10MHz - 50GHz High Gain Power Amplifier

Features

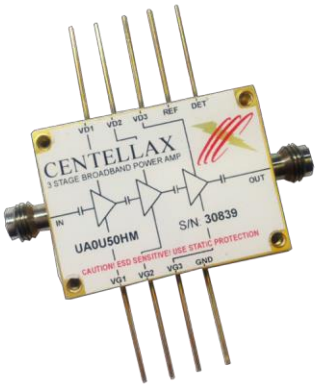
- 30dBm output power @ 10GHz
- 26dBm output power @ 40GHz
- 28dB gain to 26GHz
- 25dB gain to 40GHz
- Useful gain and power to 50GHz
- Optional integrated power detector
- Small Size
- ECCN 3A001.b.4.c

Description

The UA0U50HM Amplifier is a broadband, high power, moderate gain instrumentation grade amplifier. The amplifier was designed to provide exceptional gain flatness per octave over greater than 5 octaves of frequency coverage. The 10 MHz to 50 GHz amplifier provides up to 30dB of gain and 30dBm output power with low harmonics and low residual phase noise. The amplifier is provided in a small modular package.

Application

The UA0U50HM Amplifier is an ideal selection for laboratory and instrumentation systems where a high performance broadband RF power amplifier is required. Examples include use as a post amplifier for synthesizers, mixers, modulators, etc. where output powers are low and need to be increased to the 20 dBm to 30 dBm range. The amplifier was designed for use in communications systems, test equipment, military systems, etc.

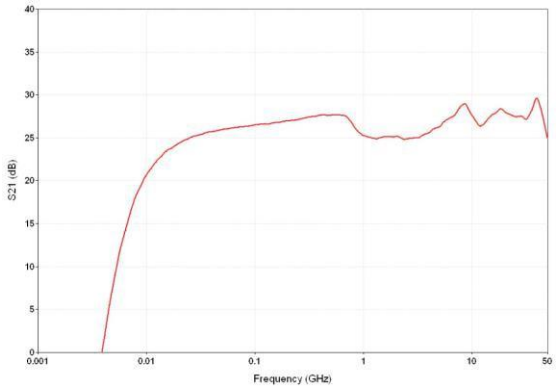


Key Characteristics @ *25˚C:* VD1 = VD2 = 6V; VD3 = 7V; Vg1 = Vg2 = Vg3 = -0.1V; Zo = 50Ω

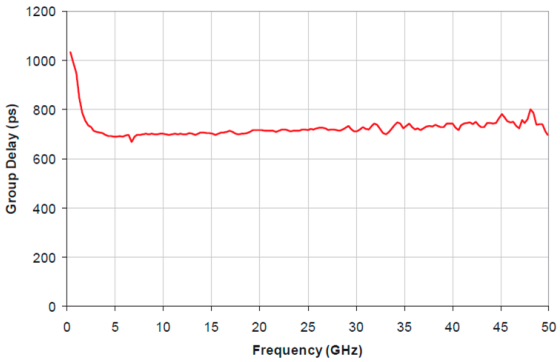
Parameter	Description	10MHz-2GHz Typ	2-10GHz Typ	10-26GHz Typ	26-40GHz Typ	40-50GHz Typ
Psat (dBm)	Saturated Output Power	24	30	29	27	24
P1dB (dBm)	1db Compressed Power	22	28	27	25	22
S21 (dB)	Small Signal Gain	25	29	28	25	24
S11 (dB)	Input Match	-15	-15	-15	-10	-8
S22 (dB)	Output Match	-6	-15	-10	-6	-6
S12 (dB)	Reverse Isolation	-60	-60	-60	-50	-50
NF (dB)	Noise Figure	-	9	9	10.5	12
H2 (dBc)	2nd Harmonic @P-1	-40	-40	-40	-35	-30
H3 (dBc)	3rd Harmonic @P-1	-20	-20	-20	-	-

Absolute Maximum Ratings*

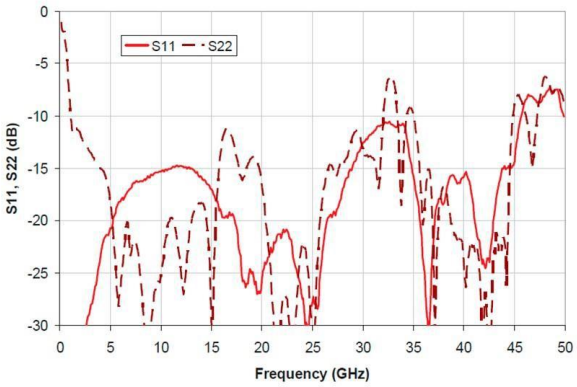
UA0U50HM S21



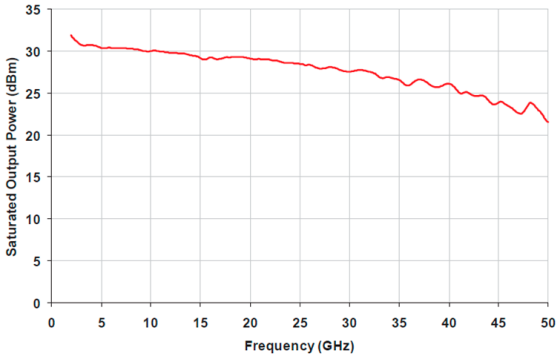
UA0U50HM Group Delay



UA0U50HM S11, S22



UA0U50HM Saturated Output Power

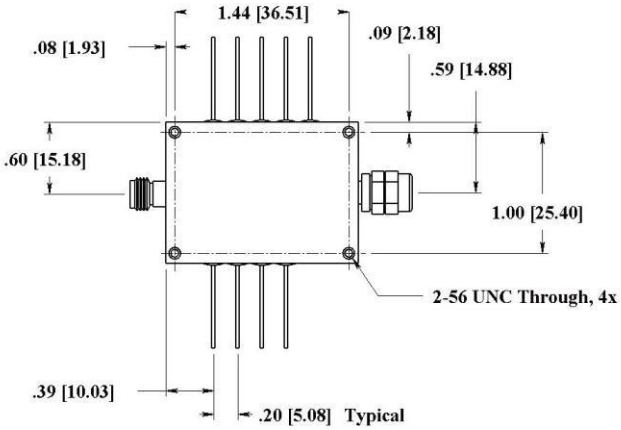


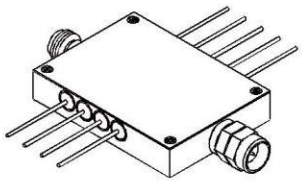
Parameter	Description	Minimum	Typ	Maximum
Vd1 (V)	Drain Bias Voltage FET1	-	6	8
Vg1 (V)	Gate Bias Voltage FET1	-4	-0.2 to 0	0.5
Idd1 (mA)	Drain Bias Current FET1	-	200mA	500mA
Vd2 (V)	Dain Bias Voltage FET2	-	6	8
Vg2 (V)	Gate Bias Voltage FET2	-4	-0.2 to 0	0.5
Idd2	Drain Bias Current FET2	-	600mA	1000mA
Vd3 (V)	Drain Bias Voltage FET3	-	7	8
Vg3 (V)	Gate Bias Voltage FET3	-4	-0.2 to 0	0.5
Idd3 (V)	Drain Bias Current FET3	-	1000mA	1200mA
Pin	Input Power (CW)	-	-	20 dBm
Pdc	Power Dissipation	-	12	-
Tbs	Backside Case Temperature	-	-	75°C

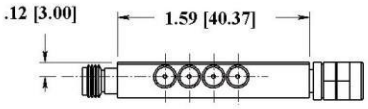
Note:
It is recommended to apply gate bias voltages before drain bias voltages, however, it is not necessary to absolutely guarantee this sequence. This device is robust and will survive drain voltages being applied before gate voltages.

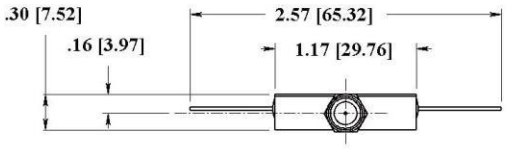
1Operation listed under the Supplemental Specifications may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the Operating Specifications is not implied. Prolonged use at the absolute maximum rating conditions may affect device reliability.

Physical Dimensions and Pin Assignment









Physical Characteristics

(all measurements in inches[mm])

Tolerance typically +/- 0.0025in (+/- 0.0635mm)

DC pin diameter is 0.03in [0.76mm]

Note: physical dimensions drawing is shown with option 263 (male output V-connector). Standard product is female input V-connector and female output V-connector.

Pin	Function	Operational Notes
RFin	RF input	V-connector (female)
RFout	RF output	V-connector (female)
Vg1	1st stage gate bias	Set at typical operating specification
Vg2	2nd stage gate bias	Set at typical operating specification
Vg3	3rd stage gate bias	Set at typical operating specification
Vd1	1st stage drain bias	Set at typical operating specification
Vd2	2nd stage drain bias	Set at typical operating specification
Vd3	3rd stage drain bias	Set at typical operating specification
Ref	DC reference offset (optional)	Remove this offset from the detector voltage (see appnote AN02)
Det	RF power detector (optional)	Remove the DC offset from this signal and linearize (see appnote AN02)
Gnd	Connected	Connected to Ground

Bias Recommendations (in order):
1) Set gate bias to recommended values; 2) Apply Bias Drains; 3) Adjust bias for optimum gain (maximum gm)

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