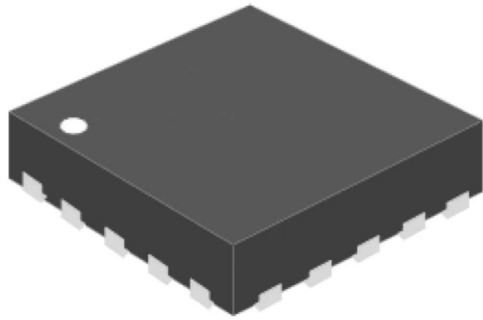


Preliminary Datasheet

MW6681H: 4.9-5.945GHz Wi-Fi Integrated PA Module



Package: QFN 20 Pin 4.0mm x 4.0mm x 0.85mm

Applications

- Customer Premise Equipment (CPE)
- Wireless Access Points, Gateway
- Routers
- Set-Top Box Applications
- Picocell / Femtocell
- IoT

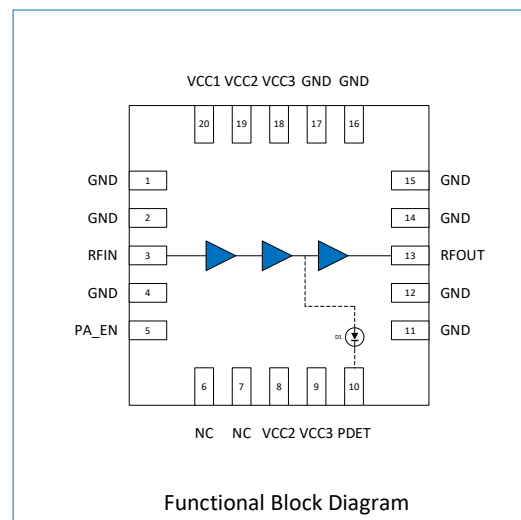
Features

- High output power amplifier
- P1dB=34.5dBm(CW)
- Input and Output Matched to 50Ω
- Pout = 26.5dBm, 5V, 11ac, 80MHz
MCS9 at 1.8% DEVM (-35dB Dynamic EVM)
- Pout = 28dBm, 5V, 11n, 20/40MHz
MCS7 at 3% DEVM (-30dB Dynamic EVM)
- Required external components minimized
- Typical Gain = 30dB

Product Description

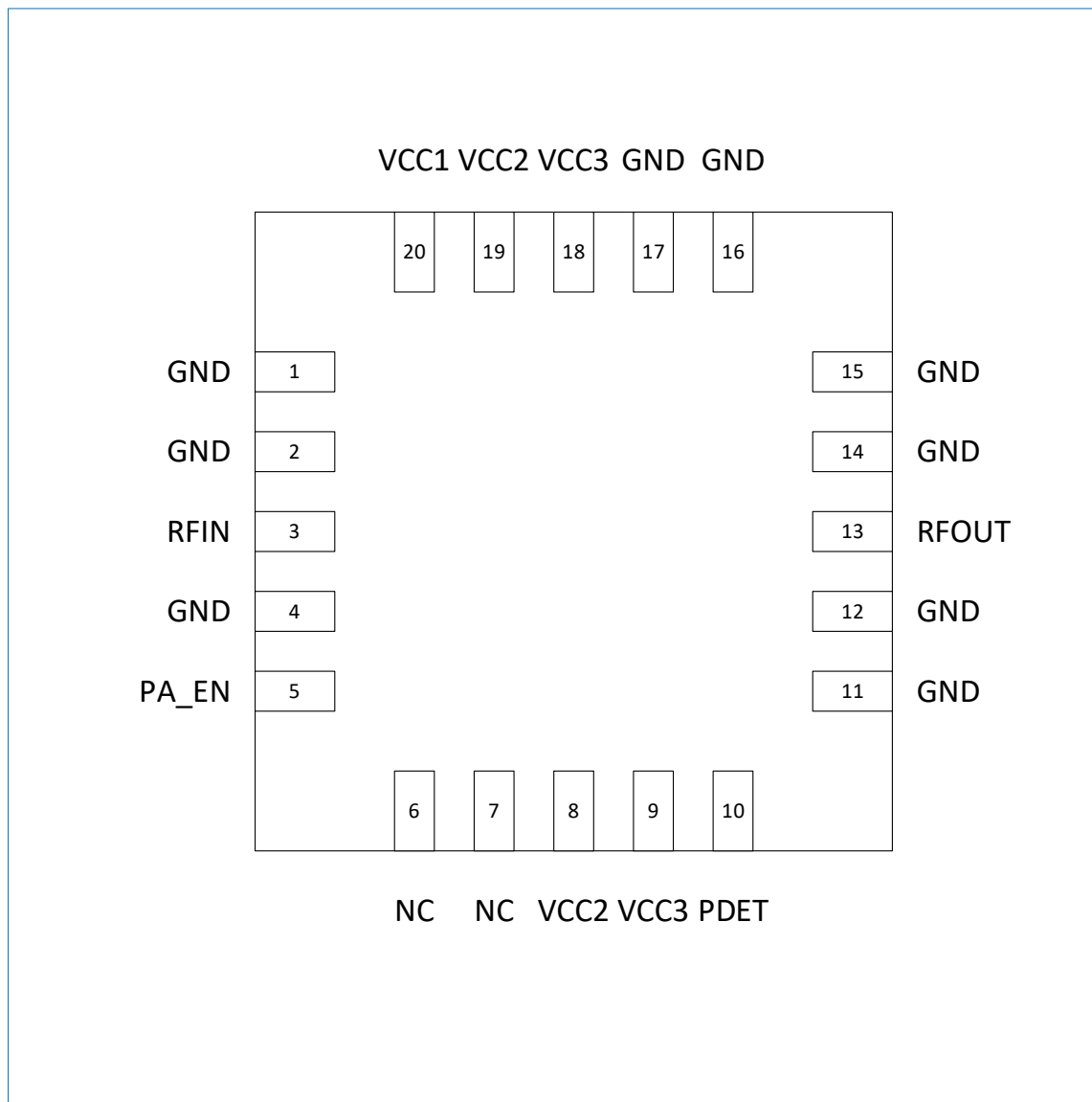
The **MW6681H** is a three-stage power amplifier designed for 802.11a/n/ac applications. The integrated input and output 50Ω match greatly reduce the layout area, bill of materials and manufacturability cost in customer applications. This module is optimized to minimize the required external components to maintain linear performance. **MW6681H** is capable of achieving linear powers up to 26.5dBm with an DEVM<1.8%(-35dB Dynamic EVM) while maintaining excellent power added efficiency. For wireless LAN applications, this device meets the requirements of IEEE802.11a/n/ac.

Functional Block Diagram



Module Pin Out Diagram

Pin Out



Pin Names and Descriptions

Pin #	Label	Description
1	GND	Ground
2	GND	Ground
3	RFIN	RF input. internally matched to 50Ohm and DC shorted. External DC blocking capacitor required.
4	GND	Ground
5	PA_EN	Power Amplifier Enable and Reference Voltage
6	NC	Not connected internally. It may be left floating or connected to ground.
7	NC	Not connected internally. It may be left floating or connected to ground.
8	VCC2	Power supply
9	VCC3	Power supply
10	PDET	Power detector. Provides an output voltage proportional to the RF output power level.
11	GND	Ground
12	GND	Ground
13	RFOUT	Antenna port (bi-directional); matched to 50Ohm internally; DC blocked
14	GND	Ground
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	VCC3	Power supply
19	VCC2	Power supply
20	VCC1	Power supply
Package backside	GND	DC/RF ground (consult for recommended via pattern for optimum performance)

Absolute Maximum Ratings

Parameter	Definition	Min	Max	Unit
VCC	Supply Voltage on pins VCC3	-0.5	+6	V
	Supply Voltage on pins VCC1, VCC2	-0.5	V _{CC3}	
I _{MAX}	DC Supply Current		1500	mA
PA_EN/VREF	Power Amplifier Enable and Reference Voltage	-0.3	+6	V
Ruggedness	Input OFDM 6Mbps into RFIN with 10:1 VSWR No damage.		+10	dBm
T _{STG}	Storage Temperature Range	-40	+150	°C
T _j	Maximum Junction Temperature		+160	°C

NOTE: Stresses above those conditions listed under Absolute Maximum Ratings may reduce device reliability and also may cause permanent damage.

Recommended Operating Conditions

Parameter	Description	Min	Typ	Max	Unit
VCC	Power Supply VCC1, VCC2, VCC3	4.75	5.00	5.25	V
T _{CASE}	Maximum Case Temperature	-40		+85	°C
PA_EN - High	PA_EN(High)/Reference Voltage	2.85	2.9	2.95	V
PA_EN - Low	PA_EN(Low)/Reference Voltage	0		0.3	V

Current Characteristics

Conditions: T=25°C, V_{CC1}=V_{CC2}=V_{CC3}=5.0V, V_{PAEN}=2.9V, de-embedded from EVB loss

Parameter	Conditions	Min	Typ	Max	Unit
Operating Current	P _{OUT} =23dBm		480	530	mA
	P _{OUT} =26dBm		590	640	
	P _{OUT} =28dBm		690	740	
Quiescent Current	RF=Off		300	350	mA
PA Enable Current	PA_EN High		1		μA
Leakage Current	RF OFF; VCC=5.0V; VPAEN =0V		0.2		μA

TX Electrical Characteristics

Conditions: T=25°C, V_{CC1}=V_{CC2}=V_{CC3}=5.0V, V_{PAEN}=2.9V, de-embedded from EVB loss

Parameter	Conditions	Min	Typ	Max	Unit
Frequency Range		5.15		5.85	GHz
Extended Operating Frequency		4.90		5.945	GHz
Output Power	802.11a, 54Mbps, 64QAM, 3% DEVM(DEVM<-30dB)	26.5	28		dBm
	11n, 20/40MHz, MCS7 64QAM, 3% DEVM(DEVM<-30dB)	26.5	28		dBm
	11ac, 80MHz, MCS9 256QAM, 1.8% DEVM(DEVM<-35dB)		26.5		dBm
	11ac, 80MHz, MCS9 256QAM, 1% DEVM(DEVM<-40dB)		25		dBm
Mask Compliance	11n, MCS0 HT20		31.5		dBm
Output 1dB compression point	No modulation	32.5	34.5		dBm

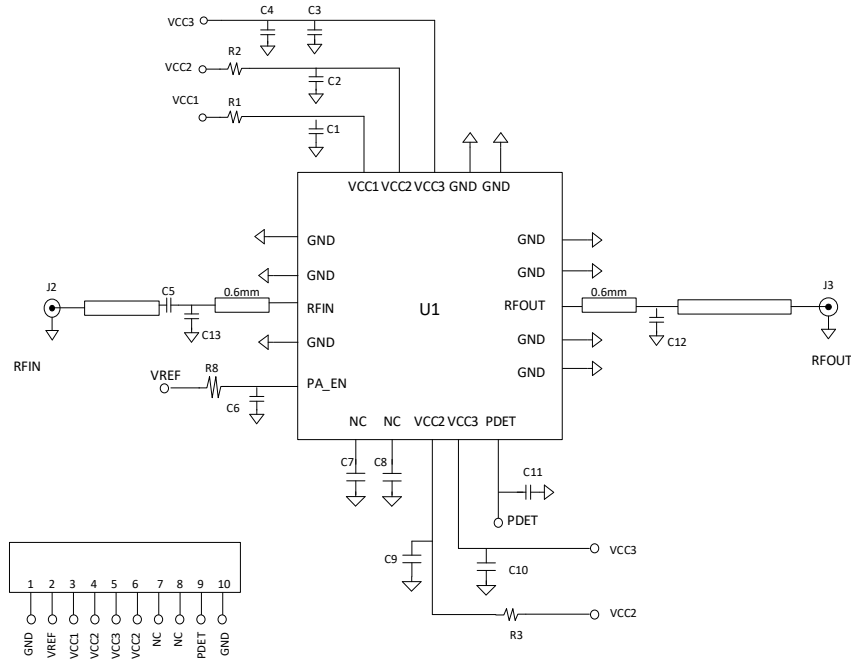
Gain	$P_{IN} = -25\text{dBm}$		30		dB
Gain Variation	Within each UNII Band	-2.5		+2.5	dB
2nd Harmonic	$P_{OUT}=29.5\text{dBm}$, measured with a standard IEEE802.11a 6Mbps waveform		-30	-25	dBm/MHz
3rd Harmonic			-50	-45	dBm/MHz
Rise and Fall Time			0.2		μs

Power Detector

Conditions: $T=25^{\circ}\text{C}$, $V_{CC1}=V_{CC2}=V_{CC3}=5.0\text{V}$, $V_{PAEN}=2.9\text{V}$, de-embedded from EVB loss

Parameter	Conditions	Min	Typ	Max	Unit
P_{OUT} detect range		0		$P_{1\text{dB}}$	dBm
Output Power Range		0		27	dBm
Power Detector Range	$P_{OUT}=34.5\text{dBm}, \text{CW}$		1.90		V
	$P_{OUT}=27\text{dBm}, \text{CW}$		0.90		V
	$P_{OUT}=23\text{dBm}, \text{CW}$		0.66		V
	$P_{OUT}=20\text{dBm}, \text{CW}$		0.52		V
	RF= Off		0.25		V
Detector Accuracy	P_{OUT} at constant VDET	-0.65		+0.65	dB
Output Impedance			3.0		$\text{K}\Omega$

MW6681H Applications Schematic

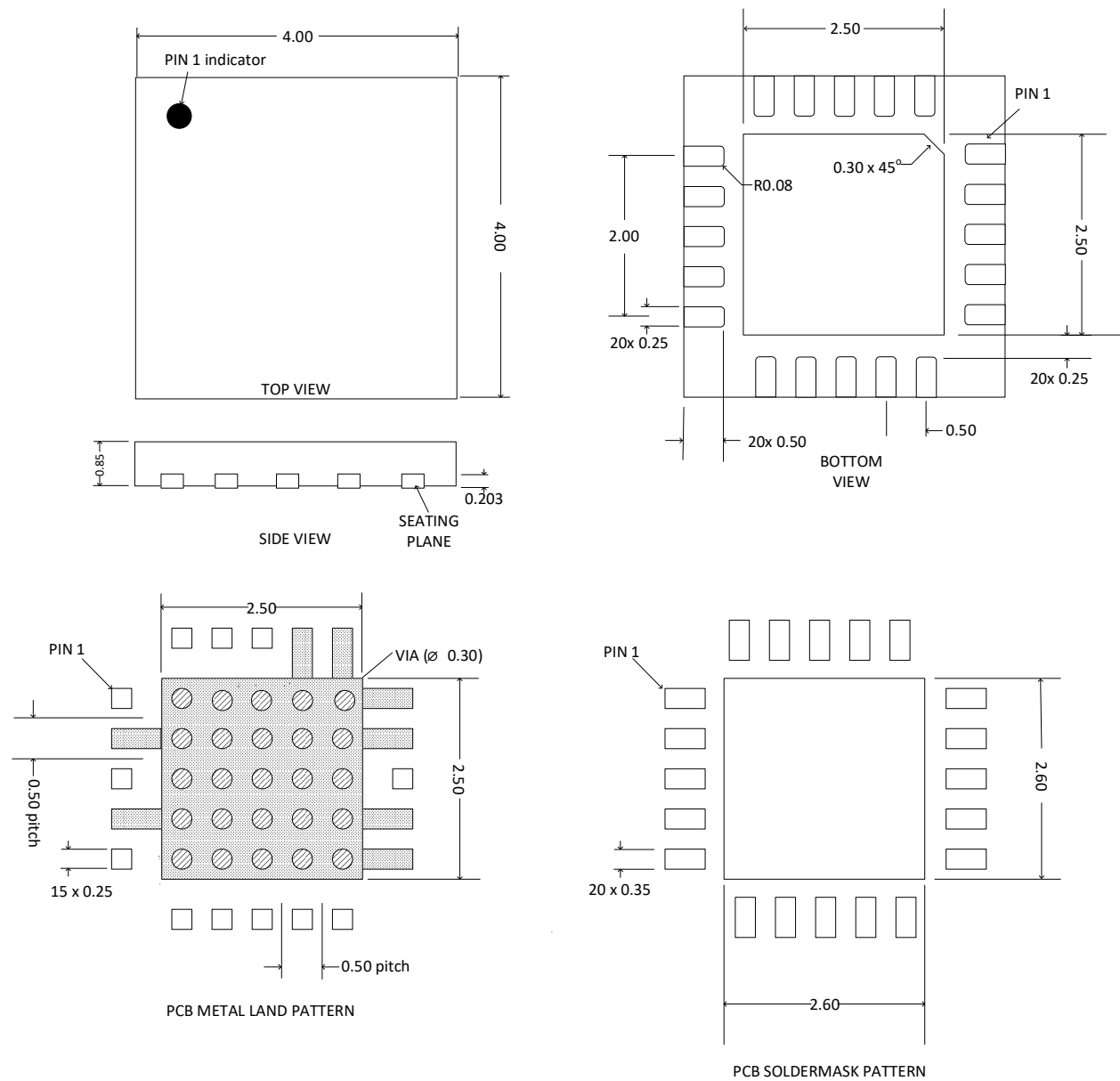


Note: place C12 and C13 0.6mm to chip-edge

Bill of Material

Ref. Des.	Value	Manuf.	Part number	Description
U1	/	XMW	MW6681H	XMW Tech.MW6681H
C1,C2,C3,C9	2.2uF	Murata	GRM155R61A225KE95D	Capacitor, 10%, 10V, 0402
C5	15pF	Murata	GRM0335C1H150JA01D	Capacitor, 5%, 50V, 0201
C6,C7,C8,C10,C11	100pF	Murata	GRM033R71E101KA01D	Capacitor, 10%, 25V, 0201
C12,C13	0.4pF	Murata	GRM0335C1HR40WA01D	Capacitor, 5%, 50V, 0201
R1,R2,R3,R8	0 Ω	YAGEO	RC0201JR-070RL	Resistor, 5%, 0.05W
others	DNI	/	/	Do Not Install

Module Package Drawing



Note: Unless otherwise specified

1. All DIMENSIONS ARE IN MILLIMETERS.



Datasheet | **MW6681H** | 4.9-5.945GHz Wi-Fi Integrated PA

Module ESD/MSL

Name	Class/Level	Standard
ESD – Human Body Model (HBM)	1000V	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	2000V	JESD22-C101
MSL – Moisture Sensitivity Level	3	IPC/JEDEC J-STD-020

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive, as amended by Directive 2015/863/EU.

- Lead free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A ($C_{15}H_{12}Br_4O_2$) Free
- SVHC Free