OKI Electronic Components

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KGL4132F

10 Gbps AGC Amplifier IC

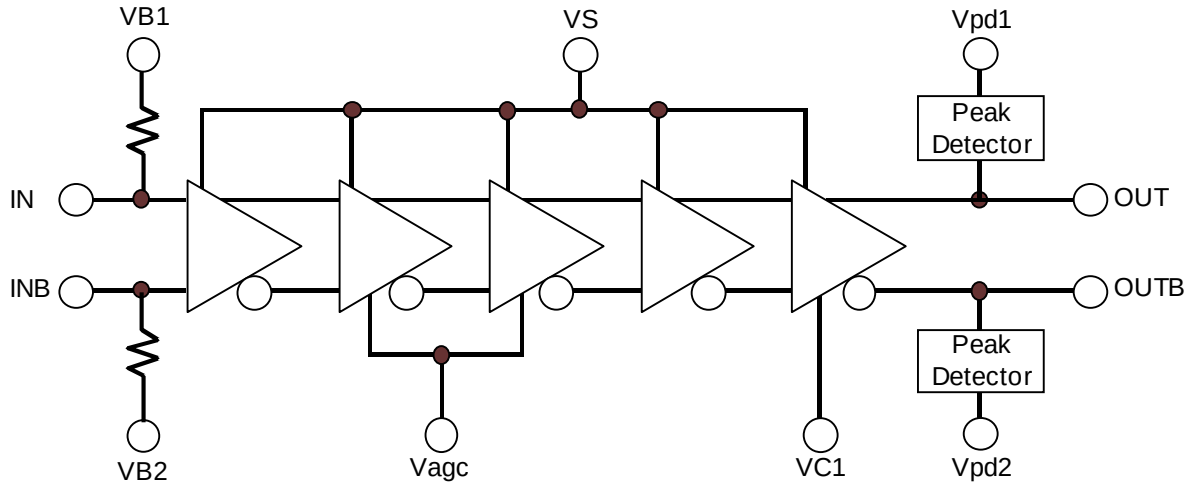
DESCRIPTION

KGL4132F is an ultra-broadband AGC (Automatic Gain Control) Amplifier implemented 0.1 μm gate GaAs P-HEMT device technology by using the Gilbert-Cell multiplier circuit configuration.

FEATURES

- Broadband Amplifier : > 10 GHz
- Wide Variable Gain Range : 25 dB
- Single Supply Voltage : –5 V
- Power Consumption : < 1W (@VS = –5 V)

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Items	Symbol	Min.	Max.	Unit
Supply Voltage	VS	–6.5	0.3	V
Output Saturation Control Voltage	VC1	–6.5	VS + 1.2 (Max. 0.3)	V
Bias Control Voltage	VB1, VB2	VS – 5 (Min. –6.5)	VS + 3.5 (Max. 0.3)	V
Gain Control Voltage	Vagc	–6.5	VS + 4.5 (Max. 0.3)	V
Temperature at Package Base under Bias	Ts	–45	100	°C
Storage Temperature	T_{ST}	–45	125	°C

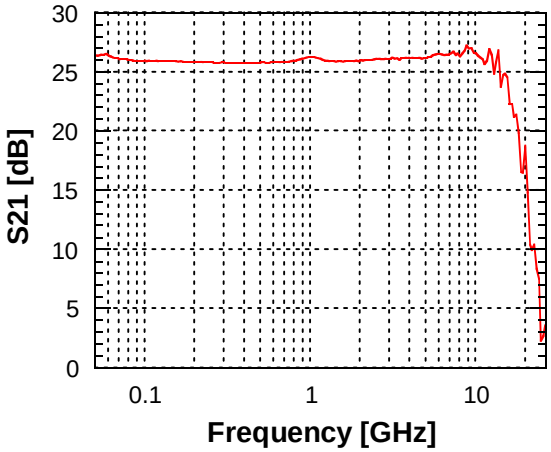
RECOMMENDED OPERATION CONDITION

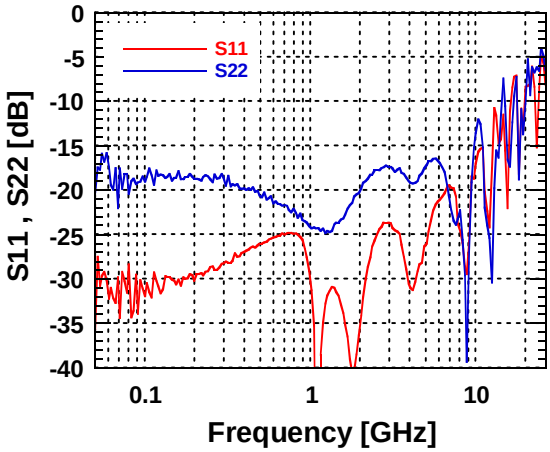
Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	VS	–5.5	–5.2	–4.9	V
Output Saturation Control Voltage	VC1	VS	—	VS + 0.5	V
Bias Control Voltage	VB1, VB2	VS + 1.1	—	VS +1.9	V
Gain Control Voltage	Vagc	VS + 1.9	—	VS + 3.6	V
Operating Temperature	Ta	0	—	80	°C

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Power Consumption	Pc	—	—	1.2	W	
Maximum Gain	Gmax	22	—	—	dB	
Bandwidth (–3 dB)	Fc	10	—	—	GHz	@ Maximum Gain
Variable Gain Range	GR	25	30	—	dB	
Output Saturation Amplitude	ΔVop	1.0	—	1.8	V_{PP}	@ VC1 = VS
Minimum Input Amplitude	Vmin		15		mVpp	@BER < 1E-9
Peak Detector Sensitivity	Vpk	0.3	—	—	V/V_{PP}	
Input Return Loss	S11	15 12	—	—	dB	< 8 GHz < 10 GHz
Output Return Loss	S22	12 8	—	—	dB	< 8 GHz < 10 GHz

TYPICAL CHARACTERISTICS



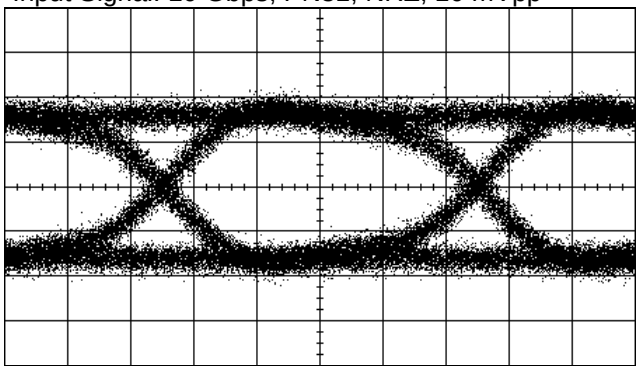


Maximum Gain : 26 dB
-3dB Band Width : 15 GHz

S11 : < –17 dB (@ < 10 GHz)
S22 : < –13 dB (@ < 10 GHz)

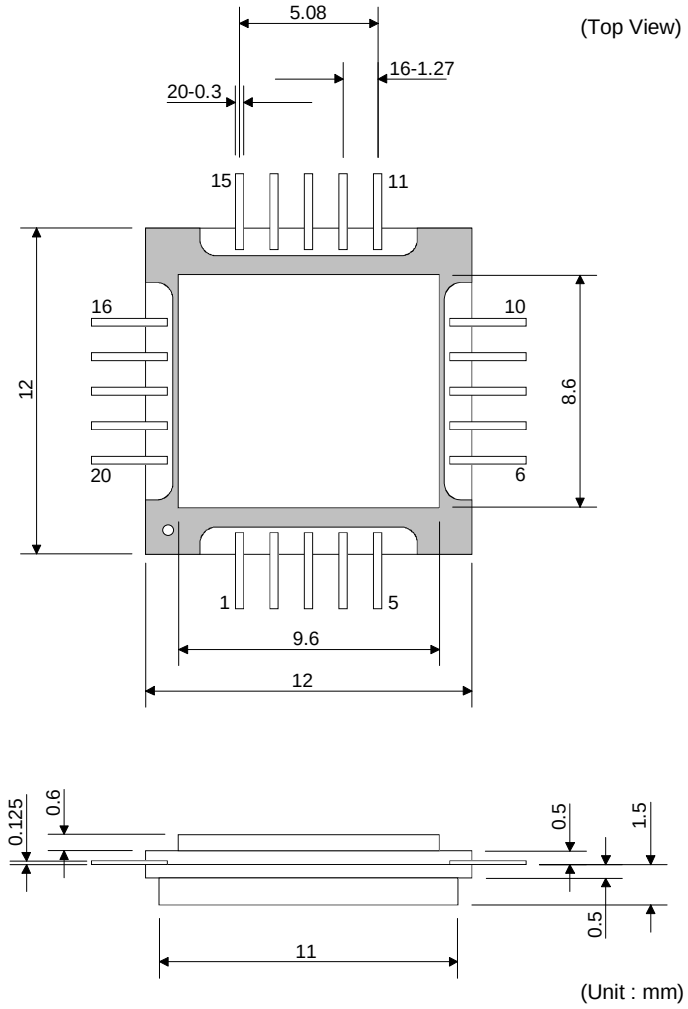
Output Waveform

Input Signal: 10 Gbps, PN31, NRZ, 10 mVpp



Output Amplitude : 160 mVpp
Bit Error Rate : < 1E-12

PACKAGE DIMENSIONS



(Unit : mm)

PIN CONNECTION

No.	Symbol	Note	No.	Symbol	Note
1	VB2	Input-bar termination port (External capacitor is required) and input-bar bias control port	11	Vpd1	Output of peak detector (OUT)
2	N.C.	No connection	12	VS	Supply voltage port
3	N.C.	No connection	13	Vagc	Gain control port
4	Vc1	Output saturation voltage control port	14	VS	Supply voltage port
5	Vpd2	Output of peak detector (OUTB)	15	VB1	Input termination port (External capacitor is required) and input bias control port
6	GND	Ground	16	GND	Ground
7	OUTB	Signal output-bar port	17	IN	Signal input port
8	GND	Ground	18	GND	Ground
9	OUT	Signal output port	19	INB	Signal input-bar port
10	GND	Ground	20	GND	Ground

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