AEG09T3R10

Manual

CONTENTS

1. Introduction

It performs the role of collecting and controlling operation status information for various IOT solutions such as lighting, meter reading, and emergency bell, and provides smart services to each utility using wireless sense network technology.

- Wireless Sensor networks
- Ad-hoc network
- Routing Algorithm
- UART Interface
- 900 MHz SRD Telecommunication
- GFSK Modulation

2. Electrical Characteristics

■ Absolute Maximum Ratings

Item	MIN	TYP	MAX	Unit
Supply Voltage		5.0		V
Temperature	-40		85	℃

■ Power Consumption

Item	parameter	SPEC			Unit	Condition
		MIN	TYP	MAX		
TX	200mW		340		mA	Continuous
RX	RX		44		mA	Average consumption
Idle	Idle		12		mA	Average consumption

■ RF Characteristics

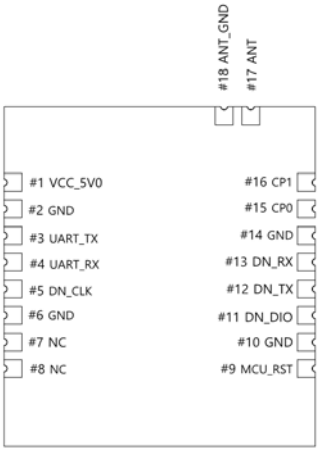
Item	Parameter	SPEC			Unit	Condition
		MIN	TYP	MAX		
TX	TX Frequency	902		928	MHz	ISM Band
	TX Power			+23	dBm	
RX	Receiving Sensitivity		-108		dBm	

■ **Frequency Channel**

Channel							
CH	Freq. (MHz)	CH	Freq. (MHz)	CH	Freq. (MHz)	CH	Freq. (MHz)
1	902.5	17	908.9	33	915.3	49	921.7
2	902.9	18	909.3	34	915.7	50	922.1
3	903.3	19	909.7	35	916.1	51	922.5
4	903.7	20	910.1	36	916.5	52	922.9
5	904.1	21	910.5	37	916.9	53	923.3
6	904.5	22	910.9	38	917.3	54	923.7
7	904.9	23	911.3	39	917.7	55	924.1
8	905.3	24	911.7	40	918.1	56	924.5
9	905.7	25	912.1	41	918.5	57	924.9
10	906.1	26	912.5	42	918.9	58	925.3
11	906.5	27	912.9	43	919.3	59	925.7
12	906.9	28	913.3	44	919.7	60	926.1
13	907.3	29	913.7	45	920.1	61	926.5
14	907.7	30	914.1	46	920.5	62	926.9
15	908.1	31	914.5	47	920.9	63	927.3
16	908.5	32	914.9	48	921.3	64	927.7

3. AEG09T3R10 Function Description

- Module Construction



PIN No.	PIN Name	Description
1	VCC_5V0	+5.0V
2	GND	GND
3	UART_TX	UART RXD (MCU Connect, +3.3V)
4	UART_RX	UART TXD (MCU Connect, +3.3V)
5	DN_CLK	Download
6	GND	GND
7	NC	Not Connect
8	NC	Not Connect
9	MCU_RST	/RESET
10	GND	GND
11	DN_DIO	Download
12	DN_TX	Download
13	DN_RX	Download
14	GND	GND
15	CP0	LOW : RF ON
16	CP1	HIGH : UART RX Buffer empty.
17	ANT	ANT Matched 50 ohm
18	ANT_GND	GND

■ Control Command between HOST MCU and AEG09T3R10 Module

1. UART Configuration
   - ➢ Baud rate : 115,200bps
   - ➢ Parity : none
   - ➢ Stop bit : 1
   - ➢ h/w flow : none

2. Command Set
   - ➢ Host → AEG09T3R10 (Hex data Communication)

0xF0	HEADER	PAYLOAD	0x0F

Name		Size	Description	
0xF0		1-byte	SOP(Start of Packet)	
Header	Packet Type	1-byte	Command Packet	0x01 : control packet
			Data Packet	0x10 : data packet
	Command/Network Address	1-byte	Command Packet	API command
			Data Packet	Destination network address for packet transmission
	Node Address	1-byte	Command Packet	The node address value combined with the command, 0x00 if not used
			Data Packet	Destination node address for packet transmission
	Attribution	1-byte	0x00	
	MID SN	6-byte	0x00, 0x00, 0x00, 0x00, 0x00, 0x00	
	Length	1-byte	Length of payload field	
Payload		≤ 60 bytes	Data for transmission	
0x0F		1-byte	EOP(End of Packet)	

   - ➢ Sub-command

Code	Command	Description	Direction
0x10	set node parameters	[Communication parameter setting command] ① If the MID value matches the own MID value, the communication parameter values received by the own communication module are set. ② If the MID value is different from the own MID value, a "set initial parameters" MAC command is generated. (However, to execute this command, the same frequency must be used.) - MID : MID of the node to set the parameter value (10-byte) - No. of Nodes [20] : 2 ~ 240 - MPL(Maximum path length) [4] : 1(= single-hop) ~ 7(= 7-hop) - Channel [72] : 0(= 902.3MHz) ~ 127(= 927.7MHz) (Note: KOR 74 ~ 105) - RF Power [3] : 0 ~ 7 (8 단계) (Note: 3 = 1mW @DSD09T3R10) - Network Address [0] : 0 ~ 14 - Node Address[0] : 0 ~ 239 (However, < "No. of Nodes", Address 0 is assigned as the gateway address) - Max No. of Hops [MPL+1] : MPL + 1 - Group [1] : 1(Group #1) ~ 4(Group #4)	Host → Module
0x12	receiving for "set node parameters"	[Command notifying receipt of "set initial parameters" MAC command] The node that has received the "set initial parameters" MAC command sets its own communication module parameter values at the MAC side, and is a command to notify the host of the MAC command reception through API IF. - Same payload as "set node parameters" command (9 parameters, 18-byte)	Host ← Module
0x14	get node parameters	[A command that requests the transmission of the communication parameter value built into the node's own communication module.] A command that reads the communication parameter values built into the own communication module and requests transmission to the host.	Host → Module
0x15	response for get node parameters	[Response to the 'get node parameters' command] Command that reads the communication parameter values built into own communication module and transmits it to the host - Same payload as "set node parameters" command (8 parameters excluding MID, 8-byte)	Host ← Module

Code	Command	Description	Direction
0x48	exist node path?	[Command to check the existence of a path connecting a specific node in the network] Does the path information for a specific node exist in the UNI_PATH table (or BROAD_PATH table)? If present, a command requesting that the path be transferred to the host. - node address in packet header : 0 ~ 239 (However, it cannot exceed the'No. of nodes')	Host → Module
0x49	response for exist node path	[Response command to the 'Exist node path' command] Command that checks the existence of a path to a specific node and transmits the host (Note: The path is displayed in the order of relay based on the command execution node.) - node address in packet header : 0 ~ 239 (However, it cannot exceed the'No. of nodes') - type : 1 = UNI_PATH 0 = doesn't exist - 1st Relay route (@ UNI_PATH table) : 1st Relay node address, ..., 6th Relay node address - 2nd Relay route (@ UNI_PATH table) : 1st Relay node address, ..., 6th Relay node address	Host ← Module

Code	Command	Description	Direction
0x78	get module information	[Command to request transmission of information related to communication module and communication characteristics] Command that reads information related to communication module and communication characteristics and requests transmission to host - Information Type : 1 (RSSI value of the most recently received frame)	Host → Module
0x79	response for get module information	[Response command for "get RF Information" command] Reads the information related to the communication module and communication characteristics and sends it to the host. - Information Type : 1 (RSSI value of the most recently received frame) - RSSI : Little-Endian 2-byte integer type	Host ← Module

Specification :

The revised User Manual does not contain the FCC required warning statement

a. Rule Part 15.19(a)(3): 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.

b. Rule Part 15.21: The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- products using this module shall be used at least 20 cm away from the human body.
- Products using this module require Part 15 subpart B conformity testing.