

# XM-35

# Bluetooth Module

# Hardware

# Datasheet

Rev 1.2

(BC57E68)



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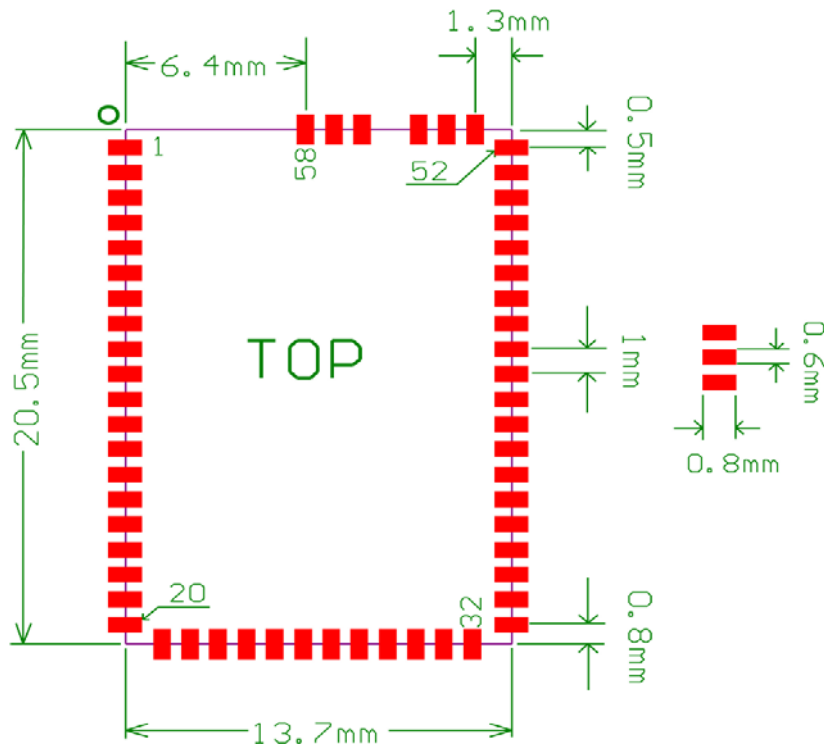
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## 1. Product Dimensions



## 2. Feature

### ● Radio Transceiver

- Typical -82dBm sensitivity
- Up to +2dBm RF transmit power with power level control

### ● Baseband

- Fully Qualified Bluetooth V2.0+EDR
- Integrated Audio CODEC in one chip
- Built-in link controller, link manager protocol and flash
- Low Power 3.3V Operation
- Full speed USB interface, compliant with USB 1.1
- Integrated Battery Charger With Programmable Current
- PIO control
- Standard HCI(UART or USB)l
- UART interface with programmable baud rate
- Basic module without antenna
- Basic module as SMD type
- With Audio Out & Audio in

- Package option

- Edge connector

### 3. Summary of Benefit

- Complete Bluetooth Solution

- Complete 2.4GHz radio transceiver and baseband
- CSR Bluecore 05- BT MultiMedia, single chip bluetooth system with CMOS technology
- Adaptive frequency hopping feature (AFH)
- Smallest footprint, 20.5mmX13.7mm
- Simplify overall design/development cycle
- Full speed Class 2 bluetooth operation
- Class I support using external power amplifier

- Low power standby modes to enable high efficient power management

- High performance radio transceiver

- Low overall system cost

- Application

- Stereo Headphone
- Automotive Hands-Free Kits
- Handsfree headset
- Stereo (AV) Transmitter
- Bluetooth Sound Box

- Software

- Support CSR bluetooth stack
- Design for Client

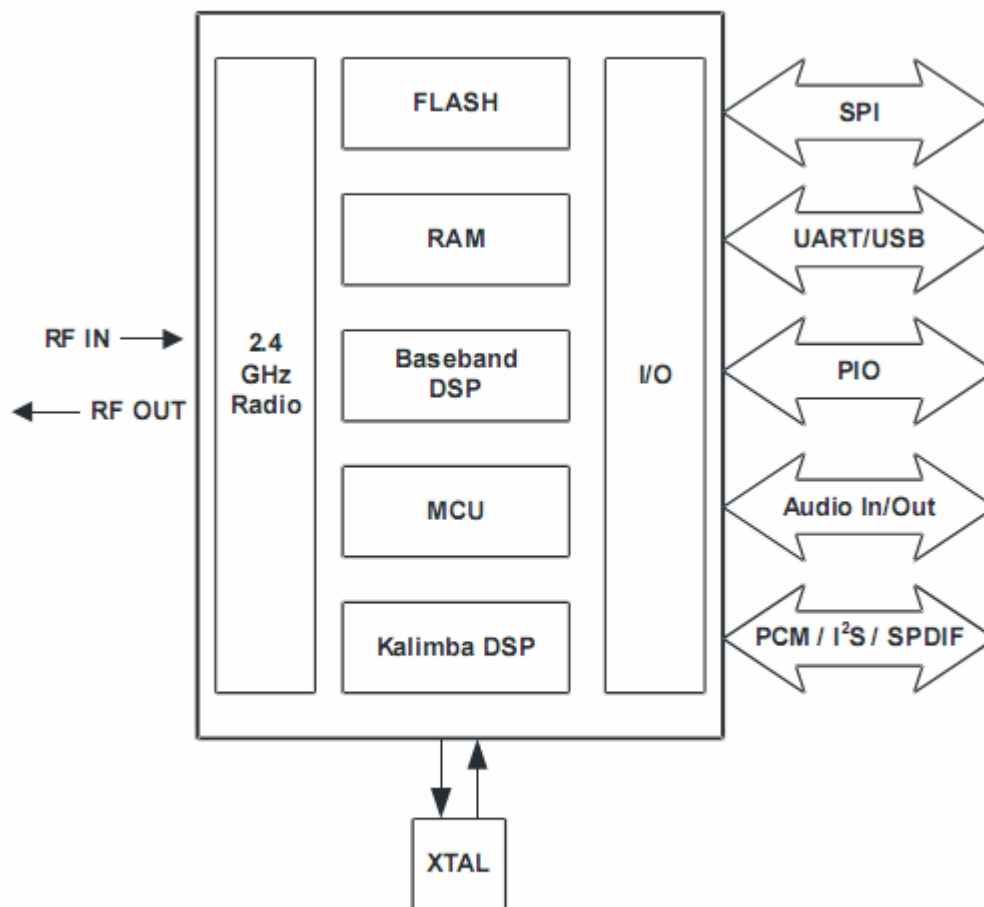
#### 4. Device Terminal Function

PIN Name	PIN #	Pad type	Description	Note
<b>GND</b>	<b>1.21.32.40 43.4856.5 8</b>	<b>VSS</b>	<b>Ground pot</b>	
<b>1.8V</b>	<b>39</b>	<b>VDD1.8V</b>	<b>Integrated 1.8V (+) supply with On-chip output within 1.7-1.9V</b>	
<b>3.3V</b>	<b>31</b>	<b>VDD3.0V</b>	<b>Integrated 3.3V (+) supply with On-chip I output within 3.0.-3.3V</b>	
<b>BATT</b>	<b>41</b>	<b>Battery terminal+ve</b>	<b>Lithium ion/polymer battery positiveterminal.</b>	
<b>CHG</b>	<b>42</b>	<b>Charger input</b>	<b>Lithium ion/polymer battery charger input</b>	
<b>VREN</b>	<b>38</b>	<b>Analogue</b>	<b>High-voltage linear regulator and switch-moderegulator</b>	
<b>AIO0</b>	<b>5</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>AIO1</b>	<b>4</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO0</b>	<b>54</b>	<b>Bi-Directional RX EN</b>	<b>Programmable input/output line, control output for LNA(if fitted)</b>	
<b>PIO1</b>	<b>55</b>	<b>Bi-Directional TX EN</b>	<b>Programmable input/output line, control output for PA(if fitted)</b>	
<b>PIO2</b>	<b>3</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO3</b>	<b>2</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO4</b>	<b>22</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO5</b>	<b>23</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO6</b>	<b>24</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO7</b>	<b>18</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO8</b>	<b>19</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO9</b>	<b>14</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO10</b>	<b>12</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>PIO11</b>	<b>16</b>	<b>Bi-Directional</b>	<b>Programmable input/output line</b>	
<b>RET</b>	<b>25</b>	<b>CMOS Input with weak intemal pull-down</b>	<b>RESET</b>	
<b>UART_RT</b>	<b>11</b>	<b>CMOS output, tri-stable with</b>	<b>UART request to send, active low</b>	

<b>S</b>		<b>weak internal pull-up</b>		
<b>UART_CTS</b>	<b>10</b>	<b>CMOS input with weak internal pull-down</b>	<b>UART clear to send, active low</b>	
<b>UART_RX</b>	<b>8</b>	<b>CMOS input with weak internal pull-down</b>	<b>UART Data input</b>	
<b>UART_TX</b>	<b>9</b>	<b>CMOS output, Tri-stable with weak internal pull-up</b>	<b>UART Data output</b>	
<b>SPI_MOSI</b>	<b>35</b>	<b>CMOS input with weak internal pull-down</b>	<b>Serial peripheral interface data input</b>	
<b>SPI_CSB</b>	<b>30</b>	<b>CMOS input with weak internal pull-up</b>	<b>Chip select for serial peripheral interface, active low</b>	
<b>SPI_CLK</b>	<b>33</b>	<b>CMOS input with weak internal pull-down</b>	<b>Serial peripheral interface clock</b>	
<b>SPI_MISO</b>	<b>34</b>	<b>CMOS input with weak internal pull-down</b>	<b>Serial peripheral interface data Output</b>	
<b>USB_DN</b>	<b>6</b>	<b>Bi-Directional</b>	<b>USB</b>	
<b>USB_DP</b>	<b>7</b>	<b>Bi-Directional</b>	<b>USB</b>	
<b>MIC_A_P</b>	<b>51</b>	<b>Analogue input</b>	<b>Microphone input L positive pot</b>	<b>Microphone Left Positive</b>
<b>MIC_A-N</b>	<b>52</b>	<b>Analogue input</b>	<b>Microphone input L negative pot</b>	<b>Microphone Left Negative</b>
<b>MIC_B_P</b>	<b>49</b>	<b>Analogue input</b>	<b>Microphone input R positive pot</b>	<b>Microphone Right Positive</b>
<b>MIC_B_N</b>	<b>50</b>	<b>Analogue</b>		<b>Microphone Right</b>

		<b>input</b>	<b>Microphone input R negative pot</b>	<b>Negative</b>
<b>SPK_A_P</b>	<b>46</b>	<b>Analogue output</b>	<b>Speaker output L negative</b>	<b>Left Negative</b>
<b>SPK_A_N</b>	<b>47</b>	<b>Analogue output</b>	<b>Speaker output L positive</b>	<b>Left Positive</b>
<b>SPK_B_P</b>	<b>44</b>	<b>Analogue output</b>	<b>Speaker output R negative</b>	<b>Right Negative</b>
<b>SPK_B_N</b>	<b>45</b>	<b>Analogue output</b>	<b>Speaker output R positive</b>	<b>Right Positive</b>
<b>PCM_IN</b>	<b>26</b>		<b>Synchronous PCM data input</b>	
<b>PCM_SY NC</b>	<b>28</b>		<b>Synchronous PCM data strobe</b>	
<b>PCM_CLK</b>	<b>27</b>		<b>Synchronous PCM data clock</b>	
<b>PCM_OUT</b>	<b>29</b>		<b>Synchronous PCM data output</b>	
<b>ANT</b>	<b>57</b>	<b>Analogue</b>	<b>RF In/Out</b>	
<b>LED0</b>	<b>37</b>	<b>Open drain output</b>	<b>LED driver</b>	
<b>LED1</b>	<b>36</b>	<b>Open drain output</b>	<b>LED driver</b>	
<b>MIC_BAIS</b>	<b>53</b>	<b>Analogue</b>	<b>Microphone bia</b>	

## 5. Block Diagram



## System Architecture

## 6. Electrical Specification:

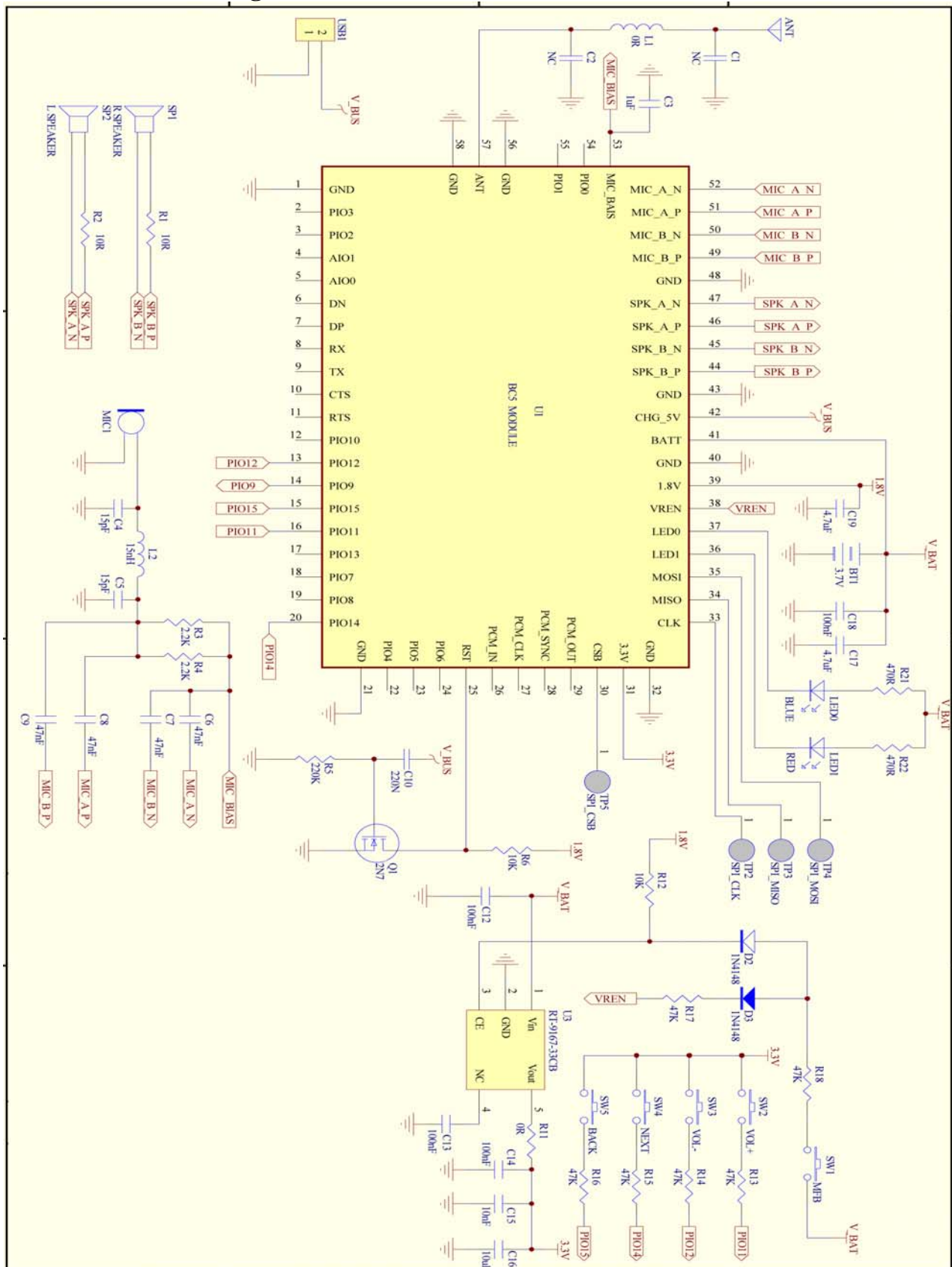
### ● Recommended Operating condition

Operating Condition	Min	Max
Operating temperature range	-20°C <sup>(1)</sup>	+75°C <sup>(1)</sup>
Guaranteed RF performance range <sup>(a)</sup>	-20°C <sup>(1)</sup>	+75°C <sup>(1)</sup>
Supply voltage: VDD_RADIO, VDD_VCO, VDD_ANA and VDD_CORE	1.7V	1.9V
Supply voltage: VDD_PADS, VDD_PIO, VDD_MEM and VDD_USB	1.7V	3.6V
Supply voltage: VREG_IN	3.0V <sup>(1)</sup>	4.2V <sup>(b)</sup>
Supply voltage: BAT_P	3.0V <sup>(1)</sup>	4.2V
Supply voltage: V_CHG	4.35V	6.5V



Radio Characteristics	VDD = 1.8V		Temperature = +20°C		
	Min	Typ	Max	Bluetooth Specification	Unit
Maximum RF transmit power <sup>(a)</sup> (b)	-	2.5	-	-6 to +4 <sup>(c)</sup>	dBm
RF power variation over temperature range with compensation enabled <sup>(±)</sup> <sup>(d)</sup>	-	1.5	-	-	dB
RF power variation over temperature range with compensation disabled <sup>(±)</sup>	-	2	-	-	dB
RF power control range	-	35	-	≥16	dB
RF power range control resolution <sup>(e)</sup>	-	0.5	-	-	dB
20dB bandwidth for modulated carrier	-	780	-	≤1000	kHz
Adjacent channel transmit power $F = F_0 \pm 2\text{MHz}$ <sup>(f)</sup> (g)	-	-40	-	≤-20	dBm
Adjacent channel transmit power $F = F_0 \pm 3\text{MHz}$	-	-45	-	≤-40	dBm
Adjacent channel transmit power $F = F_0 \pm > 3\text{MHz}$	-	-50	-	≤-40	dBm
$\Delta f_{1\text{avg}}$ Maximum Modulation	-	165	-	$140 < f_{1\text{avg}} < 175$	kHz
$\Delta f_{2\text{max}}$ Minimum Modulation	-	150	-	≥115	kHz
$\Delta f_{1\text{avg}}/\Delta f_{2\text{avg}}$	-	0.97	-	≥0.80	-
Initial carrier frequency tolerance	-	6	-	±75	kHz
Drift Rate	-	8	-	≤20	kHz/50μs
Drift (single slot packet)	-	7	-	≤25	kHz
Drift (five slot packet)	-	9	-	≤40	kHz
2nd Harmonic Content	-	-65	-	≤-30	dBm
3rd Harmonic Content	-	-45	-	≤-30	dBm

## 7. Schematic Diagram



## 8. Testing Block Diagram

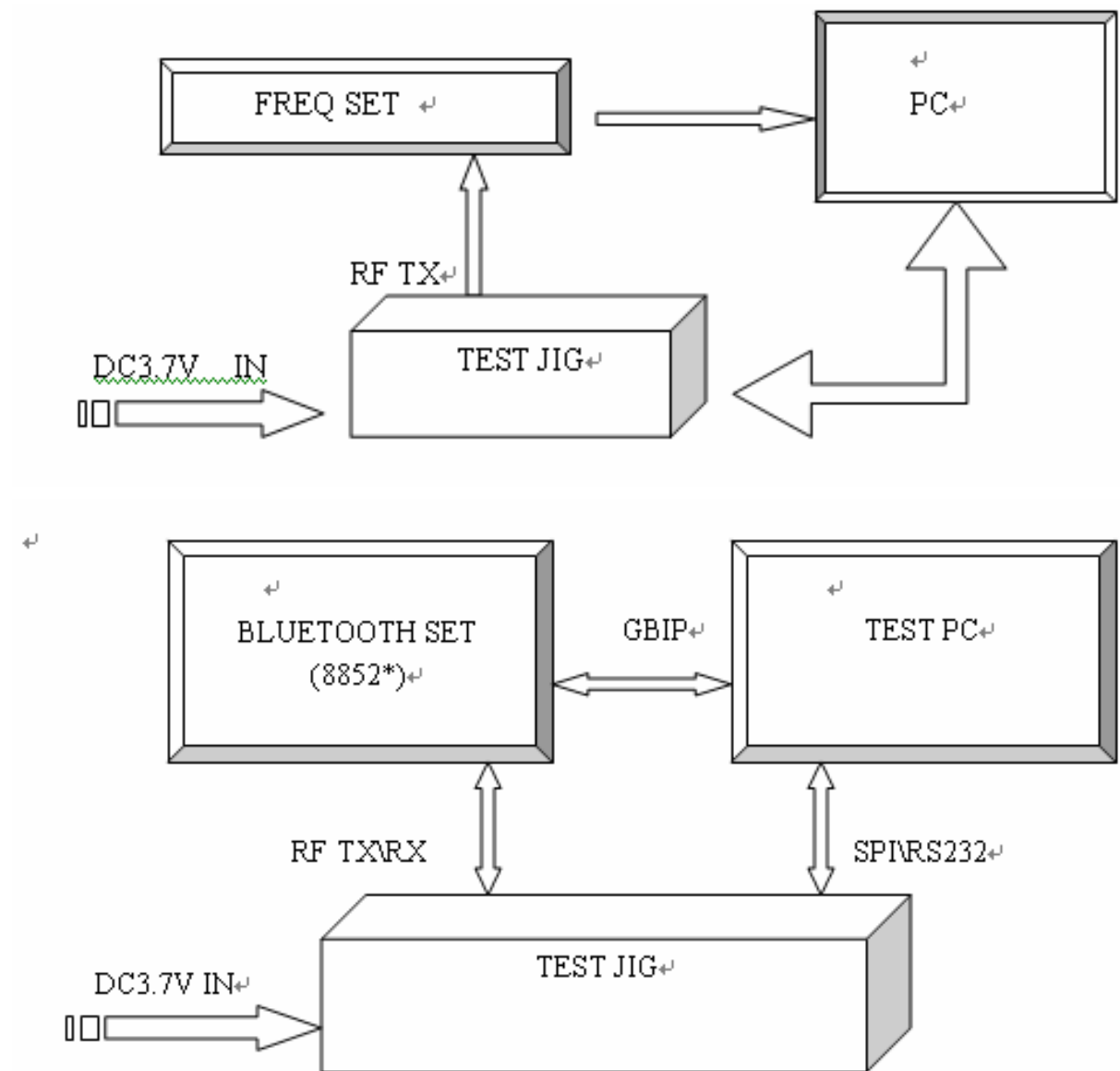
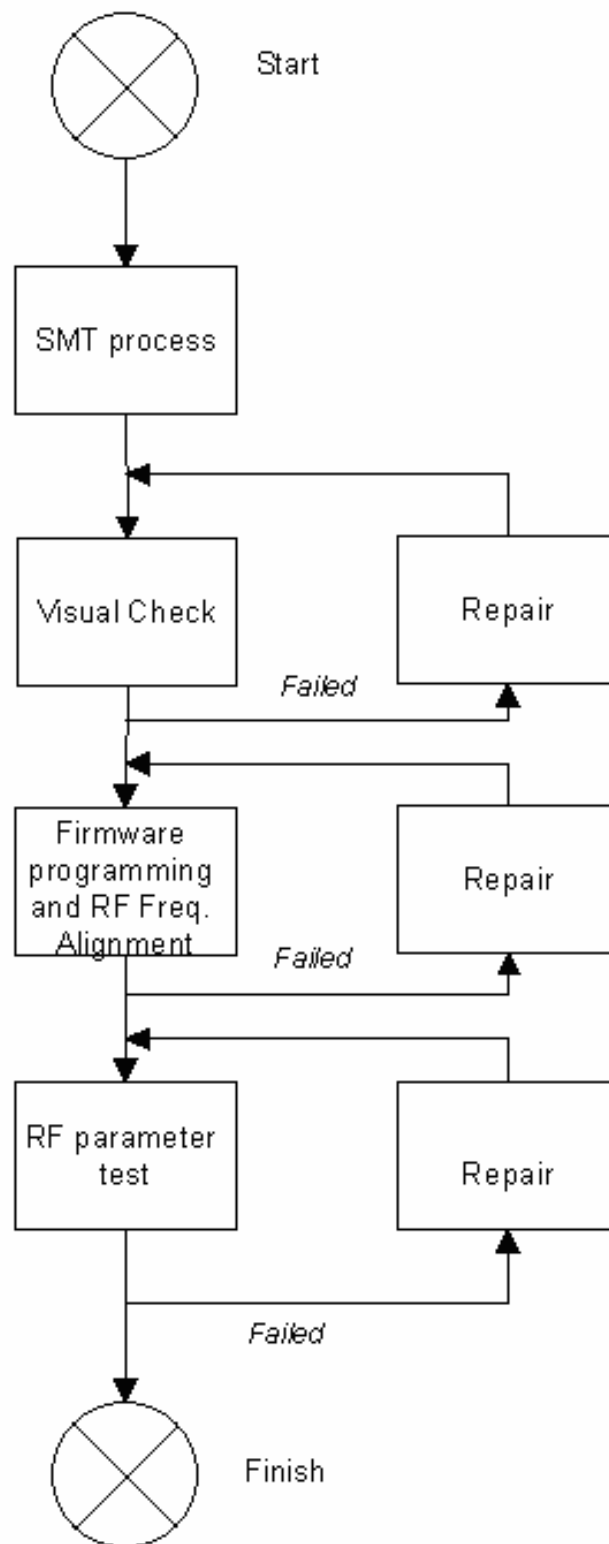


Fig 2 RF Parameter Test procedure

**Fig 3 Assemble/Alignment/Testing Flow Chart**