TAT7464

CATV 75 Ω pHEMT Dual RF Amplifier

Applications

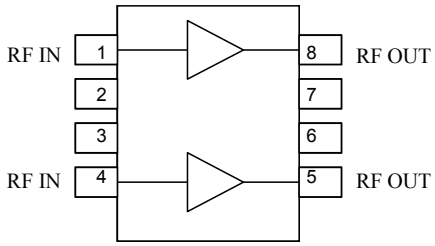
- V-ONU receiver output stage
- Multi-Dwelling Units
- Edge QAM
- Push-pull high-output stage
- SAT frequency distribution

SOIC-8 package

Product Features

- 50-2600 MHz bandwidth
- pHEMT device technology
- Simple external tuning allows excellent return loss
- 5 V supply voltage
- 190 mA typical current consumption
- Easy bias current adjustment
- 13 dB typical gain
- 4.4 dB typical NF from 50 MHz to 1300 MHz
- Low distortion: CSO -83 dBc, CTB -75 dBc (33 dBmV/ch at output, 80 ch)
- SOIC-8 package

Functional Block Diagram



General Description

The TAT7464 is a 75 Ω RF Amplifier designed for use from 50 MHz to 2600 MHz, addressing the CATV and Satellite bands in a single part. The TAT7464 contains two separate amplifiers for push pull applications. It provides an easy means for adjusting bias current allowing designers to optimize power consumption for high efficiency applications. The TAT7464 is fabricated using 6-inch GaAs pHEMT technology to optimize performance and cost.

Pin Configuration

Pin #	Symbol
1	RF IN
2, 3, 6, 7	No Connect
4	RF IN
5	RF OUT
8	RF OUT
Exposed Slug	GND

Ordering Information

Part No.	Description
TAT7464	75 Ω Dual pHEMT Amplifier (lead-free/RoHS compliant SOIC-8 Pkg)
TAT7464-EB	Amplifier Evaluation Board

Standard T/R size = 1000 pieces on a 7" reel.

Specifications

Absolute Maximum Ratings[1]

Parameter	Rating
Storage Temperature	-65 to +150 °C
Device Voltage	+10 V
Thermal Resistance[2] (jnt to case) θ_{jc}	26 °C/W

Notes:
1. Operation of this device outside the parameter ranges given above may cause permanent damage.
2. Refer to Thermal Analysis Report.

Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
V_{DD}		5		V
I_{DD}		190		mA
T_J (for > 10^6 hours MTTF)			145	°C

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions

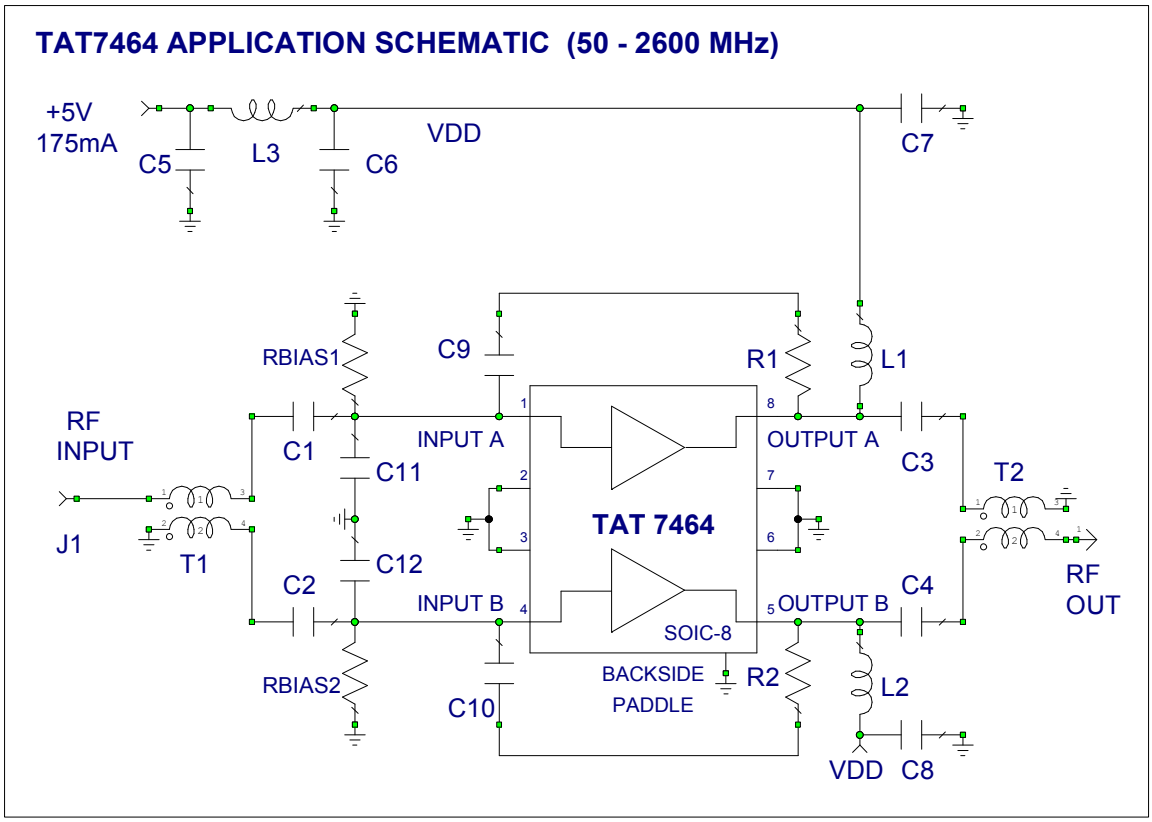
Electrical Specifications

Test conditions unless otherwise noted: 25 ºC, +5 V V_{DD}

Parameter	Conditions	Min	Typical	Max	Units
Operational Frequency Range		50		2600	MHz
Gain			13		dB
Gain Flatness	See Note 5.		+/- 0.5		dB
Noise Figure	See Note 1.		4.4		dB
Input Return Loss			16		dB
Output Return Loss			16		dB
CSO	See Note 2.		-83		dBc
CTB	See Note 2.		-75		dBc
Vsupply			+5		V
I_{DD}			190		mA

Notes:
1. 50 to 1300 MHz
2. 33 dBmV/ch at output, 80 ch flat
3. Electrical specifications are measured at specified test conditions.
4. Specifications are not guaranteed over all recommended operating conditions.
5. Gain flatness defined as the gain deviation from a best-fit straight line.

Application Circuit 50-2600 MHz



Notes:

1. See PC Board Layout, page 6 for more information.

Bill of Material

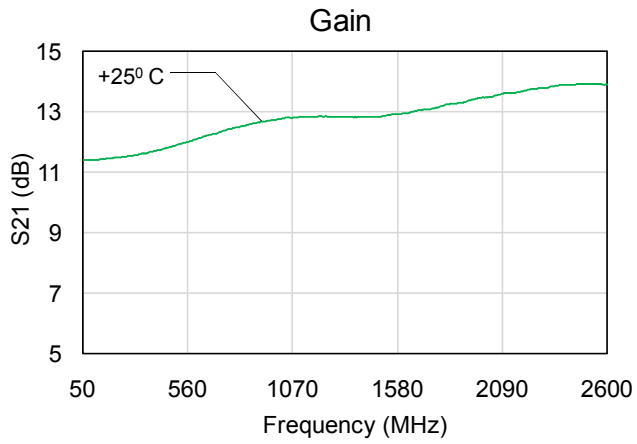
Ref. Desg.	Value	Description	Manufacturer	Part Number
U1		75 Ω dual pHEMT Amplifier	TriQuint	TAT7464
L1, L2, L3	500 nH	Chip Coil, Vertical Wire Wound Ferrite, 1206, 30 %	Murata	LQH31HNR50K
T1, T2		1:1 balun[2]	Mini-Circuits	TC1-1-13M-17+
C1, C2, C5, C6, C7, C8, C9, C10	0.01 uF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX[1]	0402YC103KAT
C3, C4	150 pF	Ceramic Chip Cap., 0402, 50 V, 5 %, NPO	AVX[1]	04025C151JAT2A
C11, C12	0.7 pF	Ceramic Chip Cap., 0402, 50 V, +/- 0.1 pF	Yuden	UVK105CH0R7BW-F
R1, R2	680 Ω	Thick Film. Chip Res., 0402, 1/16 W, 1 %,	Dale[1]	CRCW0402680RFKED
RBIAS1, RBIAS2	no load			
J1, J2		SMB edge mount	Johnson[1]	131-8701-846

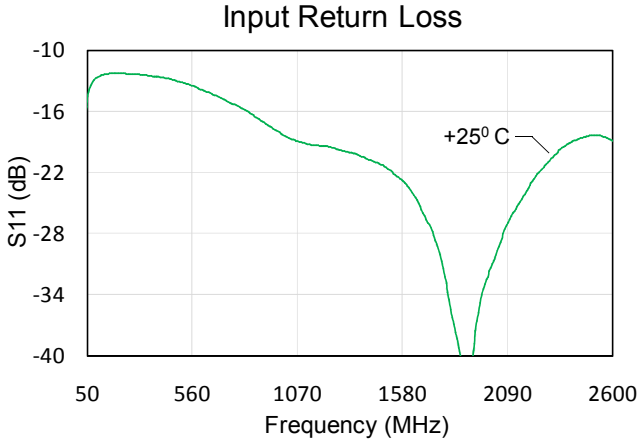
Notes:

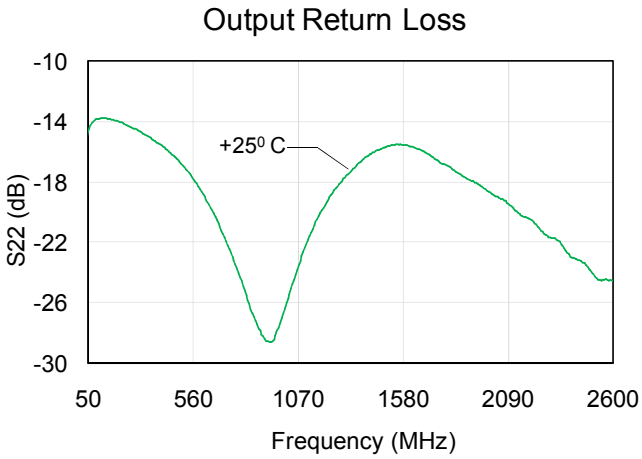
1. Or equivalent.
2. 1:1 balun may also be constructed using a binocular core (Fair Rite 2843002302; Type 43 material) with 1.5 turns of bifilar wire (MWS T2341222-10)

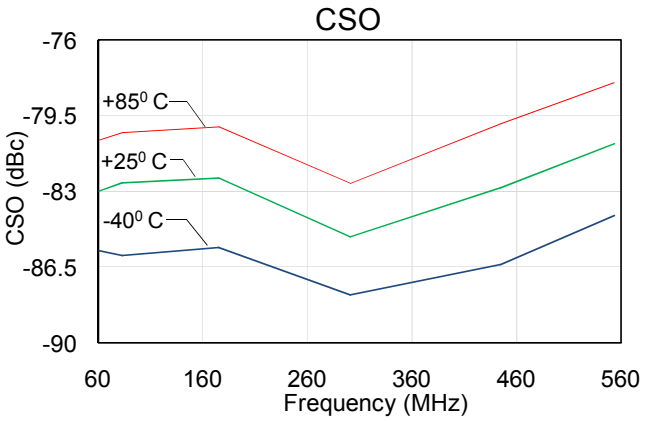
50-2600 MHz Application Board Typical Performance

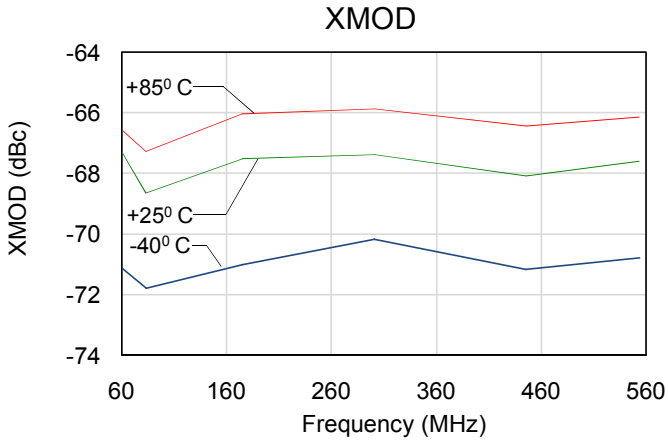
V_{DD} = +5 V, I_{DD} = 160 mA

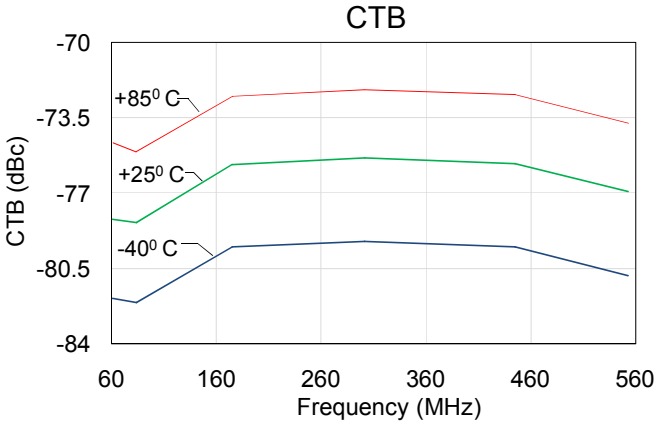


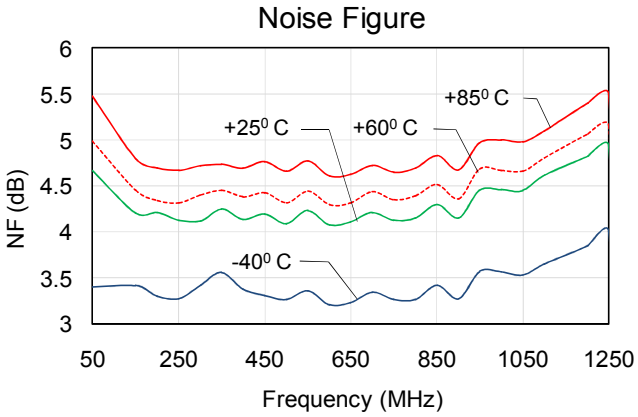












Mechanical Information

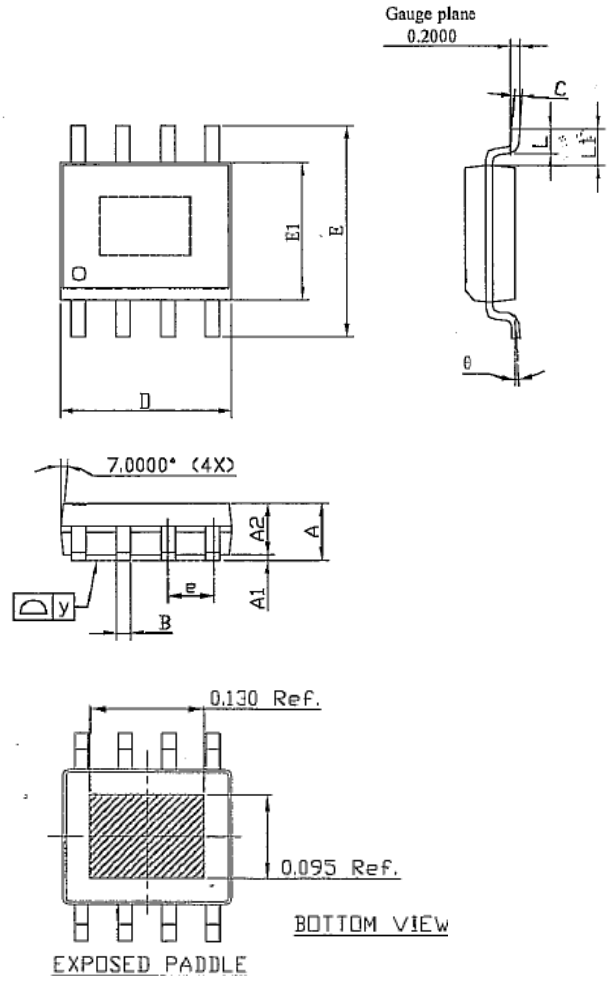
Package Information and Dimensions

This package is lead-free/RoHS-compliant. The plating material on the leads is 100% Matte Tin. It is compatible with both lead-free (maximum 260 °C reflow temperature) and lead (maximum 245 °C reflow temperature) soldering processes.

The TAT7464 will be marked with a "TAT7464" designator and an 8 digit alphanumeric lot code (XXXXYYWW). The first four digits are the lot code (XXXX). The last four digits are a date code consisting of the year and work week (YYWW) of assembly.

Dimensions in Inches

symbol	Min.	nom.	Max.
A	0.054	0.059	0.068
A1	0		0.004
A2		0.057	
B	0.013		0.020
C	0.007		0.010
D	0.189		0.197
E1	0.150	0.153	0.157
e		0.050	
E	0.228	0.236	0.244
L	0.016		0.050
y			0.004
theta	0		8
L1	0.037	0.041	0.045



Product Compliance Information

ESD Information

Caution! ESD-Sensitive Device

ESD Rating:	Class 1 A+
Value:	Passes ≥ 450 V min.
Test:	Human Body Model (HBM)
Standard:	JEDEC Standard JESD22-A114

ESD Rating:	Class IIII+
Value:	Passes ≥ 2000 V min.
Test:	Charged Device Model (CDM)
Standard:	JEDEC Standard JESD22-C101

MSL Rating

Level 3 at +260 °C convection reflow.
The part is rated Moisture Sensitivity Level 3 at 260 °C per JEDEC standard IPC/JEDEC J-STD-020.

Solderability

Compatible with the latest version of J-STD-020, Lead free solder, 260 °C.

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

Contact Information

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