

ACI108 Module Specification

ACI108-A40-(08)

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璋忠科技: +886-2-2658-9129 <http://www.avantcom.tw>

奇翰电子: +86-755-82793559 <http://www.avantcom.cn>

General Description

The ACI108-A40-08 module is designed for low cost 433MHz ISM band wireless applications using AVANTCOM ACI108 FSK transceiver. This module features a fully programmable frequency synthesizer by SPI. The maximum data rate is 250kbps.

Electrical Specification

Item	Specification	Remark
Supply voltage	2.0V~3.6V	
Current consumption	0.2uA @Deep Sleep mode 2.0uA @Sleep mode 0.25mA @Idle mode 1.5mA @Stand-by mode 8.5mA @PLL mode 14.5mA @Rx mode(AGC ON) 16mA @Tx mode (-12dBm,TBG=0, TDC=0, PAC=0) 20mA @Tx mode (1dBm,TBG=1, TDC=0, PAC=0) 22mA @Tx mode (5dBm,TBG=2, TDC=0, PAC=0) 30mA @Tx mode (10dBm,TBG=3, TDC=0, PAC=0) 39mA @Tx mode (13dBm,TBG=4, TDC=0, PAC=0) 48mA @Tx mode (15dBm,TBG=5, TDC=0, PAC=0) 55mA @Tx mode (16dBm,TBG=6, TDC=0, PAC=0) 70mA @Tx mode (17dBm,TBG=7, TDC=2, PAC=1) 78mA @Tx mode (17.5dBm,TBG=7, TDC=3, PAC=3)	Typical +3.3V, 25°C *1
Frequency	433.92 MHz	ISM band
Transmit output power	17.5 dBm (TBG=7, TDC=2, PAC=1) 13.5 dBm (Pass CE)	Typical, +3.3V, 25°C *1
Rx sensitivity	-117 dBm @ 2 Kbps mode, Dev = 8 KHz, IFBW=50KHz -114 dBm @ 2 Kbps mode, Dev = 8 KHz, IFBW=100KHz -114 dBm @ 10 Kbps mode, Dev = 18.75 KHz, IFBW=50KHz -112 dBm @ 10 Kbps mode, Dev = 37.5 KHz, IFBW=100KHz -110 dBm @ 50 Kbps mode, Dev = 18.75 KHz, IFBW=50KHz -107 dBm @ 100 Kbps mode, Dev = 37.5 KHz, IFBW=100KHz -106 dBm @ 150 Kbps mode, Dev = 56.25 KHz, IFBW=150KHz -103 dBm @ 250 Kbps mode, Dev = 93.75 KHz, IFBW=250KHz	BER _≤ 1E-3 +3.3V, 25°C *2
Modulation	FSK	
Interface	10 pin 2.0mm header	
Dimension	31.6mm(L) x 28.7mm(W) x 0.8mm(H)	Not including Connector
Operating temperature	-40 ~ 85 °C	

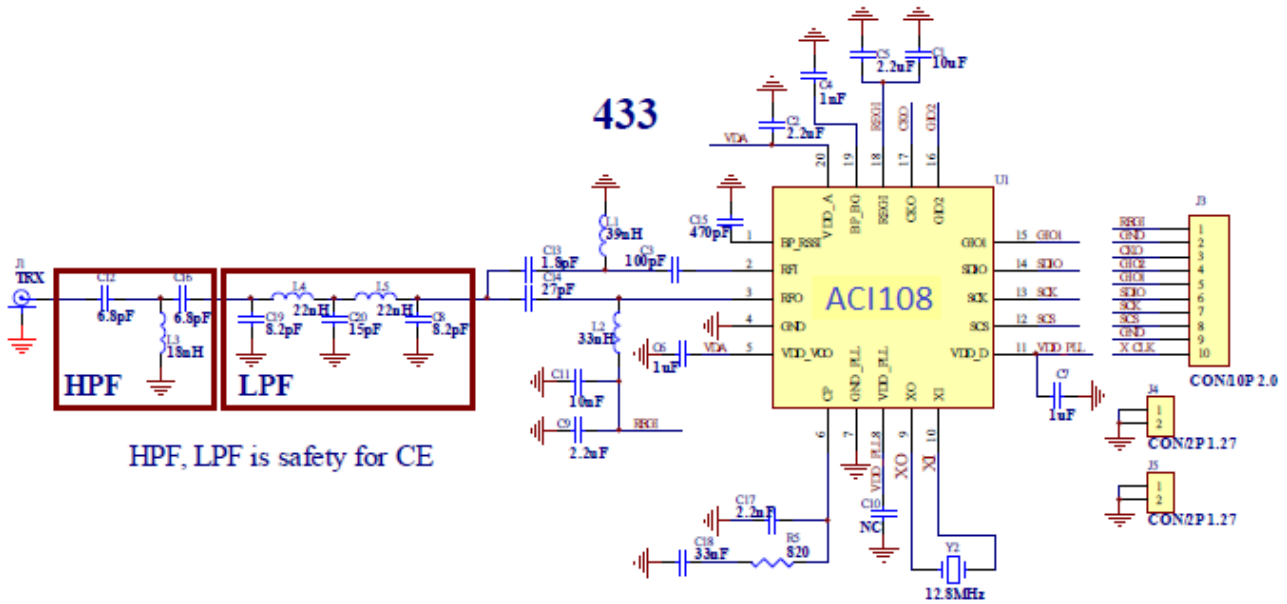
Annotation:

1. To pass CE, the setting of TBG, TDC, PAC maybe changed with different antenna.
2. For 250Kbps data rate mode, customers should use 16MHz X'tal. Please refer to ACI108 data sheet for detail.

Interface

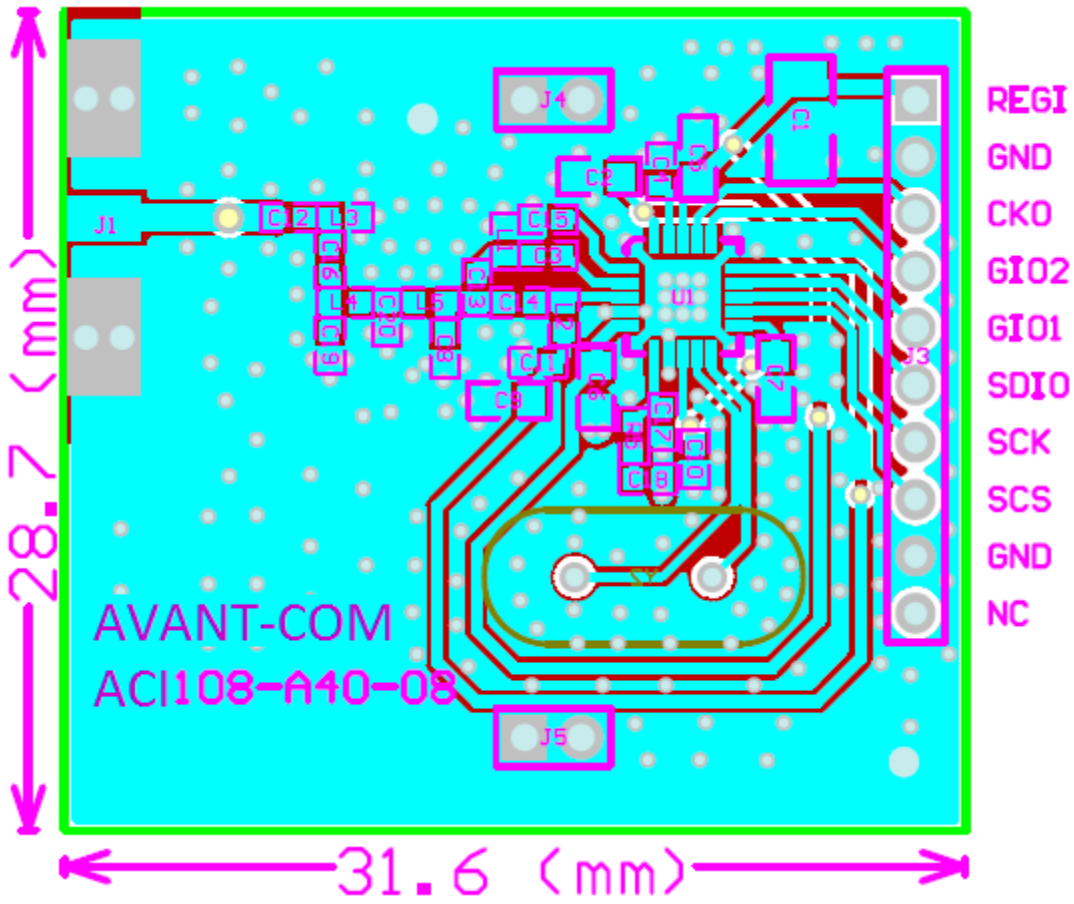
Pin No.	Symbol	Function Description	Remark
1	REGI	3.3V supply voltage input pin.	+3.3V
2	GND	Ground	
3	CKO	Multi-function clock output.	
4	GIO2	Multi-function IO 2 / SPI data output.	
5	GIO1	Multi-function IO 1 / SPI data output.	
6	SDIO	SPI Data I/O	
7	SCK	SPI Clock	
8	SCS	SPI Chip Selection	
9	GND	Ground	
10	NC	No connection	

Application Circuit



The back plate of the IC should connect to GND

Module dimension drawing (Top view)



Bill of Material for MD7102C-A40 (433MHz)

Item	Comp.	Description	Size	Value	Tol.	Part Number	Remark
1	C1	X5R ceramic capacitor	1206	10uF	±10%	GRM31CR61A106K	
2	C2	X5R ceramic capacitor	0603	2.2uF	±10%	GRM188R61C225K	
3	C3	C0G ceramic capacitor	0402	100pF	±5%	GRM1555C1H101J	RF matching circuit
4	C4	C0G ceramic capacitor	0402	1nF	±5%	GRM1555C1H102J	
5	C5	X5R ceramic capacitor	0603	2.2uF	±10%	GRM188R61C225K	
6	C6	X5R ceramic capacitor	0603	1uF	±10%	GRM188R61C105K	
7	C7	X5R ceramic capacitor	0603	1uF	±10%	GRM188R61C105K	
8	C8	C0G ceramic capacitor	0402	8.2pF	±0.25pF	GRM1555C1H8R2D	LPF
9	C9	X5R ceramic capacitor	0603	2.2uF	±10%	GRM188R61C225K	
10	C11	X7R ceramic capacitor	0402	10n F	±10%	GRM155R71C103K	
11	C12	C0G ceramic capacitor	0402	6.8pF	±0.25pF	GRM1555C1H6R8D	HPF
12	C13	C0G ceramic capacitor	0402	1.8pF	±0.25pF	GRM1555C1H1R8C	RF matching circuit
13	C14	C0G ceramic capacitor	0402	27pF	±5%	GRM1555C1H270J	RF matching circuit
14	C15	C0G ceramic capacitor	0402	470pF	±5%	GRM1555C1H471J	
15	C16	C0G ceramic capacitor	0402	6.8pF	±0.25pF	GRM1555C1H6R8D	HPF
16	C17	X7R ceramic capacitor	0402	2.2nF	±10%	GRM155R71H222K	PLL Loop Filter
17	C18	X7R ceramic capacitor	0402	33n F	±10%	GRM155R71C333K	PLL Loop Filter
18	C19	C0G ceramic capacitor	0402	8.2pF	±0.25pF	GRM1555C1H8R2D	LPF
19	C20	C0G ceramic capacitor	0402	15pF	±5%	GRM1555C1H150J	LPF
20	R5	Chip resistor	0402	820R	5%		PLL Loop Filter
21	L1	Chip inductor	0402	39nH	±5%	LQG15HS39NJ02	RF matching circuit
22	L2	Chip inductor	0402	33nH	±5%	LQG15HS33NJ02	RF matching circuit
23	L3	Chip inductor	0402	18nH	±5%	LQG15HS18NJ02	HPF
21	L4	Chip resistor	0402	22nH	5%	LQG15HS22NJ02	LPF
25	L5	Chip resistor	0402	22nH	5%	LQG15HS22NJ02	LPF
26	U1	TRx IC	QFN 20 (4*4)	A7108		AVANTCOM	
27	Y1	Crystal	US49	12.8MHz	±20ppm	YOKE	Cload = 20pF ²

Annotation:

1. C10 is NC.
2. About the spec. of X'tal, please see ACI108 Datasheet for detail.

瑋忠科技股份有限公司 / 台灣



瑋忠科技股份有限公司

Avant-Com.Inc

Tel: +886-2-2658-9129(Rep)

Fax: +886-2-2658-9738 / +886-2-2658-9739

10F-1, No.301, Sec. 2, Tiding Blvd., Neihu Dist.,
Taipei City 11493, Taiwan(R. O. C.)

地址:臺北市內湖區提頂大道二段301號10F-1

郵遞區號:11493

E-mail : service@avantcom.com.tw

奇翰電子有限公司 · 香港奇翰科技有限公司 / 深圳市



深圳奇翰電子有限公司 Avant-Com (Shenzhen) , Ltd.

香港奇翰科技有限公司 Avant-Com , Ltd.

Tel: +86-755-82793556

Fax: +86-755-82793553

地址:中國廣東省深圳市南山區南頭街98號南頭大廈9A(南頭街道辦事處樓上)