

# MDHKT-81BK

wireless voice intercom and data transmission module

## DATA SHEET

DATA: 2014-2-13

## 1. Summary:

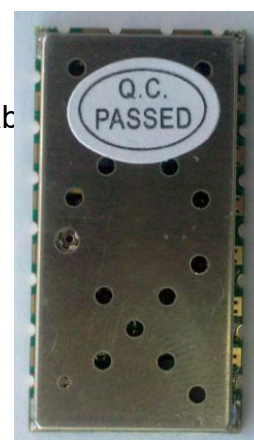
MDHKT-81BK is a cost-effective wireless voice intercom and data transmission module, with built-in high-performance RF transceiver chip, microcontroller and RF amplifier.

The external MCU can set the working parameters of the module and through the standard asynchronous serial interface (RS232) communication and control the working state of the module.

This module only needs an external antenna, a MIC and a voice amplifier to form a complete intercom or DMR(digital mobile radio) station.

## 2. Characteristics:

- Frequency demodulation technology based on digital signal processing technology ;
- Frequency range : 350~390MHZ;
- Frequency space: 5K/6.25K/12.5K/25K;
- RF output power: High power 1W, Low power 0.5W
- Voice Encryption (interference) (8 options)
- SMS transceiver function;
- Built-in CTCSS (38 groups), CDCSS (83 groups) codec;
- Automatic elimination of tail sound function;
- Digital volume (level 1-8) adjustable;
- Voice control hands-free communication function (level 0-8) adjustable;
- Noise level (0-9) adjustable;
- MIC sensitivity adjustable software (1-8)
- High reception sensitivity: -122dbM;
- Ultra-low-power sleep mode (0.1uA);
- Supply voltage: 3.3~5.0V
- Size: 18\*35\*3.2MM;



(module photo)

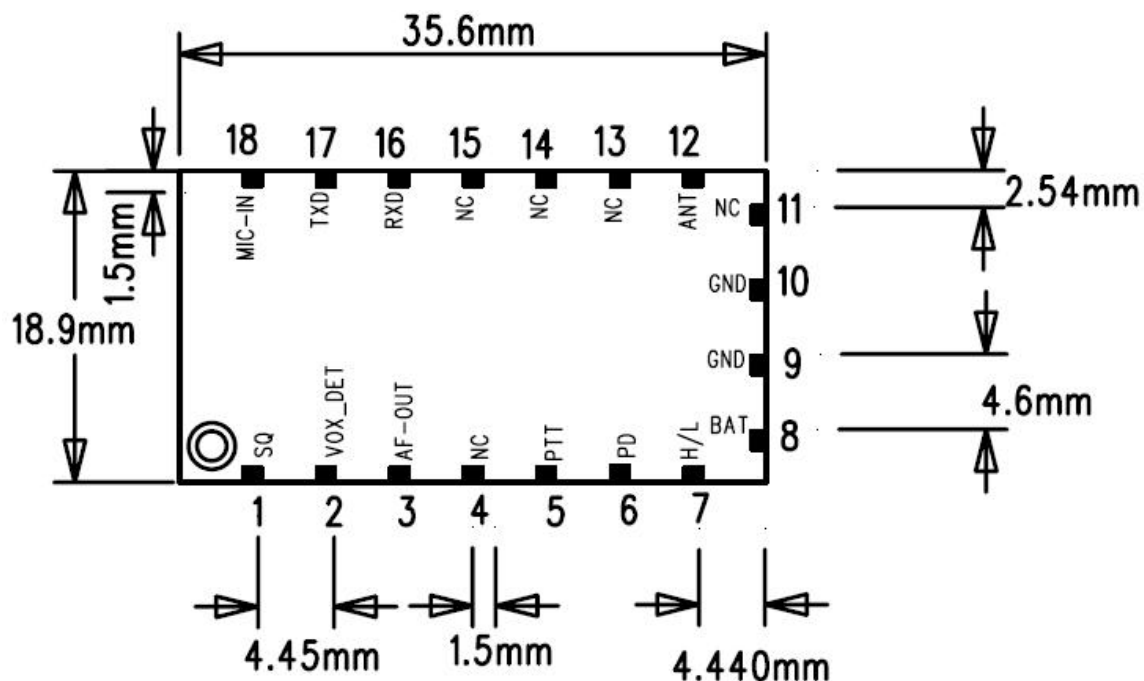
- RF range: 5km in open air

Applications : 1、Portable intercom and paging system;

2、Wireless Data Transmission (SMS) system;

3、mobile phone and other products with interphone function embedded.

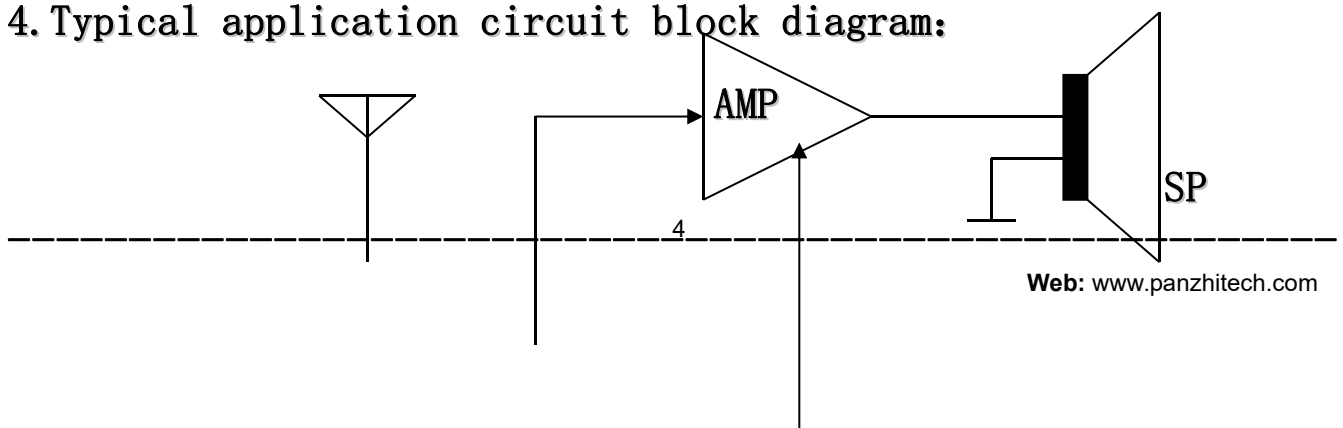
### 3. Dimensions and pins (bottom view):

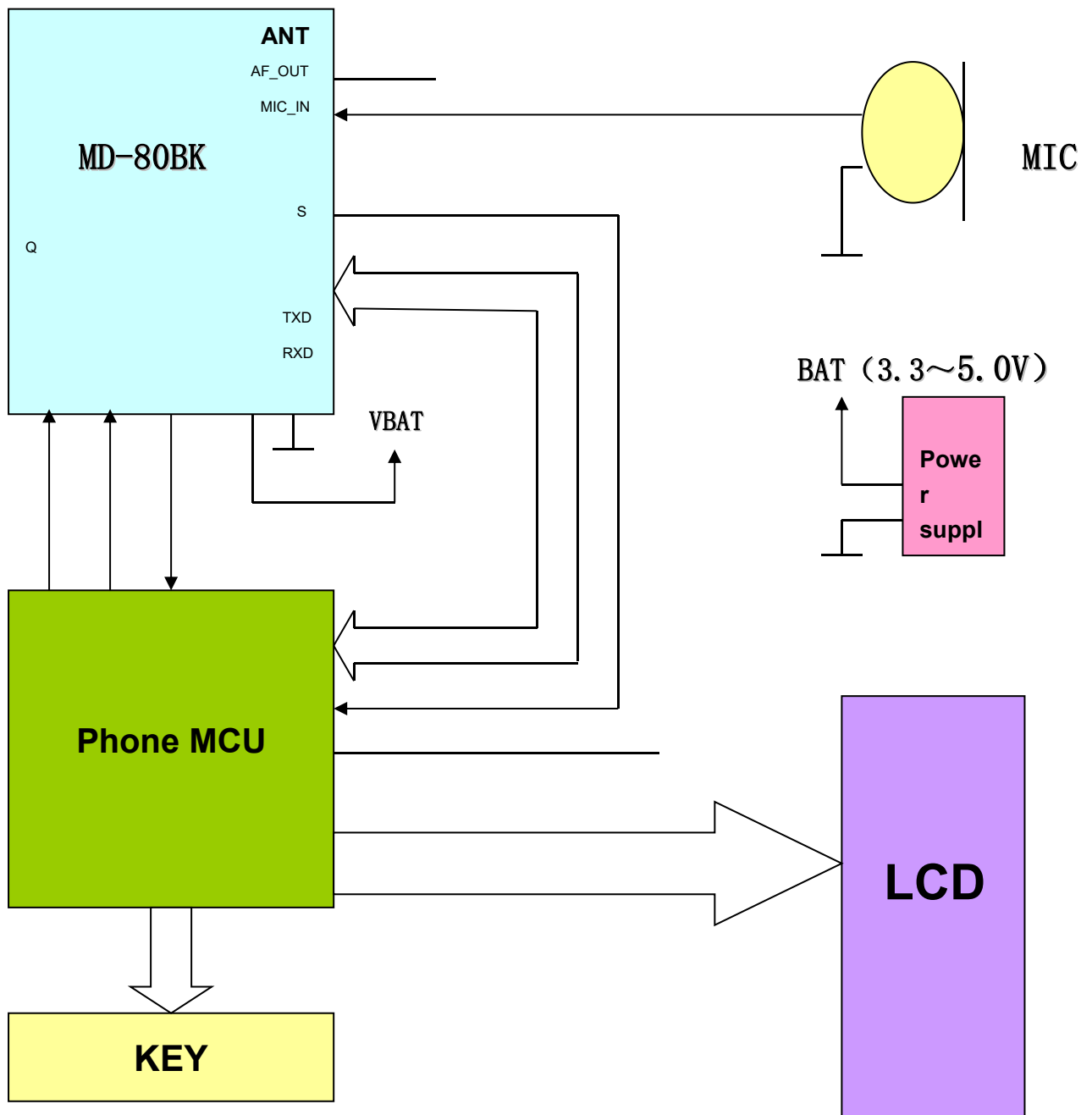


Pins	Number	Function description
SQ	1	Noise silencer, low level enable

VOX_DET	2	Voice control, hands-free call detection, high level enable
AF_OUT	3	audio output
MIC1 (NC)	4	NC
PTT	5	Transmit/receive control pin, 1= receive, 0= transmit
PD	6	Module SLEEP enable pin, 0=SLEEP
H/L	7	RF high and low power control;Ground connected for low power 0.5W, floating for high power 1W.
BAT	8	Power positive
GND	9	GND
GND	10	GND
NC	11	NC
ANT	12	Rf input/output
NC	13	NC
NC	14	NC
NC	15	NC
RXD	16	Asynchronous serial interface (receiving data port)
TXD	17	Asynchronous serial interface (sending data port)
MIC_IN	18	MIC input (audio input)

#### 4. Typical application circuit block diagram:





## 5. technical specification:

- DC electrical parameters (recommended working range)

Symbol	Description	Min	Typical	Max	unit
VBAT	Supply voltage	3.3	3.7	4.2	V

Tamb	environment temperature	-20	27	60	° C
	Power on module initialization time	400	500		ms
	CMOS low level voltage	0		0.6	V
	CMOS high level voltage	2.4		3	V

Notes: VCC = 3V(Interface voltage)

## ● DC electrical parameters (the largest scope of work)

Symbol	Description	Min	Typical	Max	unit
VBAT	Supply voltage	3.3	4.2	5.0	V
Tamb	environment temperature	-30		85	° C
I <sub>IN</sub>	I/O input current <sup>(1)</sup>	-5		5	mA
V <sub>IN</sub>	I/O input voltage <sup>(1)</sup>	-0.3		3.3	V

## ● power consumption indicators

(test condition: VBAT = 4.0V , T<sub>A</sub> = -25 to 85 ° C)

operating mode	Description	Test condition	Typical	unit
continuous reception	Receiver on	The input is 350MHz -47dBm frequency modulation signal	40	mA
continuous transmission	Transmitter on	Input is 1KHz modulated signal, high power: Low power:	650 350	MA MA

Receive static noise standby power-saving mode	The receiver is in standby power-saving working state		15	mA
Deep sleep (PDN is	The receiver/transmitter	Power on process can be completed within 500ms,	0.1	uA

low)	is completely off	switching to continuous receive/transmit mode.		
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● Overall electrical performance specification

frequency range (MHz)	400-470
channel spacing (KHz)	25 / 12.5KHZ
antenna impedance( $\Omega$ )	50
operating temperature range ( $^{\circ}\text{C}$ )	-20~+55
frequency stability (ppm)	$\pm 2.5$

● Receiving characteristics

(Unless otherwise specified, the test conditions are VBAT = 4.0 V, TA = -25 to 85  $^{\circ}\text{C}$ )

Symbol	parameter description	Test condition	Min	Typical	Max	Unit
$f_{IN}$	Rf input frequency range	Intercom frequency band	350		390	MHz
Sensitivity	Reference sensitivity	12dB Output voice message sonar ratio	-120	-122		dBm
	Noise-opening sensitivity	Software adjustable		-120		
	Receiving SNR S/N	1.5 KHz frequency deviation	52	55		
	adjacent channel selectivity	12.5KHz channel interval	52	55		dB
	intermodulation immunity	12.5KHz channel interval	52	55		
	Spurious response suppression	12.5KHz channel interval	52	55		dB
AF OUT	Audio output	Fo=1KHz software		150	150	MV

	amplitude (effective value)	adjustable				
	Audio output distortion	Fo=1KHz		1	3	%
	audio frequency response	300HZ 500HZ 1KHZ 3000HZ		+4.5 +5.5 0 -13		

## ● transmission characteristics

(Unless otherwise specified, the test conditions are VBAT = 4.0 V, T<sub>A</sub> = -25 to 85 ° C)

Symbol	parameter descriptor	Test condition	Min	Typic al	Max	Unit
f <sub>OUT</sub>	Rf output frequency range		400		470	MHz
P <sub>OUT</sub>	Output power H L		800 400	1000 500	1200 600	MW
	Transmit current H L			700 350	750 450	MA
	Maximum modulation frequency offset limit	Narrow band Wide band			2.5 5.0	KHZ KHZ
	Modulation sensitivity	Software adjustable (8 gears)	5	7	12	MV
	Audio modulation distortion			1	3	%
	modulation characteristic	300HZ 500HZ 1000HZ 3000HZ	-5 3	-13 -6 0 6	-9 9	DB DB DB DB



SNR	SNR(Signal to Noise Ratio)		40	42	45	dB
	carrier suppression			-60		dBc
	IM3 suppression			-60		dBc
	Adjacent power	12.5KHz offset		-60		dBc
	Spurious Emission			-36		dBc

## 6. serial communication protocol :

MDHKT-81BK module provides AT instruction interface, through which it is convenient to communicate and control with the module. The AT instruction set provided by this module covers all the queries and control commands for this module. The customer can use the module according to their own requirements. For details, please refer to MDHKT-81BK Serial Communication Protocol.

### Pay Attention:

1, After the module is powered on, if no AT instruction is received, its default working parameters are GBW= 12.5khz, TFV= 450.050mhz.

RFV= 450.050mhz, receiving and transmitting CTCSS=0, SQ=3, torsion off);

2, When the module is in data communication mode, the PTT pin cannot be connected to the low level.