



QPA9831

GaAs/GaN Push Pull Hybrid 45MHz to 1218MHz

Product Overview

The QPA9831 is a Hybrid Push Pull amplifier module. The part employs GaAs MESFET, GaAs pHEMT and GaN HEMT die. QPA9831 is designed to operate from 45MHz to 1218MHz. It provides excellent linearity and superior return loss performance with low noise. The product is packaged in SOT-115J and uses the latest GaN technology for the output stage.

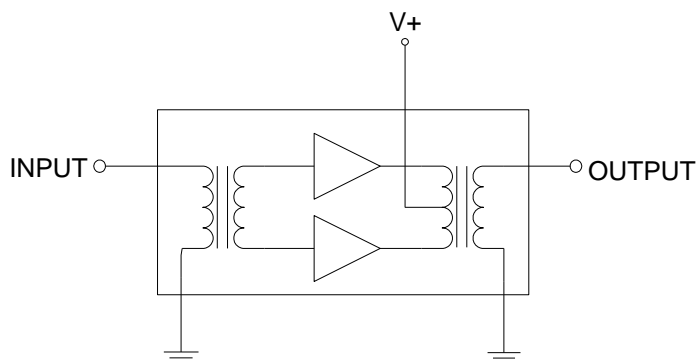


Package: SOT-115J

Key Features

- Excellent Linearity
- Superior Return Loss Performance
- Extremely Low Distortion
- Optimal Reliability
- Low Noise
- Unconditionally Stable Under All Terminations
- 23 dB min. Gain at 1218MHz
- 270mA max. at 24VDC

Functional Block Diagram



Applications

- 45 – 1218 MHz CATV Amplifier Systems
- DOCSIS 3.1 Applications

Ordering Information

| Part No. | Description |
|----------|--------------------|
| QPA9831 | Box with 50 pieces |

Absolute Maximum Ratings

| Parameter | Rating |
|-------------------------------------|----------------|
| RF Input Voltage (single Tone) | 75 dBmV |
| DC Supply Over-Voltage (5 minutes) | 30 V |
| Storage Temperature | -40 to +100 °C |
| Operating Mounting Base Temperature | -30 to +100 °C |

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.

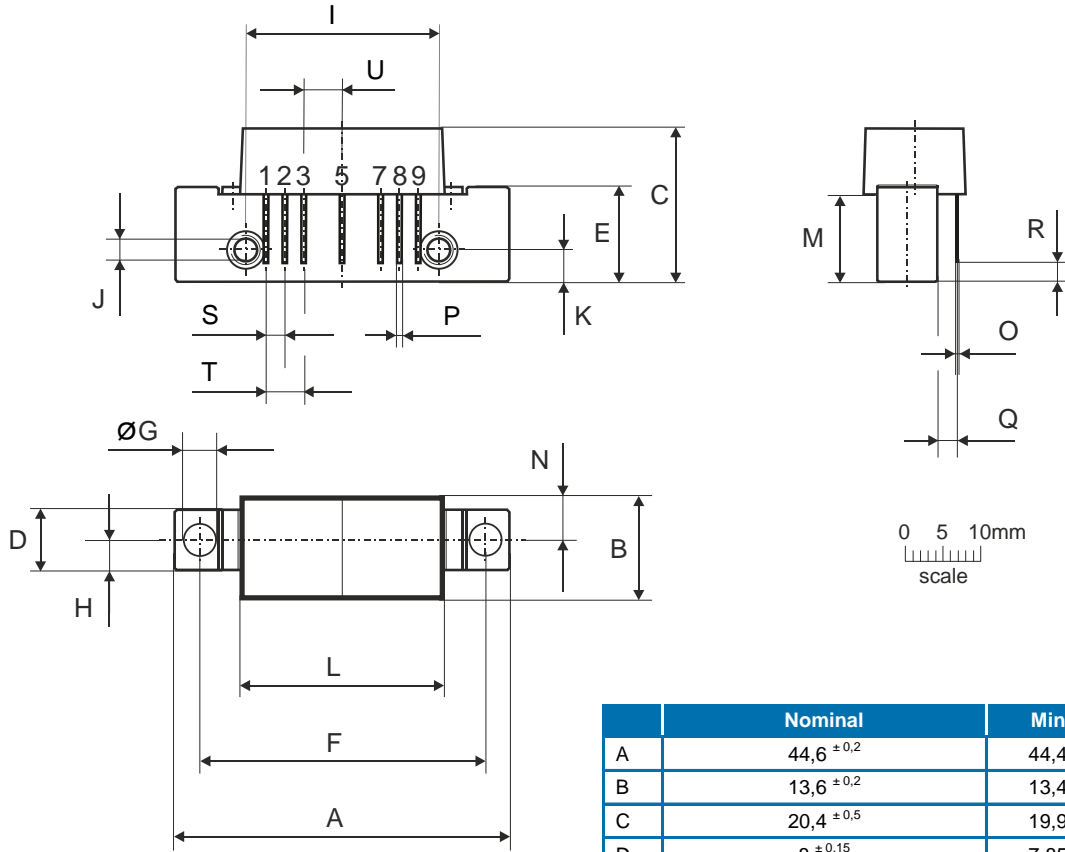
Electrical Specifications

| Parameter | Test conditions: $V_{+}=24V$, $T_{MB}=30^{\circ}C$, $Z_S=Z_L=75\Omega$ | Min | Typ | Max | Units |
|---------------------------|---|------|------|------|-------|
| Operating Frequency Range | | 45 | | 1218 | MHz |
| Power Gain | f = 45 MHz | 21.0 | 21.6 | 23.0 | dB |
| | f = 1218 MHz | 23.0 | 23.7 | 24.5 | dB |
| Gain Slope | f = 45 MHz to 1218 MHz | 1.0 | 2.0 | 2.5 | dB |
| Gain Flatness | f = 45 MHz to 1218 MHz | | | 0.8 | dB |
| Input Return Loss | f = 45 MHz to 320 MHz | 20 | | | dB |
| | f = 320 MHz to 640 MHz | 19 | | | dB |
| | f = 640 MHz to 870 MHz | 18 | | | dB |
| | f = 870 MHz to 1003 MHz | 17 | | | dB |
| | f = 1003 MHz to 1218 MHz | 16 | | | dB |
| Output Return Loss | f = 45 MHz to 320 MHz | 20 | | | dB |
| | f = 320 MHz to 640 MHz | 19 | | | dB |
| | f = 640 MHz to 870 MHz | 18 | | | dB |
| | f = 870 MHz to 1003 MHz | 17 | | | dB |
| | f = 1003 MHz to 1218 MHz | 16 | | | dB |
| IDC | | | 260 | 270 | mA |
| Noise Figure | f = 45 MHz to 1218 MHz | | 5.0 | 5.5 | dB |
| CTB | $V_0 = 45$ dBmV flat, 79 analog channels plus 111 digital channels (-6dB offset) [2][3], TCP[4] = 65.3dBmV | | -72 | -68 | dBc |
| XMOD | | | -64 | -60 | dBc |
| CSO | | | -80 | -73 | dBc |
| CIN | | 66 | 70 | | dB |

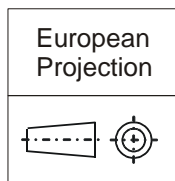
Notes:

- The slope is defined as the difference between the gain at the start frequency and the gain at the stop frequency.
- 79 analog channels, NTSC frequency raster: 55.25MHz to 547.25MHz, +45.0dBmV flat, plus 111 digital channels J.83/B, -6dB offset relative to the equivalent analog carrier.
- Composite Triple Beat (CTB) - The CTB parameter is defined by ANSI/SCTE 6.
Composite Second Order (CSO) - The CSO parameter (both sum and difference products) is defined by ANSI/SCTE 6.
Cross Modulation (XMOD) - the XMOD parameter is defined by ANSI/SCTE 58, measured at baseband (selective voltmeter method), referenced to 100% modulation of the carrier being tested.
Carrier to Intermodulation Noise (CIN) - The CIN parameter is defined by ANSI/SCTE 17 (Test procedure for carrier to noise).
- Total Composite Power

Package Drawing (Dimensions in mm)



Notes:



Pinning:

| Pin | Name |
|-----|--------|
| 1 | Input |
| 2-3 | GND |
| 4 | |
| 5 | V+ |
| 6 | |
| 7-8 | GND |
| 9 | Output |

| | Nominal | Min | Max |
|---|--------------|-------|-------|
| A | 44,6 ±0,2 | 44,4 | 44,8 |
| B | 13,6 ±0,2 | 13,4 | 13,8 |
| C | 20,4 ±0,5 | 19,9 | 20,9 |
| D | 8 ±0,15 | 7,85 | 8,15 |
| E | 12,6 ±0,15 | 12,45 | 12,75 |
| F | 38,1 ±0,2 | 37,9 | 38,3 |
| G | 4 +0,2/-0,05 | 3,95 | 4,2 |
| H | 4 ±0,2 | 3,8 | 4,2 |
| I | 25,4 ±0,2 | 25,2 | 25,6 |
| J | UNC 6-32 | - | - |
| K | 4,2 ±0,2 | 4,0 | 4,4 |
| L | 27,2 ±0,2 | 27,0 | 27,4 |
| M | 11,6 ±0,5 | 11,1 | 12,1 |
| N | 5,8 ±0,4 | 5,4 | 6,2 |
| O | 0,25 ±0,02 | 0,23 | 0,27 |
| P | 0,45 ±0,03 | 0,42 | 0,48 |
| Q | 2,54 ±0,3 | 2,24 | 2,84 |
| R | 2,54 ±0,5 | 2,04 | 3,04 |
| S | 2,54 ±0,25 | 2,29 | 2,79 |
| T | 5,08 ±0,25 | 4,83 | 5,33 |
| U | 5,08 ±0,25 | 4,83 | 5,33 |

Handling Precautions

| Parameter | Rating | Standard |
|----------------------------------|--------|--------------|
| ESD – Human Body Model (HBM) | 2 | JEDEC JS-001 |
| ESD – Charged Device Model (CDM) | C2b | JEDEC JS-002 |



Caution!
ESD-Sensitive Device

RoHS Compliance

This part is compliant with 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.

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

Important Notice

The information contained in this Data Sheet and any associated documents (“Data Sheet Information”) is believed to be reliable; however, Qorvo makes no warranties regarding the Data Sheet Information and assumes no responsibility or liability whatsoever for the use of said information. All Data Sheet Information is subject to change without notice. Customers should obtain and verify the latest relevant Data Sheet Information before placing orders for Qorvo® products. Data Sheet Information or the use thereof does not grant, explicitly, implicitly or otherwise any rights or licenses to any third party with respect to patents or any other intellectual property whether with regard to such Data Sheet Information itself or anything described by such information.

DATA SHEET INFORMATION DOES NOT CONSTITUTE A WARRANTY WITH RESPECT TO THE PRODUCTS DESCRIBED HEREIN, AND QORVO HEREBY DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO SUCH PRODUCTS WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Without limiting the generality of the foregoing, Qorvo® products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death. Applications described in the Data Sheet Information are for illustrative purposes only. Customers are responsible for validating that a particular product described in the Data Sheet Information is suitable for use in a particular application.

© 2020 Qorvo US, Inc. All rights reserved. This document is subject to copyright laws in various jurisdictions worldwide and may not be reproduced or distributed, in whole or in part, without the express written consent of Qorvo US, Inc. | QORVO® is a registered trademark of Qorvo US, Inc.