

## E2-950 RADIO MODULE DECLARATION

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

### 1 Shielding

The entire radio circuit of the E2-950 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 2 messages/packets.

### 3 Regulated Power Supply

The E2-950 module uses a combination of passive filtering and on board regulators to ensure compliance of the transmitted RF.

There is 1 voltage required by the E2-950 module 9 to 30V. The 9 to 30V is regulated by two on board buck regulators (IC301, IC302) which provide a regulated 5.2Vdc, and 7.6Vdc to the power amplifier. There is another on board buck regulator which provides a regulated 3.3Vdc from the 5.2Vdc. 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 5.2Vdc is used to power the radio. 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.

The single voltage rail supplied to the E2-950 is not required to be regulated but must remain with 9 to 30Vdc.

### 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 are compatible with this radio.

#### 4.1 Dipole Antenna – CFD940

The CFD940 is a ground independent half wave coaxial dipole antenna. These antennas are vertically polarized with an omnidirectional radiation pattern having a marine grade fibreglass radome with a powder coated aluminium mounting pole.

**Specifications:**

Frequency: 900 - 960MHz

Gain: 2dBi

VSWR: 1.5:1 across band

Polarization: Vertical

H Plane: Omnidirectional

Length: 400 mm (16")

Construction: Half wave coaxial dipole enclosed in fibreglass.

Termination: SMA male on 3m of RG58 low loss cable

Weight: 0.35kg (0.75lbs)

#### 4.2 Collinear Antenna – SG900EL, SG940-6

The SG900EL and SG940-6 are a ground independent 5dBi and 8dBi (respectively) collinear antennas. These antennas are vertically polarized with an omnidirectional radiation and have a fibreglass radome with an aluminium mounting pole.

**Specifications:**

Frequency: 890-960MHz (SG900EL), 930-960MHz (SG940-6)

Gain: 5dBi (SG900EL), 8dBi (SG940-6)

VSWR: 1.5:1 across band

Polarization: Vertical

H Plane: Omnidirectional

E Plane: 32 deg (SG900EL), 16 deg (SG940-6)

Length: 900 mm (35") (SG900EL), 1370 mm (54") (SG940-6)

Construction: fibreglass/aluminium

Termination: N-type female on 100mm cable (SG900EL), N-type female at the base of the pole (SG940-6)

Weight: 0.55kg (1.2lbs) (SG900EL), 0.7kg (1.5lbs) (SG940-6)

#### 4.3 Yagi Antenna – YU6-940

The YU6-940 is a ground independent 11dBi antenna. This antenna is vertically polarized with directional radiation and aluminium construction.

**Specifications:**

Frequency: 900-960MHz

Gain: 11dBi

VSWR: 1.5:1

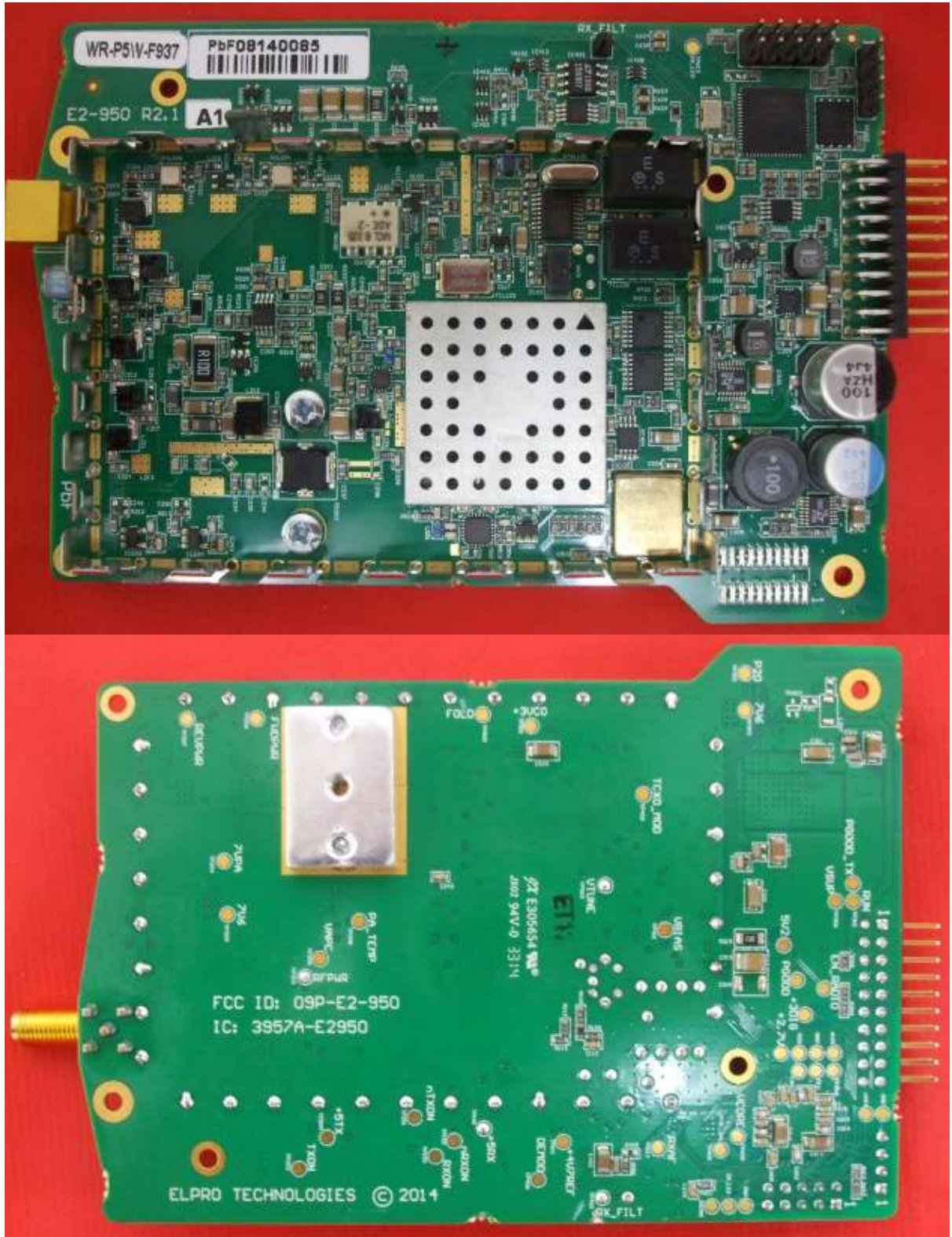
Polarization: Vertical (when mounted vertically)  
H Plane: 51 deg  
E Plane: 46 deg  
F/B ratio: 17.8 dB  
Length: 600 mm (23")  
Construction: Aluminum and Stainless Steel  
Termination: N-type female on a 250mm cable,  
Weight: 1.7kg (3.7lbs)

## **5 Stand alone testing**

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

## **6 Labels**

The FCC ID numbers are printed on 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 950U-E.

## 8 Section 15.211 Rules attestation:

<b>Limited Single-Modular Transmitter Requirement</b>	<b>Yes</b>	<b>No *</b>
The radio elements must have the radio frequency circuitry shielded. Physical components and tuning capacitor(s) may be located external to the shield, but must be on the module assembly;	Y – section 1	
The module must have buffered modulation/data inputs to ensure that the device will comply with Part 15 requirements with any type of input signal	Y – section 2	
The module must contain power supply regulation on the module	Y – section 3	
The module must contain a permanently attached antenna, or contain a unique antenna connector, and be marketed and operated only with specific antenna(s), per Sections 15.203, 15.204(b), 15.204(c), 15.212(a), 2.929(b);	Y – section 4	
The module must demonstrate compliance in a stand-alone configuration;	Y – section 5	
The module must be labelled with its permanently affixed FCC ID label, or use an electronic display (See KDB Publication 784748 about labelling requirements)	Y – section 6	
The module must comply with all specific rules applicable to the transmitter including all the conditions provided in the integration instructions by the grantee	Y – user manual for module	
The module must comply with RF exposure requirements (see discussions below).	Y – test report	