CAPELLA MICROSYSTEMS
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CM1220

Power Monitor PDIC

DESCRIPTION

The CM1220 is a reception front power IC (PMIC) developed for CD-R and CD-RW optical pickups. The CM1220 can be used in CD-R and CD-RW applications. The CM1220 is a fully integrated trans-impedence amplifier and photodiode on the same silicon, which can offer a low impedance steady output. The package is a COB-6PIN that is suitable for compact, thin optical pickups.

The CM1220 also incorporates Capella's patented Automatic Calibration Circuitry (ACC) to reduce the offset in each of the photo-detector channel. The ACC completes the calibration process before the disk is up to speed.

FEATURES

- Designed for CD-R and CD-RW applications
- Frequency characteristics: **90MHz (typ)**
- Gain control can be changed by external resistor (100Ω~500Ω)
- Compact and thin package (COB-6PIN)
- Solder re-flowing permitted

APPLICATIONS

- CD-R and CD-RW Optical Pickups
- DVD/CD-R/CD-RW Combo Pickups

Revision: 1.3 **Date:** 21-Dec-2001

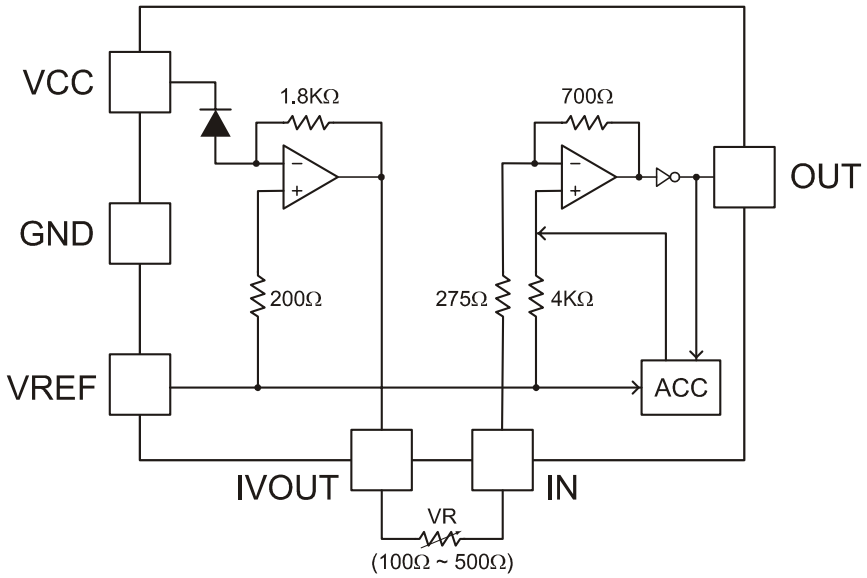

Figure 1: CM1220 Block Diagram

Absolute Maximum Ratings

Description	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	7.0	V
Power Dissipation	Pd	240	MW
Storage Temperature	Tstg	-40 ~ +85	°C

Recommended Operating Conditions

Description	Signal	Condition	Min.	Typ.	Max.	Unit
Operating Supply Voltage Range	V_{CC}	-	4.5	5.0	5.5	V
Operating Reference Voltage Range	V_{REF}	(Note 1)	2.3	2.5	2.7	V
Operating Temperature Range	Topr		0		70	°C

Note 1: VS must be able to sink/source ±500μA

Table 1: CM1220 Pin Descriptions

Pin No.	Pin Signal	I/O	Pin Description
1	V_{CC}	I	5V ± 10% DC Supply
2	V_{REF}	I	Reference voltage input pin provided by a stable external voltage source.
3	GND	I	GND (Ground)
4	I/VOUT	O	I/V Amplifier Output
5	IN	I	Latter Amplifier Input
6	OUT	O	Output

Electrical Characteristics

(Ta = 25°C, V_{CC} = 5V, V_S=2.5V, R_L=10K, C_L = 15pf, λ=780 nm, VR=200Ω)

Description	Symbol	Condition	Min.	Typ.	Max.	Unit	Applies to
Current Consumption	I_{CC}	*(Note 2)*		15		mA	V_{CC}
DC Output Voltage (Sensitivity)	GV_{OUT}	DC Gain *(Note 3)*	-1.5	-2.0	-2.6	mV/μW	OUT
Output Offset Voltage	V_{OS}	*(Note 2)*	-8	0	+8	mV	OUT
Cutoff Frequency	f_C	-3dB point for 1MHz modulated signal *(Note 3)*	70	90	-	MHz	OUT
Response Characteristic	T_r, T_f	Time (rise time, fall time) for a $1V_{p-p}$ pulse *(Note 3)*	-	5.0	-	ns	OUT
Maximum Output Voltage	V_{OUT}	Output minimum voltage with reference to GND	-	0.8	1.0	V	OUT
Automatic Calibration power on setup time	T_{SU}	During power up *(Note 3)*	-	-	150	ms	
Automatic Calibration Time	T_{ACC}	During power up *(Note 3)*	-	-	100	μs	

Note 2: Dark conditions, which implies no light incident on the photodiode.
Note 3: Guaranteed by design.

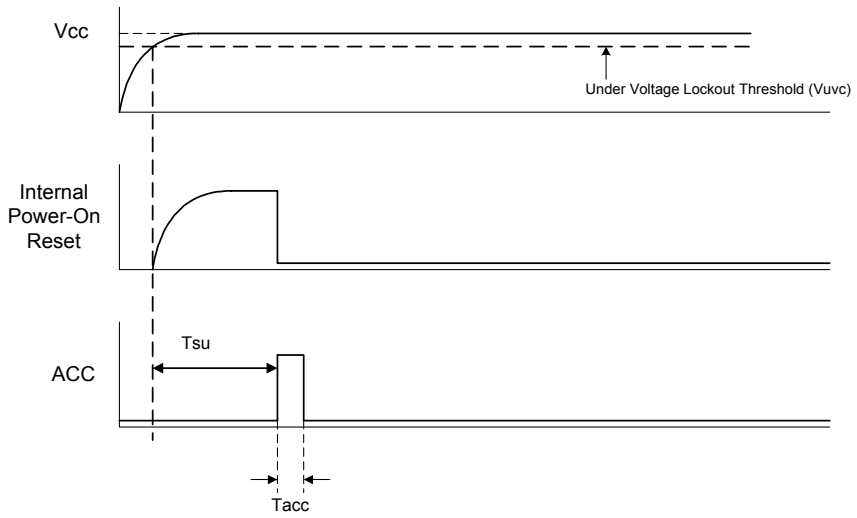

Figure 2: Automatic Calibration Timing Diagram

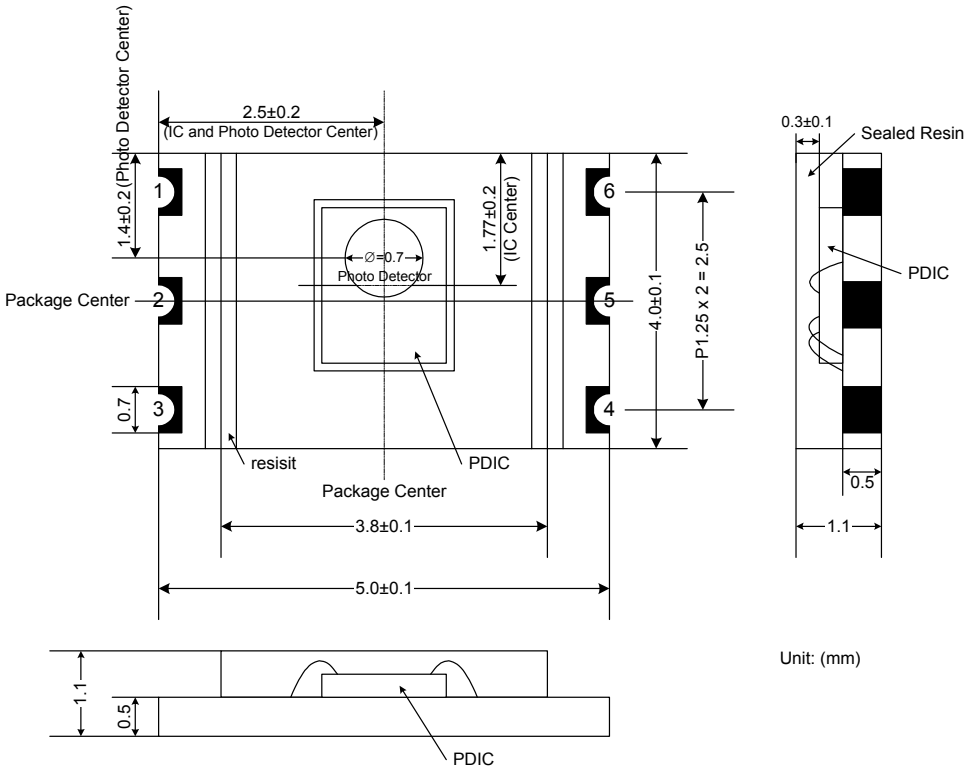

Figure 3: CM1220 COB Package Dimensions