

Allegato A2 – Sat Router



UHP-1000

UNIVERSAL SATELLITE ROUTER

SCPC

TDM/TDMA

Hubless TDMA

UHP-1000 satellite router is a universal software-defined component of highly-efficient satellite networks of any operation mode or topology. UHP-1000 can work as an SCPC modem with the satellite carrier fixed or assigned on-demand. It can also be a mini-hub or a remote station in TDM/TDMA network or any mode (master or slave) in a fully meshed Hubless TDMA network.

Innovative algorithms for network access, resource allocation and data encapsulation as well as advanced modulation and coding, implemented in the UHP routers, ensure efficient utilization of satellite resource. Two built-in demodulators allow simultaneous reception of either TDM carrier from the hub and TDMA mesh carrier from two distinct satellite beams or from two antennas. Universal modulator can simultaneously switch from TDMA burst mode to SCPC mode, thus assuring high data throughput and efficiency.



UHP-1000 router is a compact and reliable device and can be installed on a work desk or in an equipment rack or inside a customized enclosure. Low power consumption and uniquely fast start on power-up facilitate use of alternative power sources, such as solar batteries. Integrated high-performance IP router supports different protocols and has expanded means for provision of Quality of Service (QoS).

UHP-1000 is a high-performance satellite router for a wide range of applications, such as enterprise networking, videoconferencing, distribution and compression of video, voice and data trunking, cellular backhaul, and broadband Internet access.

- Various modes of operation and topologies: SCPC, TDM/TDMA, TDM/TDMA Mesh, Hubless TDMA
- Two demodulators with separate IF inputs and universal SCPC/TDMA modulator
- Superior productivity up to 60'000 pps and 150 Mbps aggregate throughput and 150 voice calls compressed
- Innovative TDMA protocol with LDPC coding and proven efficiency of 96% vs SCPC
- Ultra-low latency VSAT system with round-trip delay about 570 ms for TDMA mode of operations
- Support of VLAN, multi-level QoS, codec-independent handling of real-time traffic, TCP acceleration
- Built-in adaptive hierarchic traffic shaper specially designed for VSAT applications
- Capable of receiving carriers from two satellites simultaneously
- Built-in web-based management interface, user-friendly software configuration
- Fast network startup — network is ready for use in less than a minute upon power-up
- Low power consumption — less than 10 Watt (without RF ODU)
- Compatible with majority of C, Ku and Ka-band RF Systems, supplies power and reference signals
- Easy to install hardware and reliable operation with MTBF > 200'000 hours



UHP-1000 SATELLITE ROUTER SPECIFICATIONS

NETWORK												
Topology	'point-to-point', 'hub and spoke', 'multilevel tree', 'mesh'											
Modes of operation	SCPC, SCPC/DMA, TDM/SCPC, TDM/TDMA, TDM/TDMA Mesh, Hubless TDMA											
Network size	up to 254 TDMA Inroute channels and 500 000 terminals per network											
SCPC (TDM) CHANNEL												
Symbol rate	from 300 kSps (250 kSps DVB-S) up to 32 MSps (34 MSps DVB-S)											
Modulation / Coding	FEC	1/3	2/5	1/2	3/5	2/3	3/4	4/5	5/6	7/8	8/9	9/10
Demodulator Performance C/N, BER < 10 ⁻⁴	DVB-S (QPSK)	-	-	3.4	-	4.9	6.0	-	7.0	7.8	-	-
	DVB-S2 (QPSK ACM-Long)	-	-	0.9	2.4	3.2	4.1	4.8	5.1	-	6.3	6.5
	DVB-S2 (8PSK ACM-Long)	-	-	-	5.7	6.9	8.2	-	9.7	-	11.1	11.3
	DVB-S2 (16APSK ACM-Long)	-	-	-	-	10.0	10.8	11.4	11.9	-	13.3	13.5
	DVB-S2 (32APSK ACM-Long)	Available with future software release										
	DVB-S2 (QPSK ACM-Short)	-0.9	-0.0	0.9	2.6	3.3	4.2	5.0	5.5	-	6.4	-
	DVB-S2 (8PSK ACM-Short)	-	-	-	7.6	7.5	8.6	-	9.9	-	11.3	-
QoS	DVB-S2 (16APSK ACM-Short)	-	-	-	-	10.3	11.0	11.8	12.2	-	13.4	-
	DVB-S2 (32APSK ACM-Short)	Available with future software release										
TDMA	3-level prioritization, traffic policies, CIR, hierarchic 680-channel traffic shaper, PAP											
TDMA CHANNEL												
Symbol rate	from 100 kSps up to 4 MSps											
TDMA Protocol	frame 30-1000 ms, 9 slot sizes, manageable minimal bandwidth											
Modulation / Coding	FEC	2/3 5/6										
Demodulator Performance, BER < 10 ⁻⁷	BPSK (LDPC)	Available with future software release										
	QPSK (LDPC)	5.4 6.9										
	8PSK (LDPC)	9.6 12.0										
QoS	CIR, MIR, group QoS, hierarchic manager of TDMA bandwidth											
ROUTER												
Performance	up to 60'000 packets per second; 150 Mbps aggregate throughput; 150 voice calls compressed (cRTP)											
Support	DHCP, multiple IP/VLANs, NAT, proxy ARP, L2 Bridging, TCP Acceleration											
Protocols	DHCP, ICMP, SNMP, RIP, SMTP, TFTP, cRTP											
Management	HTTP interface, SNMP, Telnet, NMS with VNO support											
INTERFACES												
User LAN port	Ethernet 10/100Base-T, RJ-45											
Maintenance console	USB, B female											
IF Rx	950-2050 MHz (LNB DC - 13.5V/18V 0.75A), F type											
IF Tx	950-1750 MHz...-30...-5 dBm, (LO 10 MHz/ +5 dBm, BUC DC - 24V / 2A), F type											
MECHANICAL / ENVIRONMENTAL (IDU)												
Power	176-283 VAC, 10 W											
Operating temperature	0°...+50°C, humidity up to 90%											
Size / Weight	147x144x29 mm / 530 g											



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Allegato A2 – Low Noise Block

■ Ku-band PLL LNB - Internal Reference (L.O. Stability: ± 10 ppm) -

MODEL No. **NJR2835H/36H/37H/39H** series

< Features >

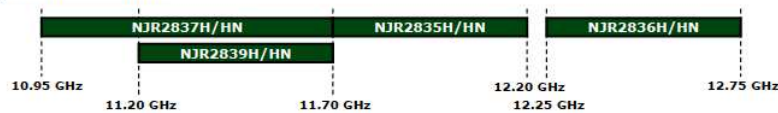
- * **Low Noise Figure**
 - Noise Figure: 0.8 dB
- * **Low DC Current Drain**
 - DC Current Drain: 250 mA
- * **Small Size & Light Weight**
 - Weight: 260 g
- * **RoHS Compliance**



< Line-Up >

Model No.	RF Frequency	Local Frequency	IF Frequency	Local Stability [-40 to +60 °C]	IF Connector	Power Supply
NJR2837H	10.95 to 11.70GHz	10.00 GHz	950 to 1,700 MHz	± 10 ppm	F-type	+24 VDC (+12 to +24 VDC)
NJR2837HN					N-type	
NJR2839H	11.20 to 11.70 GHz	10.25 GHz			F-type	
NJR2839HN					N-type	
NJR2835H	11.70 to 12.20 GHz	10.75 GHz	950 to 1,450 MHz		F-type	
NJR2835HN					N-type	
NJR2836H	12.25 to 12.75 GHz	11.30 GHz			F-type	
NJR2836HN					N-type	

Frequency Matrix



■ Ku-band PLL LNB - Internal Reference (L.O. Stability: ± 10 ppm) -

MODEL No. **NJR2835H/36H/37H/39H** series

< Specifications >

Item	Specifications
Input Interface	Waveguide, WR75 (with Groove)
Output Interface	N-type, female (50 ohm) [Model No.: NJR2835HN/36HN/37HN/39HN] F-type, female (75 ohm) [Model No.: NJR2835H/36H/37H/39H]
Noise Figure at +25 °C	0.8 dB typ., 1.0 dB max.
Linear Gain (Ta.: +25 °C)	60 dB typ., 55 dB min.
Local Stability	± 10 ppm (Ta.: -40 to +60 °C)
L.O. Phase Noise	-70 dBc/Hz typ. @ 100 Hz -80 dBc/Hz typ. @ 1 kHz
L.O. Leakage Level	-25 dBm max. at the IF Output Connector -60 dBm max. at the RF Input Flange
Spurious	a) -140 dBm max. at input, Fixed frequency spur, unrelated to test CW signal (Measured at specified IF band). b) -55 dBc max. with test CW signal -10 dBm IF output (Measured at specified IF band).
Input V.S.W.R.	2.5 : 1 typ.
Output V.S.W.R.	2.3 : 1 max.
Power Requirement	+24 VDC (+12 to +24 VDC)
Current Drain	250 mA max.
Temperature Range (ambient)	-40 to +60 °C (operating), -40 to +80 °C (storage)
Waterproof/Dustproof (IP Code)	IP 67
Dimension & Housing (without Interface Connectors)	100.5 mm (L) x 40 mm (W) x 40 mm (H) [3.96" (L) x 1.57" (W) x 1.57" (H)]
Weight	260 g [0.57 lbs]

*Note: The contents of this sheet are subject to change without notice. Rev.06(Jun. 2018) Ku PLL LNB (Int. Ref. 10ppm)_NJR2835H/36H/37H/39H (1/3)

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Allegato A2 – Block Up Converter

■ Universal/Standard Ku-band **3W** BUC

MODEL No. **NJT8302** series

< Features >

* RF Frequency Line-up

- Universal Ku-band: 13.75 to 14.5 GHz
- Standard Ku-band: 14.0 to 14.5 GHz

* High Efficiency Output Power

- P1dB: +34.0 dBm min. over temperature
- Power Consumption: 18 W

* Smaller Size & Lighter Weight

- Dimension: 91.55 (L) x 68 (W) x 42.5 (H) mm
- Weight: 350 g max



< Line-Up >

Model No.	RF Frequency	Local Frequency	IF Frequency	Output Power @ P1dB	IF Connector	Power Supply
NJT8302UN	13.75 to 14.5 GHz	12.80 GHz	950 to 1,700 MHz	3W Linear (+34.0 dBm min.)	N-type	+12 to +30 V DC Power
NJT8302UF	(Universal Ku-band)				F-type	
NJT8302N	14.0 to 14.5 GHz	13.05 GHz	950 to 1,450 MHz		N-type	
NJT8302F	(Standard Ku-band)				F-type	

< Specifications >

Item	Specifications	
Output Interface	Waveguide, WR75 (with Groove)	
Input Interface	N-type, female (50 ohm)	[Model No.: NJT8302N/UN]
	F-type, female (75 ohm)	[Model No.: NJT8302F/UF]
Output Power @ 1 dB G.C.P.	+34 dBm min. over temperature	
ACPR	-26 dBc min. @ Pout = +34 dBm	
Linear Gain	58 dB nom., 51 dB min.	
Requirement for External Reference	[Frequency]	10 MHz (sine-wave)
	[Input Power]	-5 to +5 dBm @ Input port
	[Phase Noise]	-125 dBc/Hz max. @ 100 Hz
		-135 dBc/Hz max. @ 1 kHz
L.O. Phase Noise	-60 dBc/Hz max. @ 100 Hz	-70 dBc/Hz max. @ 1 kHz
	-90 dBc/Hz max. @ 100 kHz	-100 dBc/Hz max. @ 1 MHz
Receive Band Noise Density @ Pout ≤ +34 dBm	[Tx: 13.75 to 14 GHz]	-156 dBm/Hz max. @ 10.95 to 12.25 GHz
	[Tx: 14 to 14.5 GHz]	-142 dBm/Hz max. @ 12.25 to 12.75 GHz
Input V.S.W.R.	2.0 : 1 max.	
Output V.S.W.R.	2.0 : 1 max.	
Power Requirement	+12 to +30 V DC Power	
Power Consumption	18 W typ., 23 W max. @ Pout = +34 dBm / 15 W max. @ No IF and +25°C	
	2W max. @ 10 MHz Reference Off (Mute on)	
Mute	Shut off the HPA in case of L.O. unlocked or no 10 MHz reference signal	
LED Indicator	GREEN: L.O. locked / RED: L.O. unlocked or no 10 MHz reference signal	
Temperature Range (ambient)	-40 to +55 °C (operating), -40 to +75 °C (storage)	
Humidity	0 to 100 %	
Altitude	15,000 feet (4572m)	
Waterproof/Dustproof (IP Code)	IP 67	
Dimension & Housing	91.55 mm (L) x 68 mm (W) x 42.5 mm (H)	
(without Interface Connectors)	[3.60" (L) x 2.68" (W) x 1.67" (H)]	
Weight	350g [0.77 lbs]	

(1/3)

*Note: The contents of this sheet are subject to change without notice.

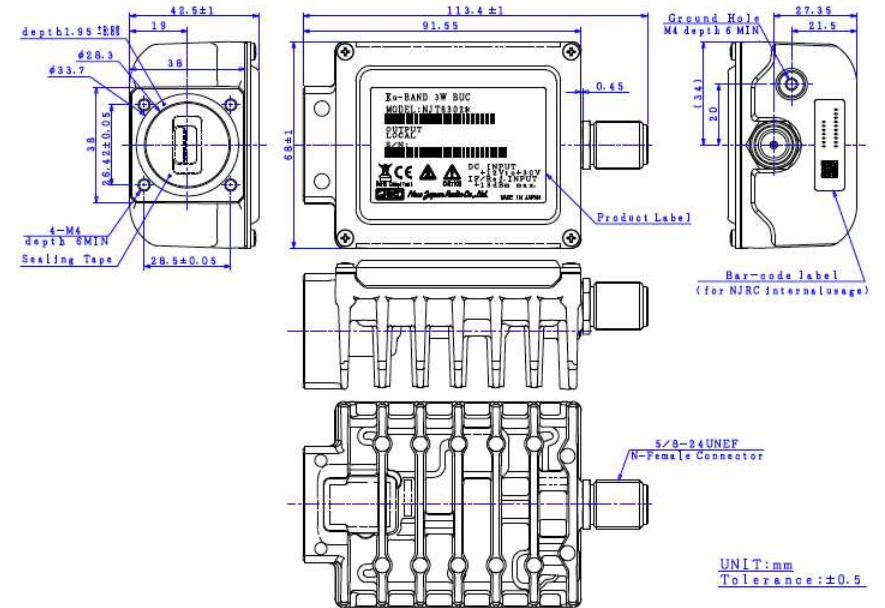
Rev.06(May 2017) Ku 3W BUC_NJT8302

■ Universal/Standard Ku-band **3W** BUC

MODEL No. **NJT8302** series

< Outline Drawing >

N-type, female Connector Model / DC Input: IF Connector



UNIT:mm
Tolerance:±0.5

(2/3)

*Note: The contents of this sheet are subject to change without notice.

Rev.06(May 2017) Ku 3W BUC_NJT8302

Allegato A2 – Antenna

96cm RxTx Class II Antenna System



RF Performance

Effective Aperture	96cm (38 in)
Operating Frequency	Tx: 13.75-14.50 GHz Rx: 10.70-12.75 GHz
Polarization	Linear, Orthogonal
Gain (± 0.3 dB)	Tx: 41.2 dBi @ 14.3 GHz Rx: 39.7 dBi @ 12.0 GHz
3dB Beamwidth	Tx: 1.5° @ 14.3 GHz Rx: 1.8° @ 12.0 GHz
Sidelobe Envelope (Tx, Co-Pol dB)	100 A/D < Θ < 20°: -29 - 25 Log Θ dB 20° < Θ < 26.3°: -3.5 dB 26.3° < Θ < 48°: -32-25 Log Θ dB 48° < Θ < 180°: -10 dB (averaged)
Antenna Cross-Polarization	30 dB within 1 dB contour
Antenna Noise Temperature*	10° El: .53K 20° El: .39K 30° El: .32K
VSWR	Tx: 1.3:1 Rx: 1.5:1
Isolation (Port to Port)	Tx: 80dB Rx: 35dB
Feed Interface	Tx: WR75 Flat Flange Rx: WR75 Flat Flange

Mechanical Performance

Reflector Material	Glass Fiber Reinforced Polyester
Antenna Optics	One-Piece Offset Feed Prime Focus
Mount Type	Elevation over Azimuth
Elevation Adjustment Range	7° - 84° Continuous Fine Adjustment
Azimuth Adjustment Range	360° Continuous, ±20° Fine
Mast Pipe Interface	73-76mm (2.88-3.00 in) Diameter O.D.
Wind Loading	Operational: 80 km/h (50 mph) Survival: 200 km/h (125 mph)
Temperature	-50°C to 80°C
Humidity	0 to 100% (Condensing)
Atmosphere	Standard Hardware Meets 720 Hour Salt Spray Test Requirements (ASTM B-117)
Solar Radiation	360 BTU/h/ft2
Shock and Vibration	As Encountered During Shipping and Handling

*Gain and Noise Temperature at Feed Horn Flange
(All Specifications Typical)

REV 03/18 - 01

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