

VM215Q

• General Description

VM215Q is a self-biased wideband amplifier operating in the frequency range 2 to 20GHz under 5V. The device is packaged in a 5x5 mm 24 leads Plastic Surface Mount Package (ROHS). This component uses VM215D Vectrawave die.

The device has a small signal gain of 16dB. With a 1dB compression output power of 15dBm. The device contains internal DC block and internal drain bias.

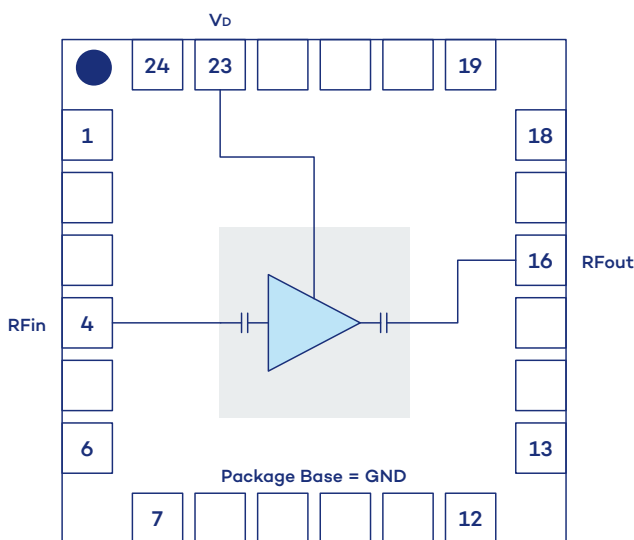
• Features

Frequency range	2 – 20GHz
Single Bias • Internal Drain Bias Input and Output DC block Input and Output 50Ω matched	
Linear Gain	15dB
OP1dB	15dBm
NF	3dB
DC bias:	V_D = +5V, I_b = 75mA
Plastic QFN	5 x 5 (mm) 24 leads

• Applications

- Radar, Electronic warfare
- Microwave Radio & VSAT
- Test and Measurement
- Broadband Communication Infrastructure
- Fiber Optics

• Pins Assignment & Functional Block Diagram



Function	Pin number
RF in	4
RF out	16
V _D	23
Gnd	Exposed Pad

• Electrical Specifications

Test conditions: unless otherwise noted

- Room Temperature = +25°C
- $V_D = +5V$

Symbol	Parameter	Min	Typ	Max	Unit
F	Frequency range	2		20	GHz
G	Linear gain		15		dB
S11	Input return loss		-12		dB
S22	Output return loss		-10		dB
OP1dB	Output Power 1dB compression Point		15		dBm
OIP3	Output Third Order Intermodulation Point		25		dBm
NF	Noise Figure		3	4	dB
I_D	Associated Drain current		75		mA
V_D	Drain voltage		5		V

• Recommended Operating Conditions

Symbol	Parameter	Value	Unit
V_D	Drain voltage	5	V

• Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_D	Drain bias voltage	10	V
I_D	Drain bias current	120	mA
P_{in}	Maximum peak input power overdrive	20	dBm
T_j	Junction temperature	-	°C
T_a	Operating temperature range	+25/+85	°C
T_{stg}	Storage temperature range	-55/+150	°C

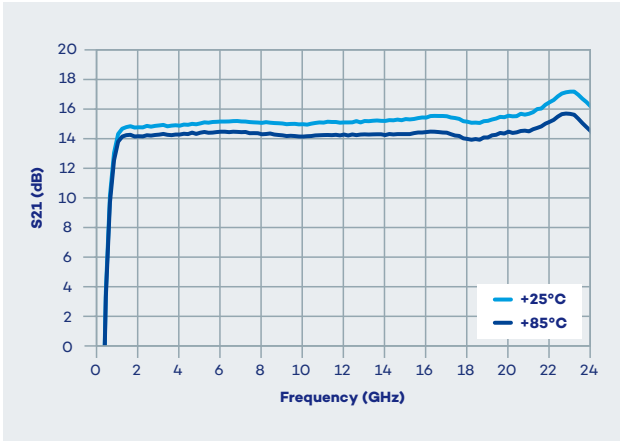
Operation of this device above any of these parameters may cause permanent damage.

• **Typical Performance**
(Small signal / Board Measurement)

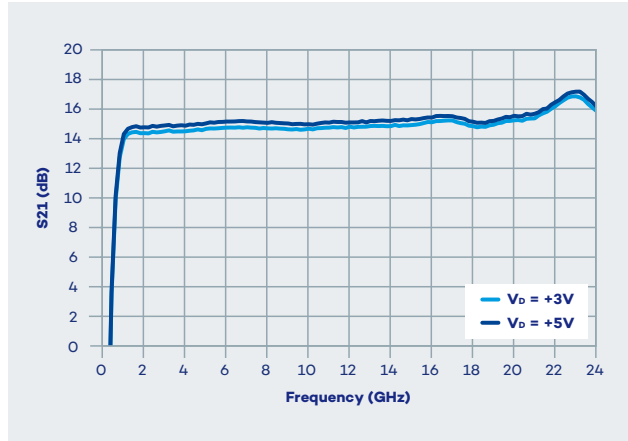
Test conditions: unless otherwise noted

- Reference plane: component access
- $T_{amb} = +25^{\circ}\text{C}$
- $V_D = +5\text{V}$

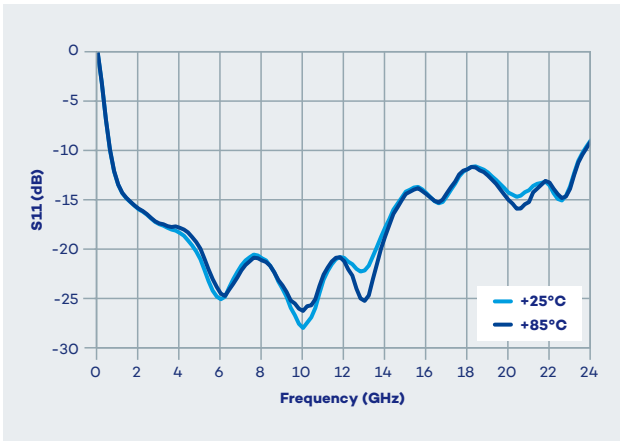
Gain vs Temperature



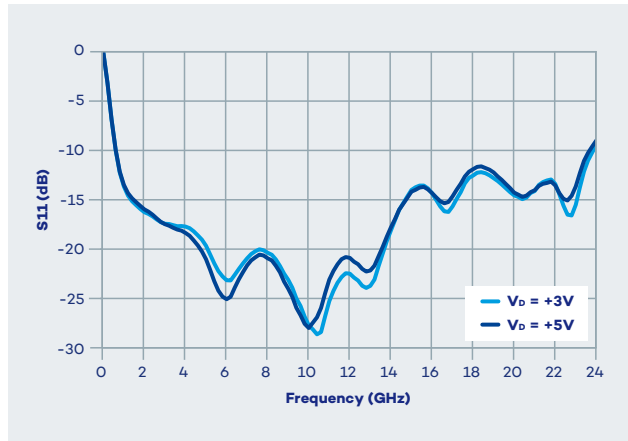
Gain vs V_D



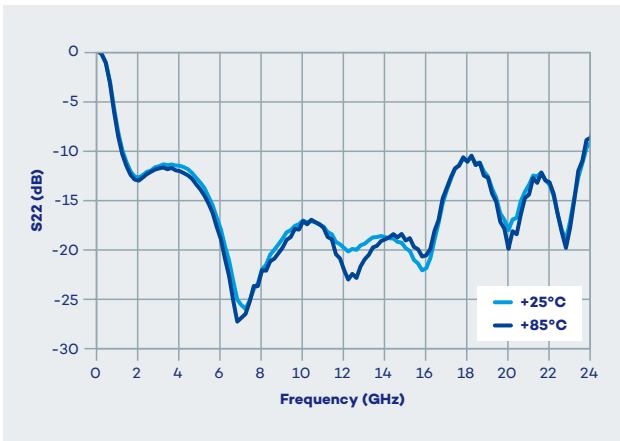
Input Return Loss vs Temperature



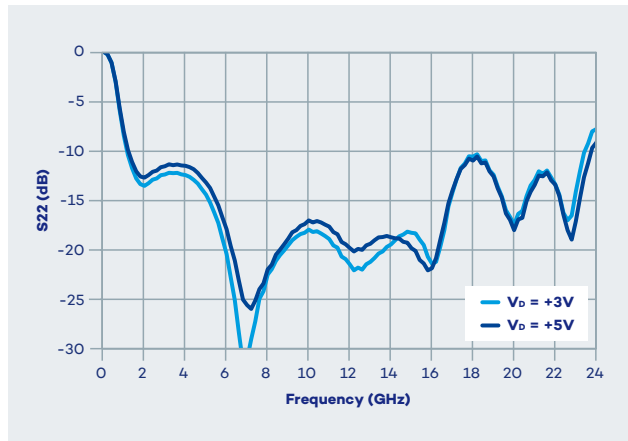
Input Return Loss vs V_D



Output Return Loss vs Temperature



Output Return Loss vs V_D

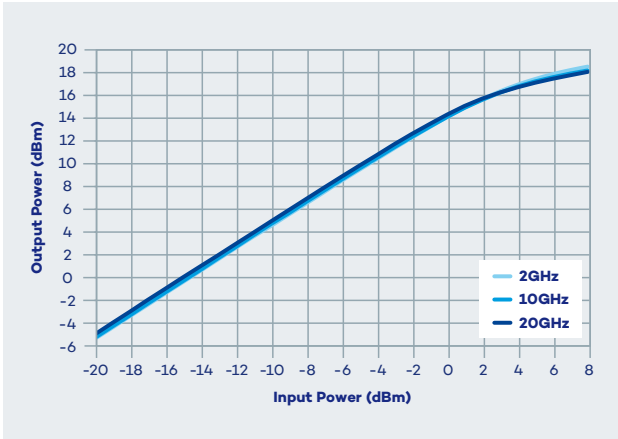


• **Typical Performance**
(Large signal / Board Measurement)

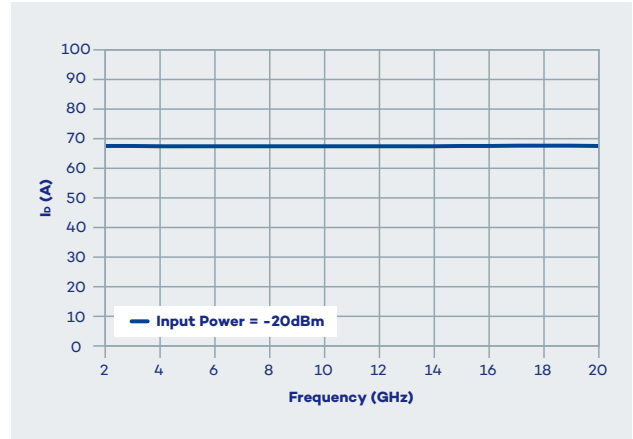
Test conditions: unless otherwise noted

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- $V_D = +5V$

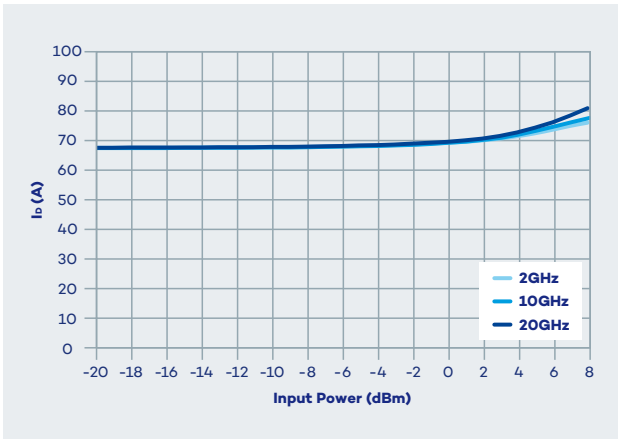
Output Power vs Input Power vs Frequency



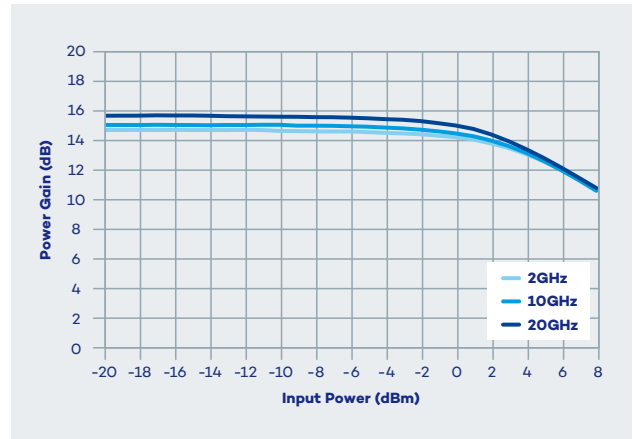
Drain Current vs Frequency



Drain Current vs Input Power vs Frequency



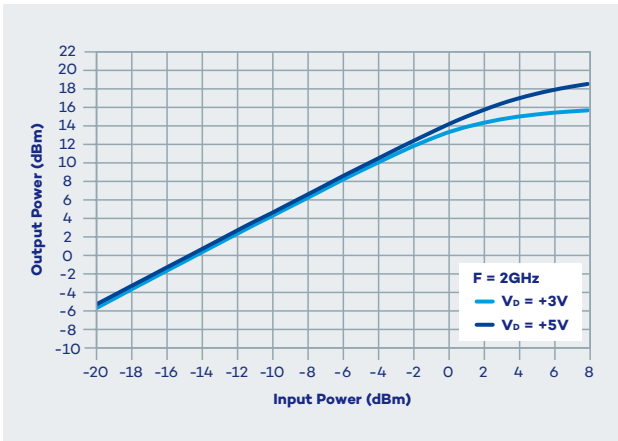
Gain vs Input Power vs Frequency



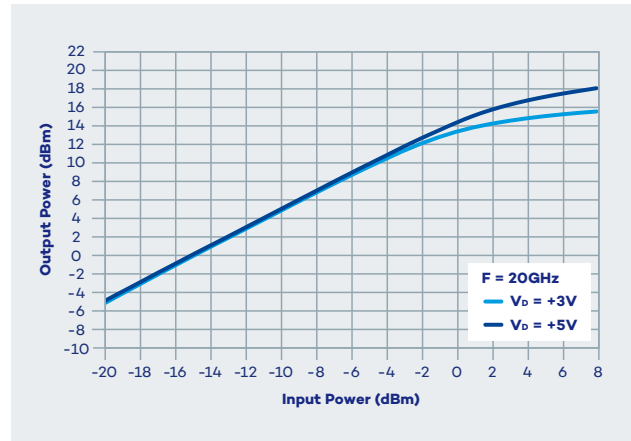
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(Large signal / Board Measurement)

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- Reference plane: component access
- $T_{amb} = +25^{\circ}C$

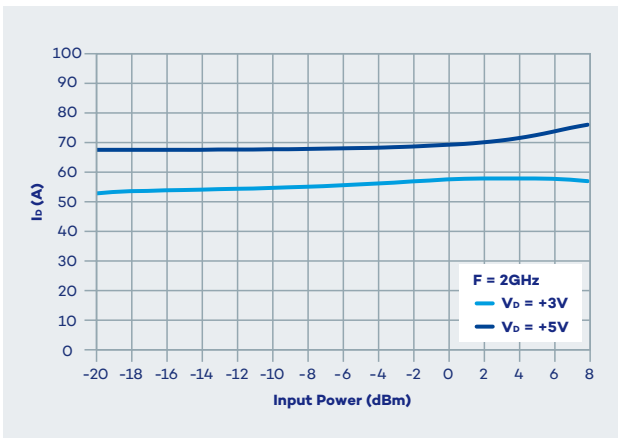
Output Power vs Input Power vs V_D



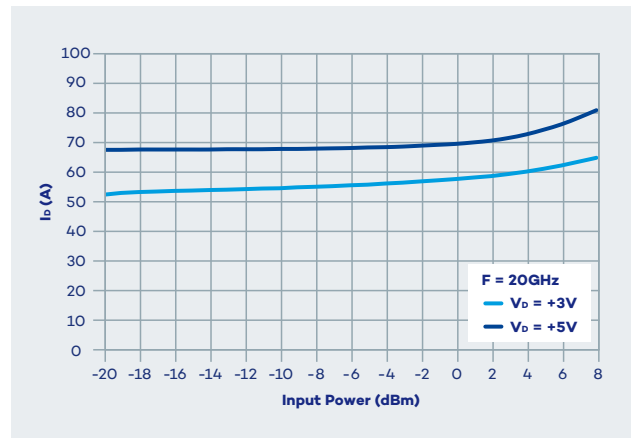
Output Power vs Input Power vs V_D



Drain Current vs Input Power vs V_D



Drain Current vs Input Power vs V_D

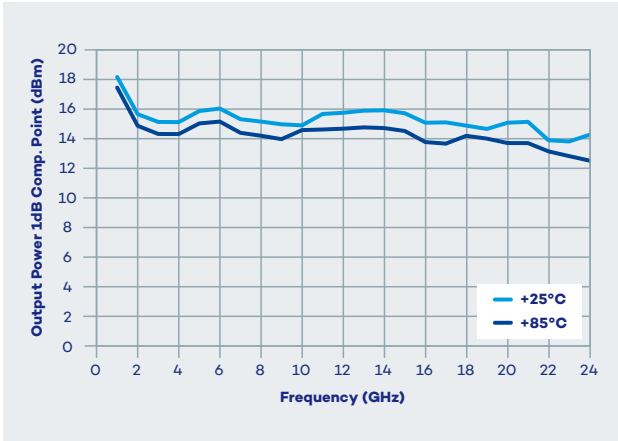


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(Large signal / Board Measurement)

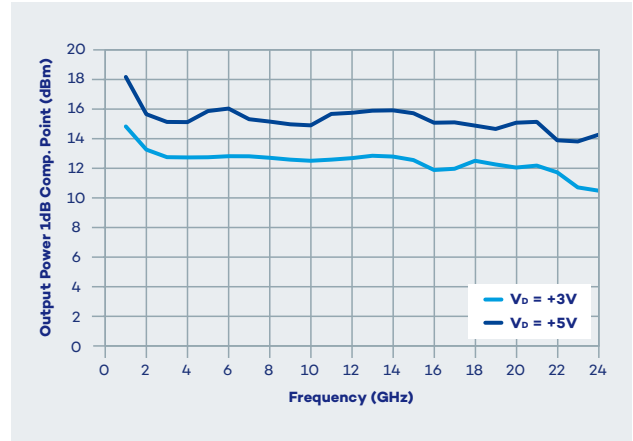
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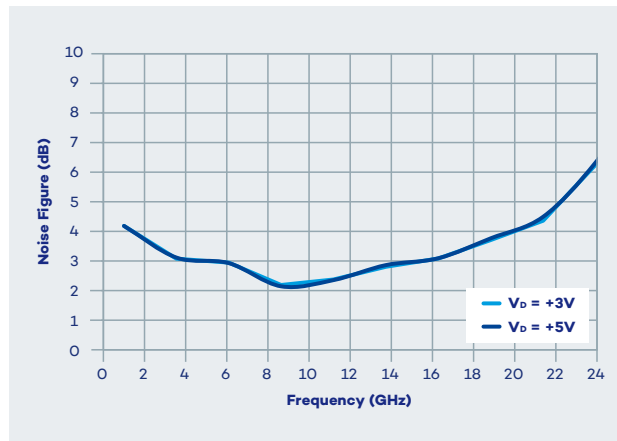
Output 1dB Compression point vs Temperature



Output 1dB Compression point vs V_D

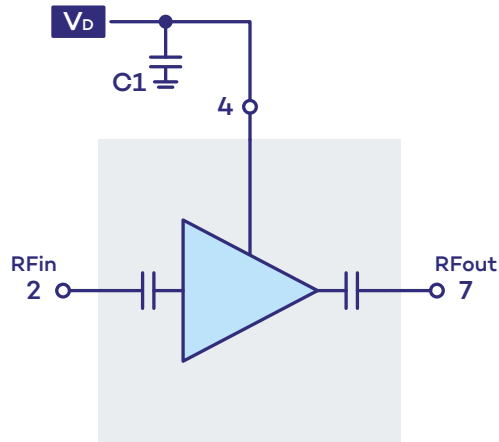


Noise Figure vs Frequency vs V_D



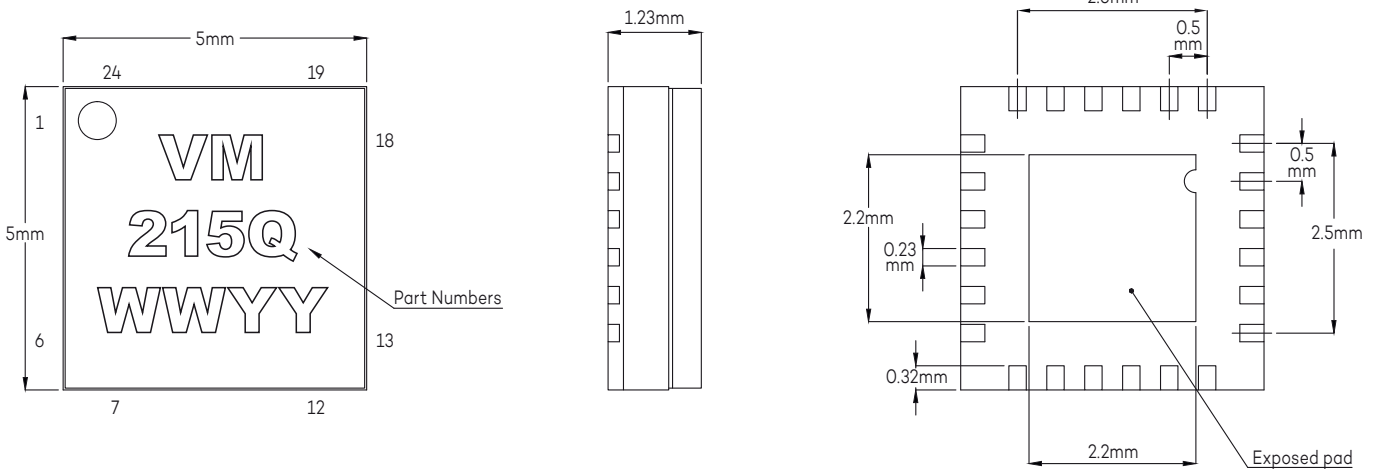
• **Application circuit**

• C1 = 1μF



• **Mechanical drawing**

QFN exposed PAD must be connected to ground (RF and DC).



• Ordering information

Product Code	Parameter
VM215Q	2 to 20GHz WideBand Amplifier in QFN format

• Associated Material

- Evaluation Board
- Mechanical files (DXF)

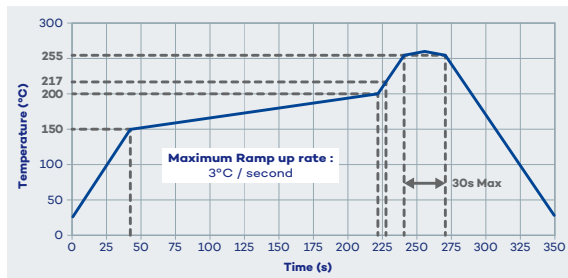
• Product Compliance Information

Solderability

Solder Stencil thickness: 127µm

Solder: SAC 305 (ROHS)

Temperature profile example: maximum recommended reflow profile (leadfree)



RoHS-Compliance

This part is compliant with EU 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

Other attributes

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C15H12Br4O2) Free
- PFOS Free
- SVHC Free

ESD Sensitivity Rating

Test: Human Body Model (HBM)

Std: JEDEC Standard JESD22-A114



• Contact information

For the latest specifications, additional product information, worldwide sales and distribution locations, and information about Vectrawave.

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