Alto L-band Redundant Amplifier Module

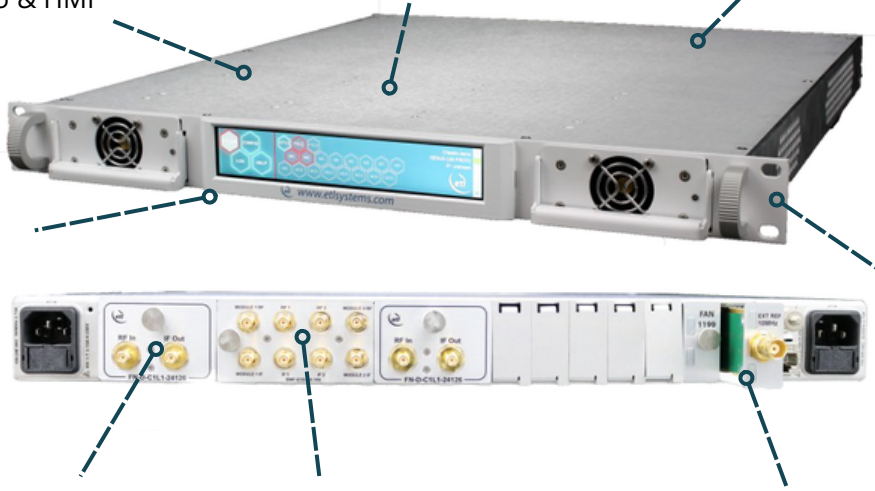
with low noise, high linearity, variable gain and slope control

ALT-G1R-S3-101 is an L-band hot swap low noise & high linearity redundant amplifier, with variable gain and slope control designed to fit into the 1U Genus chassis. The 1U redundancy chassis has the capacity for 1+1. 2+1 and 4+2 hot-swap module configurations.

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



Local control & monitoring
via HMI high resolution touchscreen

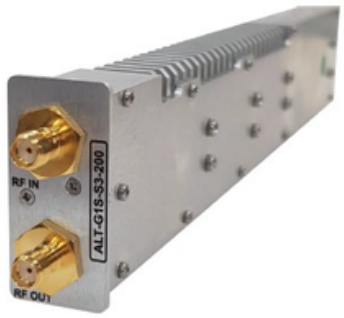
Extended L-band
850-2450MHz operating frequency range

Field replaceable Internal 10MHz reference source
and external reference inject port with auto detection (optional)

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

Compact indoor & outdoor
chassis options, which can be part populated

Chassis Specification	
Dimensions/Weight/Colour	1U 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



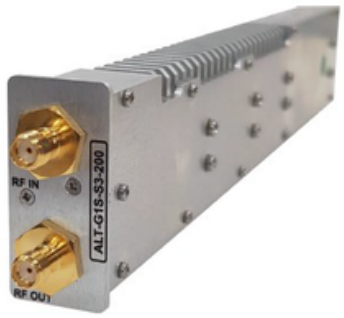
Smart Amplifier Module

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

High linearity ensures overall RF gain signal performance is optimised.

Low noise for prime signal quality.

1:1 Redundant Amplifier Module - RF Parameters			
Model Numbers		ALT-G1R-S3-101 (The spec below is for ALT-G1R-S3-101 in 1:1 redundancy configuration with SWF-G1R-SX-101)	
Frequency Range		850 - 2450 MHz	
Size		1 slot wide	
RF Ports		50Ω SMA	
MTBF		>150,000 hrs. MTBF of each amp module. These are hot-swap	
Gain		42 ± 2.0 dB max. -7 ± 2.0 dB min.	
Gain Flatness	850 - 2450MHz	±1.0 dB	When set to 0dB slope. In manual gain control mode, **not** AGC.
	Any 36MHz	±0.3 dB	
Gain Steps		0.25 ± 0.15 dB in manual gain mode	
Slope Control Range		0 to 6 dB	Pivot point is at 2450MHz. This is the point of max gain when positive slope is set to a value other than 0dB.
Slope Control Steps		1 ± 0.25 dB	
Input Return Loss		16 dB typ. 12 dB min.	
Output Return Loss		16 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	Typ.	5 dB	At max. gain
	Max.	6 dB	At max. gain
1db GCP	Typ.	19 dBm	At max. gain
	Min.	16 dBm	At max. gain
OIP3	Typ.	31 dBm	At max. gain
	Min.	28 dBm	At max. gain
OIP2	Typ.	44 dBm	
	Min.	40 dBm	
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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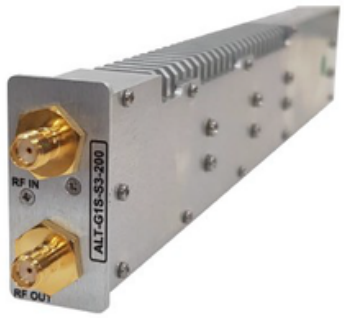
2+1 Redundant Amplifier Module - RF Parameters			
Model Numbers		ALT-G1R-L1-105 (The spec below is for ALT-G1R-S3-101 in 2+1 redundancy configuration with SWF-G1R-SX-114)	
Frequency Range		850 - 2450 MHz	
Size		1 slot wide	
RF Ports		50Ω SMA	
MTBF		>150,000 hrs. MTBF of each amp module. These are hot-swap	
Gain		38 ± 2.0 dB max. -11 ± 2.0 dB min.	
Gain Flatness	850 - 2450MHz	±1.2 dB	When set to 0dB slope. In manual gain control mode, **not** AGC.
	Any 36MHz	±0.3 dB	
Gain Steps		0.25 ± 0.15 dB in manual gain mode	
Slope Control Range		0 to 4 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 dB	
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	Typ.	6 dB	At max. gain
	Max.	7 dB	At max. gain
1db GCP	Typ.	19 dBm	At max. gain
	Min.	16 dBm	At max. gain
OIP3	Typ.	31 dBm	At max. gain
	Min.	28 dBm	At max. gain
OIP2	Typ.	41 dBm	
	Min.	37 dBm	
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.



Smart Amplifier Module

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

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4+2 Redundant Amplifier Module - RF Parameters			
Model Numbers		ALT-G1R-S3-101 (The spec below is for ALT-G1R-S3-101 in 4+2 redundancy configuration with SWF-G1R-S5-103-S5S5)	
Frequency Range		850 - 2450 MHz	
Size		1 slot wide	
RF Ports		50Ω SMA	
MTBF		>150,000 hrs. MTBF of each amp module. These are hot-swap	
Gain		36 ± 2.0 dB max. -13 ± 2.0 dB min.	
Gain Flatness	850 - 2450MHz	±1.2 dB	When set to 0dB slope. In manual gain control mode, **not** AGC.
	Any 36MHz	±0.3 dB	
Gain Steps		0.25 ± 0.15 dB in manual gain mode	
Slope Control Range		0 to 5 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 dB	
Input Return Loss		14 dB typ. 10 dB min.	
Output Return Loss		14 dB typ. 10 dB min.	
Isolation		60 dB Typ. (850-2150MHz) 50 dB Min. (850-2150MHz) 55 dB Typ. (2150-2450MHz) 45 dB Min. (2150-2450MHz)	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	Typ.	6 dB	At max. gain
	Max.	8 dB	At max. gain
1db GCP	Typ.	18 dBm	At max. gain
	Min.	15 dBm	At max. gain
OIP3	Typ.	30 dBm	At max. gain
	Min.	27 dBm	At max. gain
OIP2	Typ.	40 dBm	
	Min.	36 dBm	
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.

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.	

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.