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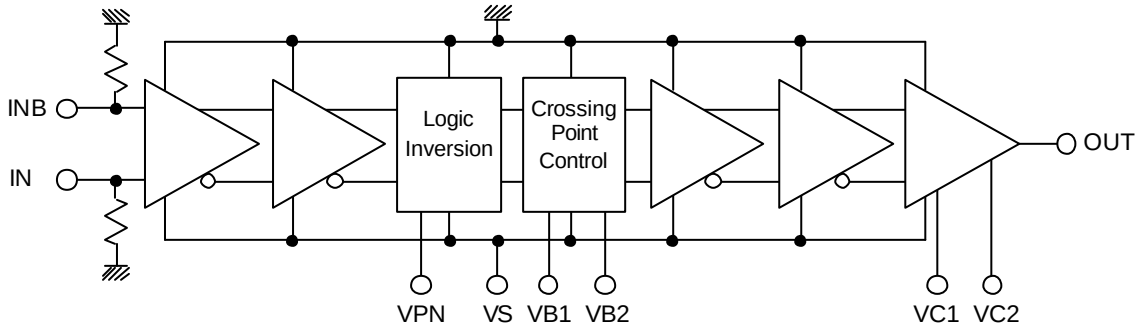
KGL4125HW/GW Preliminary

10.7 Gbps EA Modulator Driver IC

FEATURES

- Low Power : 0.8 W (@minimum amplitude, no offset)
- Input Interface : CML Compatible / AC coupled
- High Sensitive Input : 0.15 Vpp (differential)
- Output Amplitude Control : 0.8 Vpp to 2.3 Vpp
- X-Point Controllability : 35 % to 80 %
- Maximum Output Offset : 1.3 V (@50Ω)
- Logic Inversion Function

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-5.0 (Min. -6.5)	VS+3.0 (Max. 0.3)	V	
X-Point Reference Voltage	VB2	VS-5.0 (Min. -6.5)	VS+3.0 (Max. 0.3)	V	
Output Amplitude Control Voltage	VC1	-6.5	VS+1.6 (Max. 0.3)	V	
Output Bias Control Voltage	VC2	-6.5	VS+2.6 (Max. 0.3)	V	
Logic Inversion Control Voltage	VPN	-6.5	0.3	V	
Input Voltage	Vin(DC)	-2	0.6	V	DC coupled
Input Amplitude	Vin	-	1.5	Vpp	AC coupled
Operating Temperature at Package Base	Ts	-10	100	°C	
Storage Temperature	Tst	-40	125	°C	

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RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	VS	-5.5	-5.2	-4.9	V	
X-Point Control Voltage	VB1	VS+0.4	-	VS+2.5	V	
X-Point Reference Voltage	VB2 1)	-4.2	-3.95	-3.6	V	
Output Amplitude Control Voltage	VC1	VS	-	VS+1.2	V	
Output Bias Control Voltage	VC2	VS	-	VS+2.4	V	
Logic Inversion Control Voltage	VPN 2)	VS	-	VS+0.5	V	Positive Output
		-0.5	-	0	V	Negative Output
Input High Voltage	VHin	-0.2	-	0	V	DC coupled
Single-ended Input Amplitude	Vin	0.25	-	1.2	Vpp	AC coupled
Differential Input Amplitude		0.15	-	1.2	Vpp	DC/AC coupled
Operating Temperature at Package Base	Ts	0	-	85	°C	
Input Interface	DC coupled(CML) or AC coupled (External blocking capacitor is required) 3)					
Output Interface	DC coupled					

1) VB2 can be open or biased by the external circuit.
For VB2 opened, VB2 is biased at about –3.95V (VS=–5.2V).
2) For VPN opened, output polarity is positive.
3) For DC coupled, input must be differential.
For AC coupled, differential or single-ended inputs are available.

ELECTRICAL CHARACTERISTICS

Output polarity : positive

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Supply Current		Iss	minimum amplitude, no offset (VC1=VC2=VS)	-	-	165	mA
Output Amplitude (Min)		Vo (Min)	50 Ω load	-	0.8	0.9	Vpp
Output Amplitude (Max)		Vo (Max)	50 Ω load	2.2	2.3	-	Vpp
Output High Voltage		V (HI) 1)	50 Ω load, no offset	-0.5	-	0	V
Output High Voltage Offset		Vo (ofs) 1)	50 Ω load	1.1	1.3	-	V
Output Low Voltage		V (LO)	50 Ω load, maximum amplitude, maximum offset	-	-	-3.3	V
X-Point Control Range	High	XPH	50 Ω load, NRZ	75	80		%
	Low	XPL		-	35	40	%
X-Point Stability		Del (Xp)	50 Ω load, 0–70°C	-10	-	10	%
Output Rise/Fall Time		Tr/Tf	50 Ω load, 20%/80%	-	25	35	ps
Input Return Loss		S11	KGL4125HW 100kHz–10 GHz	-	13	-	dB
			KGL4125GW 100kHz–10 GHz	-	10	-	dB

1) Output high voltage with offset control is defined by " V(HI) – Vo(ofs) ".

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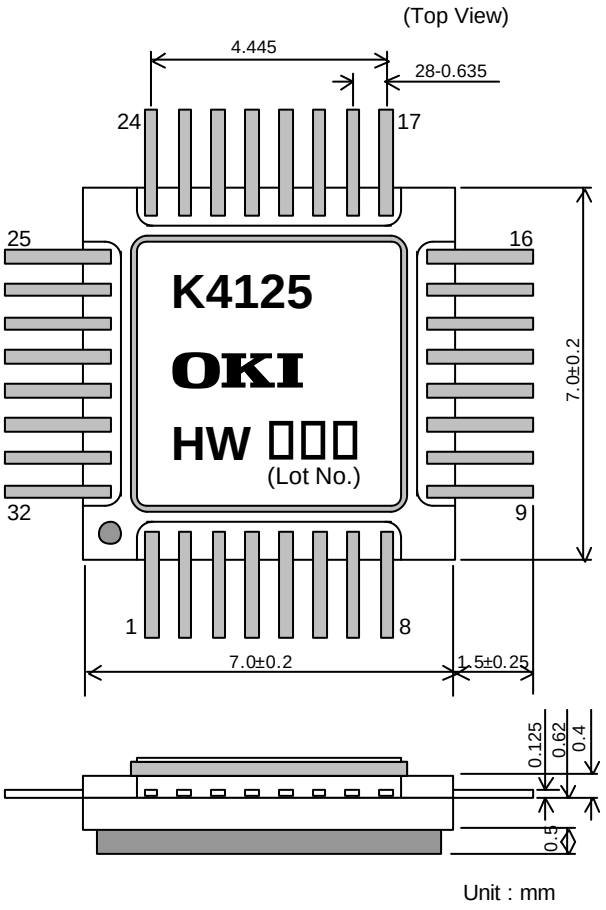
PACKAGE DIMENSIONS(KGL4125HW)



PIN CONNECTION

No.	Symbol	Note
1	GND	Ground
2	VPN	Logic Inversion Control Port
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	OUT	Signal Output Port
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	VC2	Output Bias Control Port
19	VC1	Output Amplitude Control Port
20	VS	Supply Voltage Port
21	VS	Supply Voltage Port
22	VB2	X-Point Reference Port
23	VB1	X-Point Control 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.

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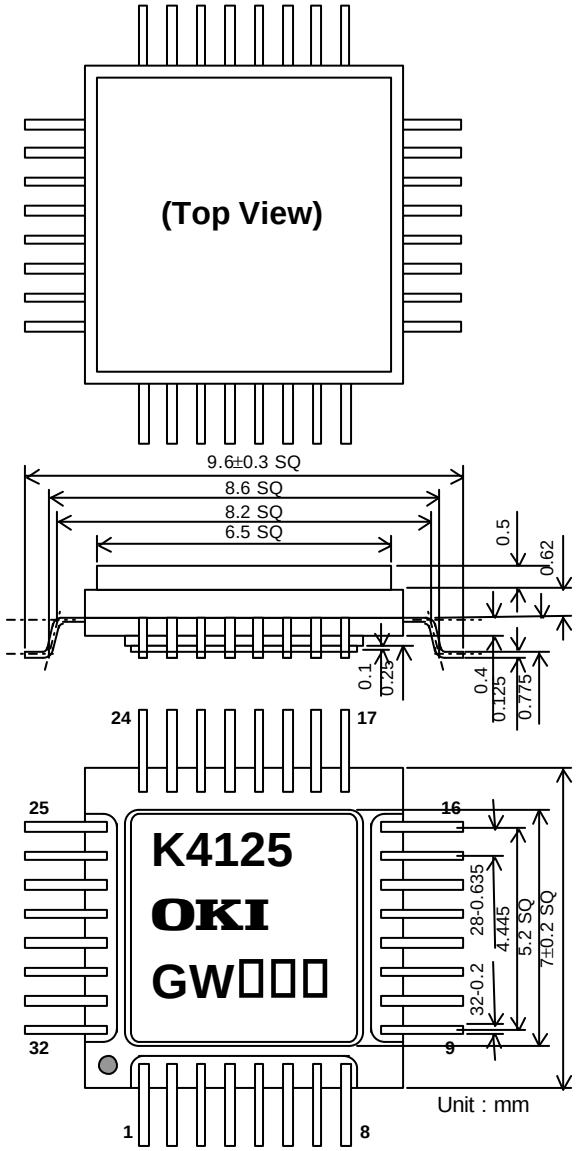

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7	GND	Ground
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9	GND	Ground
10	OUT	Signal Output Port
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	VC2	Output Bias Control Port
19	VC1	Output Amplitude Control Port
20	VS	Supply Voltage Port
21	VS	Supply Voltage Port
22	VB2	X-Point Reference Port
23	VB1	X-Point Control 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

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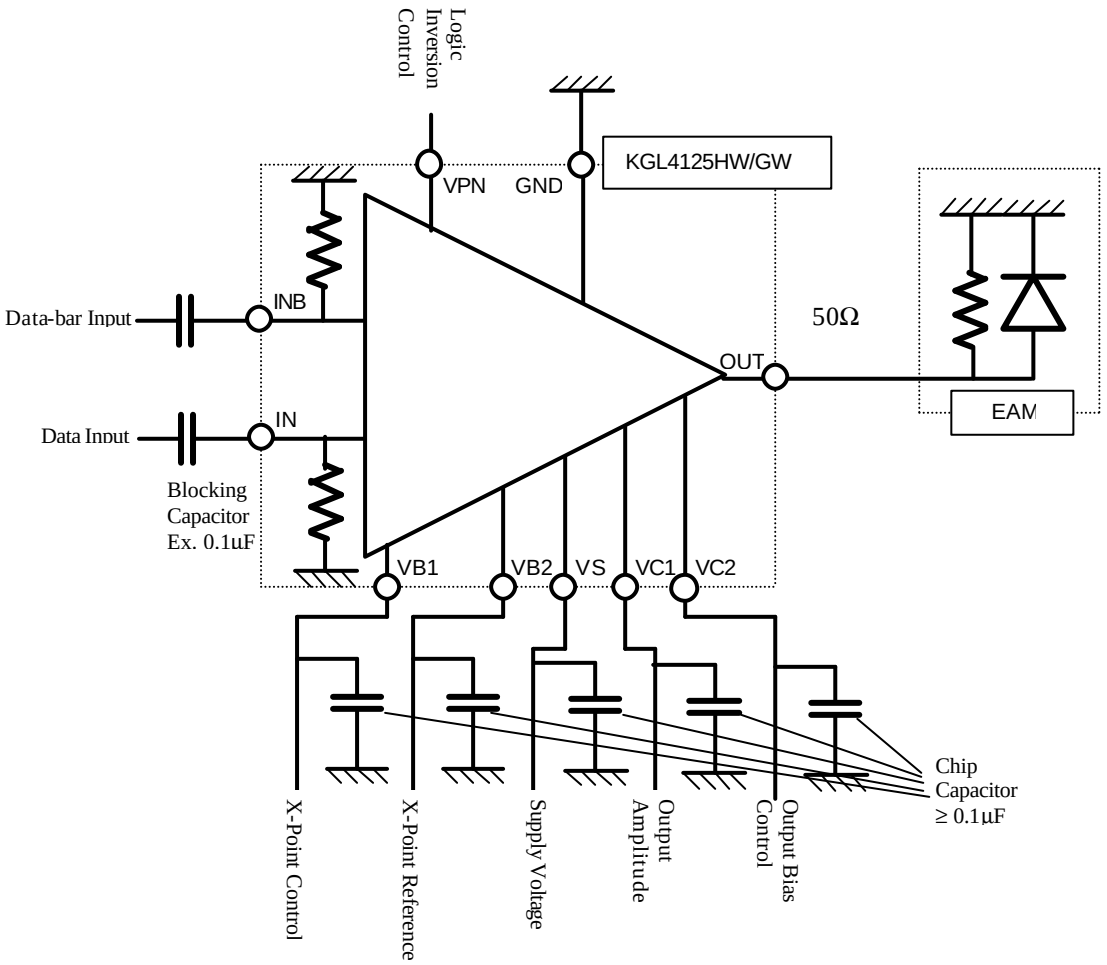
TYPICAL APPLICATION



APPLICATION NOTE

1. For stable operation;
 1-1. To prevent a dependence of "X-Point" on the supply voltage VS,
 (1) Use an external voltage source of –3.8V for "VB2", or
 (2) Control the voltage of "VB1", so that the voltage difference "VB1–VB2" is constant.

 1-2. To prevent a dependence of "Output amplitude" on the supply voltage VS,
 Control the voltage of "VC1", so that the voltage difference "VC1–VS" is constant.

 1-3. To prevent a dependence of "Output bias control voltage" on supply voltage VS,
 Control the voltage of "VC2", so that the voltage difference "VC2–VS" is constant.

2. Power-up/shut-down sequence;
 For power-up, supply control voltages (VB1, (VB2), VC1, VC2) at first, then Vs
 or supply all simultaneously.
 For shut-down, Vs at first, then control voltages or shut down all simultaneously. .
 Customer does not need to care about the sequence for the control voltages (VB1,(VB2),VC1,VC2).

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SAFETY AND HANDRING 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.

3. When designing your product, please use our product below the specified maximum ratings and within the specified operating ranges including, but not limited to, operating voltage, power dissipation, and operating temperature.

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