

## Features

- Current-controlled Output Current Source with 4 Input Channels
- Two Selectable Outputs for Grounded Laser Diodes
- Up to 350 mA Output Current per Channel
- Total Output Current up to 500 mA
- On-chip RF Oscillator
- Oscillator Frequency Range from 200 MHz to 500 MHz
- Individual Setting of RF Oscillator Current on Each Output by External Resistors
- Maximum Oscillator Current Amplitude 100 mA
- Single 5 V Power Supply
- Common Enable/Disable Input
- TTL/CMOS Compatible Control Signals
- Small Pb-free QFN20 or SSO20 Package

## Applications

- DVD-ROM with CD-RW Capability
- DVD+RW with CD-RW Capability
- DVD-RW with CD-RW Capability
- Magneto-optical Drives and Others

## Description

ATR0809 is a laser diode driver for the operation of two different grounded laser diodes for DVD-RW/+RW (650 nm) and CD-RW (780 nm). It includes four channels for four different optical power levels. All channels (channel 1 = read channel, channel 2, 3, 4 = write channels) can be controlled by fast switches. The current pulses are enabled when a low signal is applied to the NE pins. All channels are summed together and switched to one of the two outputs IOUTA or IOUTB by the select input SELA. Each write channel (channel 2, 3 and 4) can contribute up to 350 mA to the total output current of up to 500 mA. The read channel can contribute up to 150 mA. Total gains of 100 (read channel), 250 (channel 2 and 3) and 100 (channel 4) are provided between each reference current input and the selected output. Although the reference inputs are current inputs, voltage control is also possible by using external resistors. An on-chip RF oscillator can be used to reduce laser mode hopping noise in read mode. The oscillator current amplitude and frequency can be set independently for the two selectable outputs with four different resistors. Oscillation is enabled by a high signal at the ENOSC pin. Complete shutdown of the output currents is achieved by a low signal at the ENABLE input.



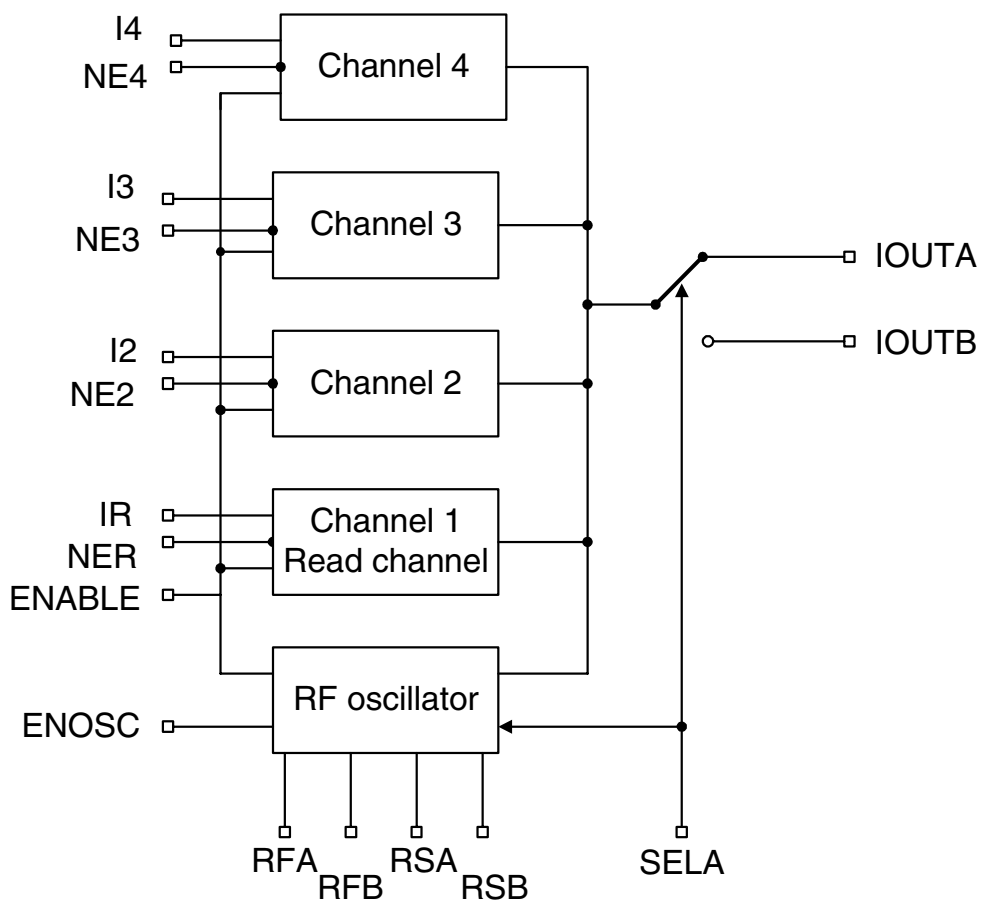
## Four Channel Laser Driver with RF Oscillator and Two Outputs

### ATR0809

### Summary

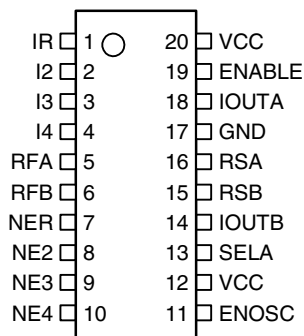


Figure 1. Block Diagram



## Pin Configuration SSO20

Figure 2. Pinning SSO20



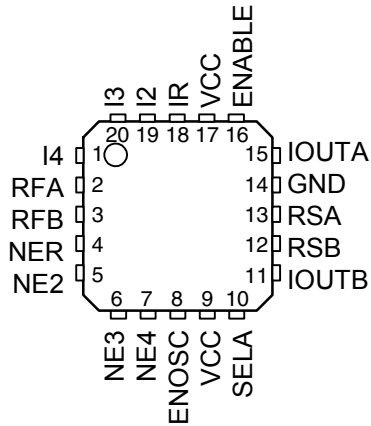
## Pin Description

Pin	Symbol	Type	Function
1	IR	Analog	Input current, bias voltage approximately GND
2	I2	Analog	Input current, bias voltage approximately GND
3	I3	Analog	Input current, bias voltage approximately GND
4	I4	Analog	Input current, bias voltage approximately GND
5	RFA	Analog	External resistor to GND sets frequency of oscillator A
6	RFB	Analog	External resistor to GND sets frequency of oscillator B
7	NER	Digital	Digital control of channel 1 (read, active low)
8	NE2	Digital	Digital control of channel 2 (active low)
9	NE3	Digital	Digital control of channel 3 (active low)
10	NE4	Digital	Digital control of channel 4 (active low)
11	ENOSC	Digital	Enables RF oscillator (active high)
12	VCC	Supply	5 V power supply
13	SELA	Digital	High: selects IOUTA, RSA, RFA Low: selects IOUTB, RSB, RFB
14	IOUTB	Analog	Output current source B for laser diode
15	RSB	Analog	External resistor to GND sets swing of oscillator B
16	RSA	Analog	External resistor to GND sets swing of oscillator A
17	GND	Supply	Ground
18	IOUTA	Analog	Output current source A for laser diode
19	ENABLE	Digital	Enables output current (active high)
20	VCC	Supply	5 V power supply



## Pin Configuration QFN20

Figure 3. Pinning QFN20



## Pin Description

Pin	Symbol	Type	Function
1	I4	Analog	Input current, bias voltage approximately GND
2	RFA	Analog	External resistor to GND sets frequency of oscillator A
3	RFB	Analog	External resistor to GND sets frequency of oscillator B
4	NER	Digital	Digital control of channel 1 (read, active low)
5	NE2	Digital	Digital control of channel 2 (active low)
6	NE3	Digital	Digital control of channel 3 (active low)
7	NE4	Digital	Digital control of channel 4 (active low)
8	ENOSC	Digital	Enables RF oscillator (active high)
9	VCC	Supply	5 V power supply
10	SELA	Digital	High: selects IOUTA, RSA, RFA Low: selects IOUTB, RSB, RFB
11	IOUTB	Analog	Output current source B for laser diode
12	RSB	Analog	External resistor to GND sets swing of oscillator B
13	RSA	Analog	External resistor to GND sets swing of oscillator A
14	GND	Supply	Ground
15	IOUTA	Analog	Output current source A for laser diode
16	ENABLE	Digital	Enables output current (active high)
17	VCC	Supply	5 V power supply
18	IR	Analog	Input current, bias voltage approximately GND
19	I2	Analog	Input current, bias voltage approximately GND
20	I3	Analog	Input current, bias voltage approximately GND

## 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 $V_{CC} + 0.5$	V
Power dissipation	$P_{max}$	0.7 <sup>(1)</sup> to 1 <sup>(2)</sup>	W
Output voltage	$V_{out}$	-0.5 to $V_{CC} - 1$	V
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{stg}$	-65 to +125	°C

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

## Thermal Resistance

Parameters	Symbol	Value	Unit
Junction case	$R_{thJC}$	27	K/W
Junction ambient	$R_{thJA}$	125 <sup>(1)</sup>	K/W

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

## Recommended Operating Conditions

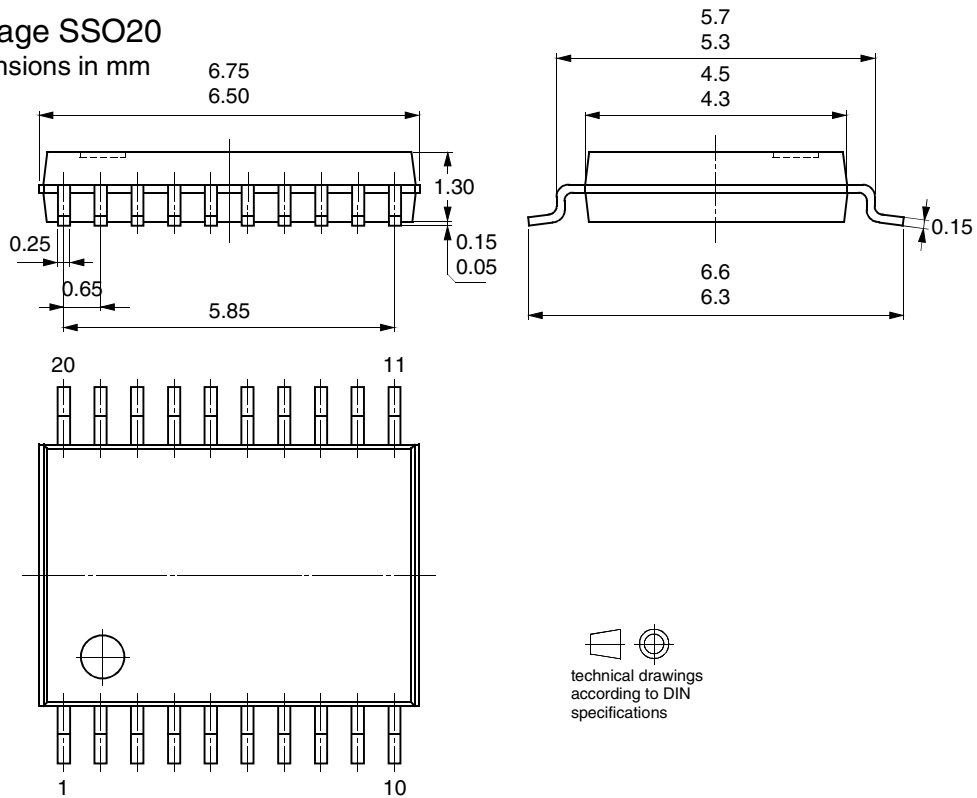
Parameters	Symbol	Value	Unit
Supply voltage	$V_{CC}$	4.5 to 5.5	V
Input current	$I_{I1}, I_{I2}, I_{I3}, I_{I4}$	< 2.5	mA
External resistor to GND to set oscillator frequency	RFA, RFB	> 3	k $\Omega$
External resistor to GND to set oscillator swing	RSA, RSB	> 1	k $\Omega$
Operating temperature range	$T_{amb}$	0 to +70	°C

## Ordering Information

Extended Type Number	Package	Remarks
ATR0809-TKQG	PB-free SSO20	Taped and reeled
ATR0809-PRQG	PB-free QFN20 (4 mm x 4 mm)	Taped and reeled

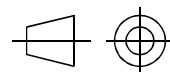
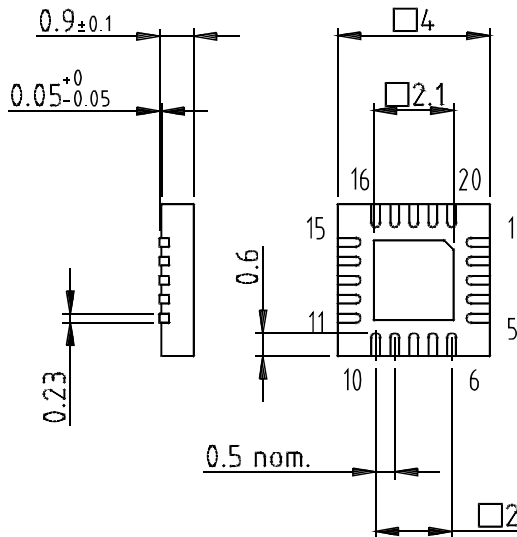
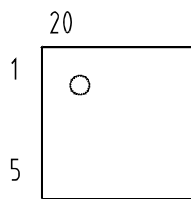
## Package Information

Package SSO20  
Dimensions in mm



Package: QFN 20 - 4x4  
 Exposed pad 2.1x2.1  
 (acc. JEDEC OUTLINE No. MO-220)  
 Dimensions in mm

Not indicated tolerances  $\pm 0.05$



technical drawings  
 according to DIN  
 specifications

Drawing-No.: 6.543-5100.01-4  
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## Atmel Corporation

2325 Orchard Parkway  
San Jose, CA 95131, USA  
Tel: 1(408) 441-0311  
Fax: 1(408) 487-2600

## Regional Headquarters

### Europe

Atmel Sarl  
Route des Arsenalux 41  
Case Postale 80  
CH-1705 Fribourg  
Switzerland  
Tel: (41) 26-426-5555  
Fax: (41) 26-426-5500

### Asia

Room 1219  
Chinachem Golden Plaza  
77 Mody Road Tsimshatsui  
East Kowloon  
Hong Kong  
Tel: (852) 2721-9778  
Fax: (852) 2722-1369

### Japan

9F, Tonetsu Shinkawa Bldg.  
1-24-8 Shinkawa  
Chuo-ku, Tokyo 104-0033  
Japan  
Tel: (81) 3-3523-3551  
Fax: (81) 3-3523-7581

## Atmel Operations

### Memory

2325 Orchard Parkway  
San Jose, CA 95131, USA  
Tel: 1(408) 441-0311  
Fax: 1(408) 436-4314

### Microcontrollers

2325 Orchard Parkway  
San Jose, CA 95131, USA  
Tel: 1(408) 441-0311  
Fax: 1(408) 436-4314

La Chantrerie  
BP 70602  
44306 Nantes Cedex 3, France  
Tel: (33) 2-40-18-18-18  
Fax: (33) 2-40-18-19-60

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Zone Industrielle  
13106 Rousset Cedex, France  
Tel: (33) 4-42-53-60-00  
Fax: (33) 4-42-53-60-01

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Colorado Springs, CO 80906, USA  
Tel: 1(719) 576-3300  
Fax: 1(719) 540-1759

Scottish Enterprise Technology Park  
Maxwell Building  
East Kilbride G75 0QR, Scotland  
Tel: (44) 1355-803-000  
Fax: (44) 1355-242-743

### RF/Automotive

Theresienstrasse 2  
Postfach 3535  
74025 Heilbronn, Germany  
Tel: (49) 71-31-67-0  
Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd.  
Colorado Springs, CO 80906, USA  
Tel: 1(719) 576-3300  
Fax: 1(719) 540-1759

### Biometrics/Imaging/Hi-Rel MPU/ High Speed Converters/RF Datacom

Avenue de Rochepleine  
BP 123  
38521 Saint-Egreve Cedex, France  
Tel: (33) 4-76-58-30-00  
Fax: (33) 4-76-58-34-80

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