

E2-450 RADIO MODULE DECLARATION

The purpose of this document is to provide information pertaining to all the requirements for FCC/IC modular approval.

1 Sheilding

The entire radio circuit of the E2-450 module is shielded in a metal cage.

2 Buffering

Data is buffered by the SAM7 microcontroller before being modulated for the radio. The buffer size is a single byte.

3 Regulated Power Supply

The E2-450 module uses a combination of passive filtering and on board regulators to ensure compliance of the transmitted RF.

There are 3 voltages required by the E2-450 module; 3.3V, 5V and 9 to 30V. The 9 to 30V is only used in transmit and has an on board buck-boost regulator (IC302) which provides a regulated 12.5V, at up to 1.5A, to the power amplifier.

The 3.3V input is only used to power the AT91SAM7S256 microprocessor (IC603). This microprocessor provides the transmit modulation (RTXD) and requires the 3.3V to be regulated. The deviation of the modulation is calibrated in the final unit, not as a module, so the 3.3V voltage may vary by +/-10%.

The 5V input is used to power the radio and the HC08 microprocessor (IC406). It also supplies a 4.7V regulator (IC601) for critical circuitry. Passive filtering is used for all other radio circuitry. +5VB uses 3.3 Ohms and 300uF, while +5VA uses 3.3 Ohms and 100uF.

So the voltage rails supplied to the E2-450 are required to be regulated but the noise and accuracy requirements are not difficult to meet.

4 Antenna

Antenna is attached to the module by a standard SMA female connector. The SMA connector is located on the module.

Elpro supplies four antennas that is compatible with this radio.

4.1 Dipole Antenna – UDP400

The UDP400 is a ground independent half wave coaxial dipole antenna. These antenna are vertically polarized with an omnidirectional radiation pattern having a marine grade fibreglass radome with a powder coated aluminium mounting pole.

Specifications:

Frequency: 360-520MHz

Gain: 2dBi

Bandwidth: 2.5MHz

VSWR: 1.1:1(at center frequency)

Polarization: Vertical

H Plane: Omnidirectional

Length: 600 mm (24")

Construction: Half wave coaxial dipole enclosed in fibreglass.

Mounting: 20mm(0.8") OD aluminium tube

Termination: N-type female at the base of the mount tube

Weight: 4.5kg (9.9 lbs)

Wind loading: 10kg (22 lbs) at 160kph (99.4 mph)

4.2 Collinear Antenna – BU3-400, BU6-400

The BU3-400 and BU6-400 are a ground independent 3dB and 6dB (respectively) collinear antennas. These antenna are vertically polarized with an omnidirectional radiation and have a fibreglass radome with an aluminium mounting pole.

Specifications:

Frequency: 360-520MHz

Gain: 5dBi (BU3-400), 8dBi (BU6-400)

Bandwidth: 4% for BU3-400, 1.5% for BU6-400

VSWR: 1.5:1 across all bands

Polarization: Vertical

H Plane: Omnidirectional

E Plane: 32 deg (BU3-400), 16 deg (BU6-400)

Length: 1200-1600 mm (47-63") BU3-400, 2300-2800 mm (90-110") BU6-400

Construction: fibreglass/aluminium

Mounting: 25mm(0.9") OD aluminium tube

Termination: N-type female at the base of the pole

Weight: 4.0kg

Wind loading: 5.7kg (12.5 lbs) at 160kph (99 mph) BU3-400, 8kg (17.6 lbs) at 160 kph (99 mph) BU6-400

4.3 Yagi Antenna – YU3-400, YU6-400, YU9-400, YU16-400

The YU3, YU6, YU9, YU16 are ground independent 3dB, 6dB, 9dB, and 16dB (respectively) antennas. These antenna are vertically polarized with directional radiation and aluminium construction.

Specifications:

Frequency: 360-520MHz

Gain: 6 dBi (YU3), 9 dBi (YU6), 12 dBi (YU9), 15 dBi (YU16)

Bandwidth: 5%

VSWR: 1.2:1

Polarization: Vertical (when mounted vertically)

H Plane: 76 deg (YU3), 50 deg (YU6), 44 deg (YU9), 35 deg (YU16)

E Plane: 57 deg (YU3), 46 deg (YU6), 36 deg (YU9), 32 deg (YU16)

F/B ratio: 15 dB for YU3, 17 dB for YU6, YU9, YU16

Length: 600 mm (23") YU3, 1200 mm (47") YU6, 1600 mm (63") YU9, 2400 mm (95") YU16

Construction: Aluminium

Mounting: Use BR_YAGI_KIT for mounting up to 50 mm (2")

Termination: N-type female on a 150mm cable, suitable for CC10 or CC20 cables

Weight: 0.8kg (YU3), 1.4kg (YU6), 1.6kg (YU9) 3.0kg (YU16)

Wind loading (160kph or 99 mph): 4.6kg (10 lbs) YU3, 8kg (17.6 lbs) YU6, 11.5kg (25.3 lbs) YU9, 15kg (33 lbs) YU16.

4.4 Whip Antenna – WH400-BNC

The WH400 is a ground dependent quarter wave, vertically polarized, omnidirectional whip antenna. These antenna can be used for demonstration, testing or short distance applications where the wireless unit and antenna are mounted inside a non-metallic enclosure.

Specifications:

Frequency: 360-520MHz

Gain: -2dBi

Bandwidth: 7%

VSWR: as per center frequency

Polarization: Vertical

H Plane: Omnidirectional

Length: Cut to frequency, 200 – 300 mm (7.8 – 11.8")

Construction: PVC/wire

Mounting: BNC connector base to module

Termination: BNC male

Weight: 100g (3.5 ounces)

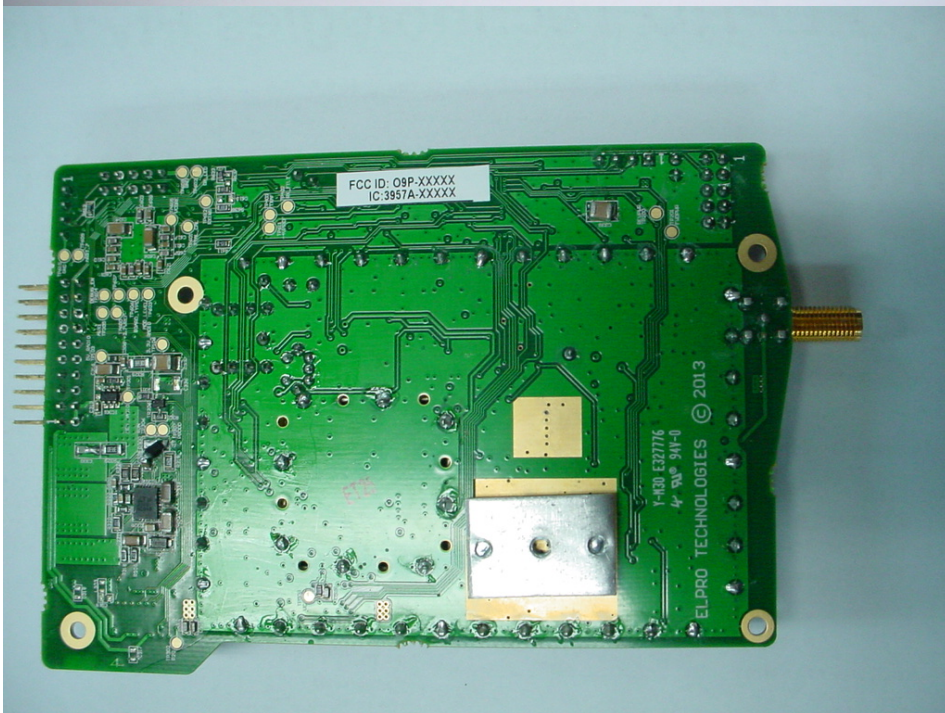
Wind loading: N/A

5 Stand alone testing

Testing has been performed by EMC Technologies P/L , New Zealand.

6 Labels

The FCC ID and IC numbers are attached to the module as per photo below.



7 Operational Instructions

Operational instructions are contained in the complete product of a product that uses the module. An example operational manual for such a product is the Elpro 450U-E.