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APPENDIX E: PRODUCT DESCRIPTION

SPECIFICATIONS 12

- **Applicable international standards** : IEEE 802.11/IEEE 802.11b
- **Communication method** : Simplex
- **Radio communication type** : Direct Sequence Spread Spectrum (DSSS)
- **Modulation method** : DPSK/DQPSK (Burger/CKK code)
- **Frequency band** : 2.4 GHz band (2400 – 2472 MHz)
- **Available channels** : 1 – 11
- **Data transmission rates** : Max. 11 Mbps
- **Transmission range** : Approx. 30m (indoor) at 11 Mbps
- **Security** : WEP (Wired Equivalent Privacy)
ESSID (Extended Service Set Identifier)
- **Built-in antenna** : Diversity slot antenna
- **Transmission power** : Less than 1 W
- **Reception sensitivity** : –76 dBm max. (frame error rate: 8%)
- **Demodulation method** : Digital demodulation (matched filter type)
- **Operating temperature range** : 0 – +55°C
- **Input power** : 7.5 V DC $\pm$ 5% (using supplied AC adaptor)
- **Power consumption** : Transmit 450 mA (typical)
Receive 400 mA (typical)
- **Outline dimensions** : 100 (W) $\times$ 30.5 (H) $\times$ 70 (D) mm
(excluding projections)
- **Mass** : Approx. 90 g (excluding accessories)
- **Supported machines** : PC/AT compatible machine,
- **Supported OS** : Windows 98, Windows 98 Second Edition,
Windows Millennium Edition,
Windows 2000
Windows ^{XP}

* The specifications may be subject to change without notice.

* The transmission range may vary depending on the transmission speed and the environmental conditions.

----- Operation Explanation -----

MAIN unit operation explanation

1- Receiving unit

(1) 2.4G part

The receiving signal that was input from the antenna terminal is passed through the BPF FI1 and antenna switch IC3, then it is guided to RF-AMP IC16. The output of RF-AMP is passed through the LC-BPF FI7 and amplified with IC4. After that, it is mixed with 1st-LO inside IC4 and be transformed to the 1st-IF signal of 374MHz.

(2) IF part

1st-IF signal is output through sending and receiving switching SW, inside IC4, after it's band was restricted with BPF FI8 and then it is guided to IC6.

After signal was amplified in IC6, it is done quadrature detection by 2 LO that have the phase difference of 90 degrees.

Each I and Q signal passed through the LPF circuit inside the IC6 and then becomes output.

The local oscillator signal used for detection, it is generated by oscillation circuit.(Q4 and D3). The output frequency of this oscillator (748MHz) applied to IC6 that was divided to 1/2 and it's phase shifted inside of the IC6.

(3) Base band part

I/Q signal from IC6 is input to base band processor IC7. The IC7 changes the A/D output signal and recovers it to normal demodulate signal form. The receive data of demodulated signal is output through interface.

2.Transmission part

(1) Base band part

The transmission data is input to IC7 through the interface. Responding the transmission speed that was set up inside IC7 is converted with each method of BPSK,QPSK and CCK.

In the case of BPSK and QPSK, that are 11bits after dispersion becomes output.

(2) IF part

The signal that was diffused, is input to IC6. Signal has the phase difference of 90 degrees inside IC6 and via two LO modulated becomes 1st –IF signal (374MHz).

1st-IF signal is output through sending and receiving switching SW and after it was restricted the

band with BPF FI8 it is input to IC4.

(3) 2.4G part

1st-IF signal is mixed with 1st-LO with IC4 and becomes a RF signal. The RF signal is output, after it was amplified inside IC4. The output of IC4 is passed through the LC-BPF FI3 and amplified by PA-IC IC1. This output be through antenna switch IC3 and after removed the unnecessary bandwidth via BPF FI1, it is sent to the antenna.

(4) ALC part

The transmission RF power is detected by the detection part inside IC1 and be sent to IC7.

There is an AGC register inside the IC7 that is controlled via software, the signal that was controlled here controls AGC-AMP of IC6.

3. VCO . PLL unit

(1) 1st-LO part

2038 to 2088MHz as 1st-LO is produce.

IC-4 is including the PLL synthesizer and it's output provides lock for VCO unit.

The output of VCO enters into IC4, after it was amplified with IC5. 1st-LO that entered into IC4 is used to the signal supply to the mixing and PLL of the signal inside IC4.

(2) 748MHz LO part

The LO (748MHz) of quadrature modulation and for demodulation is produce.

IC6 is including the PLL synthesizer and the lock is applied to VCO that is composed of Q4 and D3. The output of VCO enters into IC6, after it was amplified with Q5.

The LO that entered to IC6, used to the signal supply for modulate and demodulate and PLL 's signal inside IC6

(2) System clock part

The reference clock of 44MHz is produce. The oscillation circuit is composed with IC14 (B), X1 and be supplied to the every part through the buffer of IC14 (A).

4. MAC unit

IC8 is MAC-IC for wireless LAN. Depends on the software (the firmware) that operates with this IC, for wireless transmission of data the necessary processing is carried out. The firmware and also NID are housed to flash memory IC10. For buffering of the sending and receiving data or operation of the firmware RAM IC11 is installed.

5. Power Supply unit

(1) 3.3V (A) power supply

It supplies the base band processor (IC7), PA-IC(IC1) , RF-AMP (IC-16), also VCCA and VCCB.

(2) 3.3V (B) power supply

It supplies MAC (IC8, UC10,IC11) and base band processor (IC7).

(3) VCCA, VCCB power supply

The 2 power supply of 2.9V are used as the power supply of the IF main unit.

VCCA is supplied to IC6, IC4 and also system clock.

VCCB is supplied to 748MHz-VCO, 1stLO of VCO, 1stLO-AMP(IC5) and IC4.

VCCA is generated by IC12 and VCCB is generated by IC13.