

# Broadband 100 Watt GaN Power Amplifier

30 to 512 MHz High Power, Class AB Design for Military Communications



## Features

- 100 Watts Typical Output Power @ P1dB
- Push-Pull Configuration
- Microprocessor Based Control
- Integrated Heat Sink
- Lightweight Package; 1.25 lbs. Max

API Technologies’ Model QBS-598 is a high power, class AB amplifier utilizing the latest GaN technology to offer broadband performance from 30 to 512 MHz in support of critical communication requirements for both commercial and military applications. The two stage push-pull design incorporates a microprocessor, and a high efficiency DC to DC converter to promote operation over a wide DC input voltage range of +22 to +32 VDC. Over this power supply window, the amplifier draws 9 amps at rated output power for 1dB compression, which is typically 100W, and has a saturated gain of approximately 30 dB.

The integrated microprocessor allows for power supply sequencing, transistor bias optimization, temperature compensation, and fault monitoring. This rugged, high reliability GaN based amplifier is configured in a lightweight aluminum housing with an integrated heat sink. It is capable of performing in adverse environments and will not be damaged operating into a 10:1 load mismatch at full rated power.

## Technical Specifications <sup>(1)</sup>

Parameter	Unit	Typical 25°C	Min/Max -40°C to +55°C
Frequency Range	MHz	30 - 512	30 - 512
Power Gain <sup>(2)</sup>	dB	32	29 min.
Input Return Loss	dB	-17	-10 min.
Noise Figure	dB	6.0	7.5 max.
P <sub>OUT</sub> @ 1dB Compression	dBm	+50	+49 min.
P <sub>OUT</sub> @ 3dB Compression	dBm	+51	+50 min.
2 <sup>nd</sup> Harmonic <sup>(2)</sup>	dBc	-17	-15 max.
3 <sup>rd</sup> Harmonic <sup>(2)</sup>	dBc	-11	-10 max.
Spurious Signals	dBc	< -70	—
DC Voltage	Vdc	+28	+22 to +32
DC Current (Quiescent)	A	0.6	1.5 max.
DC Current @ P <sub>OUT</sub> = 80W	A	9.0	10.0 max.
PA Enable	TTL	Logic 1: Active / Logic 0: Current < 0.25A	
PA Enable Switching Time	µsec	—	20

## Absolute Maximum Ratings

Parameter	Specification
DC Voltage	+32.0 Vdc
RF Input Power	+27 dBm
Operating Case Temperature <sup>(3)</sup>	- 40°C to +70°C
Storage Temperature	- 55°C to +125°C

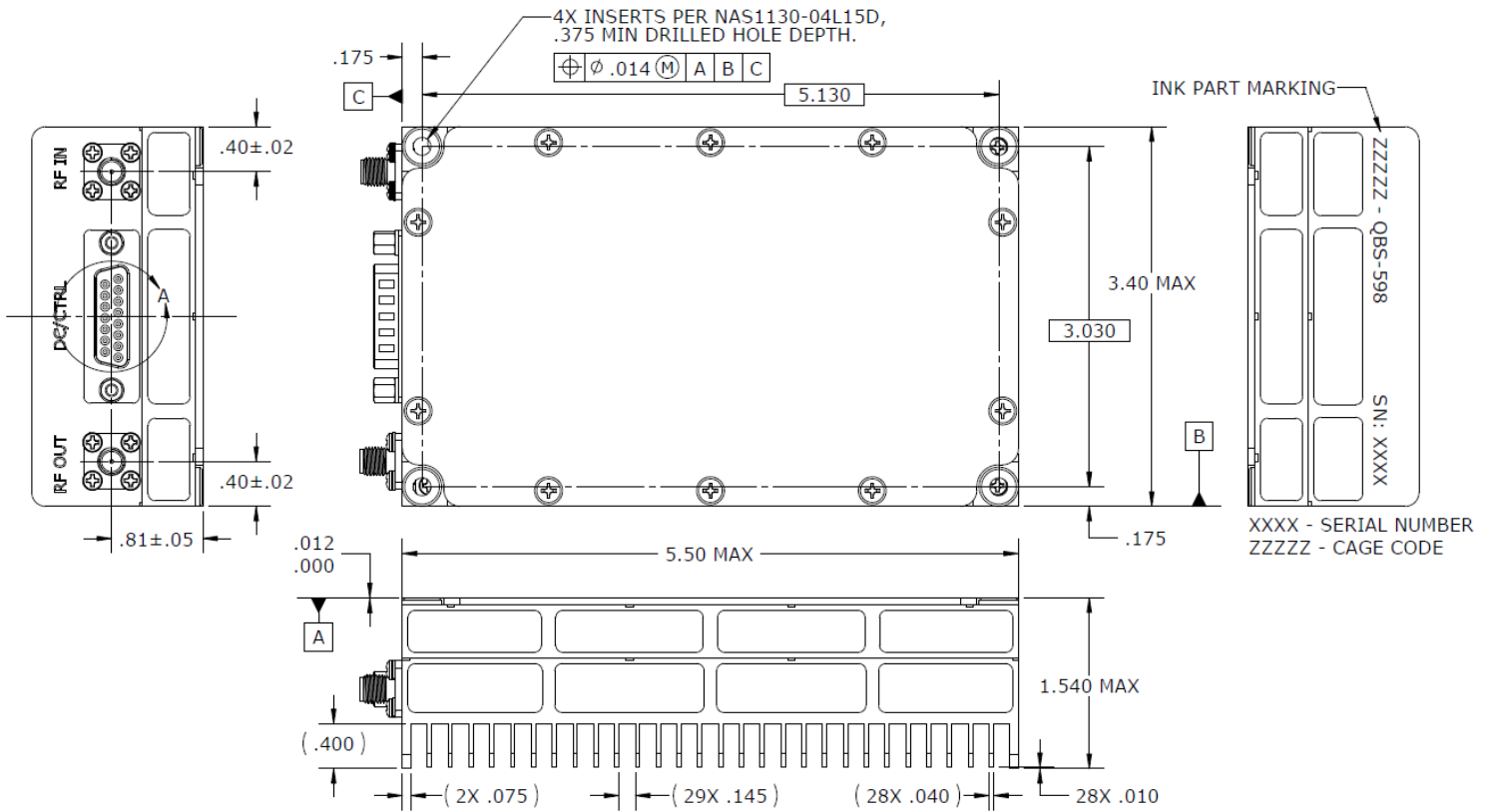
### Notes:

1. Specification ratings are based on measurements in a 50 ohm system at a nominal DC power of +28 V.
2. P<sub>OUT</sub> = 80W
3. Maximum Operating Case Temperature is defined as the baseplate temperature which, if exceeded for extended periods, could result in premature unit failure. This data is provided for user reliability information. This may or may not represent the maximum temperature for electrical parameter specifications.

## Mechanical Specifications

Parameter	Specification	Comments
Package (non-hermetic)	API Dwg: 080-25517	6061-T6 Al Alloy
Finish	Clear Iridite	MIL-DTL-5541F, Class 3
RF In / Out Connectors	SMA Female	4-Hole Flange Mount
DC/CTRL Connector	15 Pin D-Sub (Male)	Standard Density

Outline Drawing



Pin Designations

Pin #	Signal	Pin #	Signal
1	+VDC	9	+VDC
2	+VDC	10	+VDC
3	NC	11	STANDBY
4	OVERCURRENT	12	RESERVED
5	TEMP	13	RESERVED
6	SIGNAL GROUND	14	-VDC
7	-VDC	15	-VDC
8	-VDC		

