

TAT7466

75 Ω RF Amplifier



Applications

- Replacement for 5 V SOIC-8 amplifiers
- Multi-Dwelling Units
- Edge QAM gain stage

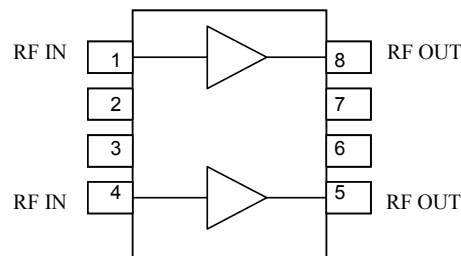


SOIC-8 package

Product Features

- 75 Ω , 50-1000 MHz Bandwidth
- 4.0 dB Noise Figure up to 1000 MHz
- Adjustable low power consumption
- 5 V supply voltage
- SOIC-8 package

Functional Block Diagram



General Description

The TAT7466 is a 75 Ω RF Amplifier designed for use up to 1000 MHz. The TAT7466 contains two separate amplifiers for push pull applications. It is fabricated using 6-inch GaAs pHEMT technology to optimize performance and cost. Each amplifier contains on-chip active biasing. The bias current set point of each amplifier is adjustable with a single resistor from the input to ground. The TAT7466 may be flexibly configured for 6 V higher gain applications using external 2:1 transformers, or for direct replacement of familiar 5 V SOIC-8 amplifiers using a 1:1 balun.

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 PADDLE

Ordering Information

Part No.	Description
TAT7466	75 Ω RF Amplifier <small>(lead-free/RoHS compliant SOIC-8 Pkg)</small>
TAT7466-EB	Amplifier Evaluation Board <small>(Evaluation board is the 2:1 Push Pull design)</small>

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

Specifications

Absolute Maximum Ratings¹

Parameter	Rating
Operating Temperature	-40 to 85 °C
Storage Temperature	-65 to +150 °C
Device Voltage	+10 V

Notes:

1. Operation of this device outside the parameter ranges given above may cause permanent damage.

Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
V_{DD}				V
I_{DD}				mA
T_J (for > 10 ⁶ hours MTF)			150	°C

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

Electrical Specifications

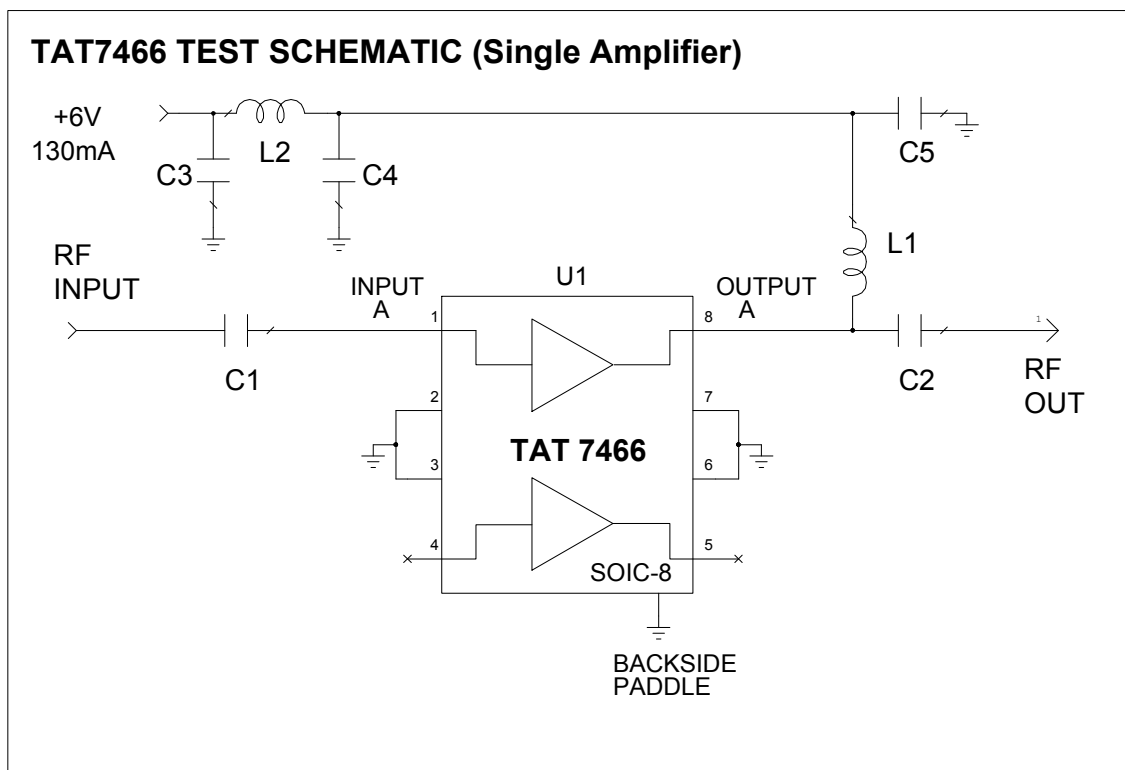
Test conditions unless otherwise noted: 25 °C, +6 V V_{DD} , Push Pull Application Circuit with 2:1 Transformers

Parameter	Typical	Typical Per Frequency					Units
		50	250	450	860	1000	
Band		50	250	450	860	1000	MHz
Gain		15.0	14.4	14.0	13.2	13.0	dB
Gain Flatness	0.5						+/-dB
Noise Figure		2.6	2.9	3.3	4.0	4.3	dB
Input Return Loss	16						dB
Output Return Loss	20						dB
CSO ¹	-80						dBc
CTB ¹	-67						dBc
I_{DD} ²	190						mA
Thermal Resistance (jnc. to case) θ_{jc}	31.5						°C/W

Notes:

1. 39 dBmV/ch at output, 80 ch flat
2. $R_{BIAS} = 5.0 \text{ k}\Omega$

Application Circuit For Single Amplifier 50-1000 MHz



Notes:

1. Please contact TriQuint for PCB layout
2. Pins 2, 3, 6, and 7 are no connect internally

Bill of Material

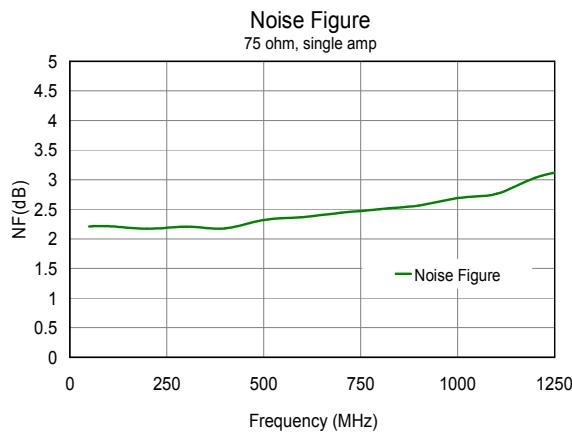
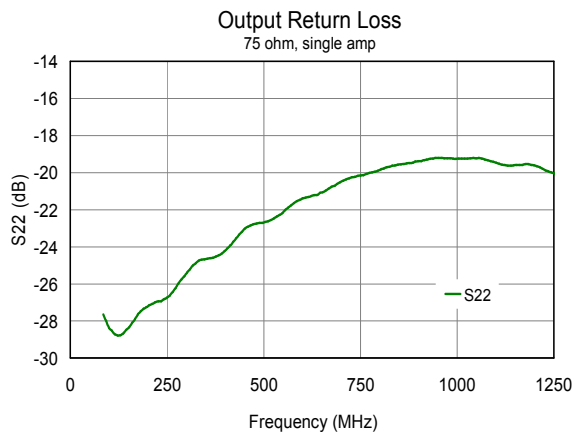
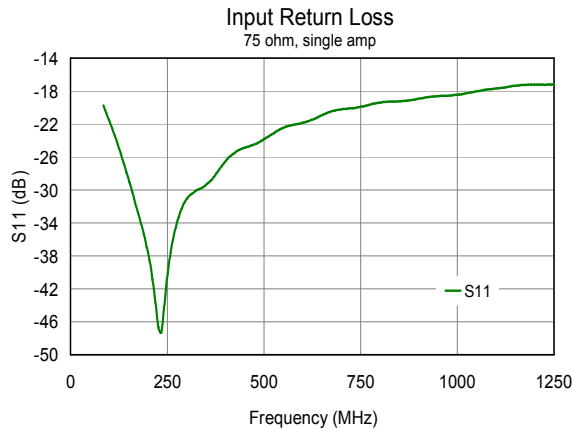
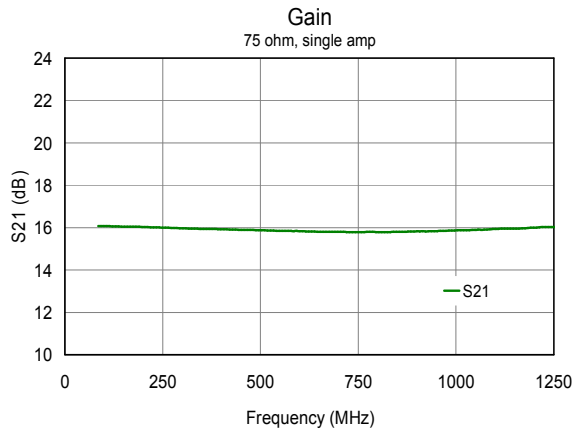
Ref. Desg.	Value	Description	Manufacturer	Part Number
U1		75 Ω dual pHEMT Amplifier	TriQuint	TAT7466
L1, L2	880 nH	Chip Coil, Vertical Wire Wound Ferrite, 1206, 30 %	Murata	LQH31HNR88K
C1, C2, C3, C4, C5	0.01 uF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	0402YC103KAT

Notes:

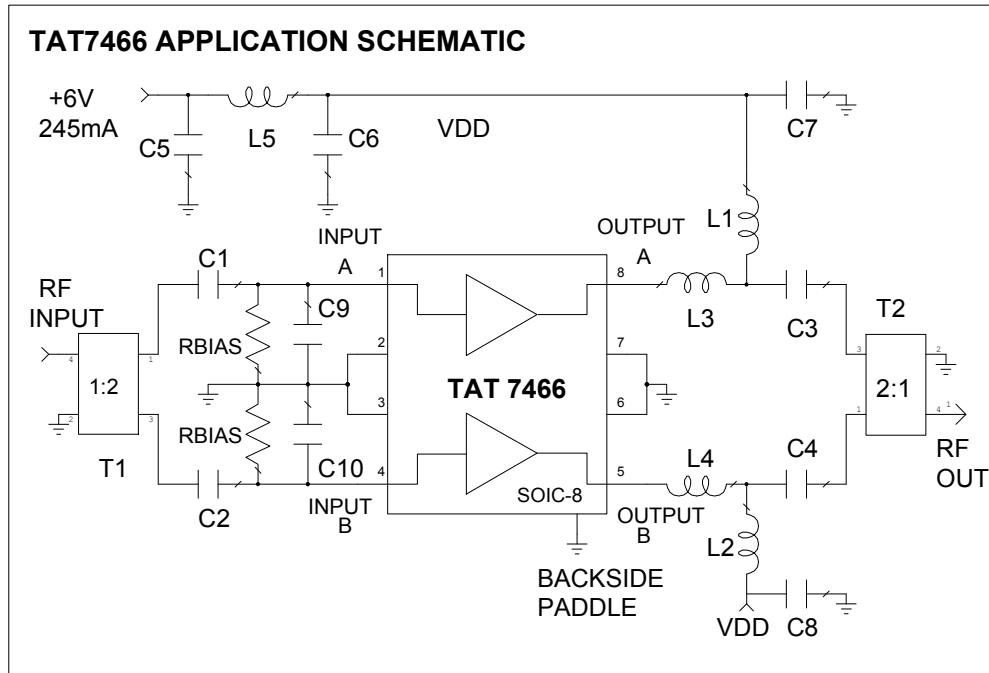
1. Or equivalent.

50-1000 MHz Single Amplifier Application Board Typical Performance

$V_{DD} = +6\text{ V}$, $I_{DD} = 130\text{ mA}$, Single amplifier



Application Circuit For 2:1 Push-Pull Amplifier 50-1000 MHz



Notes:

1. Please contact TriQuint for PCB layout
2. Pins 2, 3, 6, and 7 are no connect internally

Bill of Material

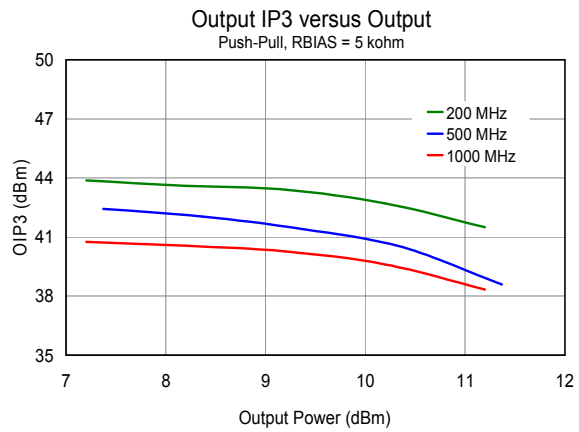
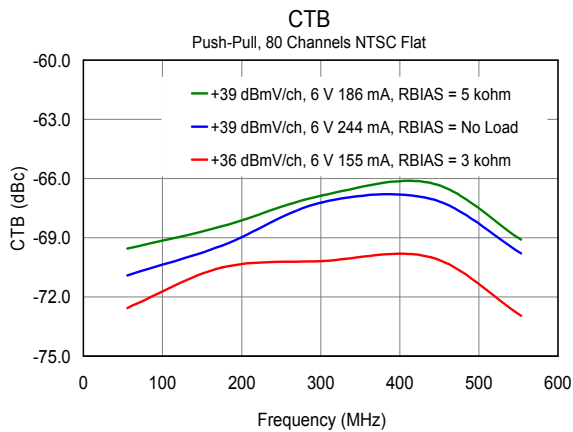
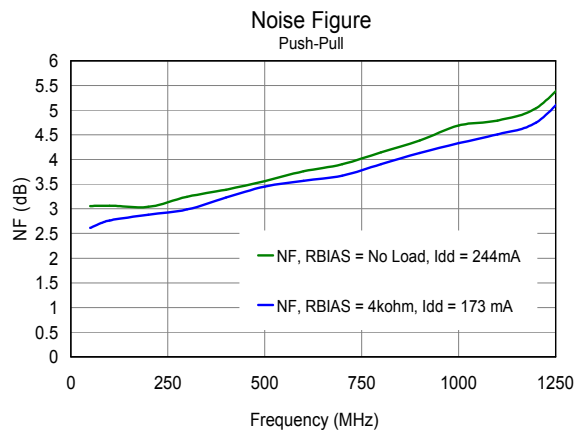
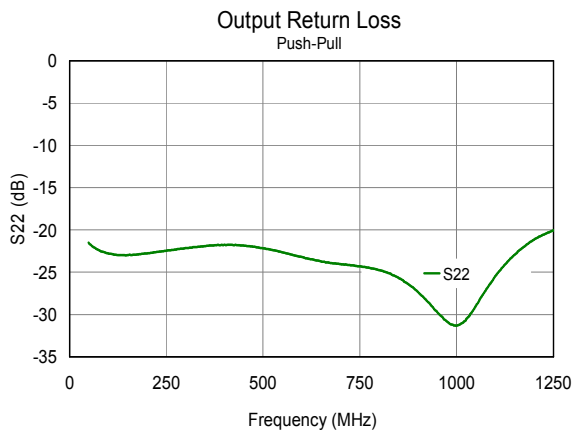
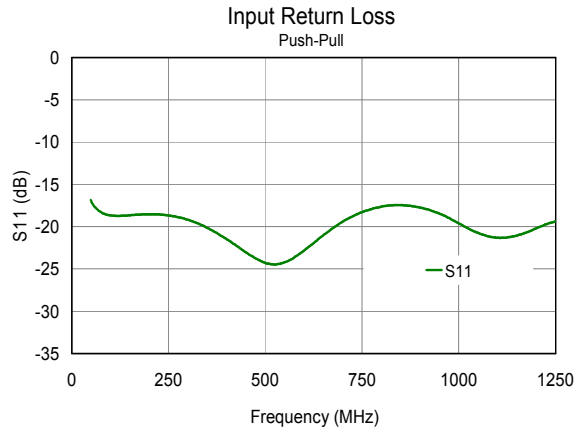
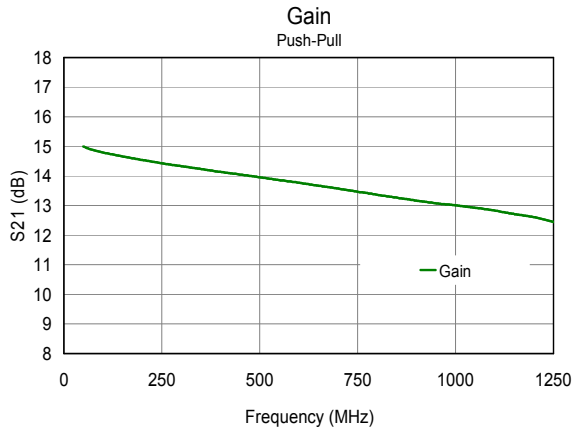
Ref. Desg.	Value	Description	Manufacturer	Part Number
U1		75 Ω dual pHEMT Amplifier	TriQuint	TAT7466
L1, L2, L5	880 nH	Chip Coil, Vertical Wire Wound Ferrite, 1206, 30 %	Murata	LQH31HNR88K
L3, L4	3.9 nH	Chip Coil, 0402, 5 %	Coilcraft	0402CS-3N9XJLW
C1, C2, C4, C6, C7, C 8	0.01 uF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	0402YC103KAT
C3, C4	150 pF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	04025A151JAT2A
C9, C10	0.5 pF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	04025A005BAT9A
T1, T2	2:1 Xformer	Transmission Line Balun Transformer, 75 Ω, 5 –1200 MHz	M/A COM	MABA-007681-CT2010
RBIAS	No Load ²	Reference Designator for Resistor, 0402		

Notes:

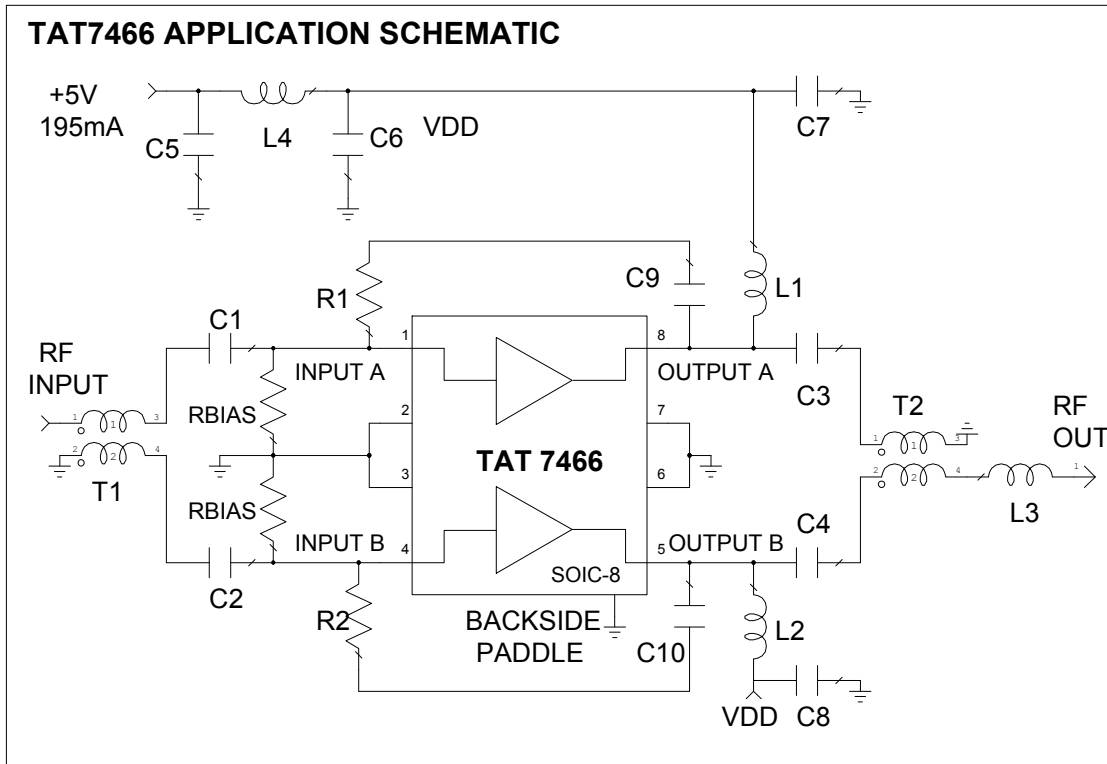
1. Or equivalent.
2. R_{BIAS} is used to reduce I_{DD} to optimum value for given application.

50-1000 MHz 2:1 Push-Pull Amplifier Application Board Typical Performance

$V_{DD} = +6\text{ V}$, Push-Pull amplifier, 2:1 Transformers



Application Circuit 1:1 Push-Pull Amplifier 50-1000 MHz



Notes:

1. Please contact TriQuint for PCB layout
2. Pins 2, 3, 6, and 7 are no connect internally

Bill of Material

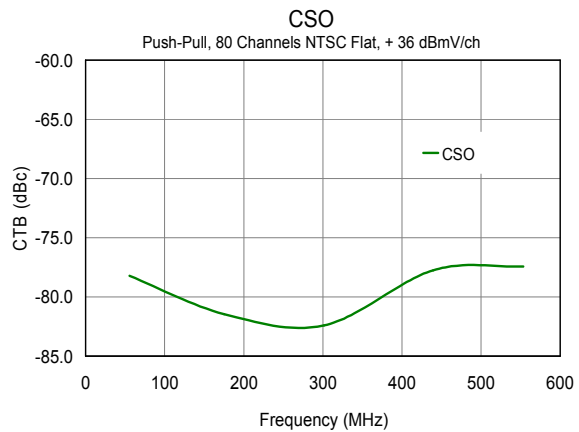
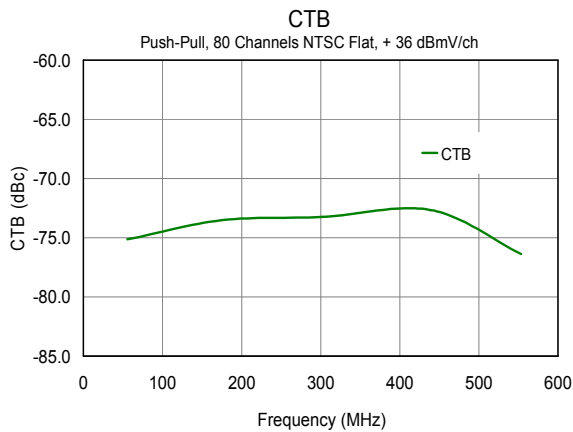
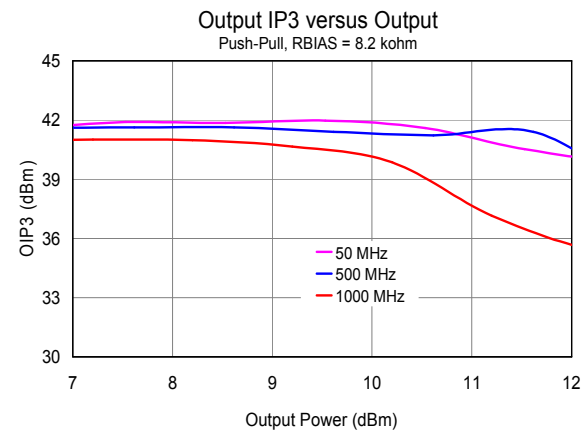
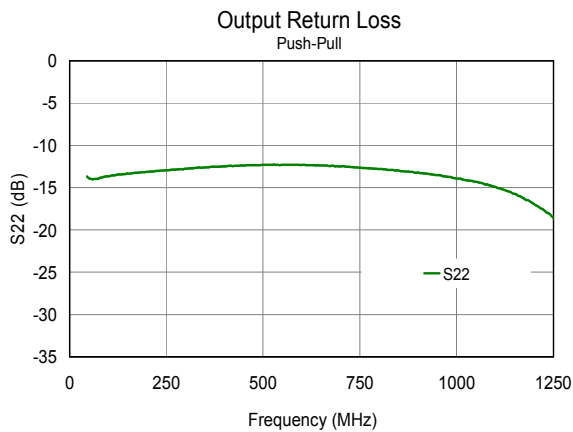
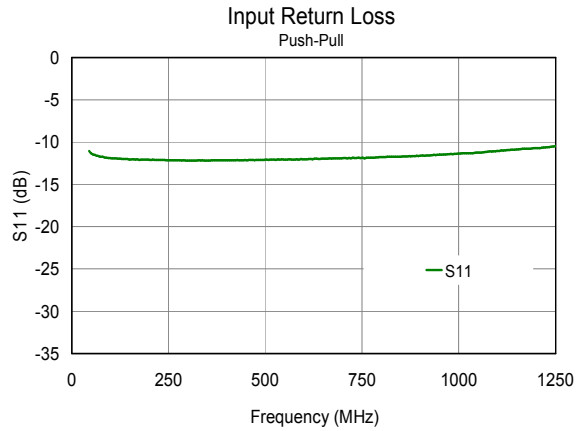
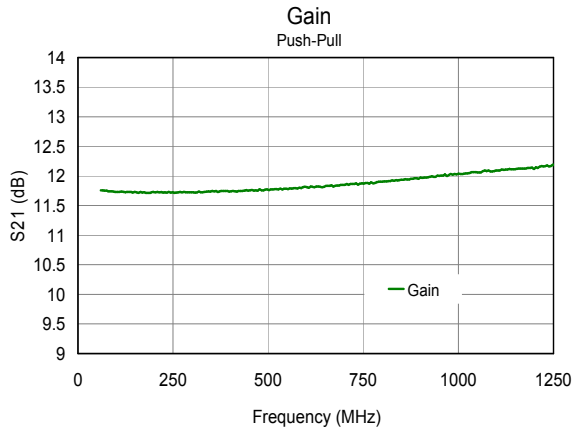
Ref. Desg.	Value	Description	Manufacturer	Part Number
U1		75 Ω dual pHEMT Amplifier	TriQuint	TAT7466
C1, C2, C5, C6, C7, C8, C9, C10	0.01 uF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	0402YC103KAT
C3, C4	220 pF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	04025A221JAT2A
L1, L2	220 nH	Chip Coil, 1206, 5 %	Coilcraft	1206CS-221XJLC
L3	2.7 nH	Chip Coil, 0402, 5 %	Coilcraft	0402CS-2N7XJLC
L4	0.9 uH	Chip Coil, Wirewound Ferrite, 1008, 10 %	Coilcraft	1008AF-901XKLC
R1, R2	560 Ω	Thick Film Res. 0402, 50 V, 5 %	KOA	RK73B1ETTP561J
R _{BIAS}	8.2 k Ω	Thick Film Res. 0402, 50 V, 5 %	KOA	RK73B1ETTP822J
T1, T2	1:1 Xformer	Balanced Transmission Line Balun, 75 Ω, 4.5 –3000 MHz	MiniCircuits	TC1-1-13M-75+

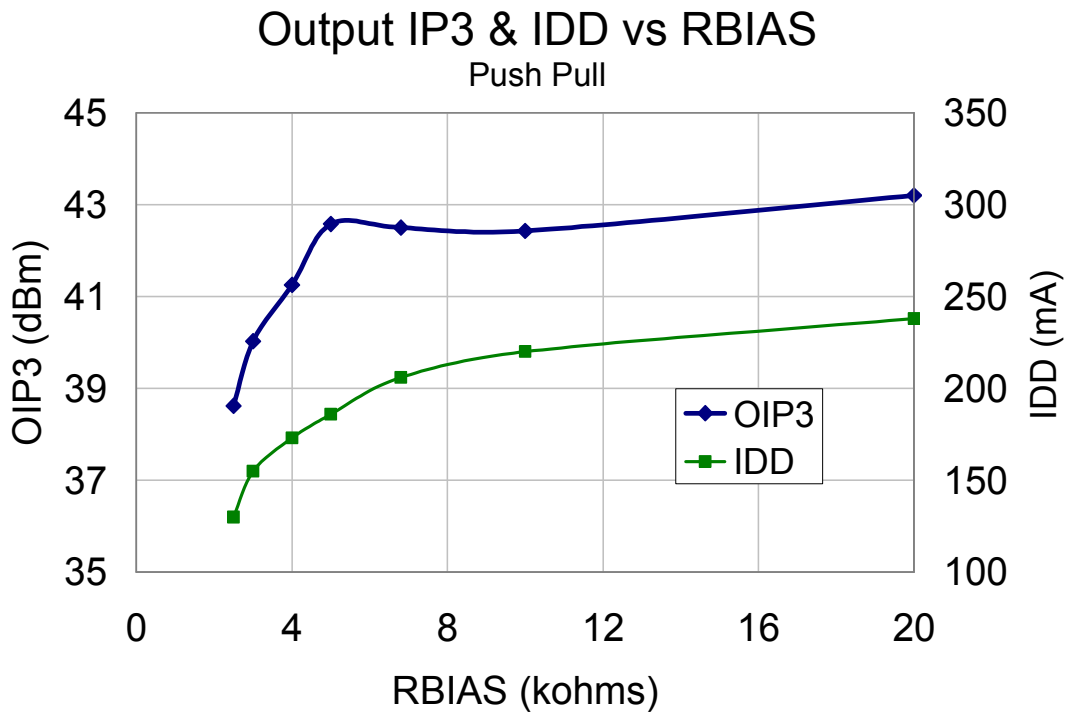
Notes:

1. Or equivalent.

50-1000 MHz 1:1 Push-Pull Amplifier Application Board Typical Performance

$V_{DD} = +5\text{ V}$, $R_{BIAS} = 8.2\text{ k}\Omega$, $I_{DD} = 195\text{ mA}$, Push-Pull amplifier, 1:1 Transformers





TAT7466

75 Ω RF Amplifier

Mechanical Information

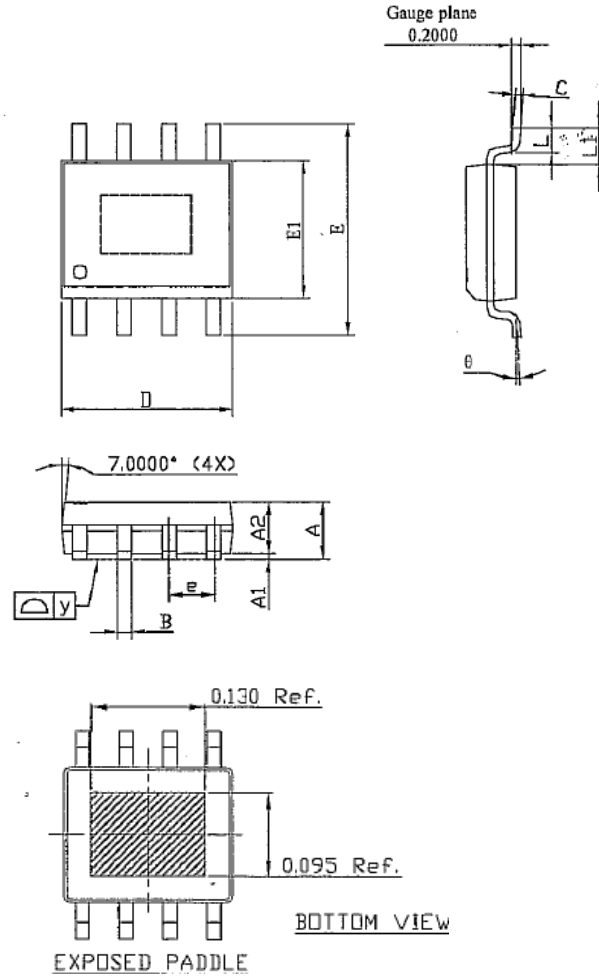
Package Information and Dimensions

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 TAT7466 will be marked with a “TAT7466” 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 \geq 450 V min.
Test: Human Body Model (HBM)
Standard: JEDEC Standard JESD22-A114

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

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).

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.

Contact Information

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

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Tel: +1.707.526.4498
Fax: +1.707.526.1485

For technical questions and application information:

Email: sjapplication.engineering@tqs.com

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