

1. OUTLINE FCC TEST PLAN

The test set up is shown in Fig 1

Use test procedures as defined by ANSI C63.4-1992

Test x2 units and return x1 to the UK.

1.1. Equipment Under Test (EUT)

4 units are available to test:

TransPondIT Serial Number	Meter Serial Number	Capacitor Value (C1)
04001011*	Not Applicable	680nF
04001014	324090694	330nF
04001017	324090697	330nF
04001018	324090695	330nF

Note (1): Unit number 04001011 is a 120V version. The difference between this unit and units 04001014, 04001017 and 04001018 (240V versions) is that capacitor C1 (see sheet 2 of the schematic) is 680nF for the 120V version and 330nF for the 240V version.

Unit number 04001011 should be tested in a Form 1S Schlumberger solid-state meter (not supplied). All other units to be tested in Form 2S meters (as supplied).

For FCC testing all 4 links (see figure 2 below) need to be fitted. Units have been dispatched with these links fitted.

Note: The normal pulse repetition rate of 0.2Hz is below the minimum rate of 20Hz permitted by the FCC for use with quasi peak detectors. Therefore, the maximum transmitted field strength will be measured by setting the unit to a 20.833Hz PRF and using quasi-peak detector.

1.2. Radiated Emissions

Limits as set in section 15.249:

Fundamental (field strength) = 50mV/m @ 3m = 93.98dBuV (based on quasi-peak detector).

Therefore the FCC limit of the fundamental is:
93.98dBuV-Antenna factor (dB/m)-Cable loss (dB).....Equation 1

Harmonics (field strength) = 500uV/m @ 3m (based on average detector)

- Convert to dBuV = $20\log_{10}(500) = 53.98$

FCC limit = 53.98 dBuV – Antenna factor (dB/m) – cable loss (dB) (based on peak detector).....Equation 2

Measurement detector functions:

The field strength of fundamental frequency will be measured using a quasi-peak detector function.

The field strength of the harmonics will be measured using a peak detector function.

Note: Emissions radiated outside the band (902MHz to 928MHz), except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or 200uV/m @ 3m, which ever is the lesser attenuation.

1. Ensure ALL links are fitted as shown in figure 2: this sets the EUT to transmit an RF packet (128 bits) that modulates the RF carrier. PRF is 20.833Hz.
2. Setup the measurement equipment with the following settings:
Centre frequency = 919.8976MHz
RBW = 120KHz: VBW = 300KHz
3. Set the antenna for horizontal polarization. Using a ***peak*** detector adjust the antennas height so as to determine the maximum field strength. Note the antennas height and maximum field strength.
4. Repeat step 2 and determine the maximum field strength with the antenna vertically polarized. Note the antennas height and maximum field strength.
5. From the results of 2 & 3, set the antenna height that gave the maximum field strength.
6. Set up the measurement equipment to perform a ***quasi-peak*** measurement.
7. Determine the maximum field strength.
8. Use equation 1 to determine the EUT maximum radiated emission of the fundamental (919.8976MHz).

Harmonics

Setup the measurement equipment to record using an ***average*** detector function.

9. Ensure ALL links are fitted as shown in figure 2 in the EUT. This sets the EUT to transmit RF packets at a 20.833 Hz PRF
10. Set the antenna height to that obtained in step 5.
11. Using both vertical and horizontal polarization measure the 2nd to 10th harmonic field strengths.
12. Use equation 2 to determine the maximum field strengths of the harmonics.
13. Generate test reports.

1.3. Conducted Emissions

Refer to section 15.207: Conducted limit is 250uV (based on quasi-peak detector)

Measure the conducted emissions amplitudes between 450kHz to 30MHz on the live and neutral sides of the ac power lines of the EUT. Compliance shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

Method of measurement

- 1) Set detection mode to peak detection with 10kHz bandwidth
- 2) Scan the receiver from 450kHz to 30MHz
- 3) Record the peak emission amplitude for each frequency
- 4) Set detection mode to CISPR quasi-peak detection with 9kHz bandwidth.
- 5) Record the quasi-peak amplitude value for each frequency with a PEAK margin of less than 10dB
- 6) Set detection mode to Average detection with a 10kHz bandwidth
- 7) Record Average amplitude values for each frequency with a CISPR margin of less than 6dB
- 8) Generate test report.

This completes the FCC testing strategy.

Fig 1: The Test set up

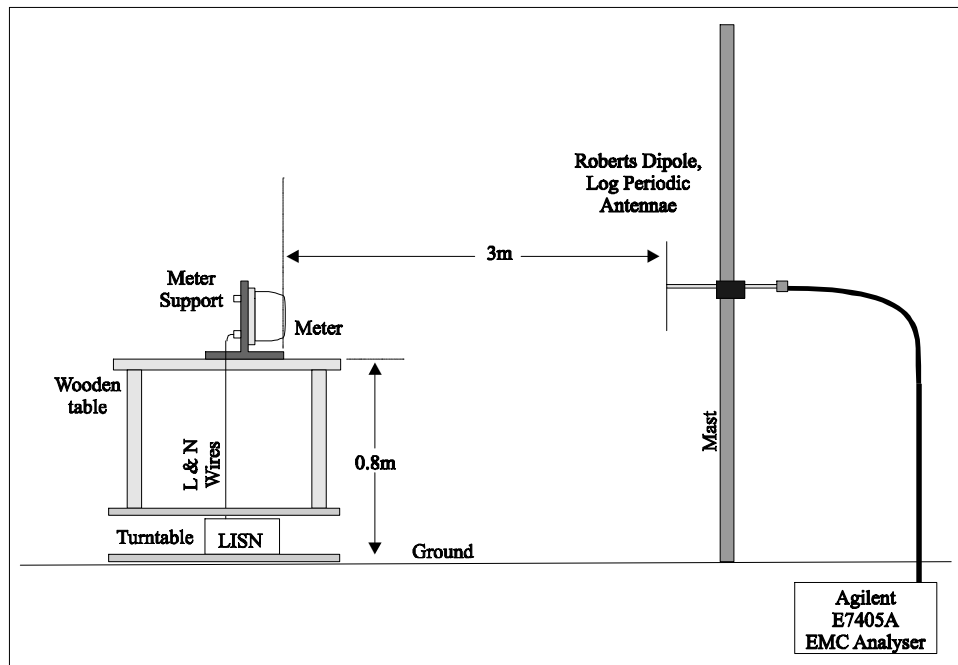
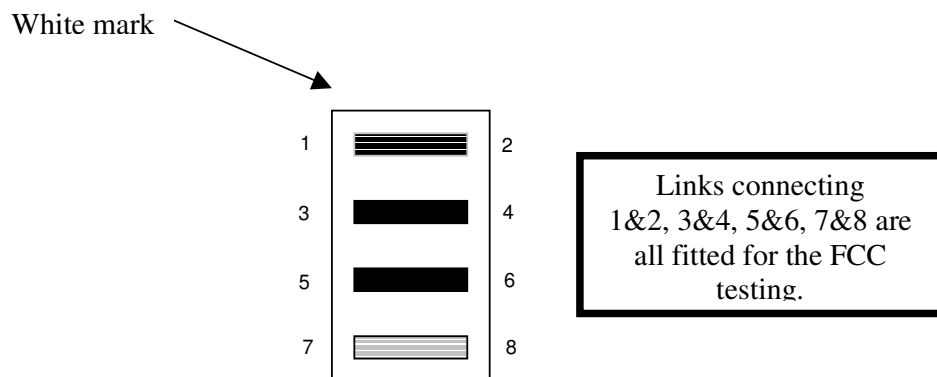


Figure 2: FCC Link Settings – rear view of PCB



Note: Normal operation has links 1&2, 3&4, 7&8 fitted only.