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Client: Hunter Engineering Co.
Model/HVIN: 45-1549
Standards: FCC 15.247
IDs: LS3-45-1549/2938A-451549
Report #: 2016038DXT

Appendix H: Technical Operational Description

Please refer to the following pages.

Operational Description of Hunter Radio 45-1549

General Description

The Hunter radio 45-1549 consists of 3 major components:

1. A combined 32-bit microcontroller/radio IC (MCU/Radio) The MCU is used to prepare and validate data for radio transmission and reception. The radio is a short range, low power 2.4GHz ISM band transceiver. The MCU/Radio also contains a voltage regulator.
2. A single 24MHz crystal that is used to develop a time base for all components and RF frequencies.
3. Two I/O (Input Output) expansion ports.
4. On-board transmit and receive antennae (PCB Artwork).
5. A board mount SMA connector to accept an external antenna.
6. An RF amplifier that boosts the power level of the transmitted and received signals.

Data Transmission

A packet of data to be transmitted is sent to the Serial UART of the Microcontroller (MCU). The serial data packet is transmitted at a data rate of 125k baud, 1 Start bit, 1 Stop bit and is at standard TTL voltage levels. The MCU acts as the buffer between the data source and the radio. There is no direct connection between the radio data input/output and the outside world.

When a data packet is received by the MCU the data is encapsulated in a packet structure that allows for reliable radio transmission. The altered packet is sent to the radio for RF transmission. (Figure 1.1)

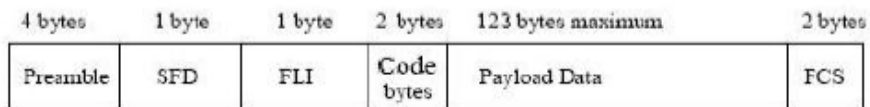


Figure 1-1. SMAC Packet Structure

The MKW21D512VHA5 contains a short range, low power 2.4GHz ISM band transceiver. It is compliant with IEEE standard 802.15.4. RF data is amplified and transmitted via an onboard antenna. The antenna is etched in the copper of the radio printed circuit board as described in Figure 2.

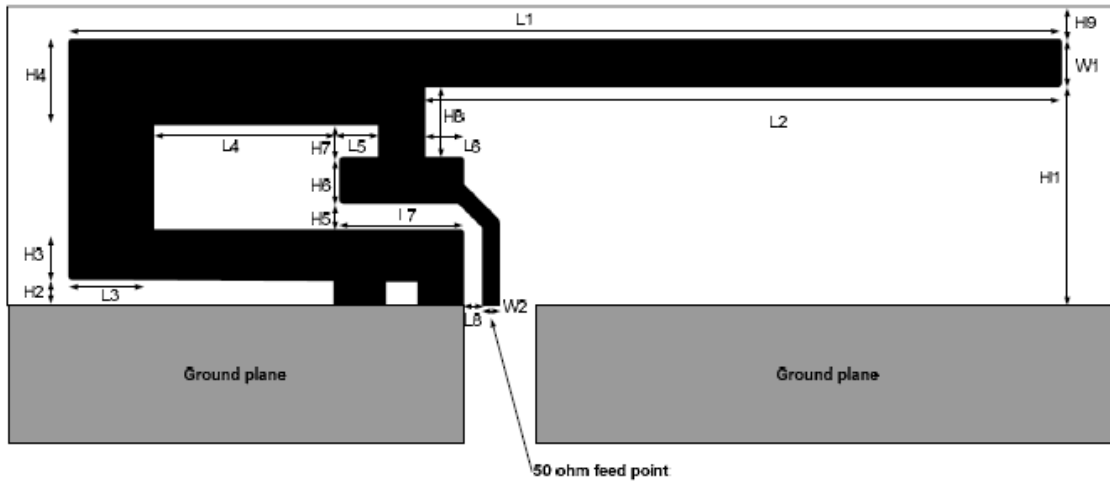


Figure 1. IFA Dimensions

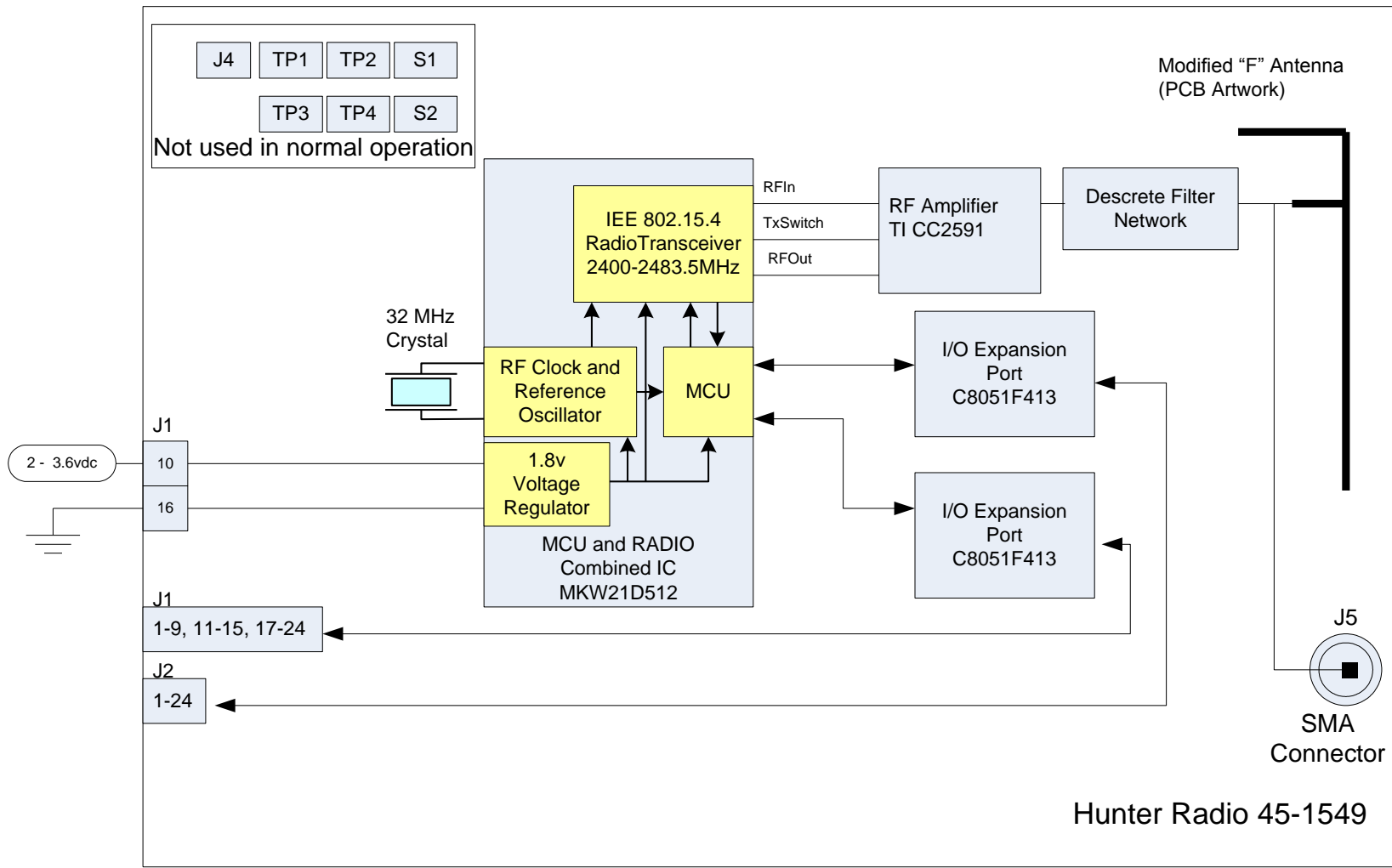
H1	5.70 mm	W2	0.46 mm
H2	0.74 mm	L1	25.58 mm
H3	1.29 mm	L2	16.40 mm
H4	2.21 mm	L3	2.18 mm
H5	0.66 mm	L4	4.80 mm
H6	1.21 mm	L5	1.00 mm
H7	0.80 mm	L6	1.00 mm
H8	1.80 mm	L7	3.20 mm
H9	0.61 mm	L8	0.45 mm
W1	1.21 mm		

Table 1. IFA Dimensions

Figure 2

Data Reception

Incoming RF data is amplified, received by the radio and sent to the MCU. The MCU validates and removes the encapsulating radio packet structure. The received data is then sent to the host via the serial UART.



Hunter Radio 45-1549 Block Diagram