



# UDM-240ZBH,ZH

## Service Manual



## ※ BEFORE USING THIS

- ♣ Please read this manual in detail before using the device. (Please read and understand the manual before using this equipment)
- ♣ Features can be subject to change or modify without any prior notice for its improvement of performance (better performance)
- ♣ Copyright of this manual belongs to UNIMO Technology Co., Ltd., in a whole or in part authorized copy or modify are prohibited.
- ♣ Pictures on this manual may differ from the actual products.
- ♣ Please contact our local agency or Unimo A/S division directly if you have any questions.

## Safety Precautions

**This content is for user's safety and property. Please read it and fully understand.**

(Details affect to its performance and appearance)



경 고

**Please use recommended voltage for input power supply voltage.**



주 의

**Battery, adapter, external ear-phones are designed to Unimo models. Using non-Unimo goods can cause damage or malfunction to the product.**



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**Please use communication purpose only.**



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**Please do not disassemble or modify the product.  
Damage or malfunction caused by those, won't be repaired free of charge.**

※ **Avoid severe impact to the product.**

※ **Please keep avoid being exposed to direct sunlight or high temperatures and a lot of humidity**

Details affect to the operation of radios or other equipments.

Communication range can be shortened near the products using 2.4GHz due to interference of electric wave.

(Microwave, Wi-Fi, Computer, other equipment using 2.4GHz,... etc.)



Turn off the radio on airplane. Please follow the instructions or rules when you use it.



Please check whether can use or not before using the radio the due to electronic effect.



Do not use the radios near electronic equipments such as Wi-Fi or computers. Radios may does not work properly due to strong interference

※ Electromagnetic waves in a variety of electrical and electronic equipment occurs. The influence of electromagnetic interference is generated. Distance calls can also be shortened remarkably.

## Safety Requirement

Please read the following information about safe and effective use of the product.



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Keep your distance at least 1 inch(2.5cm) from your body when you use the radios.



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Make sure the regulations regarding the use of radio while driving, please do not use the radios as much as possible while you drive.  
Use additional accessories, such as earphones, for your safety.



경 고

Do not listen at very high volume. Your hearing may be affected.



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For use in hazardous areas, only explosion-proof device must be used. Within the hazardous areas, do not remove, exchange or charge/discharge the battery. If an electrical spark pops up in hazardous areas, it can cause severe burns or death.



경 고

Turn it off around the workplaces, causing an explosion of electromagnetic behavior of the product.

## 1 FEATURES

UDM-240ZH is designed to have light and durable structure and it provides a powerful sound.

It is the first product using 2.4GHz band developed in Korea and provides a clear digital sound.

UDM-240ZH is designed to provide adequate service for industrial products, public safety users.

It also provides clear digital radio communication between the UDM-240ZV and can be operated with the existing VHF, UHF, TETRA vehicle and base station and can communicate remotely if it's interfaced with UDM-240ZV.

- Clear 3FND Display
- 16 channels (#11~#26)
- Perfect security. (AES 128bit)
- 1,150mAh built-in LI-ION battery pack
- Group Call
- SCAN
- Group Scan
- UDM-240ZH : 0:11~26, 1:11~15, 2:16~20, 3:21~26
- UDM-240ZBH : 0:11~25, 1:11~15, 2:16~20, 3:21~25
- Volume Control (up to 8 Level)
- Ear-Phone Function
- Cradle type of Charger
- RX/TX while charging
- Good design due to a built-in antenna
- Designation of group ID up to 64,000
- 1 to N communication (per channel/ group ID)
- IP67 (Waterproofed)

## 2 COMPONENTS

### 2-1 Basic Components

- Main Unit, Charger, User Manual, Power Cigar Jack

### 2-2 Optional Components

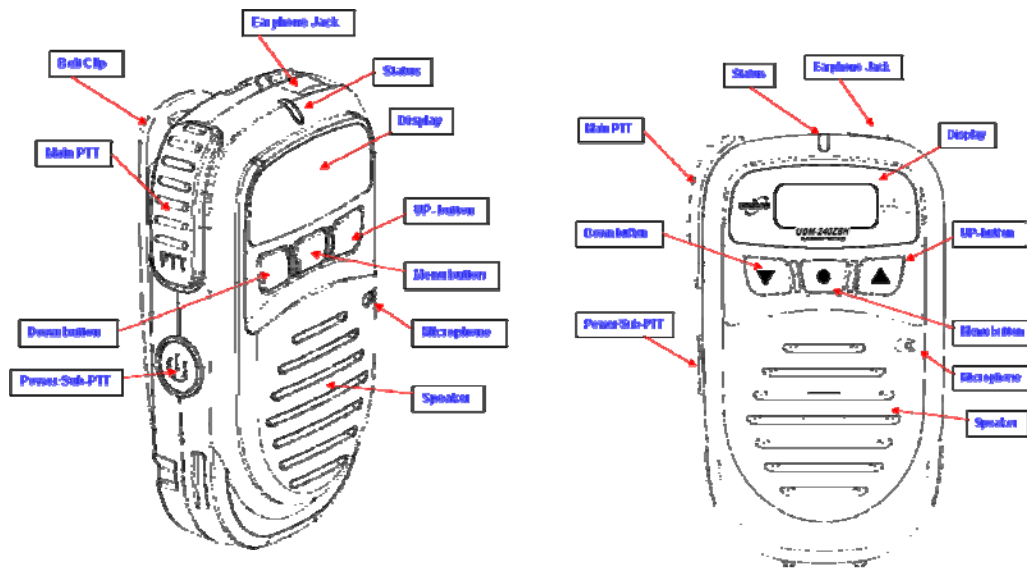
- Ear-Phone
- Wrist Strap
- AC220/DC5V/500mA Adapter
- Programming software
- USB PC Programming cable

**\*\*\* Components can be changed according to the request.**

### 3 DESCRIPTION OF CONTROLS & INDICATORS

Detail operating instructions can be found in the next page.

#### 3-1 Key and Button



#### Power On/Off button

Press the “power” button for more than 2 seconds then, the UDM is turned ON.

Press the “power” + “menu” button for more than 2 seconds then, the UDM is turned OFF.

Depending on the application, the power button can be used as a PTT button or INT button.

#### UP, Down button

Up/Down buttons are used for changing channels. The number of channels are 16(11Ch ~ 26CH) and it can be displayed C11~C26 or H11~H26.

#### Main-PTT

If you press this button, the UDM-240ZH will be transmission mode and if you release



the button, the UDM-240ZH will be turned to standby mode.

#### Sub PTT

This function can be programmed to the power button on the side of the UDM. It is used for transmission on a pre-programmed channel.

#### Menu button

It can be used to select and set user configurable features.

#### Earphone jack

The Earphone Jack on the top of the UDM will be used for interface with external earphone.

The UDM-240ZH can be programmed by its PC program and programming cable.

### 3-2 Display

#### Status LED

The users can be recognized the current status by LED indicator on the top of the UDM.

The status indication will be as followings.

- Red LED ON : Transmitting
- Green LED ON : Receiving
- Blue LED ON : Charging (LED will be OFF after completion of charging)
- The UDM-240ZH can transmit and receive while charging.

#### FND Display

Displays menu function through 3FND type LCD

Ptt : TX status using the C channel

Int : TX status using the H channel

Ud1 : Program version(1<sup>st</sup>)

Ud2 : Program version(2<sup>nd</sup>)

OFF : Power OFF

## 4 HOW TO USE

### 4-1 Power ON/OFF

- Press the “power” button for more than 2 seconds then the UDM-240ZH is turned ON.
- The device will not be turned on while charging.
- Power can be on after 3 seconds if the device is separated from the cradle.
- When the device is on, if you place it into the charging cradle, it is possible to use on and on.

### 4-2 HOW TO CHARGE

The built-in Li-ion battery is safe and reliable to guarantee high-performance.

**Batteries MUST be fully charged before use.**



Charging cradle



Terminal



Charging

#### Battery charging time

Low battery voltage will shorten the talk range and will make the performance of radio worse.

When Battery Charging is needed;

- After using the battery 4 ~5 hours the performance is seemed to be reduced.

- Check the battery indicator using the “menu” button, and FND displayed as below.

E- F(100%), E- 4(75%), E- 3(50%), E- 2(25%), E- E(Need to charge)

### HOW TO CHARGE

■ UDM-240ZH input power is DC 1.5V, UDM-240ZBC input power is DC12V ~ 24V.

■ LED Indications of charger

Status	LED
Charging	Blue LED : ON
Fully charged	Blue LED : OFF



CAUTION

**Battery charger used with UDM-240ZH must be supplied by UNIMO Technology Co., Ltd**

**Other manufacturer’s can cause unexpected damage of the battery and terminal.**

### CAUTIONS

- The UDM-240ZH is designed to be used with the supplied charging cradle only. In case of all the problems or damages caused by use of other chargers, manufacturer will be free from its responsibility of all the problems or damages.
- DO NOT disassemble and short circuit because it may cause fire or explosion.
- Be careful when the battery terminals touch the metal or conductor, it can damage to your device or human body.
- Never expose under direct sunlight and do not charge near fire.

## 5 DESCRIPTION OF FUNCTION

### 5-1 POWER On/Off

Press the “power” button for more than 2 seconds then, the UDM is turned ON, a “beep” sound is heard and “Ud1” or “Ud2” is displayed.

### 5-2 TRANSMIT

While pressing the “PTT” or “power” button for transmitting, the red LED will be on and through the setup channel, you can communicate.

For the better sound quality, it is recommended to take 5~10cm away from your body.

According to the program versions FND can be displayed as follows.

“C 1 1”or”H 15”or”P E E”or” I n E”

### 5-3 RECEIVE

User can adjust the volume level (1~8 steps) by using Up/Down button while receiving.

According to the program versions FND can be displayed as follows.

“C 1 1”or”H 15”or”P E E”or” I n E”

### 5-4 CHANGE THE CHANNEL

Enter into the menu mode by pressing menu button and press Up/Down button to change the channels.

Whenever the channel is changed, a “beep” sound will be heard.

According to the option program source the channel menu will be changed.

UDM-240ZBH: use Up/Down button in the standby mode).

- Main channel (PTT Button) : C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25
- Fixed channel (power button) : C26(fixed for transmit)

UDM-240ZH: use Up/Down button in the menu mode (C channel ,H channel selectable)

- **Main channel (PTT Button)** : C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25  
C26
- **Spare channel (Power Button)** : H11 H12 H13 H14 H15 H16 H17 H18 H19 H20 H21 H22 H23 H24  
H25 H26

## 5-5 SCAN

In the standby mode, enter into the menu mode then enable or disable SACN function.

 → Scan( *0n,OFF* ) → Scan Group ( *0 1 2 3* )select → press the PTT button to save

SCAN group in the UDM-240ZBH: *0* : ALL (11~25CH), *1* : 11~15CH,  
*2* : 15~20CH, *3* : 21~25CH

SCAN channels in the UDM-240ZH: 11CH ~ 26CH

## 5-6 FND DISPLAY

According to operational status FND shows following displays;

**Main Channel: 16CH**

*C 11,C 12,C 13,C 14,C 15,C 16,C 17,C 18,C 19,C 20,C 21,C 22,C 23,C 24,C 25,C 26*

**Sub channel: 16CH**

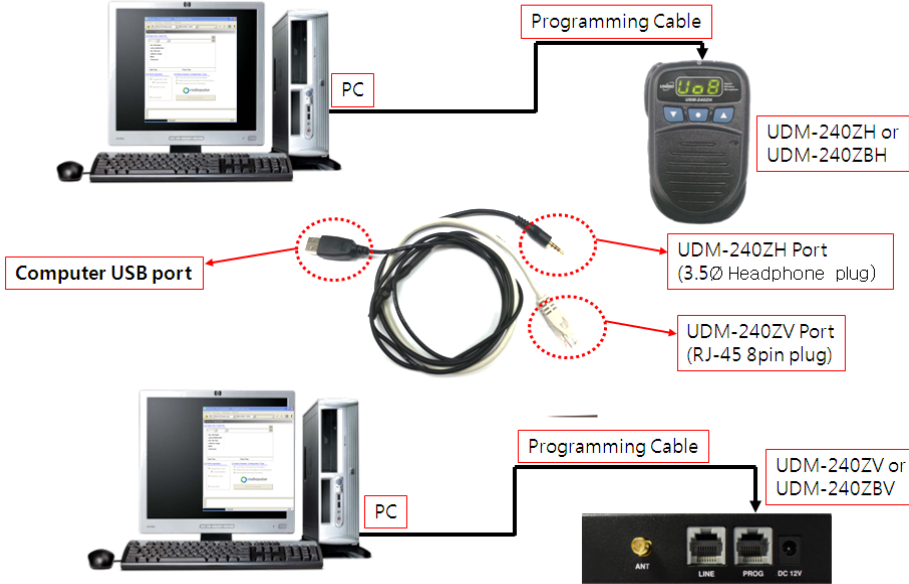
*H 11,H 12,H 13,H 14,H 15,H 16,H 17,H 18,H 19,H 20,H 21,H 22,H 23,H 24,H 25,H 26*

**Volume display: 8 levels**

*U 01,U 02,U 03,U 04,U 05,U 06,U 07,U 08*

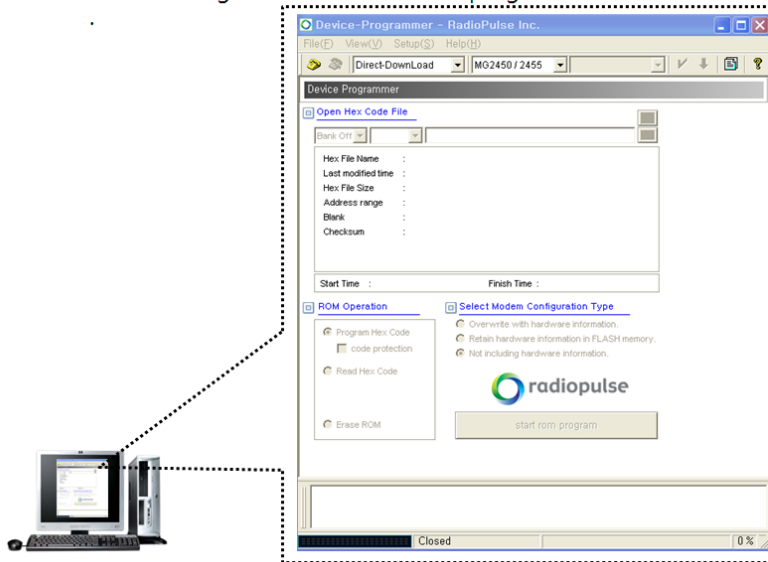
5-7 INSTALLATION FOR PC PROGRAM AND SETUP

**UNIMO** UDM-240ZH/240ZV Program



**UNIMO** UDM-240ZH/240ZV Program

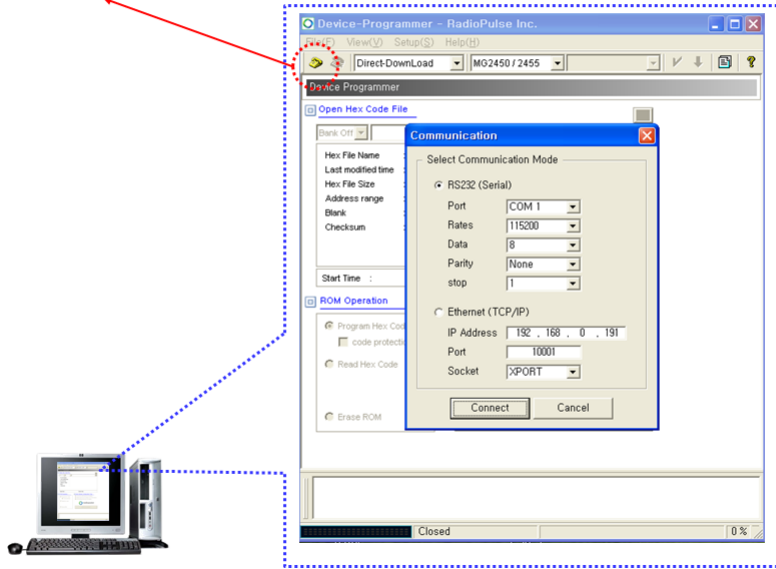
"Device-Programmer 3.54"Run the program.





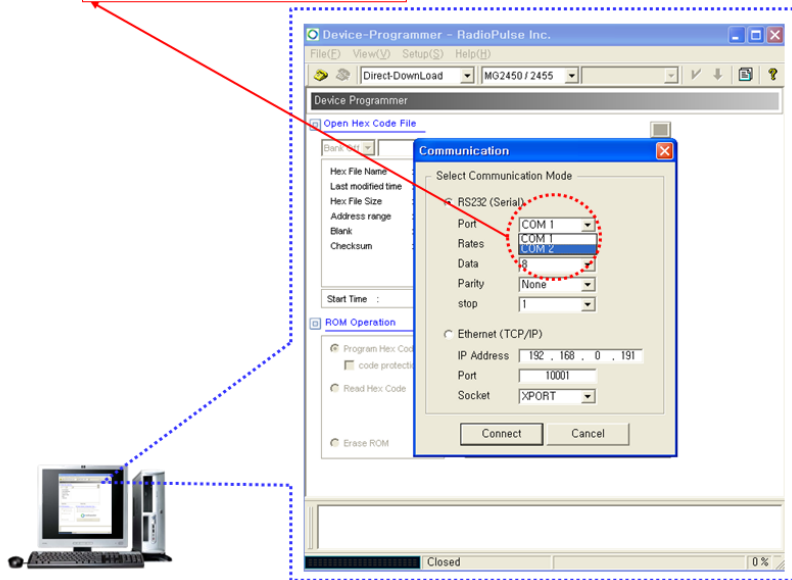
### UDM-240ZH/240ZV Program

"Telephone icon", select the Port Settings mode.



### UDM-240ZH/240ZV Program

Select the port to be used.



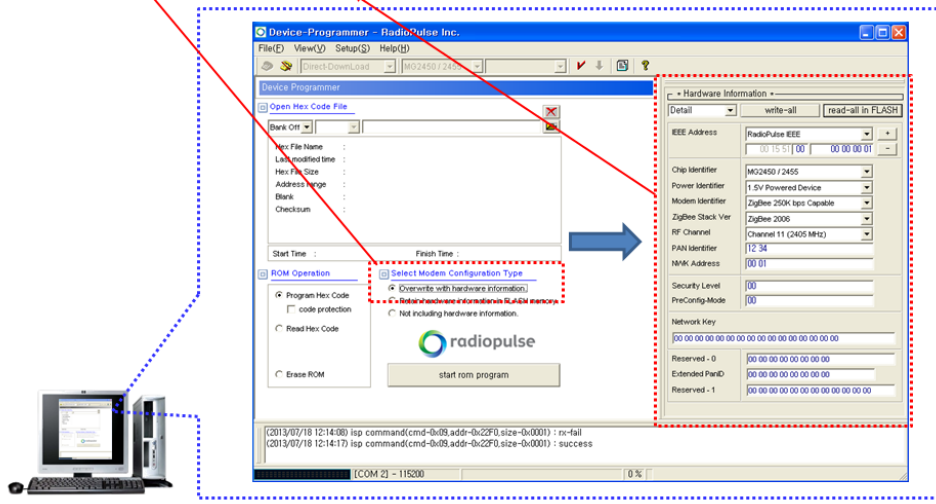




### UDM-240ZH/240ZV Program

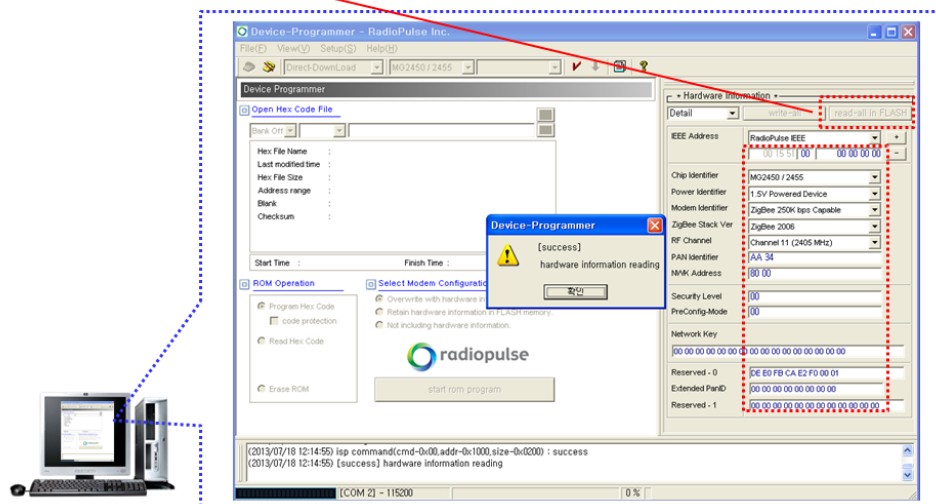
1. Select the Program mode "Overwrite with hardware information"

2. Advanced menu window will appear.



### UDM-240ZH/240ZV Program

1. "read-all in FLASH" The program reads the value of the products connected to





### UDM-240ZH/240ZV Program

Flash parameter values

The screenshot shows the 'Hardware Information' window with the following parameters:

IEEE Address	RadioPulse IEEE	+	00 15 51   00	00 00 00 00	-
Chip Identifier	MG2450 / 2455				
Power Identifier	1.5V Powered Device				
Modem Identifier	ZigBee 250K bps Capable				
ZigBee Stack Ver	ZigBee 2006				
RF Channel	Channel 11 (2405 MHz)				
PAN Identifier	AA 34				
NMK Address	80 00				
Security Level	00				
PreConfig-Mode	00				
Network Key	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
Reserved - 0	DE E0 FB CA E2 F0 00 01				
Extended PanID	00 00 00 00 00 00 00 00				
Reserved - 1	00 00 00 00 00 00 00 00 00 00				



### UDM-240ZH/240ZV Program

"Warning" If the parameter value should not be changed arbitrarily

The screenshot shows the same 'Hardware Information' window as above, but with a warning dialog box overlaid. The warning text is: "Warning" If the parameter value should not be changed arbitrarily. Red arrows point from this text to the IEEE Address, NMK Address, and Network Key fields in the hardware information window.



UDM-240ZH/240ZV Program

UDM-240ZV Program

Change the parameter values set group ID(00~99)

3. UDM-240ZV  
TX Microphone Input  
Level A, B, C Set
- DC
  - E4
  - E6
  - EB
  - FO
  - F5
  - FA
  - FF (maximum)

2. UDM-240ZV  
Rx Audio Input  
Level A,B,C Set
- DC
  - E4
  - E6
  - EB
  - FO
  - F5
  - FA
  - FF (maximum)



UDM-240ZH/240ZV Program

UDM-240ZH Program

Change the parameter values set group ID(00~99)

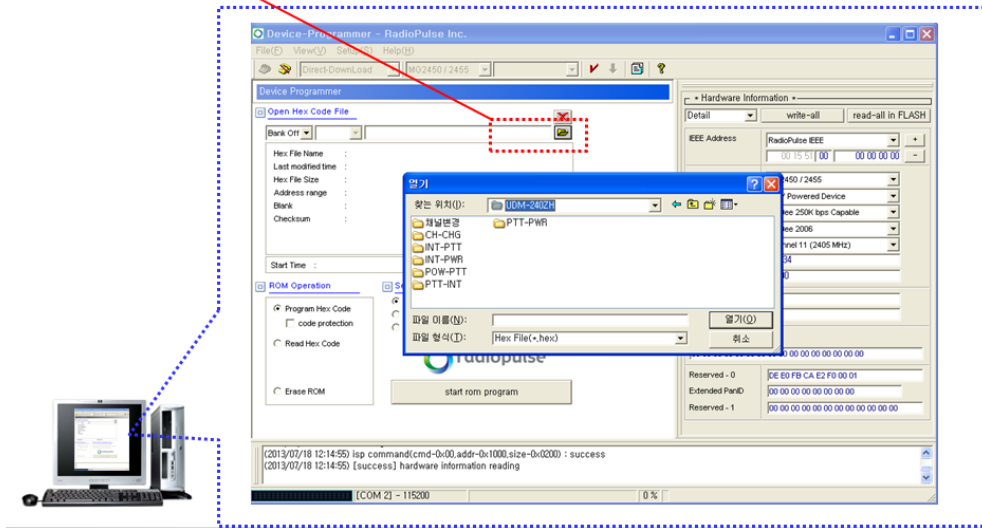
2. UDM-240ZH  
Rx Audio Output  
Volume value of  
standby Level Set
- 01
  - 02
  - 03
  - 04
  - 05
  - 06
  - 07
  - 08 (maximum)

3. UDM-240ZH  
TX Microphone Output  
Level A, B, C Set
- DC
  - E4
  - E6
  - EB
  - FO
  - F5
  - FA
  - FF (maximum)



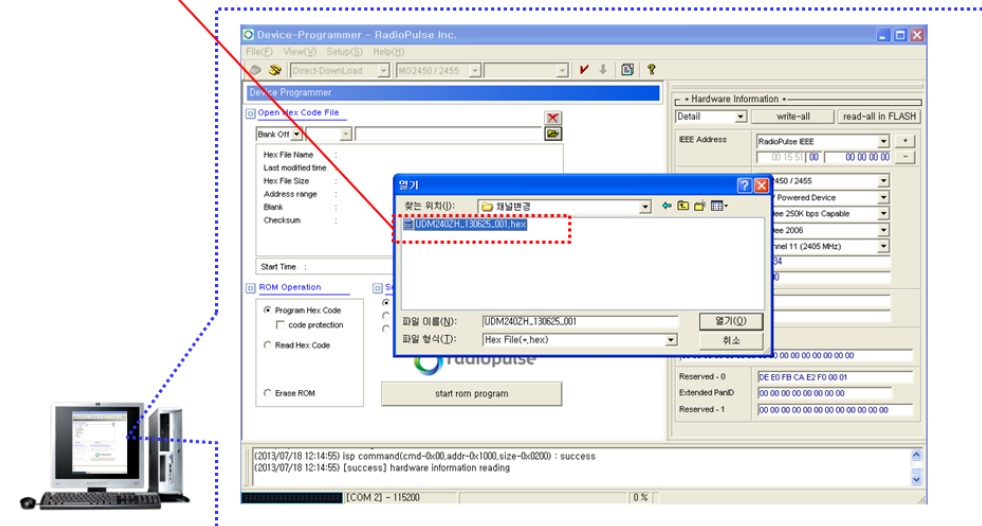
### UDM-240ZH/240ZV Program

Searches for a reference source.



### UDM-240ZH/240ZV Program

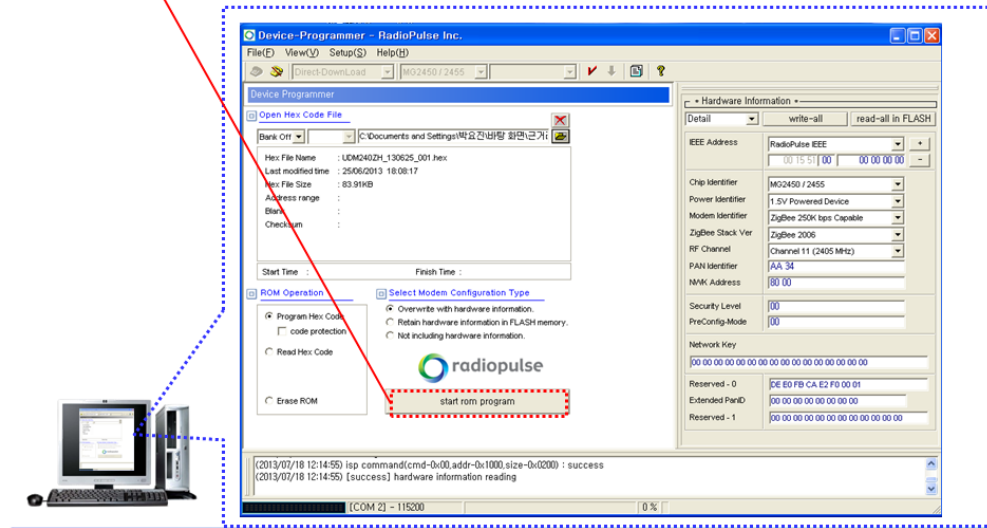
Selects the program source to be





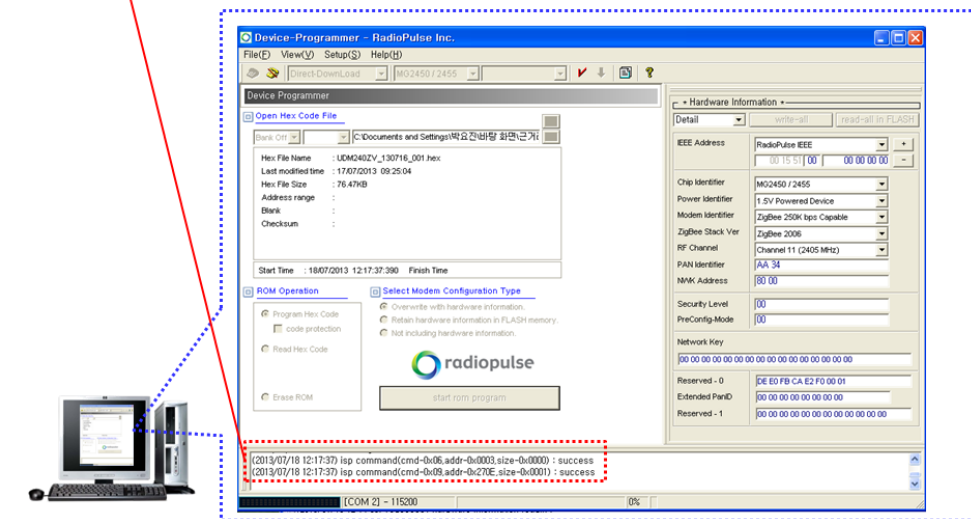
### UDM-240ZH/240ZV Program

"Start rom program" Run



### UDM-240ZH/240ZV Program

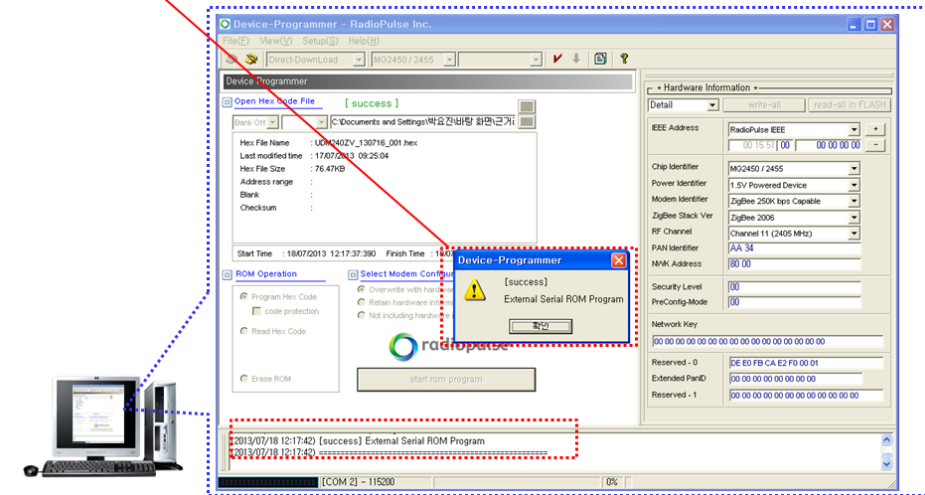
Check the status





## UDM-240ZH/240ZV Program

1. Click the "확인" button
2. Switch off the power supply to the product program
3. Disconnect the cable between the product and the program.

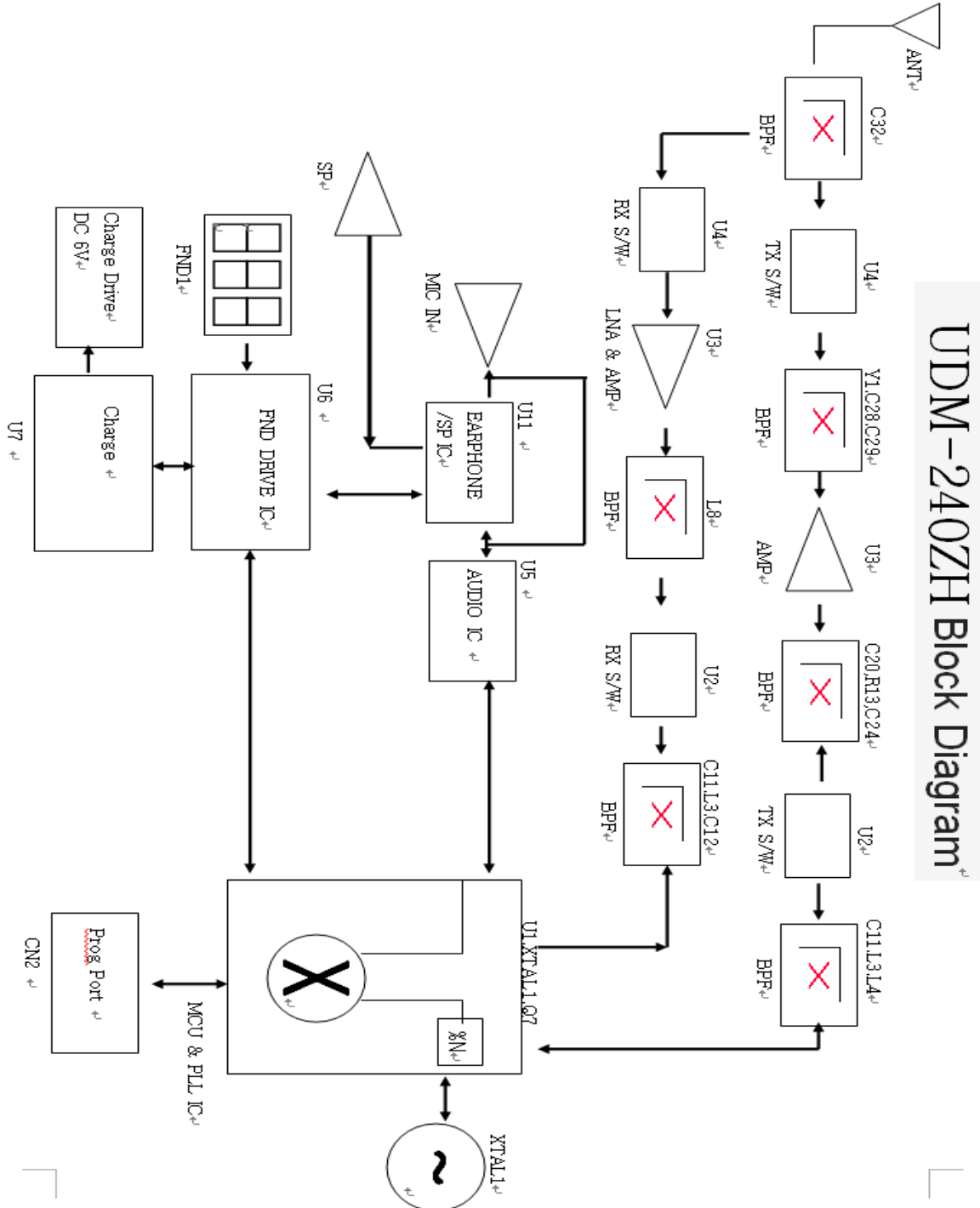


## 5-8 Functional differences between the version of the program

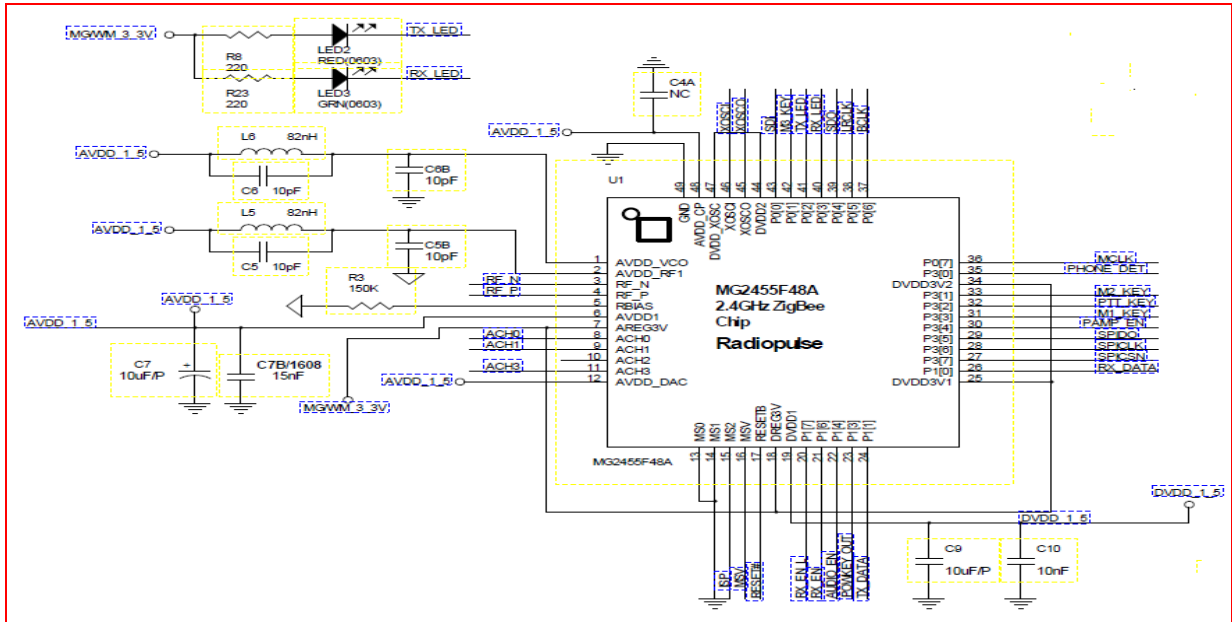
Model Name	Features	The source file name	
UDM-240ZV	Vehicle ,Base, Receive automatic, Check busy	UDM240ZV_V1_1_송신무선처리.hex	New
	Vehicle , Base, Receive automatic, Check VOX	UDM240ZV_VOX_level60_retry0.hex	신형
	Vehicle, Base, Check busy	UDM240ZV_누이즈개선_001.hex	New
UDM-240ZBV	Marine, Base, Receive automatic, Check busy	UDM240ZV_V1_1_송신무선처리.hex	New
	Marine, Base, Receive automatic, Check VOX	UDM240ZV_VOX_level60_retry0.hex	New
UDM-240ZH	Vehicle, Main- PTT, Sub-PTT	UDM240ZH_V2_1car_retry_0.hex	New
	Vehicle, Main- PTT, Sub-PTT, Automatic connection	UDM240ZH_V2_1car_retry_1.hex	New
	Vehicle, Main- PTT, Alarm Coverage	UDM240ZH_1308-INT.hex	Old
UDM-240ZBH	Vehicle, Main- INT, Alarm Coverage	UDM240ZH_1308-PTT.hex	Old
	Marine, Scan, INT-Toggle	UDM240ZH_V2_1boat_retry_0_Toggle_INT.hex	New
	Marine, Scan, INT-Push	UDM240ZH_V2_1boat_Allscan_retry_0_NoINT.hex	New
	Marine, Automatic connection, Scan, INT-Toggle	UDM240ZH_V2_1boat_retry_1_Toggle_INT.hex	New
PZ-400SZ	Marine, Automatic connection, Scan, INT-Push	UDM240ZH_V2_1boat_Allscan_retry_1_NoINT.hex	New
	PZ-400SZ Zigbee	PZ-400SZ(Zigbee)-UDM240_130225_0.hex	Old
	PZ-400SZ	PZ_Rev_03_24_200NW400_Zigbee.hex	Old

Please note that between the old and new version of the program, the UDM-240ZV[ZH] are not compatible each other.

## 6 DESCRIPTION FOR CIRCUIT

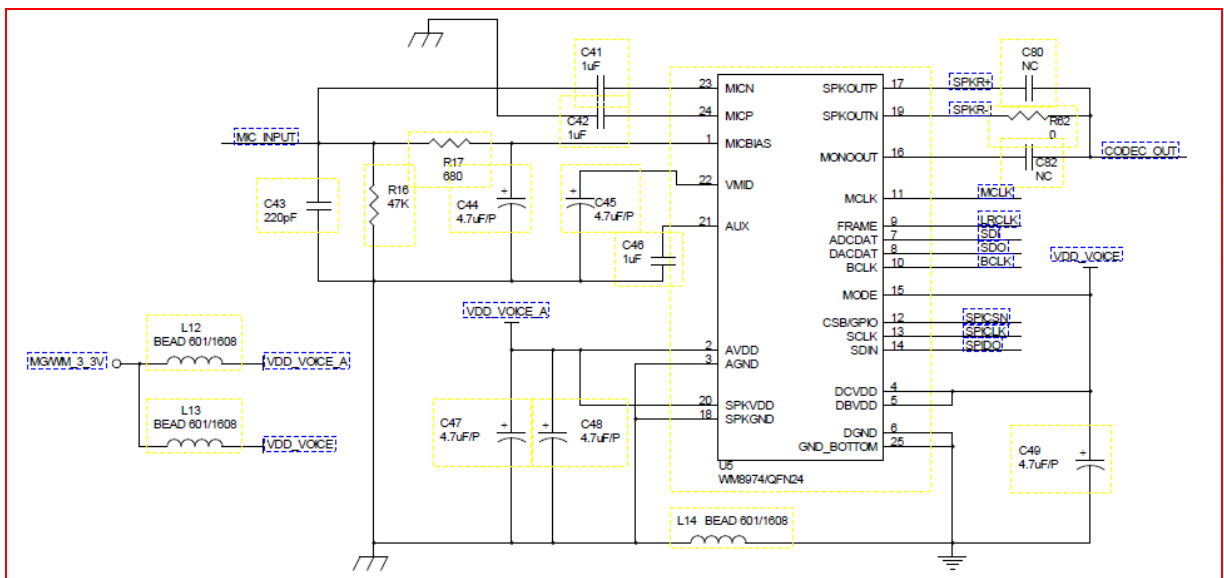


### 6-1 Wireless communication protocol chips (ISM 2.4Ghz)



### 6-2 Digital voice signaling circuit

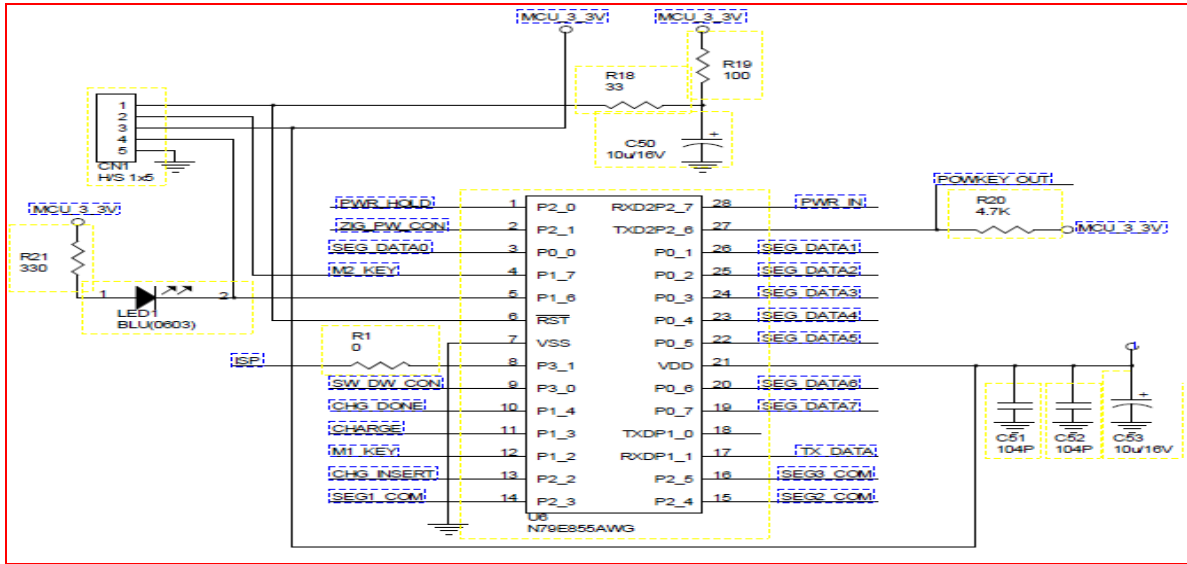
WM8974W





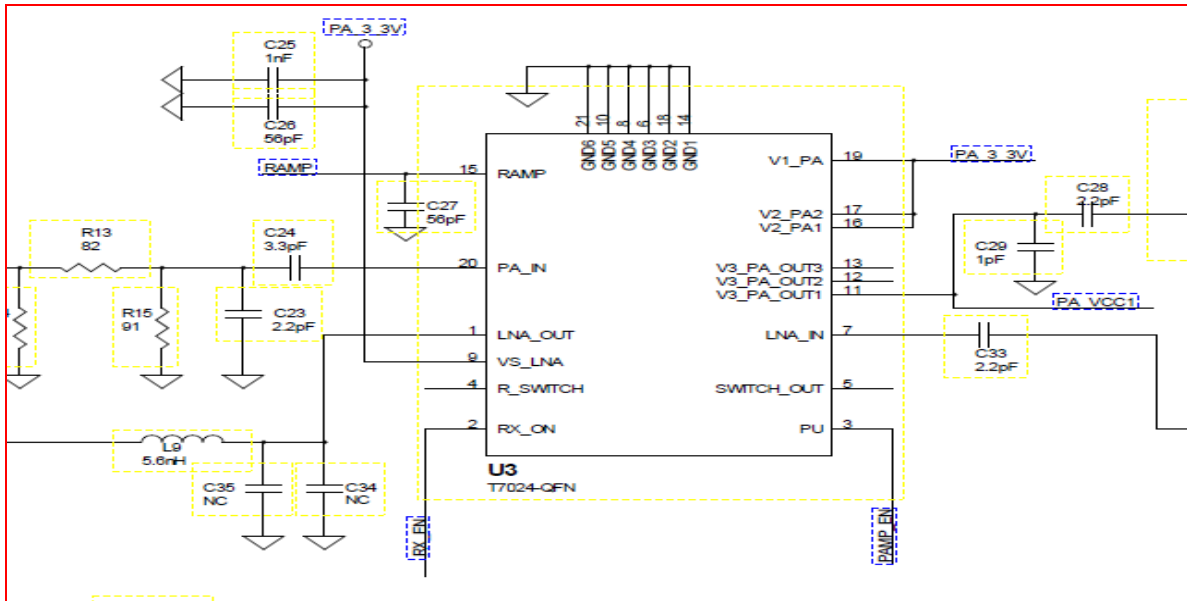
6-3 Function control circuit

1Chip MCU N79855AWG

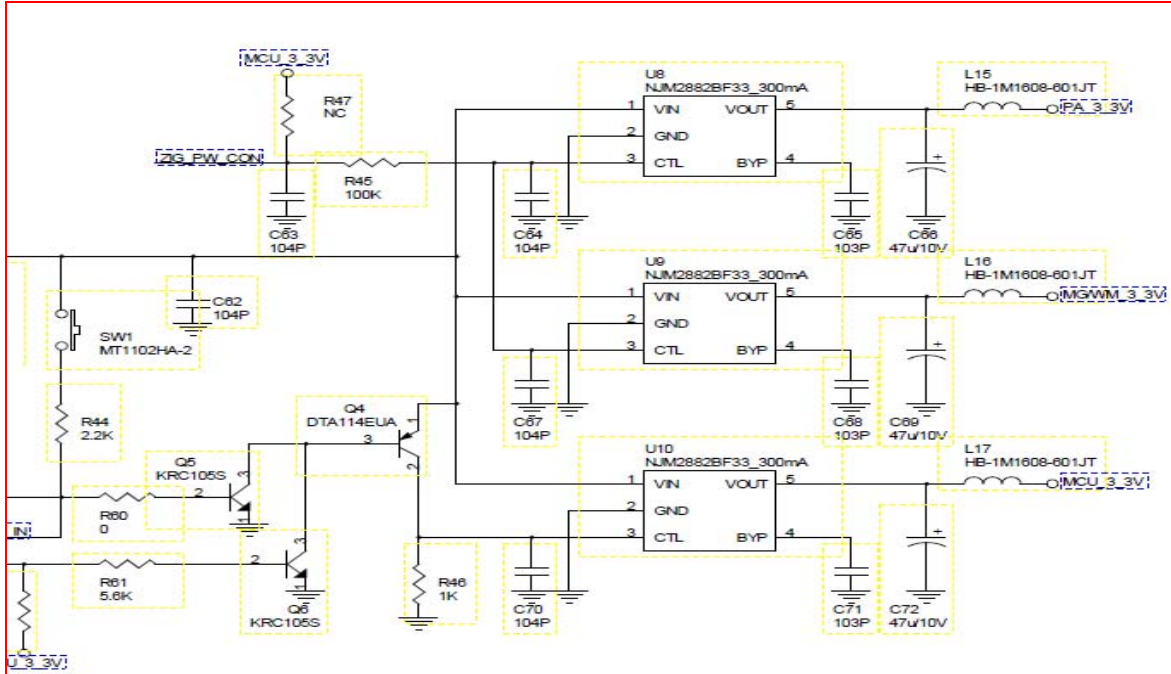


6-4 TX power/RX sensitivity AMP Circuit

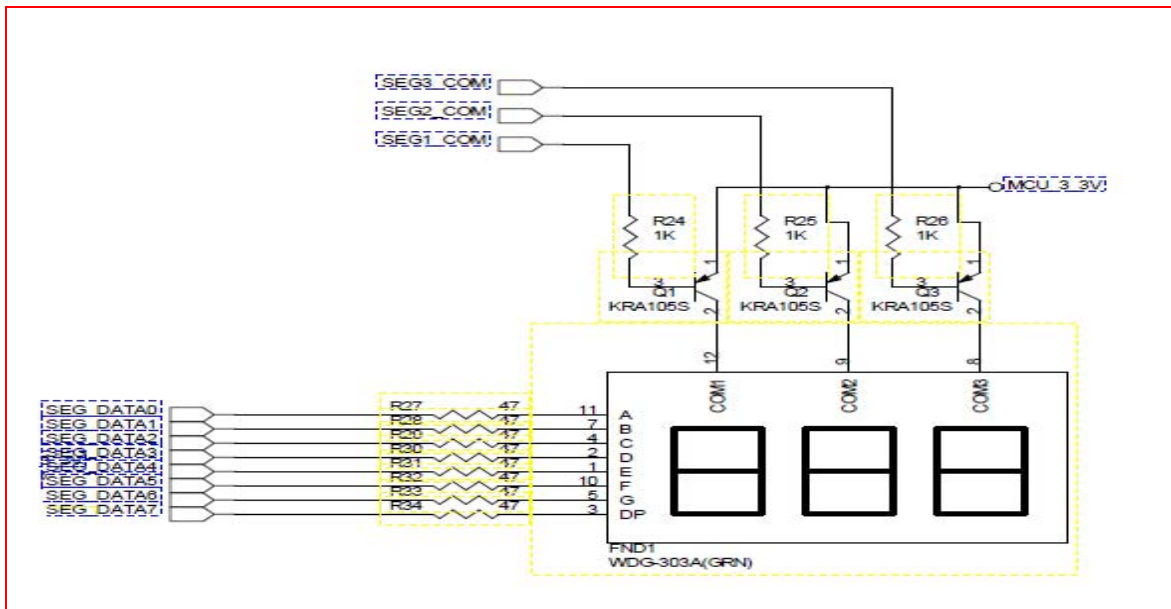
U3 : T7024



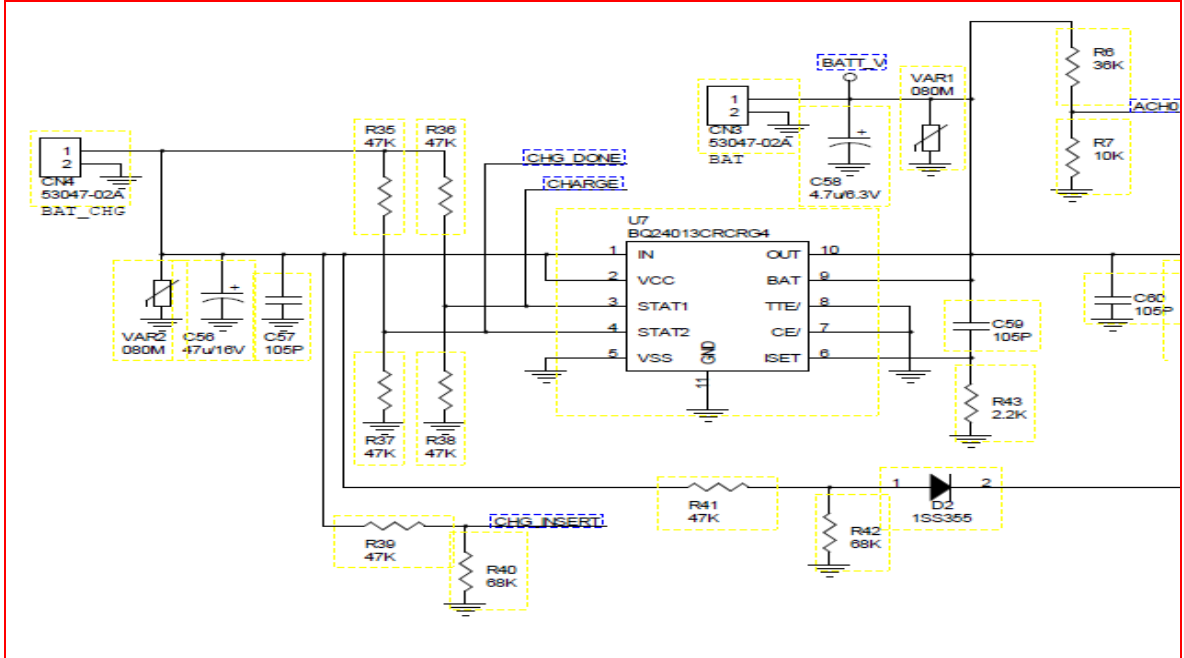
## 6-5 Power supply circuit



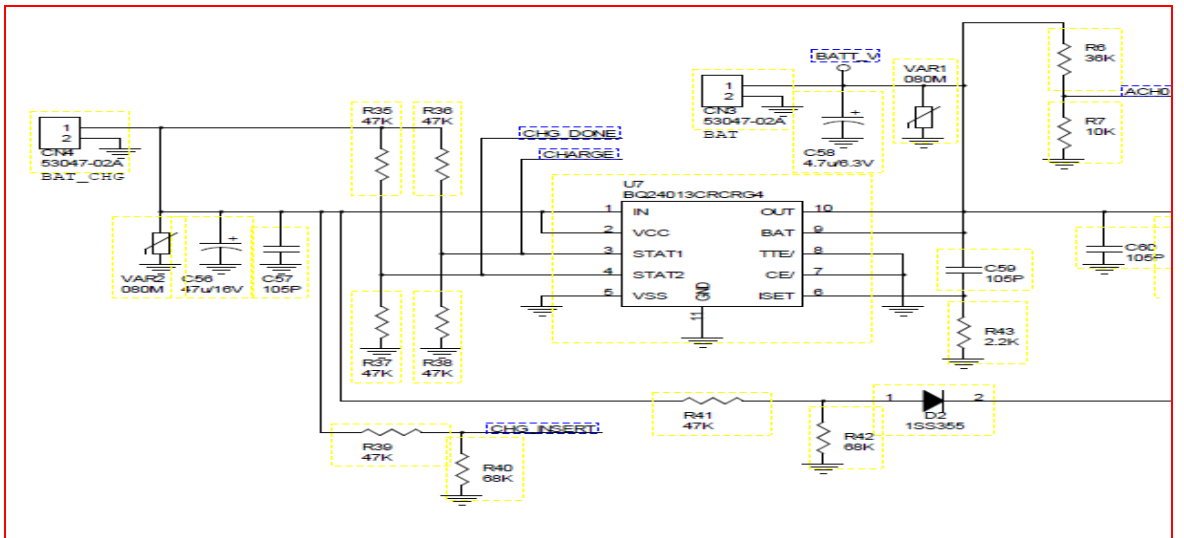
## 6-6 FND display Circuit



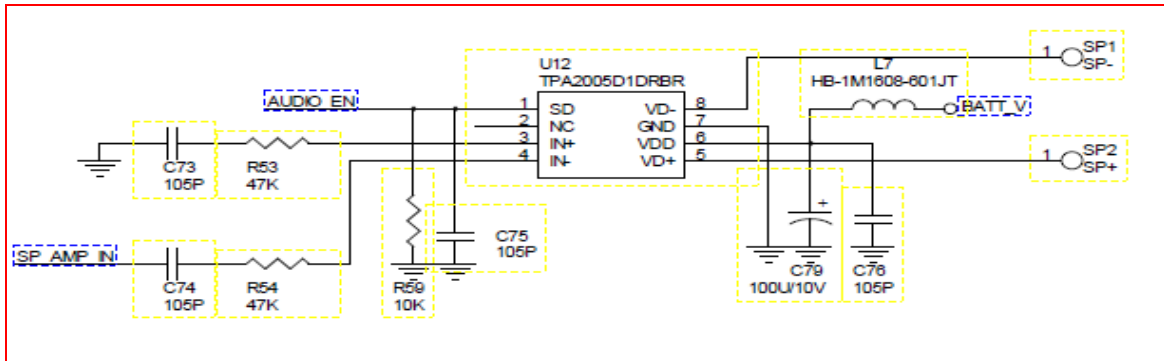
## 6-7 FND display Circuit



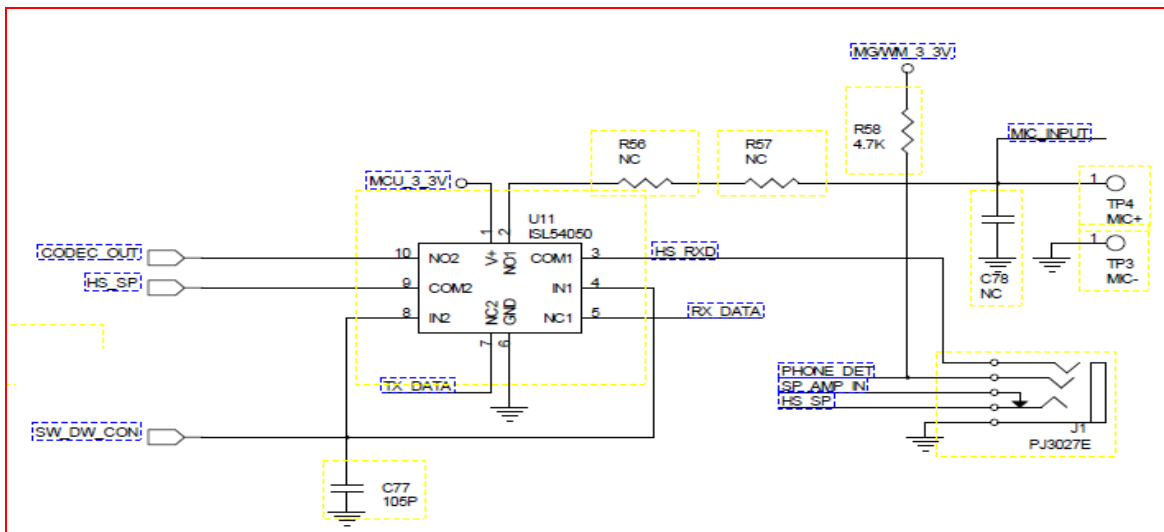
## 6-8 Battery charger circuit



6-9 Audio Amp

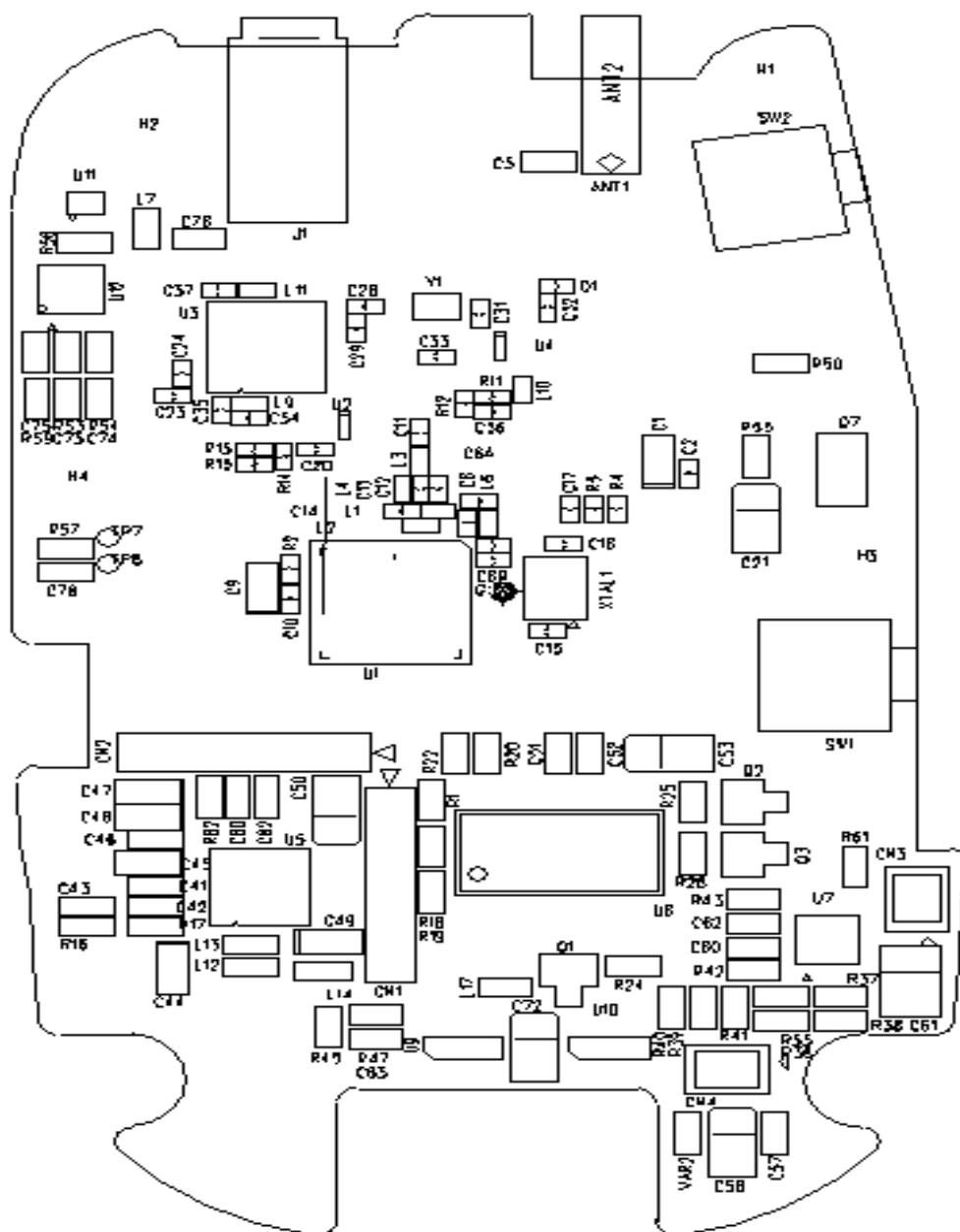


6-10 Ear Phone circuit

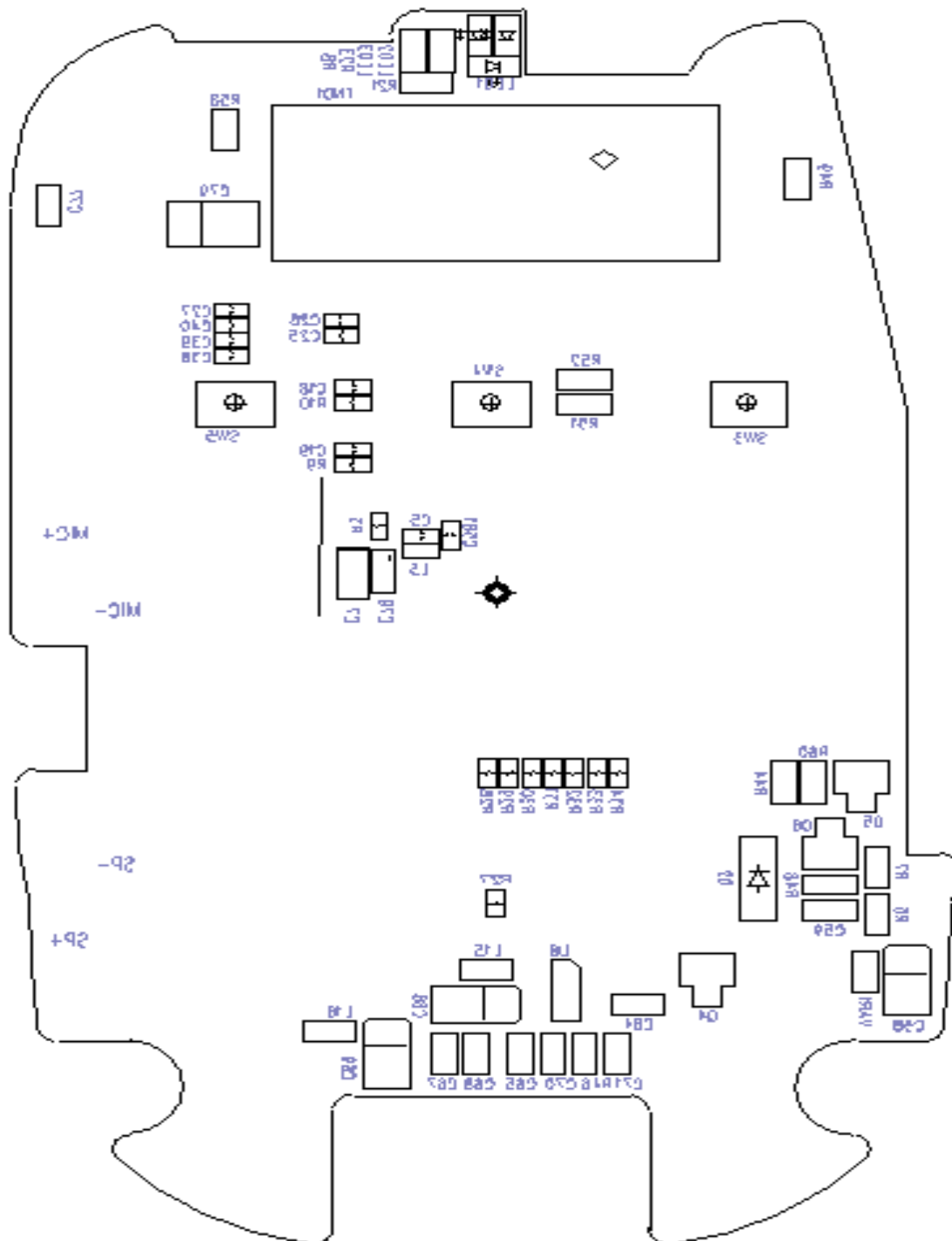


## 7 PCB MAP

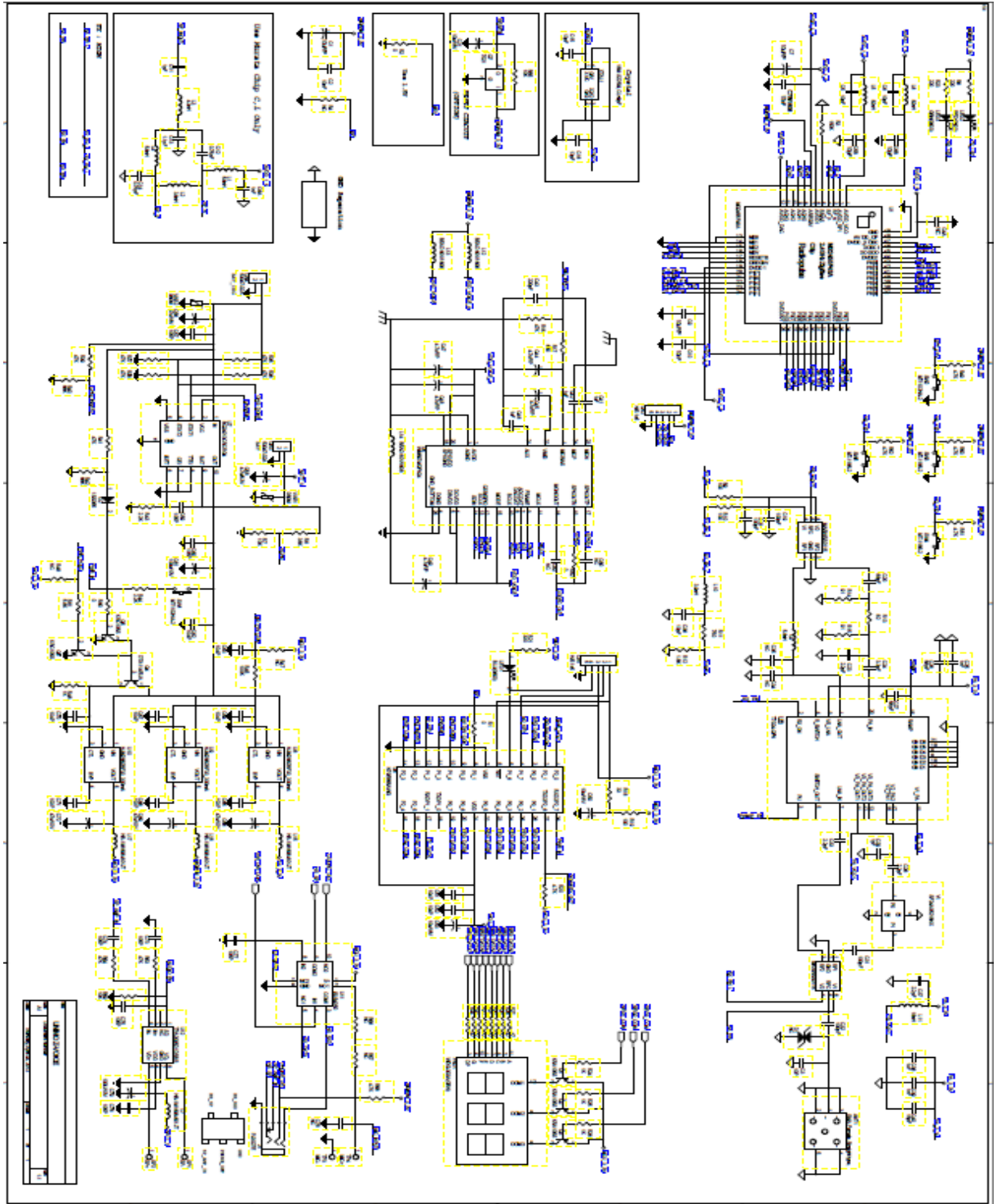
### 7-1 TOP



7-2 BOTTOM



7-3 Circuit Diagram



How to use the correct





**FCC Information to User**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**Caution**

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**FCC Compliance Information :** This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

**IMPORTANT NOTE:****FCC RF Radiation Exposure Statement:**

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.