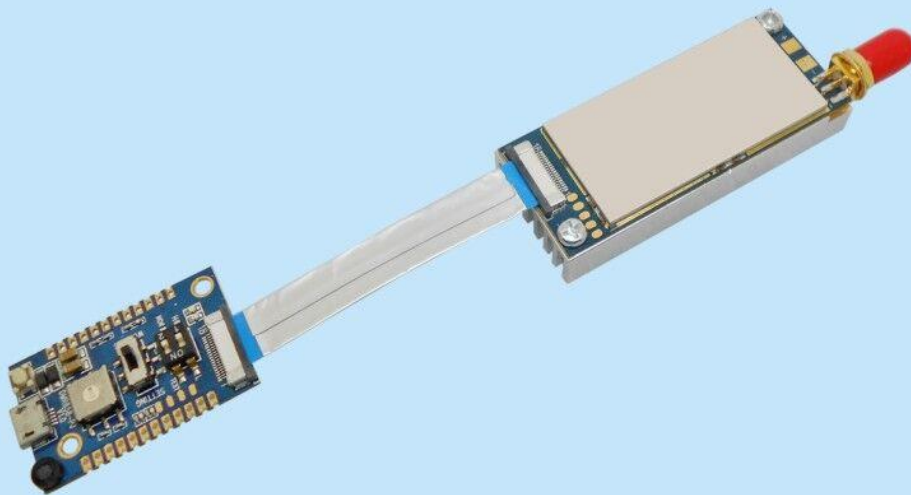


5W all-in-one DMR walkie talkie module

Product Specification



Catalogue

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Note: Revision History

Revision	Date	Comment
V1. 0	2017-11	First release
V1. 1	2018-9	Modify DMR858-PJ board PIN

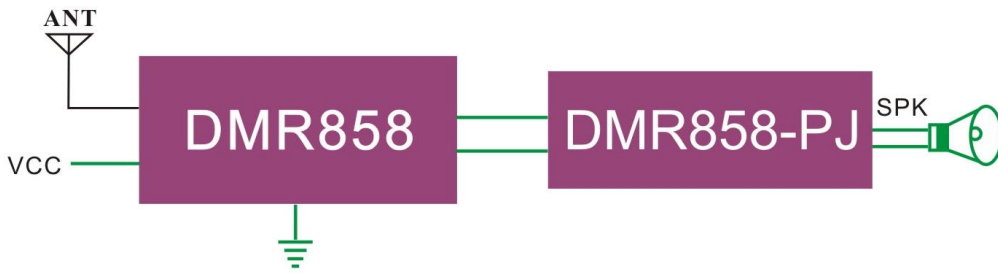
1. Brief Description

DMR858 is an ALL-IN-ONE DMR 5W professional walkie talkie. It combined analog and DMR walkie talkie function, and compatible with the walkie talkie in the market. DSP processor , DMR encoder/decoder, RF / Audio Amplifier , PTT, Microphone, 16 Channel switch, Volume adjustment all on board. Connected with power supply and speaker, it build a 5W professional DMR walkie talkie. This product has very good voice quality and very good range. Also special heat sinks are designed specially to guarantee long time talking without any problems.

2. Product feature

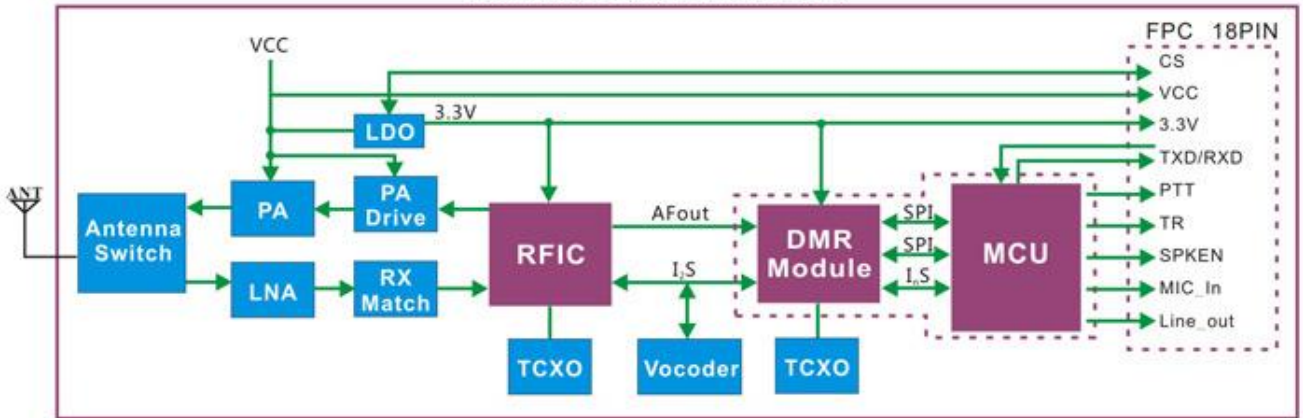
- UHF band frequency: 400~470 MHz
- VHF band frequency: 134~174MHz
- 350 band frequency: 320-400MHz
- (3 frequency bands are optional)
- Voice encoder: NVOC
- AMBE++(MOTO compatible)
- (2 voice encoders are optional)
- 7 Km in open area
- Output power up to 5W
- Sensitivity up to: -124dBm
- Less than 1% BER @ -121dBm
- TX/RX frequency set separately
- Bandwidth for analogy:12.5 / 25 KHz
- Bandwidth for DMR:6.25KHz
- Combined DMR / Analog walkie talkie
- Support IP confirmed/unconfirmed
- SMS. Provide pre-save SMS
- 1ppm TCXO Crystal
- CTCSS: 51 levels
- CDCSS: 166 levels
- Digital volume :9 class
- Analog volume : continuous (stepless)
- Encryption for SMS and voice
- Support various voice calling types:
 - Broadcast, group call and private call
- Reminder for input calling, calling status checking
- Support enhanced function such as
 - emergency alarm and radio monitor
- Support Frequency scan
- Support Radio kill and activate
- RSSI value read out
- Provide PC software to configure
- EEPROM inside, parameters stored even powered off

3. Typ. Circuit

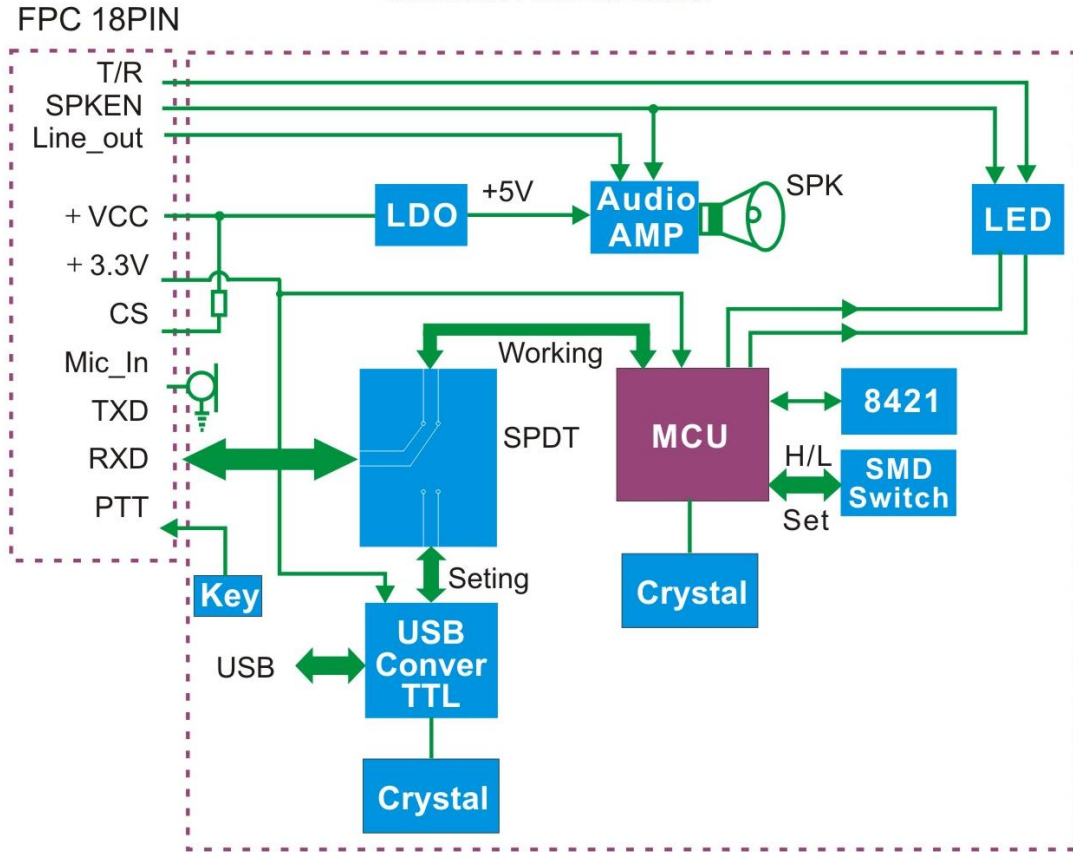


4. Block Diagram

DMR858 Functional Board



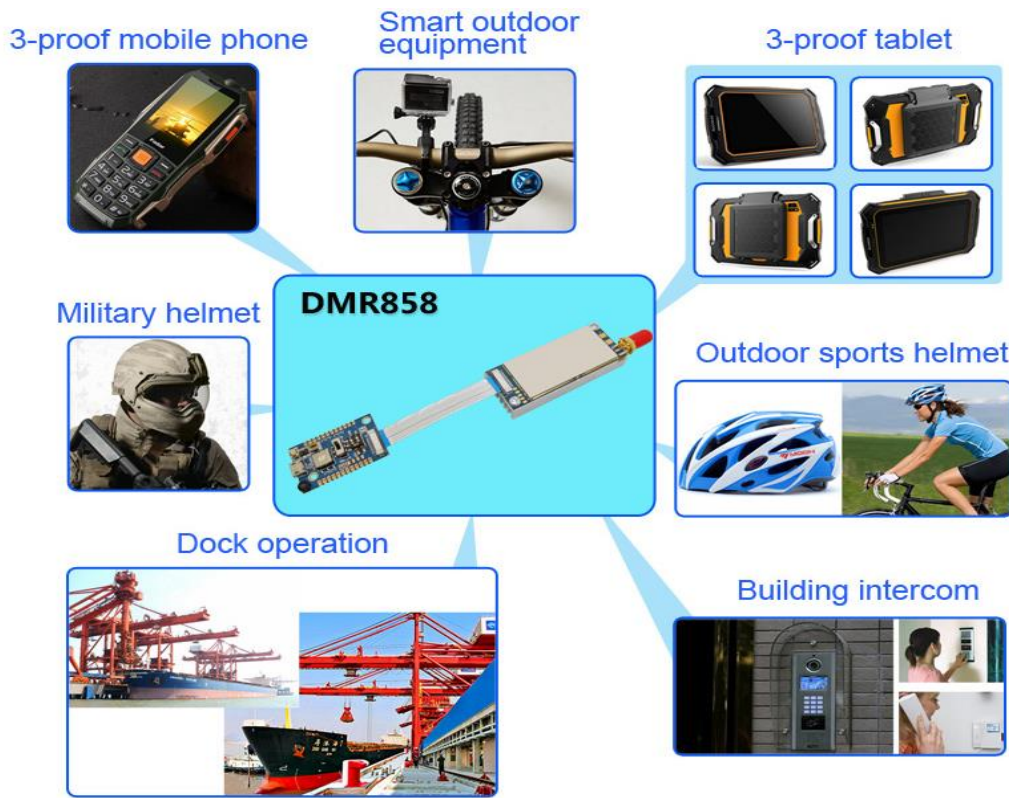
DMR858 Control board



5. Electrical Characters

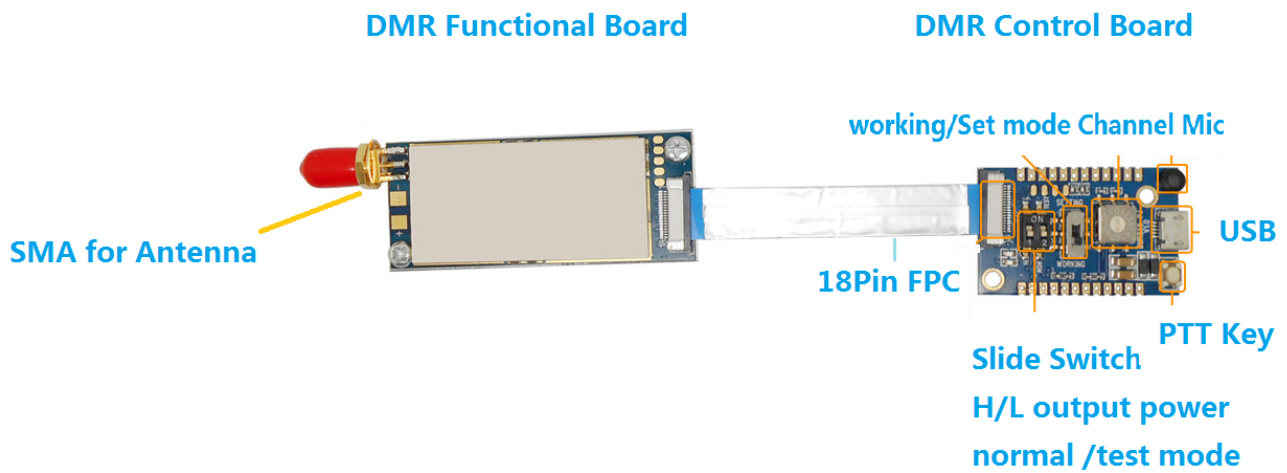
Parameters	condition	Min	Typ	Max	Unit
Power Supply		3.3	8	9.0	V
Working temperature		-30	25	70	°C
Frequency Range	@UHF	400		480	MHz
	@VHF	134		174	MHz
	@350	320		400	MHz
Serial baud rate			57600		bps
Current Consumption					
Sleep current			<50		uA
RX Current	@VCC=8.0V		< 100		mA
TX current	@VCC=8.0V,5W		< 1.6		A
	@VCC=8.0V,3W		<1.1		A
	@VCC=4.0V, 1.8W		< 1000		mA
	@VCC=4.0V,1W		< 750		mA
TX Power	@high power, 4v		1.6		W
	@low power,4v		1.0		W
	@high power, 8v	4	5	5.5	W
	@Low power, 8v	2	3	3.5	W
Mic input voltage			0.1	1.6	Vpp
Other Parameters					
RX Sensitivity			-124		dBm
BER @DMR mode	@ -121dBm		1		%
Speaker		2W & 8 ohm			

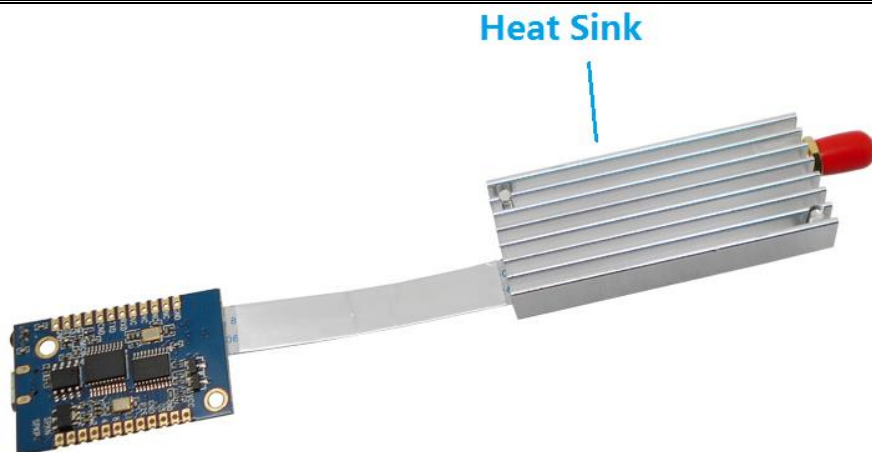
6. Typical Application



7. Pin Description

- DMR858 include 3 parts:
 - DMR858 Functional board
 - DMR858PJ control board
 - DMR858 heat sinks.
 - Connected with power supply and speaker, it can be a professional long range DMR walkie talkie.
- All the 3 parts will be connected together before shipping.



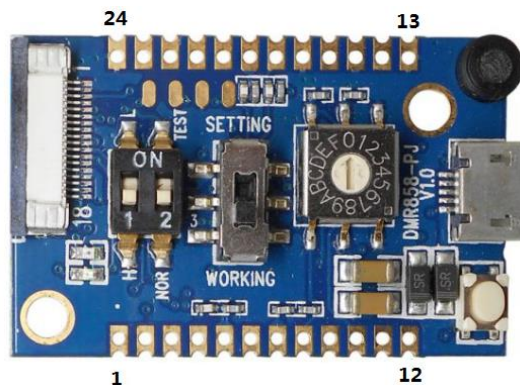


➤ DMR858 Functional Board Pin Assignment



Pin No	Definition	Description
1, 2, 4	GND	Ground
3	MIC_IN	Microphone input
5	UART-RX	Connected with UART-TX of external device
6	UART-TX	Connected with UART-RX of external device
7, 13	GND	Ground
8	CS	Sleep: 0 ; working: 1 (default when leave open)
9	PTT	TX: 0, RX: 1 (Default)
10	LINE_OUT	Line out for voice
11	T/R	TX/RX indicator, 1: TX , 0: RX
12	SPKEN	External Voice amplifier on/off, 1: on, 0:off
14, 15	+3.3 V	3.3V output, maximum 50mA loading
16,17,18,19	VCC	VCC (3.3V-9V)
20	GND	Ground

➤ DMR858-PJ (Control Board) Pin Assignment



Pin No.	Definition	Description
1	VCC	VDD (connected to Pin 19 of function board)
2,4	GND	Ground
3	CS	Connect to CS of the function board
5	PTT	Connect to PTT of the function board
6	LINE_OUT	Connect to Line Out of the function board
7	8	Frequency channel indicator,(16 channel selected) 8 :the maximum bit, 4: the 3rd bit, 2: the 2nd bit; 1: the least bit for example : 8421 encoding: 0000: channel 0, 0001: channel 1 0010: channel 2 0011 :channel 3 ... 1111 : channel 15
8	4	
9	2	
10	1	
11	SPKN	
12	SPKP	Connected with Speaker: 8 Ohm 2W
13,15,17	GND	Ground
14	SET	Setting mode (0: setting mode , 1: normal mode)
16	MIC_IN	Connect to Mic_IN of the function board
18	TXD	Connect to TXD/RXD of the function board
19	RXD	
20	+3.3V	3.3V output, can drive 50mA
21	SPKEN	Audio amplifier control
22	NC	NC
23	H/L	Output power control,connect to GND is low power
24	GND	Ground

8. Function Description

16 default channels are set before shipping. Channel 0 -7 for DMR channel, channel 8-15 are analog Walkie Talkie. A rotary switch is used to change the channels. And Pin7 - 10 output the channel status.

1) Parameters setting

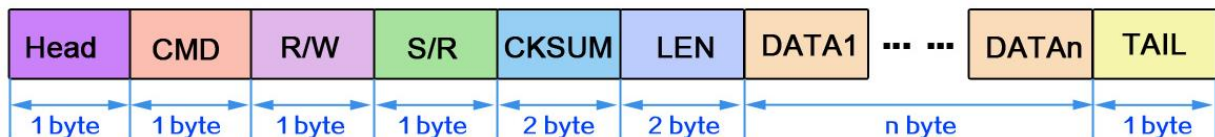
Both Standard mini-USB interface and serial UART interface are used to configure the parameter. Either of them can be used. And we provide PC software which is easy to use to configure all the necessary parameters. Below is the typical connection diagram.

2) Serial Communication Protocol

All the parameters of DMR818 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.

9. Dimension (Unit: mm)

