Features

- Three Selectable Outputs
- All Outputs Can Be Used Either for Standard (5V) or High Voltage (9V)
- Maximum Output Current at All Outputs Up to 150 mA
- On-chip Low-EMI RF Oscillator With Spread-spectrum Technology
- Control of 3 Different Swings Using 3 External Resistors
- Oscillator Frequency Range from 200 MHz to 500 MHz
- Maximum Oscillator Current Amplitude 100 mA_{pp}
- On-chip High-gain Transimpedance (IV) Amplifier
- Small Green QFN24 4 mm × 4 mm Package

Applications

- HD-DVD/DVD/CD ROM Drives
- Blu-ray/DVD/CD ROM Drives
- HD-DVD/DVD/CD Player
- Blu-ray/DVD/CD Player

1. Description

ATR0885 is a laser diode driver designed to operate three different grounded or floating laser diodes for reading CDs (λ = 780 nm), DVDs (λ = 650 nm), and HD-DVDs/Blu-ray (λ = 405 nm). An on-chip, low-EMI RF oscillator is available to reduce laser mode hopping noise. The oscillator's current amplitude can be set independently for the three selectable outputs using three resistors (RSA, RSB, RSC). The frequency setting is common to all IOUT outputs via a single resistor (RF). A logic high level on the ENOSC pin enables the spread-spectrum RF oscillator. The ATR0885 also includes a fast-settling transimpedance amplifier. It is provided to interface between the front-end monitor photo diode and the adaptive laser diode power control circuit. The gain of the transimpedance amplifier can set independently for each of the three outputs using the resistors RTIA, RTIB and RTIC.

3-output Laser Driver for HD-DVD/ Blu-ray/DVD/ CD-ROM

ATR0885

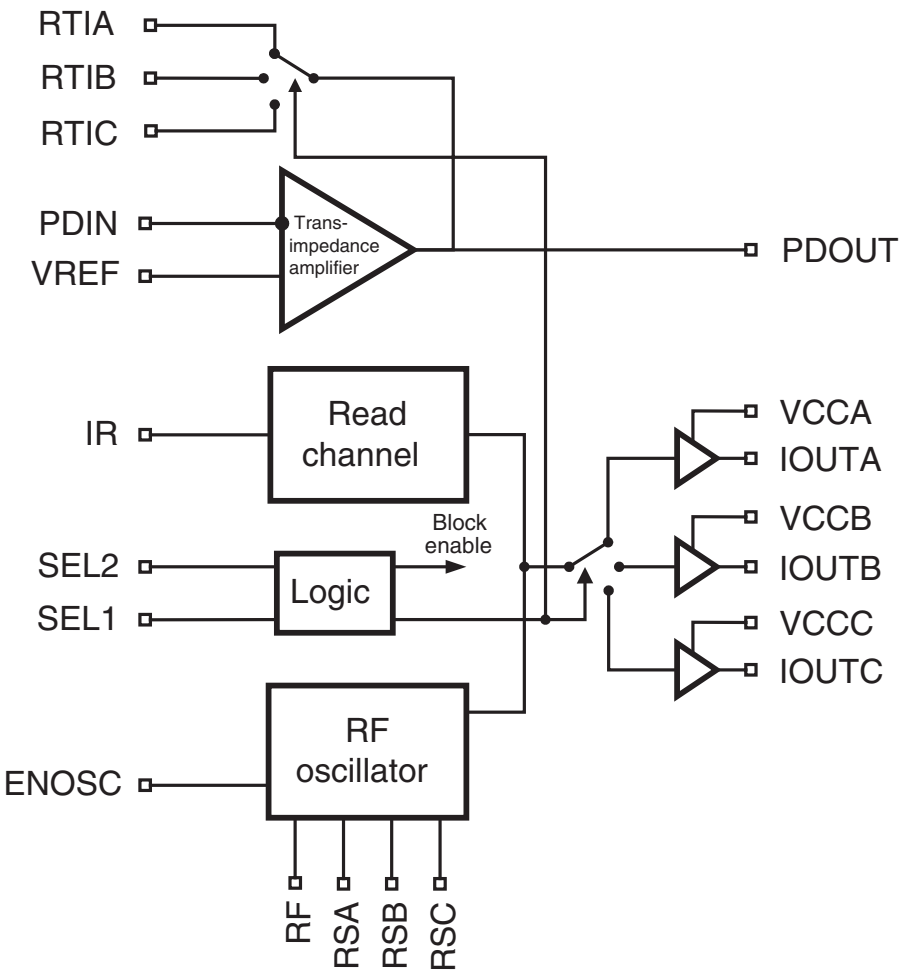
Preliminary

Summary

NOTE: This is a summary document. The complete document is available under NDA. For more information, please contact your local Atmel sales office.

4923CS–DVD–02/08

Figure 1-1. Block Diagram



2. Pin Configuration

Figure 2-1. Pinning QFN24

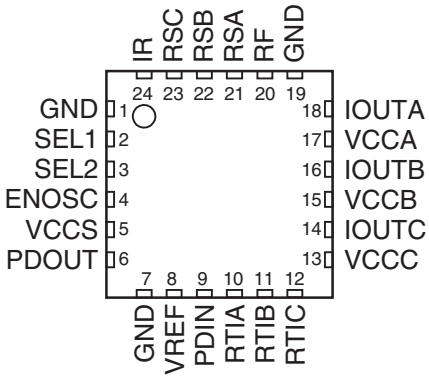


Table 2-1. Pin Description

Pin	Symbol	Type	Function
1	GND	Supply	Ground, power supply
2	SEL1	Digital	Logic pin 1 to select IOUT/ENABLE IC
3	SEL2	Digital	Logic pin 2 to select IOUT/ENABLE IC
4	ENOSC	Digital	Digital control of RF oscillator
5	VCCS	Supply	+5V power supply for internal circuit
6	PDOUT	Analog	IV amplifier output
7	GND	Supply	Ground, power supply
8	VREF	Analog	Reference voltage input
9	PDIN	Analog	Photo-diode input
10	RTIA	Analog	External resistor defining transimpedance IOUTA
11	RTIB	Analog	External resistor defining transimpedance IOUTB
12	RTIC	Analog	External resistor defining transimpedance IOUTC
13	VCCC	Supply	+5V to +9V power supply for IOUTC
14	IOUTC	Analog	Output current source C for laser diode
15	VCCB	Supply	+5V to +9V power supply for IOUTB
16	IOUTB	Analog	Output current source B for laser diode
17	VCCA	Supply	+5V to +9V power supply for IOUTA
18	IOUTA	Analog	Output current source A for laser diode
19	GND	Supply	Ground, power supply
20	RF	Analog	External resistor to GND; sets frequency of oscillator
21	RSA	Analog	External resistor to GND; sets swing of oscillator A
22	RSB	Analog	External resistor to GND; sets swing of oscillator B
23	RSC	Analog	External resistor to GND; sets swing of oscillator C
24	IR	Analog	Input current bias; ~500Ω to ground
Paddle	GND	Supply	-

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	Pin	Symbol	Value	Unit
Supply voltage		V_{VCCS}	–0.5 to +6.0	V
Supply voltage output stages (VCCA, VCCB, VCCC)		V_{VCCH}	–0.5 to +9.5	V
Input voltage		V_{PDIN}	–0.5 to V_{cc}+0.5	V
Differential voltage	8, 9	$V_{diff_8,9}$	|0.5|	V
Power dissipation		P_{max}	0.7[1] to 1[2]	W
Output voltage		V_{out}	–0.5 to V_{cch}–1	V
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	–65 to +125	°C

Notes: 1. $R_{thJA} \leq$ 115 K/W at T_{amb} = 70°C
2. $R_{thJA} \leq$ 115 K/W at T_{amb} = 25°C

Electrostatic sensitive device.
Observe precautions for handling.

4. Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient	R_{thJA}	50[1]	K/W

Note: 1. Measured with multi-layer test board (JDEC standard)

5. Recommended Operating Conditions

Parameters	Symbol	Value	Unit
Supply voltage	V_{VCCS}	4.5 to 5.5	V
High supply voltage (VCCA, VCCB, VCCC)	V_{VCCH}	V_{VCCS} to 9.0	V
Input current	I_{IR}	< 2	mA
Output voltage range	V_{PDOUT}	0.8 to (V_{VCCS} – 1.8)	V
External resistor to GND to set oscillator frequency	RF	> 3	kΩ
External resistor to GND to set oscillator swing	RS1, RS2, RS3	> 100	Ω
Operating temperature range	T_{amb}	0 to +70	°C
Transimpedance resistor	R_{TI}	1 to 50	kΩ
Total capacitance at PDIN	C_{PD}	< 15	pF
Load resistance	R_{Load}	> 5	kΩ
Load capacitance	C_{Load}	< 30	pF
Reference voltage	V_{REF}	1.6 to 3.0	V

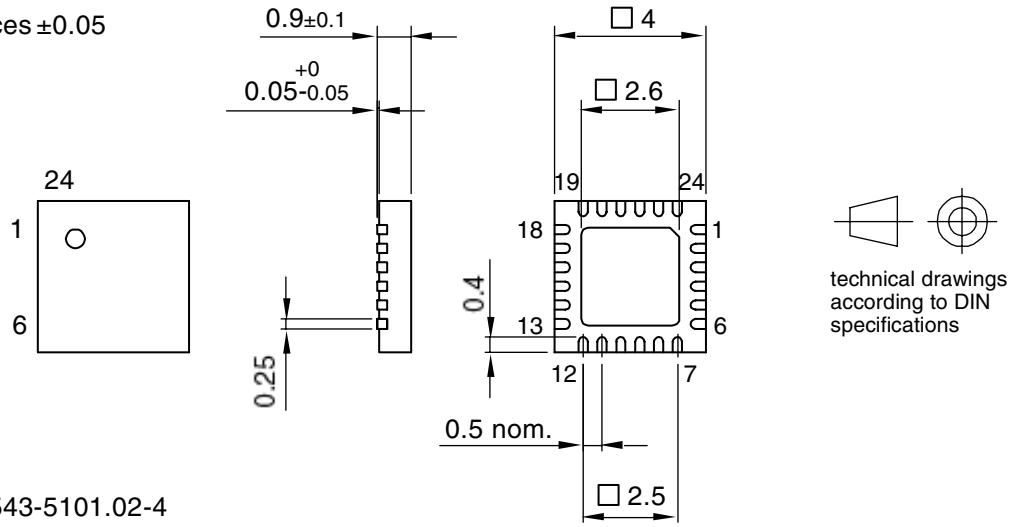
6. Ordering Information

Extended Type Number	Package	Remarks
ATR0885-PFQW	Green QFN24 (4 mm × 4 mm)	Taped and reeled

7. Package Information

Package: QFN 24 - 4 x 4
Exposed pad 2.6 x 2.6
(acc. JEDEC OUTLINE No. MO - 220)
Dimensions in mm

Not indicated tolerances ±0.05



Drawing-No.: 6.543-5101.02-4

Issue: 1; 03.06.05

8. Revision History

Please note that the following page numbers referred to in this section refer to the specific revision mentioned, not to this document.

Revision No.	History
4923CC-DVD-02/08	• Put datasheet in a new template • Pin Description table (page 3): Function of Pin 2 and 3 changed

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