

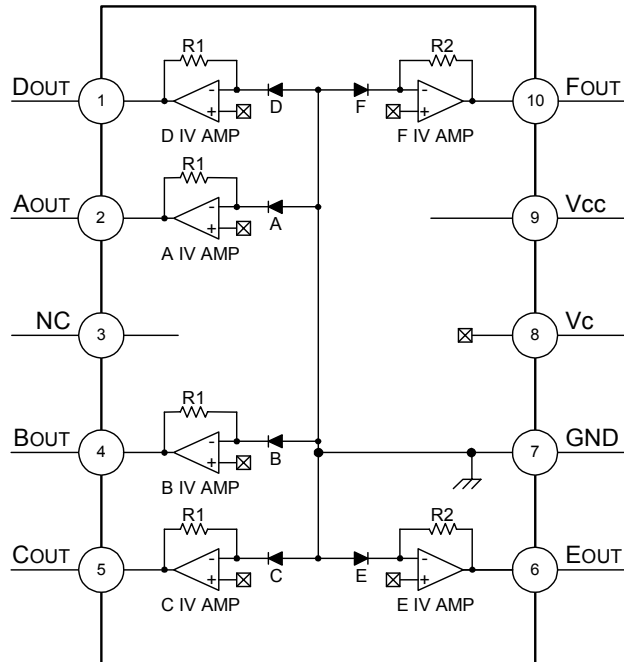


CM1212

Integrated PD+TIA

DESCRIPTION

The Capella CM1212 PDIC is a low voltage integrated photodiode and transimpedance amplifier (TIA) for use as the photodetector in CD optical pickups. The built-in TIA has low output impedance for stability. The CM1212 can also be used in quadruple-speed drives because the photodiode and TIA can operate at typical speeds of 8MHz.



R1 = 88K Ω , R2 = 182k Ω

A~F Photodiodes

FEATURES

- Low voltage operation (2.5V ~ 5.5V)
- Built-in TIA (current-to-voltage conversion circuit)
- High PD sensitivity
- Recommended Diode for CD applications is an IR laser diode ($\lambda=780\text{nm}$)
- Supports Focus Servo (Astigmatism method) and Tracking servo (Three beam method)

APPLICATIONS

- Optical pickups for VideoCD-players, CD-ROM, CD-MP3 players, and CD-Audio

Revision: 0.2

Date: 20-Feb-2002

DISCLAIMER

Capella Microsystems Inc. reserves the right to make changes in specifications or discontinue this product at any time without notice. Please contact Capella Microsystems Inc. for possible updates before starting a design.

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CM1212 Pin Descriptions

Pin No.	Symbol	I/O	Equivalent Circuit	Description
1 2 4 5	DOUT AOUT BOUT COUT	O		Output of electrical signals converted from optical signals
3	NC			Common with GND for the package construction
6 10	EOUT FOUT	O		Output of electrical signals converted from optical signals
7	GND	I		Single power supply: GND
8	Vc	I		Single power supply: center voltage input
9	Vcc	I		Positive power supply



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Absolute Maximum Ratings (Ta = 25°C)

Description	Symbol	Value	Unit
Power Supply Voltage	Vcc	7.0	V
Operating Temperature	Topr	-20 ~ +75	°C
Storage Temperature	Tstg	-40 ~ +85	°C
Allowable Power Dissipation	P _b	200	mW

Operating Conditions

Description	Signal	Condition	Min	Typ	Max	Unit
Supply Voltage (* Note 1)	Vcc	-	2.5	5.0	5.5	V
Reference Voltage (* Note 2)	Vc	Vcc/2	1.25	2.5	2.75	V

Electrical & Optical Characteristics

(Vcc = 5V, Vs = 2.5V, Ta = 25°C)

Description	Signal	Condition	Min	Typ	Max	Unit	Applicable to
Current Consumption	Icc	(*Note 3)	-	6.0	8.0	mA	Vcc
Output Offset Voltage	Voff	Offset voltage with Respect to Vc (*Note 3)	-15	0	+15	mV	AOUT ~ FOUT
Output Offset Voltage Difference	ΔV_{off}	(A+B) - (C+D) (*Note 3)	-20	0	+20	mV	AOUT ~ DOUT
		(A+D) - (B+C) (*Note 3)	-20	0	+20	mV	AOUT ~ DOUT
		(A+C) - (B+D) (*Note 3)	-20	0	+20	mV	AOUT ~ DOUT
		(E - F) (*Note 3)	-15	0	+15	mV	EOUT ~ FOUT
Output Voltage (A-D)	Vo	Po = 10 μ W, λ =780nm	290	370	450	mV	AOUT ~ DOUT
Output Voltage (E-F)	Vo	Po = 10 μ W, λ =780nm	610	770	930	mV	EOUT ~ FOUT
Max. Output Voltage (A-D)	Vomax	Po = 100 μ W, λ =780nm	4.0	4.2	-	V	AOUT ~ DOUT
Max. Output Voltage (E-F)	Vomax	Po = 100 μ W, λ =780nm	4.0	4.2	-	V	EOUT ~ FOUT
Cutoff Frequency (A-D)	fc	100KHz, -3dB	6.0	8.0	-	MHz	AOUT ~ DOUT
Cutoff Frequency (E-F)	fc	10KHz, -3dB	100	400	-	KHz	EOUT ~ FOUT

* **Note 1:** The CM1212 is based on a single power supply

* **Note 2:** Vc must be able to sink / source $\pm 500\mu A$

* **Note 3:** Dark Condition. There is no light incident on the photodiodes

* **Note 4:** The output voltage and the output offset voltage are with respect to Vc

* **Note 5:** The maximum output voltage is with respect to GND

* **Note 6:** The output voltage parameters and the frequency characteristics are guaranteed by design



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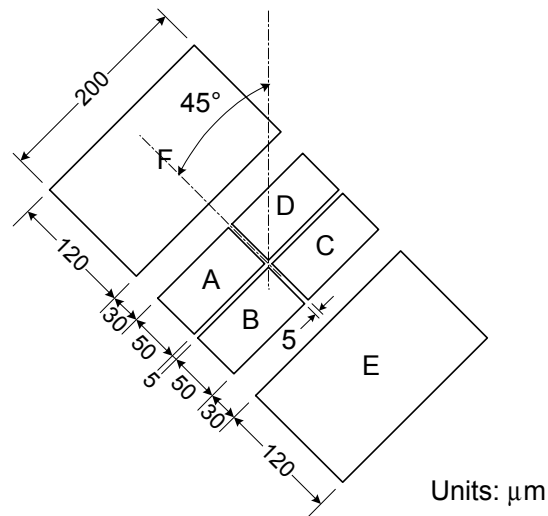
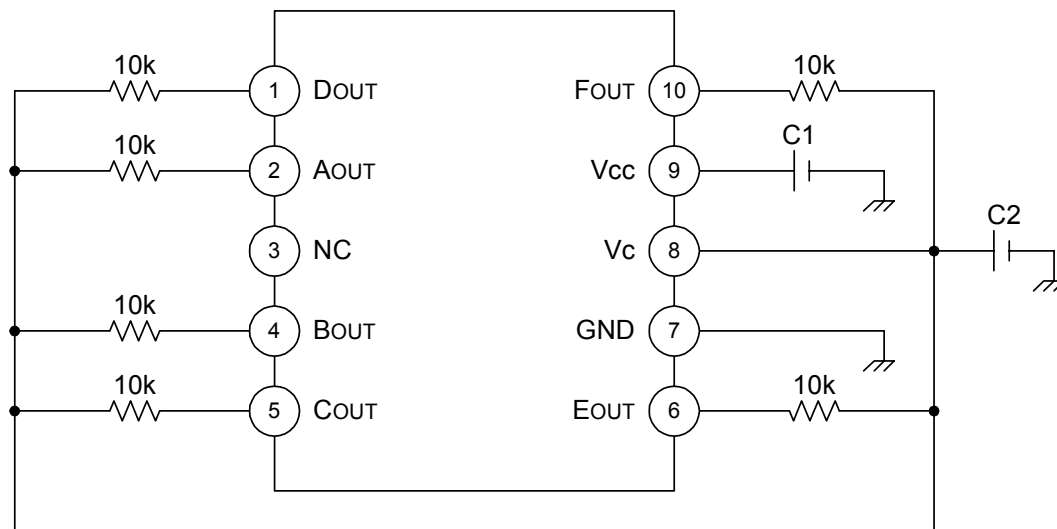


Figure 2: CM1212 Photodiode Alignment



Note: C1 and C2 are 0.1 μF capacitors

Figure 3: CM1212 Test Measurement Circuit Diagram



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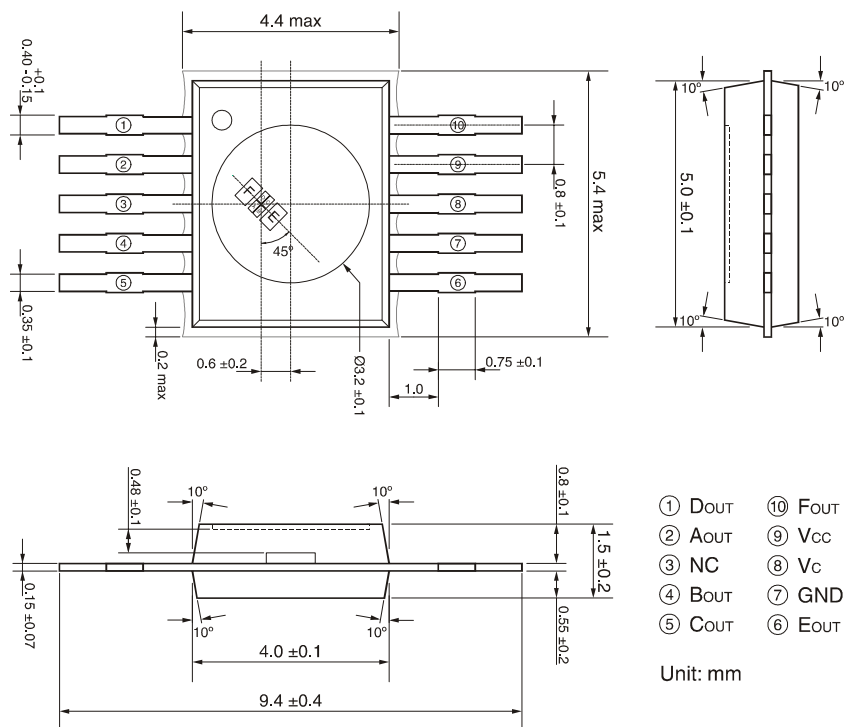


Figure 4: CM1212 CMP Package Dimensions

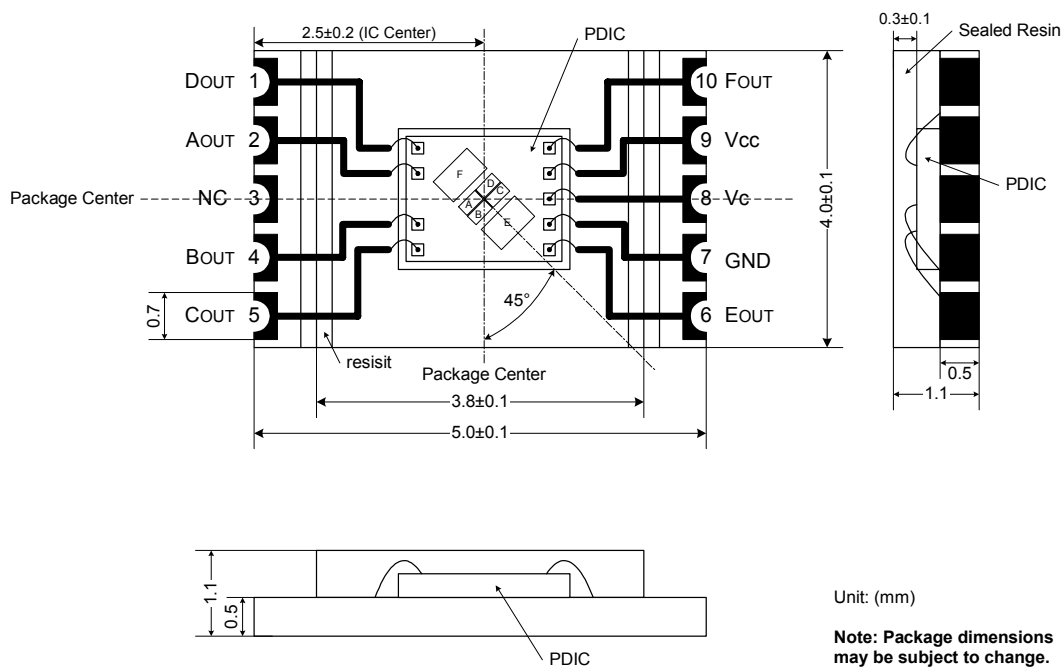


Figure 5: CM1212 COB Package Dimensions