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700MHZ B12 TRDU USER MANUAL

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1.0 Introduction

MTI's G07CRH-48-01B is a 2x67W LTE TRDU which has two RF transmitters, two receivers and double duplexer filter. It is packaged in a single shelf-mounted module and is deployed in CPRI-compliant basestation networks.

The TRDU features in-house developed dynamic digital power amplifier linearization technology which efficiently processes LTE transmissions, enabling:

- High PA efficiency, resulting in low power consumption (475 W)
- Low EVM waveform support. Adjustable from <4% to >12%
- Efficient unbalanced power transmissions

Additional features:

- Hardware ready to support 1 LTE carrier with 1.4MHz, 3MHz, 5MHz and 10MHz bandwidth or up to 3 LTE carriers with 15MHz maximum bandwidth.
- Low receiver noise figure (2dB), enables the base station OEM to reach excellent receiver sensitivity. Two Rx chains support receive diversity, increasing uplink performance even further.
- Two externally pluggable SFP sockets enabling field selectable optical interfaces including 1310nm(UL)/ 1550nm(DL) single-mode single fiber and 850nm multi-mode dual fiber. Electrical interfaces are supported as well
- Software supports Ethernet over CPRI and allows easy implementation of customer specific requirements.
- Supports 2-way MIMO. Two units can be combined to support 4x4 MIMO or 2-way MIMO with 4 receive branches.
- External AISG interface, I2C interface and a serial port for additional system control and monitoring.
- Extensive Operations and Maintenance functionality supported through flexible O&M SW. Self-diagnosis and alarms continuously monitoring:
- High MTBF (>375,000 hours)



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2.0 System Specifications

Table 1: MECHANICAL/ENVIRONMENTAL SPECIFICATIONS

PARAMETER	TARGET SPECIFICATIONS
Unit Dimensions	360.0 mm by 367.0 mm by 110.0 mm=14.53 liter
Unit Weight	14.5 Kg
DC Power in	-37V to -57VV (Nominal -48Vdc)
Operational Temperature Range	-40°C to +55°C
Storage/Transportation Temperature Range	-55°C to +70°C
Enclosure Class	IP20
Safety and Grounding	EN 60950-1, IEC 60950, UL 60950-1
Storage	ETSI EN 300 019-1-1 class 1.2, IEC 60721-3-1
Transportation	ETSI EN 300 019-1-2 class 2.3, IEC 60721-3-2
Operational	ETS 300 019-2-4
Standards Compliance	IEC 68 Series, ETS EN 300 019 Series
MTBF @ 40° C	>375,000 Hours, SR-332

Table 2: SYSTEM SPECIFICATIONS

Programmable Frequency Range	Band12: DL Band 729-745MHz, UL Band 699~715MHz
Power Supply Voltage	-48V DC
Total Power Consumption	475W typical
Receive Diversity	2 antenna receive diversity standard
Transmit Diversity	2 antenna transmit diversity standard
Receiver Noise Figure	2.0 dB nominal, <2.2 dB at max operating temperature
Instantaneous Bandwidth	15 MHz
# of Carriers	3 LTE carrier with maximum 15MHz bandwidth
Transmit Output Power	2x 67W (2x48.26 dBm) at antenna connector
Output Power Accuracy	+/- 0.5 dB
Downlink Modulation	LTE
SEM/ACPR/EVM	As defined in TS 36.104 V8.6.0 or latest
CPRI Rate	Support CPRI rates 1 through 5, hardware ready for rate 6
Optical or electrical Interface	Standard SFP modules, field loadable

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4.0 Interfaces

4.1 Connectors

PARAMETER	Signals	Connector type	Connection
CPRI	Data/control	SFP sockets	Interface between the RRH and Node B controller
LMT interface	Debug	RJ45/1394	Ethernet interface between the RRH and user maintenance
Transmit/Receive Antenna Connector	RF	DIN Type female	Transmit (Tx) and receive (Rx) the signals between the RRH and the antenna
Power Supply Connector	DC Power	D-Sub	Primary power input to the RRH
ALD	AISG	AISG 8-pin	Antenna Line Device
I2C	I2C	RJ45	I2C control interface
TX monitor	RF	DIN 1.0/2.3 female	TX monitor ports
Auxiliary RX I/O port	RF	DIN 1.0/2.3 female	RX monitor and testing ports

4.1.1 CPRI Data/Control

Optical/Electrical Connectors: SFP cages		
PIN #	PIN Name	Function
Primary	CPRI PRI	Master Fiber LC connector to SFP module
Secondary	CPRI SEC	Slave Fiber LC connector to SFP module

4.1.2 Debug Connector

Debug Connector: RJ45		
PIN #	PIN Name	Function
1	RJ45 TX+	Ethernet Transmit pair positive
2	RJ45 TX-	Ethernet Transmit pair negative
3	RJ45 RX+	Ethernet Receive pair positive
4	Reserved	Not used
5	Reserved	Not used
6	RJ45 RX-	Ethernet Receive pair negative
7	Reserved	Not used
8	Reserved	Not used

4.1.3 RF connectors

PIN #	PIN Name	Function
TX1/RX1	Transmit Receive	DIN type Transmit/Receive RF port
TX2/RX2	Transmit Receive	DIN type Transmit/Receive RF port

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4.1.4 DC Power Connector

DC Power Connector: Mini Fit Junior		
PIN #	PIN Name	Function
1	+24V	+24V DC supply input
2	+24V RTN	+24V DC supply return

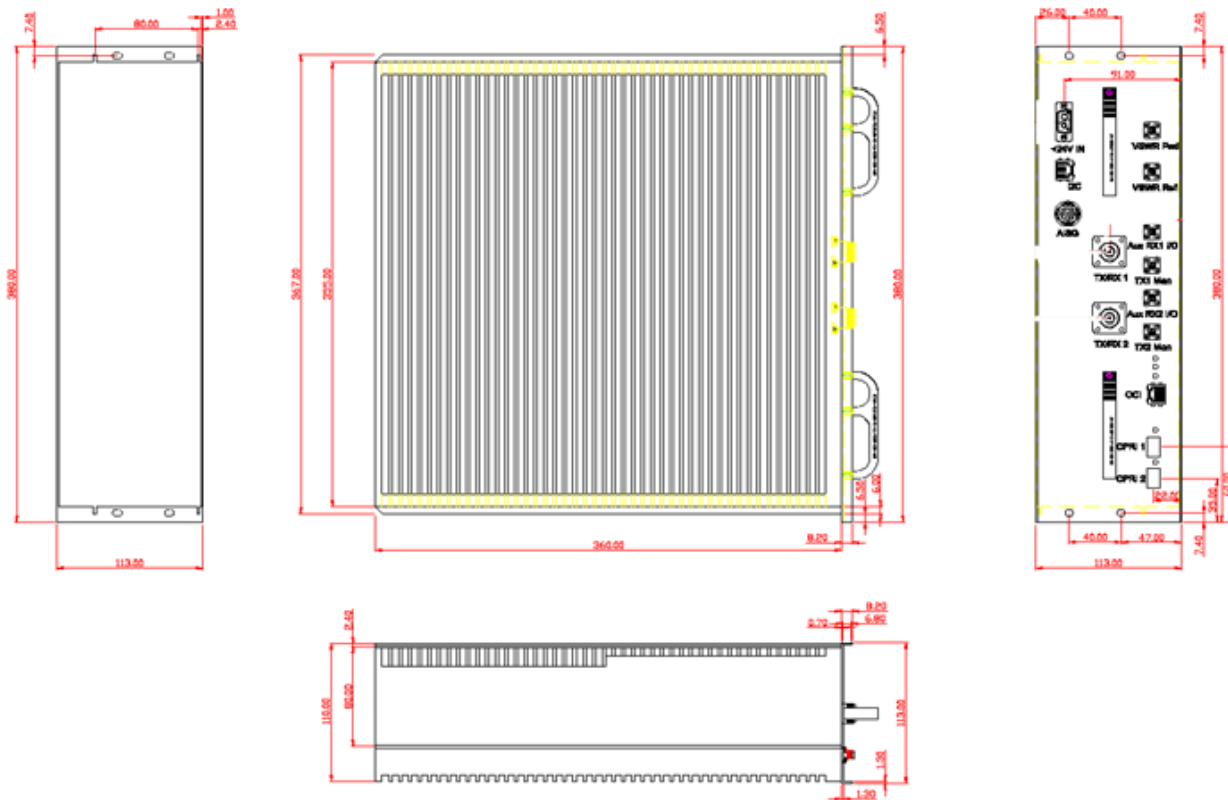
4.1.5 AISG Connector

8-pin AISG				
PIN #	Designation	Max Current Capability	Current Clamp	Additional Notes / Requirements
1	+12 V DC Nominal	1.0 A	1.0 A	RRH shall monitor and report current over CPRI.
2	not used			Not used, not connected
3	RS485 B			
4	RS485 GND			RS485 ground, isolated from DC Return and Ground
5	RS485 A			
6	+24V Nominal	850 mA	850 mA	RRH monitor and report current over CPRI
7	DC Return			
8	N/C			Not used, not connected

4.1.6 I2C Connector

8-pin RJ-45 style connector					
PIN #	Designation	Max Current Capability	Current Clamp	Description	Additional Notes/ Requirements
1	+24V_FL_1	*		+24V pin 1 (power for external filter)	RRH reports current over CPRI (current combined with Pin 2) Regulated supply. Not active until 100ms to 200ms after Pin 7 is pulled down through resistor (between 1K and 10Kohm) to ground.
2	+24V_FL_2	*		+24V pin 2 (power for external filter)	Same as Pin 1. Common internal source for Pin 1 & 2 is acceptable.
3	GND				
4	GND				
5	I2C_SDA			Serial Data I/O (I2C)	4.7k ohm pull up resistor to 3.3V
6	GND				
7	CTL_24V			Control pin for +24V	Pull down through 1kohm (or lower) resistance to enable 24V on pins 1 & 2.
8	I2C_SCL			Serial Clock (I2C)	Using pull-up resistors, pulled up to 3.3V.

5.0 Mechanical



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6.0 Photographs

6.1 Front Panel



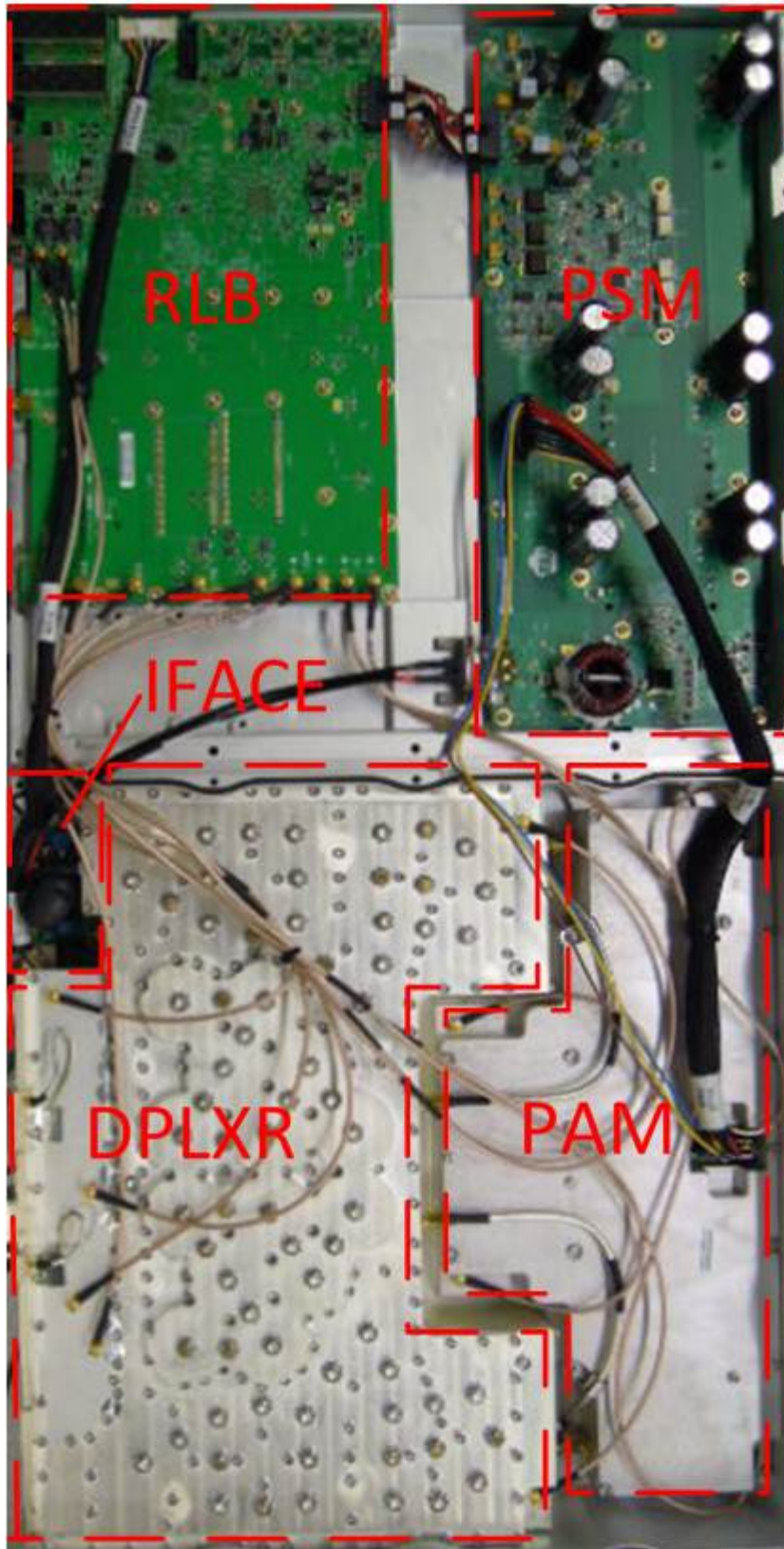
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6.2 Chassis – Open Faced



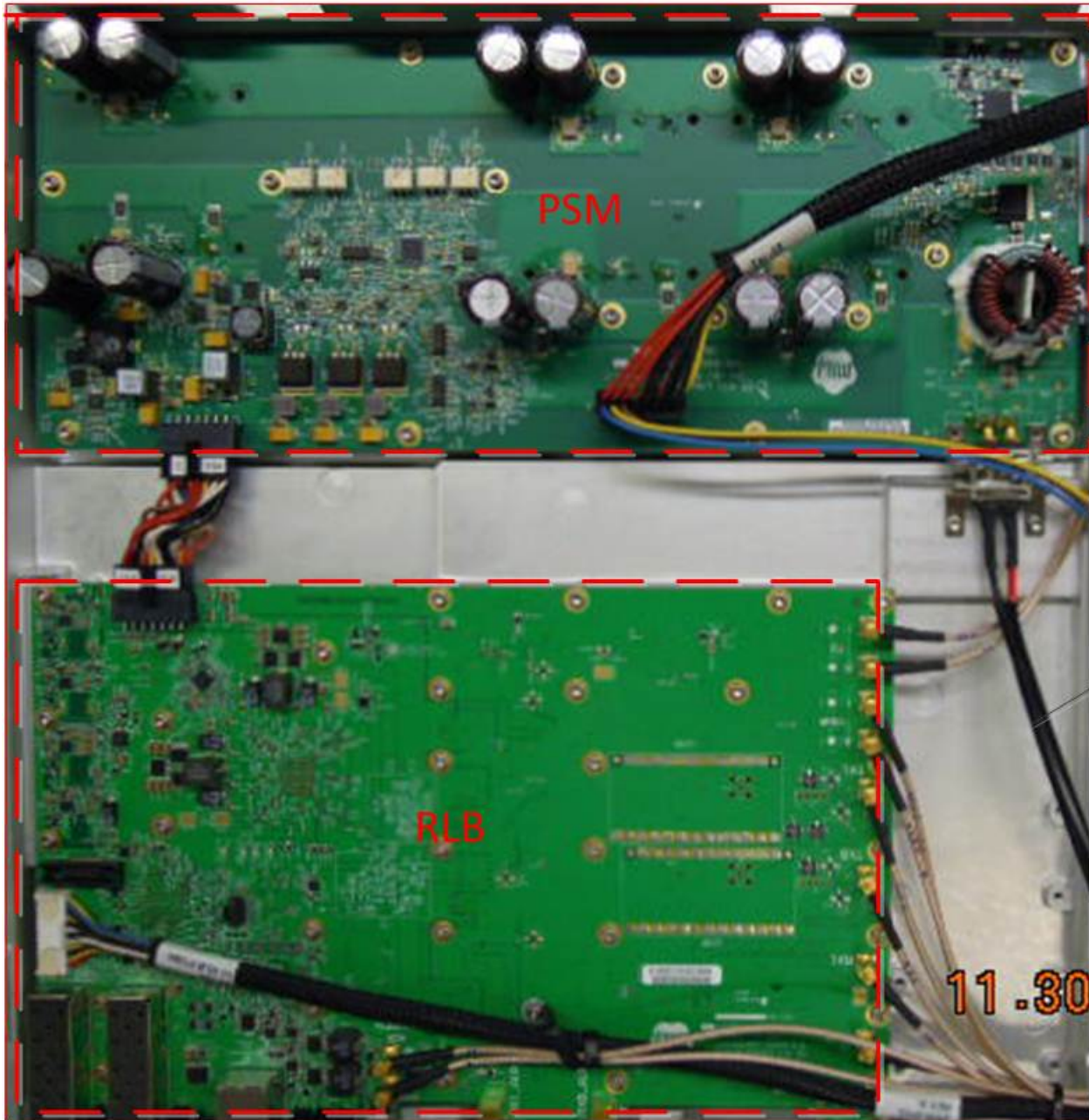
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6.3 RLB and PSM



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United States

Indoor applications

This equipment is intended for installation in restricted access locations where access is controlled or where access can only be gained by service personnel with a key or tool. Access to this equipment is restricted to qualified service personnel only.

Antenna exposure

Antenna installations for the 9412 eNodeB shall be performed in accordance with all applicable manufacturer's recommendations, and national laws and regulations. To ensure correct antenna installation, the antenna installer shall perform all necessary calculations and/or field measurements to evaluate compliance with applicable national laws or regulations regarding exposure to electromagnetic fields. The supplier of radio equipment, the supplier of antenna equipment and the integrator and builder of the site must provide sufficient information so that the limits of the exclusion zones can be determined. Any changes to the antenna or other equipment in the transmit path may require re-evaluation of the exposures to electromagnetic fields.

Pursuant to 47 CFR Part 1, Subpart I, subject to the provisions of section 1.1307, all installations must be evaluated for requirements contained in Table 1, "Limits for maximum permissible exposure," in section 1.1310.

Packaging collection and recovery requirements

Countries, states, localities, or other jurisdictions may require that systems be established for the return and/or collection of packaging waste from the consumer, or other end user, or from the waste stream. Additionally, reuse, recovery, and/or recycling targets for the return and/or collection of the packaging waste may be established.

For more information regarding collection and recovery of packaging and packaging waste within specific jurisdictions, please contact the Alcatel-Lucent Services - Environmental Health and Safety organization. For installations not performed by Alcatel-Lucent Technologies, please contact the Alcatel-Lucent Customer Support Center at:

Technical Support Services, within the United States: +1 630 224 4762, prompt 2

Product Conformance Statements - United States

Introduction

The statements that follow are the product conformance statements that apply to the 9412 eNodeB when deployed in the United States.

Federal Communications Commission

Important! Changes or modifications not expressly approved by Alcatel-Lucent, Inc. could void the user's authority to operate the equipment.

FCC Part 15

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

FCC Part 15 Class B (as marketed)

Important! This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

FCC Part 68

This Part does not apply

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RF approval

This equipment complies with Part 2, Subpart J - Equipment Authorization Procedures, of the FCC Rules.

This device complies with Part 27 - MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES, Subpart 27.53 (g)

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