

Mag One

VZ Series Service Manual

Motorola Solutions, Inc.

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Introduction

This manual provides technical information necessary for servicing the **VZ series** FM Transceiver.

Servicing this equipment requires expertise in handling surface-mount chip components. Attempts by non-qualified persons to service this equipment may result in permanent damage not covered by the warranty, and may be illegal in some countries.

One PCB layout diagrams are provided for each double-sided circuit board in the transceiver. Each side of is referred to by the type of the majority of components installed on that side (“lead” or “chip-only”). In most cases one side has only chip components, and the other has either a mixture of both chip and lead components (varistor, coils, electrolytic capacitors, ICs, etc.), or lead components only.

While we believe the technical information in this manual to be correct, **Mag One** assumes no liability for damage that may occur as a result of typographical or other errors that may be present. Your cooperation in pointing out any inconsistencies in the technical information would be appreciated.

Important Note

This transceiver was assembled using Pb (lead) free solder, based on the RoHS specification.

Only lead-free solder (Alloy Composition: Sn-3.0Ag-0.5Cu) should be used for repairs performed on this apparatus. The solder stated above utilizes the alloy composition required for compliance with the lead-free specification, and any solder with the above alloy composition may be used.

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Specifications

VHF version VZ-28-D0-5

General

Frequency Range:	136-174MHz
Number of Channels:	128
Power Supply Voltage:	7.4 V DC
Channel Spacing:	12.5/25 kHz
Battery Life (5-5-90 duty cycle with 1800mAh battery):	About 11 hours(with Battery save)
Operating Temperature Range:	-25 °C to +60 °C
Frequency Stability:	< 2.5 ppm
RF Input-Output Impedance:	50 ohm
Dimension (W x H x D):	127 x 60 x 38mm
Weight:	255 g with battery

Receive

Sensitivity(12dB SINAD):	0.20 µV
Adjacent Channel Selectivity:	65 / 60 dB
Intermodulation:	60 / 55 dB
Spurious and Image Rejection:	70 dB
Audio Output:	1W @16 Ohms (INT)

Transmitter

Output Power:	5/1W
Modulation:	11KΦF3E @ 12.5kHz, 16KΦF3E @ 25kHz
Conducted Spurious Emission:	- 30 dBm for > 1GHz - 36 dBm for < 1 GHz
FM Hum & Noise:	40 / 35 dB
Audio Distortion:	<3 %

Specifications

UHF version VZ-28-G6-4

General

Frequency Range:	400-470MHz
Number of Channels:	128
Power Supply Voltage:	7.4 V DC
Channel Spacing:	12.5/25 kHz
Battery Life (5-5-90 duty cycle with 1800mAh battery):	About 11 hours(with Battery save)

Operating Temperature Range:	-25 °C to +60 °C
Frequency Stability:	< 2.5 ppm
RF Input-Output Impedance:	50 ohm
Dimension (W x H x D):	127 x 60 x 38mm
Weight:	255 g with battery

Receive

Sensitivity(12dB SINAD):	0.20 μV
Adjacent Channel Selectivity:	65 / 60 dB
Intermodulation:	60 / 55 dB
Spurious and Image Rejection:	70 dB
Audio Output:	1W @16 Ohms (INT)

Transmitter

Output Power:	4/1W
Modulation:	11KΦF3E @ 12.5kHz, 16KΦF3E @ 25kHz
Conducted Spurious Emission:	- 30 dBm for >1GHz - 36 dBm for < 1 GHz
FM Hum & Noise:	40 / 35 dB
Audio Distortion:	<3 %

Specifications

350M version VZ-28-F6-4

General

Frequency Range:	350-390MHz
Number of Channels:	128
Power Supply Voltage:	7.4 V DC
Channel Spacing:	12.5/25 kHz
Battery Life (5-5-90 duty cycle with 1800mAh battery):	About 11 hours(with Battery save)
Operating Temperature Range:	-25 °C to +60 °C
Frequency Stability:	< 2.5 ppm
RF Input-Output Impedance:	50 ohm
Dimension (W x H x D):	127 x 60 x 38mm
Weight:	255 g with battery

Receive

Sensitivity(12dB SINAD):	0.20 μ V
Adjacent Channel Selectivity:	65 / 60 dB
Intermodulation:	60 / 55 dB
Spurious and Image Rejection:	70 dB
Audio Output:	1W @16 Ohms (INT)

Transmitter

Output Power:	4/1W
Modulation:	11K Φ F3E @ 12.5kHz, 16K Φ F3E @ 25kHz
Conducted Spurious Emission:	- 30dBm for >1GHz - 36 dBm for < 1 GHz
FM Hum & Noise:	40 / 35 dB
Audio Distortion:	<3 %

VZ-28 Instructions before use

Manual Scope:

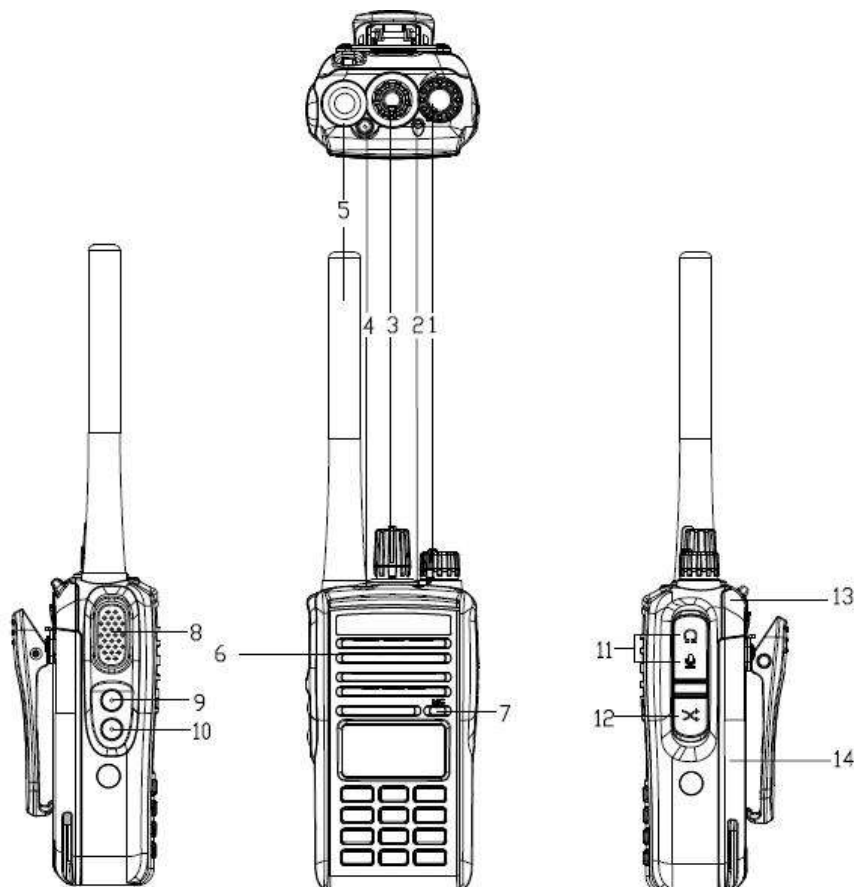
This manual is provided to professionals who are familiar with radio communications or radio communications service with experienced technical staff to use. It contains a wireless radio repair VZ-28 major technical information and data.

Precautions:

In the case of before don't carefully verify all RF plugs or any open plugs don't connect to the appropriate terminals, please don't transmit radio.

In the vicinity of flammable and explosive gases, must turn off the radio's power, don't operate this equipment. This equipment should only be performed by experienced technical personnel.

Radio Overview



1.) Power On/Off/Volume Adjustment

It is for use to turn the radio on/off and to adjust the volume level.

2.) LED State Indicator

The indicator glows red when transmitting and green when receiving.

3.) Channel Knob

It is used to select channels.

4.) Top Key (Emergency Key)

For emergency alarm function.

5.) Antenna

Transmitting / receiving signals.

6.) Speaker

It is used to output voices.

7.) Microphone

Input voices.

8.) PTT

Press(PTT) button to put the radio in transmitting state;release the button restore to receiving state.

9.) Programmable Side Key1

As defined by programming software.

10.) Programmable Side Key2

As defined by programming software.

11.) Speaker and Microphone Jack

It is for use to connect to earphone you have purchased.

12.) PC Programming Jack

If needed,you can connect to a PC programmable cable in order to

read/write the frequency of the radio via PC software.

13.) Battery Latch

Fixed / disassemble the battery pack.

14.) Battery

Power supply for radio.

VZ-28 Circuit Description

— . RECEIVER

The signal from the antenna is passed through a transmission/reception selector circuit and is amplified by T217. The signal after amplified enter to 1846 for processing then output the audio, the audio signal is amplified by UTC2822 and output by the speaker at last.

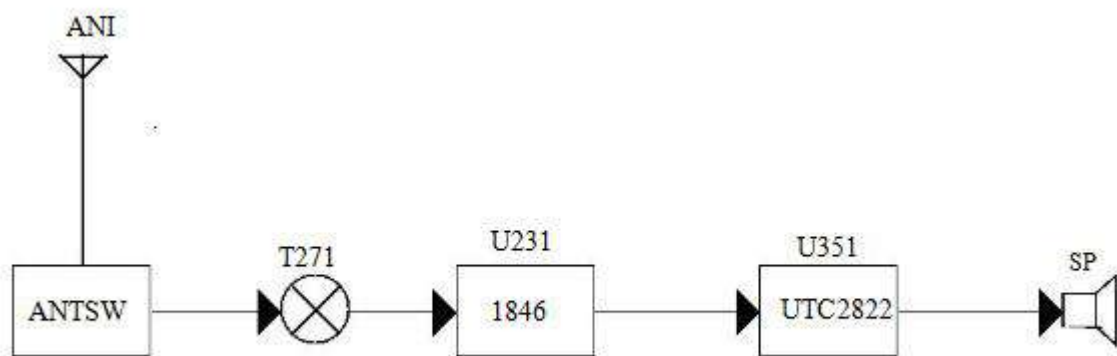


Figure1. RECEIVER CIRCUIT

二.TRANSMITTE

The signal from the microphone passes through 1846, after modulation in the carrier modulation, the modulation signal with the carrier promotes by buffer T121,T131, and amplified by T141 then sends to the antenna terminals.

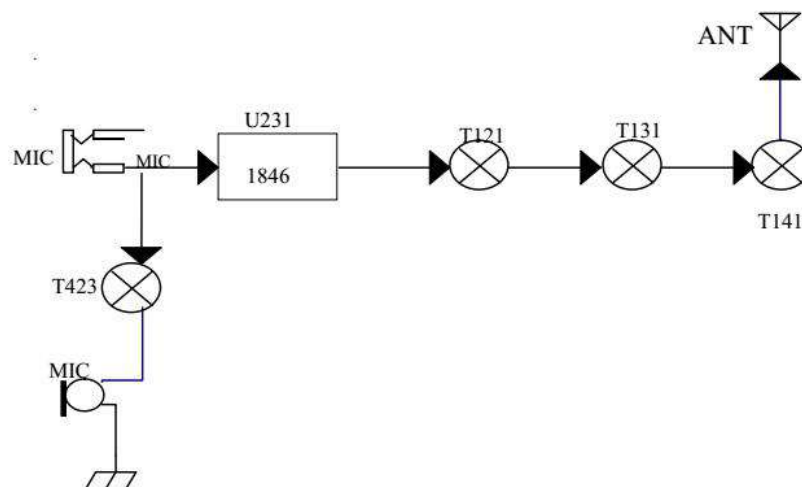


Figure2.TRANSMITTER CIRCUIT

三.TRANSMISSION/RECEPTION SELECTOR CIRCUIT

The transmission output is passed through the transmission/reception selector circuit and low-pass filter to the antenna. The transmission/reception selector circuit, which consists of diodes D161, D160, D261 and D262, is turned on during transmission and off during reception to switch the signal.

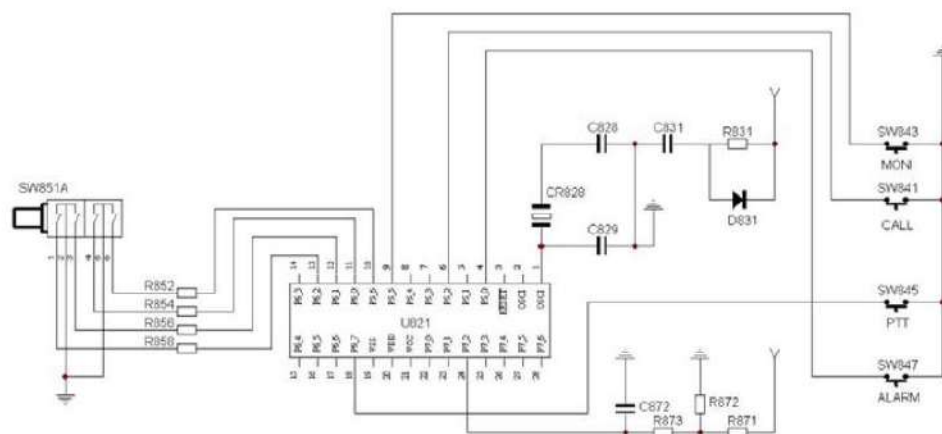
四.DIGITAL CONTROL CIRCUIT

SIDE KEY AND ENCODER CIRCUIT

The signal from side key and encoder is directly input to the processor.

Reset and backup circuit

When turn on the power, a positive pulse is output from the reset circuit consisting of D831,C831 and R831 to the third feed of reset terminal on U821 microprocessor. When turn off the power,U517 detects a 3.3 V drop, and output a low signal, it outputs data to U811 and enter backup mode.



BATTERY VOLTAGE TEST CIRCUIT

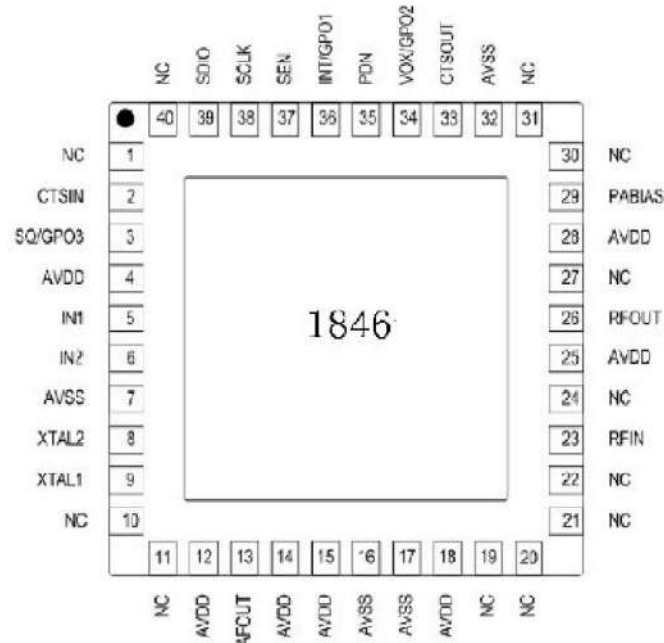
Power supply voltage after partial pressure input to the microprocessor analog interface

BATTERY SAVE CIRCUIT

The squelch is off during receive. The power circuit enters battery save mode if no key has been pressed for five seconds.

The circuit is controlled by microprocessor directly.

五 . 1846 DESCRIPTION



MAINLY SECTION DESCRIPTION

1.DSP consists of IF amplifier, FM modulation, RSSI calculator, AFC control circuit, audio/audio mixer filter, CTCSS/DCS filter and so on.

2.Synthesizer mainly functions :

- ①The synthesizer produces a local oscillator signal, used to switch the RF input to a continuous low medium frequency.
- ②Synthesizer provides the base clock to adjust the VCO frequency.

3.BASE CLOCK

1846 supports more base clocks, for example, 12.8 MHz,13MHz and so on.

4.SERIAL CONTROL INTERFACE

A three lines serial control interface is used to read the main IC and 1846 control record. Serial control is 24 characters in length, 18 bit numeric string and 6 bit address string.

VZ-28 Basic operation

BUSY CHANNEL LOCK

This function can prevent other two way radio from disturbing. There are two choices for customer to select in the programming software.

-  **FREQUENCY:** It is not allowed to transmit or make other operation while the radio is receiving.
-  **CTCSS/DCS:** While receiving signal, the radio is allowed to transmit the CTCSS/DCS received is different; and is not allowed to transmit if both frequency and CTCSS/DCS are the same.

VOX SENSITIVITY

You can use programming software to select the level of the VOX sensitivity (1-9 levels).

TX POWER

You can set the high power or low power for each channel by programming software.

SQUELCH LEVEL

You can use programming software to adjust the squelch level (0-9 levels).

BEEP SETTING

You can hear a beep sound when turn on the radio or press a key. You can use programming software to open or close this function.

TIME OUT TIMER (TOT)

TOT is use the prevent any user a channel for a long time .it will damage the radio if transmit for a long time .

CTCSS/DCS

You can use the programming software to set the CTCSS/DCS for each channel.
There are 38 groups of CTCSS and 83 groups of DCS for you to select.

WIDE/NARROW BAND

You can use the programming software to set the wide/narrow band for each channel.

EMERGENCY CALL

In case of emergency, press emergency key the radio will sound alert tone and also send alert

BATTERY SAVE

This function can decrease power consumption no signal is received.and no operation performed.
You can use PC software to open or close this function.

END ROGER

It is very usefully for hand free users to eliminate the End Roger Beep,
You can use programming software to open or close this function.

LOW BATTERY WARNING

Low battery warning alerts you the battery should be recharged or replaced. While transmitting or receiving, the LED will blink red if the battery is low. Please replace the battery if "du du" tone sounds every 30 seconds.

CABLE CLONE

Step:

1. Use cable to connect Master unit ,and turn on the slave unit .Press and hold programmable Side Key 2 to turn ON master unit ,, LED flash Orange twice.
2. Press PTT of Master unit to transmit the data and Slave unit begin to receive data from Master unit
3. During cable cloneing Master unit blink red and Slave unit blink Green
4. When cloning completed , Slave unit restart automatically.
5. Switch to next slave unit and power on,press side key2 of master unit to clone.
6. Power of master unit to exit

 During data transmission, if no data received 3 seconds Master unit flash Red (0.5s ON, 0.5s OFF)

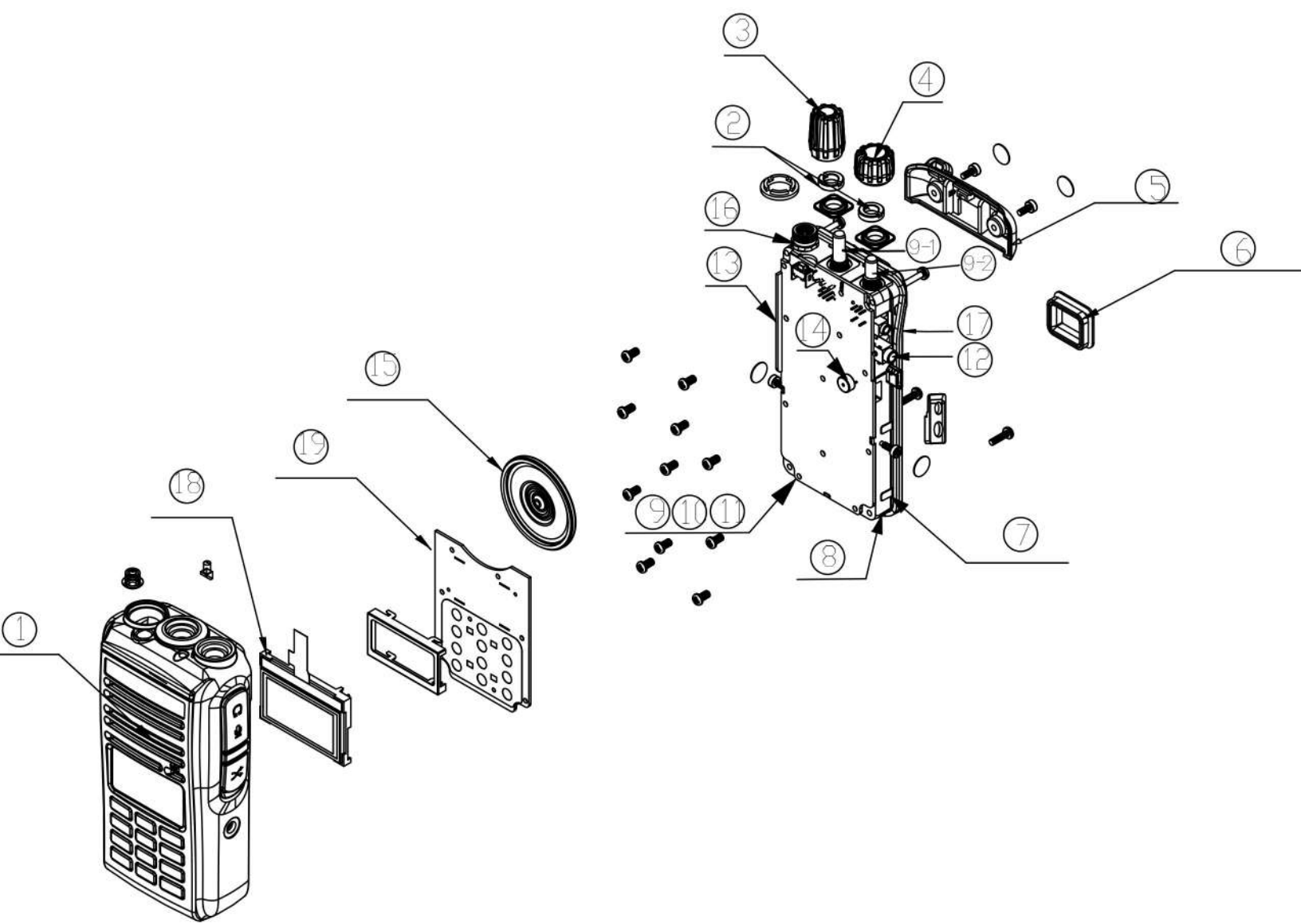
PTT ID TRANSMIT MODE

1. Press PTT to send .
 2. Release PTT to send.
 3. Both.
 4. OFF (DTMF Encode only).
-  OFF: Press PTT or release it will not send ANI code.
-  PRE-TX: Press PTT to send the ANI
-  POST-TX: Release PTT to send the ANI.
-  BOTH: Both press PTT and release to send ANI.

THE SIDE KEY CAN BE PROGRAMMED THE FUNCTIONS AS FOLLOW

1. NONE
2. MONITOR
3. TALK AROUND
4. FREQUENCY REVERSE
5. DTMF CALL
6. RADIO

EXPLODED VIEW&MISCELLANEOUS PARTS



VZ-28 Series Spare parts

No.	Part No.	Part name
1	F001A28M601	VZ-28 Housing
2	F001A28M015	Crab Eye Nut
3	F001A28M075	Channel Selector Knob
4	F001A28M044	ON/OFF/Volume Knob
5	F001A28M068	Rear Cover
6	F001A28M023	Seal Contact
7	F001A28M046	Seal Chassis
8	F001A28M052	Aluminum Chassis
9	F001A28E001	PCBA(400-470MHz)
9-1	F001A28M009	Channel Potentiometer
9-2	F001A28M014	Volume Potentiometer
10	F001A28E005	PCBA(136-174MHz)
11	F001A28E007	PCBA(350-390MHz)
12	F001A28M064	Audio Connector Jacks(two)
13	F001A28E022	PA(Power Amplifier)
14	F001A28E081	Microphone
15	F001A28E011	Speaker
16	F001A28M012	Antenna (Antenna Connector)
17	F001A28M031	Battery contact
18	F001A28M099	LCD
19	F001A28E017	Keyboard

VZ-28 PARTS LIST				136-174MHz				
Footprint	Comment	Num	Cesignators					
Capacitance								
5P	C0402	1	C275					
6P	C0402	1	C263					
10P	C0402	7	C313	C265	C232	C226	C234	C238
			C112					
12P	C0402	1	C115					
15P	C0402	1	C261					
18P	C0402	1	C262					
20P	C0402	2	C639	C638				
33P	C0402	1	C122					
39P	C0402	1	C132					
47P	C0402	5	C527	C528	C529	C315	C890	
52P	C0402	2	C318	C317				
68P	C0402	1	C316					
100P	C0402	8	C866	C865	C175	C104	C267	C815
			C816	C352				
102P	C0402	15	C631	C176	C183	C565	C117	C237
			C135	C133	C127	C118	C113	C822
			C856	C353	C841			
103P	C0402	19	C314	C312	C174	C144	C904	C898
			C239	C227	C221	C131	C101	C817
			C812	C818	C913	C181	C147	C911
			C356					
104P	C0402	37	C236	C834	C635	C632	C326	C325
			C324	C905	C103	C568	C114	C233
			C235	C271	C258	C128	C240	C584
			C585	C581	C821	C891	C893	C894
			C895	C831	C813	C879	C148	C351
			C844	C843	C842	C359	C357	C296
			C567					
105P	C0402	2	C295	C182				
220P	C0402	1	C833					
223P	C0402	1	C354					
224P	C0402	2	C561	C569				
333P	C0402	1	C871					
470P	C0402	20	C173	C180	C145	C861	C862	
			C906	C907	C102	C294	C160	C272
			C142	C141	C124	C121	C811	C892
			R557	C814	C146			
3P	C0603	1	C163					
6P	C0603	2	C169	C151				
10P	C0603	1	C164					
13P	C0603	2	C168	C166				
22P	C0603	1	C167					
27P	C0603	1		C153				
30P	C0603	1	C165					
33P	C0603	1	C161					
39P	C0603	1	C157					

56P	C0603	1	C901					
100P	C0603	1	C159					
105P	C0603	1		C231				
120P	C0603	1	C162					
104P	C0805	1	C230					
10uF/16V	C0805	2	C323	C903				
1uF/16V	C0805	2	E353	C143				
4.7uF	C0805	2	E180	C878				
10uF/16V	C0805 (A)	2	E911	E913				
1uF	C0805 (A)	1	E356					
220uF	E-0602	1	E351					
Resistance								
0R	R0402	6		R123	R114	R276	R822	R368
			C116					
1K	R0402	9	R327	R851	R556	R581	R891	R582
			C355	R352	R568			
1K5	R0402	1	R116					
1K8	R0402	1	R878					
2K2	R0402	1	R102					
3K9	R0402	3	R326	R325	R119			
4K7	R0402	6	R861	R862	R295	R291	R569	C331
5K6	R0402	2	R296	R893				
8K2	R0402	2	R553	R562				
10K	R0402	21	R527	R528	R177	R184	R567	
			R297	R294	R292	R897	R239	R882
			R884	R886	R898	R899	R187	R821
			R857	R872	R874	R888		
10R	R0402	3	R121	R359	R357			
15K	R0402	1	R584					
22K	R0402	2	R221	R585				
33K	R0402	3	R112	R186	R355			
47K	R0402	17	R633	R631	R182	R863	R864	R101
			R235	R227	R142	R141	R127	R866
			R867	R868	R869	R351	R844	
47R	R0402	2	R143	R126				
100K	R0402	7	R834	R636	R293	R314	R128	R856
			R563					
100R	R0402	7	R889	R354	R881	R883	R885	R871
			R873					
120K	R0402	1	R185					
150K	R0402	8	R833	R170	R171	R172	R173	R174
			R175	R266				
150R	R0402	2	R358	C358				
200K	R0402	1	R855					
220K	R0402	2	R635	R181				
220R	R0402	1	R566					
270K	R0402	1	R892					
270R	R0402	2	R160	R159				
300K	R0402	1	R632					
330K	R0402	3	R831	R832	R845			
330R	R0402	3	R312		R118	R113		

470R	R0402	3	R852	R273	R879			
680R	R0402	1	R843					
1M	R0402	3	R183	R895	C819			
0R	R0603	2	R134	L274				
47R	L0603	1	L125					
R39	R1206	3	R104	R105	R106			
50K	RV1208	1	RV221					
Inductance								
27NH	L0603	1	L135					
33NH	L0603	1	L262					
39NH	L0603	1	L263					
47nH	L0603	2	L275	L316				
100nH	L0603	4	L313	L317	L118	L113		
220NH	L0603	1	L160					
390NH	L0603	1	L117					
101T	L0603	3	L231	L811	L814			
101T	L0805	3	L143	L901	L131			
1R0	2520	1	L169					
0.4*1.5*5T	5T	2	L133	L164				
0.4*1.5*6T	6T	3	L261	L168	L166			
0.4*1.5*8T	8T	1	L146					
0.31*1.0*3T	3T	1	R157					
Diode								
LED(G)	D0603	1	D852					
LED(R)	D0603	1	D851					
HSC277	D-ESC	3	D262	D261	D266			
HVC131	D-ESC	2	D161	D160				
HZU5.1B	D-USC	1	D180					
KDS122	D-USM-MA742	1	D895					
Triode								
RQA0009	T-2N1A-2SK347	1	T141					
DTC114EE	T-ESM-DTA114E	6	T851	T852	T102	T352	T171	T294
2SK1824	T-ESM-2SK1824	2	T182	T555				
DTA114YE	T-ESM-DTA114E	2	T181	T271				
2SK3078	T-SOT89-2SK3078	1	T131					
2SB624	T-TSM-2SB624	2	T101	T291				
HM3401	T-TSM-2SB624	1	T351					
2SC3356	T-TSM-2SC3356	1	T121					
R3111Q271A	T-US4	1	U821					
2SC4226	T-USM-2SC4215	3	T315	T111	T266			
KTC4075	T-USM-MRF497	2	T891	T569				
LMBTH10WT1G	T-USM-MRF497	1	T565					
Integration								
RDA5802N	U-QFN24-0404	1	U331					
AT1846S	U-QFN32(RDA1846)	1	U231					
CPU	U-QFP64-1212	1	U811					
HT9172	U-SOIC18	1	U635					
AUDIO-E	U-SOP8	1	U841					
U-24C32	U-SOP8	1	U898					
UTC2822	U-SOP8	1	U351					
RH5RZ33CA-T1	U-SOT89-5A	1	U911					

NJM2904	U-SSOP8	1	U170					
Other								
32.768KHz	FX-7*1.5	1	CR815					
3.58MHZ	FX-CS20	1	CR638					
26MHz	FX-DS0305	1	CR225					
BATTERY	JK-C BC-47S-1	1	BA901					
JP18	JP-18-2	1	JP865					
CALL	JT-02	1	SW882					
MONI	JT-02	1	SW881					
PTT	JT-02	1	SW883					
ALARM	S-SKHLBA010	1	SW889					
MIRCO USB	MIRCO USB2	1	JP751					
RD810S	S-R087FENS	1	SW354					
ST-1041	JK-ST-106	1	JK875					
ST-3013-06	JK-ST-301-5	1	JK871					
ANT-1	PX-333-ANT	1	ANT160					
SW	S-ED089030	1	SW861					
BATT	J-TEST POINT	1	J1					

VZ-28 PARTS LIST 400-470MHz

Footprint	Comment	Num	Cesignators					
Capacitance								
2P	C0402	3	C277	C261	C274			
3P	C0402	1						
5P	C0402	1						
6P	C0402	1	C115					
8P	C0402	2	C122	C275				
9P	C0402	1	C112					
10P	C0402	7	C313	C265	C232	C226	C234	C238
			C262					
20P	C0402	2	C639	C638				
27P	C0402	1	C134					
47P	C0402	5	C527	C528	C529	C315	C890	
52P	C0402	2	C318	C317				
68P	C0402	1	C316					
100P	C0402	9	C866	C865	C175	C851	C852	C104
			C267	C815	C816			
102P	C0402	16	C631	C176	C183	C565	C117	C237
			C133	C127	C118	C113	C821	C822
			C856	C353	C352	C841		
103P	C0402	19	C314	C312	C174	C144	C904	C898
			C239	C273	C227	C221	C131	C817
			C812	C818	C913	C181	C147	C911
			C356					
104P	C0402	36	C236	C834	C635	C632	C326	C325
			C324	C905	C103	C568	C567	C233
			C235	C271	C258	C128	C101	C240
			C584	C585	C581	C891	C893	C894
			C895	C831	C813	C879	C148	C351
			C844	C843	C842	C359	C357	C296
105P	C0402	2	C295	C182				
220P	C0402	1	C833					
223P	C0402	1						
224P	C0402	2	C561	C569				
333P	C0402	2	C871	C354				
470P	C0402	23	C173	C180	C145	C861	C862	C906
			C907	C102	C294	C114	C160	C272
			C142	C141	C124	C121	C811	C892
			R557	C814	C146	C883	C884	
1P5	C0603	1	C166					
2P	C0603	2	C164	C154				
3P	C0603	3	C168	C163	C161			
5P	C0603	1	C165					
7P	C0603	1	C167					
12P	C0603	1	C157					
27P	C0603	1	C153					
33P	C0603	1	C151					
56P	C0603	1	C901					
68P	C0603	1	C159					

100P	C0603	1	R134					
105P	C0603	1	C231					
120P	C0603	1	C162					
104P	C0805	1	C230					
10uF/16V	C0805	2	C323	C903				
1uF/16V	C0805	2	E353	C143				
4.7uF	C0805	2	E180	C878				
10uF/16V	C0805 (A)	2	E911	E913				
1uF	C0805 (A)	1	E356					
220uF	E-0602	1	E351					
Resistance								
0R	R0402	7		R123	R114	R276	R822	R368
			C135	C116				
1K	R0402	9	R327	R851		R556	R581	R891
			C355	R582	R352	R568		
1K5	R0402	1	R116					
1K8	R0402	1		R878				
2K2	R0402	1	R102					
3K9	R0402	3	R326	R325	R119			
4K7	R0402	6	R861	R862	R295	R291	R569	C331
5K6	R0402	3	R296	R893	R128			
8K2	R0402	1		R562				
10K	R0402	21	R527	R528	R177	R184	R567	R297
			R294	R292	R897	R239	R882	R884
			R886	R898	R899	R187	R821	R857
			R872	R874	R888			
10R	R0402	3	R121	R359	R357			
12K	R0402	1	R553					
15K	R0402	1	R584					
22K	R0402	2	R221	R585				
33K	R0402	3	R112	R186	R355			
47K	R0402	17	R633	R631	R182	R863	R864	R101
			R235	R227	R142	R141	R127	R866
			R867	R868	R869	R351	R844	
47R	R0402	2	R143	R126				
100K	R0402	6	R834	R636	R293	R314		R856
			R563					
100R	R0402	5	R889	R354	R881	R883	R885	
120K	R0402	1	R185					
150K	R0402	8	R833	R170	R171	R172	R173	R174
			R175	R266				
150R	R0402	2	R358	C358				
200K	R0402	1	R855					
220K	R0402	2	R635	R181				
220R	R0402	1	R566					
270K	R0402	1	R892					
270R	R0402	2	R160	R159				
300K	R0402	1	R632					
330K	R0402	3	R831	R832	R845			
330R	R0402	3	R312	R113	R118			
470R	R0402	5	R852	R871	R273	R879	R873	

680R	R0402	1	R843				
1M	R0402	2	R183	R895			
0R	R0603	1	L125				
0.33	R1206	3	R104	R105	R106		
50K	RV1208	1	RV221				
Inductance							
2.2NH	L0603	1	L135				
10NH	L0603	1		L274			
15NH	L0603	2	L118	L113			
33nH	L0603	1	L275				
47nH	L0603	1	L316				
100nH	L0603	2	L313	L317			
220NH	L0603	1	L160				
390NH	L0603	1	L117				
101T	L0603	3	L231	L811	L814		
101T	L0805	3	L143	L901	L131		
1R0	2520	1	L169				
0.31*1.5*3T	3T	3	L261	L164	L168		
0.31*1.5*4T	4T	1		L166			
0.4*1.5*8T	8T	1	L146				
0.31*1.2*2T	2T	1	R157				
0.4*1.5*4T	4T	1	L133				
0.4*1.5*3T	3T	2	L262	L263			
Diode							
LED(G)	D0603	1	D852				
LED(R)	D0603	1	D851				
HSC277	D-ESC	3	D262	D261	D266		
HVC131	D-ESC	2	D161	D160			
HZU5.1B	D-USC	1	D180				
KDS122	D-USM-MA742	1	D895				
Triode							
RQA0009	T-2N1A-2SK3476	1	T141				
DTC114EE	T-ESM-DTA114EE	6	T851	T852	T102	T352	T294
2SK1824	T-ESM-2SK1824	2	T182	T555			
DTA114YE	T-ESM-DTA114EE	2	T181	T271			
RD01MUS2(K6)	T-SOT89-2SK3078	1	T131				
2SB624	T-TSM-2SB624	2	T101	T291			
HM3401	T-TSM-2SB624	1	T351				
2SC3356	T-TSM-2SC3356 (1	1	T121				
2SC4226	T-USM-2SC3356 (1	3	T111	T266	T315		
KTC4075	T-USM-MRF497	2	T891	T569			
LMBTH10WT1G	T-USM-MRF497	1	T565				
Integration							
RDA5802N	U-QFN24-0404-P0	1	U331				
AT1846S	U-QFN32 (RDA1846	1	U231				
468(U+V)D-110	U-QFP64-1212-P0	1	U811				
HT9172	U-SOIC18	1	U635				
AUDIO-E	U-SOP8	1	U841				
U-24C32	U-SOP8	1	U898				
UTC2822	U-SOP8	1	U351				
RH5RZ33CA-T1	U-SOT89-5A	1	U911				

NJM2904	U-SSOP8	1	U170					
R3111Q271A	T-US4	1	U821					
Other								
32.768KHz	FX-7*1.5	1	CR815					
3.58MHZ	FX-CS20	1	CR638					
26MHz	FX-DS0305	1	CR225					
BATTERY	JK-C BC-47S-13	1	BA901					
JP18	JP-18-2	1	JP865					
CALL	JT-02	1	SW882					
MONI	JT-02	1	SW881					
PTT	JT-02	1	SW883					
ALARM	S-SKHLLBA010	1	SW889					
MIRCO USB	MIRCO USB2	1	JP751					
ST-1041	JK-ST-106	1	JK875					
ST-3013-06	JK-ST-301-5	1	JK871					
SW	S-ED089030	1	SW861					
ANT-1	PX-333-ANT	1	ANT160					
BATT	J-TEST POINT	1	J1					
RD810S	S-R087FENS	1	SW354					

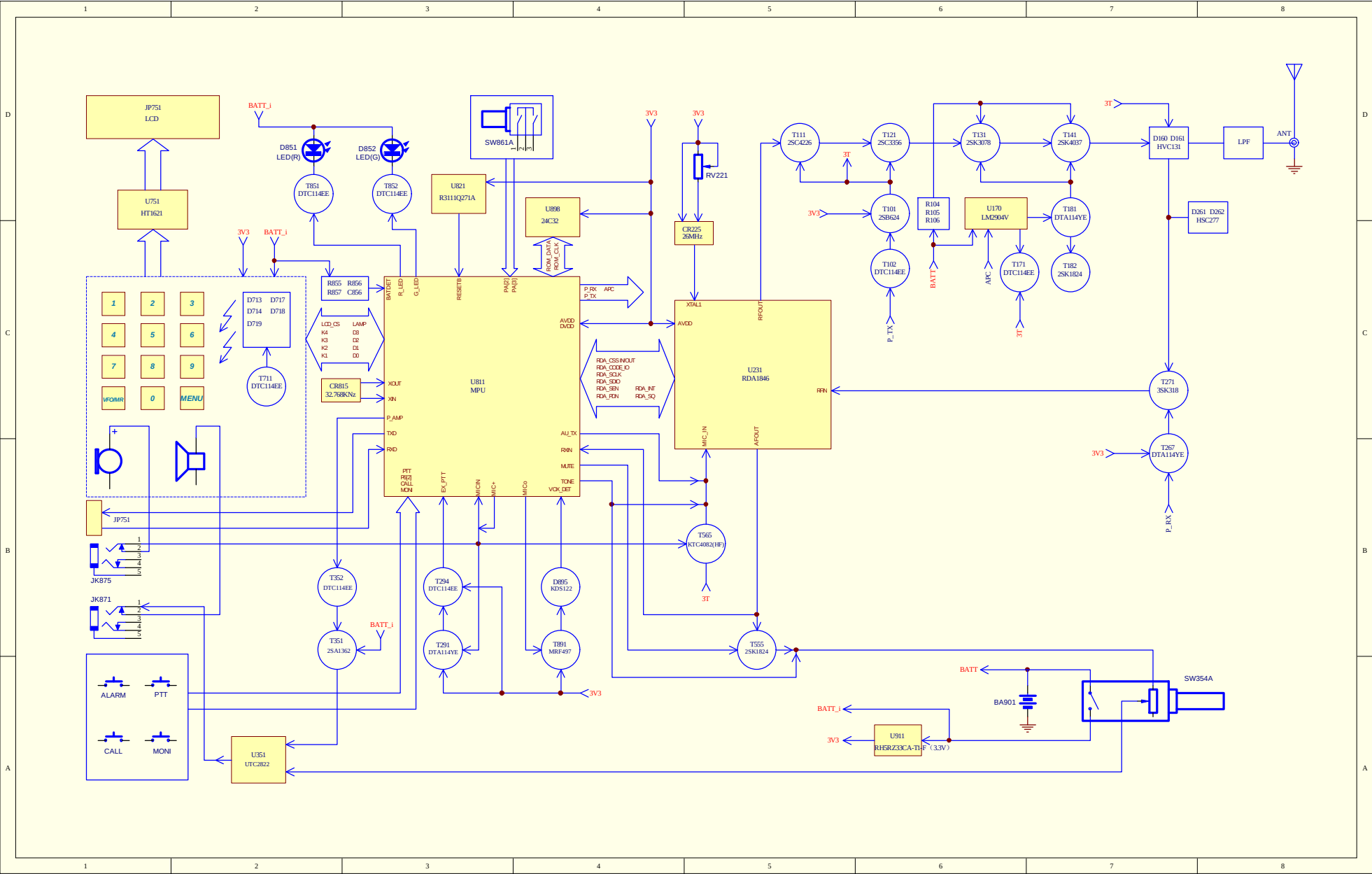
VZ-28 PARTS LIST 350-390MHz								
Footprint	Comment	Num	Cesignators					
Capacitance								
5P	C0402	1	C261					
6P	C0402	2	C115	C274				
7P	C0402	1	C275					
8P	C0402	1	C112					
9P	C0402	1	C122					
10P	C0402	6	C313	C238	C234	C226	C232	C265
15P	C0402	1	C132					
20P	C0402	4	C638	C639	C134	C262		
47P	C0402	5	C529	C528	C527	C890	C315	
52P	C0402	2	C318	C317				
68P	C0402	1	C316					
100P	C0402	9	C852	C851	C175	C865	C866	C816
			C815	C267	C104			
102P	C0402	16	C183	C176	C631	C841	C352	C353
			C856	C822	C821	C113	C118	C127
			C133	C237	C117	C565		
103P	C0402	19	C904	C144	C174	C312	C314	C356
			C911	C147	C181	C913	C818	C812
			C817	C131	C221	C227	C273	C239
			C898					
104P	C0402	36	C905	C324	C325	C326	C632	C635
			C834	C236	C296	C357	C359	C842
			C843	C844	C351	C148	C879	C813
			C831	C895	C894	C893	C891	C581
			C585	C584	C240	C101	C128	C258
			C271	C235	C233	C114	C568	C103
105P	C0402	2	C182	C295				
220P	C0402	1	C833					
223P	C0402	1	C354					
224P	C0402	2	C569	C561				
470P	C0402	21	C907	C906	C871	C862	C861	C145
			C180	C173	C146	C814	C892	C811
			C121	C124	C141	C142	C272	C160
			R557	C294	C102			
473P	C0402	1	C567					
1P	C0603	1	C169					
2P	C0603	2	C163	C166				
3P	C0603	1	C164					
3P5	C0603	1	C168					
6P	C0603	1	C167					
7P	C0603	4	C154	C157	C161	C165		
22P	C0603	1	R134					
33P	C0603	1	C170					
100P	C0603	1	C159					
105P	C0603	2	C901	C231				
470P	C0603	1	C162					
104P	C0805	1	C230					
10uF/16V	C0805	2	C323	C903				
1uF/16V	C0805	2	E353	C143				
4. 7uF	C0805	2	E180	C878				

10uF/16V	C0805 (A)	2	E913	E911				
1uF	C0805 (A)	1	E356					
220uF	E-0602	1	E351					
Resistance								
0R	R0402	8	R368	R822	R276	R114	R123	R562
			C116	C135				
1K	R0402	8	R851	R327	R352	R582	R891	R581
			C355	R556				
1K5	R0402	1	R116					
1K8	R0402	1	R878					
2K2	R0402	1	R102					
3K9	R0402	3	R325	R326	R119			
4K7	R0402	6	R862	R861	R569	R291	R295	C331
5K6	R0402	2	R893	R296				
8K2	R0402	1	R553					
10K	R0402	22	R184	R177	R528	R527	R888	R874
			R872	R857	R821	R187	R899	R898
			R886	R884	R882	R239	R897	R292
			R294	R297	R563	R567		
10R	R0402	3	R357	R359	R121			
15K	R0402	1	R584					
22K	R0402	3	R221	R585	R112			
33K	R0402	2	R355	R186				
47K	R0402	17	R864	R863	R182	R631	R633	R844
			R351	R869	R868	R867	R866	R127
			R141	R142	R227	R235	R101	
47R	R0402	2	R126	R143				
100K	R0402	6	R636	R834	R856	R128	R314	R293
100R	R0402	7	R885	R883	R881	R354	R889	R873
			R871					
120K	R0402	1	R185					
150K	R0402	8	R175	R174	R173	R172	R171	R170
			R833	R266				
150R	R0402	2	R358	C358				
200K	R0402	1	R855					
220K	R0402	2	R181	R635				
270K	R0402	1	R892					
270R	R0402	2	R159	R160				
300K	R0402	1	R632					
330K	R0402	3	R845	R832	R831			
330R	R0402	4	R312	R113	R118	R566		
470R	R0402	3	R852	R879	R273			
680R	R0402	1	R843					
1M	R0402	2	R183	R895				
0R	R0603	1	L125					
0. 33	R1206	3	R106	R105	R104			
50K	RV1208	1	RV221					
Inductance								
3. 3NH	L0603	1	L135					
10NH	L0603	1	L274					
18NH	L0603	1	L263					
15NH	L0603	2	L113	L118				
39NH	L0603	1	L275					
47nH	L0603	1	L316					

100nH	L0603	2	L313	L317				
220NH	L0603	1	L160					
390NH	L0603	1	L117					
101T	L0603	3	L814	L811	L231			
101T	L0805	3	L901	L143	L131			
1R0	2520	1	L169					
0.31*1.5*3T	3T	1	L164					
0.31*1.5*4T	4T	2	L166	L168				
0.4*1.0*4T	4T	1	L261					
0.4*1.5*8T	8T	1	L146					
0.31*1.2*2T	2T	1	R157					
0.4*1.5*4T	4T	1	L133					
Diode								
LED (G)	D0603	1	D852					
LED (R)	D0603	1	D851					
HSC277	D-ESC	3	D266	D261	D262			
HVC131	D-ESC	2	D161	D160				
HZU5.1B	D-USC	1	D180					
KDS122	D-USM-MA742	1	D895					
Triode								
RQA0009	T-2N1A-2SK3476	1	T141					
DTC114EE	T-ESM-DTA114EE	6	T852	T851	T352	T102	T294	T171
2SK1824	T-ESM-2SK1824	2	T182	T555				
DTA114YE	T-ESM-DTA114EE	2	T181	T271				
RD01MUS2 (K6)	T-SOT89-2SK3078	1	T131					
2SB624	T-TSM-2SB624	2	T101	T291				
HM3401	T-TSM-2SB624	1	T351					
2SC3356	T-TSM-2SC3356 (R)	1	T121					
R3111Q271A	T-US4	1	U821					
2SC4226	T-TSM-2SC3356 (R)	3	T266	T111	T315			
KTC4075	T-USM-MRF497	2	T569	T891				
Integration								
RDA5802N	U-QFN24-0404-PC	1	U331					
AT1846SD	U-QFN32 (RDA1846)	1	U231					
CPU	U-QFP64-1212-PC	1	U811					
HT9172	U-SOIC18	1	U635					
AUDIO-E	U-SOP8	1	U841					
U-24C32	U-SOP8	1	U898					
UTC2822	U-SOP8	1	U351					
RH5RZ33CA-T1	U-SOT89-5A	1	U911					
NJM2904	U-SSOP8	1	U170					
Other								
32.768KHz	FX-7*1.5	1	CR815					
3.58MHZ	FX-CS20	1	CR638					
26MHz	FX-DS0305	1	CR225					
BATTERY	JK-C BC-47S-13	1	BA901					
JP18	JP-18-2	1	JP865					
CALL	JT-02	1	SW882					
MONI	JT-02	1	SW881					
PTT	JT-02	1	SW883					
ALARM	S-SKHLBA010	1	SW889					
MIRCO USB	MIRCO USB2	1	JP751					
ST-1041	JK-ST-106	1	JK875					

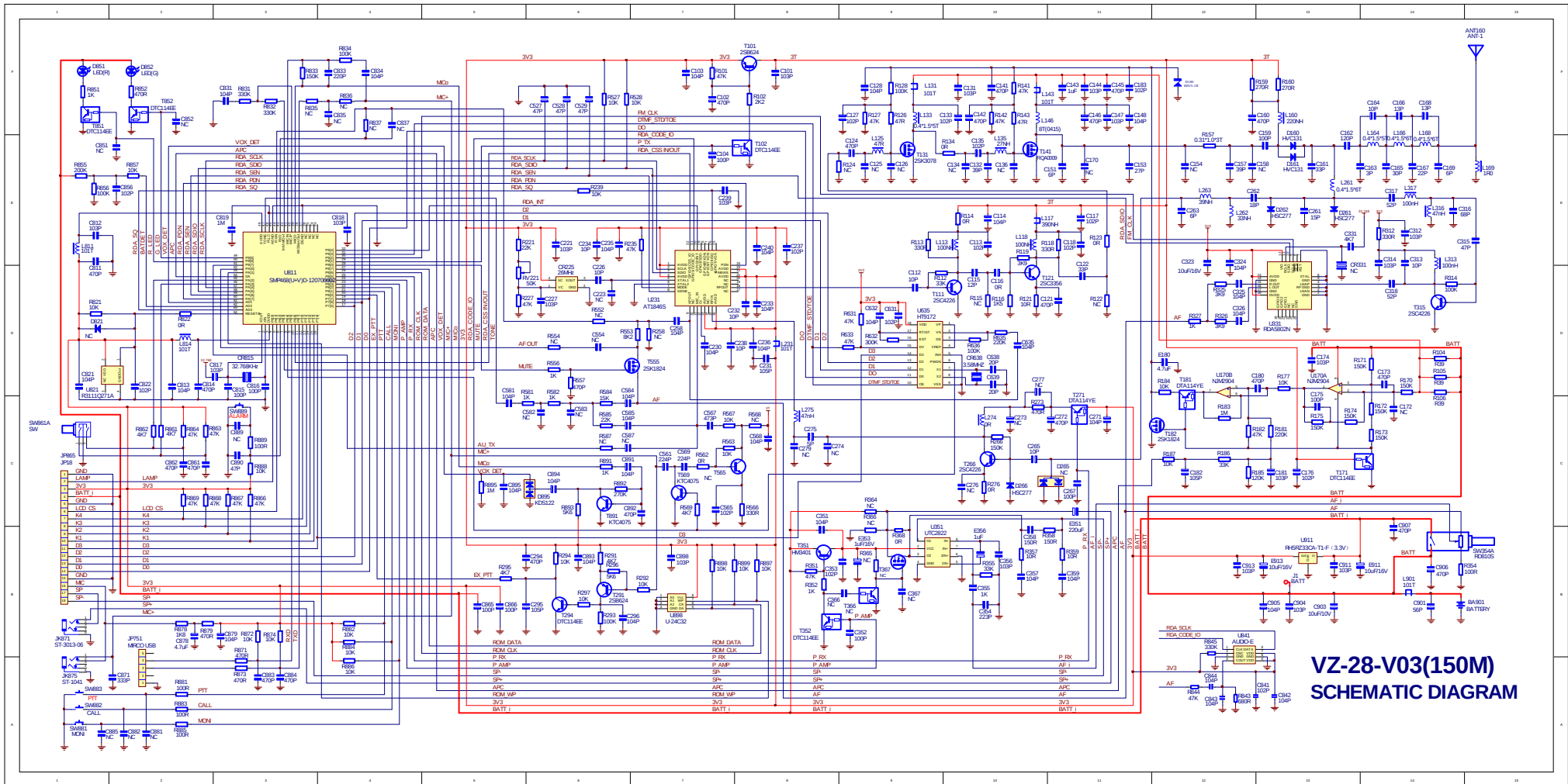
ST-3013-06	JK-ST-301-5	1	JK871					
ANT-1	PX-333-ANT	1	ANT160					
BATT	J-TEST POINT	1	J1					
SW	S-ED089030	1	SW861					
RD810S	S-R087FENS	1	SW354					

VZ-28 BLOCK DIAGRAM



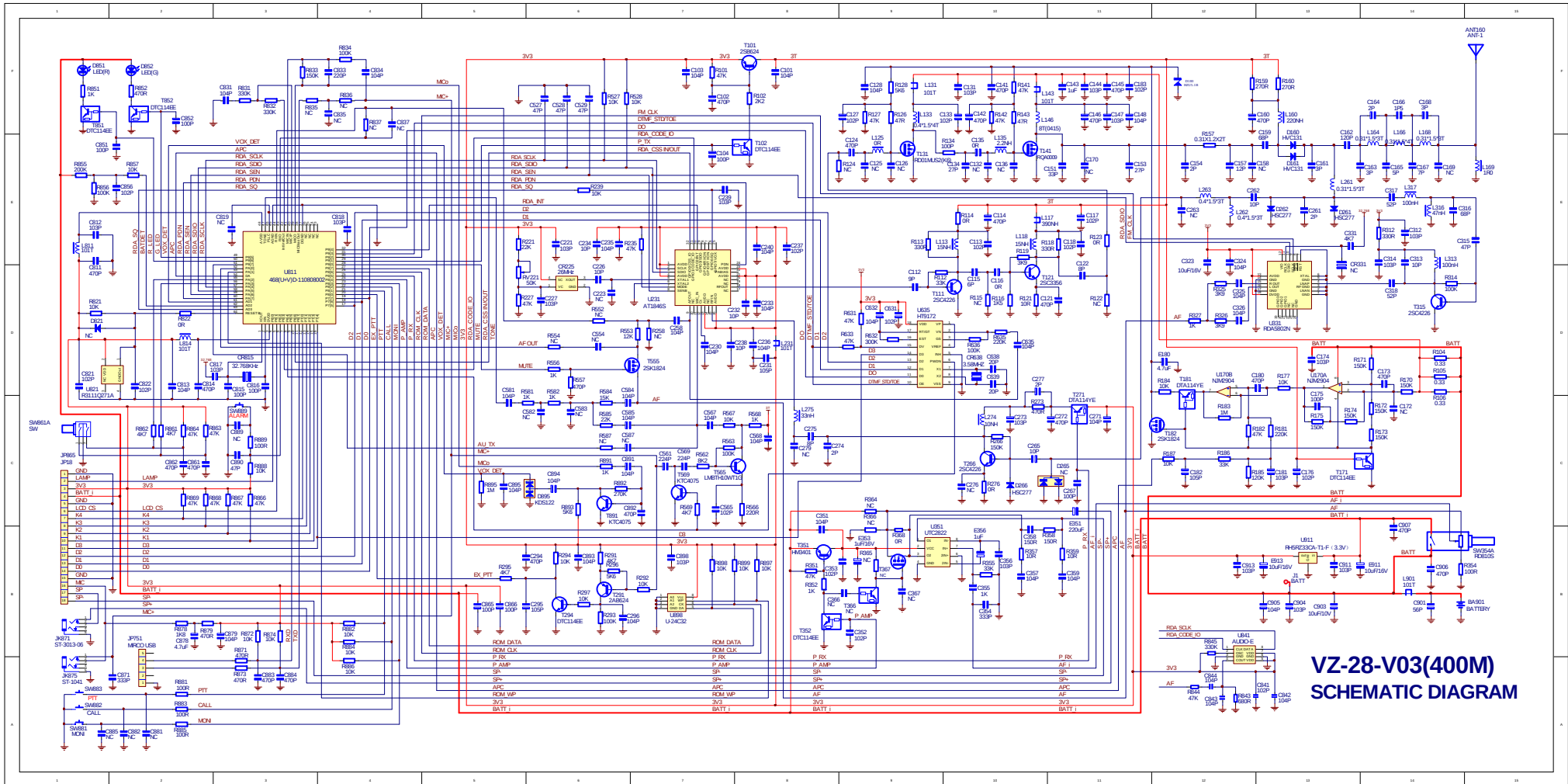
VZ-28 SCHEMATIC DIAGRAM

VZ-28-D0-5 136-174MHz



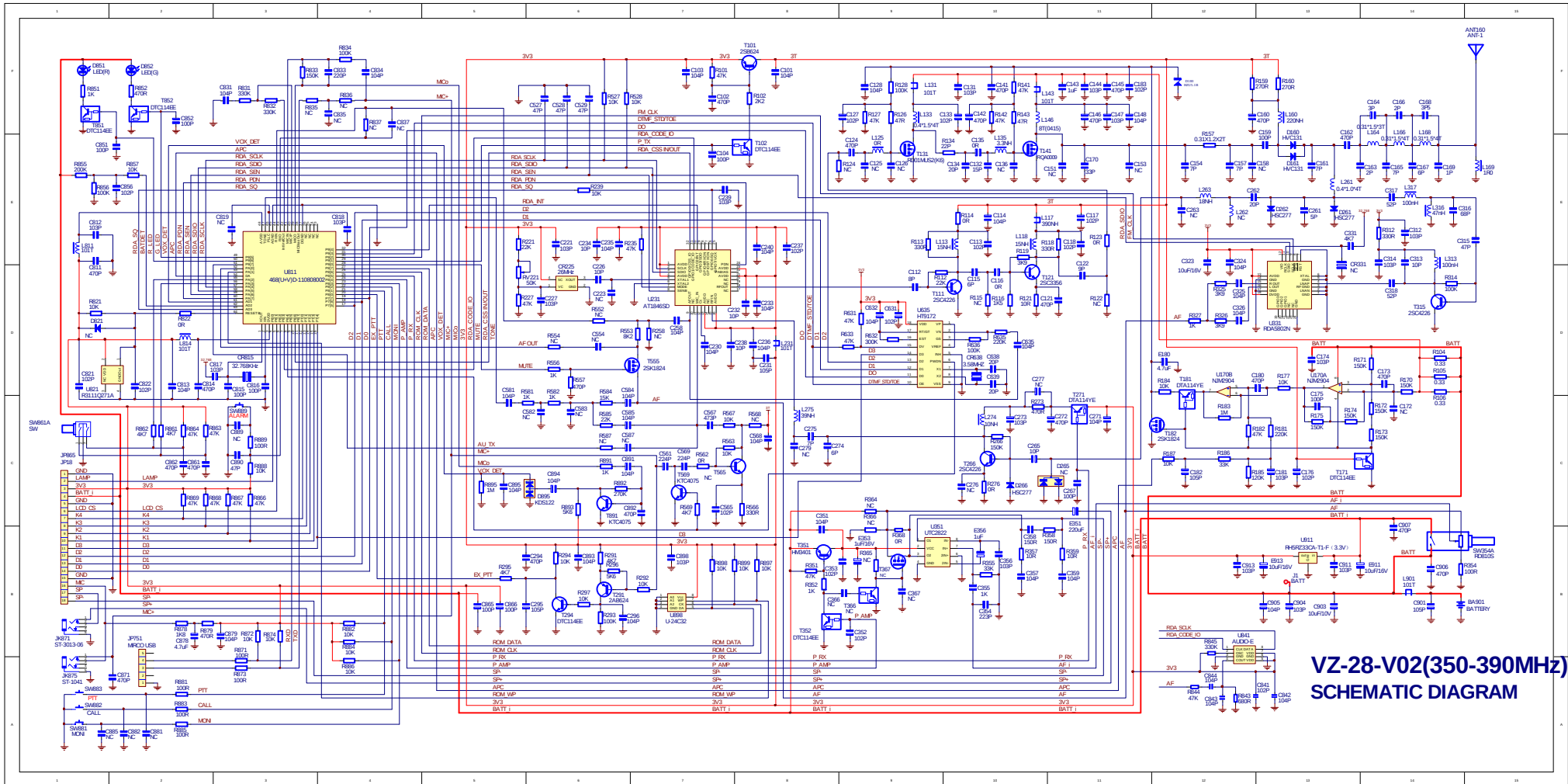
VZ-28 SCHEMATIC DIAGRAM

VZ-28-G6-4 400-470MHz

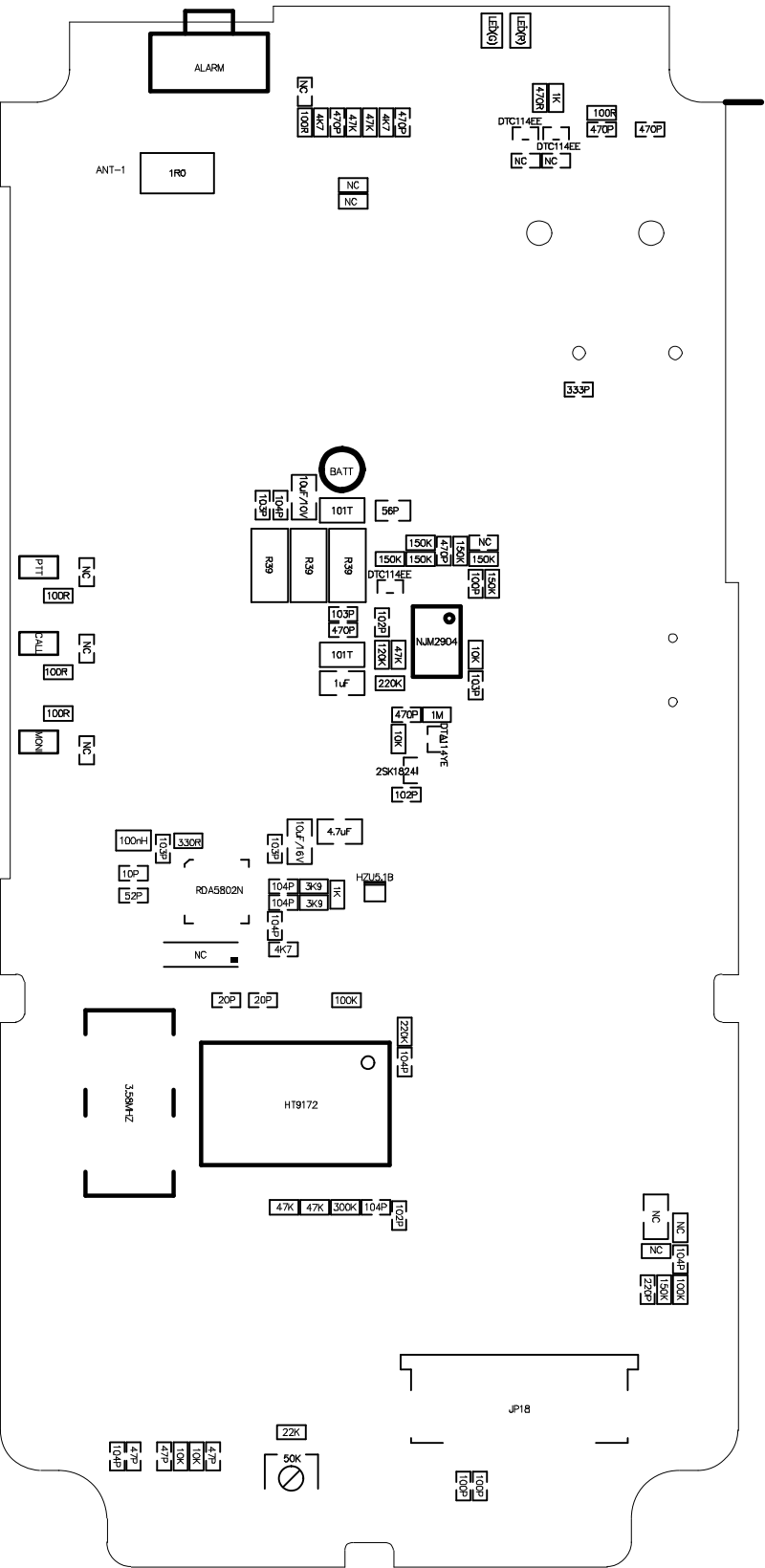


VZ-28 SCHEMATIC DIAGRAM

VZ-28-F6-4 350-390MHz

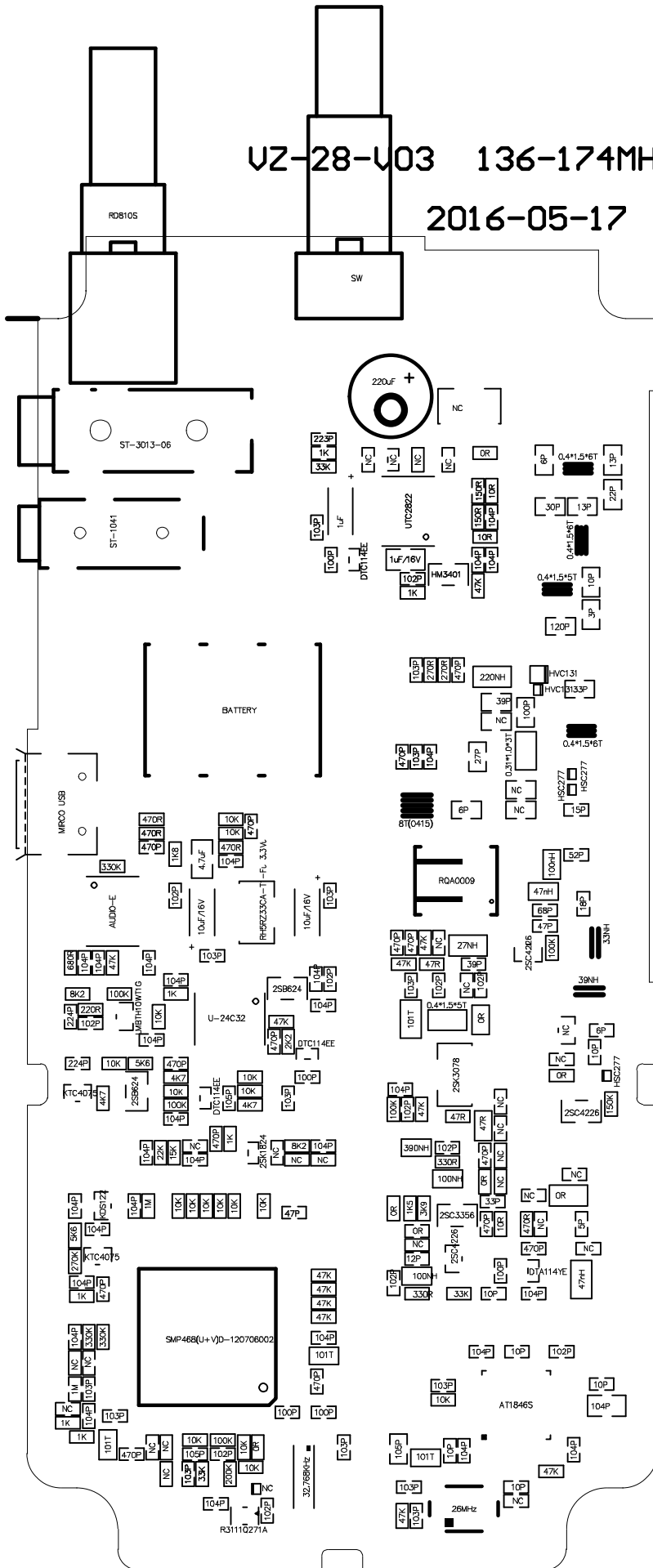


UZ-28-U03 136-174MHz
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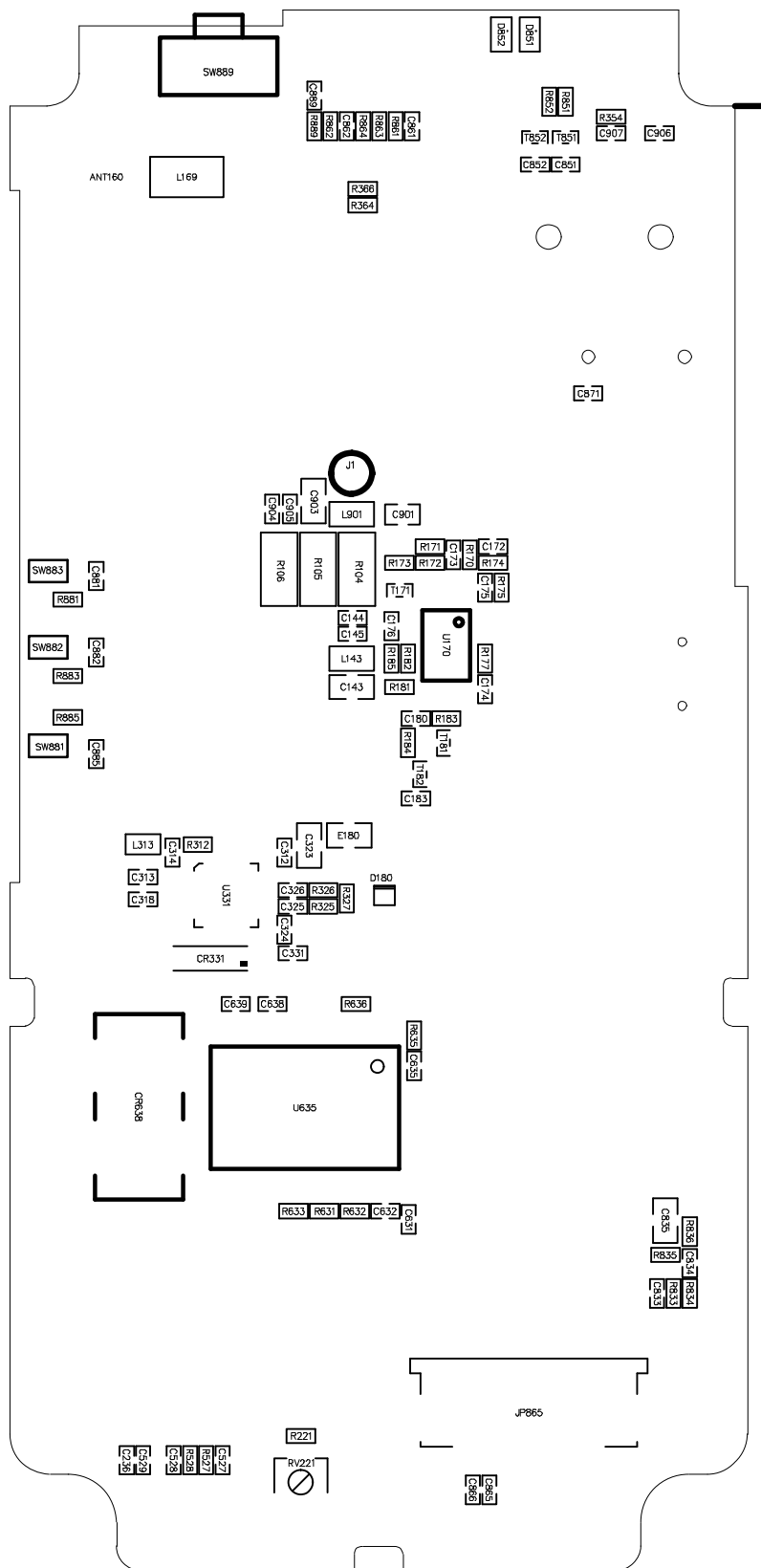


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2016-05-17

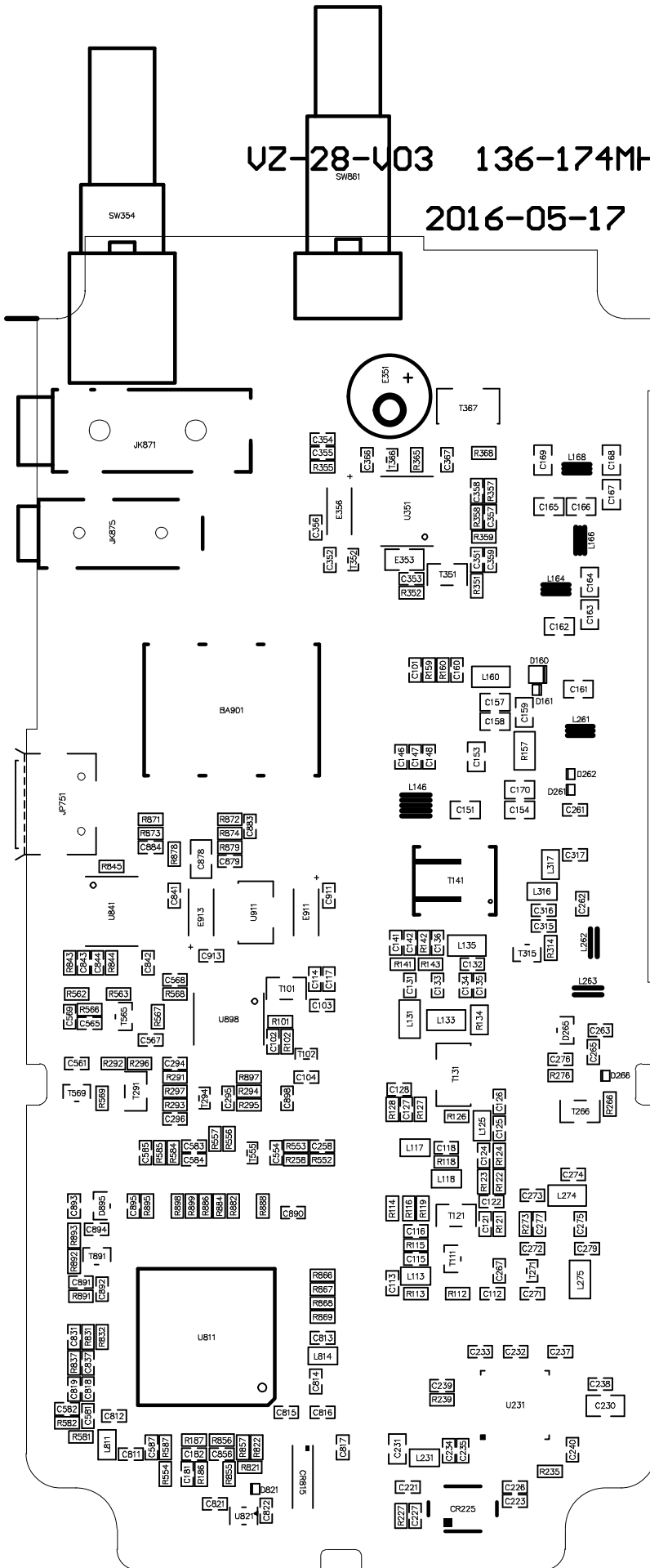


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2016-05-17

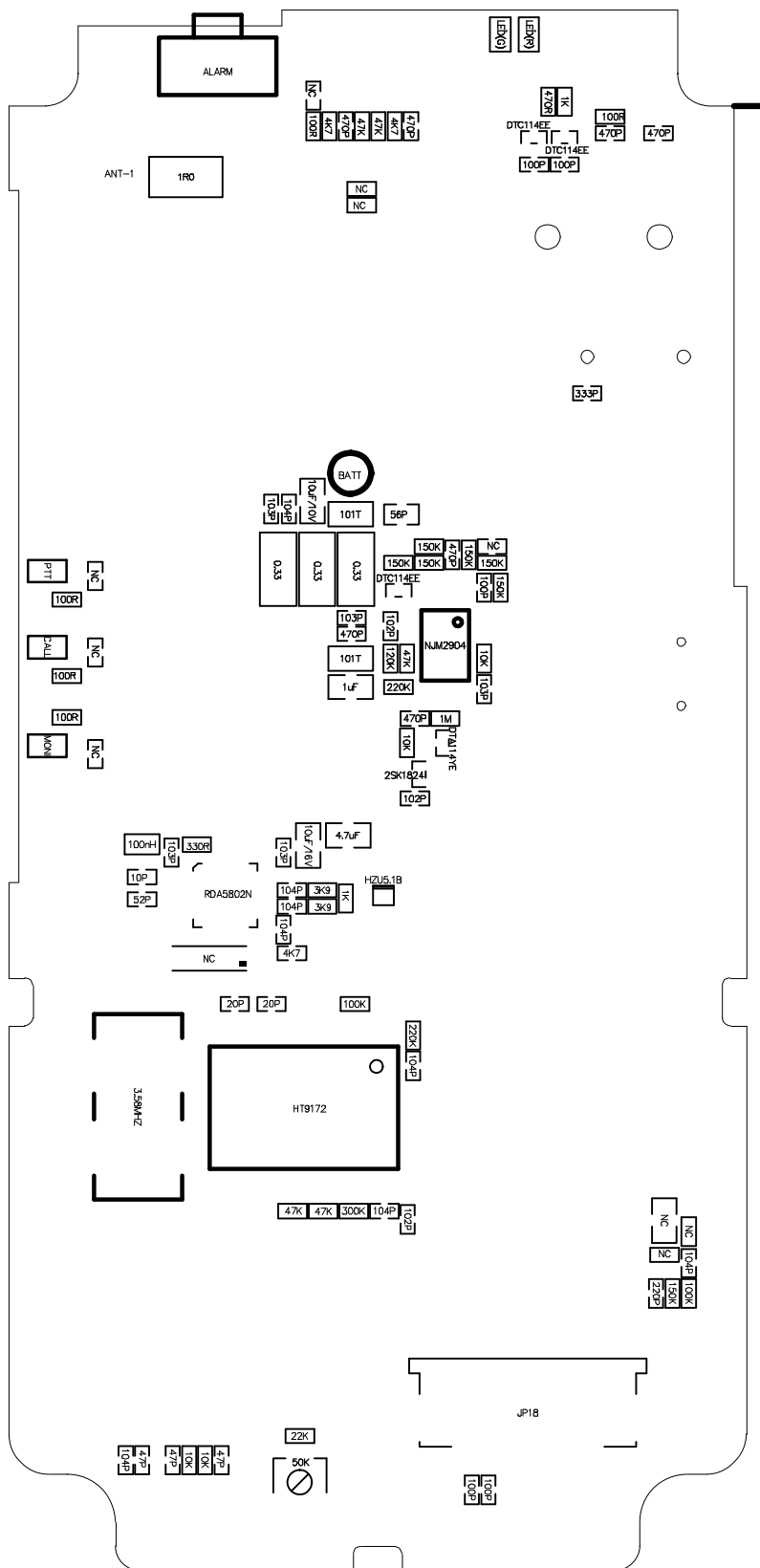


U2-28-U03 136-174MHz

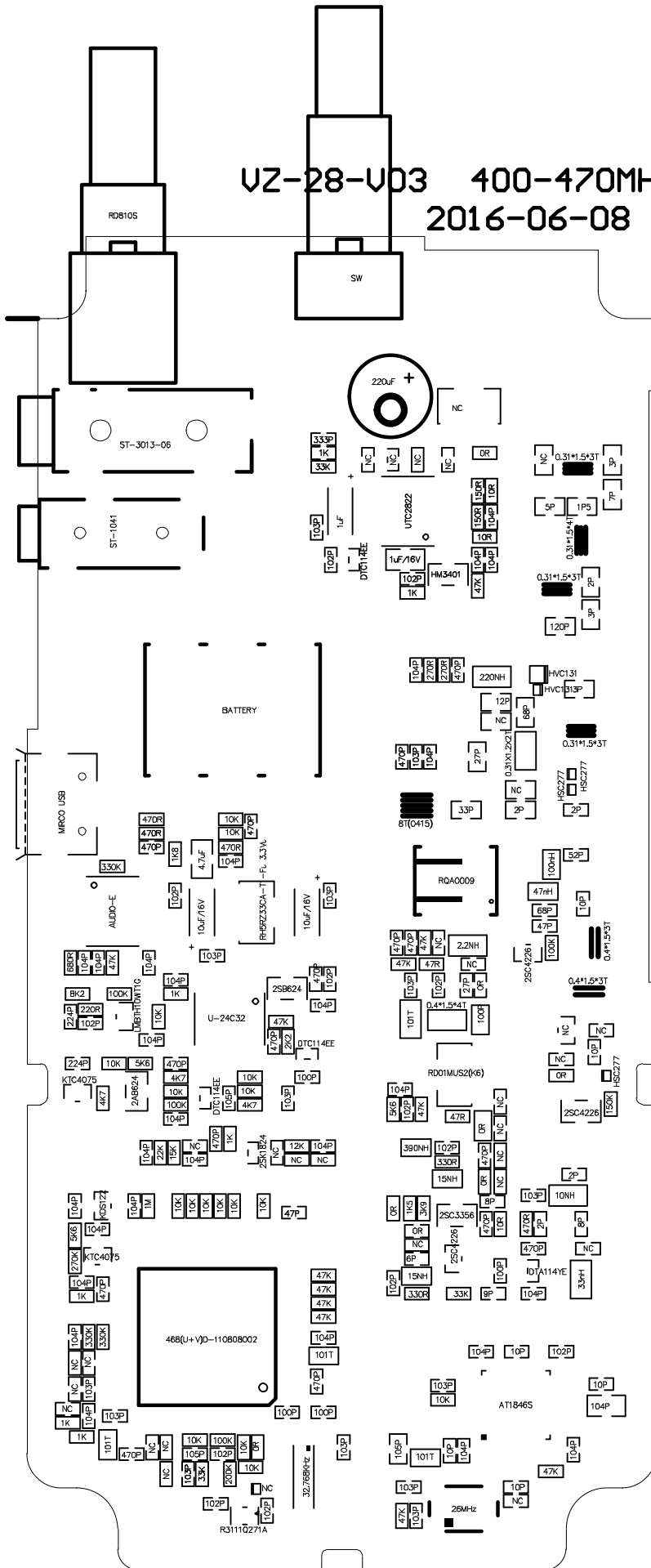
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UZ-28-V03 400-470MHz
2016-06-08

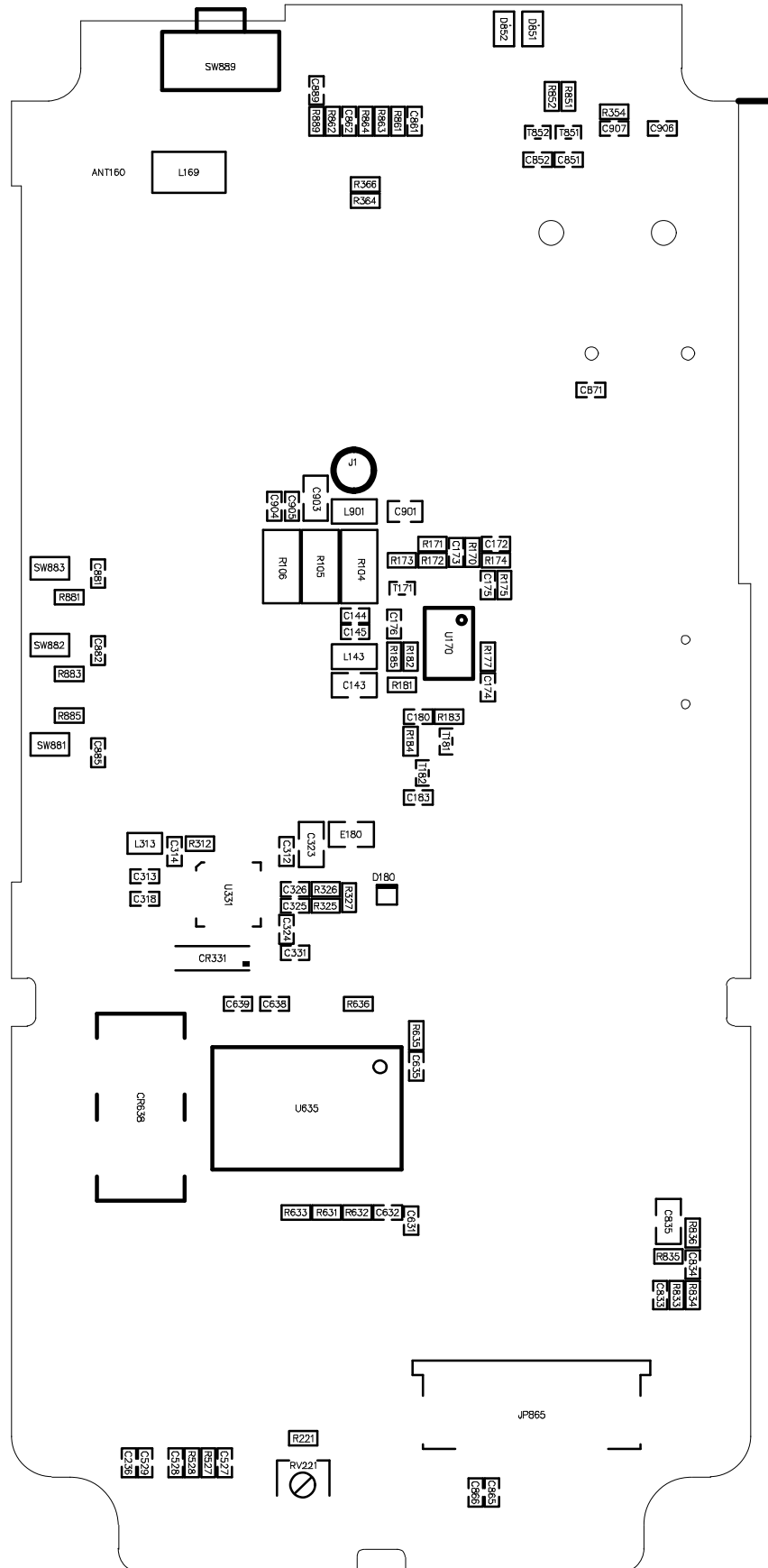


VZ-28-V03 400-470MHz
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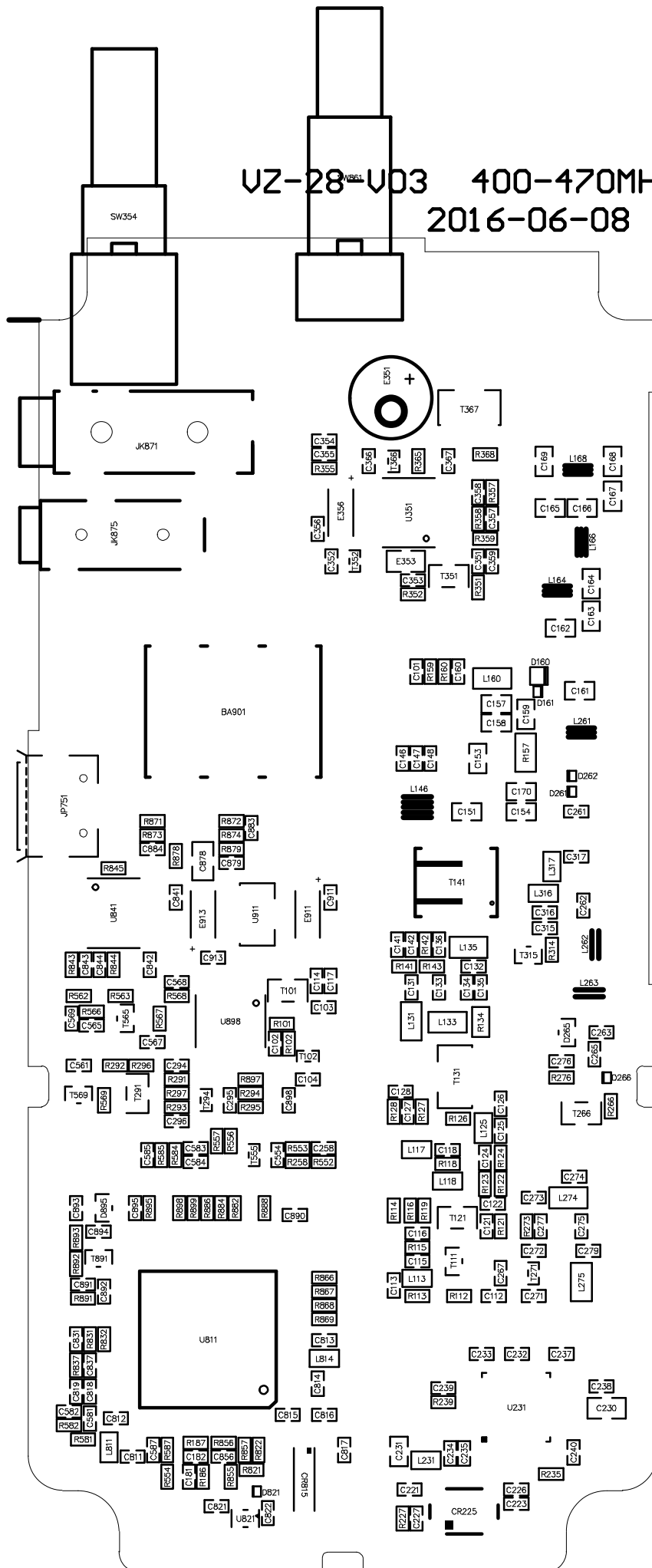


VZ-28-G6-4 400-470MHz BITMAP

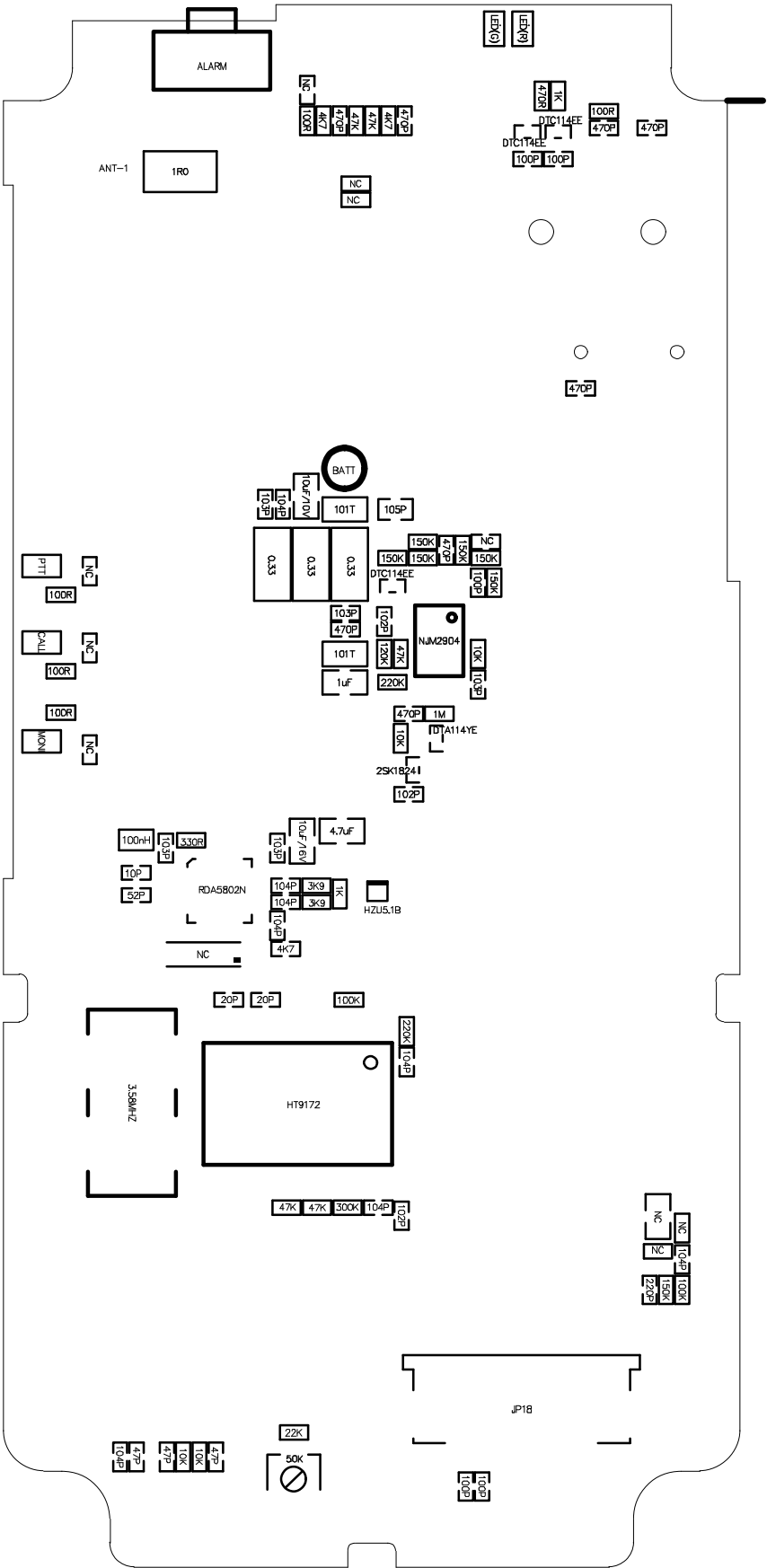
VZ-28-U03 400-470MHz
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VZ-28-V03 400-470MHz
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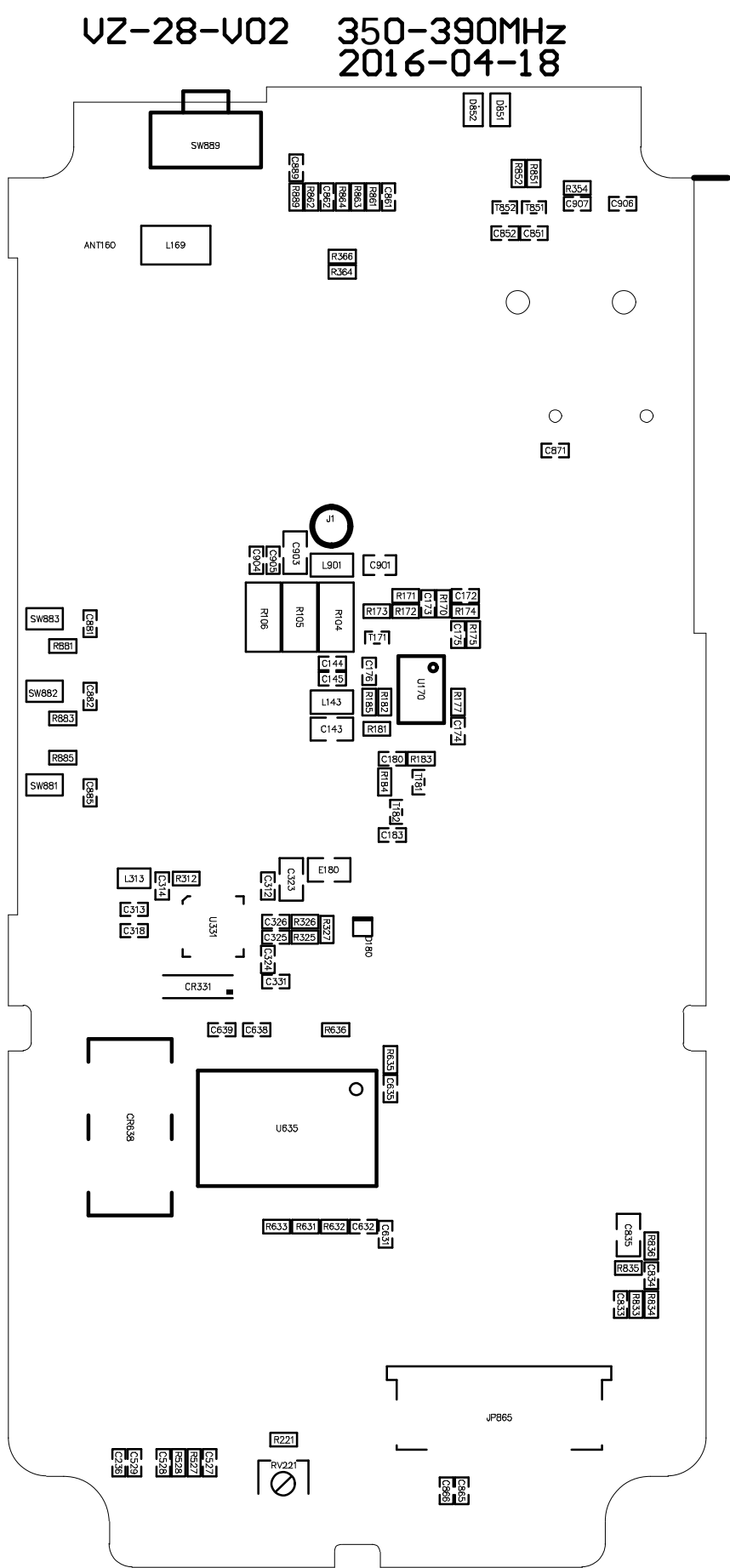
VZ-28-V02 350-390MHz
2016-04-18



2016-04-18

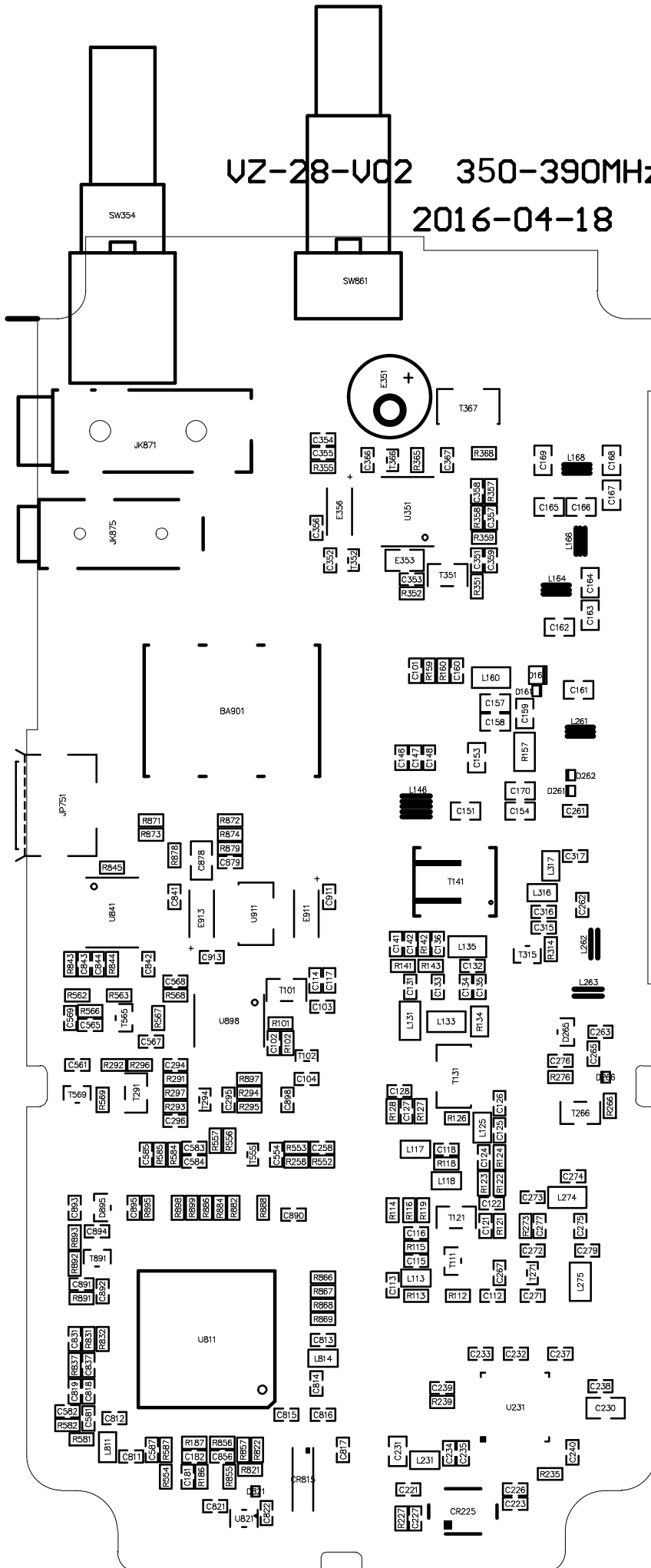


VZ-28-F6-4 350-390MHz BITMAP

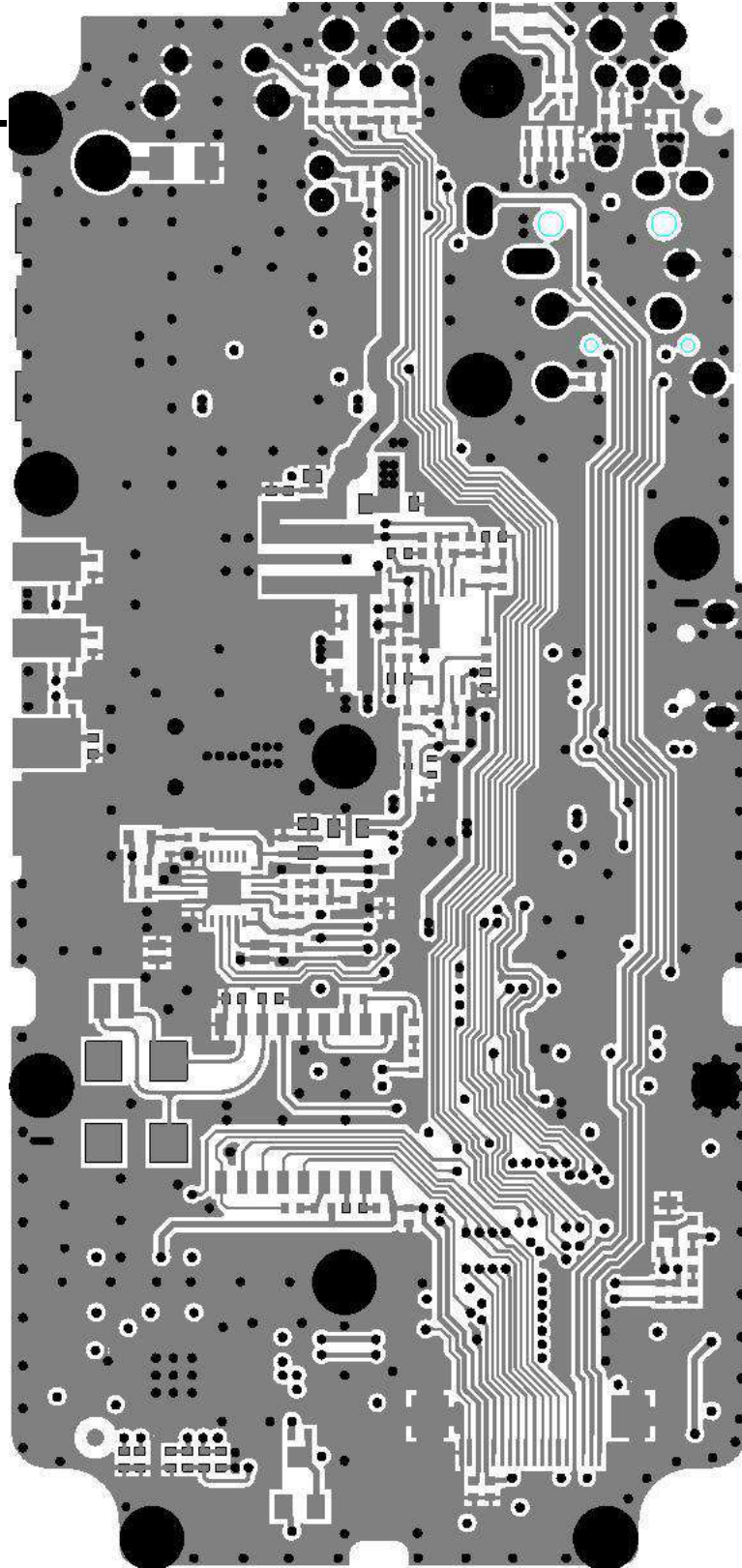


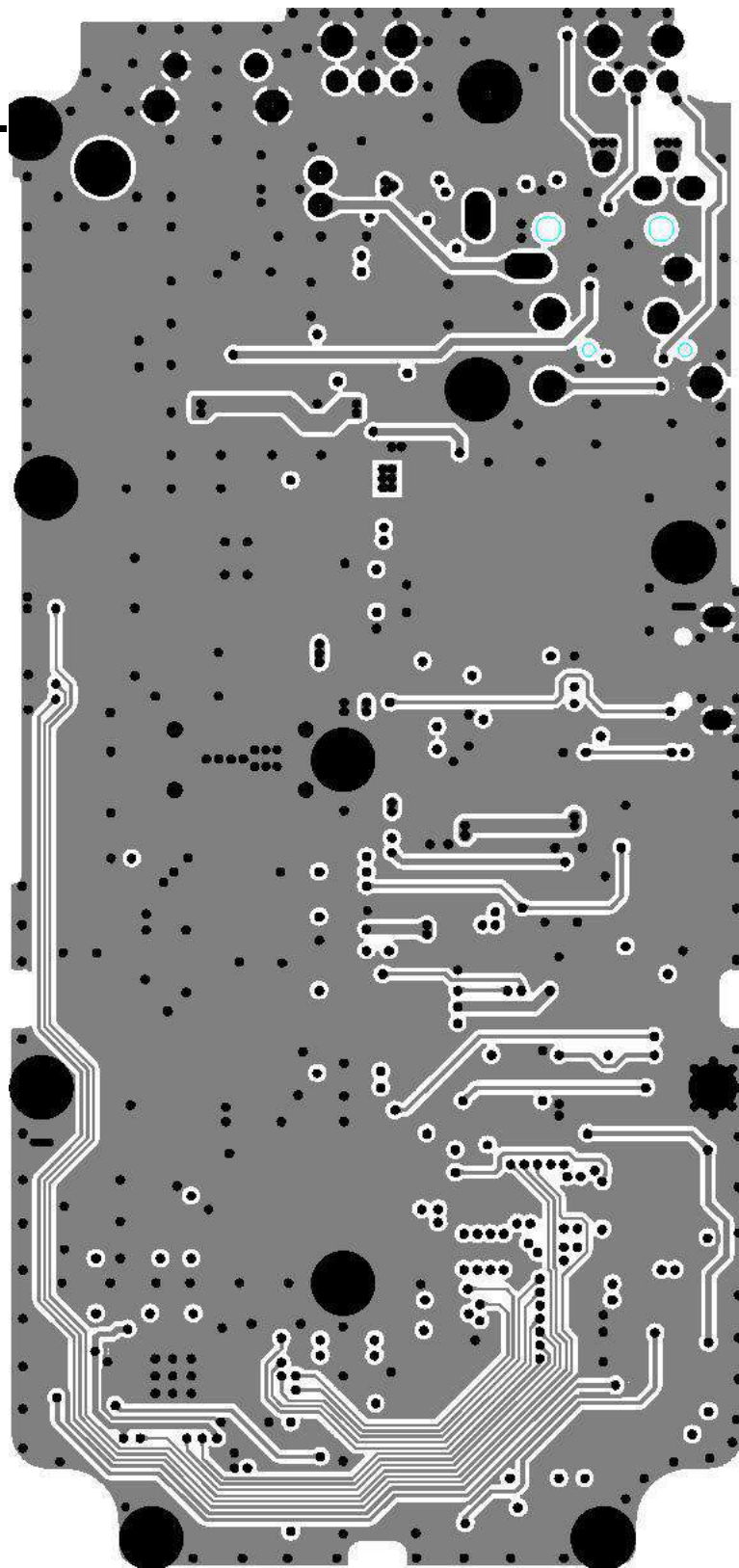
VZ-28-V02 350-390MHz

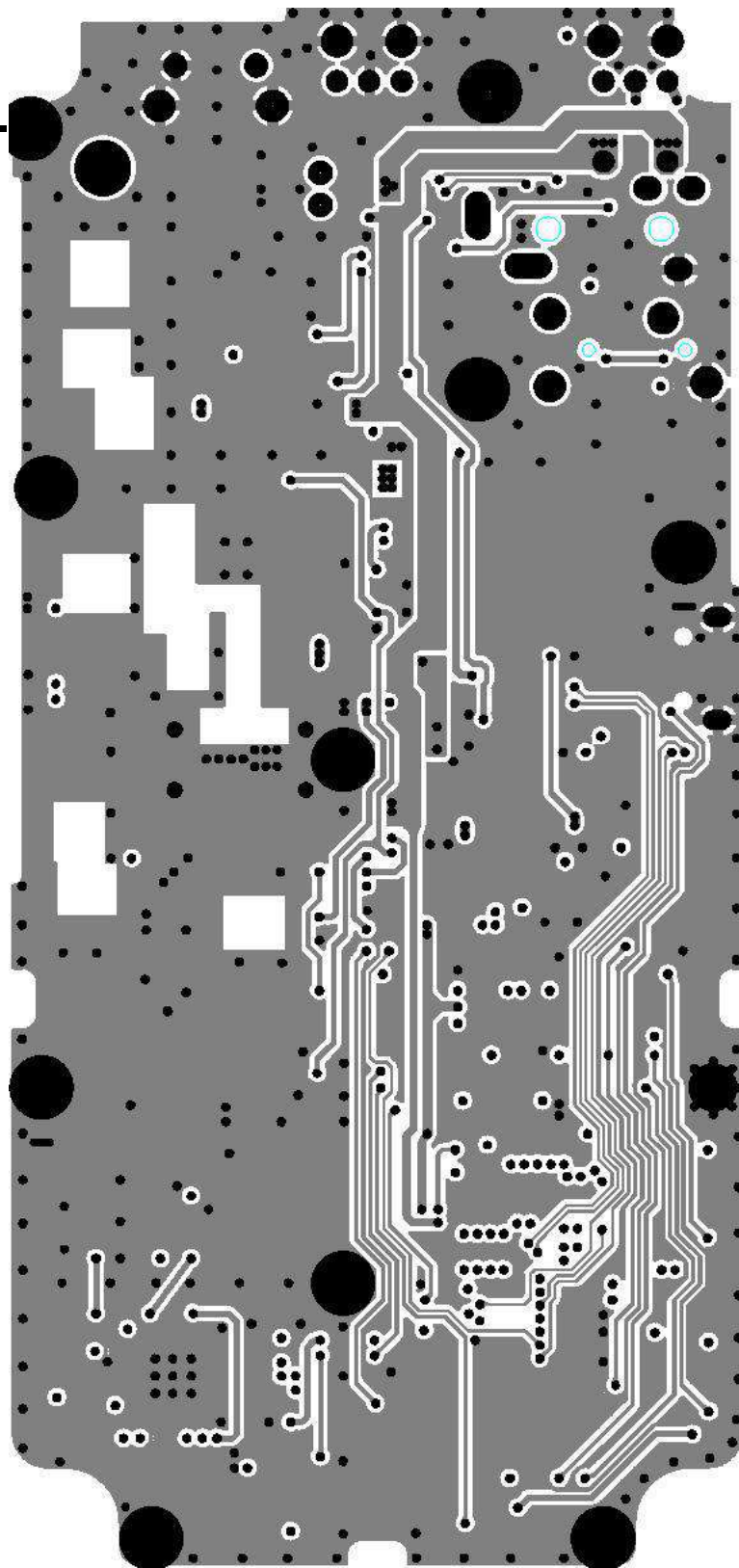
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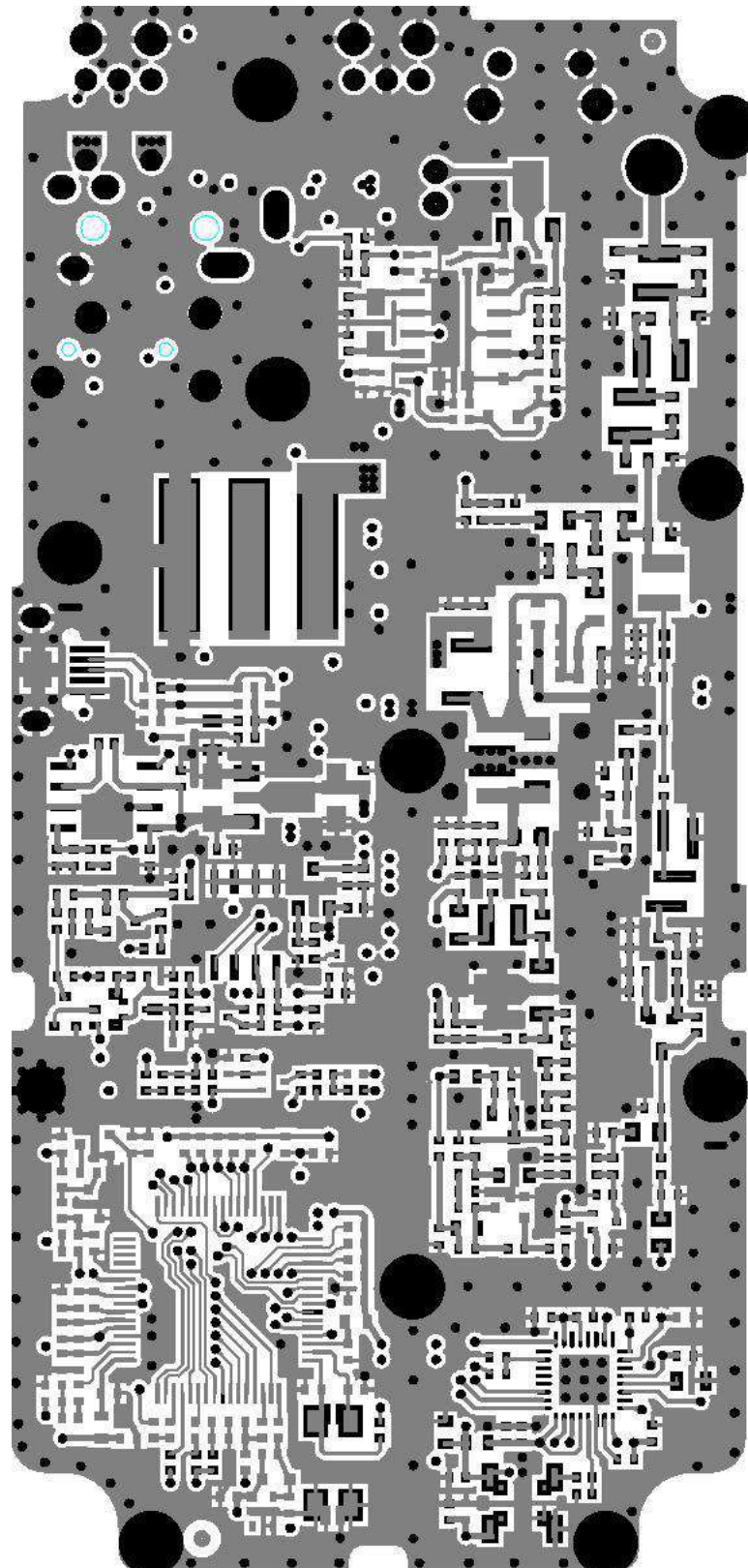


VZ-28 PCB BOARD









VZ - 28 GUIDELINE OF TROUBLESHOOTING

Faults	Solution
No electricity is supplied	• Battery may be exhausted, please replace the battery or recharge. • Battery may be installed improperly, please remove and re-install your battery pack.
Short battery life after recharged.	• The battery's service life ends, please replace with a new battery. • The battery is not fully charged, please make sure to remove the battery from charger when the LED turns green.
Failure to talk to other members in a group.	• Please make sure the frequency and subaudio frequency you are using match those used by other members in the group. • Members in the group may be too far away from you, please make sure you are in the effective range of other radios.

Faults	Solution
Voices of other persons (not a member) in the channel	• Please change your subaudio frequency settings, which also requires corresponding changes to be made on all radios in the group. (Changes may be required by your dealer)
When transmitting, no voice is heard or the voice received by others is small in volume.	• Please make sure the volume knob has been turned to appropriate position. • Send your device to the dealer to test for possible damages to the microphone.
Noise always on	• Other members in the group may be too far away to receive the calls, please get nearer and try again. • If you have enabled the muting function, please shut it off.