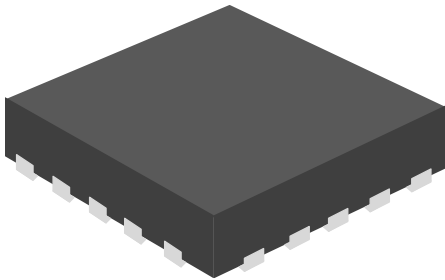


Preliminary Datasheet

MW5545H: 4.9-5.925GHz Wi-Fi Integrated PA Module



— 从心做起 • 芯火相传 —



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

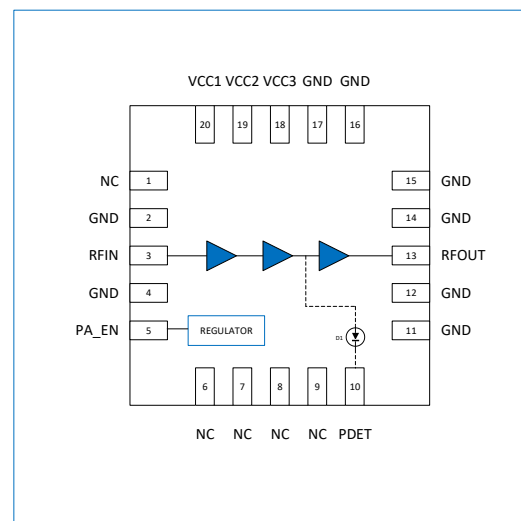
Features

- High output power amplifier
- Input and Output Matched to 50Ω
- Pout = 24.5dBm, 5V, 11ac, 80MHz
MCS9 at 1.8% EVM
- Pout = 25dBm, 5V, 11n, 20/40MHz
MCS7 at 3% EVM
- Required external components
minimized
- Typical Gain = 32.5dB

Product Description

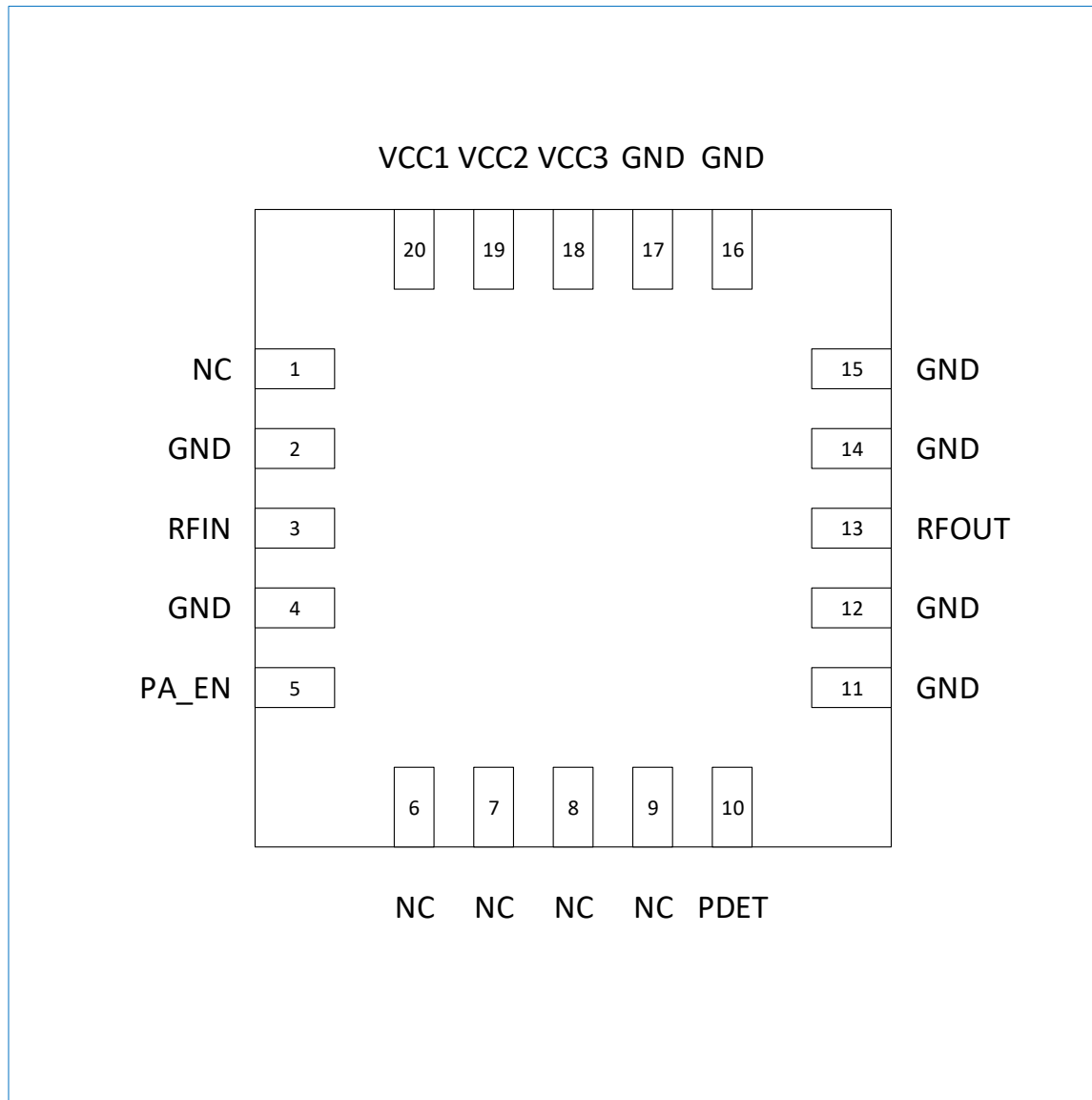
The MW5545H is a three-stage power amplifier designed for 802.11a/n/ac applications. The integrated input and output 50Ω match greatly reduce the layout area, bill of materials and manufacturability cost in customer applications. This module is optimized to minimize the required external components to maintain linear performance. MW5545H is capable of achieving linear powers up to 23dBm with an EVM<1.8% while maintaining excellent power added efficiency. For wireless LAN applications, this device meets the requirements of IEEE802.11a/n/ac.

Functional Block Diagram



Pin Out Diagram

Pin Out



Pin Names and Descriptions

Pin #	Label	Description
1	NC	Not connected internally. It may be left floating or connected to 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	NC	Not connected internally. It may be left floating or connected to ground.
9	NC	Not connected internally. It may be left floating or connected to ground.
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	Third stage supply voltage
19	VCC2	Second stage supply voltage
20	VCC1	First stage supply voltage
Package backside	GND	DC/RF ground (consult for recommended via pattern for optimum performance)

Absolute Maximum Ratings

Symbol	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		1000	mA
PA_EN/VREF	Power Amplifier Enable and Reference Voltage	-0.3	+6	V
RFIN	RF Input Power into 50Ω Load for 11a/n/ac (No Damage).*R1=0Ω		+10	dBm
T _{STG}	Storage Temperature Range	-40	+150	°C
T _j	Maximum Junction Temperature		+160	°C
ESD	JEDEC JESD22-A114 all pins		TBD	V

Recommended Operating Conditions

Symbol	Parameter	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	1.8	3.0	3.3	V
PA_EN - Low	PA_EN(Low)/Reference Voltage	0		0.3	V

DC Electrical Characteristics

Conditions: T=25°C, V_{CC1}=V_{CC2}=V_{CC3}=5.0V, V_{PAEN} =3.0V, de-embedded from EVB loss)

Parameter	Conditions	Min	Typ	Max	Unit
Operating Current	P _{OUT} =23dBm P _{OUT} =26dBm P _{OUT} =27dBm		405 510 560		mA
Quiescent Current	RF=Off		220		mA
PA Enable Current	PA_EN High		1		μA
Leakage Current	RF OFF; VCC=5.0V; VPAEN =0V		0.2		μA

AC Electrical Characteristics

Conditions: T=25°C, V_{CC1}=V_{CC2}=V_{CC3}=5.0V, V_{PAEN} =3.0V, de-embedded from EVB loss

Parameter	Conditions	Min	Typ	Max	Unit
Frequency Range		5.180		5.925	GHz
Extended Operating Frequency		4.900		5.925	GHz
Output Power	802.11a, 54Mbps, 64QAM, 3% EVM	25.5	26.5		dBm
	802.11a, 54Mbps, 64QAM, 2.5% EVM	25	26		dBm
	11n, 20/40MHz, MCS7 64QAM, 2.5% DEVM	24.5	26		dBm
	11ac, 80MHz, MCS9 256QAM, 1.8% DEVM		24.5		dBm
	11ac, 80MHz, MCS9 256QAM, 1.5% DEVM		23		dBm
Mask Compliance	11n, MCS0 HT20		30		dBm
Output 1dB compression point	No modulation	31	33		dBm

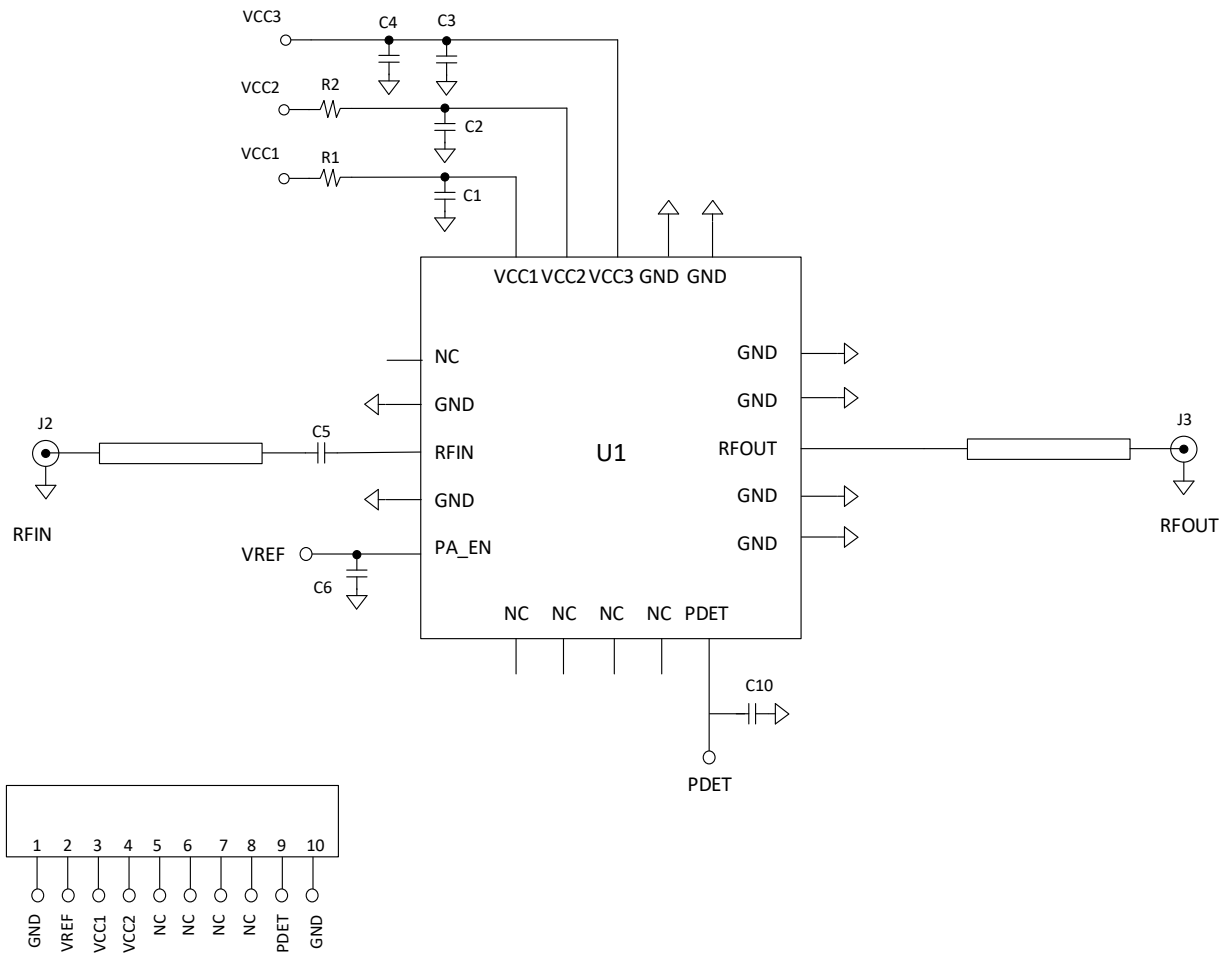
Gain	$P_{IN} = -25\text{dBm}$	30.5	32.5		dB
Gain Variation	Within each UNII Band	-2.5		+2.5	dB
Second Harmonic	$P_{OUT}=27\text{dBm}$, measured with a standard IEEE802.11a 6Mbps waveform		TBD	TBD	dBm/MHz
Third Harmonic			TBD	TBD	dBm/MHz
Rise and Fall Time			0.2		μS

Power Detector

Conditions: $T=25^{\circ}\text{C}$, $V_{CC1}=V_{CC2}=V_{CC3}=5.0\text{V}$, $V_{PAEN}=3.0\text{V}$, 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	$P_{OUT}=27\text{dBm}$		1.0		V
	$P_{OUT}=23\text{dBm}$		0.73		V
	$P_{OUT}=20\text{dBm}$		0.58		V
	RF= Off		0.25		V
Detector Accuracy	P_{OUT} at constant V_{DET} ,	-0.65		+0.65	dB
Output Impedance			3.0		$\text{K}\Omega$

MW5545H Applications Schematic



Bill of Material

Ref. Des.	Value	Manuf.	Part number	Description
U1	/	XMW	MW5545H	MW5545H
C1, C2, C3	2.2uF	Murata	GRM155B30J225KE95D	Capacitor, Chip, 10%, 6.3V, 0402
C6	1nF	Murata	GRM155R61A102KA01D	Capacitor, Chip, 10%, 10V, 0402
C10	10pF	Murata	GRM155C1E100JA01D	Capacitor, Chip, 5%, 16V, 0402
R1,R2	0 Ω	Kamaya	RMC10-000JTH	Capacitor, Chip, 5%,0.1W
Other				Do Not Install



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ESD/MSL

PARAMETER	RATING	STANDARD
ESD – Human Body Model (HBM)	Class 1C (1000V)	ESDA/JEDEC JS-001-2017
ESD – Charged Device Model (CDM)	Class C3 (1000V)	ESDA/JEDEC JS-002-2018
MSL – Moisture Sensitivity Level	TBD	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 (C15H12Br4O2) Free
- SVHC Free