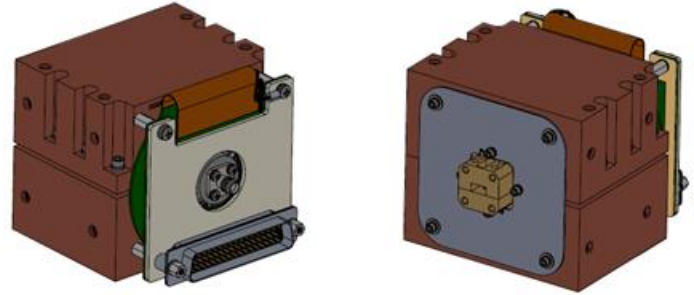


Product Description

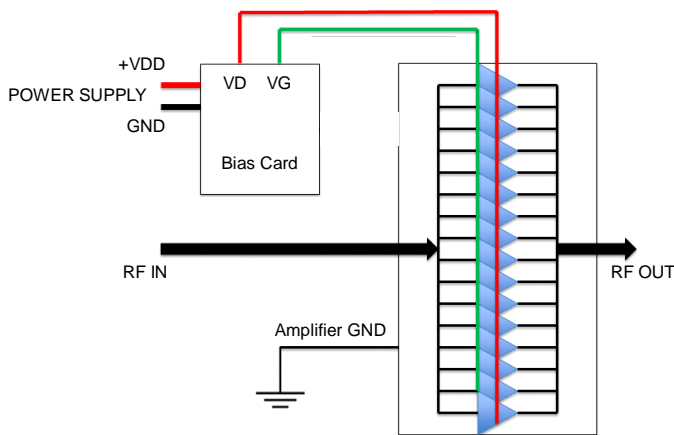
An excellent alternative to traveling wave tube amplifiers, Qorvo’s Spatium™ QPB3238 is a solid state, spatial-combining amplifier with an operating range of 32–38 GHz while achieving a minimum of > 51 dBm of instantaneous saturated power. With its maximum performance in output power, gain, efficiency, and power flatness, this Spatium is the ideal building block for millimeter-wave high power transmitters for EW and radar applications.

Qorvo’s patented and field-proven Spatium combining technology provides unprecedented Solid-State Power Amplifier (SSPA) performance in a rugged, compact size and weight which reduces total cost of ownership compared to alternative technologies. This product offering combines Qorvo’s market leadership in GaN technology and Ka-band MMIC design along with our high-count combining techniques for a best in class solution to power amplification.



Input (L) and Output (R)

Functional Block Diagram



Product Features

- Frequency Range: 32 – 38 GHz
- Saturated Output Power: > 51 dBm ($P_{IN} = 43$ dBm)
- Solid State MMIC Reliability
- Multi-Element Redundancy
- Instant On (no warm-up)

Performance is typical across frequency. Please reference electrical specification table and data plots for more details.

Applications

- TWTA Replacement

Ordering Information

Part No.	Description
QPB3238	32 – 38 GHz Spatium™ Amplifier

Absolute Maximum Ratings

Parameter	Value / Range
Prime Power (V_{DC})*	26 V
Drain Current (I_{D_DRIVE})	40 A
Operating Temperature**	-40 to +71 °C

Operation of this device outside the parameter ranges given above may cause permanent damage. These are stress ratings only, and functional operation of the device at these conditions is not implied.

* Rating for GaN Process

** Refers to outside clamp surface temperature

Recommended Operating Conditions

Parameter	Value / Range
Drain Voltage (V_D)	24 V
Quiescent Drain Current (I_{DQ})	5.0 A
Operating Drain Current (I_D)	33.9 A
Operating Temperature	-10 to +71 °C

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions.

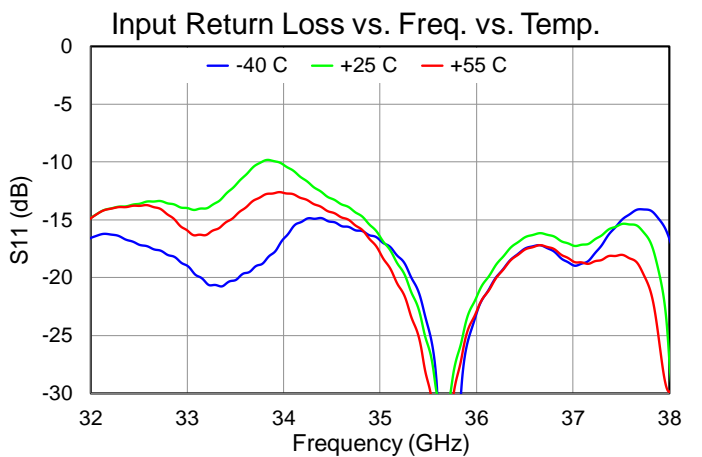
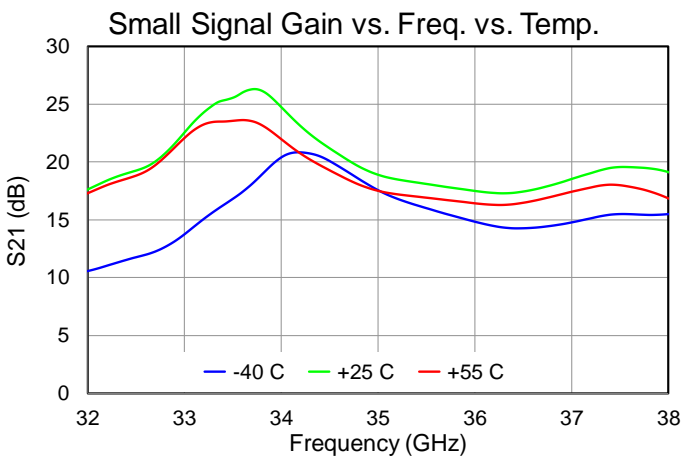
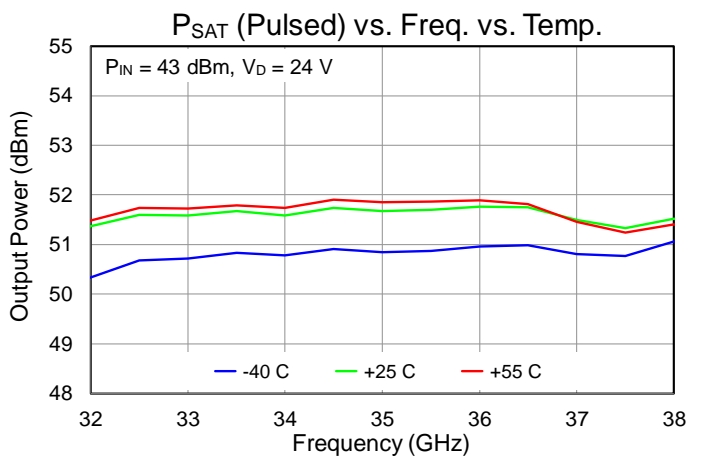
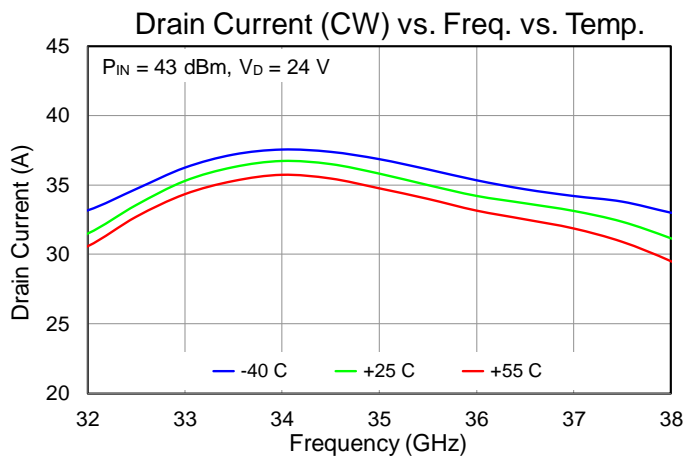
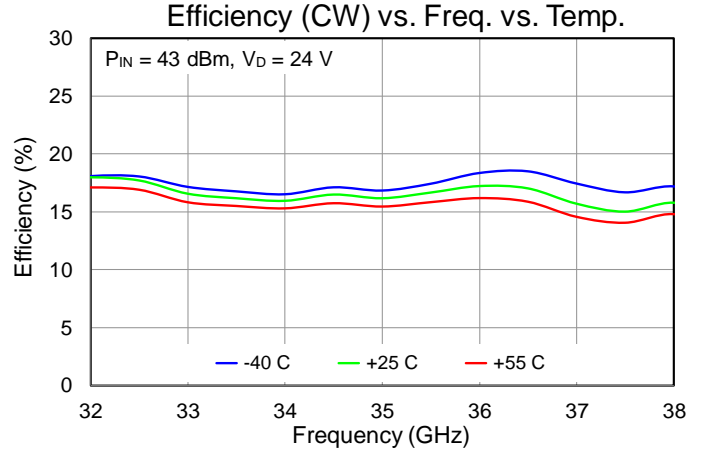
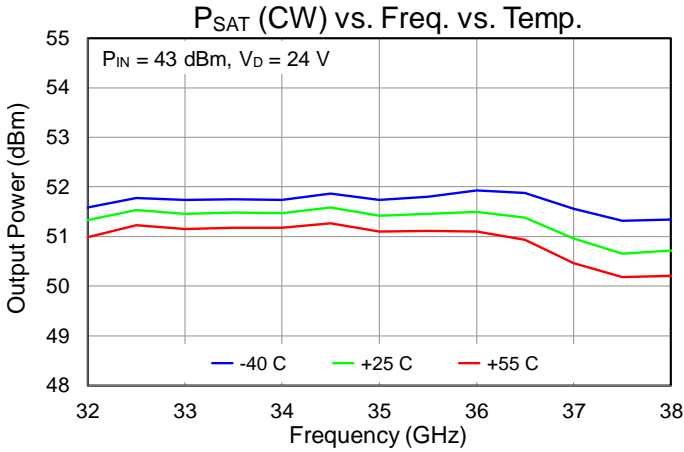
Electrical Specifications

Test conditions unless otherwise noted: $V_D = 24$ V; $I_{DQ} = 5.0$ A; $T = 25$ °C; CW Operation; Pulsed Operation: $PW = 9$ us, $PPD = 75$ us

Parameter		Min	Typ	Max	Units
Frequency		32		38	GHz
Saturated P_{OUT} , CW ($P_{IN} = 43$ dBm)	$T = +25$ °C		51.3		dBm
	$T = +40$ °C		51.2		dBm
	$T = +55$ °C		50.9		dBm
Drain Efficiency, CW ($P_{IN} = 43$ dBm)	$T = +25$ °C		16.5		%
	$T = +40$ °C		16.3		%
	$T = +55$ °C		15.6		%
Saturated P_{OUT} , Pulsed (Pulsed $P_{IN} = 43$ dBm)	$T = +25$ °C		51.6		dBm
	$T = +40$ °C		51.7		dBm
	$T = +55$ °C		51.7		dBm
Power Gain ($P_{IN} = 43$ dBm, $T = 25$ °C)			> 8		dB
Small Signal Gain ($P_{IN} = -20$ dBm, $T = +25$ °C)			19.8		dB
Input Return Loss			> 10		dB
DC Power at P_{SAT} ($T = 55$ °C)			795		W
Input RF Interface	2.92 mm (F) Coaxial Connector				
Output RF Interface	WR-28 Waveguide				
Weight – Amplifier Unit, Bias Card and Cable	7.3 (3.31)				lbs. (kg)
Dimensions – Amplifier Unit (L) x (W) x (H)	3.25 x 2.91 x 3.93				inches
	82.6 x 73.9 x 99.8				millimeters

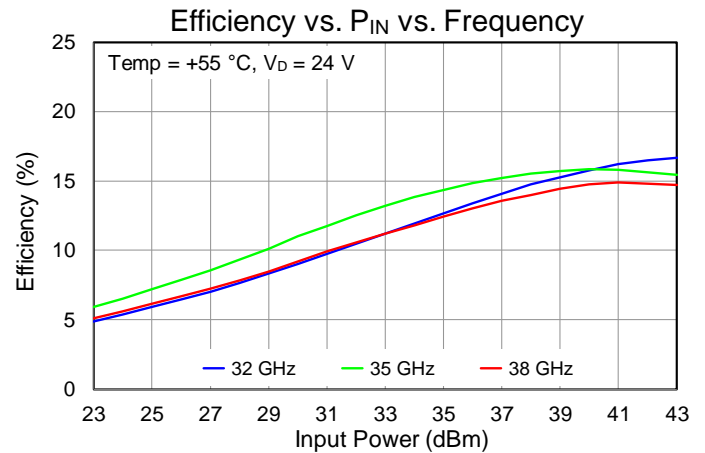
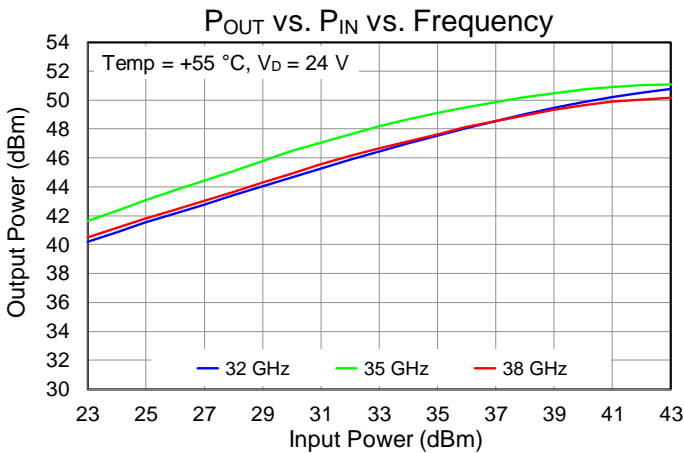
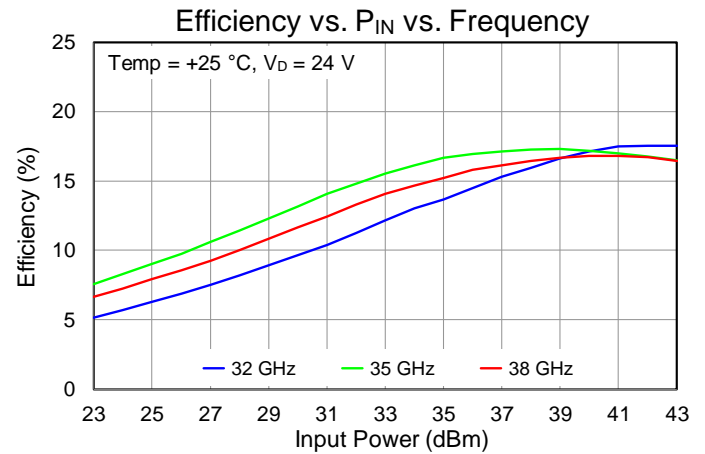
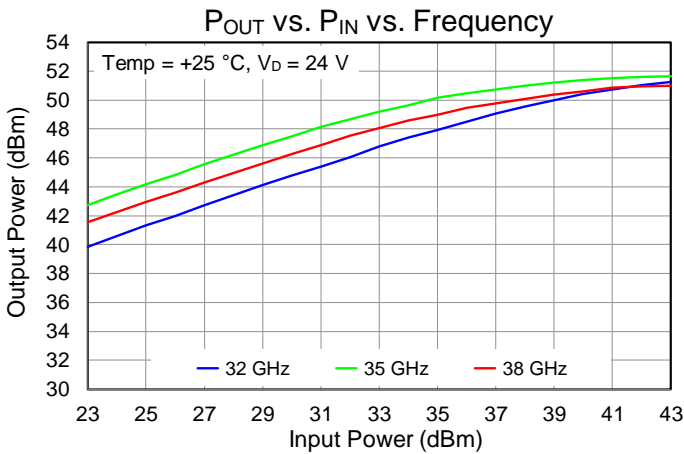
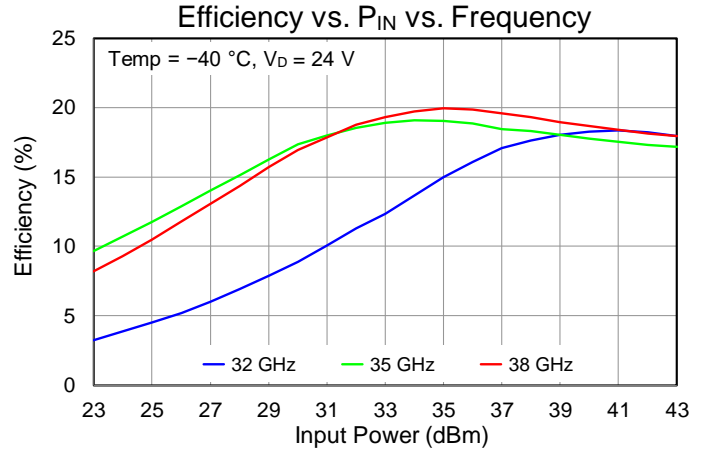
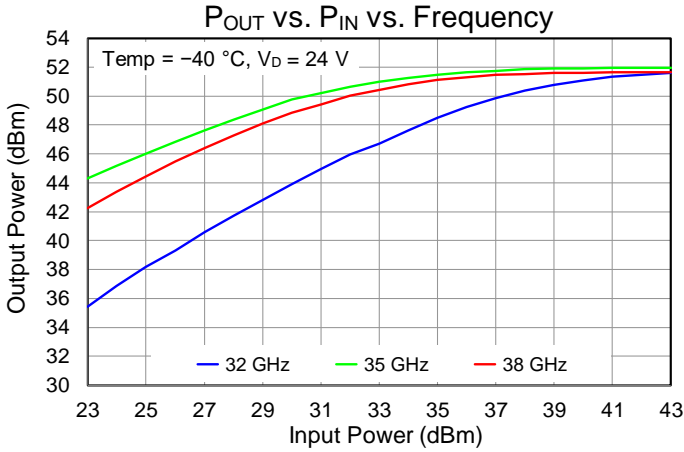
Typical Performance – Large Signal, S-Parameters

Conditions unless otherwise specified: $V_D = +24\text{ V}$; $I_{DQ} = 5.0\text{ A}$; $T = 25\text{ }^\circ\text{C}$; CW Operation; Pulsed Operation: 9 μs PW, 75 μs PPD



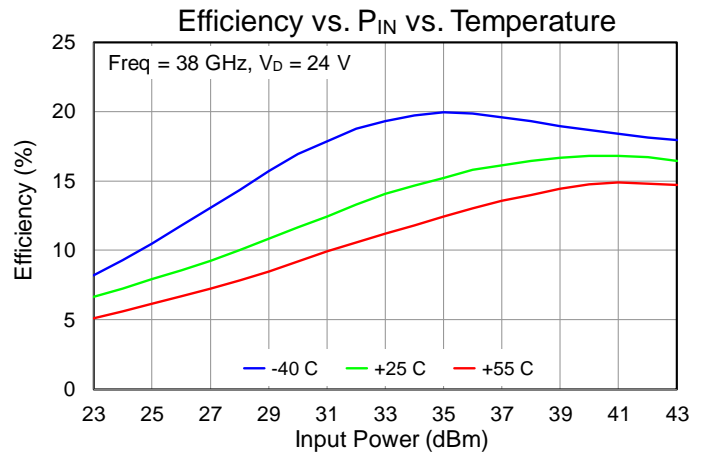
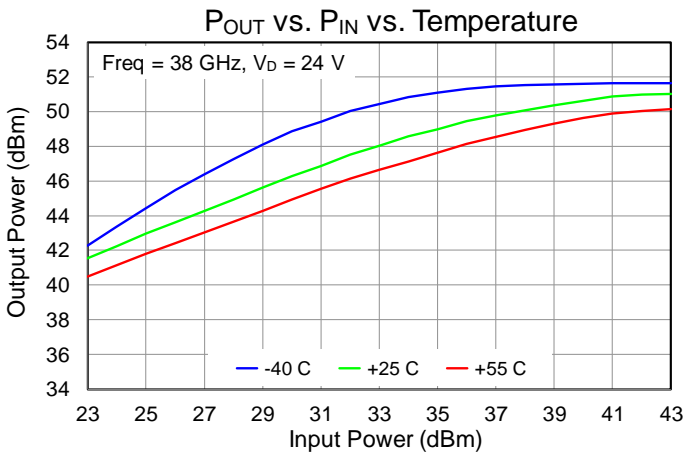
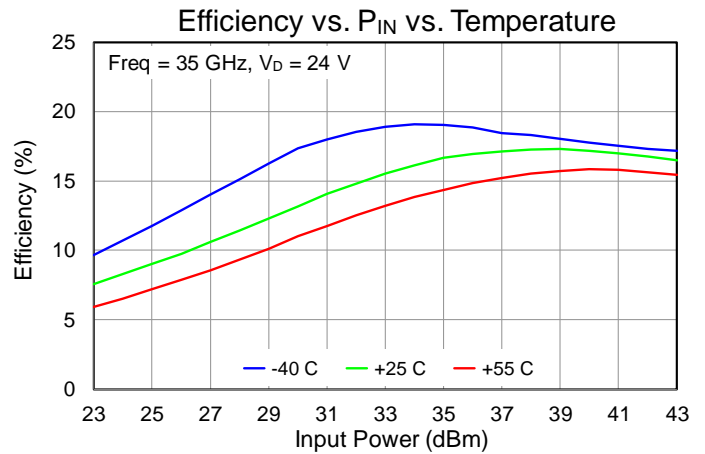
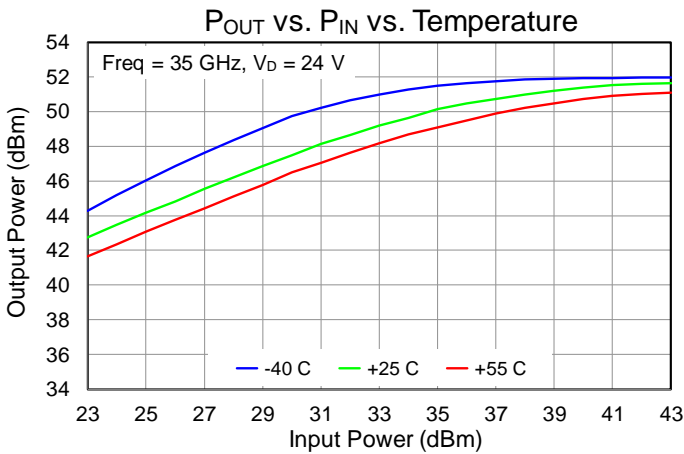
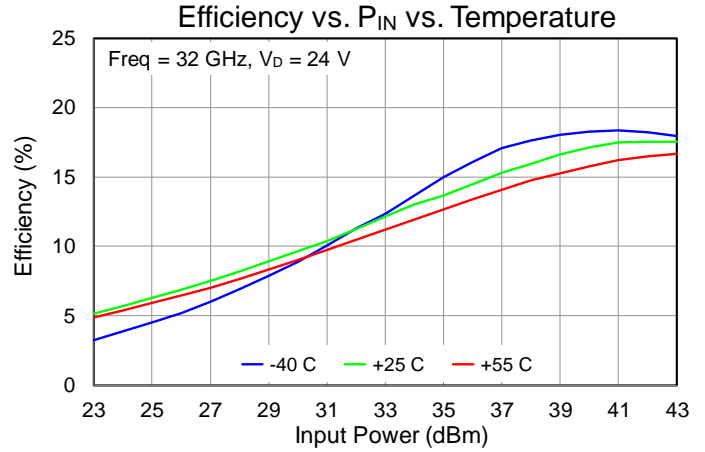
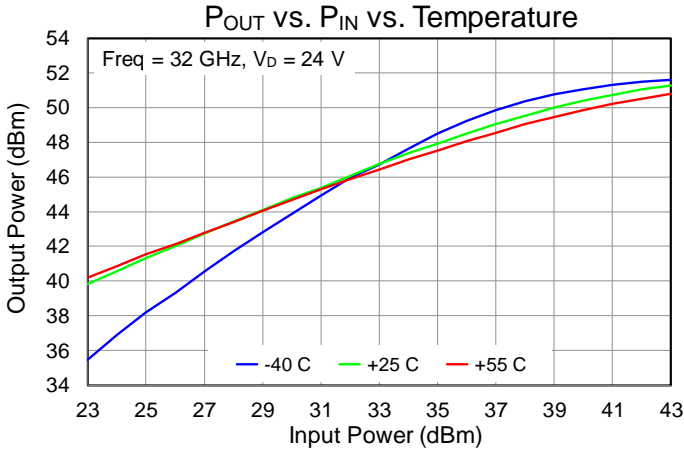
Typical Performance – Large Signal

Conditions unless otherwise specified: $V_D = +24\text{ V}$, $I_{DQ} = 5.0\text{ A}$, $T = 25\text{ }^\circ\text{C}$, CW Operation

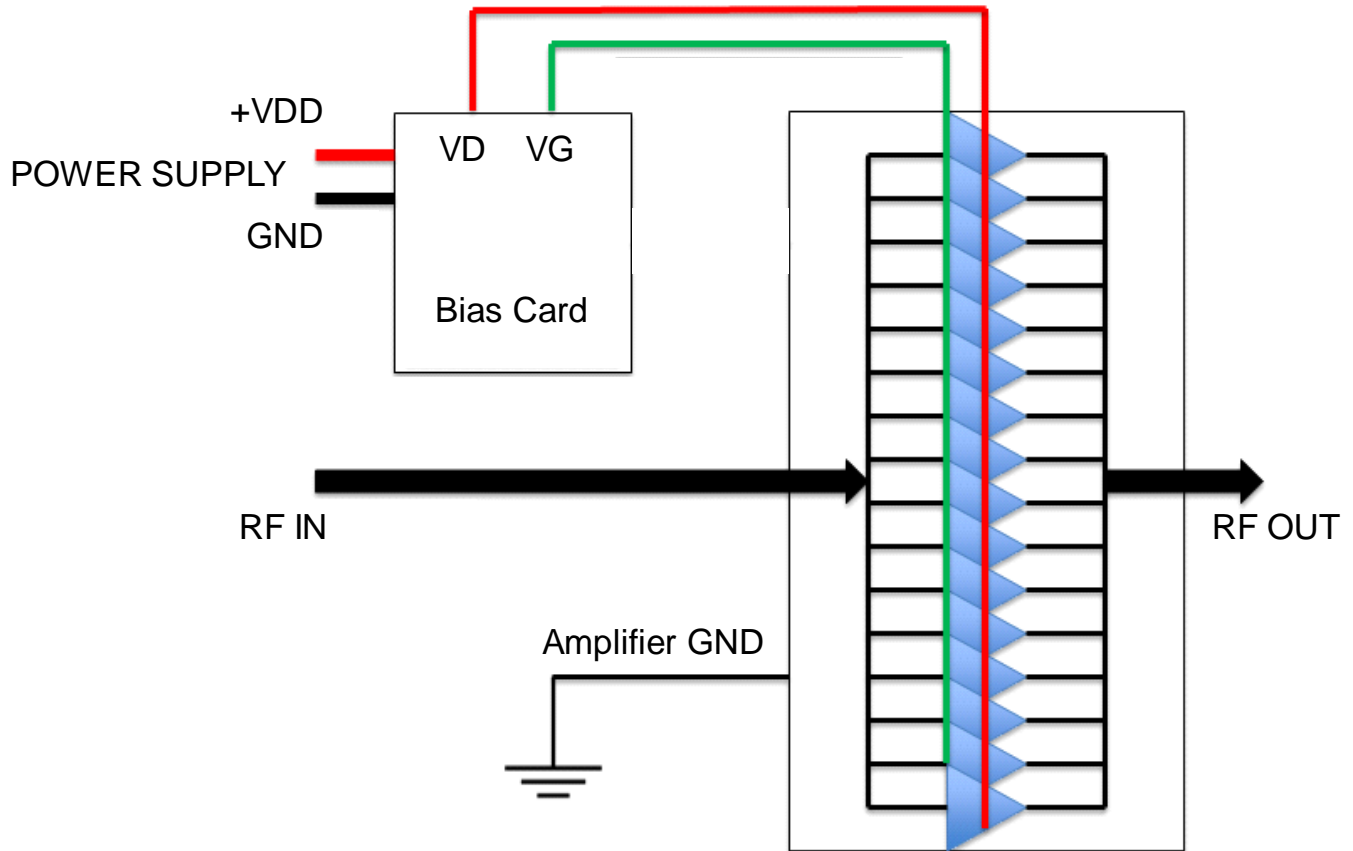


Typical Performance – Large Signal

Conditions unless otherwise specified: $V_D = +24\text{ V}$, $I_{DQ} = 5.0\text{ A}$, $T = 25\text{ }^\circ\text{C}$, CW Operation



Block Diagram and Description



Pin No.	Label	Description
RF In	N/A	2.92mm (F) Coaxial RF Input.
RF Out	N/A	WR28 Waveguide High Power RF Output
POWER SUPPLY +VDD	J2000	MOLEX connector, PN76825-0008
POWER SUPPLY GND	J2001	MOLEX connector, PN76825-0010

Mechanical Information – Outline Drawing (Spatium™ Unit)

NOTES: UNLESS OTHERWISE SPECIFIED

⚠ LABELS ARE IDENTICAL. ENSURE SERIAL NUMBERS THE SAME ON BIAS CARD, SPATIUM, AND CABLE FOR MATCH SET.

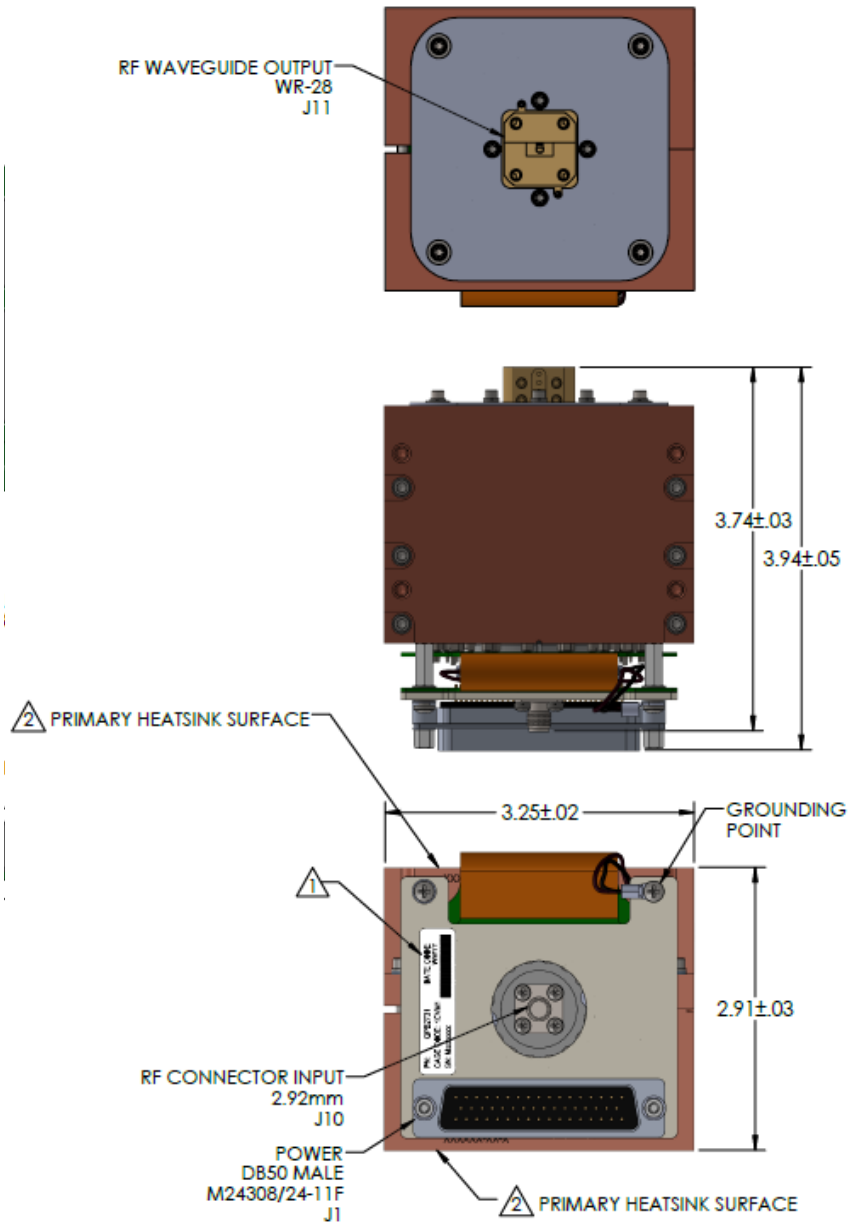
SN: * * * * *

┌───┐ BATCH I.D.
 ┌───┐ WORK WEEK
 ┌───┐ CALENDAR YEAR
 └───┘ MANUFACTURER

QPN: QPB3238	DATE CODE: WWYY
CAGE CODE: 1CVM1	
SN: M0000000	

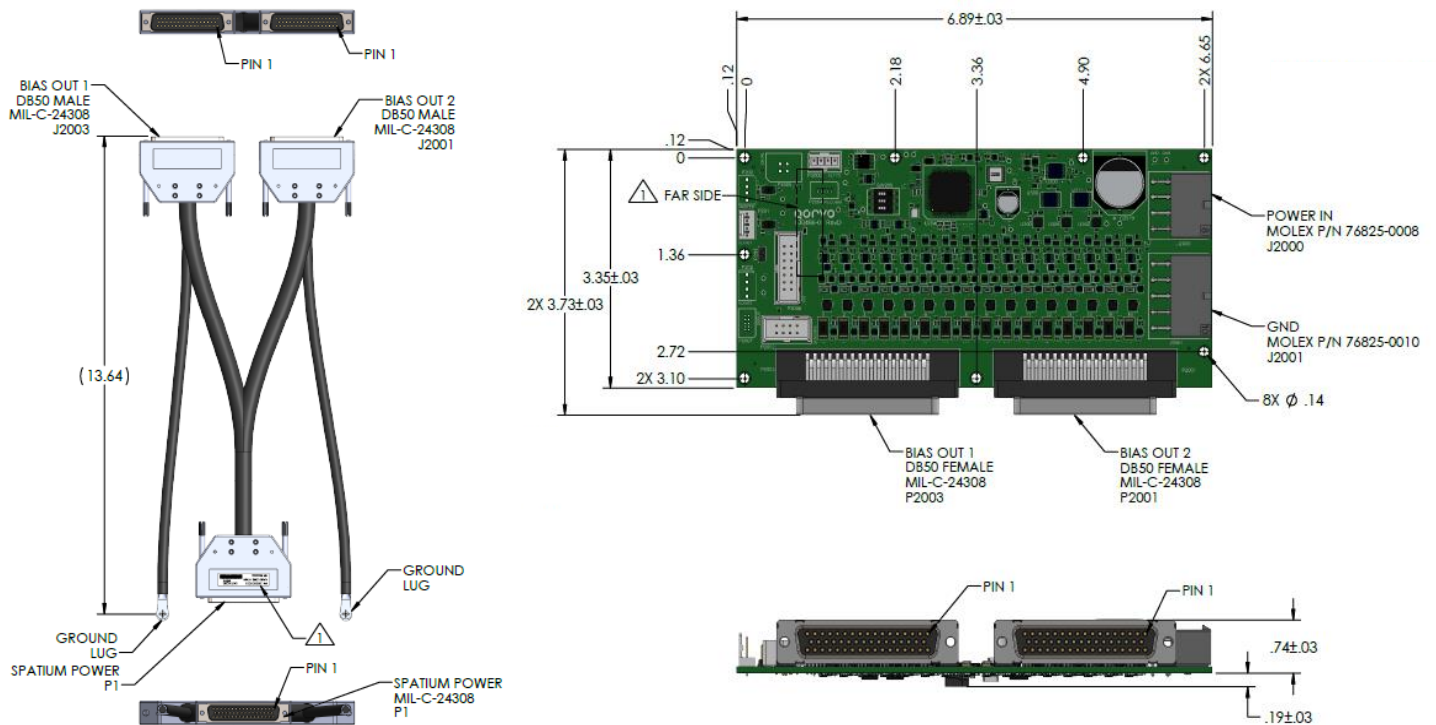
⚠ SPATIUM REQUIRES 2 SIDED COOLING ON OPPOSITE FACES INDICATED.

3. BIAS CARD REQUIRES AIR FLOWING OVER IT AT A MINIMUM RATE OF 1m/Sec.



Dimensions are in INCHES

Mechanical Information – Outline Drawing (Bias Card & Cabling)



Dimensions are in INCHES

