

# ADH

## ADH8066 Quad band GSM/GPRS Module

Product Data Sheet

<V1.4>

[ADH Technology Co.,LTD](#)

Subject to changes in technology, design and availability

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## Revision History

Version	Effective Date	Description of Changes
1.0	2009/6/12	Formal release of V1.0
1.1	2009/9/25	Update power consumption and GPIO10 functionality
1.2	2009/12/11	Update standby power consumption
1.3	2010/5/17	1. Update PIN 11, PIN 12, PIN 20 and PIN 32, PIN 43 ~ 48 2. Add ordering information
1.4	2010/11/10	Update the Max. value of VIH

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## Ordering Information

Model Name	Ordering No.	Description
ADH8066	876-82160-01	850/900/1800/1900 Quad band GSM/GPRS module with embedded TCP/IP, no HW flow control, with SIM holder
	876-82160-A1	850/900/1800/1900 Quad band GSM/GPRS module with embedded TCP/IP, no HW flow control, with SIM holder
	876-82060-01	850/900/1800/1900 Quad band GSM/GPRS module with embedded TCP/IP, w/o SIM holder, no HW flow control
	876-82060-A1	850/900/1800/1900 Quad band GSM/GPRS module with embedded TCP/IP, w/o SIM holder, w HW flow control

ADH ADH8066 module is a quad band GSM/GPRS communication module. It supports standard AT commands and enhanced AT commands which provide rich voice and data communication functions. It's an ideal solution for various communication applications.

## 1. Product Introduction

### 1.1. Physical Dimensions

ADH8066 wireless module physical characteristics are described as table 1-1 and figure 1-1.

Figure 1-1 ADH8066 physical appearance

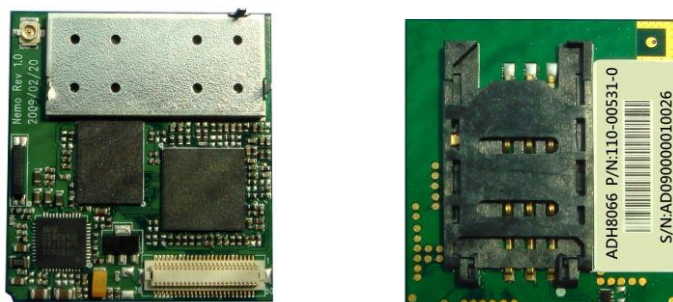


Table 1-1 Product physical characteristics

Physical Characteristics	
Weight	8g
Dimension (Length x Width x Height)	33mm×36mm×5.4mm (with SIM holder) 33mm×36mm×3.3mm (without SIM holder)

### 1.2. Product Functions

ADH8066 functions are listed as table 1-2

Table 1-2 ADH8066 function list

Product features	Descriptions
Frequency	GSM 850/900/1800/1900 Quad Band
Maximum RF Power	GSM850/EGSM900 Class 4 (2W) GSM1800/GSM1900 Class 1 (1W)
Receiving Sensitivity	<-106dBm
Working Temperature	-30°C~+70°C (-40°C~+85°C without SIM holder)
Power Voltage	3.4V~4.5V (4.0V is recommended)
Average STB current	<2 mA (Standby mode)
Current Leakage	<0.1mA
Protocol	Support GSM/GPRS Phase2/2+
AT COMMAND	GSM Standard AT commands V.25 AT commands

Product features	Descriptions
	ADH defined AT commands
50PIN B2B Connector	UART interface (maximum I/O speed: 115,200bit/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 cancellation.
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/UDP/FTP protocol. Support multi-slot, ACK response, adjustable large memory buffer and domain name resolution.
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 ADH AT commands

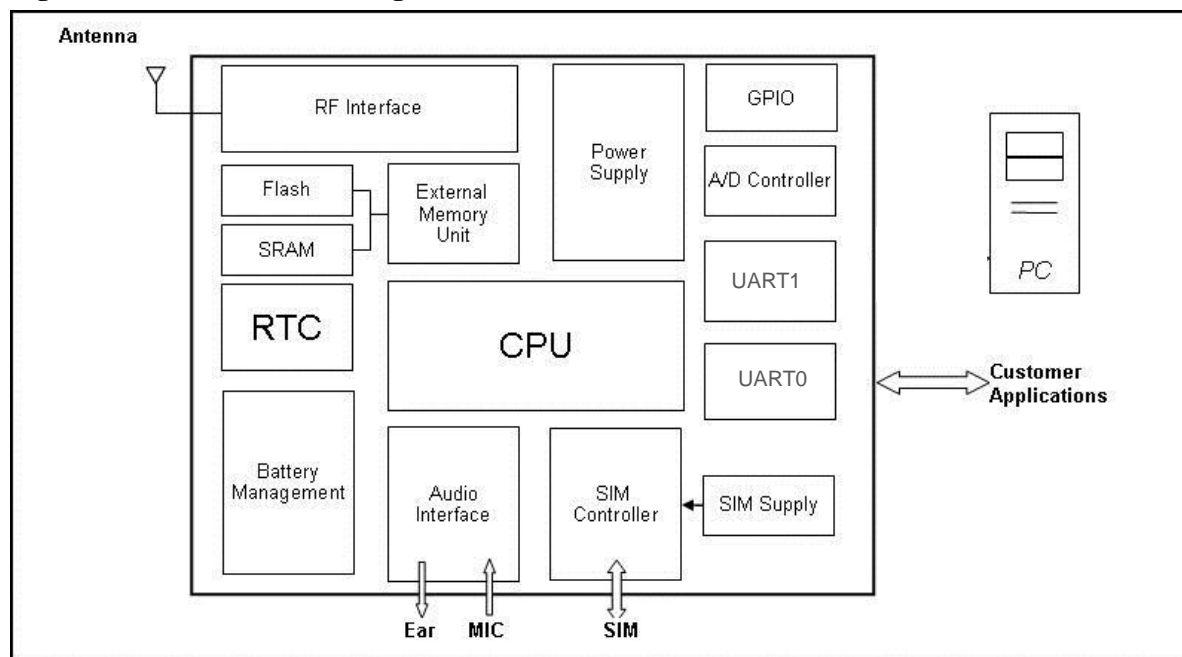
<sup>1</sup> Depend on network condition

<sup>2</sup> Upon customer request

## 1.3. System Architecture

Figure 1-2 describes ADH8066 function diagram and main interface.

Figure 1-2 ADH8066 block diagram



## 2. Application Environment and Interfaces

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

### 2.1. Extreme conditions

ADH8066 extreme environment conditions are described as below:

Table 2-1 ADH8066 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

## 2.2. Board to board connector interface and definitions

### 2.2.1. Interface pin definition

The board to board connector pin definitions are described as below table:

**Table 2-2**Board 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	GPIO10	SIM detection (When SIM holder is not mounted) or system ready for AT command
6	GND	Ground
7	PCMDI	PCM data input
8	PCMFSO	PCM frame synchronization
9	PCMCLK	PCM clock
10	PCMDO	PCM data output
11	BATTEMP	Measuring battery temperature
12	NC	NC
13	GPIO3	Can be used for GSM/GPRS network connection indicator or network quality indicator (CSQ > 15)
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	NC	NC
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
33	DTR0	UART0 Ready to receive, can be used as GPIO
34	CTS0	UART0 Permission to sent

PIN.NO	PIN.NAME	Note
35	DSR0	UART0 Ready to receive, can be used as GPIO
36	IIC_SCL	NC
37	RTS0	UART0 Request to send (Output)
38	IIC_SDA	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 (Handsfree/Normal mode)
44	MIC1_N	MIC 1 IN negative (Handsfree/Normal mode)
45	MIC2_P	MIC 2 IN positive (Carkit mode)
46	MIC2_N	MIC 2 IN negative (Carkit mode)
47	AUXOUTP	AUX out 2 positive (Carkit)
48	AUXOUTN	AUX out 2 negative (Handsfree)
49	EARP	Audio out 1 positive (Normal)
50	EARN	Audio out 1 negative (Normal)

ADH8066 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.

### 2.2.2. Type of Board to Board Connector

ADH8066 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.

**Figure 2-1 50 pin board to board connector**



## 2.3. Antenna interface

Antenna interface of ADH8066 is GSC RF connector to be connected with an external antenna cable. The connector is an ultra-miniature SMT antenna connector (Hirose U.FL-R-SMT or compatible connector)

## 2.4. UART Interface

ADH8066 has two UART interfaces. UART0 is used for software download to the



module flash system and AT COMMAND interface. The maximum baud rate is 115,200bps. UART1 is reserved.

## 2.5. Recommended application environment

### 2.5.1. Digital interface

Recommended digital interfaces of ADH8066 are described as below

**Table 2-3 Recommended settings for digital interface**

Parameter	Parameter descriptions	Min	Max	Unit
VIH	Voltage input high voltage	2	3.3	V
VIL	Input low voltage	-0.3	0.8	V
IIH	Leak current when high input level	-	2	$\mu$ A
III	Leak current at low input level	-2	-	$\mu$ A
VOH	Voltage output at high voltage level	2.39	3.00	V
VOL	Voltage output at low voltage level	0	0.40	V
CIN	Input capacitor	-	15	pF

### 2.5.2. Digital interface

Recommended digital interfaces of ADH8066 are described as below

**Table 2-4 Recommended settings for digital interface**

Parameter	Parameter descriptions	Min	Max	Unit
VIH	Voltage input high voltage	2	3.3	V
VIL	Input low voltage	-0.3	0.8	V
IIH	Leak current when high input	-	2	$\mu$ A
III	Leak current at low input level	-2	-	$\mu$ A
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

### 2.5.3. Audio Interface

ADH8066 audio interface reference testing value is as table 2-8, 2-9, 2-10 and 2-11.

**Table 2-5 MIC 1 audio input**

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

**Table 2-6 EAR 1 audio output**

Parameter	Testing	MIN	TYP	MAX
EAR+ or EAR- maximum	Differentiate	-	-	1%
EAR+ or EAR- maximum output	16 $\Omega$ 5%	3.1VPP	-	43.92VP

	4Ω 5%	1.2VPP	-	1.5VPP
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## 2.6. Power characteristics

### 2.6.1. Input power

The input power of ADH8066 is described as below table:

**Table 2-7 Input power requirement**

Parameter	Min	Typ	Max	Unit
VBatt+	3.4	4.0	4.5	V

### 2.6.2. Operation Current

The operation current requirement is described as below:

**Table 2-8 Operation current requirement**

Operation mode	Min	TYP	Max	Unit
Standby mode	-	-	< 2	mA
Talking mode	-	250	-	mA
GPRS data transmission	-	350 (GPRS4+1)	-	mA
Power off mode	-		100	μA

The peak current of ADH8066 is 2A.

## 3. Power On/Off the module

### 3.1. General Description

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

### 3.2. Power On

When the module is supplied with over 3.4V power and PWON signal is low (300ms), ADH8066 will be powered on.

### 3.3. Power Off

To power off ADH8066, the external CPU needs to pull low PWON for 2 to 3 seconds to power off the board.

## 4. Mechanical Dimension

