

KGL4126HA

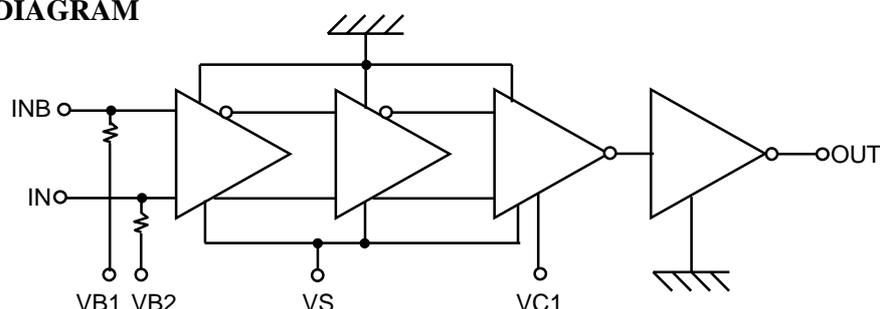
Preliminary

11.3 Gbps Mach-Zehnder Modulator Driver IC

FEATURES

- High Output Voltage: Maximum Amplitude > 5.7 Vpp
- X-Point Control Function
- Output Amplitude Control Function
- Small Package : 7mm x 7mm QFP

FUNCTION DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit	Note
Supply Voltage	VS	-6.5	0.3	V	
X-Point Control Voltage	VB1	VS-4.5 (Min. -6.5)	VS+2.0 (Max. 0.3)	V	
Current Source FET Gate Bias Voltage	VC1	-6.5	VS+1.2 (Max. 0.3)	V	
DC Bias for Output Stage Amplifier	VD	0	5.0	V	
Operating Temperature at Package Base	Ts	-10	100	°C	
Storage Temperature	Tst	-40	125	°C	

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	VS	-5.46		-4.94	V
DC Bias for Output Stage Amplifier ^{*1,2}	VD	2.0		4.0	V
X-Point Control Voltage	VB1	VS+1.1		VS+1.5	V
Current Source FET Gate Bias Voltage ^{*1,3}	VC1	VS	VS+0.85	VS+1.0	V
Input Amplitude : Differential	Vin	0.25		1	Vpp
: Single – Ended		0.5		1	Vpp
Operating Temperature at Package Base	Ts	0		70	°C
Input Interface	AC coupled (External blocking capacitor is required)				
Output Interface	AC coupled (External Bias-T is required for VD)				

*1 Output amplitude can be tuned by control voltage VD.

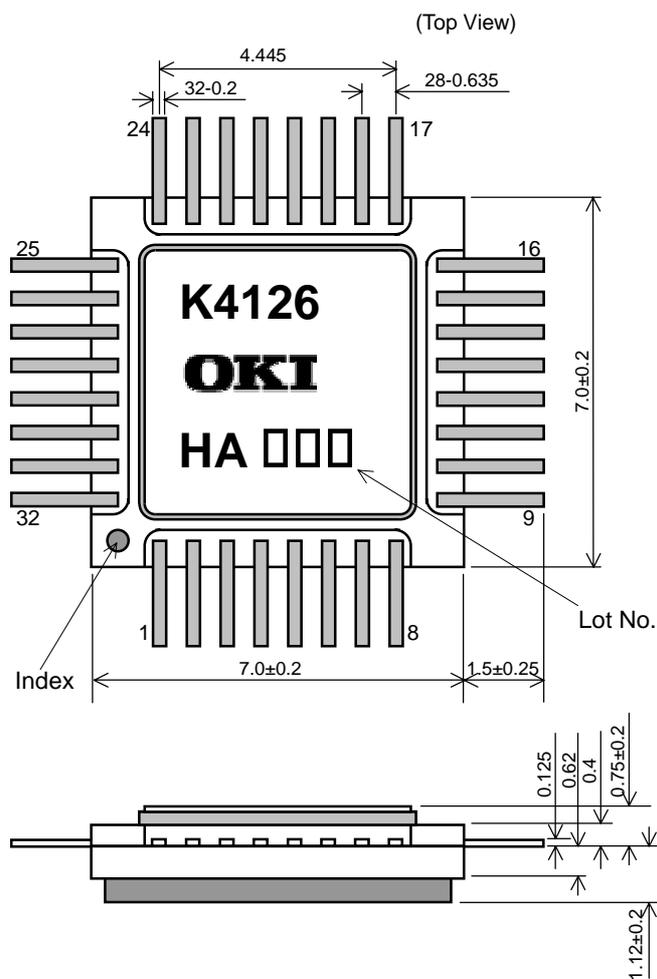
*2 VD is supplied at Output Port using External Bias-T.

*3 It is recommended to set VC1 to a fixed value between VS+0.7V and VS+1.0V.

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Input Data Rate		NRZ	11.3			Gbps
Supply Current of VS	I _{SS}	X-Point : 45% - 55%		210	250	mA
Supply Current of VD	I _D	Supply DC Bias by Bias-T		90	130	mA
Power Dissipation	P _w	Maximum Amplitude		1.5		W
Output Amplitude (Max)	V _o (Max)	50 Ω load,(AC Coupled)	5.7	6.0		V _{pp}
X-Point Control	X _p	NRZ, 50 Ω load	45		55	%
Output Rise/Fall Time	T _r /T _f	50 Ω load 20%-80%			40	ps
Input Return Loss	S11	100kHz-10 GHz		13		dB

PACKAGE DIMENSIONS



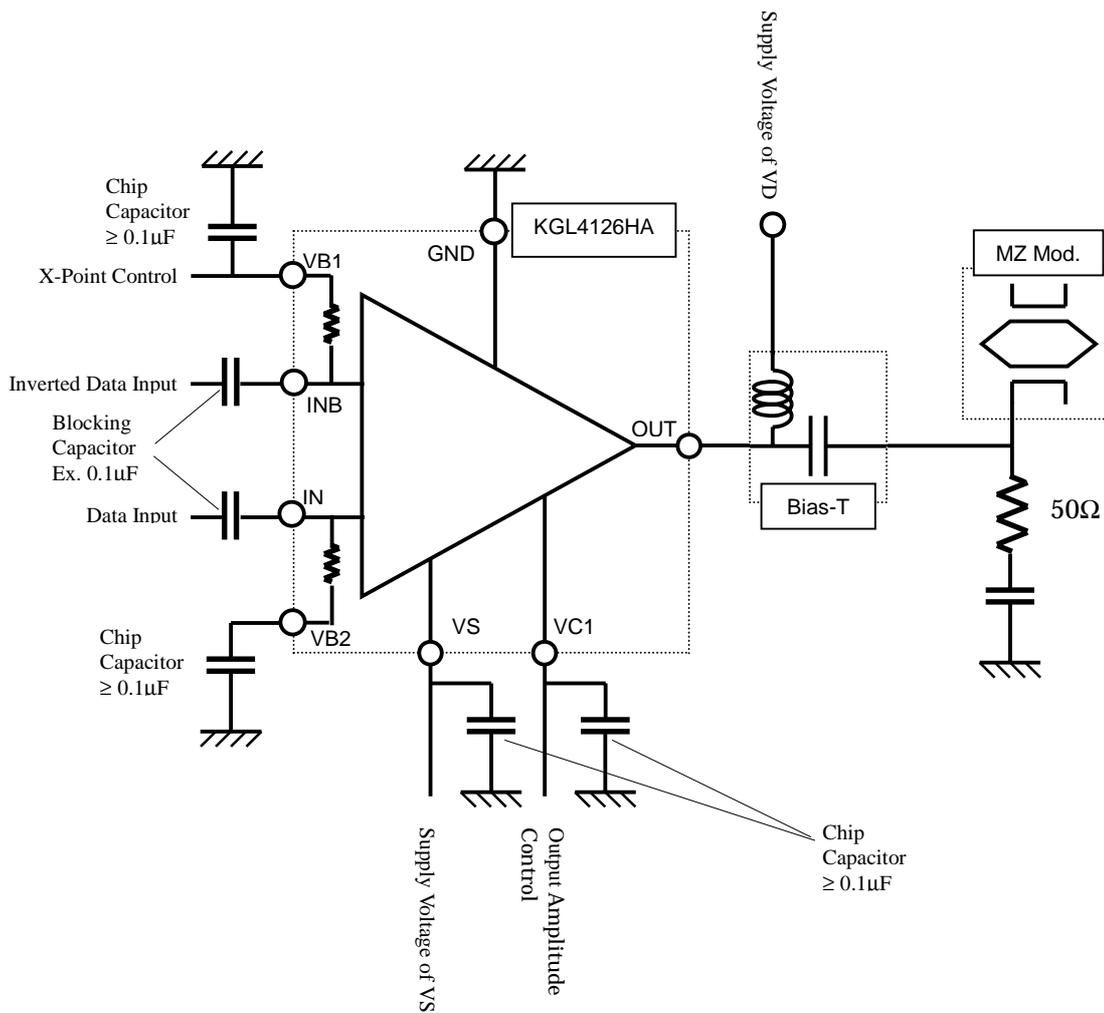
Unit : mm

PIN ASSIGNMENT

No.	Symbol	Note
1	GND	Ground
2	GND	Ground
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	OUT	Signal Output Port
14	GND	Ground
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	GND	Ground
19	VC1	Output Amplitude Control Port
20	VS	Supply Voltage Port
21	VS	Supply Voltage Port
22	VB2	Input Termination Port
23	VB1	X-Point Control Port and Inverted Input Termination Port
24	GND	Ground
25	GND	Ground
26	GND	Ground
27	GND	Ground
28	INB	Inverted Input Port
29	GND	Ground
30	GND	Ground
31	IN	Signal Input Port
32	GND	Ground

Note) This Package is non-hermetic.

TYPICAL APPLICATION



APPLICATION NOTE

1. EXTERNAL BLOCKING CAPACITORS ARE REQUIRED FOR THE DATA INPUTS (IN/INB). TERMINATION CAPACITORS ARE REQUIRED BETWEEN THE CONTROL VOLTAGES (VB1/VB2) AND GROUND.
2. To minimize the dependence of the “X-Point” on the supply voltage VS
 - a. VB2 is open
VB2 is biased at about $0.76 \times VS$ ($-3.8V @ VS = -5.2V$) by the internal circuit. Control VB1, so that the voltage difference “VB1–VB2” is constant.
 - b. VB2 is biased
Bias VB2 at about $-3.8V$ by using the external voltage source independent of VS.
Control VB1 by using the external voltage source independent of VS.
3. To minimize the dependence of “Output amplitude” on the supply voltage VS
 - a. It is recommended to set “VC1” to a fixed value between $VS+0.7V$ and $VS+1.0V$. Control the voltage of “VC1”, so that the voltage difference “VC1–VS” is constant.
 - b. The Output Amplitude can be tuned by adjusting VD; VD is supplied at the Output Port using an External Bias-T.
4. Power-up/shut-down sequence
 - a. For manual power-up, turn on supply control voltages (VB1, VB2, VC1) at first, next VS, then VD. For shutdown, turn off VD first, then VS, then control voltages. The sequence for the control voltages (VB1, VB2, VC1) is not critical.
 - b. For simultaneous start up it is recommended that the delay between the supply control voltages (VB1, VB2, VC1) and VS be minimized, or that all voltages be applied at the same time.

SAFETY AND HANDLING INFORMATION ON GaAs DEVICES

Arsenic Compound (GaAs Devices)

The product contains arsenic (As) as a compound.

This material is stable for normal use, however, its dust or vapor may be potentially hazardous to the human body.

Avoid ingestion, fracture, burning or chemical treatment to the product.

- Do not put the product in your mouth.
- Do not burn or destroy the product.
- Do not perform chemical treatment for the product.

Keep laws and ordinances related to the disposal of the products.

NOTICE

1. The information contained herein can change without notice owing to product and/or technical improvements. Before using the product, please make sure that the information being referred to is up-to-date.
2. The outline of action and examples for application circuits described herein have been chosen as an explanation for the standard action and performance of the product. When planning to use the product, please ensure that the external conditions are reflected in the actual circuit, assembly, and program designs.
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