

# **AMOD**

## **ACM8060 Quad band GSM/GPRS Module**

### **Product Data Sheet**

**<V1.401>**

AMOD Technology Co.,LTD

Subject to changes in technology, design and availability

URL: <http://www.amod.com.tw>

Add. 8F., No. 46, Lane 10, Jihu Road, Neihu, Taipei 11492, Taiwan, R.O.C.

Tel. +886-2-2657-8811; Fax +886-2-2657-9090; Email [sales@amod.com.tw](mailto:sales@amod.com.tw)

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## FCC Statement

- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Maximum antenna gain allowed for use with this device is **1.57** dBi.

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the

Our module is for OEM integrations only. The end-user product will be professionally installed in such a manner that only the authorized antennas are used.

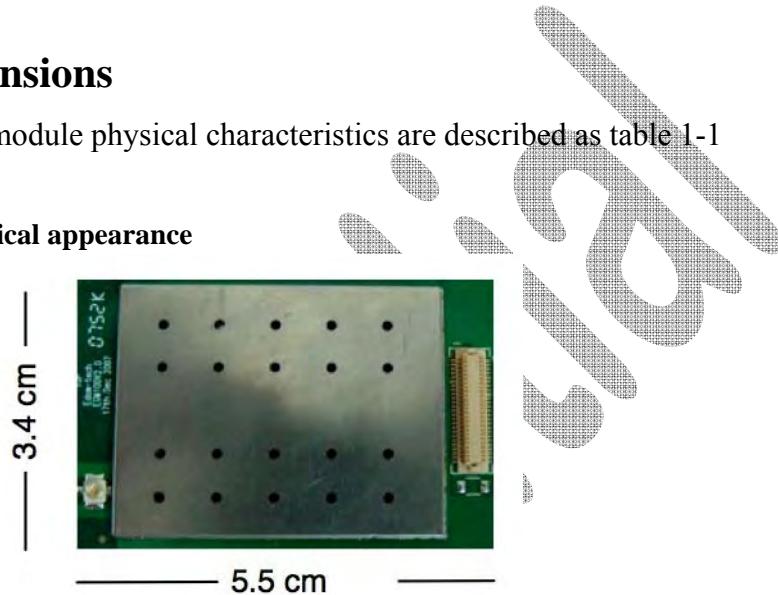
AMOD ACM8060 module is a quad band GSM/GPRS communication module. It supports standard AT command and enhanced AT command which provide rich voice and data communication functions. It's an ideal solution for various communication applications. ACM8060 supports PPP protocol which allows users to transmit data with PPP protocol.

## Product Introduction

### 1.1. Physical Dimensions

ACM8060 wireless module physical characteristics are described as table 1-1 and figure 1-1.

**Figure 0-1 ACM8060 physical appearance**



**Table 0-1 Product physical characteristics**

Physical Characteristics	
Weight	12g
Dimension (Length x Width x Height)	52mmx34mmx3.3mm (Including the shielding can)

### 1.2. Product Functions

ACM8060 functions are listed as table 1-2

**Table 0-2 ACM8060 function list**

Product features	Descriptions
Frequency	GSM 850/ GSM900/GSM1800 /GSM1900 Quard Band
Maximum RF Power	GSM850/EGSM900/GT800 Class4(2W) GSM1800 GSM 1900 Class1(1W)
Receiving Sensitivity	<-106dBm
Working Temperature	-30°C~+85°C
Power Voltage	3.4V~4.5V ( 4.0V is recommended )
Average STB current	<3mA (Standby mode)
Leaking voltage	<0.1mA
Protocol	Support GSM/GPRS Phase2/2+

Product features	Descriptions
AT COMMAND	GSM Standard AT COMMAND
	V.25 AT COMMAND
	AMOD defined AT COMMAND
50PIN B2B Connector	UART Interface ( Maximum I/O speed: 115200bit/s )
SIM interface	Standard SIM interface ( 3V/1.8V )
Audio interface	2 Analogue audio Input/Output interfaces
Power interface	Power interface
GSC RF Connector	50Ω (MALE) RF Antenna Connector
Voice Communication	Support FR, EFR, HR and AMR voice codec
	Support hands free operation and echo exhibition.
SMS	Support MO and MT
	Support Point-to-Point Short Message Cell Broadcast
	Support TEXT and PDU mode
GPRS Data transmission	GPRS CLASS 10
	Coding scheme CS 1, CS 2, CS 3, CS 4
	Maximum transmission speed: 85.6Kbit/s <sup>1</sup>
	Support PBCCH
	Built-in TCP/IP protocol. Support multi-slot, ACK response, support large memory buffer.
CSD Service	Support CSD data transmission up to 9600bit/s
	Fax support: Group3 , Class1.0
	Support USSD
Supplemental service	Caller ID, Call transfer.
Group Service	Support group call, broadcast, Group call service & broadcast service
STK <sup>2</sup>	Support STK through enhanced AMOD AT COMMAND

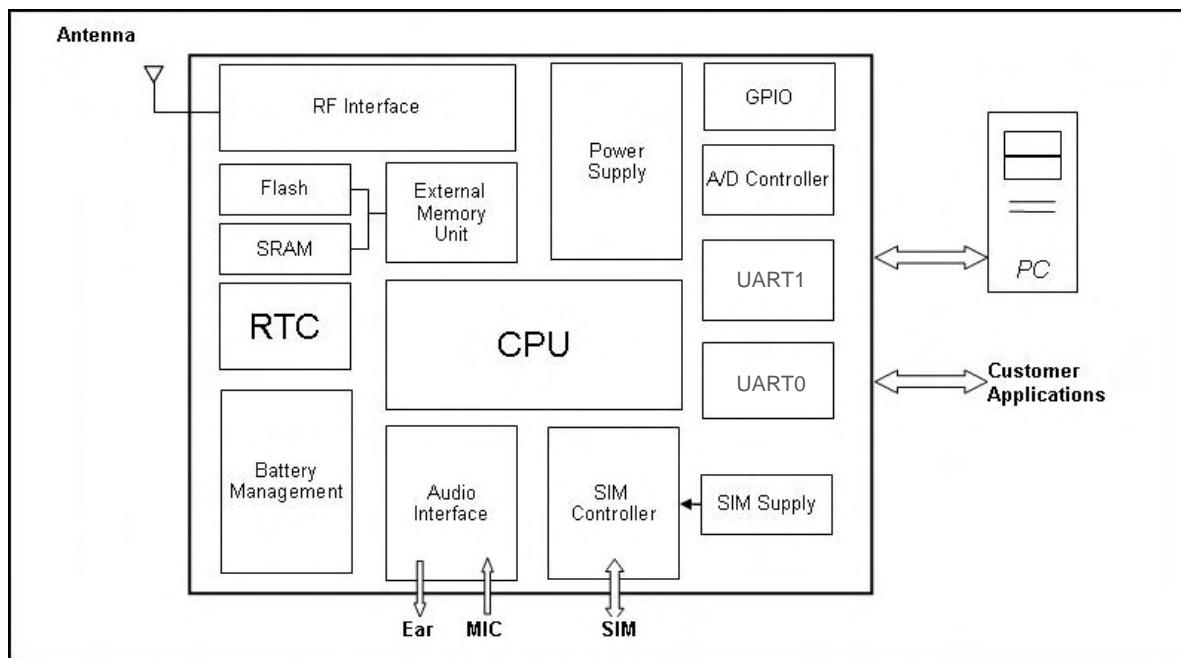
### 1.3. System Architecture

Figure 1-2 describes ACM8060 function diagram and main interface.

**Figure 0-2 ACM8060 block diagram**

<sup>1</sup> Depending on network condition

<sup>2</sup> Upon customer request



## Application Environment and Interface

The application environment, connectors, and hardware interface design are described in this chapter.

### 1.4. Extreme conditions

ACM8060 extreme environment conditions are described as below:

**Table 0-1 ACM8060 extreme condition specification**

Parameters	Description	MIN	MAX	Unit
Ts	Storage Temperature	-40	+85	°C
Vi	In/Out voltage at any pin	-0.5	3.5	V
IIN	Input current	-	1000	mA
VESD	ESD voltage	-	±2000	V

### 1.5. Board to board connector interface and definitions

#### 1.5.1. Interface pin definition

The board to board connection pin definitions of ACM8060 are described as below table:

**Table 0-2Board to board interface connector pin definitions**

PIN.NO	PIN.NAME	Note
1	SIMCLK	SIM Card interface, supporting 1.8V/3V SIM card
2	SIMVDD	
3	SIMIO	

4	SIMRST	
5	SIMDET	SIM Card Detector, can be used as GPIO
6	GND	Ground
7	PCMDI	PCM data input
8	PCMFSO	PCM frame synchronization
9	PCMCLK	PCM clk
10	PCMDO	PCM data output
11	ADC1	Adc1
12	BATTEMP	Adc2 ( bat temp )
13	GPIO3	GPIO
14	TXD1	UART1 Data Output
15	TXD0	UART0 Data Output
16	RXD1	UART1 Data Input
17	RXD0	UART0 Data Input
18	VCHAGE	Charging interrupt detection, also can be used as charging pin with current limit under 400Ma.
19	VCHAGE	Charging interrupt detection, also can be used as charging pin with current limit under 400Ma.
20	CHV_DRV	CHV_DRV charging control
21	GND	Ground
22	GND	
23	GND	
24	GND	
25	GND	
26	VBAT	Power input positive, input voltage is limited to 3.5V~4.5V.
27	VBAT	
28	VBAT	
29	VBAT	
30	VBAT	
31	V1.8	1.8V Power output with load of 50mA
32	RI0	UART0 ring tone indicator output, can also be used as GPIO or interrupt.
33	DTR0	UART0 Ready to receive, can be used as GPIO
34	CTS0	UART0 Permission to sent
35	DSR0	UART0 Ready to receive, can be used as GPIO or interrupt
36	IICSCL	NC
37	RTS0	UART0 Request to send (Output)
38	IICSDA	NC
39	DCD0	UART0
40	CHV_MAX	NC
41	ON_KEY	Power On/OFF signal. Effective at low. Required 100ms above power level
42	GND	
43	MIC1_P	Mic 1 in positive

44	MIC1_N	Mic 1 in negative
45	MIC2_P	Mic 2 in positive
46	MIC2_N	Mic 2 in negative
47	AUXOUTP	AUX out 2 positive
48	AUXOUTN	AUX out 2 negative
49	EARP	Audio out 1 positive
50	EARN	Audio out 1 negative

ACM8060 module is used as DCE (Data circuit-terminating equipment). However to let customer connect DCE-DTE, the signal naming is provided here as DTE (Data terminal equipment) signal definitions.

### 1.5.2. Type of Board to Board Connector

ACM8060 connector is a 50 Pin Board to Board connector with 0.5mm pitch as figure 2-1. The model number is Hirose's DF12C(3.0)-50DS-0.5V. The connector is as figure 2-1.

**Figure 0-1 50 pin board to board connector**



### 1.6. Antenna interface

Antenna interface of ACM8060 is GSC RF connector to be connected with an external antenna cable. ACM8060 uses an ultra-miniature SMT antenna (Model Name: U.FL-R-SMT) connector from Hirose Ltd.

### 1.7. UART Interface

ACM8060 has two UART interfaces. UART0 is used for software download to the module flash system and AT COMMAND interface. Its baud rate is 115200bps. UART1 is reserved.

### 1.8. Recommended application environment

#### 1.8.1. Digital interface

Recommended digital interfaces of ACM8060 are described as below

**Table 0-3 Recommended settings for digital interface**

Parameter	Parameter descriptions	Min	Max	Unit
VIH	Voltage input high voltage	2	3.14	V

VIL	Input low voltage	-0.3	0.8	V
IIH	Leak current when high input	-	2	µA
IIL	Leak current at low input level	-2	-	µA
VOH	Voltage output at high voltage	2.39	3.00	V
VOL	Voltage output at low voltage	0	0.40	V
CIN	Input capacitor	-	15	pF

### 1.8.2. Audio Interface

ACM8060 audio interface reference testing value is as table 0-8, 0-9, 0-10 and 0-11.

**Table 0-4 MIC 1 audio input**

Parameter	Typical Value
Maximum input level (MIC+-MIC-)	32.5mVrms
Differential input resistance	220 KΩ
MIC Skew voltage	1.9~2.1V
	2.0~2.2V

**Table 0-5 MIC1 audio output**

Parameter	Testing	MIN	TYP	MAX
Resistance (MIC+-MIC-)	4VPP Output	16Ω	-	-
	3V 1KHz	<1Ω	-	-

**Table 0-6 EAR 1 audio output**

Parameter	Testing	MIN	TYP	MAX
EAR+ or EAR- maximum	Differentiate	-	-	1%
EAR+ or EAR- maximum output	16Ω 5%	3.1VPP	-	43.92VP
	4Ω 5%	1.2VPP	-	1.5VPP

**Table 0-7 EAR2 audio output**

Parameter	Testing	MIN	TYP	MAX
EAR+ or EAR- capacitance	Differential	-	-	1%
EAR+ or EAR- maximum output	16Ω 5%	3.1VPP	-	43.92VP
	4Ω 5%	1.2VPP	-	1.5VPP

## 1.9. Power characteristics

### 1.9.1. Input power

The input power of ACM8060 is described as below table:

**Table 0-8 Input power requirement**

Parameter	Min	Typ	Max	Unit
VBatt+	3.4	4.0	4.5	V

### 1.9.2. Operation Current

The operation current requirement is described as below:

**Table 0-9 Operation current requirement**

Operation mode	Min	TYP	Max	Unit
Standby mode	-	-	3.8	mA
Talking mode	-	250	-	mA
GPRS data	-	350(GPRS4+1)	-	mA
Power off mode	-		100	µA

The peak current of ACM8060 is 2A.

## Power On/Off the module

### 1.10. General Description

The power on and off procedures are described in this chapter.

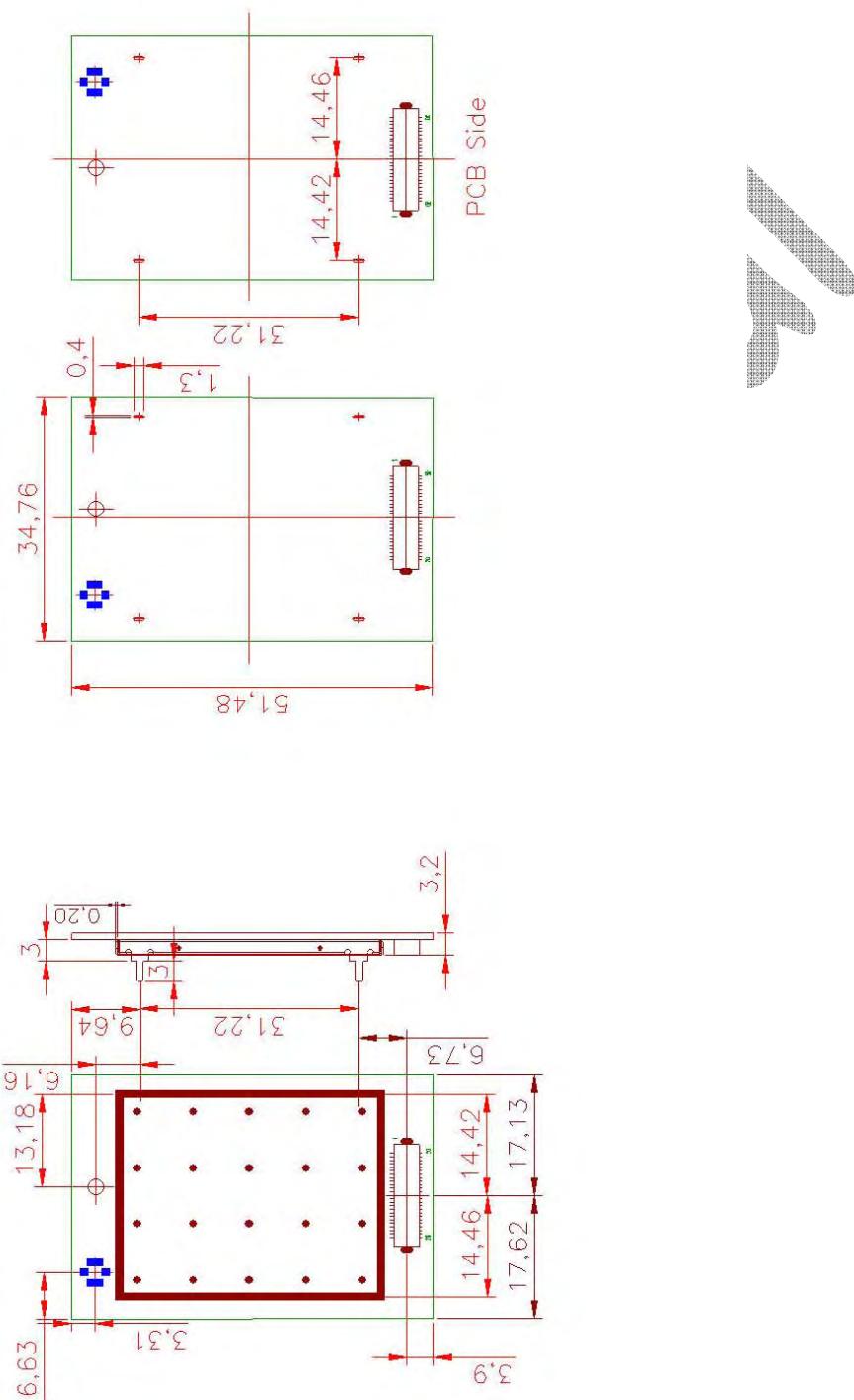
### 1.11. Power On

When the module is supplied with over 3.4V power and PWON signal is low (300ms), ACM8060 will be powered on.

### 1.12. Power Off

To power off ACM8060, the external CPU needs to pull low PWON for 2 to 3 seconds to power off the board.

# Mechanical Dimension



## Appendix A FCC Statement

Confidential