

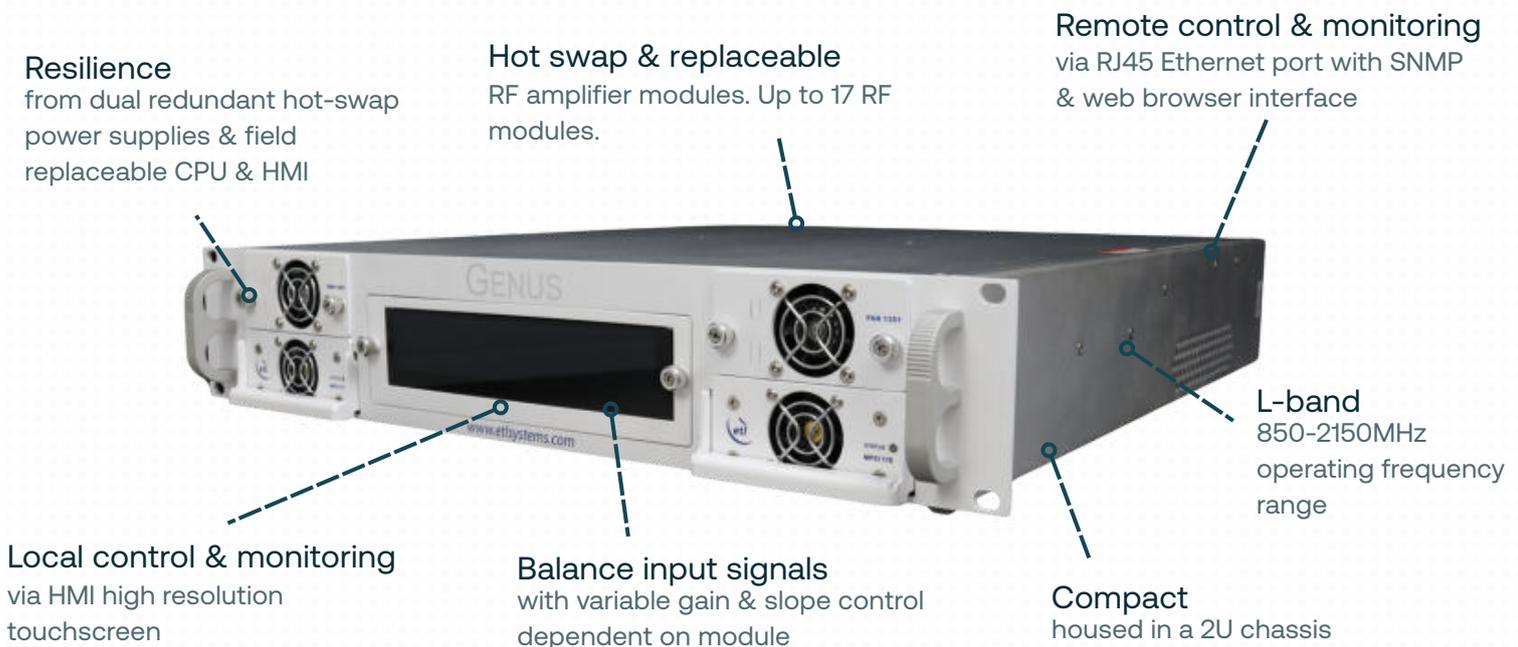
# Alto L-band Redundant Amplifier Module

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

L-Band redundant amplifier module. Designed to be housed in Genus 2U 19" chassis. It operates over 850-2150 MHz. The module has low noise, high linearity, with variable gain control. Positive slope compensation.

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.



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	Dependent upon module fitted



# ALT-G2R-L1-131 ■ & SWF-G2R-SX-126-S5S5



## 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.

1+1 Redundant Amplifier Module - RF Parameters Preliminary Specifications		
Model Numbers	ALT-G2R-L1-131 (The spec below is for ALT-G2R-L1-131 in 1+1 redundancy configuration with SWF-G2R-SX-126-S5S5)	
Frequency Range	850 - 2150 MHz	
Size	1 slot wide	
MTBF	>150,000 hours	
Gain	40 ± 2.0 dB max. 10 ± 2.0 dB min.	
Gain Flatness <small>When set to 0dB slope. In manual gain control mode, not AGC.</small>	850 - 2150MHz	±1.75
	Any 36MHz	±0.35
Gain Steps	0.25 ± 0.15 in manual gain mode	
Slope Control Range	0 to 6 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 ± 0.25	
Input Return Loss	14 dB typ. 10 dB min.	
Output Return Loss	14 dB typ. 10 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	9 dB typ. @ max gain setting 11 dB max. @ max gain setting	
1dB GCP	29 dBm typ. 27 dBm min.	At max. gain
OIP3	38 dBm typ. 36 dBm min.	At max. gain
OIP2	60 dBm typ. 58 dBm min.	At max. gain
RF Output Detector (dBm)	-23 min. 27 max. ±3 accuracy	
In band, signal independent spuri	<-85 dBm typ.	Very low level spuri from CPU clock, switch mode PSU and other control electronics inside the chassis.
Maximum Input Level	+20 dBm	For no damage. Non-operational.
Tech Spec Version	V1.0	



# ALT-G2R-L1-131 ■ & SWF-G2R-SX-134-S5S5



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Gain Flatness <small>When set to 0dB slope.</small>	850 - 2150MHz	±1.75 dB
	Any 36MHz	±0.35 dB
Gain Steps		0.25 ± 0.15 dB
Slope Control Range		0 to 6 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 dB ± 0.25
Input Return Loss		14 dB typ. 10 dB min.
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RF Output Detector		-23 dBm min. 27 dBm max. ±3 dBm accuracy
In band, signal independent spuri		<-85 dBm typ. Very low level spuri from CPU clock, switch mode PSU and other control electronics inside the chassis.
Maximum Input Level		+20 dBm For no damage. Non-operational.
Technical Specification Version		V1.1

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
10	23.5	23.5	23.5
15	28.5	28.5	28.5
20	28.5	28.5	28.5
25	30.2	28.9	28.2
30	30.2	28.9	28.2
35	30.2	28.9	28.2
40	30.2	28.9	28.2

**Typical P1dB - Compromise Mode**

Gain (dB)	P1dB @ 850MHz	P1dB @ 1500MHz	P1dB @ 2150MHz
10	23.5	23.5	23.5
15	28.5	28.5	28.5
20	29.5	28.1	28.5
25	30	28.7	28
30	30.2	28.8	28.1
35	30.2	28.9	28.2
40	30.1	28.9	28.2

**Typical P1dB - Noise Mode**

Gain (dB)	P1dB @ 850MHz	P1dB @ 1500MHz	P1dB @ 2150MHz
10	10.2	10.2	9
15	15.3	15.4	14.2
20	20	20	19.1
25	25	24.6	23.5
30	29.6	28.2	27.3
35	30.2	28.9	28.3
40	30.2	28.9	28.3

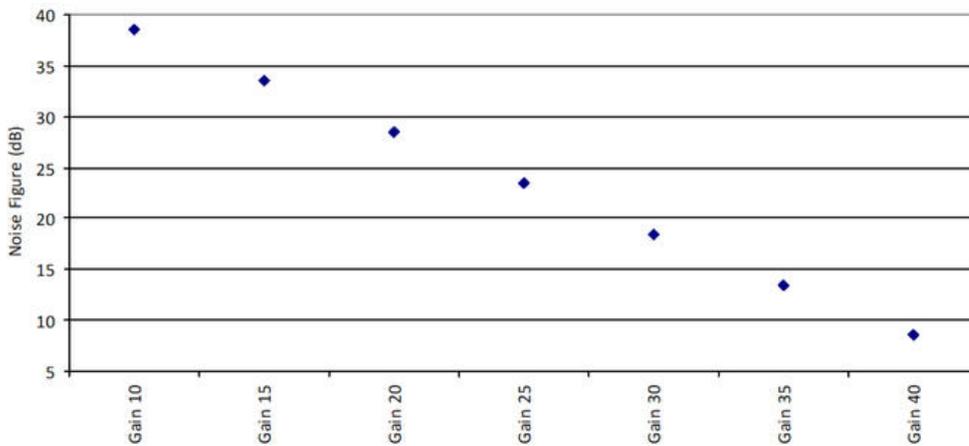
The performance quoted above is for a standalone amplifier. For in-chassis performance, see relevant spec. tables.

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.

Typical Noise Figure - Power Mode

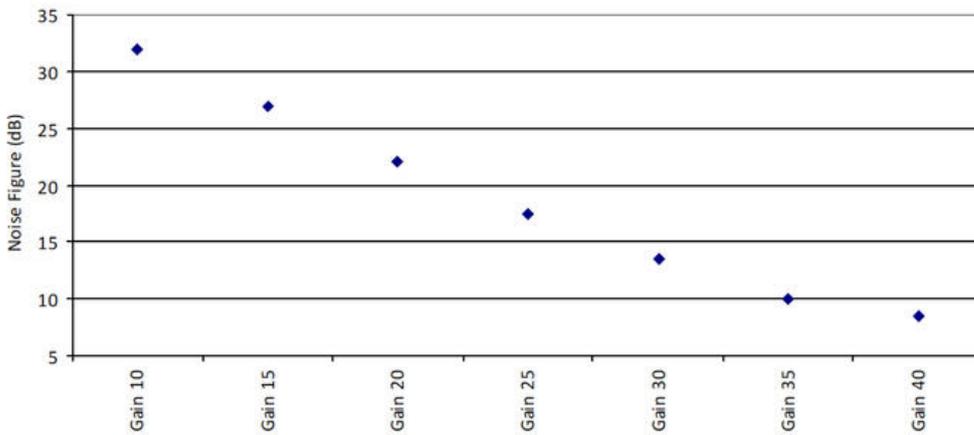
Typical OIP2 - Power Mode

**Noise Figure Scatter**


Gain (dB)	OIP2 (dBm)
10	61.32
15	61.12
20	61.21
25	61.35
30	61.05
35	61.37
40	61.44

Typical Noise Figure - Noise Mode

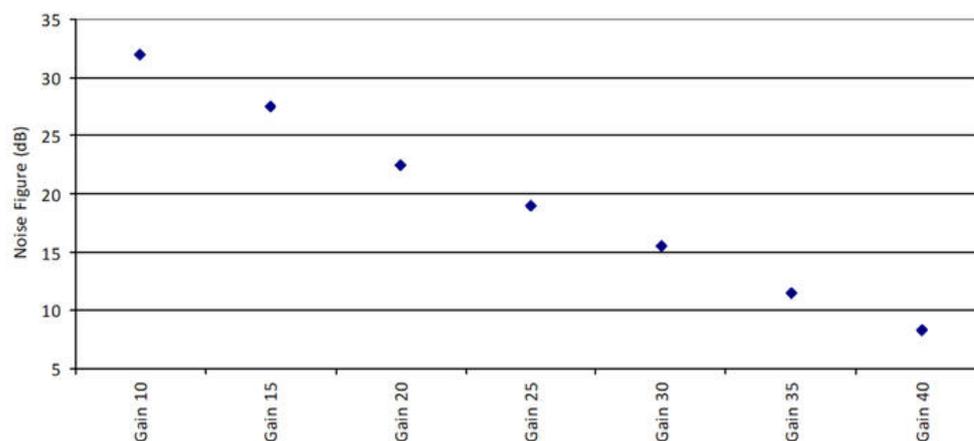
Typical OIP2 - Noise Mode

**Noise Figure Scatter**


Gain (dB)	OIP2 (dBm)
10	48.39
15	52.02
20	55.25
25	57.75
30	59.39
35	60.9
40	61.8

Typical Noise Figure - Compromise Mode

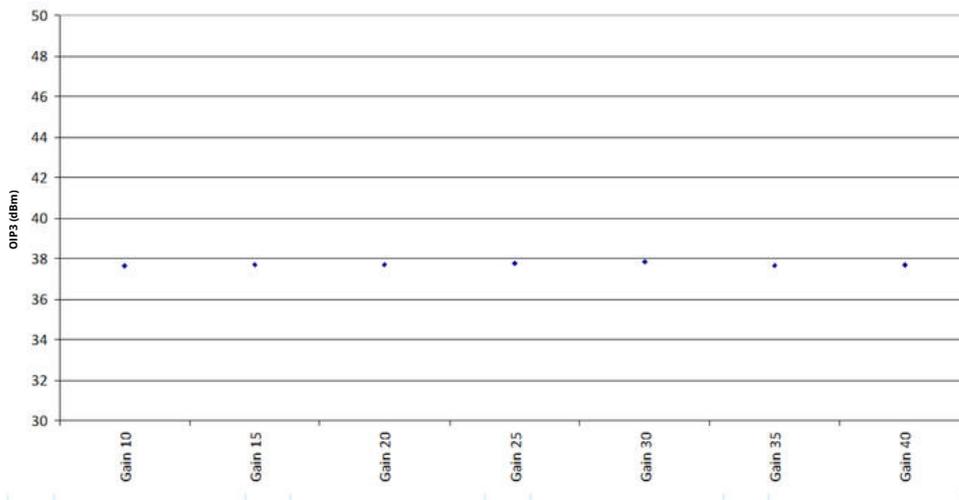
Typical OIP2 - Compromise Mode

**Noise Figure Scatter**


Gain (dB)	OIP2 (dBm)
10	59.67
15	60.35
20	61.15
25	62.01
30	62.15
35	63.03
40	62.13

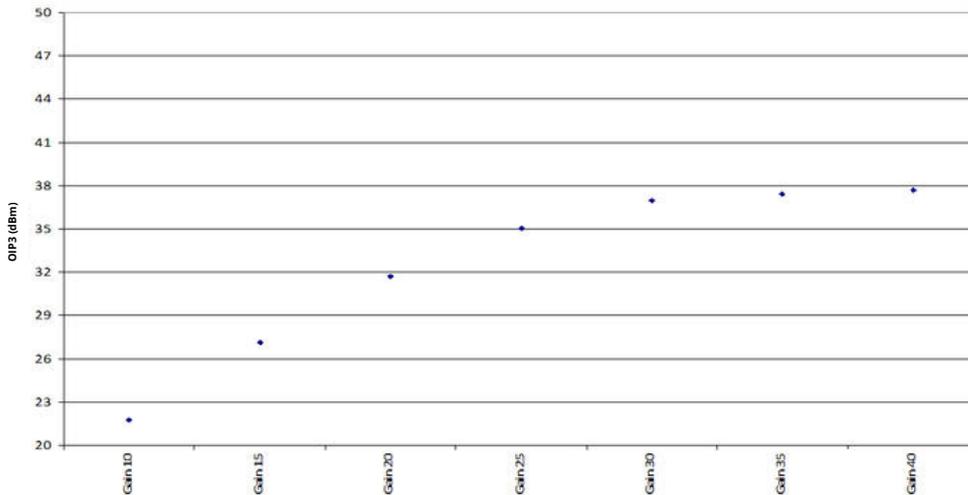
## Typical OIP3 - Power Mode

## OIP3 Minimum Scatter



## Typical OIP3 - Noise Mode

## OIP3 Minimum Scatter



## Typical OIP3 - Compromise Mode

## OIP3 Minimum Scatter

