DATA SHEET

O K I G a A s P R O D U C T S

KGL4115F
10-Gbps EA Modulator Drive IC

June 2000

Oki Semiconductor

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GENERAL DESCRIPTION

Oki's KGL4115F is an EA (Electro-Absorption) modulator driver for 10-Gbps transmitter communication applications. This device is designed using InGaAs/GaAs pseudomorphic BP MESFET technology and 0.2-µm gate length geometry, and is used to drive an EA modulator.

The KGL4115F is available in a 20-pin ceramic package. The device's minimum output amplitude is 2.7 V peak to peak. The input is AC coupled requiring an external blocking capacitor and the output is DC coupled. The KGL4115F's supply voltage is -5 V and power consumption is 1.5 W (maximum).

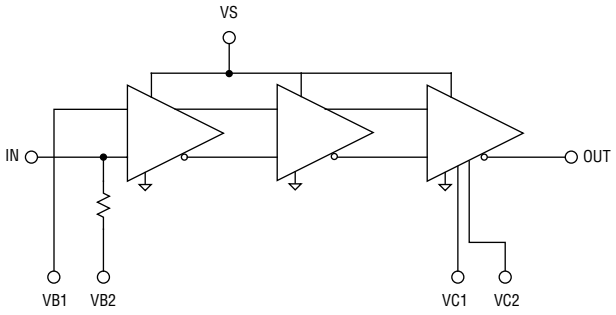
FEATURES

- Ultra-Broadband Amplifier: DC-10 GHz
- High Output Voltage: > 2.7 V_{PP} (maximum)
- Cross-Point Control Function
- Output Bias Control Function
- 20-pin ceramic package

APPLICATION

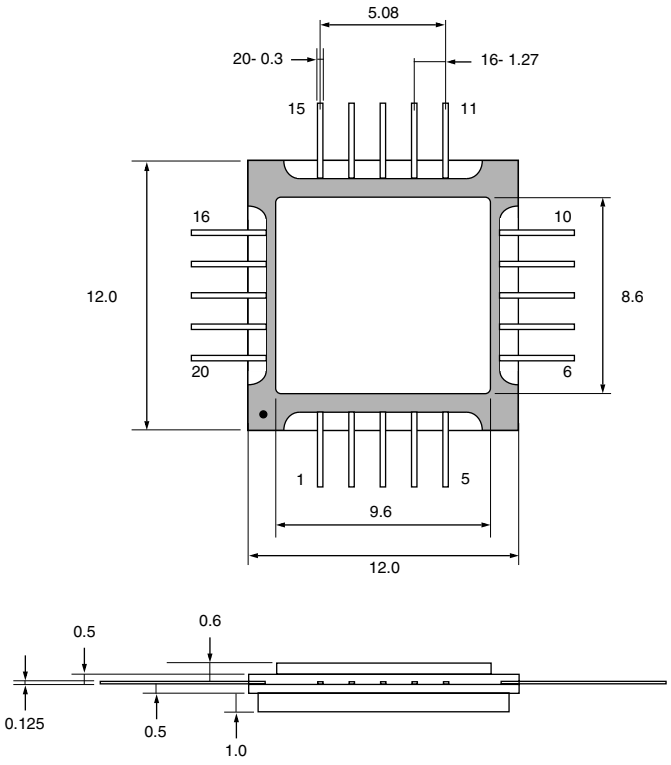
- OC-192 Optical Communication EA Modulator Driver

BLOCK DIAGRAM



PACKAGE DIMENSIONS

(Units: mm)



Pin Configuration

Pin	Symbol	Description	Pin	Symbol	Description
1	NC	No Connection	11	VC2	Output Bias Control Voltage Port
2	NC	No Connection	12	VC1	Output Amplitude Control Voltage Port
3	NC	No Connection	13	VS	Supply Voltage Port
4	NC	No Connection	14	VB2	Input Terminal Port
5	NC	No Connection	15	VB1	Cross-Point Control Voltage Port
6	GND	Ground	16	GND	Ground
7	OUT	Signal Output Port	17	NC	No Connection
8	GND	Ground	18	GND	Ground
9	NC	No Connection	19	IN	Signal Input Terminal
10	GND	Ground	20	GND	Ground

ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Min.	Max.	Units	Notice
Cross-Point Control Voltage	VB1	-6.5	0.3	V	
Output Amplitude Control Voltage	VC1	-6.5	0.3	V	VC1 - VS > 1.2 V
Output Bias Control Voltage	VC2	-6.5	0.3	V	VC2 - VS > 2.4 V
Supply Voltage	VS	-6.5	0.3	V	
Operating Temperature (at package base)	T_S	0	100	°C	
Storage Temperature	T_{ST}	-40	125	°C	

Recommended Operating Conditions (Ta=25°C)

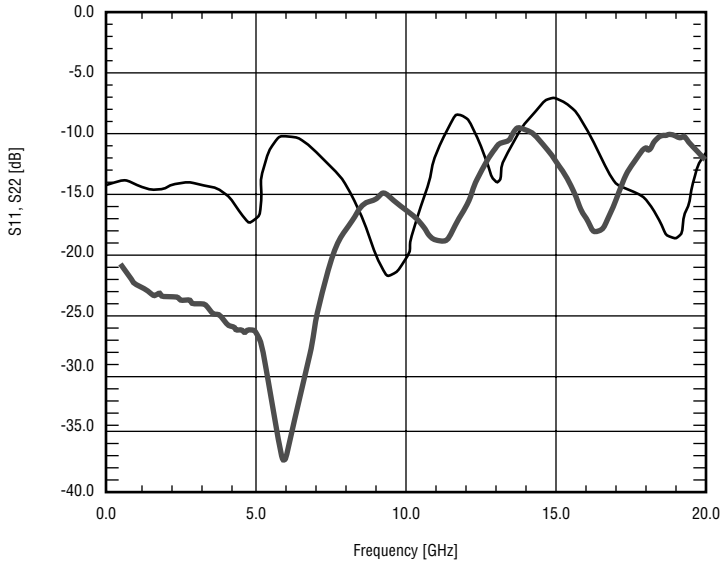
Parameter	Symbol	Min.	Typ.	Max.	Units
Cross-Point Control Voltage	VB1	-3.4	-3.8	-4.2	V
Output Amplitude Control Voltage	VC1	-5.0		-4.0	V
Output Bias Control Voltage	VC2	-5.0		-2.8	V
Supply Voltage	VS	-5.5		-5.0	-5.0V
Operating Temperature (at package base)	T_S	0		70	°C
Input Interface	AC Coupled (External blocking capacitor is required)				
Output Interface	DC Coupled				

Electrical Characteristics (Ta=25°C)

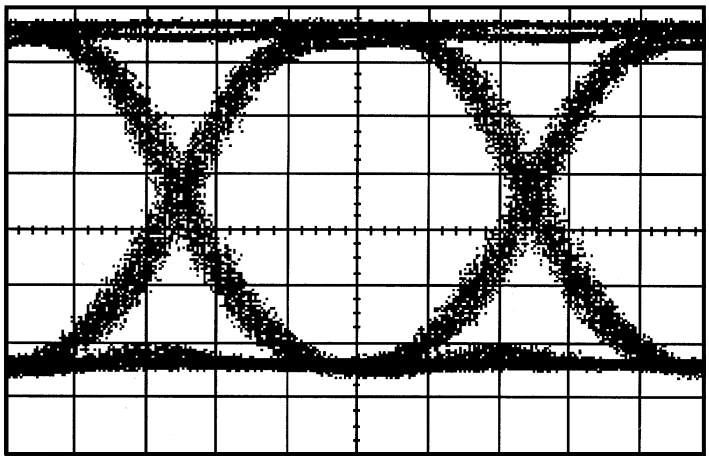
Parameter	Symbol	Min.	Typ.	Max.	Units	Notice
Supply Current	I_{SS}			285	mA	Including bias current = 20 mA
Voltage Offset	V_0 (ofs)	-1		0	V	50-Ω load, bias current = 20 mA
Input Amplitude	V_{IN}	0.5		1	V	
Output Amplitude (Max.)	V_0 (max)	2.7			V_{PP}	50-Ω load Term
Output Low Voltage (Min.)	V_{LO}			-3	V	50-Ω load
Output High Voltage (Max.)	V_{HI}			-1	V	50-Ω load
Cross-Point Control	X_P	20		80	%	NRZ, 50-Ω load
Pulse-Width Stability	Del (PW)			10	%	0 to 75°C 50-Ω load
Output Rise / Fall Time	T_R / T_F			40	ρs	50-Ω load 20% / 80%
Input Return Loss	S_{11}		15		dB	100 kHz to 10 GHz

TYPICAL CHARACTERISTICS

S11/S22 of EA Modulator Driver IC



Output Waveform of EA Modulator Driver IC



V: 500 mV/div, H: 20 ps/div

Bench Operating Conditions

VB1 = -3.8 V
VC1 = -4.0 V (Max. amplitude)
VC2 = -5.0 V (Bias current: OFF
VS = -5.0 V (IS = 197.4 mA)
Input Signal: 10 Gbps NRZ, PN:31, PRBS
0.5 V_{PP}, T_R / T_F = 40 ps / 38.2 ps (20 - 80%)

Output Amplitude = 2.93 V_{PP}
Ride Time = 31.6 ρs
Fall Time = 30.2 ρs
Eye Height = 2.69 V_{PP}
Eye Width = 82.0 ρs

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