

### VM171D

Preliminary Product Specification

## General Description

The VM171D is a Microwave Monolithic Integrated Circuit (MMIC) designed in HEMT (High Electron Mobility Transistor) structure for operating frequency range from 32 to 36GHz.

The MMIC is developed on a 120nm GaN/SiC process and is internally matched for 50Ω RF accesses. It provides an output power of 43dBm, and associated power added efficiency of 28% in continuous wave (CW) or pulsed mode.

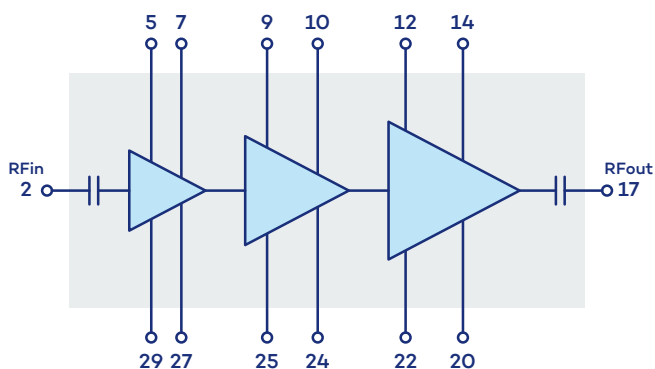
## Features

Frequency range	<b>32 – 36GHz</b>
Output Power	<b>43dBm @Pin = 26dBm</b>
PAE	<b>28% @Pin = 26dBm</b>
Linear Gain	<b>24dB</b>
DC bias	<b>V<sub>D</sub> = +24V, I<sub>DQ</sub> = 640mA (V<sub>G</sub> = -2.1V Typical)</b>
Chip size	<b>4.5 x 4.5 x 0.1 (mm)</b>

## Applications

- Radar
- Satcom

## Pins Assignment & Functional Block Diagram



Function	Pin number
RF in	2
V <sub>D1A</sub> / V <sub>D1B</sub>	7 / 27
V <sub>D2A</sub> / V <sub>D2B</sub>	10 / 24
V <sub>D3A</sub> / V <sub>D3B</sub>	14 / 20
V <sub>G1A</sub> / V <sub>G1B</sub>	5 / 29
V <sub>G2A</sub> / V <sub>G2B</sub>	9 / 25
V <sub>G3A</sub> / V <sub>G3B</sub>	12 / 22
RF out	17

## • Electrical Specifications

Test conditions: unless otherwise noted

- $T_{amb} = +25^{\circ}\text{C}$
- $V_D = +24\text{V}$
- $I_{DQ} = 640\text{mA}$  ( $V_G = -2.1\text{V Typ.}$ )

Symbol	Parameter	Min	Typ	Max	Unit
F	Frequency range	32		36	GHz
G	Linear gain		24		dB
S11	Input return loss		-10		dB
S22	Output return loss		-10		dB
P <sub>out</sub>	Output power (@Pin=26dBm)		43		dBm
PAE	Associated Power Added Efficiency (@Pin=26dBm)		28		%
I <sub>D</sub>	Associated Drain current (@Pin=26dBm)		4		A
V <sub>D</sub>	Drain voltage		24		V

## • Recommended Operating Conditions

Symbol	Parameter	Value	Unit
V <sub>D</sub>	Drain voltage	24	V
I <sub>DQ</sub>	Drain quiescent current	640	mA
V <sub>G</sub>	Gate voltage	-2.1 (Typ.)	V

## • Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V <sub>D</sub>	Drain bias voltage	26	V
I <sub>D</sub>	Drain bias current	4.5	A
V <sub>G</sub>	Gate bias voltage	-1.8 to -2.2	V
P <sub>in</sub>	Maximum peak input power overdrive	30	dBm
T <sub>j</sub>	Junction temperature	225	°C
T <sub>a</sub>	Operating temperature range	-40/+85	°C
T <sub>stg</sub>	Storage temperature range	-55/+150	°C

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

## • Ordering information

Product Code	Parameter
VM171D	32 to 36GHz - 20W GaN/SiC Power Amplifier in die form

## • Associated Material

- Packaged die
- Die Evaluation Board (die EVB)
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- Mechanical files (DXF)
- Measurements files (S2P)

## • Product Compliance Information

### Solderability

Use only AuSn (80/20) solder and limit exposure to temperature above 300 °C during 3-4 minutes, maximum.

### ESD Sensitivity Rating

Test: Human Body Model (HBM)  
Std: JEDEC Standard JESD22-A114



### 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

## • Contact information

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

### vectrawave.com

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