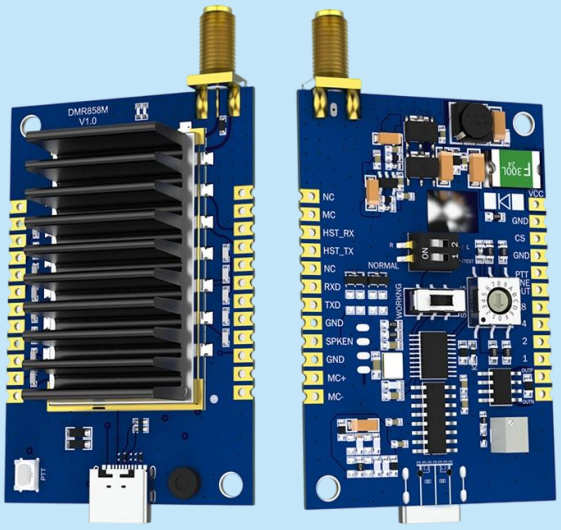
DMR858M

DMR Dual Time Slot Analog-Digital Integrated 5W Walkie-Talkie

- Power supply 8V, RF output power up to 5W
- Built-in 0.5ppm TCXO, frequency stability
- Dual time-slot digital walkie-talkie, with independent transmit and receive frequency settings
- In analog mode,compatible with all analog walkie-talkies on the market

Product Specification



Catalogue

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Note: Revision History

Revision	Date	Comment
V1.0	2025-6	First release
V1.1	2026-5	Update picture
V1.2	2026-7	Update Output Power

1. Description

DMR858M is a cost-effective 5W full-function digital walkie-talkie module developed by our company. It is compatible with analog walkie-talkie commonly used in the market and features the DMR Tier II digital walkie-talkie functionality. The module comes with an integrated Moto AMBE++ vocoder. Inside the module, components such as the microcontroller, digital walkie-talkie chip, RF power amplifier, and audio amplifier are all integrated. Customers only need to connect external components like power supplies and speakers to use it as a small digital walkie-talkie with 16 adjustable frequency channels. The module's ultra-compact size also allows for easy and quick embedding into various handheld devices, enhancing the overall performance of end products.

DMR858M strictly uses lead-free technology for production and testing, complying with RoHS and Reach standards

➢ **The digital intercom supports the following functions in DMR mode:**

- SMS sending function, support pass-through and SMS application;
- Voice encryption function, SMS encryption function;
- Calling and called prompts

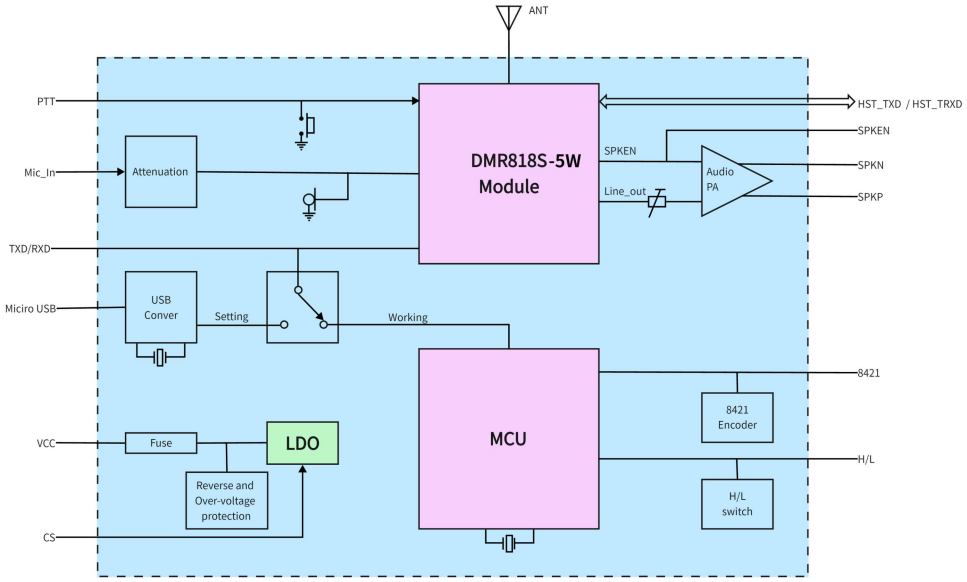
2. Features

- UHF band frequency: 400~470 MHz
  VHF band frequency: 134~174 MHz
  350 band frequency: 320~400 MHz
  (3 frequency bands are optional)
- Distance up to 7-8Km
- High power : 5W, Low power :2W
- High Sensitivity:-120dBm
- Bit error rate down to 5% under -117dBm
- Built-in standard DMR protocol
- DMR /Analog walkie talkie
- Supports SMS sending function
- Supports low power sleep mode
- Dual time-slot walkie-talkie, repeater compatible
- Tail sound elimination automatically
- Highly integrated, cost-effective
- Compact design, easy to embed

3. Application



4. Block Diagram

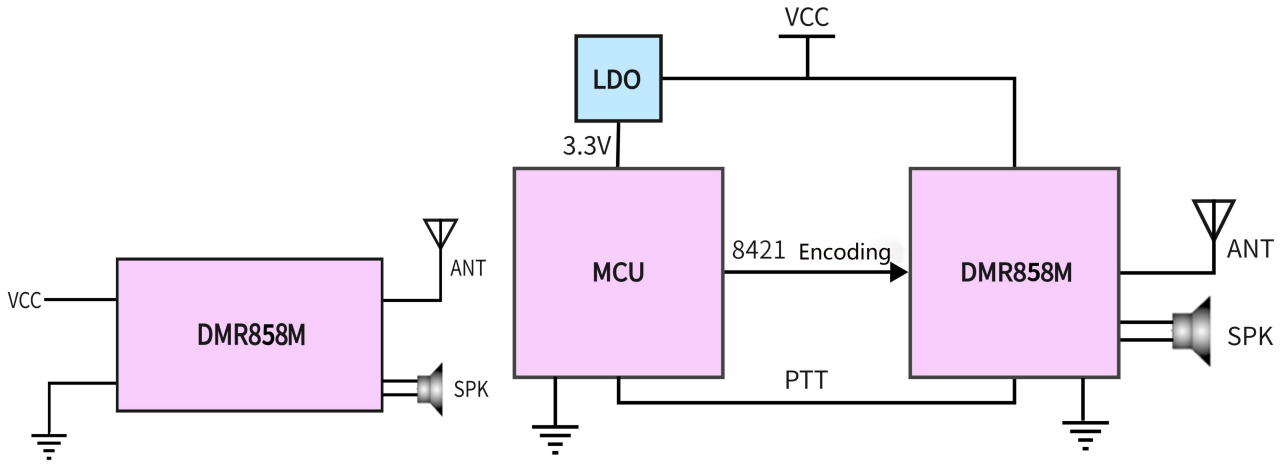


DMR858M

5. Voltage and Power Comparison Table (Digital Mode)

Operating Voltage (V)	Output Power (dBm)	Operating Current (mA)
3.7	27	468
4.0	31.7	580
4.5	32.8	654
5.0	33.5	675
5.5	34.2	714
6.0	35.0	752
6.5	35.7	793
7.0	36.2	830
7.5	36.8	870
8.0	37.3	910
8.5	37.7	970

6. Typical Schematic Circuit

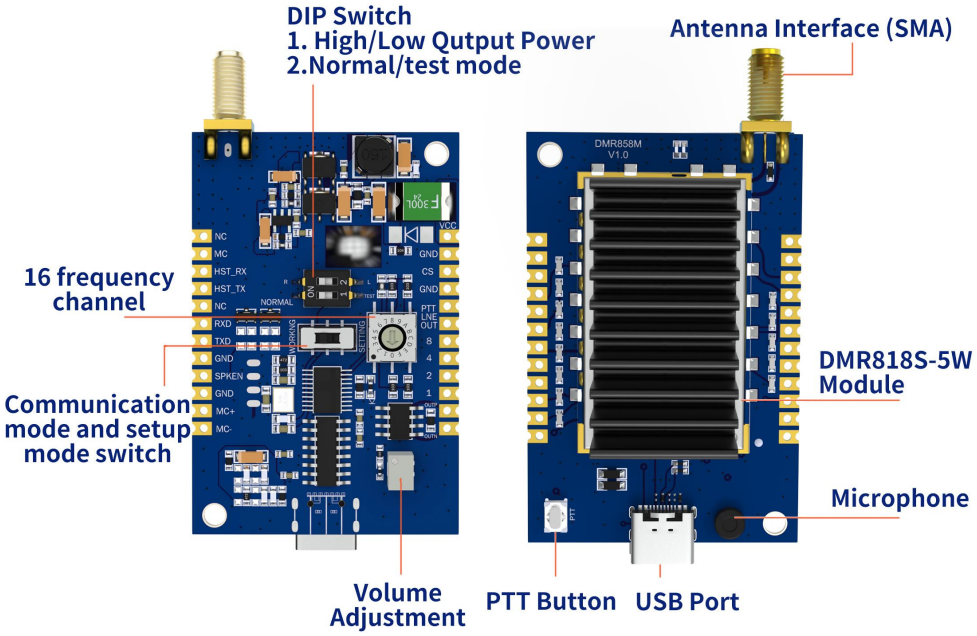


7. Electrical Characteristics

Parameters	Test condition	Min.	Typ.	Max.	Unit.
Voltage range		3.7	8.0	8.5	V
Operating Temperature		-20	25	60	℃
Frequency range	@UHF	400		470	MHz
	@VHF	134		174	MHz
	@350	320		400	MHz
Output Power	@High Power,430MHz	36	36.5	37.5	dBm
	@Low Power,430MHz	32	33	34.5	dBm
Uart baud rate			57600		bps
Current Consumption					
Sleep current	@CS pulled low for 3 seconds		< 0.1		mA
Rx current			< 165		mA
Tx current （high power）	@VCC=8V,5W		900		mA
Tx current （high power）	@VCC=8V,5W		1700		mA
Tx current （low power）	@VCC=8V,2W		640		mA
Tx current （low power）	@VCC=8V,2W		1000		mA
Sensitivity and Audio					
Rx sensitivity (Analog)	@12dB SINAD		-120		dBm
Receiving BER(DMR modulation)	@ -117dBm		5		%
Receiving S/N	1.5K Frequency Deviation		40		dB
Adjacent Channel Selectivity	12.5KHz Channel Spacing		62		dB
Intermodulation Immunity	12.5KHzChannel Spacing		63		dB
Blocking Immunity	Interference Frequency Interval > 1M		88		dB
Audio Output Amplitude (Lineout)	F0=1KHz	0.2	130	460	mV
Audio Output Impedance (SPK)			8		Ohm
Audio Distortion	F0=1KHz			5	%
Audio Response	300Hz		+8		dB
	500Hz		+6		
	1KHz		0		
	2KHz		-6		
	3KHz		-12		
Digital Receiving					
Receiving BER(DMR modulation)	@ -117dBm		4		%
Adjacent Channel Selectivity (ACS)	Offset:+12.5kHz	60			dB
	Offset:-12.5kHz				

Intermodulation	Offset:+50/100kHz	63			dB
	Offset:-50/100kHz				
Blocking	Offset:+/-1MHz	87			dB
	Offset:+/-5MHz				
Analog Transmission					
Max Modulation Deviation	12.5KHz Frequency Deviation（N）		2.2	2.5	KHz
	25KHz Frequency Deviation（W）		4.5	5.0	KHz
Modulation Sensitivity	1.5KHz/2.5KHz Frequency Deviation	4	7	10	mV
Audio Modulation Distortion	1.5KHz/2.5KHz Frequency Deviation		1	5	%
Modulation Characteristics	300Hz	-13	-11	-9	dB
	500Hz	-9	-6	-5	dB
	1KHz	-3	0	1	dB
	2KHz	3	6	7	dB
	3KHz	3	7	11	dB
CTCSS modulation frequency offset		350	400	600	Hz
Receiving SNR	1.5kHz/2.5kHz Frequency (N/W)	38	40	50	dB
Digital Emission					
Frequency Error			0.5		ppm
4FSK Transmission BER				≤1×10-4	
Adjacent Channel Power (dB)	+/-25kHz			≤-68	dB

8. Interface specification



9. Functions descriptions

DMR858M has default 16 channels, CH0~CH7 in DMR mode, CH8~CHF in analog mode. All the rapameters can be configured by serial instructions.

1) Parameter configuration

DMR858M Module offers standard serial port, users can configure and read the related parameters by sending serial instructions. Module has built-in memory, all configured parameters can be saved even power off. Meanwhile, we offer PC software to customers free of charge. DMR858M can be connected with computer via USB cable or UART interface, in this way, users can configure the parameters on PC software or their own device. The connection as shown in the figure below:

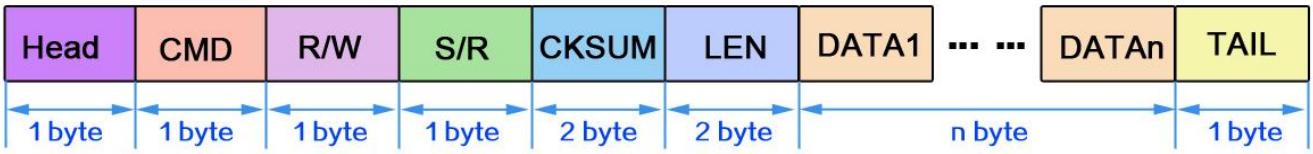


2) Brief of Serial Communication Protocol

All the parameters of DMR858M can be configured using Serial Communication Protocol.

MSB for the command.

Format as below：



The definition of protocol as below：

Offset	Flag	Length	Comment	Detail
0	Head	1	Packet header	0x68

1	CMD	1	command	0x01~0x28：parameter function refer to table 1
2	R/W	1	Read /write operation	0x00：reading ； 0x01：writing ； (external CPU TX is writing，external CPU RX is reading) 0x02：initiative sending
3	S/R	1	Setting/Responding	setting： 0x01：start answering： 0x00 Done 0x01 busy or fail（**note 2**） 0x02 No channel or channel errors （**note 3**） 0x07 module killed 0x09 check error note：message, voice refer to below corresponding specification
4、5	CKSUM	2	Checksum	Checksum for all the packet
6、7	LEN	2	Data length	DATA length，no information， LEN is 0
8	DATA	len	Data info	
	TAIL	1	Tail of packet	0x10

Note 1：CMD as below：

CMD	Function	Message available for All channels or current channel	Message save when Power off (yes / no)
0x01	Channel change		**yes**
0x02	Receive volume	**All**	**yes**
0x03	scanning	current channel	no
0x04	Transceiver status checking	current channel	no
0x05	Signal strength value	current channel	no
0x06	Various call modes（Call Type）	current channel	no
0x07	Message mode setting and transmit	current channel	no
0x09	Emergency alarm	current channel	no
0x0a	Enhancements	current channel	no
0x0b	Mic Gain configuration	**All**	**yes**
0x0c	Power-saving mode configuration	**All**	**yes**
0x0d	Transceiver frequency	current channel	**yes**
0x0e	Repeater/off-web	current channel	no
0x10	Receive/call type, number output	current channel	no
0x11	Read received data	current channel	no
0x12	SQ setting	current channel	**yes**

0x13	Mode of CTCSS/CDCSS	current channel	**yes**
0x14	CTCSS/CDCSS	current channel	**yes**
0x15	Monitor switch	current channel	no
0x16	Bit Error rates		no
0x17	High/low power	current channel	**yes**
0x18	Contact person	current channel	no
0x19	Encryption switch	current channel	no
0x1a	Completed initialization		no
0x22	Transmit contacts information	current channel	no
0x23	Testing message	current channel	no
0x24	ID reading	**all**	no
0x25	Firmware Version reading	**all**	no
0x26	Check contacts list	**all**	no
0x27	Checking scan status	current channel	no
0x28	Checking encryption status	current channel	no

Note 2: When module is transmitting, receiving, and configuring, it will show 0x01 to tell setting fail for busy.

Note 3: It show 0x02 for below condition:

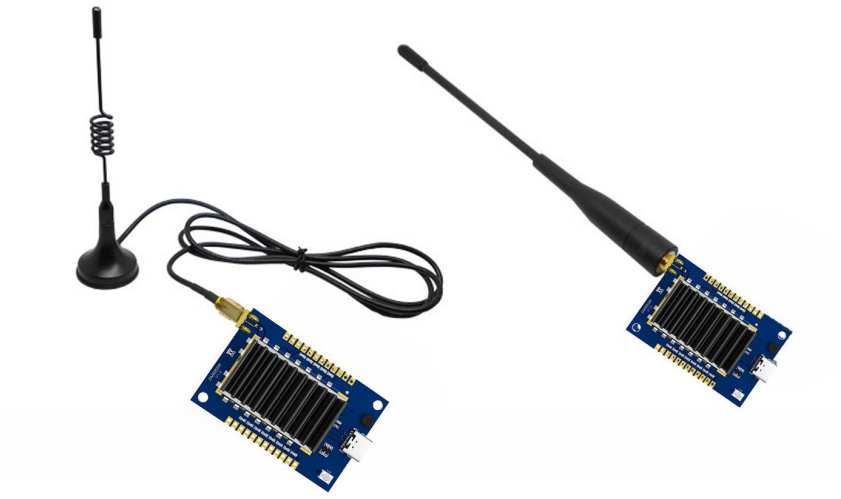
3.1: When change to non-exist channel;

3.2: It all happen when configure DMR settings in analogy channel(such as: message, special functions) ,

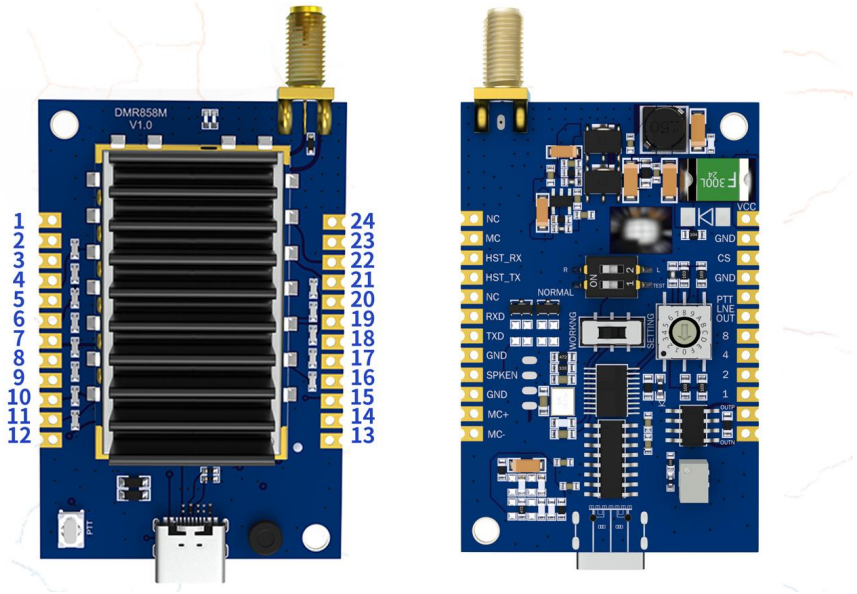
3.3 : Configure analog parameters in DMR channel.

10. Accessories

The antenna is very important for RF communication，Its performance will affect the Communication, The module requires the antenna with 50Ω impedance. Universal antennas are Rod antenna， sucker antenna and telescopic antenna, User can choose the right antenna according to their application. We advise to use antennas listed on our website to get better performance.



11. Pin Assignment



Pin NO.	Pin name	Description
1	VCC	Positive supply
2,4	GND	Ground
3	CS	Module sleep enable pin, "0" for sleep mode, "1" for active mode
5	PTT	Transmit/receive control pin, "0" for transmit mode, "1" for receive mode, default is receive mode
6	LINE_OUT	Audio output
7	8	16 Channels, Code 8421, 8th，default output “1”
8	4	16 Channels, Code 8421, 4th，default output “1”
9	2	16 Channels, Code 8421, 2nd，default output “1”
10	1	16 Channels, Code 8421, 1st，default output “1”
11	OUTP	Audio output, connect to speaker 8Ω 2W and 4Ω 5W
12	OUTN	Audio output, connect to speaker 8Ω 2W and 4Ω 5W
13	MIC-	Negative terminal of the external microphone
14	MIC+	Positive terminal of the external microphone (internal bias provided, no additional power supply required)
16	SPKEN	Receive indicator pin, normally low, turns high when a signal is received
18	TXD	Serial data transmission port
19	RXD	Serial data transmission port
20,23,24	NC	
21	HST_TX	Serial data transmission pin (used for firmware upgrade)
22	HST_RX	Serial data receive pin (used for firmware upgrade)

12. Mechanism Dimension(Unit:mm)

