GTD-18395 Rev. 4.1

OKI Electronic Components

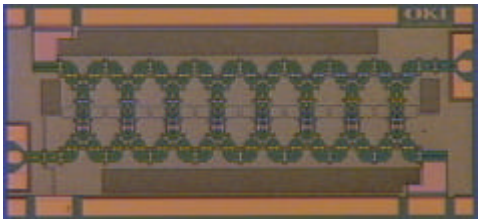
This version: Dec. 2001
Previous version: Oct. 2001

KGA8010 Preliminary

Ultra Broadband Distributed Amplifier

FEATURES

KGA8010 is a broadband distributed amplifier using 0.1um-gate GaAs P-HEMT and coplaner waveguide technologies. KGA8010 can be used as a multi-purpose amplifier for 40Gb/s optical communication and millimeter wave applications.



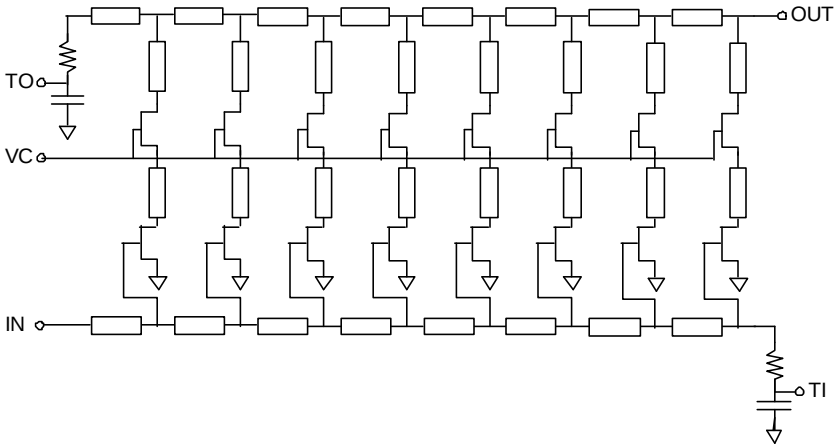
FEATURES

- High Gain : 11.5dB
- Broadband : >50GHz
- Low Noise : 3.5dB
- High Output Power: 12dBm

APPLICATIONS

- Pre-amplifiers, base-band amplifiers, EA drivers for 40Gb/s optical communication systems
- Low noise amplifiers and gain amplifiers for millimeter wave band radio communication systems

CIRCUIT DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Unit	Min.	Max.
Power Supply Voltage [1)]	Vdd	V	0	+5.0
Common Gate Bias Voltage	VC	V	0	Vdd-1.0
Power Supply Current	Idd	mA	---	+128.0
Input Bias Voltage [2)]	Vgg	V	-1.5	+0.7
Input Voltage High [3)]	Vih	V		+0.8
Input Voltage Low [4)]	Vil	V	-1.6	
Operating Channel Temperature	Tch	℃	0	+125
Thermal Resistance	Rth	℃/W	---	165
Storage Temperature	Tstg	℃	-45	+125

1,2) See TYPICAL BIAS NETWORK

3,4) Vih=Vgg+Vin/2, Vil=Vgg-Vin/2, where Vin is the peak-to-peak input voltage swing.

RECOMMENDED OPERATING CONDITIONS

Item	**Symbol**	**Unit**	**Min.**	**Typ.**	**Max.**	**Note**
Power Supply Voltage	Vdd	V	3.0	3.3	3.6	
Common Gate Bias Voltage	VC	V	---	1.5	---	
Power Supply Current	Idd	mA	---	76.8	---	
Operating Channel Temperature	Tch	℃	20	---	100	

ELECTRICAL CHARACTERISTICS (DC)

(Ta=25ºC, Vdd=3.3V, VC=1.5V, Idd=76.8mA)

Item	Symbol	Unit	Condition	Min.	Typ.	Max.
DC Saturated Drain Current	Idd0	mA	Vgg=0V	---	76.8	---
DC Input Bias Pinch-Off Voltage	Vggoff	V	Idd=0.64mA	---	-0.7	---
Input Bias Current	Igg0	mA	Vgg=-1.0V	---	0.05	1.0
VC Bias Current	Ic0	mA		---	0.35	1.0

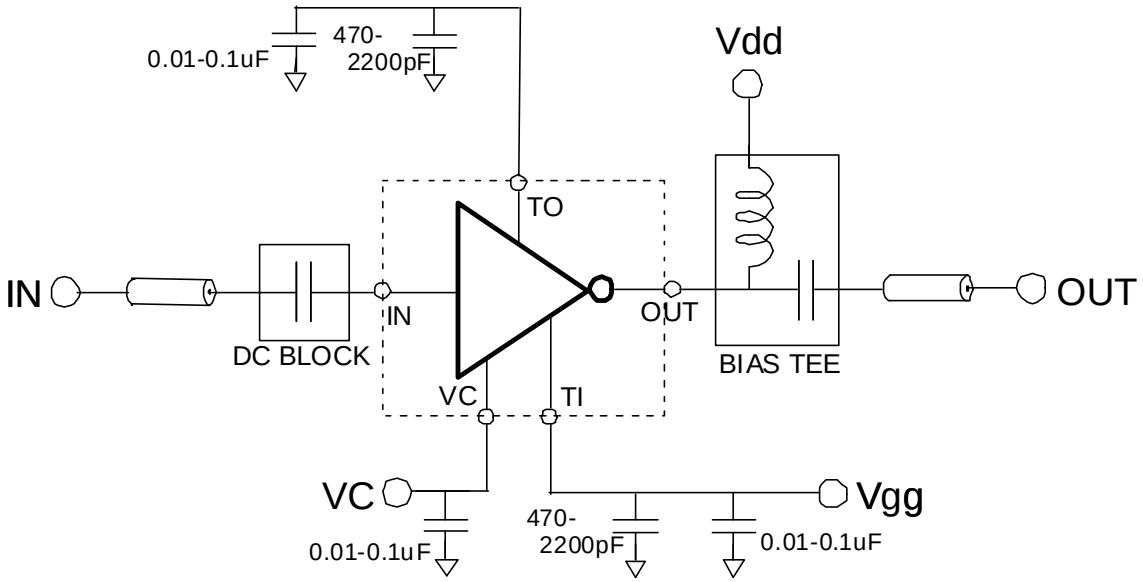
ELECTRICAL CHARACTERISTICS (AC)

(Ta=25ºC, Vdd=+3.3V, Idd=76.8mA, Vc=1.5V, Zin=Zout=50ohm)

Item	Symbol	Unit	Condition	Min.	Typ.	Max.
Small-Signal Gain	G_{SS}	dB	Freq=1-50GHz	10	11.5	---
Gain Flatness	Gf	dB	Freq=1-50GHz	---	+/-1.0	+/-1.5
Noise Figure	NF	dB	Freq=40GHz	---	3.5	---
Output Power at 1dB gain compression	P_{o1}	dBm	Freq=40GHz	---	12	---
Input/Output Return Loss	RL	dB	Freq=1-50GHz	10	14	---
Reverse Isolation	ISrev	dB	Freq=1-50GHz	15	25	---

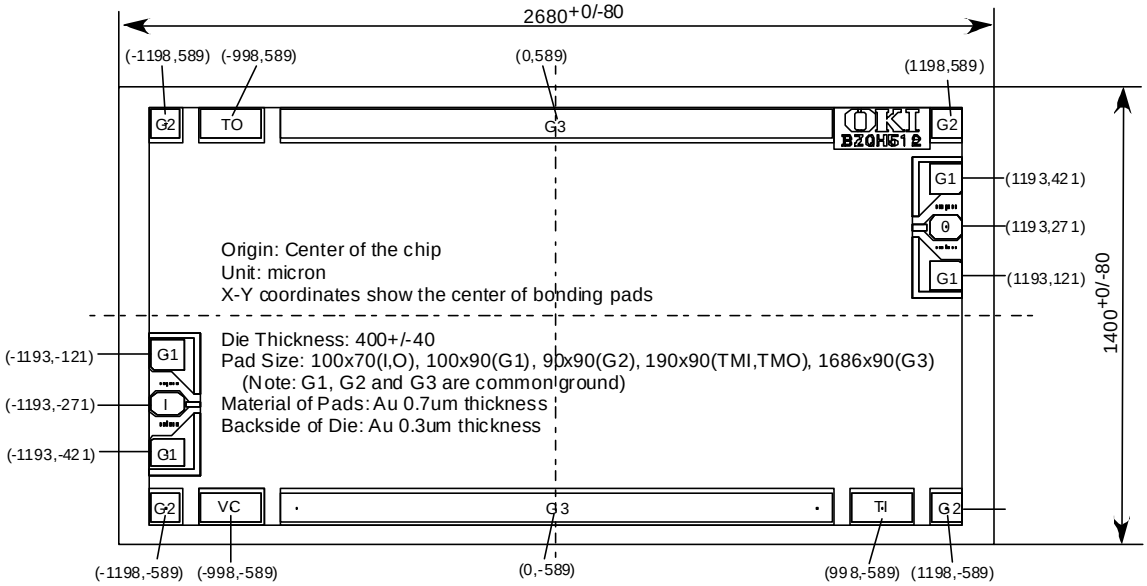
1) Bandwidth can be extended to lower frequency by use of external capacitors

TYPICAL BIAS NETWORK



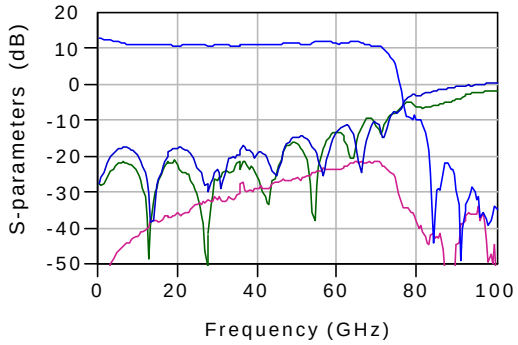
Note: This schematic is an example for 40Gb/s amplifier applications. In these baseband signal applications, KGA8010 operates as an inverting logic.

CHIP DIMENSION



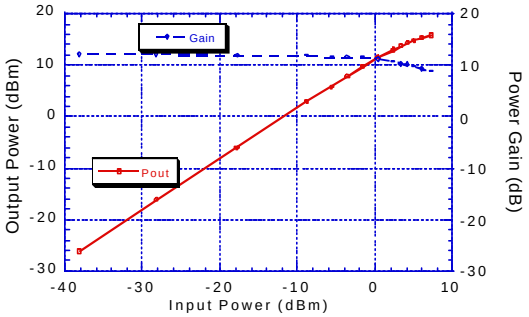
TYPYCAL CHARACTERISTICS

Small Signal Characteristics



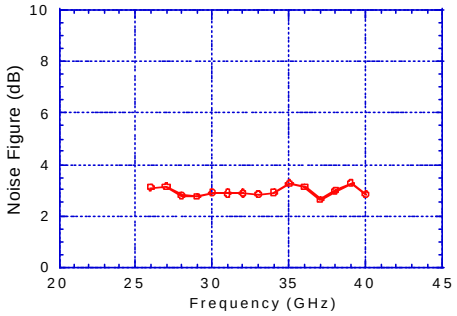
On-Wafer Test
Vdd: 3.3V
Idd: 76.8mA
Vc: 1.5V
Temp: RT
Measured without external capacitors

Pin-Pout Characteristics



On-Wafer Test
Vdd: 3.3V
Vgg: -0.2V
Vc: 1.2V
Temp: RT

Noise Characteristics



On-Wafer Test
Vdd: 3.3V
Vgg: -0.2V
Vc: 1.2V
Temp: RT