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**

Four Channel Laser Driver with RF Oscillator and Two Outputs

ATR0809

Summary

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.

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Figure 1. Block Diagram

4792BS–DVD–05/04
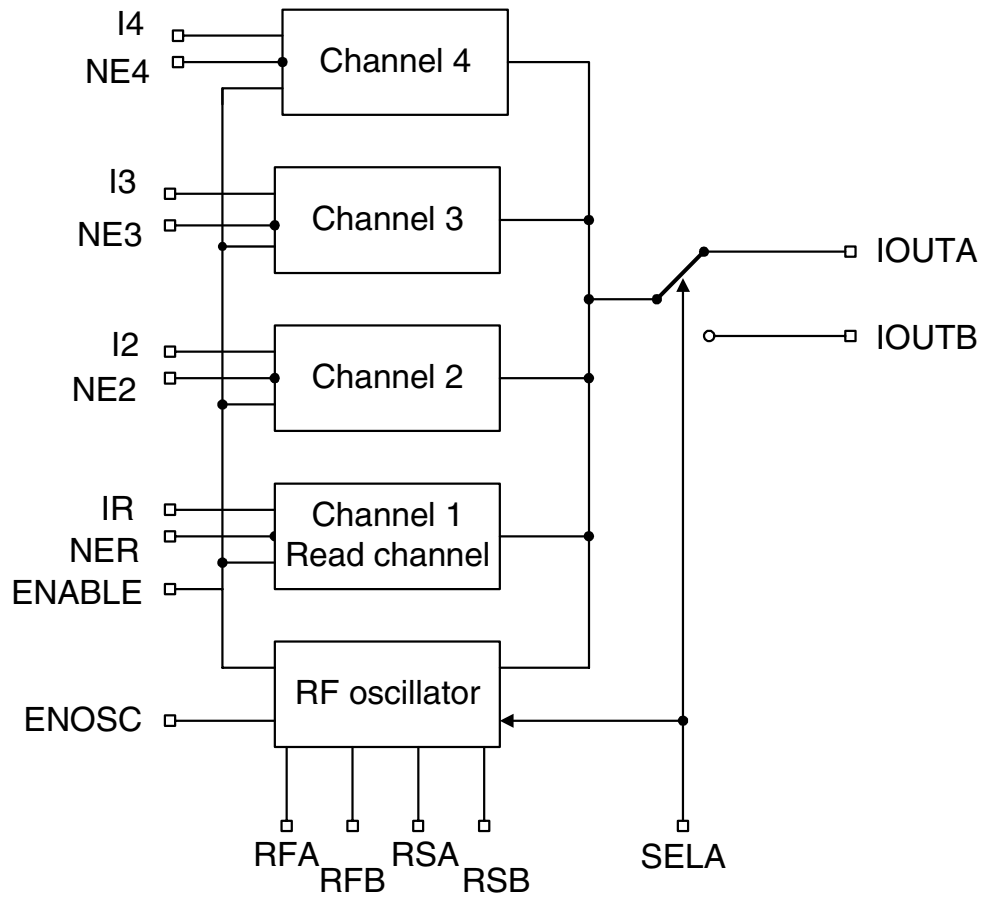
Pin Configuration SSO20

Figure 2. Pinning SSO20


```
IR   1 ○      20  VCC
I2   2        19  ENABLE
I3   3        18  IOUTA
I4   4        17  GND
RFA  5        16  RSA
RFB  6        15  RSB
NER  7        14  IOUTB
NE2  8        13  SELA
NE3  9        12  VCC
NE4  10       11  ENOSC
```
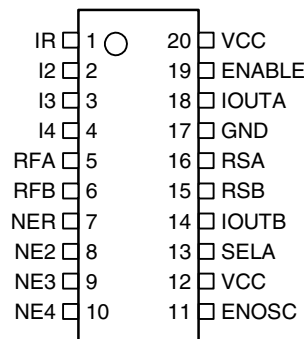
Pin Description

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
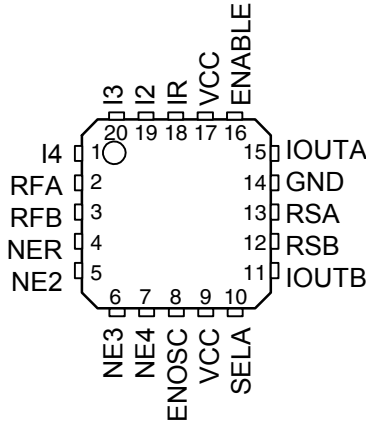
Pin Description

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

ATR0809

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

Thermal Resistance

Parameters	Symbol	Value	Unit
Junction case	R_{thJC}	27	K/W
Junction ambient	R_{thJA}	125[1]	K/W

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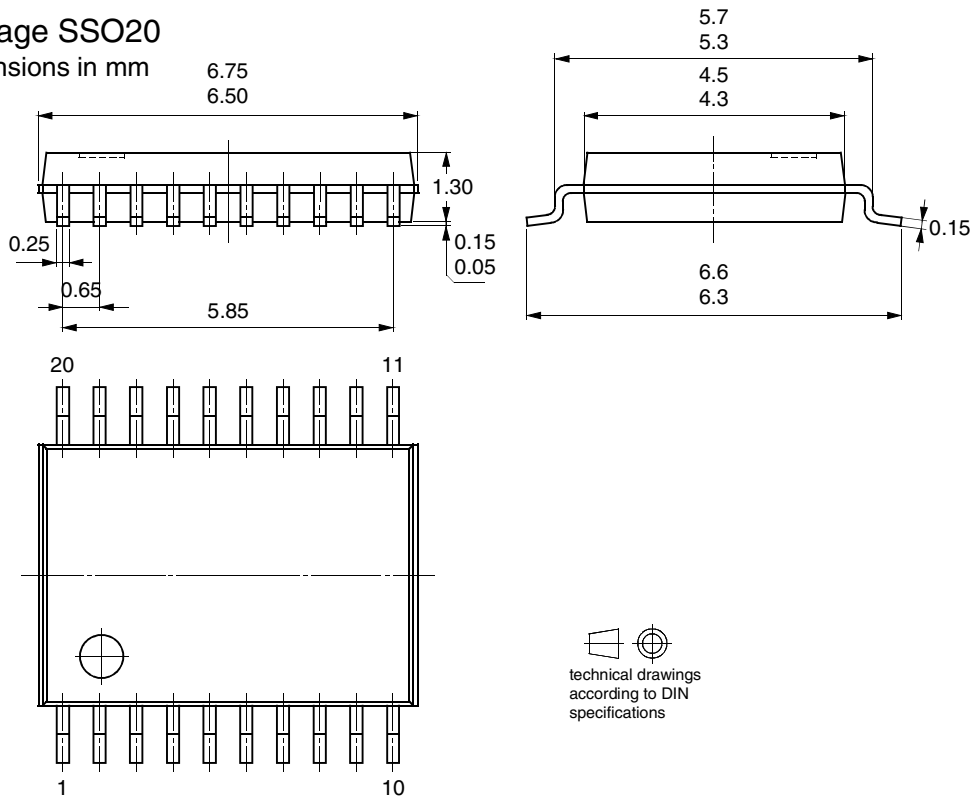
Recommended Operating Conditions

Parameters	Symbol	Value	Unit
Supply voltage	V_{CC}	4.5 to 5.5	V
Input current	I_{IR}, I_{I2}, I_{I3}, I_{I4}	< 2.5	mA
External resistor to GND to set oscillator frequency	RFA, RFB	> 3	kΩ
External resistor to GND to set oscillator swing	RSA, RSB	> 1	kΩ
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)	Tuped and reeled

Package Information

Package SSO20
Dimensions in mm

6.75
6.50

1.30

0.25

0.15
0.05

0.65

5.85

5.7
5.3

4.5
4.3

0.15

6.6
6.3

20   11

1   10

technical drawings
according to DIN
specifications

4792BS–DVD–05/04

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

Not indicated tolerances ±0.05

0.9 ± 0.1

$0.05^{+0}_{-0.05}$

$\square 4$

$\square 2.1$

20

1

5

16   20

15   1

0.6

11   5

10   6

0.23

0.5 nom.

$\square 2$

technical drawings
according to DIN
specifications
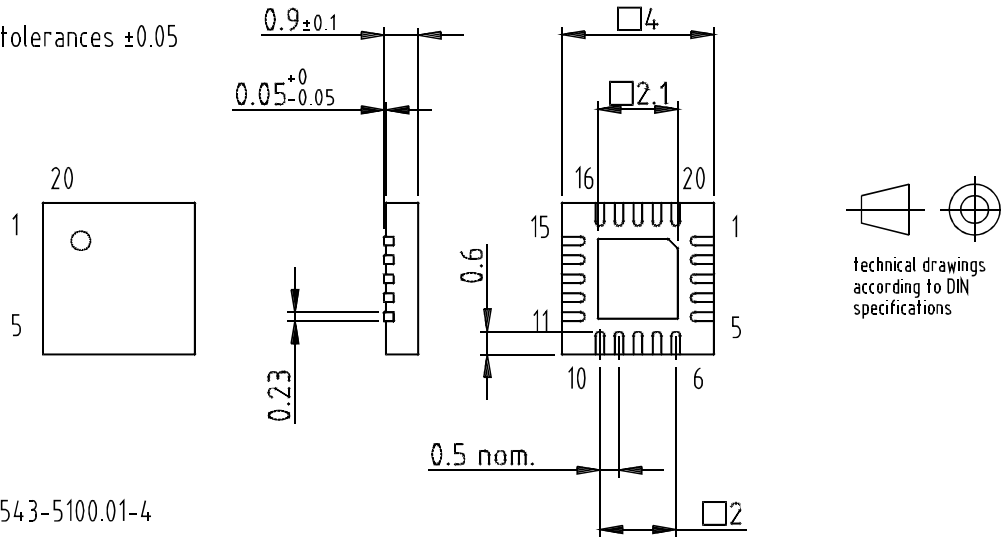
Drawing-No.: 6.543-5100.01-4
Issue: 1; 04.06.03

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