

New generation of GaN based SSPAs/BUCs for broadcast satcom



USING CUTTING-EDGE GAN TECHNOLOGY, THE NEW KU SSPA FAMILY OFFERS OUTSTANDING PERFORMANCE IN OUTDOOR/INDOOR OPERATIONS

Multicarrier operation

No memory effects and limited back off guaranteeing unlimited carriers.

Modularity

A combination in phase of 600 W SSPAs delivers output powers up to a few kW's on a built-in redundancy and hot swappable amplification configuration.

Efficiency & Reliability

Super linearity for maximum useable output power to provide customised linearisation independent of the modulation method used.

Robust performance guaranteed through individual unit testing over temperature at factory. Built-in output isolator for protection against reflected power.

Advanced packaging and cooling techniques enable the equipment to be operated in the toughest environments.

Monitoring & Control

Full M&C capability through RS-485/USB (ASCII commands) or with the option of an Ethernet port (Telnet, HTTP with embedded user-friendly web page or SNMP).

Discrete lines for mute and turn on/off functions and a summary alarm (Form C relay and discrete) for speedy operation.



Key Features

- * Ultra high output power
- * Highly efficient
- * Super high linear power
- * Multicarrier operation
- * Superior lifetime based on GaN-tech
- * High MTBF
- * Soft-fail redundancy
- * Hot-swappable amplification modules
- * OPEX savings
- * Weatherproof (outdoor)
- * Compact design
- * Simple operation & maintenance



OTHER FEATURES

- * Automatic Control Mode: AGC, ALC
- * Pressure window
- * Output RF calibrated sample port

OPTIONS

- * Extended temperature range: -40 °C, +55 °C
- * Receive reject filter (external)
- * Harmonic filter (external)
- * L to Ku band up-converters in 1:1 redundancy configuration (external)
- * SNMP
- * AC breaker box

RF performance

Operating frequency range	13.75 - 14.50 GHz / 12.75-13.25 GHz
Output power (P_{SAT} (typical))	
1.1 kW / 2 kW / 3.5 kW	60.4 dBm / 63 dBm / 65.4 dBm
Linear output power (P_{LINEAR})	
1.1 kW / 2 kW / 3.5 kW	59.4 dBm / 62 dBm / 64.4 dBm
Gain	>70 dB
Gain flatness	<4 dB p-p over full band; <1 dB p-p over any 40 MHz
Gain variation over temperature	< \pm 1.5 dB over full operating range
Attenuation adjustment range	30 dB in 0.25 dB step
Input VSWR	\leq 1.5:1
Output VSWR	\leq 1.3:1
Spectral regrowth	-25 dBc @ P_{LINEAR} *
Spurious	-60 dBc max @ P_{LINEAR} *

* For single carrier with modulation DVB-S, 4Mbaud, roll-off: 0.25, ModCod QPSK-3/4, occupied bandwidth 5MHz, measured @1.0x symbol rate

Power Supply

Input voltage	90-264 VAC, 50-60 Hz
Power consumption @ P_{SAT}	
1.1 kW / 2 kW / 3.5 kW	<5 kW / <10 kW / <20 kW

Interfaces & Physical

Dimensions (L x W x H)	
Outdoor	1200 x 1200 x 1000 mm (1.1 kW) 1200 x 1200 x 2000 mm (2 kW) 1200 x 1600 x 2000 mm (3.5 kW)
Indoor	19" Rack cabinet 44 U (H), 1 m (D) Qty. x1 (1.1 kW / 2 kW) Qty. x2 (3.5 kW)
Interfaces	RF input: N (f) RF output: WR75 grooved / RF sample: SMA M&C: Ethernet or 19-pin MIL circular (outdoor) M&C: Ethernet or 15-pin D-Sub (indoor)

Monitor & Control

Remote control	RS-485 / Ethernet / Dry-Contacts / Web user interfaces
Monitor parameters	Forward & Reverse output power / Input power / Individual SSPAs output power / Temperature / Summary alarms
Internal self protection	Temperature (>85 °C) / Reflected power / High input-output power

Environmental

Operating temperature	-30 °C to +55 °C (outdoor) / 0 °C to +50 °C (indoor)
Storage temperature	-40 °C to +85 °C
Humidity	100 % condensing (outdoor)



SOFT REDUNDANCY

- * 2 GaN SSPAs in phase combination
- * 60.4 dBm at Psat in full operation
- * 57.4 dBm at Psat when one SSPA is in failure (~3 dB losses)

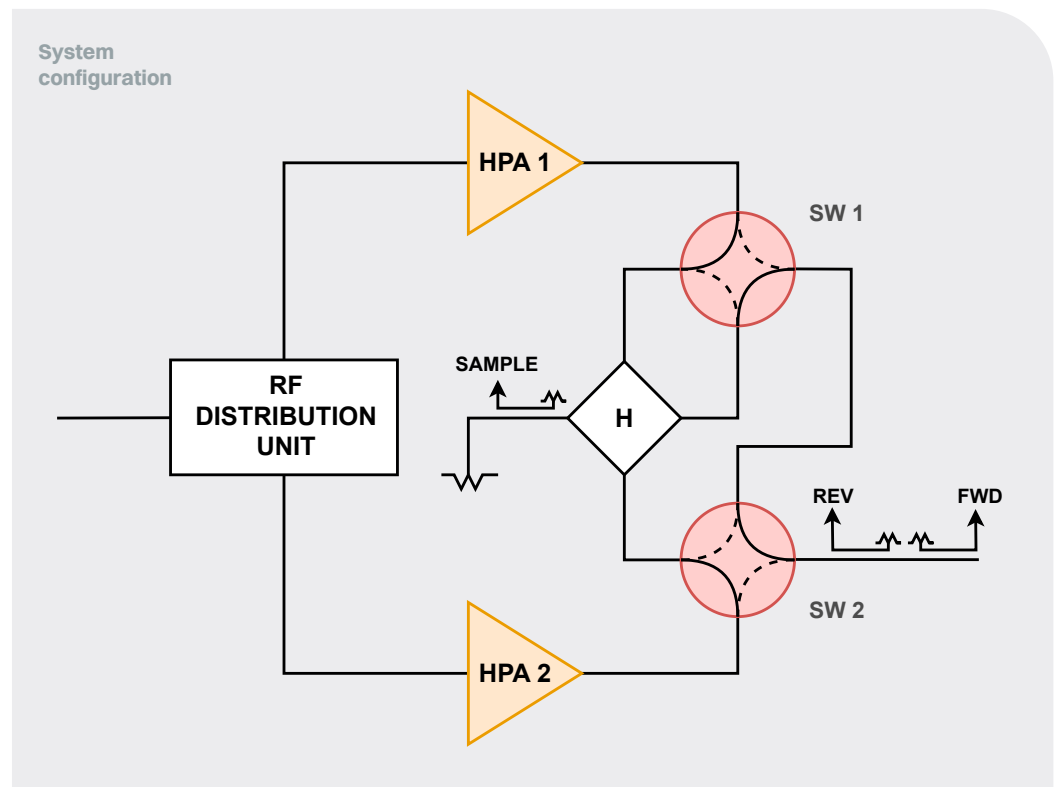
 **Parts included**

GaN high power transmitter	GaN SSPA Ku 600W (qty 2)
WG assembly kit	WG combiner WR-75 sections WG load (qty 1) WG switches (qty 2) FWD & REV dual crossguide coupler Sample crossguide coupler
System controller	STANDARD model Ethernet port USB local port Dual internal power supply
RF distribution unit	RF power divider Pre-amplifier stage for gain controlling
System cabling	M&C from controller to SSPAs (qty 2) M&C from controller to switches (qty 2) RF from RF distribution unit to SSPAs (qty 2) RF from power couplers to controller (qty 3)
Mating connectors	AC line for SSPAs (qty 2) AC line for controller (qty 2) Ethernet (qty 1) RS-485 (qty 1)
Frame/Structure	Mechanical frame with lateral and top covers - Outdoor system Rack cabinet (qty 1) - Indoor system

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sales@ttinorte.es

Information contained in this document is subject to change without notice.

Unless otherwise specifications, tests have been done at 23 °C.





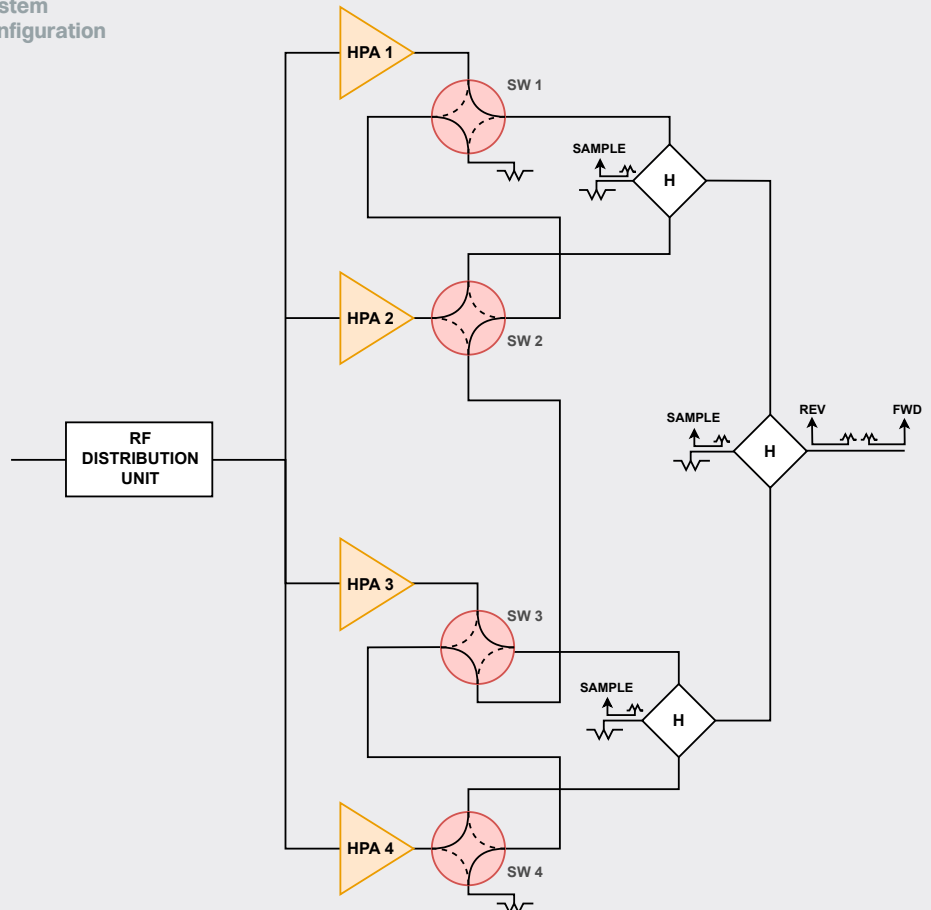
SOFT REDUNDANCY

- * 4 GaN SSPAs in phase combination
- * 63 dBm at Psat in full operation
- * 60.6 dBm at Psat when one SSPA is in failure (~2.4 dB losses)

 **Parts included**

GaN high power transmitter	GaN SSPA Ku 600W (qty 4)
WG assembly kit	WG combiner WR-75 sections WG loads (qty 3) WG switches (qty 4) FWD & REV dual crossguide coupler Sample crossguide coupler (qty 3)
System controller	HYPER model Ethernet port USB local port Dual internal power supply
RF distribution unit	RF power divider Pre-amplifier stage for gain controlling
System cabling	M&C from controller to SSPAs (qty 4) M&C from controller to switches (qty 4) RF from RF distribution unit to SSPAs (qty 4) RF from power couplers to controller (qty 5)
Mating connectors	AC Line for SSPAs (qty 4) AC Line for controller (qty 2) Ethernet (qty 1) RS-485 (qty 1)
Frame/Structure	Mechanical frame with lateral and top covers - Outdoor system Rack cabinet (qty 1) - Indoor system

System configuration



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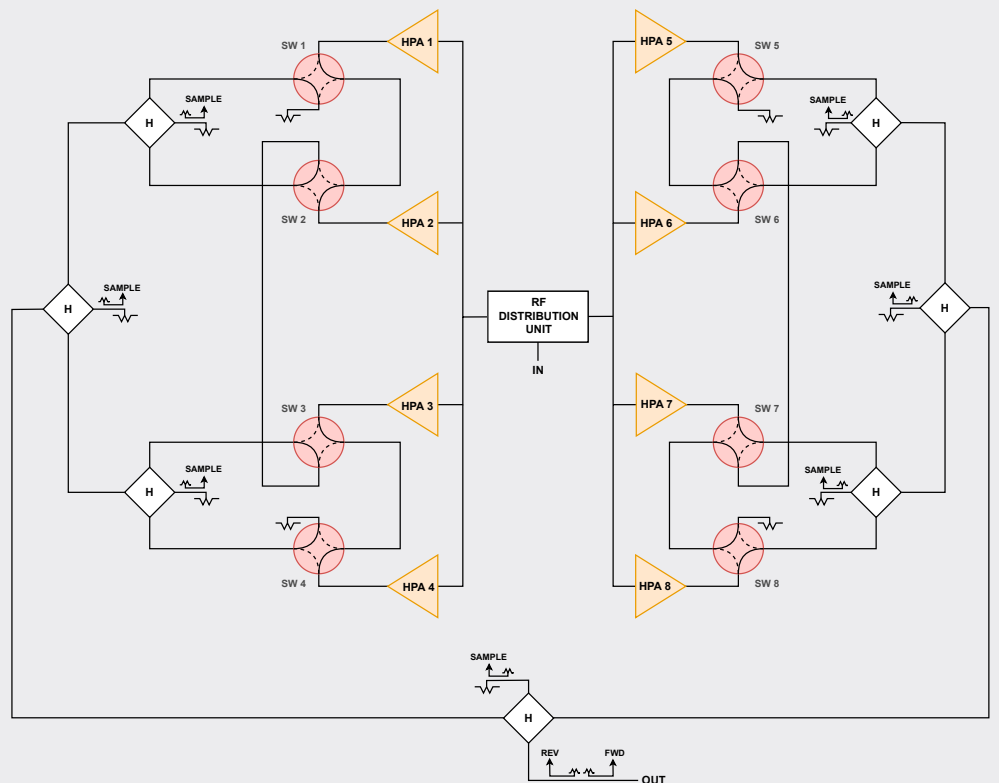
SOFT REDUNDANCY

- * 8 GaN SSPAs in phase combination
- * 65.4 dBm at Psat in full operation
- * 64.15 dBm at Psat when one SSPA is in failure (~1.25 dB losses)

 **Parts included**

GaN high power transmitter	GaN SSPA Ku 600W (qty 8)
WG assembly kit	WG combiner WR-75 sections WG loads (qty 7) WG switches (qty 8) FWD & REV dual crossguide coupler Sample crossguide coupler (qty 7)
System controller	ULTRA model Ethernet port USB local port Dual internal power supply
RF distribution unit	RF power divider Pre-amplifier stage for gain controlling
HotSwap switching unit	Switching control
System cabling	M&C from controller to SSPAs (qty 8) M&C from controller to switches (qty 8) RF from RF distribution unit to SSPAs (qty 8) RF from power couplers to controller (qty 9)
Mating connectors	AC Line for SSPAs (qty 8) AC Line for controller (qty 2) Ethernet (qty 1) RS-485 (qty 1)
Frame/Structure	Mechanical frame with lateral and top covers - Outdoor system Rack cabinet (qty 2) - Indoor system

System configuration



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