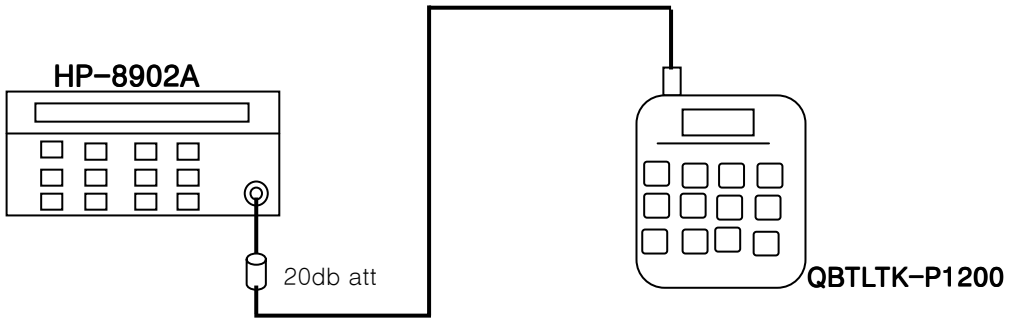
Description	Minimum specification	Model
Power meter	+ / - 0.2dB, - 60 to -20dBm. 100 KHz to 1GHz	HP-436A/8481D
Spectrum analyzer	100KHz to 3GHz, up to -120 dBm	HP-8591E
Measuring receiver	0.2 to 1300MHz, 0 to -125dBm, Freq Counter	HP-8902A
Oscilloscope	DC to 100MHz, 5mV to 1V/div, Rise Time capavility	TEK TDS360
Frequency Counter	+ / - 0.1ppm, 10Hz ~ 1GHz, 9digit	HP-53181A
Attenuator	10W, 20dB Att, DC to 1GHz	Tescom 99910

1. Frequency Accuracy

Frequency : 26.9950MHz

Stavility : Same as reference oscillator accuracy. Internal 1ppm 0 to 50degC

1.Test Setup



Carrier frequency accuracy test

2. HP-8902A : auto tuning, frequency display

3. QBTLTK-P1200

1) Connect 20dB Attenuators
2) Power On
3) X3 Key, enter, #1 key enter, RF ON

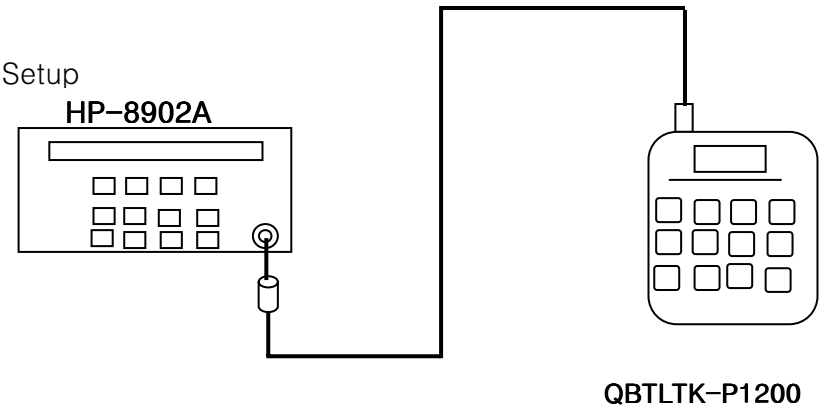
TC-1950A FREQ	Lower Limit	Actual	Upper Limit	Remarks
26.9950MHz	26.9750		27.0150	

2. RF Output Level Accuracy

RF level : 33dBm

Accuracy : +/-1dB

1.Test Setup



2.HP-8902A : Auto-tuning, RF Power

3.QBTLTK-P1200 :

1) Connect 20dB Attenuators

2) Power On

3) X3 Key, enter, #1 key enter, RF ON

Level	QBTLTK-P1200 Outpu mod on/off (MHz)	Lower Limit	Actual	Upper Limit	Remark
33dBm	Service Off	32		34	

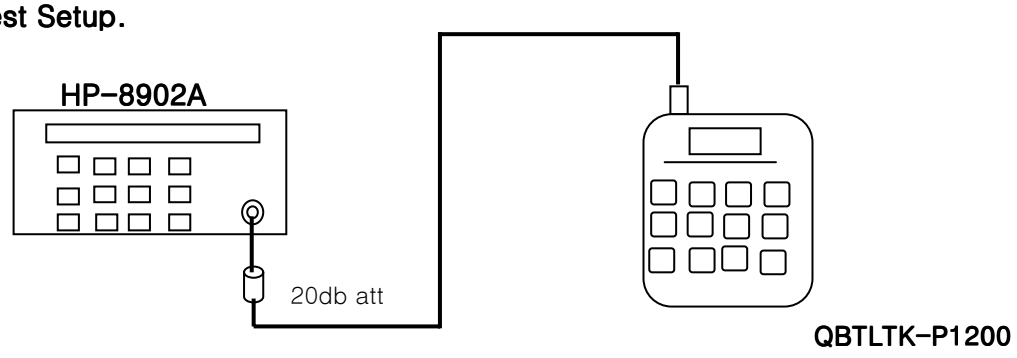
3. Spectral Purity

3.1. Residual FM Noise

RMS Noise : <10Hz Typ, 300Hz ~ 3KHz

<70Hz Typ, 50Hz ~ 3KHz

1. Test Setup.



2. HP 8902A : FM, RMS, Filter BW 300Hz ~ 3KHz

3.QBTLTK-P1200 :

1) Connect 20dB Attenuators

2) Power On

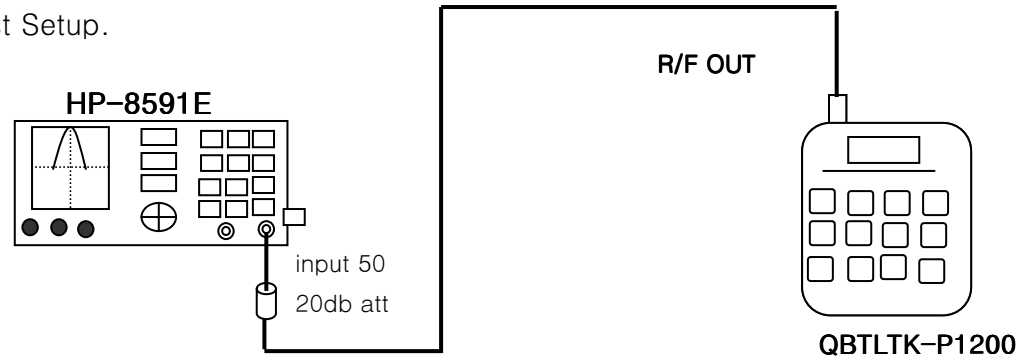
3) X3 Key, enter, #1 key enter, RF ON

8902 Filter BW		Actual	Limit (Hz)	Remark
HPF	LPF			
300Hz	3KHz		10Hz	
50Hz	3KHz		70Hz	

3.2. Harmonic Spurious :

Harmonic Level at 2xFOUT : <-60dBc

1. Test Setup.



Harmonice test

2. HP 8591E : Span = 500KHz, RBW = 10KHz, VBW = 30KHz.
3. QBTLTK-P1200 :
   1) Connect 20dB Attenuators
   2) Power On
   3) X3 Key, enter, #1 key enter, RF ON

QBTLTK-P1200 Harmonic Spurious

Fout(MHz)	Spurious(MHz)	Level(dBm)	Fout-2*Fout	Limit	Remark
26.9950	53.9900			-60dbc	

4. Modulation

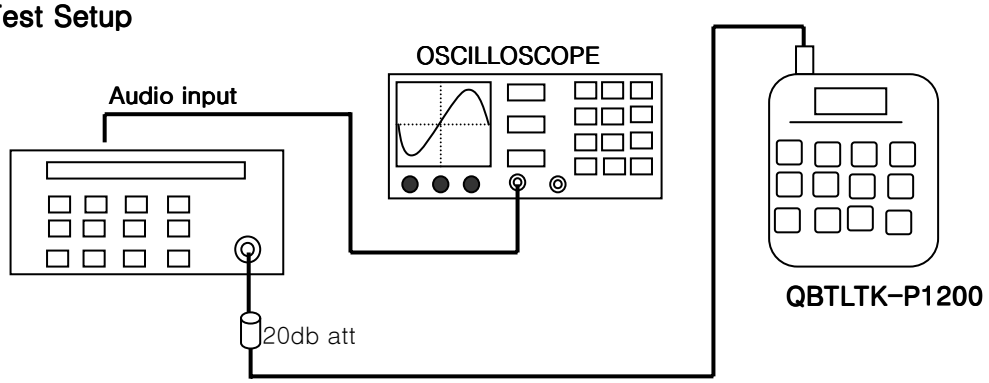
4.1. FM(RECT) (Internal F S K Test Patterns)

Deviation Accuracy

Deviation : 4.5KHz,

Accuracy : +/-5% (4.275 < FM < 4.725)@4.5KHz

1.Test Setup



FSK Deviation and Noise Test

2.Equipment

HP-8902A : FM, AVG, HPF=OFF, LPF=15KHz

TDS360 : 250us/div, 500mV/div Average : 16

3. QBTLTK-P1200

2) Power On

3) X3 Key, enter, #1 key enter, RF ON

4. Read FM Deviation in RMS.

DEV(WAITERCALL)	Limit
4.5KHz	4.5KHz + - 5%

Table : F S K Deviation Accuracy

Item	Lower	Actual	Upper	Remark
Deviation (AVG)	4.275		4.725	