Alto L-band Smart Amplifier Module

with low noise, high linearity, variable gain and slope control

L-band Smart high linearity amplifier designed to work in the Genus 2U chassis range operating over 850 to 2150MHz. The amplifier has three modes of operation:

- Power Mode - in this mode attenuation is adjusted at the input of the amplifier when gain is adjusted. This means that linearity is maintained, but noise figure increases as gain decreases.
- Noise Mode - in this mode attenuation is adjusted at the output of the amplifier when gain is adjusted. This means that noise figure is optimised, but linearity decreases as gain decreases.
- Compromise Mode - in this mode attenuation is applied equally at the input and the output of the amplifier when gain is adjusted. Neither linearity nor noise figure is favoured.

Resilience
from dual redundant hot-swap power supplies & field replaceable CPU & HMI

Hot swap & replaceable
RF amplifier modules. Up to 16 RF modules.

Remote control & monitoring
via RJ45 Ethernet port with SNMP & web browser interface

L-band
850-2150MHz operating frequency range

Local control & monitoring
via HMI high resolution touchscreen

Balance input signals
with variable gain or variable output level (AGC) modes & slope control

Compact
housed in a 2U chassis

Chassis Specification	
Dimensions/Weight/Colour	2U high x 550mm deep x 19" wide / <10kg / RAL9003 - white (semi-matte)
Capacity	17 module slots. Note: Actual modules may require >1 slot. Refer to required module spec table.
Temperature	Operating: 0˚C to +45˚C Storage: -20˚C to +75˚C
Location/Humidity/Altitude	Indoor use only / 20 to 90% non-condensing / 2,000m AMSL (Operational) 8,000m AMSL (Storage) Above Mean Sea Level
Control & Monitoring	Local: HMI, capacitive touch screen Remote: Ethernet via RJ45, 10BaseT/100 BaseTx. ETL TCP/IP, SNMPv2/3, HTTPS & built-in web server. HMI and CPU field replaceable.
MTTR	20 minutes (15 minutes to retrieve spare part and 5 mins to replace). Applies to LRUs only and assumed in-house stock.
AC Input/Consumption	85-264Vac 50/60Hz / 275W max. consumption at steady state
PSU Redundancy	Dual redundant and alarmed. Diode OR. Hot swappable.
Input & Output Ports	Dependant upon module fitted

Smart Amplifier Module

Compact form factor allows multiple modules to be housed in the 2U GENUS chassis. Each module occupies 1 slot in the chassis.

RF Parameters			
Model Numbers		ALT-G2S-L1-130-XXXX	
Frequency Range		850 - 2150 MHz	
Size		1 slot wide	
MTBF		>150,000 hours	
RF Connectors		50Ω SMA / 50Ω N-type	
Gain		45 ± 2.0 dB max. 15 ± 2.0 dB min.	
Gain Flatness When set to 0dB slope. In manual gain control mode, not AGC.	850 - 2150MHz	±1.5 dB	
	Any 36MHz	±0.25 dB	
Gain Steps		0.25 ± 0.15 dB in manual gain mode	
Slope Control Range		0 to 8 dB	Pivot point is at 2150MHz. This is the point of max gain when positive slope is set to a value other than 0dB.
Slope Control Steps		1 ± 0.5 dB	
Input Return Loss		18 dB typ. 12 dB min.	
Output Return Loss		18 dB typ. 12 dB min.	
Isolation		60dB typ. 50dB min.	With amplifiers set at the same gain level. Worst case isolation is between adjacent amps, isolation degrades dB to dB for different gain levels.
Reverse Gain		< -60 dB typ.	
Noise Figure		4 dB typ. @ max gain setting 6 dB max. @ max gain setting	
1db GCP		32 dBm typ. 30.5 dBm min.	Output power, over full gain range
OIP3		42 dBm typ. 39 dBm min.	At max. gain
OIP2		66 dBm typ. 60 dBm min.	At max. gain
RF Output Detector (dBm)		-20 min. 30 max. ±3 accuracy	
In band, signal independent spurii		<-85 dBm max.	Very low level spurii from CPU clock, switch mode PSU and other control electronics inside the chassis.
Maximum Input Level		+20 dBm	For no damage. Non-operational.

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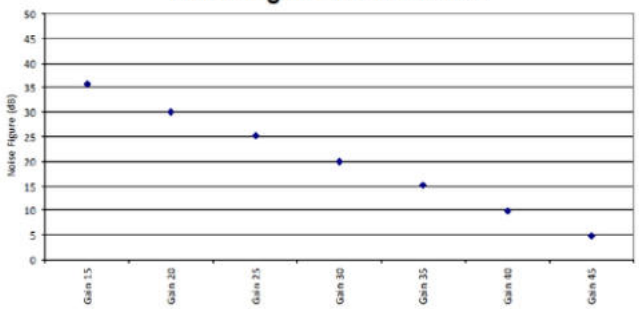
Interface, Monitoring & Alarms		
Control Method	Local and remote as provided by selected chassis	
LNB Power	None	
Environmental		
Operating Temperature	-0˚C to +50˚C	Up to 8 modules in a chassis.
	-0˚C to +45˚C	Up to 16 modules in a chassis.
Storage Temperature	-20˚C to +75˚C	
Location	Indoor use only, within parent GENUS chassis	
Humidity	20 to 90% non-condensing, relative humidity	
Altitude	10,000ft / 3,000m above mean sea level	
Physical Dimensions & Parameters		
Weight	<0.35kg typ.	

Typical P1dB* - Power Mode

Gain (dB)	P1dB @ 850MHz	P1dB @ 1500MHz	P1dB @ 2150MHz
15	>25 dBm	>25 dBm	>25 dBm
20	>30 dBm	>30 dBm	>30 dBm
25	32.7	31.8	31.4
30	32.8	31.8	31.7
35	32.8	32	31.7
40	32.8	32	31.8
45	32.9	32.1	31.8

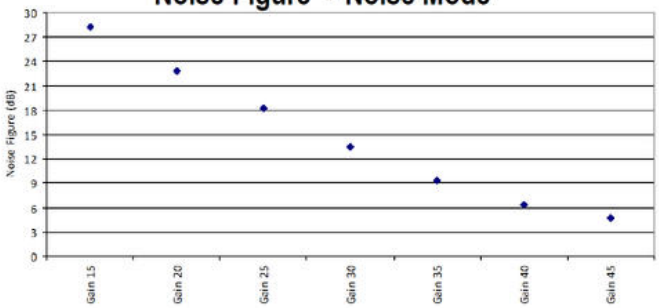
Noise Figure* Power Mode



Typical P1dB* - Noise Mode

Gain (dB)	P1dB @ 850MHz	P1dB @ 1500MHz	P1dB @ 2150MHz
15	12.7	14	13
20	17.8	19.1	18.3
25	22.6	23.9	23
30	27.5	28	27.4
35	30	29.5	29.5
40	32.8	31.9	31.7
45	32.9	32	31.8

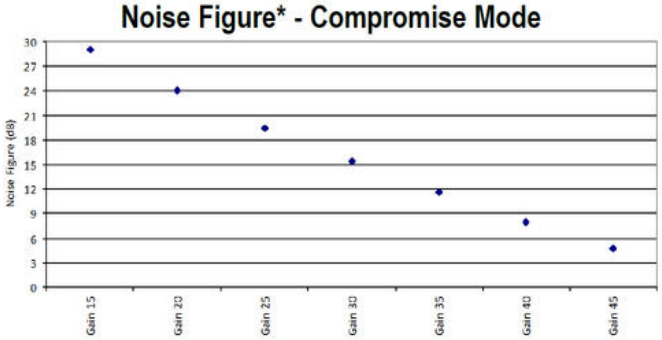
Noise Figure* - Noise Mode



Typical P1dB* - Compromise Mode

Gain (dB)	P1dB @ 850MHz	P1dB @ 1500MHz	P1dB @ 2150MHz
15	>25 dBm	>25 dBm	>25 dBm
20	>30 dBm	>30 dBm	>30 dBm
25	32.6	31.4	30.4
30	32.8	31.7	31
35	32.8	32	31.3
40	32.9	32	31.4
45	32.9	32.1	31.3

Noise Figure* - Compromise Mode



The performance quoted above is for a standalone amplifier. For in-chassis performance, see relevant spec. tables.
Note 1: The specification is subject to regular reviews and will be updated from time to time as part of our continuing product development and improved spec accuracy.
Note 2: Operation beyond the quoted limits stated above may cause instantaneous and permanent damage.
*Measured values taken at room temperature