Features

- 405 nm, 650 nm and 780 nm Wavelengths Supported
- Blu-ray/HD-DVD x5, CD-R/RW x52, DVD-R/RW x16
- Adjustment of Mode and Gain by Setting Internal Register via Serial Interface
- Paraphase Outputs
- Internal Reference Voltage Generation
- Fast Settling Time
- Low Offset Voltage
- Power-down Mode
- Pb-free Optical 12-pin Package

Applications

- Blu-ray/HD-DVD
- DVD+RW with CD-RW Capability
- DVD-RW with CD-RW Capability
- DVD-RAM with CD-RW Capability
- Recordable Optical Data Storage Devices

1. Description

The ATR1842 is a front monitor diode (FMD) which controls the laser power of the optical pickup for Blu-ray/HD-DVD, DVD and CD drives in one IC.

With the serial programming interface (SPI) it is possible to fit the laser power for Blu-ray/HD-DVD, DVD and CD. 2 bits are used to set the mode/gain level and 6 additional bits are used for gain trimming, within ±6 dB. Also setting into sleep mode can be done via the serial programmin interface (SPI).

The integrated PIN diode and the high speed amplifier with low output impedance ensures stable driver performance.

All output channels are set to tri-state during sleep mode.

Due to its small package size the ATR1842 is especially suited for applications with low height requirements like SLIM and Ultra-SLIM drives.

Front Monitor Diode for Blu-ray/HD-DVD/ DVD/CD with Serial Interface

ATR1842

Summary

Preliminary

NOTE: This is a summary document. The complete document is currently not available. For more information, please contact your local Atmel sales office.

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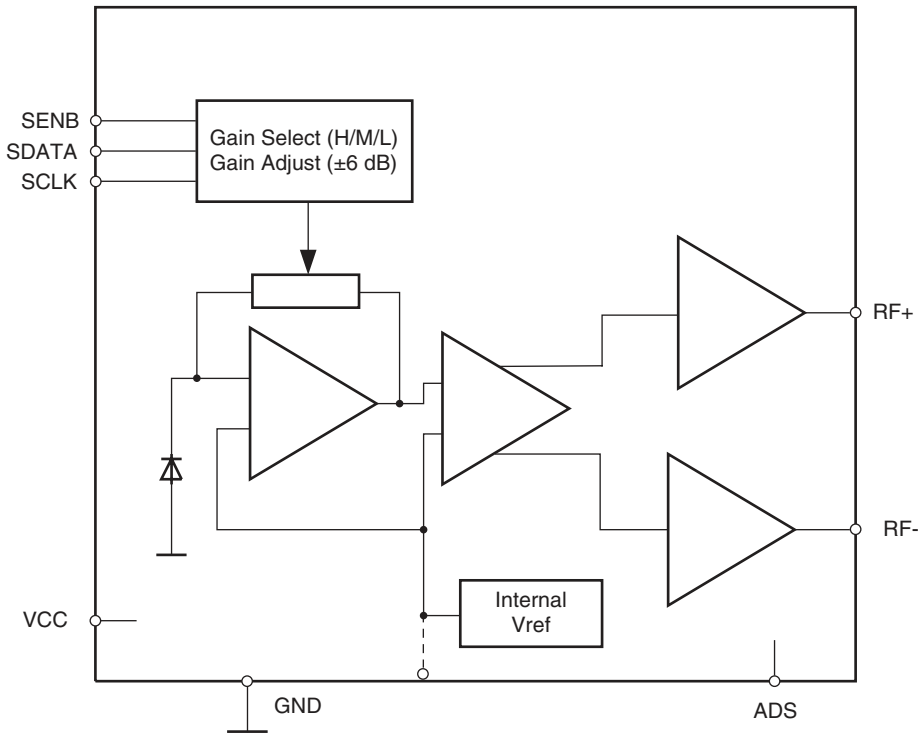
Figure 1-1. Block Diagram



2. Pin Configuration

Figure 2-1. Pinning QFN12L

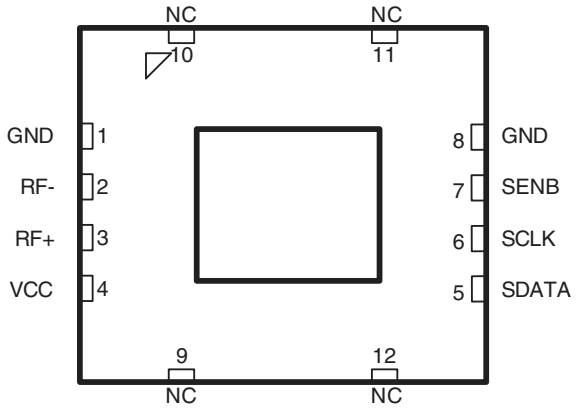


Table 2-1. Pin Description

Pin	Symbol	Type	Function
1	GND	Supply	Ground
2	RF-	Analog	Negative output
3	RF+	Analog	Positive output
4	VCC	Supply	Power supply
5	SDATA	Digital	Serial interface, data input
6	SCLK	Digital	Serial interface, clock
7	SENB	Digital	Serial interface, data enable
8	GND	Supply	Ground
9	NC		Not connected
10	NC		Not connected
11	NC		Not connected
12	NC		Not connected

3. Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameters	Symbol	Value	Unit
Supply voltage	V_{CC}	–0.5 to +6.0	V
Input voltage at any input	V_{in}	–0.5 to VCC – 0.5	V
Storage temperature	T_{stg}	–40 to +100	°C
Soldering temperature QFN_Open package	T_{sol}	260	°C

4. Recommended Operating Conditions

Parameters	Symbol	Value	Unit
Supply voltage	V_{CC}	4.5 to 5.5	V
Operating temperature range	T_{amb}	–10 to +80	°C

5. Electrical Characteristics: General

V_{CC} = 5V, T_{amb} = 25°C, λ = 405 nm/780 nm/650 nm
Output load: R_{load} = 10 kΩ, C_{load} = 20 pF

No.	Parameters	Test Conditions	Pin	Symbol	Min.	Typ.	Max.	Unit	Type*
1	**DC Specifications, Power Supply**								
1.1	Supply current			I_{CC}		28	30	mA	A
1.2	Supply current (standby mode)			I_{CC}			0.5	mA	A
1.3	V_{REF_INT}					1.65		V	A
1.4	TCV_{REF_INT}					15		µV/°C	C
1.5	Maximum output voltage			V_{out}	VCC – 0.9			V	C
1.6	Minimum output voltage			V_{out}			0.3	V	C
1.7	Power supply rejection ratio	Low-frequency (10 kHz), inclusive application/ flexboard		PSRR		–45		dB	C
1.8	Power supply rejection ratio	High-frequency (100 kHz), inclusive application/ flexboard		PSRR		–45		dB	C
2	**Output Offset Voltage**								
2.1	Output offset	$V_{REF} – V_{RF+}$, $V_{REF} – V_{RF–}$		V_{OFF1}	–20	0	+20	mV	C
2.2	Offset drift			dV_{OFF}/dT	–25		+25	µV/°C	C

*) Type means: A = 100% tested, B = 100% correlation tested, C = Characterized on samples, D = Design parameter

6. Serial Programming Interface

6.1 Data

MSB2							LSB2
m1	m2	g1	g2	g3	g4	g5	g6

6.2 Mode Setting

The first two bits select the mode/gain level.

Table 6-1. Mode Selection Register

m1	m2	Mode Select
1	1	High Gain
1	0	Middle Gain
0	1	Low Gain
0	0	Sleep

6.3 Gain Setting

The last six bits are used to finely adjust the gain by ±6 dB.

Table 6-2. Gain Selection Register

g1	g2	g3	g4	g5	g6	Gain
1	1	1	1	1	1	+6 dB
…						…
1	0	0	0	0	0	0 dB
…						…
0	0	0	0	0	0	–6 dB

7. Applications Recommendation

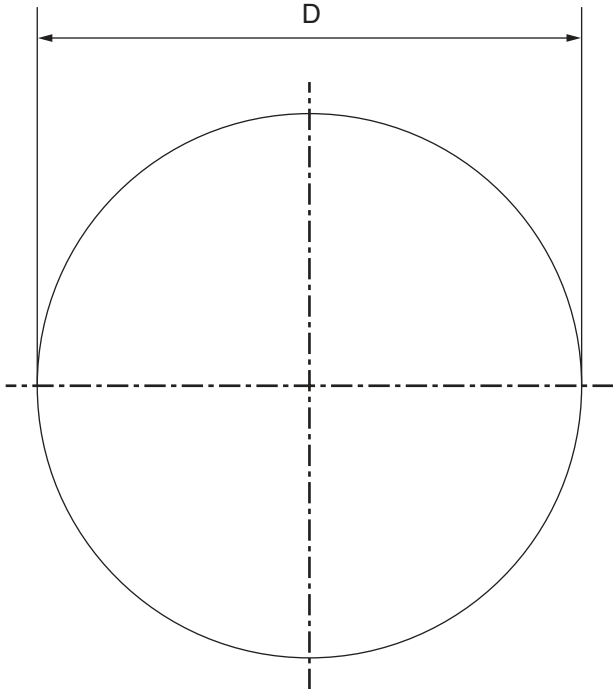
To achieve the best performance VCC needs to be blocked using a high quality capacitor (C = 100 nF) as close to IC/pin as possible.

8. Photo Diode Arrangement

Figure 8-1. Phote Diode Arrangement

	Dimensions	
D	500.0	µm

Photo diode is symmetrically centered to the center of the chip and package



9. Ordering Information

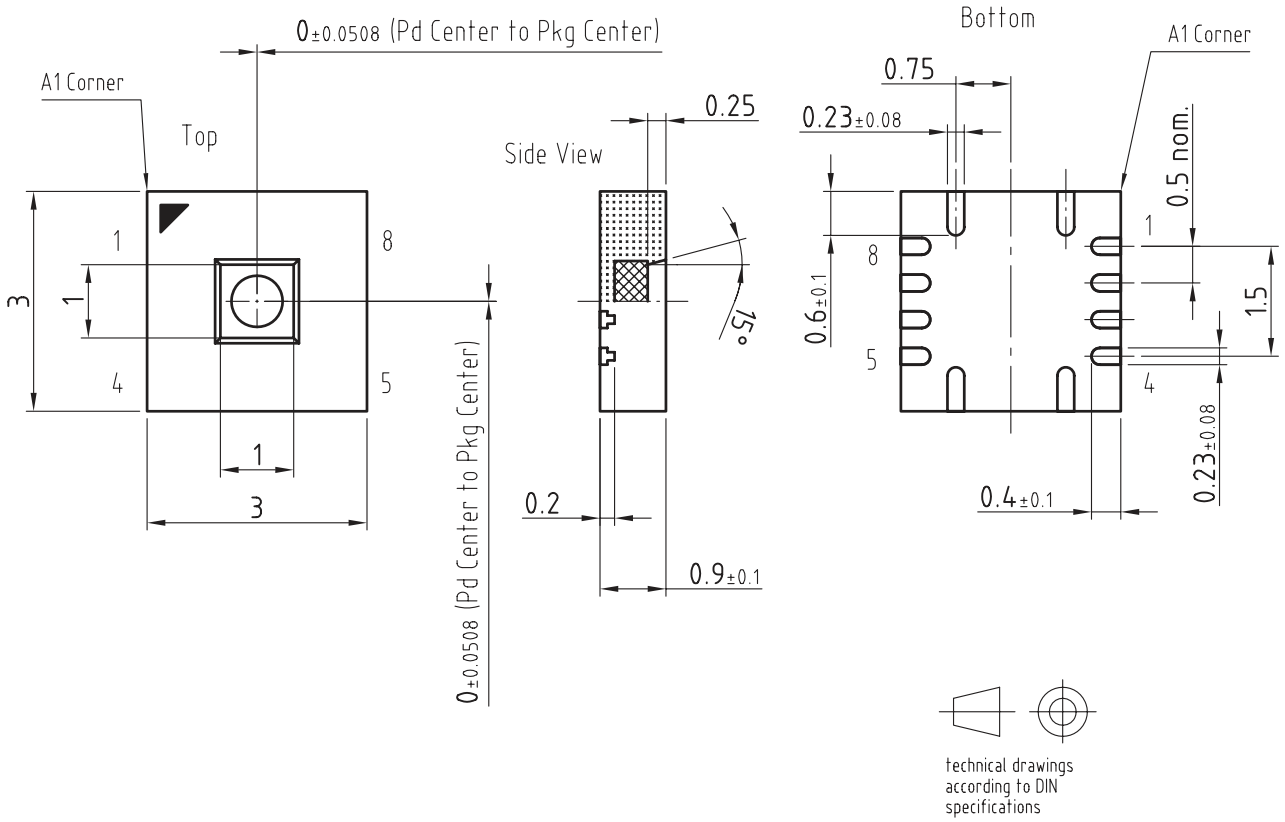
Extended Type Number	Package	Remarks
ATR1842-P1QN	QFN_OPEN_3x3_8L	Taped and reeled, Pb-free

10. Package Information

Package: QFN_OPEN_3x3_8L_W1x1

Dimensions in mm

Not indicated tolerances ±0.05



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