

EXHIBIT B

[FCC Ref. 2.1033(b)(4)]

"Description of Circuit Functions"

Exhibit B(1)-1 to B(1)-2 - Circuit Description

## **Circuit Description 27930GE3-M(AT238)**

This is a 2400MHZ band 40CH cordless telephone combine with built in caller-ID function for domestic use. Radio transmitter with FM technology provides greater mobility to the user within approximately 200 meters radius around the base.

Following paragraphs describe the detail of major building blocks.

### **1) Ringer Detection**

The ringer input signal is effective only when the telephone is in standby mode.

When a ringer signal comes to the base unit from the telephone line, it is clamped and rectified at diode input Z2 to optoisolator U2 and finally output to MCU U1 pin 68.

### **2) Surge protection**

The surge absorber V1 is mounted in the Base unit. It designed to operate when voltage over 330V. In general it is common to have induced surges in the telephone line due to lightening. If it allow entering the unit damage to the unit is imminent. The relay, Fuse and hybrid transformer is most venerable to high voltage surges and V1 surge absorber can prevent it.

### **3) Line control and Hook control.**

When the unit is operated by remote handset, line control is done by MPU(U10). It turns on transistor Q8. Then speech signal from telephone line is feed to U4 around component. U4 is an integrated circuit that provide noise reduction function for RF link.

### **4) Caller identification and DTMF generation**

The unit is fitted with caller identification feature provided by Tip and Ring. U1 can detect and receive FSK signal. U1 sends necessary digital information to handset via RF link. It makes use of Dual Tone generator inside the U1. According to user input relevant DTMF tones are been generated by U1 and sent to telephone line.

### **5) Power Control**

#### Base Unit

The main power is come from AC/DC adapter, which provide 12V DC to the unit. The RF receiving circuit is always turned on to receive the invoking signal from handset unit. But the RF transmitting circuit is normally turned off until a logic low from the MCU U1 pin 92 turns on PNP transistor. The RF transmitting supply voltage activates when the base unit is 'talk' mode, the base unit pages the handset unit, or the ringer signal enters the base unit. When the handset unit is in standby mod, the RF receiving circuit is turned on and off periodically by MCU, turning PNP transistor on and off. This means the handset unit wakes up periodically to receive the paging signal from the base

unit. However, the RF transmitting circuit will only be turned on when the handset unit is in talk mode.

#### Handset

Three cells of Ni-MH battery (3.6V) provide necessary power to the handset. In order to keep power consumption to minimum, the radio receiver is turned on and off periodically by MPU U1. The MPU is supplied with regulated 3.6V by U2.

### **7) Battery charging**

The base unit is equipped with battery charger so that handset batteries can be charged when necessary.

### **8) Radio module**

Both handset and base use 2400MHz analogue radio that transmits and receives signal in full duplex mode. Audio and data signal is FM modulated before transmitting from the module. The radio module is fully covered with shield plate in order to minimize interference to other equipment.

### **9) Security and security code generation**

The unit is provided with randomly generated security code. There are total of 65536 combinations. The unit is pre-registered at the default security code before executing registration. Charging handset on cradle of base unit does the registration. At that time the Base CPU randomly generates the security code and sends it to handset via RF link. Upon receiving the code it will be written to volatile memory in handset. The security code is also written to volatile memory at Base for future communication.

From thereafter the stored security code is accompanied each and every time communication between handset and base. These include ringing incoming, talk on, talk off etc. The subsequent commands are executed only if security codes are matched. Therefore it prohibits access of unauthorized users occupying the unit.