

## PLL Frequency Synthesizer (IC3)

The PLL synthesizer of the signal loop PLL circuit with the reference of 6.25KHz.

The IC3 PLL IC includes all the functions such as the reference oscillator, the driver, the phase detector, the lock detector, and the programmable divider.

At the reference oscillator, the 10.250MHz is connected to the pin 2 of the IC3 to oscillate the frequency of 10.250MHz.

The phase detector sends out the output power to the loop filter through 10th pin of the IC3.

If the oscillation frequency of the VCO is low compared to the referenced frequency, the phase detector sends out the output power in positive pulse. If the oscillation frequency of the VCO is high, phase detector sends out the output power in negative pulse. Therefore, the VCO can maintain the frequency set.

The programmable divider maintains the desired frequency with the control from the CPU. The dividing ratio, "N" to oscillate the desired frequency is as below:

$$N = \text{VCO oscillation frequency} / \text{reference frequency}$$

If the desired frequency is 462.5625MHz

$$N = 462.5625\text{MHz} / 0.0125\text{MHz} = 37005$$

## CPU

Most of the control functions are controlled by the IC4 CPU.

## Weather Receiver

FR558WB Weather receiver parts are composed in the single conversion system, which has the IF Frequency of 450KHz, with the Frontend circuit which has an excellent band characteristic and skirt characteristic, the 1 pole MCF used in the Frontend, and the 2 pole ceramic filter in the IF, the reception interrupting factors such as the image and the sensitivity repression are reduced for the more stable reception.

### RF Frontend

The signal received by the antenna will be transmitted to the frontend through the antenna switching circuit consisted of L29, C205, L22. The frontend consists of the RF amplifier transistor Q13 and input/output band pass filter (CF4). Band pass filter has the bandwidth of approximately 10MHz, primarily diminishes the other signal within the reception band and amplifies only the necessary signal within the RF.

### Mixer, IF, FM Detector(IC5)

The receiver RF signal, which has been infused to IC5 is mixed with the 1st L/O signal of FM VCO, and converted to 450KHz, IF frequency. IF frequency passed through the CF3, the ceramic filter of 10.7MHz. After the limiting inside the IC4 and the FM demodulating by the quarter detector inside the IC5, the signal offers the output through the 14th pin of the IC5.