QPF4506

Wi-Fi Front End Module

Product Overview

The Qorvo® QPF4506 is an integrated front end module (FEM) designed for Wi-Fi 802.11ax systems. The compact form factor and integrated matching minimizes layout area in the application.

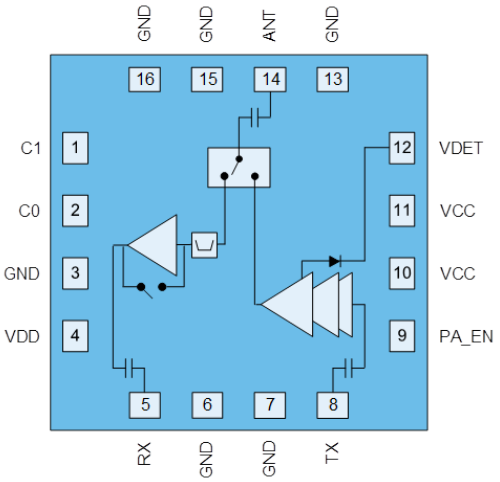
Performance is focused on optimizing the PA for a 5 V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput. Receive path matches the optimal technologies to maximize Rx sensitivity through noise figure performance that is consistent over a wider variety of conditions.

The receive path has integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

For power accuracy feedback a integration of a DC power detector with logarithmic feedback across power which enables power control to lower powers and enables the possibility to calibrate against a constant slope for applications which use higher gain antennas or end users wanting to reduce device calibration time in production.

The QPF4506 integrates a 5 GHz power amplifier (PA), regulator, single-pole two throw switch (SP2T), and a bypassable low noise amplifier (LNA).

Functional Block Diagram



Top View

16 Pad 3x3mm Laminate Package

Key Features

- 5150 – 5925MHz
- P_{OUT} = +15 dBm MCS11 HE160 -43 dB Dynamic EVM
- P_{OUT} = +21 dBm MCS9 VHT80 -35 dB Dynamic EVM
- P_{OUT} = +23 dBm MCS7 HT40 -30 dB Dynamic EVM
- P_{OUT} = +25 dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +5 V Operation
- 30 dB Tx Gain
- 1.7 dB Noise Figure
- 13.5 dB Rx Gain & 6.5 dB Bypass Loss
- 28 dB 2.4 GHz Rejection on Rx Path
- Integrated Logarithmic DC Power Detector

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4506SB	Sample bag with 5 pieces
QPF4506SQ	Sample bag with 25 pieces
QPF4506SR	7” reel with 100 pieces
QPF4506TR13-5K	13” reel with 5000 pieces
QPF4506EVB-01	Assembled Evaluation Board

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1A (350V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1KV)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

- Product uses RoHS Exemption 7c-I to meet RoHS Compliance requirements
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A ($C_{15}H_{12}Br_4O_2$) Free
- SVHC Free

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

Web: www.qorvo.com

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Email: customer.support@qorvo.com

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QPF4518

Wi-Fi Front End Module

Product Overview

The Qorvo® QPF4518 is an integrated front end module (FEM) designed for Wi-Fi 5 (802.11ac) systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 5V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput.

The receive path is pinned out so external filtering can be added in the optimal position. Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

There are two options for power detect, a DC power detector which has voltage output and an RF power detector with an RF output from a directional coupler.

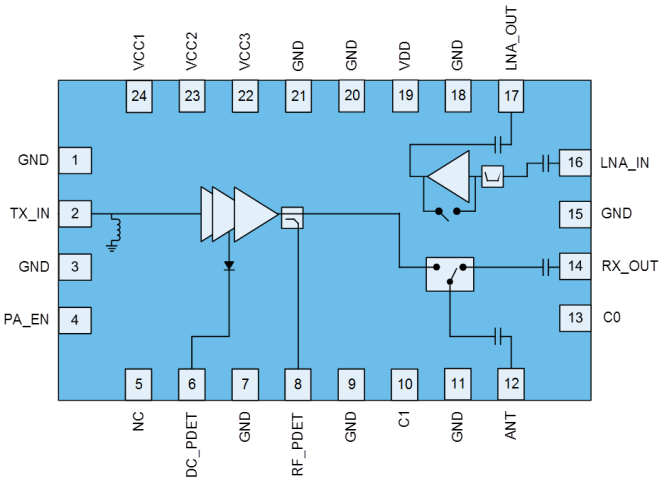
The QPF4518 integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device.

24 Pin 5x3 mm QFN Package

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +23 dBm MCS9 VHT80 -35 dB Dynamic EVM
- P_{OUT} = +24.5 dBm MCS7 HT20/40 -30 dB Dynamic EVM
- P_{OUT} = +25 dBm MCS0 HT20 Spectral Mask Compliance
- 160 MHz Bandwidth and MCS11 Capable
- Optimized for +5 V Operation
- 32 dB Tx Gain
- 2 dB Noise Figure
- 16 dB Rx Gain & 6.5 dB Bypass Loss
- 25 dB 2.4 GHz Rejection on Rx Path
- Integrated RF Power Detector Coupler as well as DC Power Detector

Functional Block Diagram



Top View

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4518SB	Sample bag with 5 pieces
QPF4518SQ	Sample bag with 25 pieces
QPF4518SR	7” reel with 100 pieces
QPF4518TR13	13” reel with 2,500 pieces
QPF4518PCK401	Assembled Evaluation Board + 5 pcs

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B (750V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C2a (700V)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 2	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: NiPdAu

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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QPF4518M

Wi-Fi Front End Module

Product Overview

The Qorvo® QPF4518M is an integrated front end module (FEM) designed for Wi-Fi 5 (11ac) systems. The compact form factor and integrated matching minimizes layout area in the application.

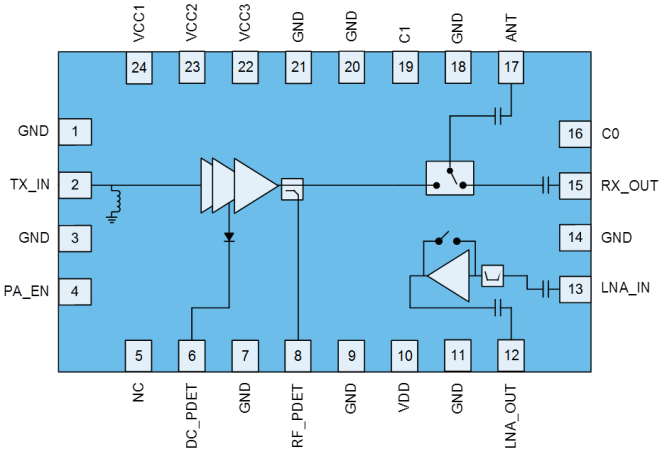
Performance is focused on optimizing the PA for a 5V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput.

The receive path is pinned out so external filtering can be added in the optimal position. Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

There are two options for power detect, a DC power detector which has voltage output and an RF power detector with an RF output from a directional coupler.

The QPF4518M integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device

Functional Block Diagram



Top View

24 Pin 5x3 mm QFN Package

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +23dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +24.5dBm MCS7 HT20/40 -30dB Dynamic EVM
- P_{OUT} = +25dBm MCS0 HT20 Spectral Mask Compliance
- 160MHz Bandwidth and MCS11 Capable
- Optimized for +5V Operation
- 32 dB Tx Gain
- 2dB Noise Figure
- 16dB Rx Gain & 6.5dB Bypass Loss
- 25dB 2.4GHz Rejection on Rx Path
- Integrated RF Power Detector Coupler & DC Power Detector

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4518MSB	Sample bag with 5 pieces
QPF4518MSQ	Sample bag with 25 pieces
QPF4518MSR	7” reel with 100 pieces
QPF4518MTR13	13” reel with 2,500 pieces
QPF4518MPCK401	Assembled Evaluation Board + 5 pcs

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B (750V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C2a (700V)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 2	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Nickel Palladium Gold (NiPdAu)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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QPF4519

Wi-Fi Front End Module

Product Overview

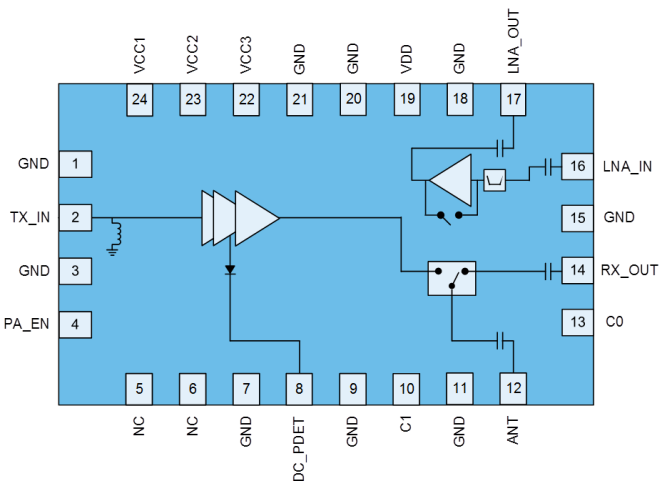
The Qorvo® QPF4519 is an integrated front end module (FEM) designed for Wi-Fi 802.11a/n/ac systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 5V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput.

The receive path is pinned out so external filtering can be added in the optimal position. Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included

The QPF4519 integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device

Functional Block Diagram



Top View

24 Pin 5x3 mm QFN Package

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +23 dBm MCS9 VHT80 -35 dB Dynamic EVM
- P_{OUT} = +24.5 dBm MCS7 HT20/40 -30d B Dynamic EVM
- P_{OUT} = +25 dBm MCS0 HT20 Spectral Mask Compliance
- 160MHz Bandwidth and MCS11 Capable
- Optimized for +5 V Operation
- 32 dB Tx Gain
- 2 dB Noise Figure
- 16 dB Rx Gain & 6.5 dB Bypass Loss
- 25 dB 2.4 GHz Rejection on Rx Path

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4519SB	Sample bag with 5 pieces
QPF4519SQ	Sample bag with 25 pieces
QPF4519SR	7” reel with 100 pieces
QPF4519TR13	13” reel with 2,500 pieces
QPF4519PCK401	Assembled Evaluation Board + 5 pcs

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B (750V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C2a (700V)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 2	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electrolytic plated Au over Ni

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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QPF4526

Wi-Fi 6 Front End Module

Product Overview

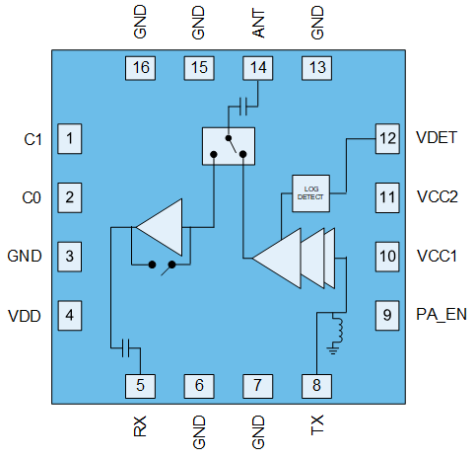
The Qorvo® QPF4526 is an integrated front end module (FEM) designed for Wi-Fi 6 (802.11ax) systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 5V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput.

Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included. A broadrange, constant slope voltage logarithmic power detector is provided for application feedback.

The QPF4526 integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device.

Functional Block Diagram



Top View

16 Pad 3 x 3 mm Laminate Package

Key Features

- 5150 – 5850 MHz
- P_{OUT} = +17 dBm MCS11 HE160 -43 dB Dynamic EVM
- P_{OUT} = +19 dBm MCS11 HE80 -43 dB Dynamic EVM
- P_{OUT} = +23.5 dBm MCS9 VHT80/160 -35 dB Dynamic EVM
- P_{OUT} = +27 dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +5 V Operation
- 33 dB Tx Gain
- 1.9 dB Noise Figure
- 14.5 dB Rx Gain & 8 dB Bypass Loss
- 25 dB 2.4 GHz Rejection on Rx Path
- Integrated DC Power Detector

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4526SB	Sample bag with 5 pieces
QPF4526SR	7” reel with 100 pieces
QPF4526TR13	13” reel with 10,000 pieces
QPF4526EVB	Assembled Evaluation Board

.

ES France - Département RF & Hyperfréquences - 127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 60 - Fax. 01 47 01 16 22 - e-mail: hyper@es-france.com - Site Web: www.es-france.com

QPF4526
Wi-Fi 6 Front End Module

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1C (1000V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1000V)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	MSL 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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QPF4528

Wi-Fi Front End Module

Product Overview

The Qorvo® QPF4528 is an integrated front end module (FEM) designed for Wi-Fi 802.11ax systems. The compact form factor and integrated matching minimizes layout area in the application.

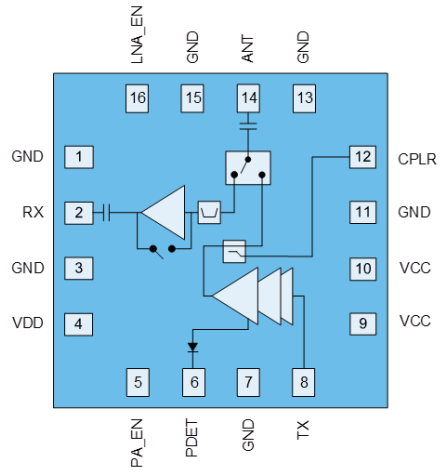
Performance is focused on optimizing the PA for a 3.3V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput. Receive path matches the optimal technologies to maximize Rx sensitivity through noise figure performance that is consistent over a wider variety of conditions.

The receive path is pinned out so external filtering can be added in the optimal position. Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

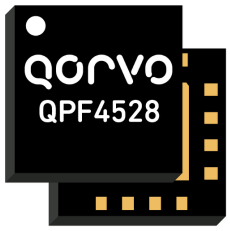
There are two options for power detect, a DC power detector which has voltage output and an RF power detector with an RF output from a directional coupler.

The QPF4528 integrates a 5 GHz power amplifier (PA), regulator, single pole two throw switch (SP2T), bypassable low noise amplifier (LNA), coupler and voltage power detector into a single device

Functional Block Diagram



Top View



16 Pad 3x3 mm Laminate Package

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +12.5dBm MCS11 HE80 -47dB Dynamic EVM
- P_{OUT} = +15dBm MCS11 HE80 -43dB Dynamic EVM
- P_{OUT} = +18dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +19dBm MCS7 HT20/40 -30dB Dynamic EVM
- P_{OUT} = +21dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +3.3 V Operation
- 0.5W Power Consumption at P_{OUT} +17dBm
- 30 dB Tx Gain
- 2 dB Noise Figure
- 15 dB Rx Gain & 7 dB Bypass Loss
- 35 dB 2.4 GHz Rejection on Rx Path
- Integrated RF Coupler as well as DC Power Detector

Applications

- Access Points
- Wireless Routers
- Client Equipment
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4528SB	Sample bag with 5 pieces
QPF4528SQ	Sample bag with 25 pieces
QPF4528SR	7” reel with 100 pieces
QPF4528TR13-5K	13” reel with 5,000 pieces
QPF4528PCK-01	Assembled Evaluation Board + 5 pcs

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B (500V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1kV)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260°C max. reflow temperature) and tin/lead (245°C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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QPF4530

Wi-Fi Front End Module

Product Overview

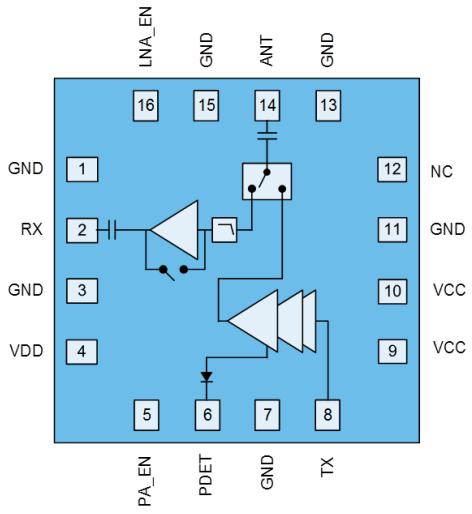
The Qorvo® QPF4530 is an integrated front end module (FEM) designed for Wi-Fi 802.11ax systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 3.3V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput. Receive path matches the optimal technologies to maximize Rx sensitivity through noise figure performance that is consistent over a wider variety of conditions.

The receive path is pinned out so external filtering can be added in the optimal position. Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included. A DC power detector which has voltage output provides feedback for close loop applications.

The QPF4530 integrates a 5 GHz power amplifier (PA), regulator, single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device

Functional Block Diagram



Top View

16 Pin 3x3 mm QFN Package

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +15dBm MCS11 HE80 -43dB Dynamic EVM
- P_{OUT} = +18dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +19dBm MCS7 HT20/40 -30dB Dynamic EVM
- P_{OUT} = +21dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +3.3 V Operation
- 0.5W Power Consumption at P_{OUT} +17dBm
- 30 dB Tx Gain
- 2 dB Noise Figure
- 15 dB Rx Gain & 7 dB Bypass Loss
- 37 dB 2.4 GHz Rejection on Rx Path
- Integrated DC Power Detector

Applications

- Access Points
- Wireless Routers
- Client Equipment
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4530SB	Sample bag with 5 pieces
QPF4530SQ	Sample bag with 25 pieces
QPF4530SR	7” reel with 100 pieces
QPF4530TR13-5K	13” reel with 5,000 pieces
QPF4530PCK-01	Assembled Evaluation Board

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B (500V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1kV)	JESD22-C101
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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QPF4538

Wi-Fi Front End Module

Product Overview

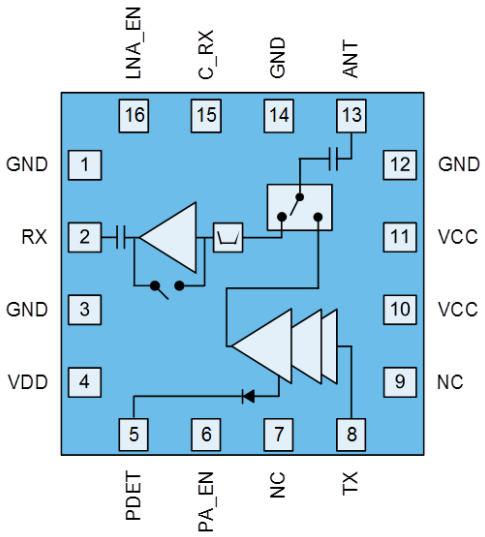
The Qorvo® QPF4538 is an integrated front end module (FEM) designed for Wi-Fi 802.11a/n/ac systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for PoE applications by centering on 0.5W power consumption while maintaining the highest linear output power and leading edge throughput.

Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

The QPF4538 integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device.

Functional Block Diagram



Top View

16-Pin, 2.5x2.5 mm Module Package

Key Features

- 4900 – 5925 MHz
- P_{OUT} = +17.5dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +18.5dBm MCS7 HT20/40 -30dB Dynamic EVM
- P_{OUT} = +21dBm MCS0 HT20 Spectral Mask Compliance
- 160MHz Bandwidth and MCS11 Capable
- Optimized for +3.3 V Operation
- Low Power Consumption ~ 0.5W
- 30 dB Tx Gain
- 2.5 dB Noise Figure
- 14.5 dB Rx Gain & 6 dB Bypass Loss
- 15 dB 2.4 GHz Rejection on Rx Path
- Integrated DC Power Detector

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Set-Top Boxes
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4538SB	Sample bag with 5 pieces
QPF4538SQ	Sample bag with 25 pieces
QPF4538SR	7” reel with 100 pieces
QPF4538TR7	7” reel with 2,500 pieces
QPF4538TR13	13” reel with 10,000 pieces
QPF4538PCK-01	Assembled Evaluation Board + 5 pcs

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3	JESD22-C101
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electrolytic plated Au over Ni

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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PRELIMINARY

QPF4550

Wi-Fi Front End Module

Product Overview

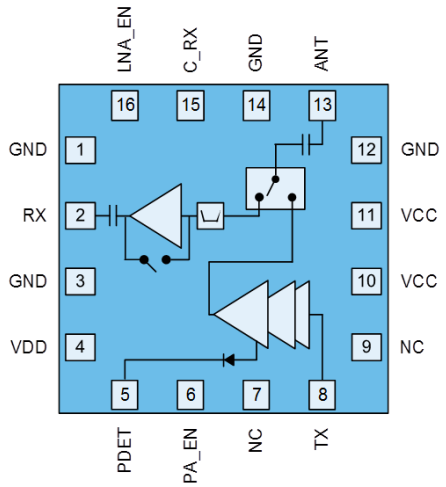
The Qorvo® QPF4550 is an integrated front end module (FEM) designed for Wi-Fi 6 (802.11ax) systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 5 V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput.

Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

The QPF4550 integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device.

Functional Block Diagram



Top View

16 Pad 2.5x2.5 mm Laminate Package

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +15dBm MCS11 HE160 -43dB Dynamic EVM
- P_{OUT} = +16dBm MCS11 HE80 -43dB Dynamic EVM
- P_{OUT} = +20.5dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +24.5dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +5 V Operation
- 30 dB Tx Gain
- 2.1 dB Noise Figure
- 13.5 dB Rx Gain & 8 dB Bypass Loss
- 30 dB 2.4 GHz Rejection on Rx Path

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4550SB	Sample bag with 5 pieces
QPF4550SQ	Sample bag with 25 pieces
QPF4550SR	7” reel with 100 pieces
QPF4550TR13	13” reel with 10,000 pieces
QPF4550EVB-01	Assembled Evaluation Board

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 2	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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PRELIMINARY

QPF4550

Wi-Fi Front End Module

Product Overview

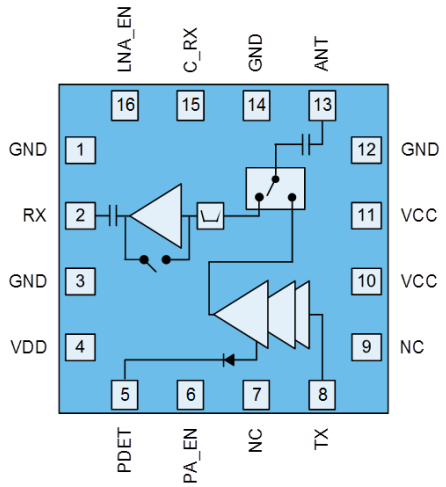
The Qorvo® QPF4550 is an integrated front end module (FEM) designed for Wi-Fi 6 (802.11ax) systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 5 V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput.

Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

The QPF4550 integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device.

Functional Block Diagram



Top View

16 Pad 2.5x2.5 mm Laminate Package

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +15dBm MCS11 HE160 -43dB Dynamic EVM
- P_{OUT} = +16dBm MCS11 HE80 -43dB Dynamic EVM
- P_{OUT} = +20.5dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +24.5dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +5 V Operation
- 30 dB Tx Gain
- 2.1 dB Noise Figure
- 13.5 dB Rx Gain & 8 dB Bypass Loss
- 30 dB 2.4 GHz Rejection on Rx Path

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4550SB	Sample bag with 5 pieces
QPF4550SQ	Sample bag with 25 pieces
QPF4550SR	7” reel with 100 pieces
QPF4550TR13	13” reel with 10,000 pieces
QPF4550EVB-01	Assembled Evaluation Board

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 2	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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QPF4551

Wi-Fi 6 Front End Module

Product Overview

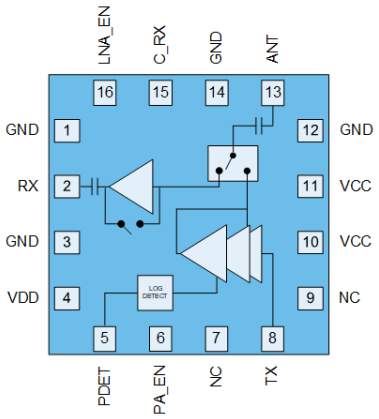
The Qorvo® QPF4551 is an integrated front end module (FEM) designed for Wi-Fi 6 (802.11ax) systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 5V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput.

Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included. A broadrange, constant slope voltage logarithmic power detector is provided for application feedback

The QPF4551 integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device.

Functional Block Diagram



Top View

16 Pad 2.5 x 2.5 mm Laminate Package

Key Features

- 5150 – 5850 MHz
- P_{OUT} = +17 dBm MCS11 HE160 -43dB Dynamic EVM
- P_{OUT} = +19 dBm MCS11 HE80 -43dB Dynamic EVM
- P_{OUT} = +23.5 dBm MCS9 VHT80/160 -35dB Dynamic EVM
- P_{OUT} = +27 dBm MCS0 VHT20 Spectral Mask Compliance
- Optimized for +5 V Operation
- 32 dB Tx Gain
- 2 dB Noise Figure
- 13.5 dB Rx Gain & 8 dB Bypass Loss
- 25 dB 2.4 GHz Rejection on Rx Path

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4551SB	Sample bag with 5 pieces
QPF4551SR	7” reel with 100 pieces
QPF4551TR13	13” reel with 10,000 pieces
QPF4551EVB	Assembled Evaluation Board

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 2 (2000V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1000V)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A ($C_{15}H_{12}Br_40_2$) Free
- SVHC Free
- PFOS Free

Contact Information

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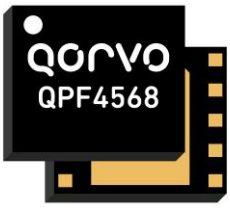
PRELIMINARY

QPF4568

Wi-Fi Front End Module



10 Pad 2.0x1.7 mm Laminate Package

Product Overview

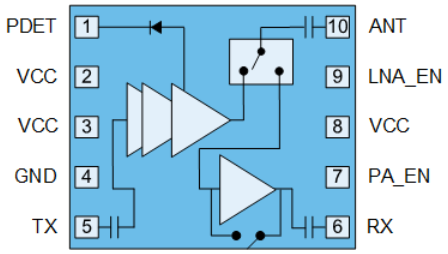
The Qorvo® QPF4568 is an integrated front end module (FEM) designed for Wi-Fi 6 (802.11ax) systems. The ultra small form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 3.7V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput.

Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

The QPF4568 integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device.

Functional Block Diagram



Top View

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +16dBm MCS11 HE80 -43dB Dynamic EVM
- P_{OUT} = +19dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +20dBm MCS7 HT20 -30dB Dynamic EVM
- P_{OUT} = +21.5dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +3.7 V Operation
- 29.5 dB Tx Gain
- 2.3 dB Noise Figure
- 12.5 dB Rx Gain & 3.7 dB Bypass Loss
- 30 dB 2.4 GHz Rejection on Rx Path

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4568SB	Sample bag with 5 pieces
QPF4568SR	7” reel with 100 pieces
QPF4568TR13	13” reel with 10,000 pieces
QPF4568EVB01	Assembled Evaluation Board

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 2 (2,000V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1,000V)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electrolytic plated Au over Ni

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

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QPF4588A

Wi-Fi 6 Front End Module

Product Overview

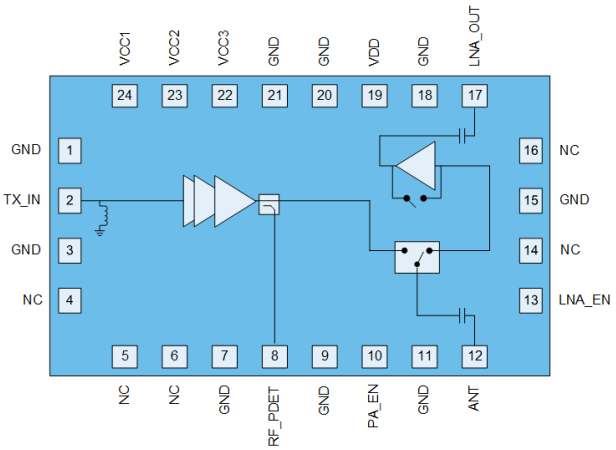
The Qorvo® QPF4588A is an integrated medium power front end module (FEM) designed for Wi-Fi 6 (802.11ax) systems. The small form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the PA for a 5V supply voltage, while providing optional operation over a wide range, that conserves power consumption while maintaining the highest linear output power and leading edge throughput. Receive path matches the optimal technologies to maximize Rx sensitivity through noise figure performance that is consistent over a wider variety of conditions.

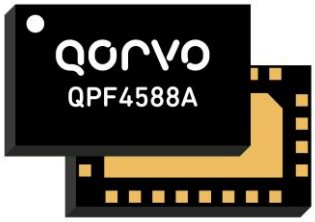
Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included. For application feedback, an RF power detector is integrated in the package providing a coupled signal from the transmit path.

The QPF4588A integrates a 5 GHz power amplifier (PA), single pole two throw switch (SP2T) and bypassable low noise amplifier (LNA) into a single device.

Functional Block Diagram



Top View



24 Pad 5 x 3 mm Laminate Package

Key Features

- 5150 – 5850 MHz
- P_{OUT} = +17dBm MCS11 HE160 -43dB Dynamic EVM
- P_{OUT} = +19dBm MCS11 HE80 -43dB Dynamic EVM
- P_{OUT} = +23.5dBm MCS9 VHT80/160 -35dB Dynamic EVM
- P_{OUT} = +27dBm MCS0 VHT20 Spectral Mask Compliance
- Optimized for +5 V Operation
- 33 dB Tx Gain
- 2 dB Noise Figure
- 14 dB Rx Gain & 8 dB Bypass Loss
- 23 dB 2.4 GHz Rejection on Rx Path
- Integrated RF Power Detector

Applications

- Access Points
- Wireless Routers
- Residential Gateways
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
QPF4588ASB	Sample bag with 5 pieces
QPF4588ASR	7” reel with 100 pieces
QPF4588ATR13	13” reel with 10,000 pieces
QPF4588AEVB	Assembled Evaluation Board

ES France - Département RF & Hyperfréquences - 127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 60 - Fax. 01 47 01 16 22 - e-mail: hyper@es-france.com - Site Web: www.es-france.com

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 2 (2000V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1000V)	ANSI/ESD/JEDEC JS-002
MSL – Moisture Sensitivity Level	3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

Web: www.qorvo.com

Tel: 1-844-890-8163

Email: customer.support@qorvo.com

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QPF8538

Wi-Fi Front End Module
4900MHz to 5925MHz

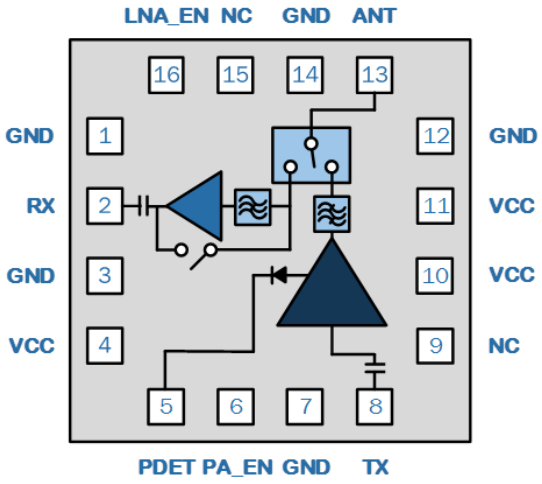
Product Description

The QPF8538 provides a complete integrated solution in a single front end module (FEM) for Wi-Fi 802.11a/n/ac systems. The small form factor and integrated matching minimizes layout area in the application and greatly reduces the number of external components.

Performance is focused on a balance of efficiency to linear power that increases the range and throughput of connections. Control lines are reduced to a two-line control scheme

The QPF8538 integrates a 5GHz power amplifier (PA), single-pole two-throw switch (SP2T) and a low noise amplifier (LNA) with bypass. Integrated filtering includes 2nd and 3rd harmonic as well as 2.4GHz rejection for dual-band dual-concurrent operation. A DC power detector is integrated for application calibration enablement. The device is provided in a 2.3mm x 2.3mm x 0.0.63mm, 16-pin laminate package.

Functional Block Diagram



Package: Laminate, 16-pin,
2.3mm x 2.3mm x 0.63mm max

Feature Overview

- P_{OUT} = +17dBm, 802.11ac, VHT80 MCS9 at-35dB Dynamic EVM
- P_{OUT} = +18dBm, 802.11n, HT20/40 MCS7 at-30dB Dynamic EVM
- P_{OUT} = +21dBm, HT20 MCS0 at Spectral Mask Compliance
- 3.3V Operation

- RX Gain = 12.5dB
- Noise Figure = 2.5dB
- Bypass Loss = 5dB
- Input and Output Matched to 50Ω
- Integrated 2.4GHz Rejection Filter

Applications

- Wireless Routers
- Access Points
- Enterprise Client Access Points
- Consumer Premise Equipment
- Wireless Adapters
- Internet of Things

Ordering Information

PART NUMBER	DESCRIPTION
QPF8538SB	Sample bag with 5 pieces
QPF8538SQ	Sample bag with 25 pieces
QPF8538SR	7" Reel with 100 pieces
QPF8538TR7	7" Reel with 2500 pieces
QPF8538PCK401	Assembled Evaluation Board

RFMD + TriQuint = Qorvo

Absolute Maximum Ratings

PARAMETER	RATING	UNIT
DC Supply Voltage (No RF Applied)	-0.5 to +6	V_{DC}
Control Voltage	-0.5 to +5	V_{DC}
DC Supply Current	500	mA
Storage Temperature	-40 to +150	ºC
Maximum TX Input Power into 50Ω Load for 11a/n/ac (No Damage)	+10	dBm
Maximum RX Input Power - LNA On Mode (No Damage)	+5	dBm
Maximum RX Input Power – Bypass Mode (No Damage)	+25	dBm

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

Nominal Operating Parameters

PARAMETER	MIN	TYP	MAX	UNIT	CONDITION
COMPLIANCE					**802.11A, 802.11N, 802.11AC**
Operating Frequency	5.150		5.925	GHz	
Extended Operating Frequency	4.9		5.925	GHz	
Operating Temperature	-40		+85	ºC	
Power Supply V_{CC}	3.0	3.3	4.2	V	
Control Voltage-High	2.8	2.95	V_{CC}	V	
Control Voltage-Low		0	0.2	V	

TRANSMIT (TX-ANT) HIGH POWER MODE					**V_{CC}=3.3V, T=+25ºC, *f*=5.15-5.925GHz, PA_EN=High, LNA_EN=Low; Unless otherwise noted**
11ac VHT80 Output Power		17		dBm	MCS9
Dynamic EVM		1.5	1.8	%	
		-36	-35	dB	
11n HT20/40 Output Power		18		dBm	MCS7
Dynamic EVM		2.5	3	%	
		-32	-30	dB	
Margin to 802.11ac 80MHz Spectral Mask		3	0	dBc	P_{OUT} = +19dBm, MCS0
Margin to 802.11n 20MHz Spectral Mask		3	0	dBc	P_{OUT} = +20.5dBm, MCS0
Margin to 802.11a Spectral Mask		3	0	dBc	P_{OUT} = +21dBm, OFDM 6MBps
Large Signal Gain	26	28		dB	
	24	25.5		dB	T = +85ºC
Gain Flatness	-0.25		+0.25	dB	Across any 80MHz channel

PARAMETER	MIN	TYP	MAX	UNIT	CONDITION
Out of Band Gain			-41	dB	*f* = 800-900MHz
			-39	dB	*f* = 1800-2100MHz
			-35	dB	*f* = 2300-2400MHz
			-31	dB	*f* = 2490-2690MHz
			6	dB	*f* = 3400-3800MHz
			20	dB	*f* = 3800-4400MHz
			24	dB	*f* = 7250-7700MHz
			-10	dB	*f* > 10500MHz
Quiescent Current		160		mA	RF=Off
Operating Current		210		mA	P_{OUT} = 17dBm
		215		mA	P_{OUT} = 18dBm
		270		mA	P_{OUT} = 21dBm
TX Port Return Loss	7	10		dB	
ANT Port Return Loss	10	15		dB	
2nd Harmonics		-30	-25	dBm/MHz	P_{OUT} = 21dBm 802.11a 6MBps
3rd Harmonics		-30	-25	dBm/MHz	P_{OUT} = 21dBm 802.11a 6MBps
ANT-RX Isolation	25	30		dB	
Power Detector Voltage		0.23		mV	RF Off
		0.45		mV	P_{OUT} = +17dBm@5775MHz
		0.62		mV	P_{OUT} = +21dBm@5775MHz

TRANSMIT (TX-ANT) LOW POWER MODE					**V_{CC}=3.3V, T=+25ºC, *f*=5.15-5.925GHz, PA_EN & LNA_EN=High; Unless otherwise noted**
11ac VHT80 Output Power		14		dBm	MCS9
Dynamic EVM		1.5	1.8	%	
		-36	-35	dB	
Large Signal Gain	25	27		dB	
	23	24.5		dB	T = +85ºC
Gain Flatness	-0.25		+0.25	dB	Across any 80MHz channel
Operating Current		160		mA	P_{OUT} = 14dBm
TX Port Return Loss	7	10		dB	
ANT Port Return Loss	10	20		dB	

RECEIVE (ANT-RX) LNA ON MODE					**V_{CC}=3.3V, T=+25ºC, *f*=5.15-5.925GHz, PA_EN=Low, LNA_EN=High; Unless otherwise noted**
Gain		12.5		dB	
		11		dB	T = +85ºC

PARAMETER	MIN	TYP	MAX	UNIT	CONDITION
Out of Band Gain			-45	dB	*f* = 2400-2480MHz
			-5	dB	*f* = 2480-3800MHz
Noise Figure		2.5	3	dB	
RX Operating Current		10	15	mA	
RX Port Return Loss		7		dB	
ANT Port Return Loss		7		dB	
Input P^{1dB}		-4		dBm	
Input IP3		4		dB	Two-tone inband

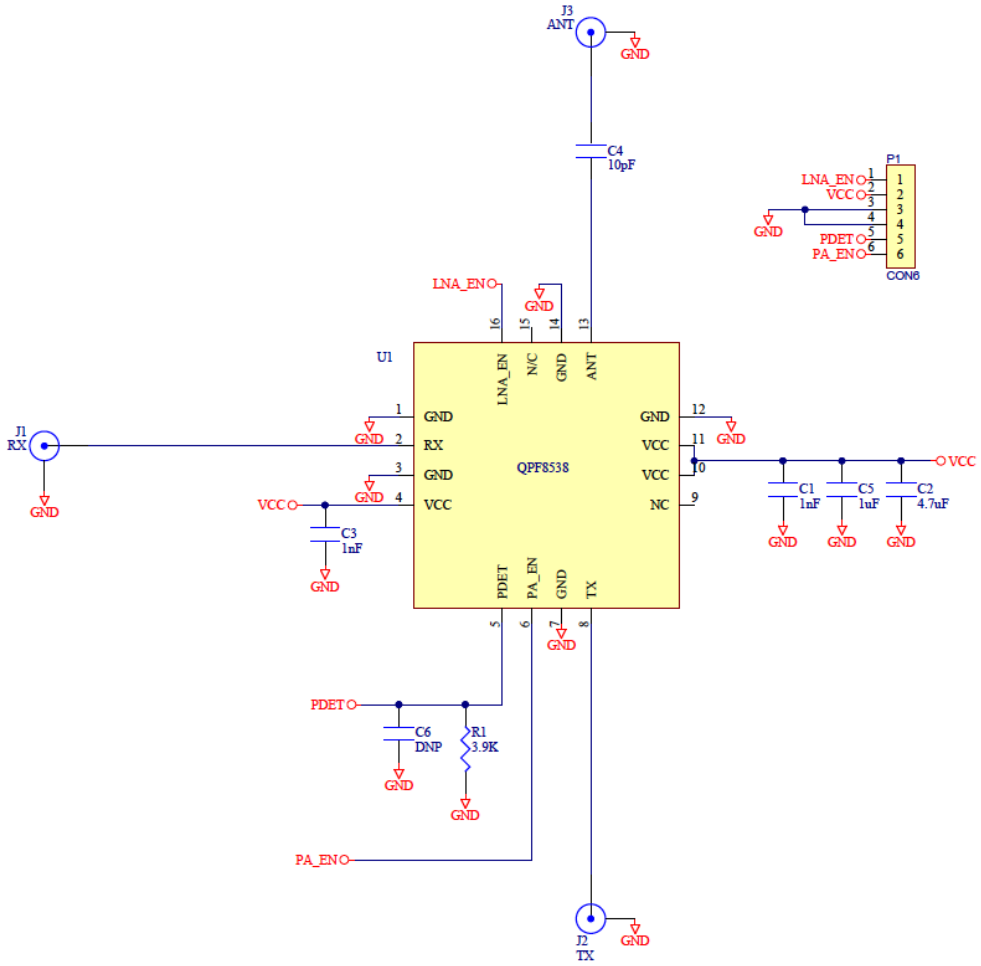
RECEIVE (ANT-RX) BYPASS MODE					**V_{CC}=3.3V, T=+25ºC, *f*=5.15-5.925GHz, PA_EN & LNA_EN=Low; Unless otherwise noted**
Bypass Loss	3.5	5	6.5	dB	
RX Port Return Loss		8		dB	
ANT Port Return Loss		20		dB	
Input P^{1dB}		+15		dBm	
Input IP3		30		dB	Two-tone inband

GENERAL SPECIFICATIONS					
FEM Leakage Current		5	10	µA	
PA_EN Control Current		250		µA	
LNA_EN Control Current		80		µA	
PA Turn-On Time		200	500	nS	10%<->90%; Referencing from control voltage to RF power
LNA Turn-On Time		200	500	nS	
PA Stability			22	dBm	Unconditional into 4:1 VSWR; No spurs above -50dBm/MHz max

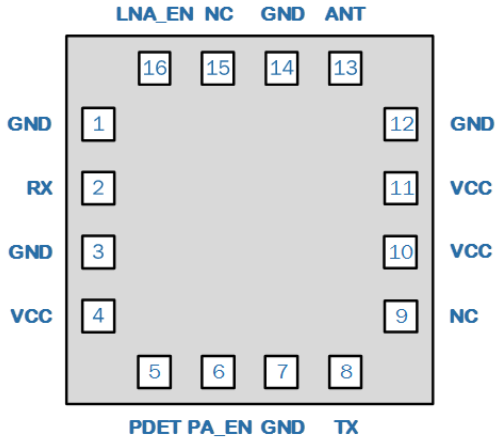
Switch Control Logic Truth Table

OPERATING MODE	PA_EN	LNA_EN
802.11a/n/ac TX High Power	High	Low
802.11a/n/ac TX Low Power	High	High
802.11a/n/ac RX Gain	Low	High
802.11a/n/ac RX Bypass	Low	Low
Standby	Low	Low

Evaluation Board Schematic



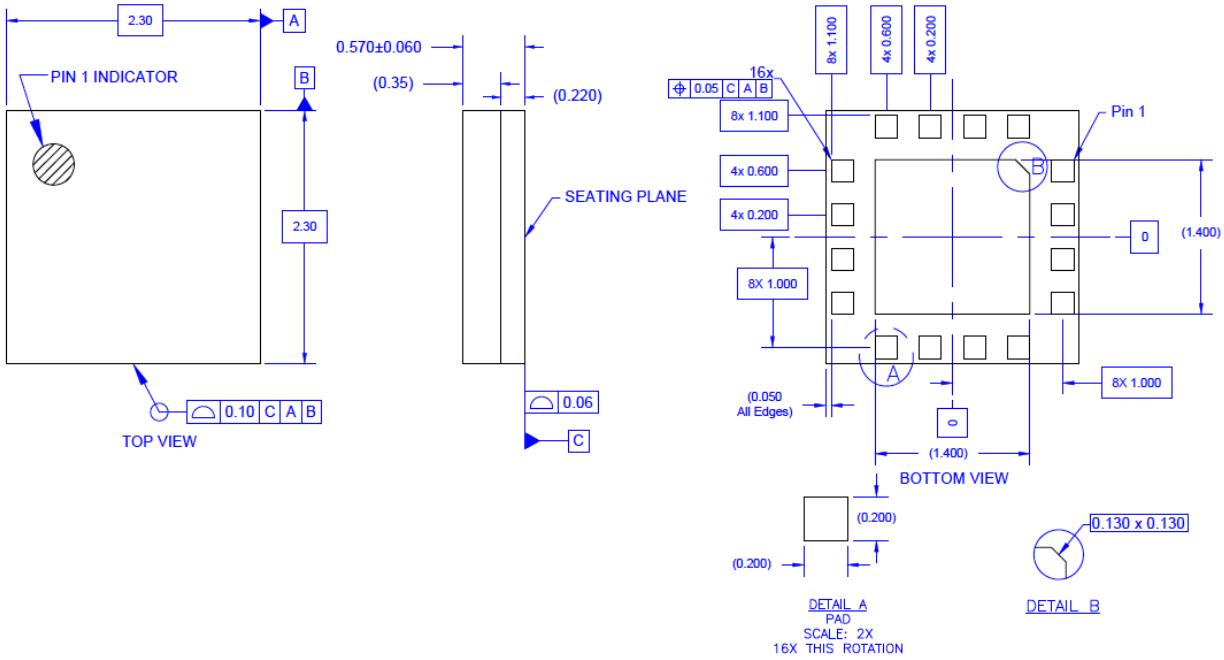
Pin Out



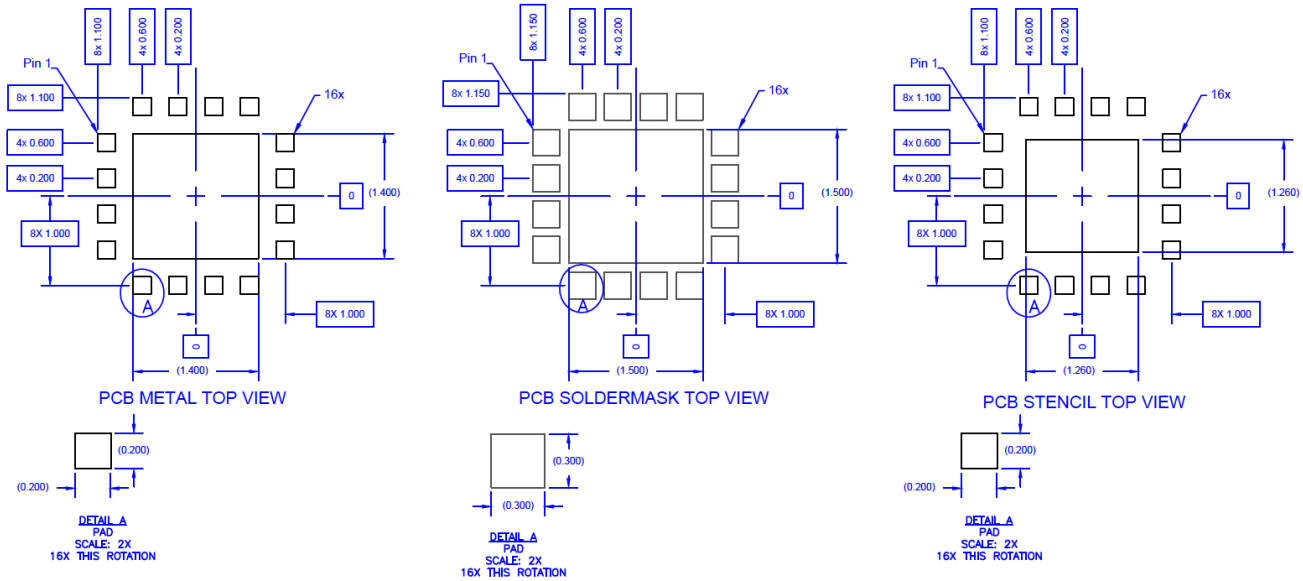
Pin Names and Descriptions

PIN	NAME	DESCRIPTION
1	GND	Ground connection. This pin is not connected internally.
2	RX	RF output port for the LNA. This port is matched to 50Ω and DC blocked internally.
3	GND	Ground connection. This pin is not connected internally.
4	VCC	Supply voltage for the LNA and PA Regulator. See applications schematic for biasing and bypassing components.
5	PDET	Power Detector voltage for the TX path. May need external series R/shunt C to adjust voltage level and to filter RF noise.
6	PA_EN	Control voltage. See Switch Control Logic Truth Table for proper voltage settings.
7	GND	Ground connection. This pin is not connected internally.
8	TX	RF input port for the PA. This port is matched to 50Ω and DC blocked internally.
9	NC	No connect. This pin is not connected internally and can be left floating or connected to ground.
10	VCC	Supply voltage for the 1st and 2nd stages of the PA. See applications schematic for biasing and bypassing components.
11	VCC	Supply voltage for the final stage of the PA. See applications schematic for biasing and bypassing components.
12	GND	Ground connection. This pin is not connected internally.
13	ANT	RF bi-directional antenna port matched to 50Ω. An external DC block is required.
14	GND	Ground connection. This pin is not connected internally.
15	NC	No connect. This pin is not connected internally and can be left floating or connected to ground.
16	LNA_EN	Control voltage. See Switch Control Logic Truth Table for proper voltage settings.
Pkg Base	GND	Ground connection. The backside of the package should be connected to the ground plane through a short path, i.e., PCB vias under the device are recommended.

Package Outline (Dimensions in millimeters)



PCB Mounting Pattern (Dimensions in millimeters)



Product Compliance Information

Caution! ESD-Sensitive Device

ESD Sensitivity Ratings

ESD Rating:	Class 1B
Voltage:	Passes ≥500V to <1000V
Test:	Human Body Model (HBM)
Standard:	JEDEC Standard JESD22-A114

ESD Rating:	Class C3
Voltage:	Passes ≥1000V
Test:	Charged Device Model (CDM)
Standard:	JEDEC Standard JESD22-C101

MSL Rating

MSL Rating:	Level 3
Test:	260°C convection reflow
Standard:	JEDEC Standard IPC/JEDEC J-STD-020

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

RoHS Compliance

This part is compliant with EU 2002/95/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C15H12Br402) Free
- PFOS Free
- SVHC Free

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations, and information about Qorvo:

Web: www.qorvo.com
Tel: +1-844-890-8163
Email: customer.support@qorvo.com

For information about Qorvo:

Web: www.qorvo.com

RFMD + TriQuint = Qorvo

RFFM4552

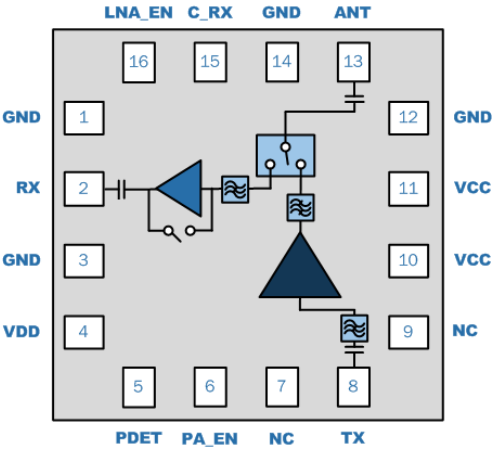
4.9GHz to 5.925GHz 802.11a/n/ac Wi-Fi Front End Module

Product Description

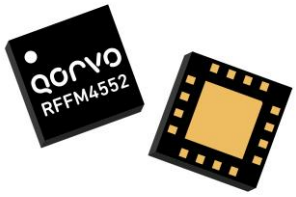
The RFFM4552 provides a complete integrated solution in a single front end module (FEM) for Wi-Fi 802.11a/n/ac systems. The ultra-small factor and integrated matching minimizes layout area in the customer's application and greatly reduces the number of external components. Performance is focused on linear output power under a number of conditions including duty cycle and packet length while balancing power consumption needs of leading edge device platforms. This simplifies the total front end solution by reducing the bill of materials, system footprint, and manufacturing cost.

The RFFM4552 integrates a 5GHz power amplifier (PA), single pole two throw switch (SP2T) and an LNA with bypass. Also this FEM includes integrated 2nd and 3rd Harmonic filters and integrated out of band rejection filters. The device is provided in a 3.0mm x 3.0mm x 0.98mm, 16-pin package. This module meets or exceeds the RF front end needs of IEEE 802.11a/n/ac Wi-Fi RF systems.

Functional Block Diagram



Functional Block Diagram



Package: Laminate, 16-pin
3.0mm x 3.0mm x 0.98mm

Feature Overview

- 5.0V Operation
- P_{OUT} = +20dBm, 802.11ac, 80MHz MCS9 at 1.8% Dynamic EVM
- P_{OUT} = +21dBm, 802.11n, MCS7 HT20/40 at 3.0% Dynamic EVM
- P_{OUT} = +24dBm, MCS0 HT20 at Spectral Mask Compliance
- High efficiency
- Input and Output Matched to 50Ω
- Integrated 5GHz PA, SP2T, LNA with Bypass and power detector.
- Integrated RX notch filter @ 2.5GHz for DBDC operation.
- High Impedance PA Enable

Applications

- Customer Premise Equipment
- Set-Top Boxes
- Netbooks/Notebooks
- Mobile Routers/Access Points
- Data Cards
- TV/Monitors/Video

Ordering Information

PART NUMBER	DESCRIPTION
RFFM4552SB	Standard 5 piece sample bag
RFFM4552SQ	Standard 25 piece sample bag
RFFM4552SR	Standard 100 piece reel
RFFM4552TR7	Standard 2500 piece reel
RFFM4552PCK-410	Fully assemble EVB + 5pcs sample bag

Solderability

Compatible with both lead-free and tin/lead reflow solder processes. Recommended solder profiles are available at www.qorvo.com

RoHS Compliance

The part is compliant with EU 2002/95/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment)

- Lead Free
- Halogen Free (Chlorine and Bromine)
- Antimony Free
- TBBP-A Free
- PFOS Free
- SVHC Free
- Qorvo Green

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:
Web: www.qorvo.com
Tel: 1-844-890-8163
Email: customer.support@qorvo.com

For information about the merger of RFMD and TriQuint as Qorvo:
Web: www.qorvo.com

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RFMD + TriQuint = Qorvo

RFFM4554

Wi-Fi Integrated Front End Module
4.9GHz to 5.925GHz

Package: QFN, 16-pin,
2.3mm x 2.3mm x 0.45mm

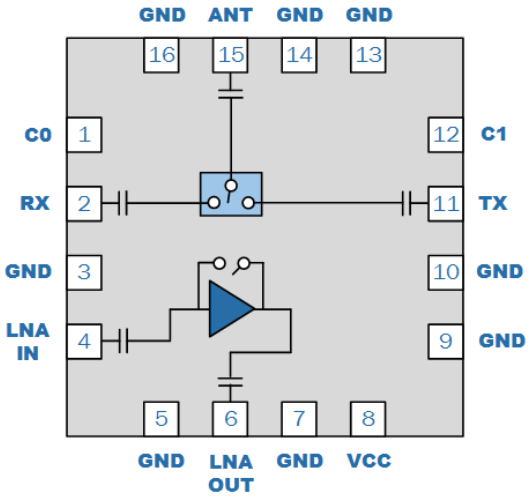
The RFFM4554 is a front end module (FEM) designed for 802.11a/n/ac applications. The integrated single-pole double throw switch and low noise amplifier with bypass greatly reduces the layout area, bill of materials and manufacturability cost in the customer application. The RFFM4554 has a unique structure where the switch to LNA path has pins so filtering can be added in the ideal path for current Wi-Fi circuit applications. The device is provided in a 2.3mm x 2.3mm x 0.45mm 16-pin QFN package that meets or exceeds the power requirements of IEEE802.11a/n/ac Wi-Fi RF systems.

Features

- 13.5dB LNA Gain
- 5dB Bypass Loss
- 1.7dB Noise Figure
- TX to ANT path loss of 0.5dB
- Max Power at TX Input of 30dBm
- 2.4GHz Rejection
- Input and Output Matched to 50Ω
- Break out path between switch and LNA for optimal filter placement

Applications

- Customer Premise Equipment (CPE)
- Wireless Access Points, Gateways
- Routers
- Set-Top Box Applications
- Picocell/Femtocell
- Internet of Things



Functional Block Diagram

Ordering Information

RFFM4554SB	Standard 5-piece Sample Bag
RFFM4554SQ	Standard 25-piece Sample Bag
RFFM4554SR	Standard 100-piece Reel
RFFM4554TR7	Standard 2500-piece Reel
RFFM4554PCK401	Fully Assembled Evaluation Board

Pin Names and Descriptions

Pin	Name	Description
1	C0	Control pin 0. See truth table for proper voltage level.
2	RX	RF output port for the RX throw of the T/R switch. This port is matched to 50Ω and AC coupled internally
3	GND	Ground connection
4	LNAIN	RF input port for the LNA. This port is matched to 50Ω and AC coupled internally
5	GND	Ground connection
6	LNAOUT	RF output port for the LNA. This port is matched to 50Ω and AC coupled internally
7	GND	Ground connection
8	VCC	Supply voltage for the module. See applications schematic for bypassing components.
9	GND	Ground connection
10	GND	Ground connection
11	TX	RF input port for the TX throw of the T/R switch. This port is matched to 50Ω and AC coupled internally
12	C1	Control pin 1. See truth table for proper voltage level.
13	GND	Ground connection
14	GND	Ground connection
15	ANT	RF bidirectional antenna port matched to 50Ω and AC coupled
16	GND	Ground connection
Pkg Base	GND	Ground connection. The back side of the package should be connected to the ground plan though as short of a connection as possible. PCB vias under the device are recommended.

RFFM4558

Wi-Fi Front End Module

Product Overview

The Qorvo® RFFM4558 is an integrated front end module (FEM) designed for Wi-Fi 802.11ac systems. The compact form factor and integrated matching minimizes layout area in the application.

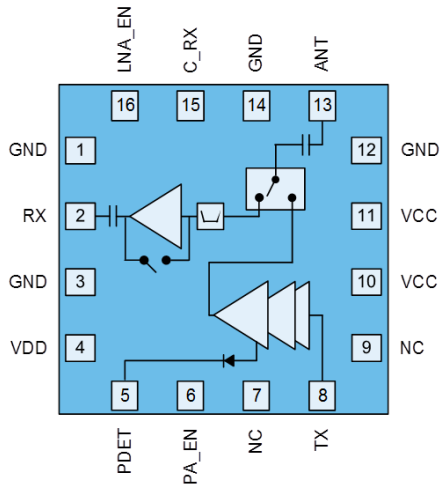
Performance is focused on optimizing the power amplifer for a 5V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput. Receive path matches the optimal technologies to maximize Rx sensitivity through noise figure performance that is consistent over a wider variety of conditions.

Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

A DC power detector which has voltage output is integrated as a power control feedback option.

The RFFM4558 integrates a 5 GHz power amplifier (PA), regulator, single pole two throw switch (SP2T), and bypassable low noise amplifier (LNA) into a single device

Functional Block Diagram



Top View

16 Pad 2.5x2.5 mm Laminate Package

Key Features

- 5180 – 5925 MHz
- P_{OUT} = +20.5 dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +21 dBm MCS7 HT20/40 -30dB Dynamic EVM
- P_{OUT} = +24 dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +5 V Operation
- 32 dB Tx Gain
- 2.5 dB Noise Figure
- 14 dB Rx Gain & 5 dB Bypass Loss
- 15 dB 2.4 GHz Rejection on Rx Path
- Integrated DC Power Detector

Applications

- Access Points
- Wireless Routers
- Client Equipment
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
RFFM4558SB	Sample bag with 5 pieces
RFFM4558SQ	Sample bag with 25 pieces
RFFM4558SR	7” reel with 100 pieces
RFFM4558TR7	7” reel with 2,500 pieces
RFFM4558TR13	13” reel with 10,000 pieces
RFFM4558PCK-410	Assembled Evaluation Board + 5 pcs Sample Bag

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B (500V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1kV)	JESD22-C101
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

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

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

Web: www.qorvo.com

Tel: 1-844-890-8163

Email: customer.support@qorvo.com

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RFFM4558A

Wi-Fi Front End Module

Product Overview

The Qorvo® RFFM4558A is an integrated front end module (FEM) designed for Wi-Fi 802.11ac systems. The compact form factor and integrated matching minimizes layout area in the application.

Performance is focused on optimizing the power amplifer for a 5V supply voltage that conserves power consumption while maintaining the highest linear output power and leading edge throughput. Receive path matches the optimal technologies to maximize Rx sensitivity through noise figure performance that is consistent over a wider variety of conditions.

Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included.

A DC power detector which has voltage output is integrated as a power control feedback option.

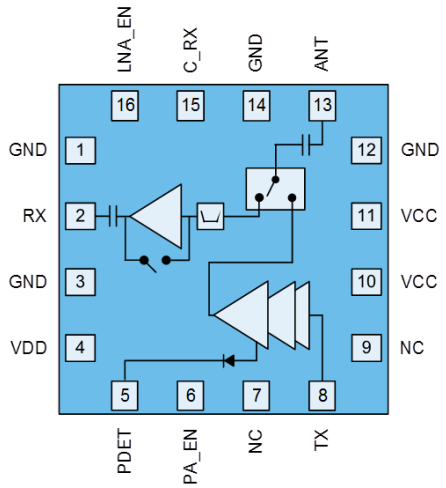
The RFFM4558A integrates a 5 GHz power amplifier (PA), regulator, single pole two throw switch (SP2T), and bypassable low noise amplifier (LNA) into a single device

16 Pad 2.5x2.5 mm Laminate Package

Key Features

- 5150 – 5925 MHz
- P_{OUT} = +20.5 dBm MCS9 VHT80 -35dB Dynamic EVM
- P_{OUT} = +21 dBm MCS7 HT20/40 -30dB Dynamic EVM
- P_{OUT} = +24 dBm MCS0 HT20 Spectral Mask Compliance
- Optimized for +5 V Operation
- 32 dB Tx Gain
- 2.5 dB Noise Figure
- 14 dB Rx Gain & 5 dB Bypass Loss
- 15 dB 2.4 GHz Rejection on Rx Path
- Integrated DC Power Detector

Functional Block Diagram



Top View

Applications

- Access Points
- Wireless Routers
- Client Equipment
- Customer Premise Equipment
- Internet of Things

Ordering Information

Part Number	Description
RFFM4558ASB	Sample bag with 5 pieces
RFFM4558ASQ	Sample bag with 25 pieces
RFFM4558ASR	7” reel with 100 pieces
RFFM4558ATR7	7” reel with 2,500 pieces
RFFM4558APCK401	Assembled Evaluation Board + 5 pcs Sample Bag

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B (500V)	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3 (1kV)	JESD22-C101
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electroless Ni/Electroless Pd/Immersion Au (ENEPIG)

RoHS Compliance

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