

TAT7466

75 Ω RF Amplifier



Applications

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

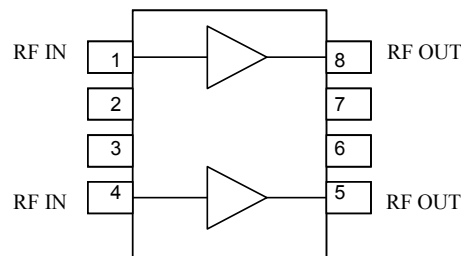


SOIC-8 package

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 MTTF)			150	°C

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

Electrical Specifications

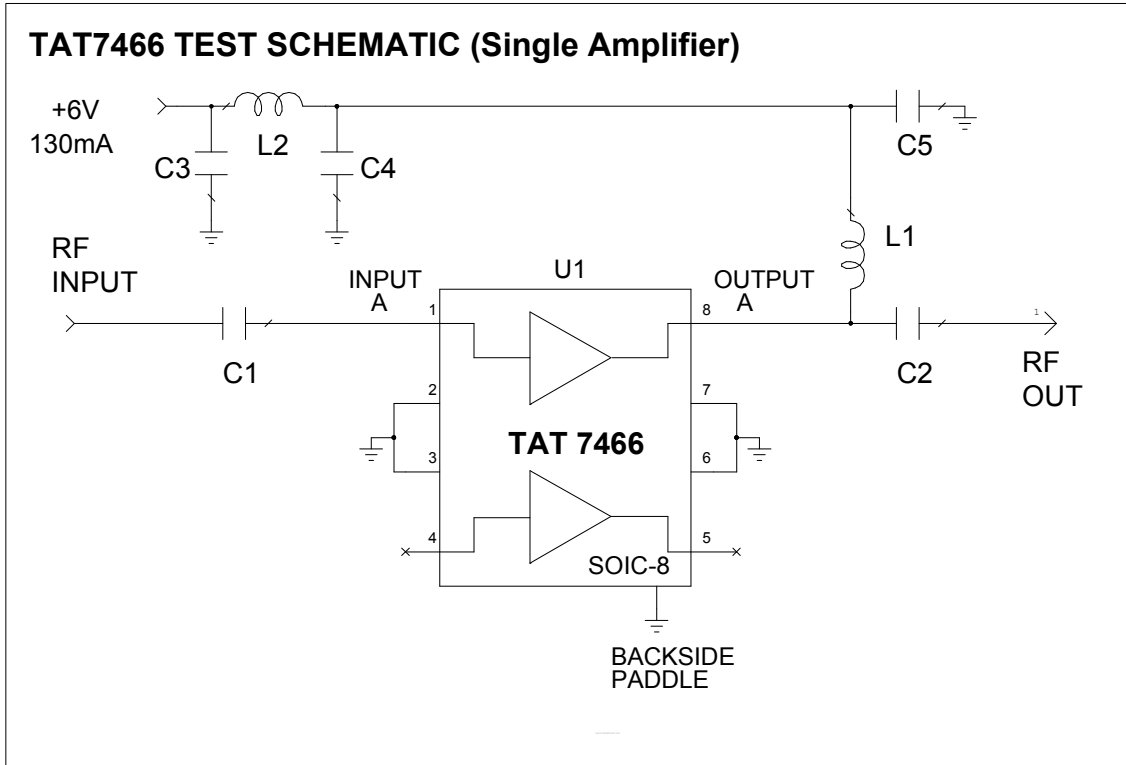
Test conditions unless otherwise noted: 25 °C, +6 V V_{DD} , Push Pull Application Circuit with 2:1 Transformers

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

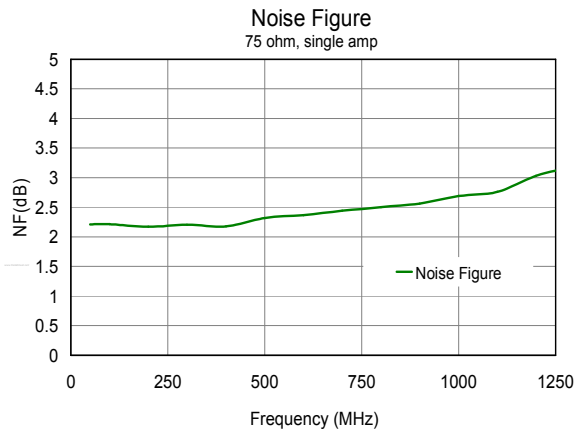
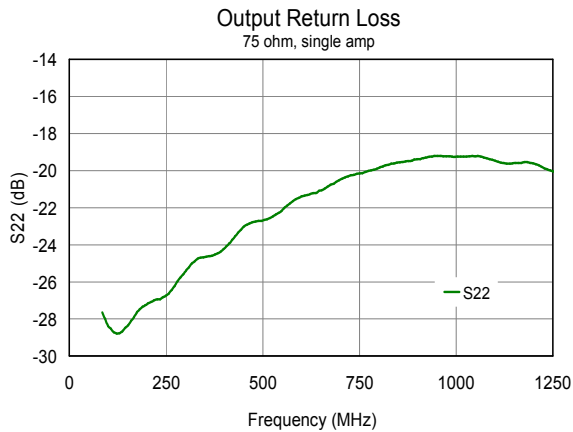
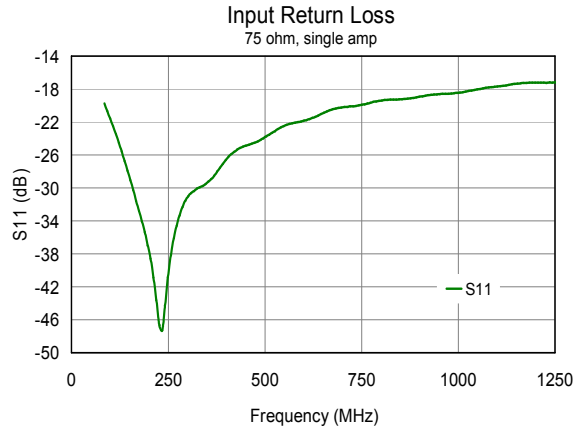
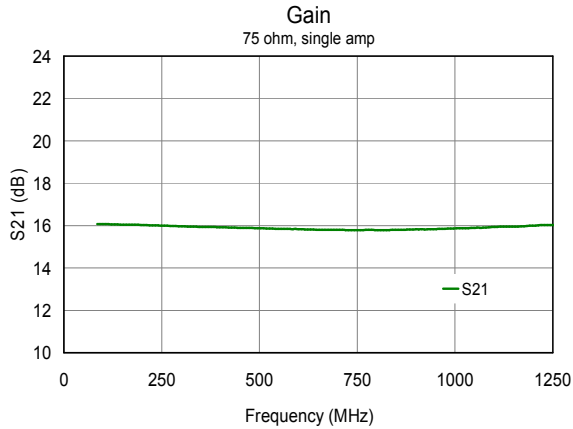
Ref. Desg.	Value	Description	Manufacturer	Part Number
U1		75 Ω dual pHEMT Amplifier	TriQuint	TAT7466
L1, L2	880 nH	Chip Coil, Vertical Wire Wound Ferrite, 1206, 30 %	Murata	LQH31HNR88K
C1, C2, C3, C4, C5	0.01 μ F	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	0402YC103KAT

Notes:

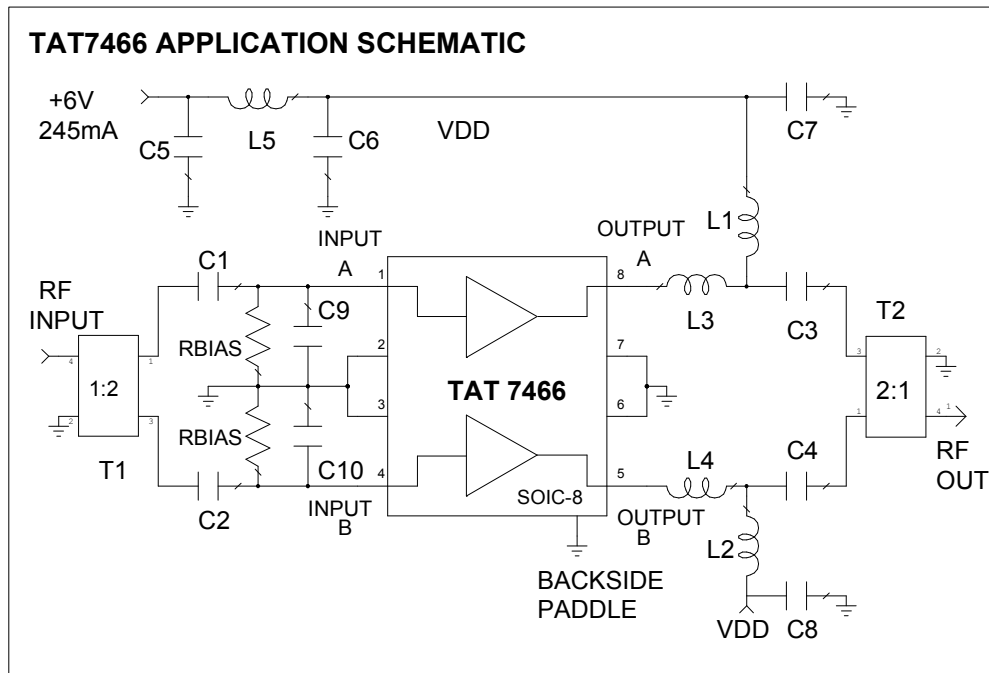
1. Or equivalent.

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

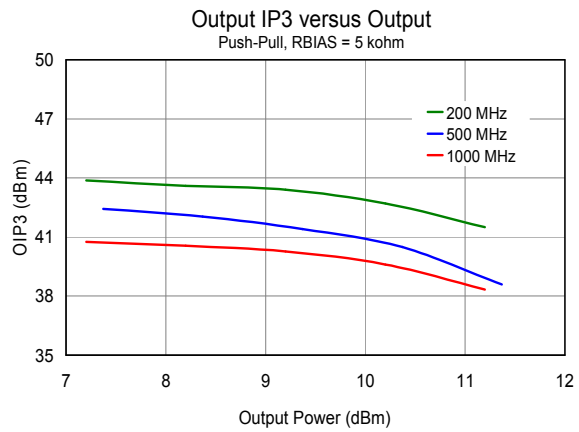
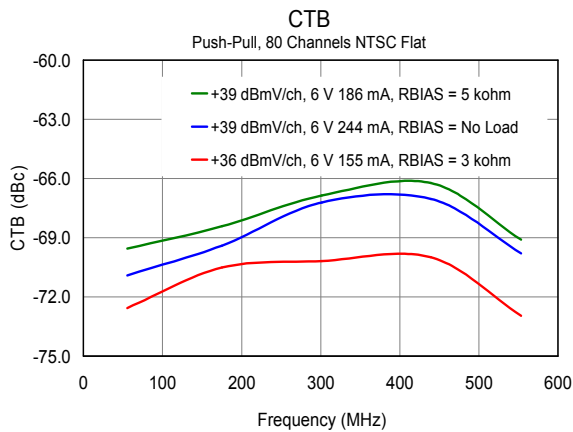
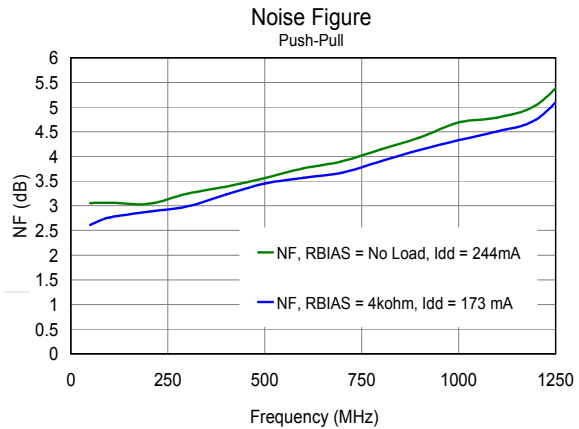
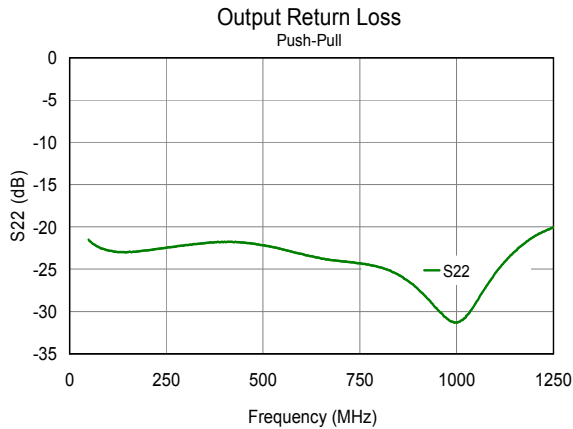
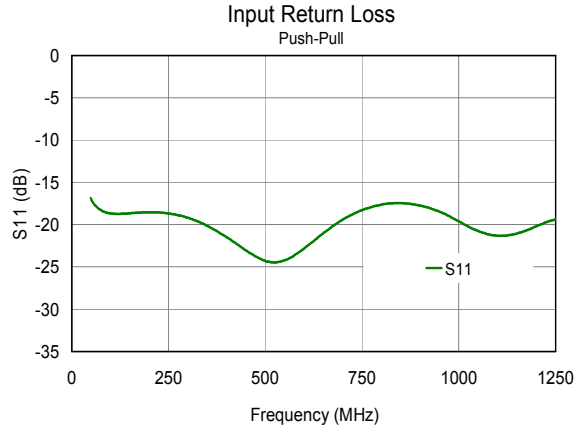
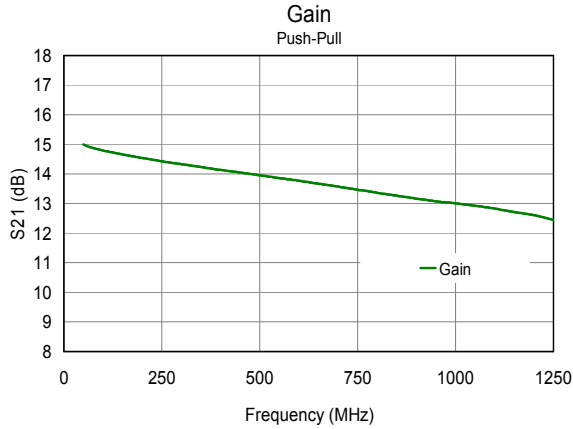
Ref. Desg.	Value	Description	Manufacturer	Part Number
U1		75 Ω dual pHEMT Amplifier	TriQuint	TAT7466
L1, L2, L5	880 nH	Chip Coil, Vertical Wire Wound Ferrite, 1206, 30 %	Murata	LQH31HNR88K
L3, L4	3.9 nH	Chip Coil, 0402, 5 %	Coilcraft	0402CS-3N9XJLW
C1, C2, C4, C6, C7, C 8	0.01 uF	Ceramic Chip Cap., 0402, 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:

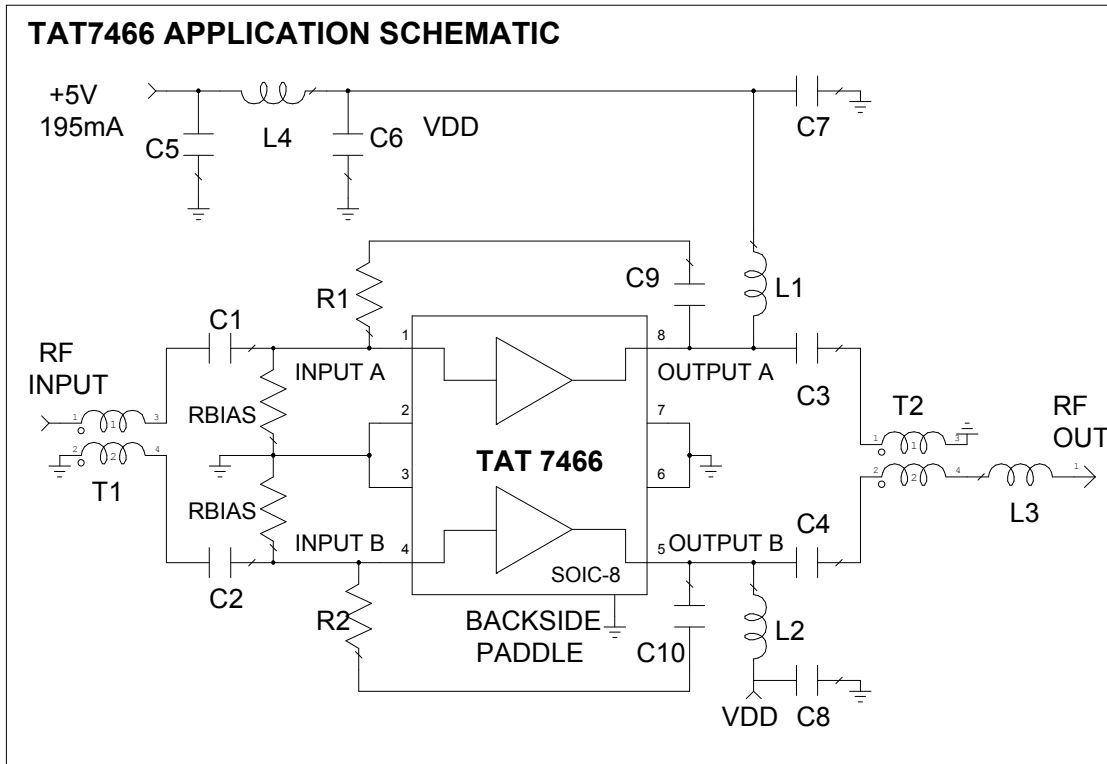
1. Or equivalent.
2. R_{BIAS} is used to reduce I_{DD} to optimum value for given application.

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

$V_{DD} = +6$ 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

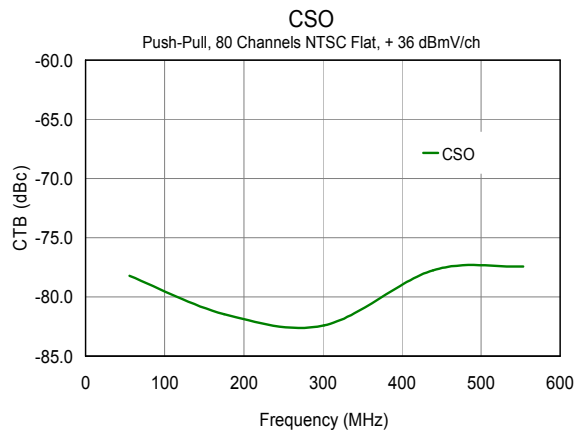
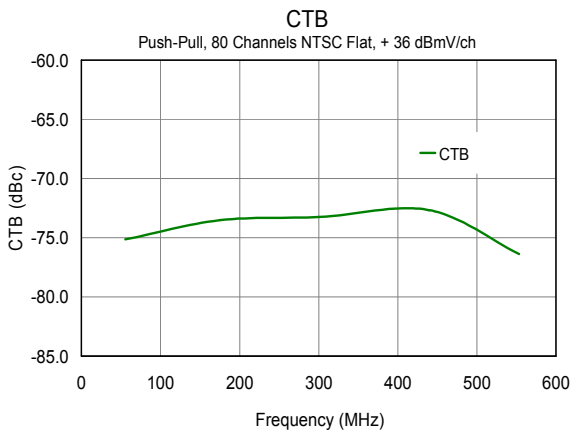
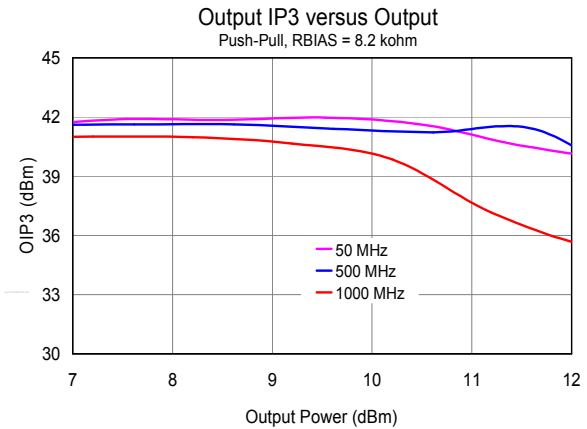
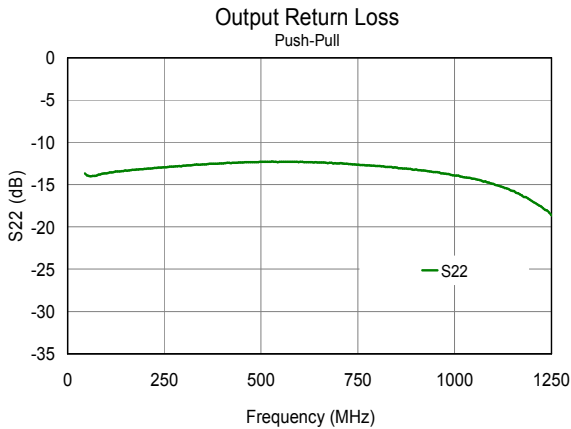
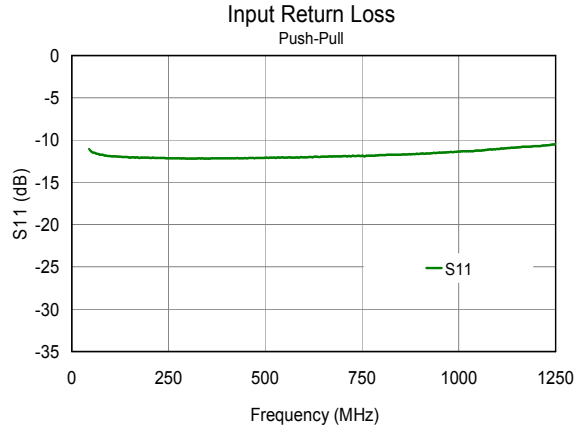
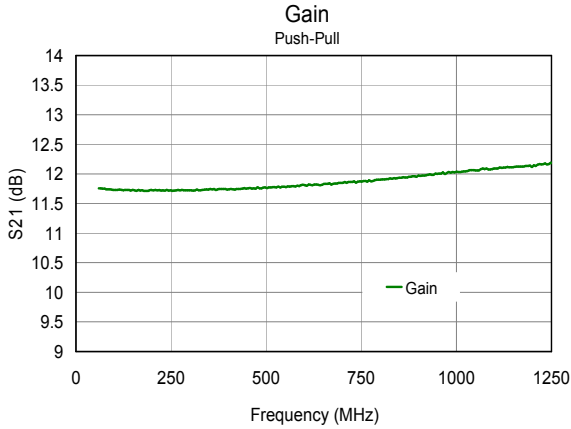
Ref. Desg.	Value	Description	Manufacturer	Part Number
U1		75 Ω dual pHEMT Amplifier	TriQuint	TAT7466
C1, C2, C5, C6, C7, C8, C9, C10	0.01 uF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	0402YC103KAT
C3, C4	220 pF	Ceramic Chip Cap., 0402, 16 V, 10 %, X7R	AVX ¹	04025A221JAT2A
L1, L2	220 nH	Chip Coil, 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
RBIAS	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.

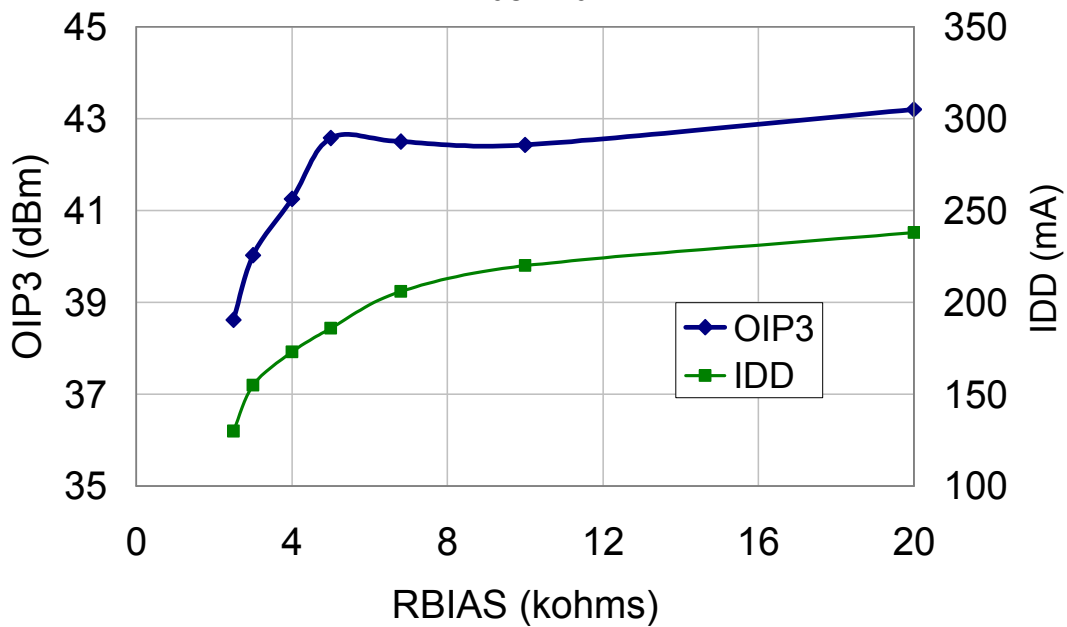
50-1000 MHz 1:1 Push-Pull Amplifier Application Board Typical Performance

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



Output IP3 & IDD vs RBIAS

Push Pull



TAT7466

75 Ω RF Amplifier

Mechanical Information

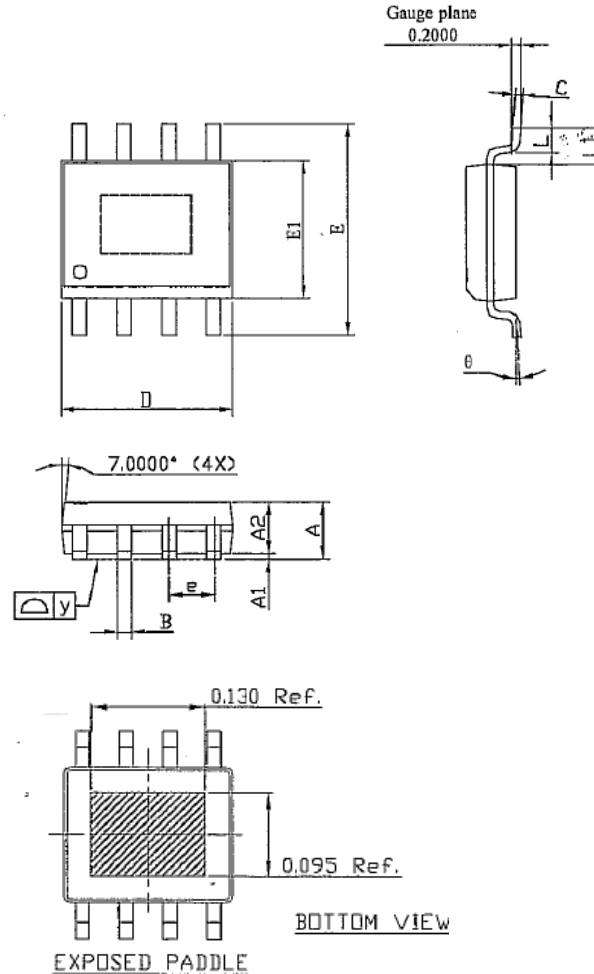
Package Information and Dimensions

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

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

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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