

Ku-band 40W GaN BUC

RF Frequency:
13.75 to 14.5 GHz and 14.0 to 14.5 GHz

Model No. NJT8371 series

- RF Frequency : 14.0 to 14.5 GHz / 13.75 to 14.5 GHz
- LO Frequency : 13.05 GHz / 12.80 GHz
- IF Frequency : 950 to 1,450 MHz / 950 to 1,700 MHz
- Saturation Output Power : +46 dBm (40W)
- IF / Ref. (10MHz) Input: N-type / F-type, Female Connector
- DC Power Input : MS Connector
- M&C Option : FSK Communication M&C
RS-232C Interface M&C

Specifications

Rev.00-04 February 18, 2016

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Microwave Components Division

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Model Number

- Line-up

Model No.	RF Frequency	Local Frequency	IF Frequency	Saturation Output Power	IF Connector	Power Supply	Port for Voltage Input	M&C Option
NJT8371NMK	14.0 to 14.5 GHz (Standard Ku-band)	13.05 GHz	950 to 1,450 MHz	40W Saturation (+46 dBm)	N-type	+36 to +60 V DC Power	MS Connector	FSK M&C
NJT8371FMK					F-type			RS-232C M&C
NJT8371NMR					N-type			
NJT8371FMR					F-type			
NJT8371UNMK	13.75 to 14.5 GHz (Universal Ku-band)	12.80 GHz	950 to 1,700 MHz	40W Saturation (+46 dBm)	N-type	+36 to +60 V DC Power	MS Connector	FSK M&C
NJT8371UFMK					F-type			RS-232C M&C
NJT8371UNMR					N-type			
NJT8371UFMR					F-type			

1. Electrical Specifications

1-1.	Output Frequency Range <Universal Ku-band> <Standard Ku-band>	13.75 to 14.5 GHz 14.0 to 14.5 GHz
1-2.	Input Frequency Range <Universal Ku-band> <Standard Ku-band>	950 to 1,700 MHz 950 to 1,450 MHz
1-3.	Maximum IF Input Level (without damage)	+13 dBm max.
1-4.	Conversion Type	Single, fixed L.O.
1-5.	L.O. Frequency <Universal Ku-band> <Standard Ku-band>	12.80 GHz 13.05 GHz
1-6.	Frequency Sense	Positive
1-7.	Saturation Output Power (P _{sat})	+46 dBm min. @ +25 °C +45 dBm min. over temperature
1-8.	Linear Gain	72 dB nom., 66 dB min.
1-9.	Gain Variation over frequency @ fixed temperature <Universal Ku-band> <Standard Ku-band>	5 dBp-p max. over 750 MHz 2 dBp-p max. over 54 MHz 5 dBp-p max. over 500 MHz 2 dBp-p max. over 54 MHz
1-10.	Gain Stability over temperature @ fixed frequency	4 dBp-p max. 2 dBp-p typ.
1-11.	ACPR	-30 dBc typ., -26 dBc min. @ P _{out} = +44 dBm
1-12.	Requirement for External Reference [Frequency] [Input Power] [Phase Noise]	10 MHz (sine-wave) -5 to +5 dBm @ Input port -125 dBc/Hz max. @ 100 Hz -135 dBc/Hz max. @ 1 kHz -140 dBc/Hz max. @ 10 kHz

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1-13.	L.O. Phase Noise	-60 dBc/Hz max. @ 100 Hz -70 dBc/Hz max. @ 1 kHz -80 dBc/Hz max. @ 10 kHz -90 dBc/Hz max. @ 100 kHz -100 dBc/Hz max. @ 1MHz
1-14.	Spurious @ Pout= +44dBm [in band] [in receive and] [Out-of-band]	-50 dBc max. @ RF Frequency -70 dBm max. @ 10.95 to 12.75 GHz -50 dBc max.
1-15.	Receive Band Noise Density <Universal Ku-band> <Standard Ku-band>	Tx: 14.0 to 14.5 GHz -156 dBm/Hz max. @10.95 to 12.75 GHz Tx: 13.75 to 14.0 GHz -156 dBm/Hz max. @10.95 to 12.25 GHz -121 dBm/Hz max.)@12.25 to 12.75 GHz Tx: 14.0 to 14.5GHz -156 dBm/Hz max. @ 10.95 to 12.75 GHz
1-16.	Noise Figure	20 dB max.
1-17.	Group Delay over any 54MHz	2.5 nS p-p max.
1-18.	Input Impedance <N-type Model> <F-type Model>	50 ohms nom. 75 ohms nom.
1-19.	Input V.S.W.R.	2 : 1 max.
1-20.	Output V.S.W.R.	1.5 : 1 max.
1-21.	Output Load VSWR for Non Damage	2 : 1 max.
1-22.	DC Power Requirement [Voltage Range] [Power Consumption]	+48 VDC (+36 to +60 VDC) 120 W typ. @ No IF signal 220 W typ. @ Pout= +44dBm 260 W typ., 290 W max. @ Psat
1-23.	Mute	Shut off the HPA in case of L.O. unlocked, no 10 MHz reference signal, or Over temperature. * Note 1
1-24.	LED Indicator	GREEN: L.O. locked RED: L.O. unlocked (or no 10 MHz reference signal)

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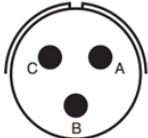
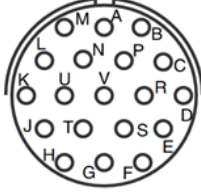
<p>1-25.</p>	<p>Monitor and Control <FSK Communication M&C> [Interface] [Functions]</p>	<p>650kHz FSK Signal on IF Connector Monitor: Tx Output Power / Temperature / Tx Status / Alarm (Over temperature * Note 1 / L.O. unlock) / Step Attenuator Control: Transmit On/Off / Step Attenuator Tx Output Power: Detector Range: 15 dB (up to Psat) Reading Accuracy: +/- 1.0 dB Step Attenuator: Attenuator Range: 0 to 15.5 dB Attenuator Step: 0.5 dB</p> <p><i>* Details are mentioned on Appendix of "<u>Monitor & Control Specifications for FSK Communications Interface</u>".</i></p>
	<p><RS-232C Interface M&C > [Interface] [Functions]</p>	<p>RS-232C Interface on MS connector Monitor: Tx Output Power / Temperature / Tx Status / Alarm (Over temperature * Note 1 / L.O. unlock) / Step Attenuator Control: Transmit On/Off / Step Attenuator Tx Output Power: Detector Range: 15 dB (up to Psat) Reading Accuracy: +/- 1.0 dB Step Attenuator: Attenuator Range: 0 to 15.5 dB Attenuator Step: 0.5 dB</p> <p><i>* Details are mentioned on Appendix of "<u>Monitor & Control Specifications for RS-232C Interface</u>".</i></p>

*Note1: Regardless of cooling fan status, the unit will operate until status of over temperature which turn out at internal temperature of around 100 °C, and the Mute and Alarm will function at status of over temperature.

* Above Specifications are subject to change without notice.

Preliminary

2. Mechanical Specifications

2-1.	<p>Input Interface</p> <p>[IF Connector]</p> <p>[Circular Connector]</p>	<p>IF / Ref. / FSK M&C Signal Input: N-type female connector, 50 ohms F-type female connector, 75 ohms</p> <p>DC Input: MS Connector Part No.: PT02E-12-3P (025) Mating connector: PT06E-12-3S (470) Assignment:</p>  <p>Pin A: DC Output (+) / Prime Pin B: Frame GND Pin C: DC Output (-) / Return</p> <p>M&C Input: MS Connector * Part No.: PT02E-14-19P (025) Mating connector: PT06E-14-19S (470) Assignment:</p>  <p>Pin A: GND COMMON Pin B: GND COMMON Pin C: N.C. Pin D: N.C. Pin E: N.C. Pin F: GND COMMON Pin G: RS-232C RxD Pin H: RS-232C TxD Pin J: N.C. Pin K: N.C. Pin L: N.C. Pin M: N.C. Pin N: N.C. Pin P: N.C. Pin R: N.C. Pin S: N.C. Pin T: N.C. Pin U: N.C. Pin V: N.C.</p> <p><i>* This MS connector is available for only RS-232C Interface M&C models.</i></p>
2-2.	Output Interface	Waveguide, WR-75 (with Groove)
2-3.	Cooling	Forced-air-cooled
2-4.	Dimension & Housing	230(L) × 150(W) × 100(H) mm [9.07" (L) × 5.12" (W) × 3.15" (H)] without interface connectors and screws
2-5.	Weight	4.4 kg [9.1 lbs]

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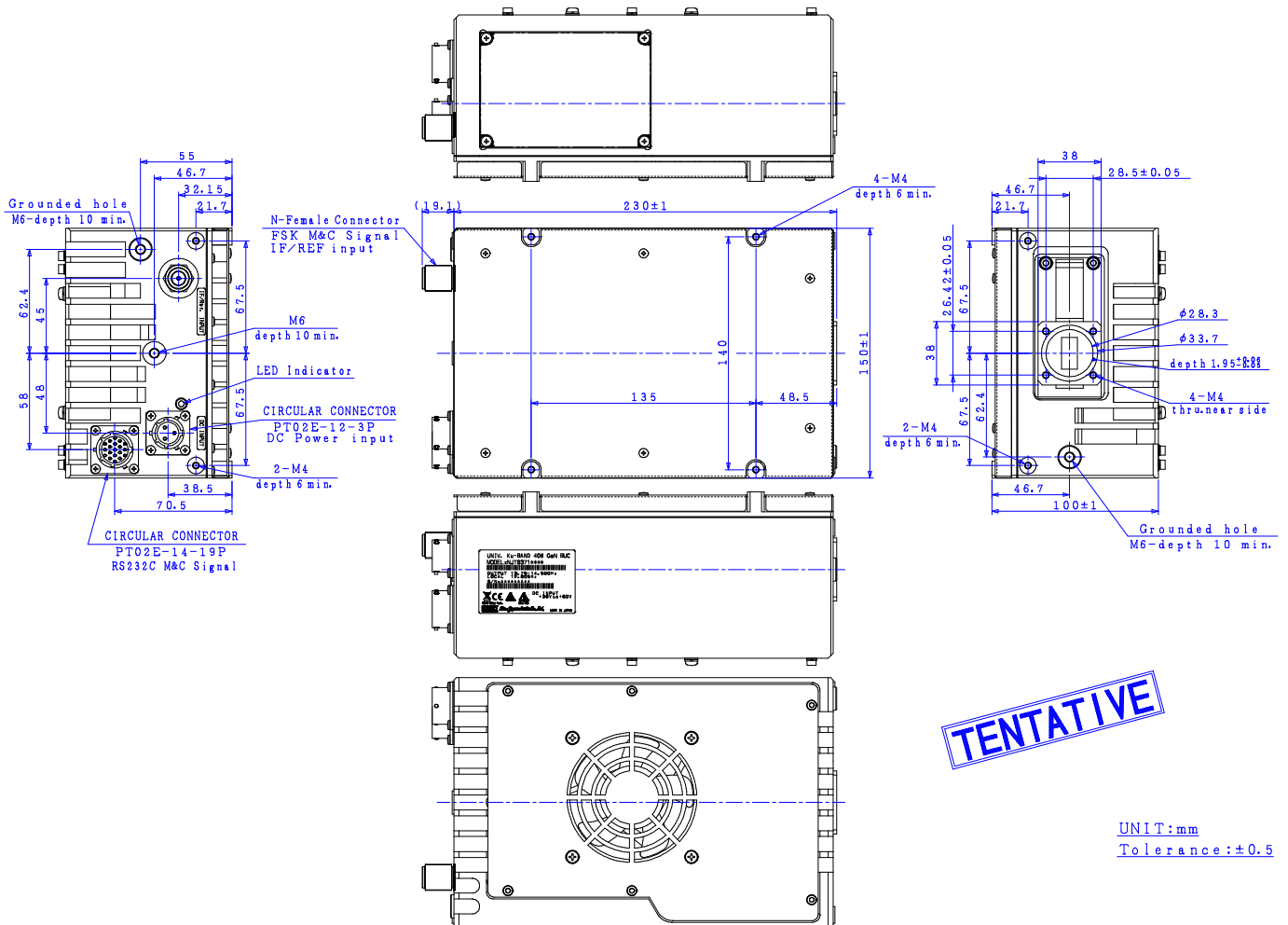
3. Environmental Specifications

3-1.	Temperature Range (ambient) [Operating] [Storage]	-40 to +60 °C -40 to +75 °C
3-2.	Humidity	0 to 100 %
3-3.	Altitude	15,000 feet (4,572 m)
3-4.	Vibration	5 G [49.03 m/s ²] (3 axis, 50 Hz to 2 kHz) 1 mm p-p (3 axis, 5 to 50 Hz)
3-5.	Shock	30 G [294.20 m/s ²] (3 axis)
3-6.	Waterproof / Dustproof (IP Code)	IP 67
3-7.	Regulations	EU Directive (CE Marking) EMC (2004/108/EC) RoHS (2011/65/EU) Safety: EN60950-1
3-8.	Comply with RoHS (Restricting the use of Hazardous Substances) directives	

* Above Specifications are subject to change without notice.

4. Outline Drawing

- IF / Ref. Input: N-type Female Connector
- DC Input: MS Connector



TENTATIVE

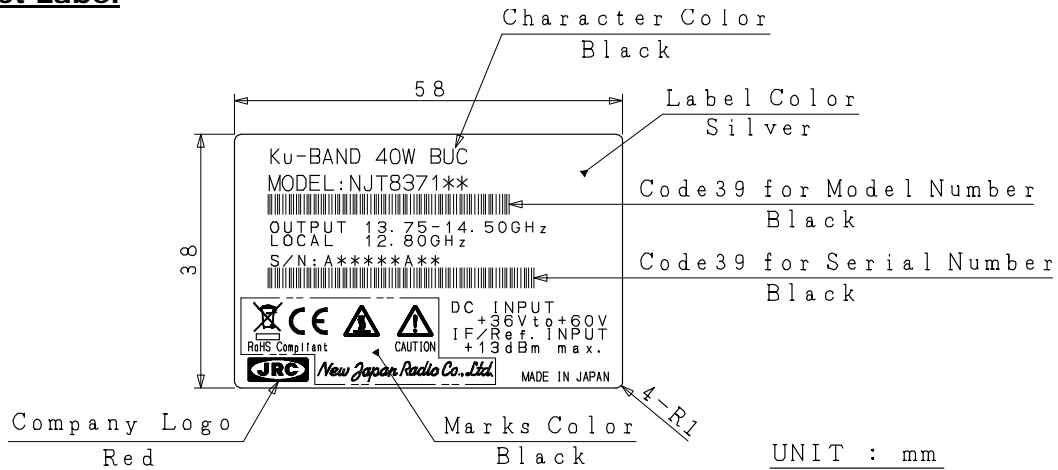
UNIT:mm
Tolerance:±0.5

Accessories

- O-ring, Qty (1), for waveguide flange
- Wrench Key, Qty (1), M4, Hexagon
- Bolts, Qty (4), M4 x 10, Hexagon socket head with spring washer and flat washer, SUS, for waveguide flange
- Screws, Qty (2), M6 x 10, Phillips head with spring washer and flat washer, SUS, for grounded hole
- Connector, Qty (1), MS Mating connector: PT06E-12-3S (470)
- Connector, Qty (1), MS Mating connector: PT06E-14-19S (470)

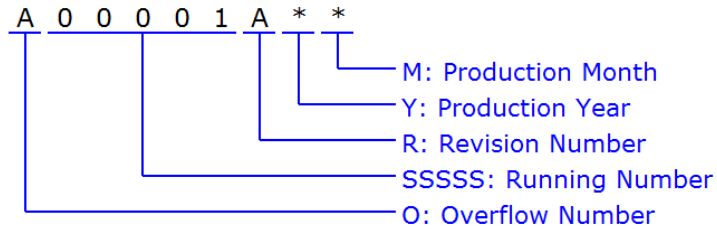
* Above Specifications are subject to change without notice.

5. Label Product Label



Definition of Serial Number

Serial Number (OSSSSRYM) - ALPHANUMERIC (9 characters)



O: Overflow Number - ALPHABET (1 character)

"A" to "Z", e.g.: A99999 ⇒ B00001

SSSS: Running Number - NUMBER (5 digits)

"00001" to "99999"

R: Revision Number - ALPHABET (1 character)

"A" to "Z"

Y: Production Year - NUMBER (1 digit)

Calendar Number, e.g.: 2009: 9, 2010: 0, 2011: 1, 2012: 2 ····

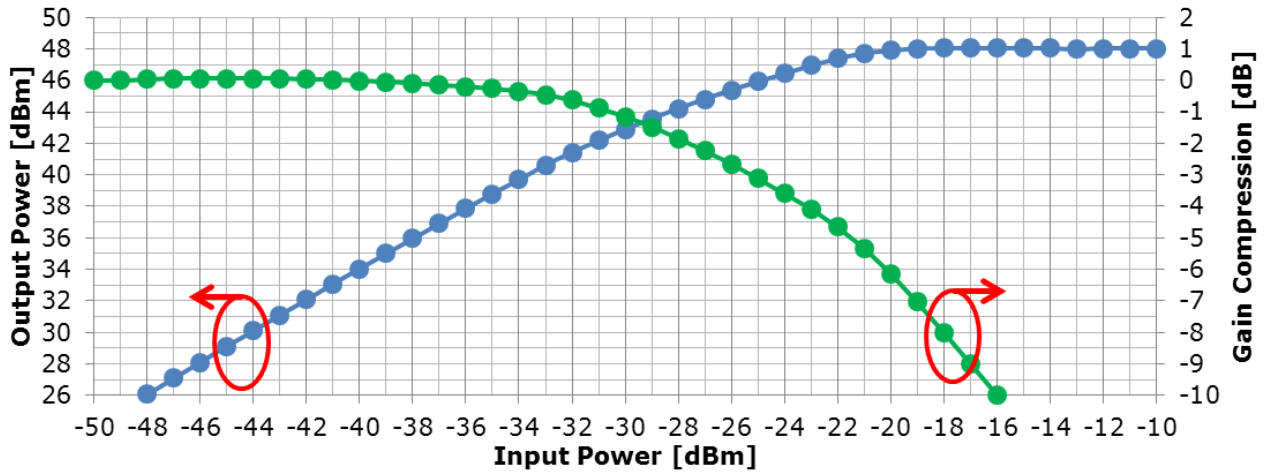
M: Production Month - ALPHANUMERIC (1 character)

"1" to "9", "X" as October, "Y" as November, "Z" as December

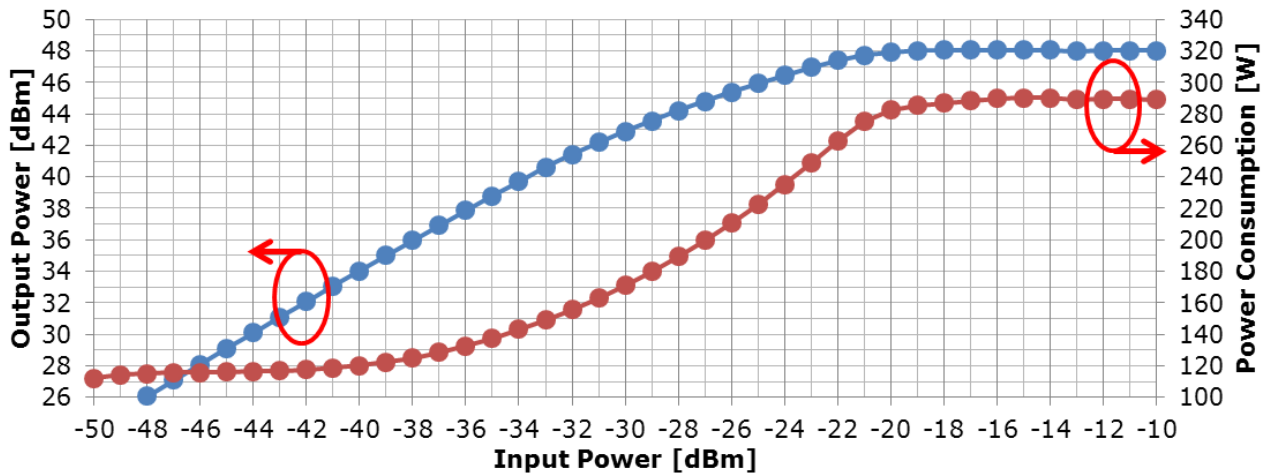
* Above Specifications are subject to change without notice.

Reference Performance

Output Power/Gain Compression vs. Input Power



Output Power/Power Consumption vs. Input Power



* Above Specifications are subject to change without notice.

Appendix)

Monitor & Control Specifications for RS-232C Interface

Rev. 2.3
July 25 2013

1. RS-232C Link Specifications

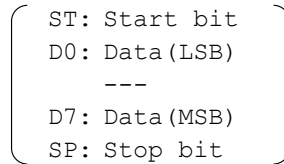
(1) Transmission Protocol

- a. Operation Mode Binary
- b. Transfer Rate 9600 bit/s
- c. Data Format 1 start bit, 8 data bits, 1 stop bit
No Parity



← Transmit

(The least significant bit (LSB) is sent first.)



2. Packet Format

(1) Byte Configuration

- a. Data Packet Length
- b. Byte Configuration

7 Bytes

Byte	Command (IDU to BUC)	Response (BUC to IDU)
1st	BUC Address (*1)	BUC Address (*2)
2nd	Command	Data Byte 1
3rd	Data Byte 1	Data Byte 2
4th	Data Byte 2	Data Byte 3
5th	Data Byte 3	Data Byte 4
6th	Data Byte 4	Data Byte 5
7th	Check Sum (*3)	Check Sum (*3)

- *1: Initial setting of a BUC address is 0x01.
- *2: Responder address is shifted left by 4 bits.
- *3: Algebraic sum of bytes 1 through 6.
Spare bytes are always filled with 0xAA (10101010).

Appendix)

e. Set Attenuator

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Set Attenuator	0x05
3	Data Byte 1	Attenuator Selection 1 or 2	Att.1 0x01 Att.2 0x02 *1
4	Data Byte 2	Setting Att. in 10dB digit	0x00 or 0x01 *2
5	Data Byte 3	Setting Att. in 1dB digit	0x00 to 0x09 *2
6	Data Byte 4	Setting Att. bit in 0.5dB digit	0x00 or 0x05 *2
7	Checksum	Algebraic sum of bytes 1 - 6	

*1 Att.1 is available, Att.2 is not available.

*2 Dynamic range and step size of the step attenuator: 15.5dB in 0.5dB step

ex) 12.5dB : Data byte 2 is 0x01
Data byte 3 is 0x02
Data byte 4 is 0x05

f. Request Status 2

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Request Status 2	0x06
3	Data Byte 1	Attenuator Selection 1 or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

(2) Response Message Structure (BUC to IDU)

a. Request Status 1

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Level Byte 1	MSbyte of Tx Output Power	*1
3	Level Byte 2	LSbyte of Tx Output Power	*1
4	Temperature	Temperature in deg. C	*2
5	Status Byte 1	Bit 0: Temperature Out-of-Range	1:Fail , 0:Normal
		Bit 1: PLL Out-of-Lock	1:Fail , 0:Normal
		Bit 2: Checksum Error	1:Error , 0:Normal
		Bit 3: Tx Status	1:Tx On , 0:Tx Off
		Bits 4 thru 7: BUC Power Class	0x1 to 0xA *3
6	Status Byte 2	Bits 0 - 3: Not used	Fixed 0xA
		Bits 4 - 7: Software Version	0x0 to 0xF
7	Checksum	Algebraic sum of bytes 1 - 6	

*1 Data Field Definition

Output power is the number which changed hexadecimal data into the decimal number and was divided by 100.

ex).

Output Power Data	Output Power
Data byte 1 is 0x10	} 0x1036 → +41.50 dBm
Data byte 2 is 0x36	

*2 Data Field Definition

Temperature data is -128 deg.C to +127 deg.C in two's complement.
(1 deg.C step).

ex).

When BUC Temperature is -40C, Temperature data is

*3 BUC Power Class

Value	0x1	0x2	0x3	0x4	0x5	0x6	0x7	0x8	0x9	0xA
Power	2W	4W	5W	8W	10W	16W	20W	25W	40W	60W

Appendix)

b. Set Transmit

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Tx On/Off	0x02
3	Data Byte 1	Tx Control	Off:0x00/On:0x01
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

c. Change BUC Address (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Change Address	0x03
3	Data Byte 1	New Address	0x01 to 0x0F
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

This command is not applicabe (N/A) in this version.

d. Set Carrier Frequency (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Set Carrier Frequency	0x04
3	Data Byte 1	Carrier Frequency	MSbyte
4	Data Byte 2	Carrier Frequency	LSbyte
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

This command is not applicabe (N/A) in this version.

e. Set Attenuator

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Set Attenuator	0x05
3	Data Byte 1	Attenuator Selection 1or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Set Att. bit in 10 dB digit	0x00 or 0x01
5	Data Byte 3	Set Att. bit in 1 dB digit	0x00 to 0x09
6	Data Byte 4	Set Att. bit in 0.5 dB digit	0x00 or 0x05
7	Checksum	Algebraic sum of bytes 1 - 6	

f. Request Status 2

Byte	Name	Description	Value
1	Address	Address of BUC	0x10 (to 0xF0)
2	Command	Request Status 2	0x08
3	Data Byte 1	Attenuator Selection 1or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Set Att. bit in 10 dB digit	0x00 or 0x01
5	Data Byte 3	Set Att. bit in 1 dB digit	0x00 to 0x09
6	Data Byte 4	Set Att. bit in 0.5 dB digit	0x00 or 0x05
7	Checksum	Algebraic sum of bytes 1 - 6	

Appendix)

Monitor & Control Specifications for FSK Communications Interface

Rev. 3.0
June 14 2013

1. FSK Communications Specifications

(1) Transmitter

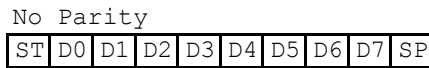
- a. Frequency 650 kHz +/-5%
- b. FSK deviation +/- 60 kHz Nominal (+60 kHz mark)
- c. Deviation tolerance +/- 50 kHz minimum ; +/-70 kHz maximum
- d. Output Level -5 to -15 dBm
- e. Output impedance 50 Ohm
- f. Start Tone 710 kHz
- g. Start Tone Time 10 ms minimum

(2) Receiver

- a. Locking range +/- 32.5 kHz
- b. Input impedance 50 Ohm
- c. Input Sensitivity -15 dBm

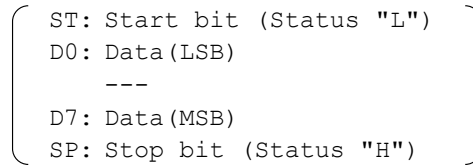
(3) Transmission Protocol

- a. Operation Mode Legacy-Binary
- b. Transfer Rate 9600 bit/s
- c. Data Format 1 start bit, 8 data bits, 1 stop bit



← Transmit

(The least significant bit (LSB) is sent first.)



- d. Maximum Response Time 50 ms
- e. Message Rate 1 every 20 ms

2. Packet Format

(1) Byte Configuration

- a. Data Packet Length 7 Bytes
- b. Byte Configuration

Byte	Command (IDU to BUC)	Response (BUC to IDU)
1st	BUC Address (*1)	BUC Address (*2)
2nd	Command	Data Byte 1
3rd	Data Byte 1	Data Byte 2
4th	Data Byte 2	Data Byte 3
5th	Data Byte 3	Data Byte 4
6th	Data Byte 4	Data Byte 5
7th	Check Sum (*3)	Check Sum (*3)

*1: Initial setting of a BUC address is 0x01.
 *2: Responder address is shifted left by 4 bits.
 *3: Algebraic sum of bytes 1 through 6.
 Spare bytes are always filled with 0xAA (10101010).

Appendix)

3. Command & Response Message Structure

The last state of the BUC condition is stored to inside memory, so when the BUC is re-turned DC power on again, the state is reproduced last condition.

(1) Command Message Structure (IDU to BUC)

a. Request Status 1

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Request Status 1	0x01
3	Data Byte 1	Not used	0xAA
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

b. Set Transmit On/Off State

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Tx On/Off	0x02
3	Data Byte 1	Tx Control	Off:0x00/On:0x01
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

c. Change BUC Address (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Change Address	0x03
3	Data Byte 1	New Address	0x01 to 0x0F
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

This command is not applicabe (N/A) in this version.

d. Set Carrier Frequency (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Set Carrier Frequency	0x04
3	Data Byte 1	Carrier Frequency	MSbyte
4	Data Byte 2	Carrier Frequency	LSbyte
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

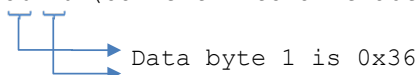
This command is not applicabe (N/A) in this version.

Data Field Definition

Carrier Frequency	Unsigned integer in MHz
-------------------	-------------------------

ex).

14000 MHz : 36 B0 (Convert into a hexadecimal number)



Appendix)

e. Set Attenuator

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Set Attenuator	0x05
3	Data Byte 1	Attenuator Selection 1 or 2	Att.1 0x01 Att.2 0x02 *1
4	Data Byte 2	Setting Att. in 10dB digit	0x00 or 0x01 *2
5	Data Byte 3	Setting Att. in 1dB digit	0x00 to 0x09 *2
6	Data Byte 4	Setting Att. bit in 0.5dB digit	0x00 or 0x05 *2
7	Checksum	Algebraic sum of bytes 1 - 6	

*1 Att.1 is available, Att.2 is not available.

*2 Dynamic range and step size of the step attenuator: 15.5dB in 0.5dB step

ex) 12.5dB : Data byte 2 is 0x01
Data byte 3 is 0x02
Data byte 4 is 0x05

f. Request Status 2

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Request Status 2	0x06
3	Data Byte 1	Attenuator Selection 1 or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

(2) Response Message Structure (BUC to IDU)

a. Request Status 1

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Level Byte 1	MSbyte of Tx Output Power	*1
3	Level Byte 2	LSbyte of Tx Output Power	*1
4	Temperature	Temperature in deg. C	*2
5	Status Byte 1	Bit 0: Temperature Out-of-Range	1:Fail , 0:Normal
		Bit 1: PLL Out-of-Lock	1:Fail , 0:Normal
		Bit 2: Checksum Error	1:Error , 0:Normal
		Bit 3: Tx Status	1:Tx On , 0:Tx Off
		Bits 4 thru 7: BUC Power Class	0x1 to 0xA *3
6	Status Byte 2	Bits 0 - 3: Not used	Fixed 0xA
		Bits 4 - 7: Software Version	0x0 to 0xF
7	Checksum	Algebraic sum of bytes 1 - 6	

*1 Data Field Definition

Output power is the number which changed hexadecimal data into the decimal number and was divided by 100.

ex).

Output Power Data	Output Power
Data byte 1 is 0x10	} 0x1036 → +41.50 dBm
Data byte 2 is 0x36	

*2 Data Field Definition

Temperature data is -128 deg.C to +127 deg.C in two's complement.
(1 deg.C step).

ex).

When BUC Temperature is -40C, Temperature data is

*3 BUC Power Class

Value	0x1	0x2	0x3	0x4	0x5	0x6	0x7	0x8	0x9	0xA
Power	2W	4W	5W	8W	10W	16W	20W	25W	40W	60W

Appendix)

b. Set Transmit

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Tx On/Off	0x02
3	Data Byte 1	Tx Control	Off:0x00/On:0x01
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

c. Change BUC Address (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Change Address	0x03
3	Data Byte 1	New Address	0x01 to 0x0F
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

This command is not applicabe (N/A) in this version.

d. Set Carrier Frequency (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Set Carrier Frequency	0x04
3	Data Byte 1	Carrier Frequency	MSbyte
4	Data Byte 2	Carrier Frequency	LSbyte
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

This command is not applicabe (N/A) in this version.

e. Set Attenuator

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Set Attenuator	0x05
3	Data Byte 1	Attenuator Selection 1or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Set Att. bit in 10 dB digit	0x00 or 0x01
5	Data Byte 3	Set Att. bit in 1 dB digit	0x00 to 0x09
6	Data Byte 4	Set Att. bit in 0.5 dB digit	0x00 or 0x05
7	Checksum	Algebraic sum of bytes 1 - 6	

f. Request Status 2

Byte	Name	Description	Value
1	Address	Address of BUC	0x10 (to 0xF0)
2	Command	Request Status 2	0x08
3	Data Byte 1	Attenuator Selection 1or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Set Att. bit in 10 dB digit	0x00 or 0x01
5	Data Byte 3	Set Att. bit in 1 dB digit	0x00 to 0x09
6	Data Byte 4	Set Att. bit in 0.5 dB digit	0x00 or 0x05
7	Checksum	Algebraic sum of bytes 1 - 6	