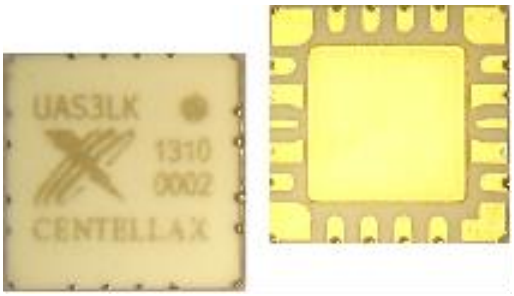
32Gb/s Broadband3V Driver Amplifier

Features

- 3V Output
- 20 dB gain (adjustable)
- Hermetic* SMT Package
  7X7x1.8mm
- Minimal external passives**
- ECCN 5A991b



Application

The UAS3LK is intended for test and measurement applications using simple NRZ or complex modulation schemes. As a general purpose gain block with flat, broadband gain, the UAS3LK is also ideal for commercial microwave radio and military electronic warfare systems.

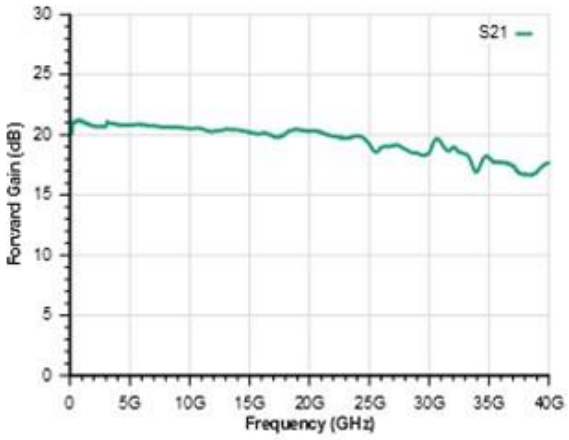
Description

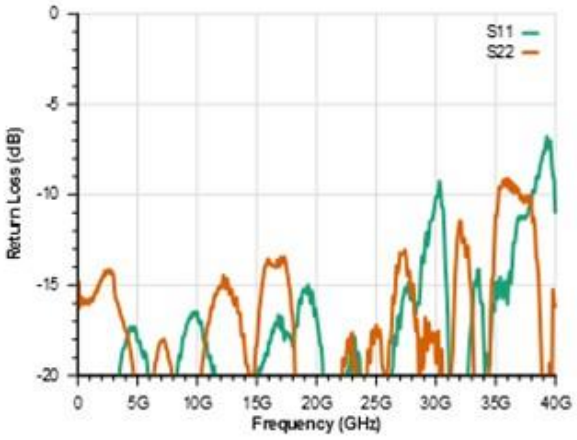
The UAS3LK is a small, single channel, two stage, high-performance broadband 32 Gb/s amplifier with low jitter, 3V amplitude and 20dB gain. Integrated bias-Ts decouple high frequency signals down to 10MHz; external inductors can be used to extend operation to lower frequencies. The amplifier stages are fabricated in a production 0.15um GaAs pHEMT process. The UAS3LK features adjustable gain and is housed in a hermetically sealed, ceramic package designed for surface mount application to printed circuit boards. The UAS3LK is RoHS compliant.

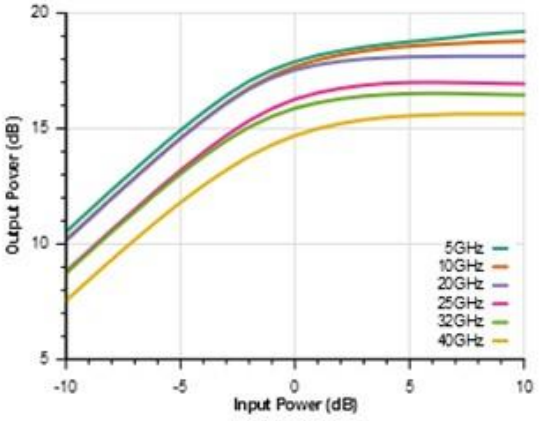
Key Characteristics: Vd1=Vd2=5.0V +/- 5%, Zo=50Ω,
Vg1 and Vg2 adjusted to obtain Id1=Id2=90mA respectively with no input signal applied
Values as measured on Microsemi P495r1 evaluation board (includes PCB loss & blocking capacitors)

Parameter	Description	Min	Typ	Max
S21 (dB)	Forward Gain			
	1MHz - 10GHz	19	21	-
	10 - 20GHz	18	20	-
	20 - 30GHz	17	19	-
S11 (dB)	Input Return Loss			
	1MHz - 10GHz	-	-15	-12
	10 - 20GHz	-	-14	-10
	20 - 30GHz	-	-10	-6
S22 (dB)	Output Return Loss			
	1MHz - 10GHz	-	-15	-12
	10 - 20GHz	-	-13	-10
	20 - 30GHz	-	-12	-8
Pout	Output Power w/Vin=200mV			
	1MHz - 10GHz	8.5	10	-
	10 - 16GHz	9	10	-
Psat	Output Power w/Vin=650mV			
	1MHz - 10GHz	16	16.5	-
	10 - 16GHz	16	16.5	-

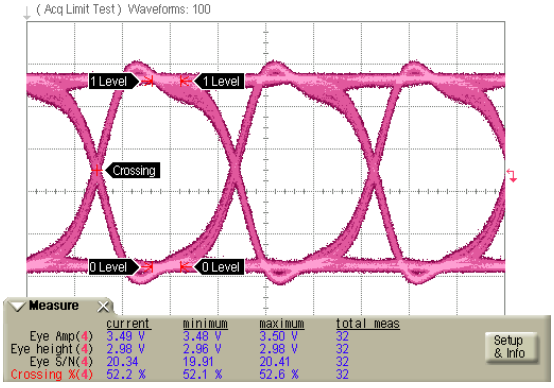
Typical Performance (data collected w/eval board)



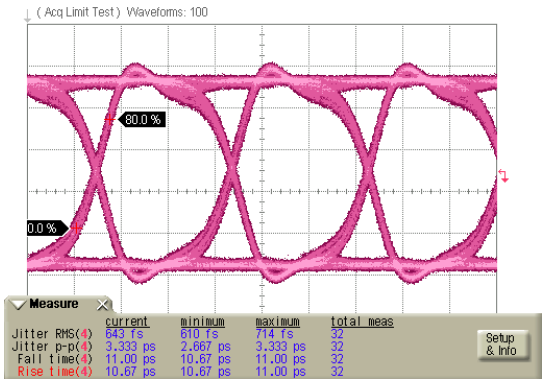




EYEs @ 23 Gb/s (400mVin)



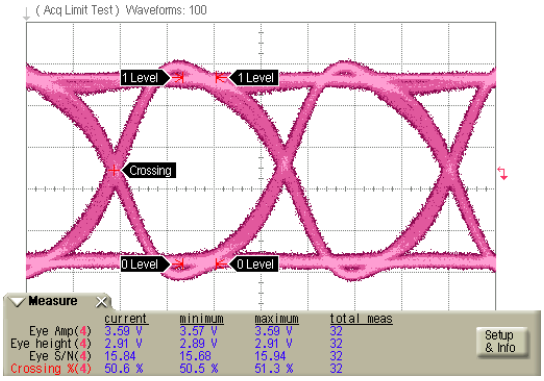
Voltage Measurements



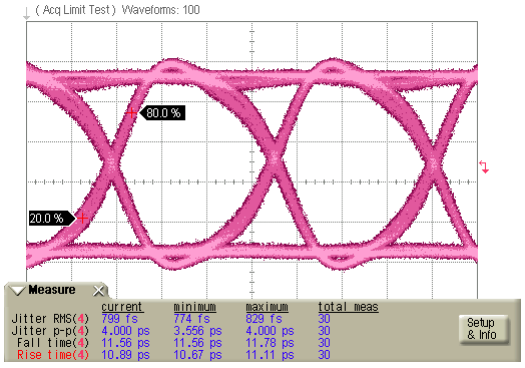
Time Measurements

Typical Performance (data collected w/eval board)

EYEs @ 28 Gb/s (400mVin)

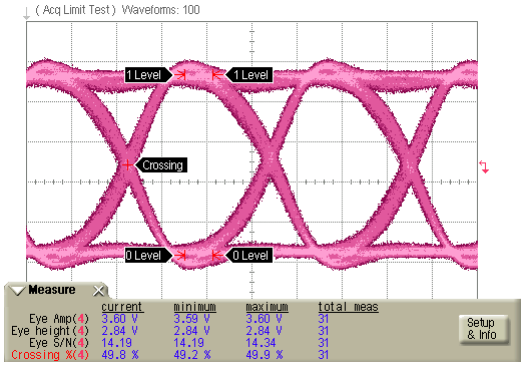


Voltage Measurements

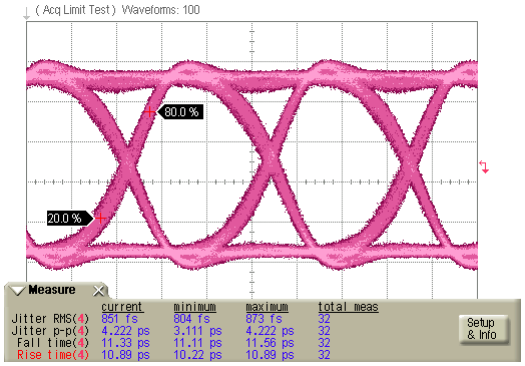


Time Measurements

EYEs @ 32 Gb/s (400mVin)

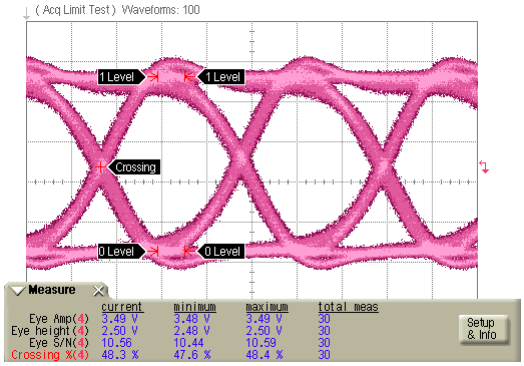


Voltage Measurements

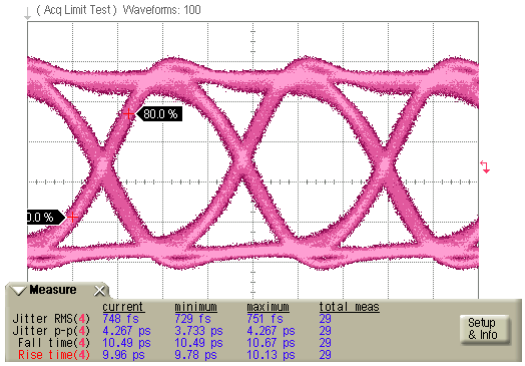


Time Measurements

EYEs @ 40 Gb/s (400mVin)

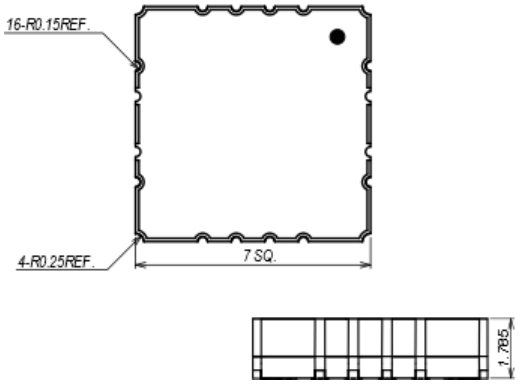


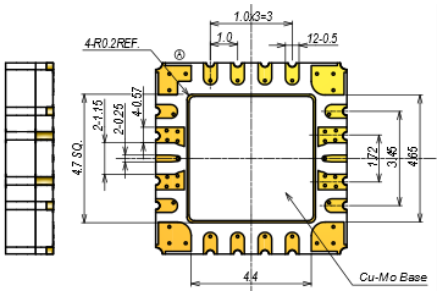
Voltage Measurements



Time Measurements

Physical Characteristics





Package Marking:

UAS3LK	*Part Number*
YY	*Assembly lot year*
WW	*Assembly lot week*
LOT	*Assembly lot number*

All measurements in mm.
Tolerances: +/- 0.15 mm

Caution, ESD Sensitive. Unpack and handle only in an ESD-safe environment

Pin Labeling

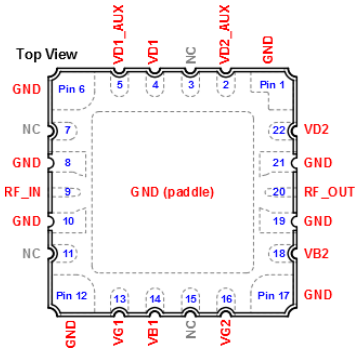


Table 1: DC & RF Pin Description

Pin #	Pin Name	Description
1,6,8,10,12,17,19,21	GND	Package Ground
2	VD2_AUX	Drain Bypass, 2nd Stage (typically leave open)
3,7,11,15	NC	No Connect
4	VD1	Drain Bias, 1st Stage
5	VD1_AUX	Drain Bypass, 1st Stage (typically leave open)
9	RF_IN	RF Input (DC coupled)
13	VG1	1st Gate Bias, 1st Stage
14	VB1	2nd Gate Bias, 1st Stage(typically leave open)
16	VG2	1st Gate Bias, 2nd Stage
18	VB2	2nd Gate Bias, 2nd Stage(typically leave open)
20	RF_OUT	RF Output (DC coupled)
22	VD2	Drain Bias, 2nd Stage
Paddle	GND	Package Ground

Functional Block Diagram

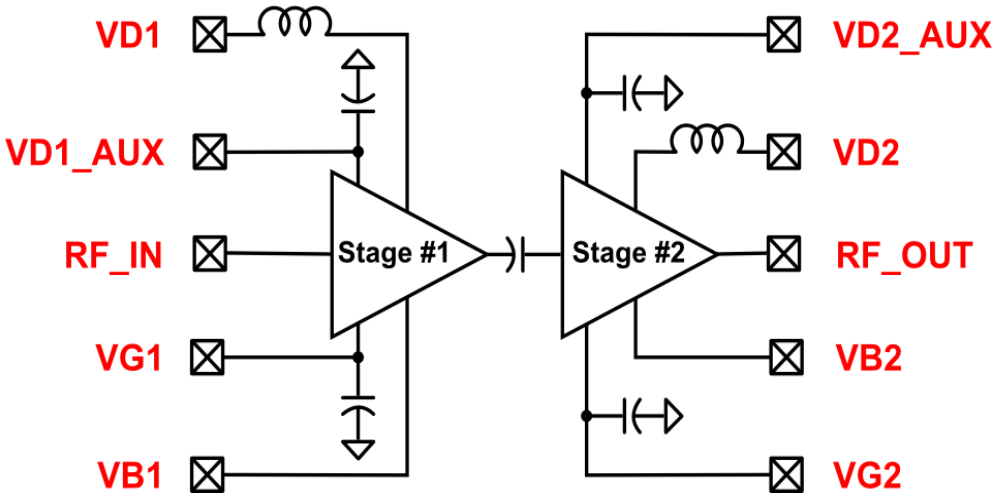


Table 2: Supplemental Specifications

		Typical Operating Conditions			Absolute Max Ratings*
Parameter	**Description**	**Min**	**Typ**	**Max**	
Vd1, Vd2	Drain Bias Voltage	+4.750 V	+5.000 V	+5.250 V	-1/+9 V
Id1, Id2	Drain Bias Current	75 mA	90 mA	150 mA	180 mA
Vg1, Vg2	1st Gate Bias Voltage (common source FET)	-0.5 V	-0.2 V	+0.2 V	-4/+0.6 V
Ig1, Ig2	1st Gate Bias Current (common source FET)	-1000 uA	-50 uA	0.0 uA	5 mA
Vb1, Vb2	2nd Gate Bias Voltage (common gate FET)	-1.0 V	Vd1/3	Vd1	-2/+9 V
Ib1, Ib2	2nd Gate Bias Current (common gate FET)	-5 mA	-	+5 mA	10 mA
Pdc	Power Dissipation**	-	0.90 W	1.58 W	-
Tcase	Base Temperature	-5 °C	-	+80 °C	-10/+100 °C
Tstore	Storage Temperature	-	-	+100 °C	-40/+125 °C
Vdc_output	DC Voltage @ RF Output	-	Vd – 4*Id	-	-1/+9 V
Idc_output	DC Current @ RF Output	-	-	150 mA	180 mA
Vdc_input	DC Voltage @ RF Input	-	-0.2	-	-4/+0.6 V
Idc_input	DC Current @ RF Input	-20 mA	-	20 mA	+/-50 mA
Lead Soldering	-	-	-	+260 °C for 5 sec	-

**Operation beyond the values listed under the Absolute Maximum Ratings may cause permanent damage to the device. Prolonged operation at conditions outside those indicated in Typical Operating Conditions may affect device reliability.*

***Combinations of supply voltage, supply current, input power, and output power shall not exceed the maximum power dissipation listed above.*

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