## Features

- **Current-controlled Output Current Source with 3 Input Channels**
- **Two Selectable Outputs for Grounded Laser Diodes**
- **Output Current per Write Channel: 350 mA**
- **Total Output Current: 500 mA**
- **500 Ω Channel Input Resistance**
- **On-chip RF Oscillator**
- **Control of Two Different Swings by Use of Two External Resistors**
- **Oscillator Frequency Range from 200 MHz to 500 MHz**
- **Oscillator Swing: 100 mA**
- **Single 5 V Power Supply**
- **Common Enable/Disable Input**
- **TTL/CMOS Control Signals**
- **Small Pb-free QFN16 (4 mm x 4 mm) or SSO16 Package**

## Applications

- **DVD-ROM with CD-RW Capability**
- **DVD+RW with CD-RW Capability**
- **DVD-RW with CD-RW Capability**
- **Writable Optical Drives**

## Description

The ATR0807 is a laser diode driver for the operation of two different grounded laser diodes for DVD-RW/DVD+RW (650 nm) and CD-RW (780 nm). It includes three channels for three different optical power levels which are controlled by a separate IC. The read channel generates a continuous output level, whereas the channels 2 and 3 are provided as write channels with very fast switching speeds. Write 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 IOUTA or IOUTB outputs by the select input SELA. Each write channel (channel 2 and 3) can contribute up to 350 mA to the total output current, up to 500 mA. The read channel can contribute up to 150 mA. Total gains of 100 (read channel), 250 (channel 2 and 3) are provided between each reference current input and the selected output. Although, the reference inputs are current inputs, voltage control is possible by using external resistors. An on-chip RF oscillator is provided to reduce laser mode hopping noise during read mode. Swing can be set independently for the two selectable outputs with two different resistors. Oscillation is enabled by a high signal at the ENOSC pin. Complete output current and oscillator switch-off is achieved by a low signal at the ENABLE input.

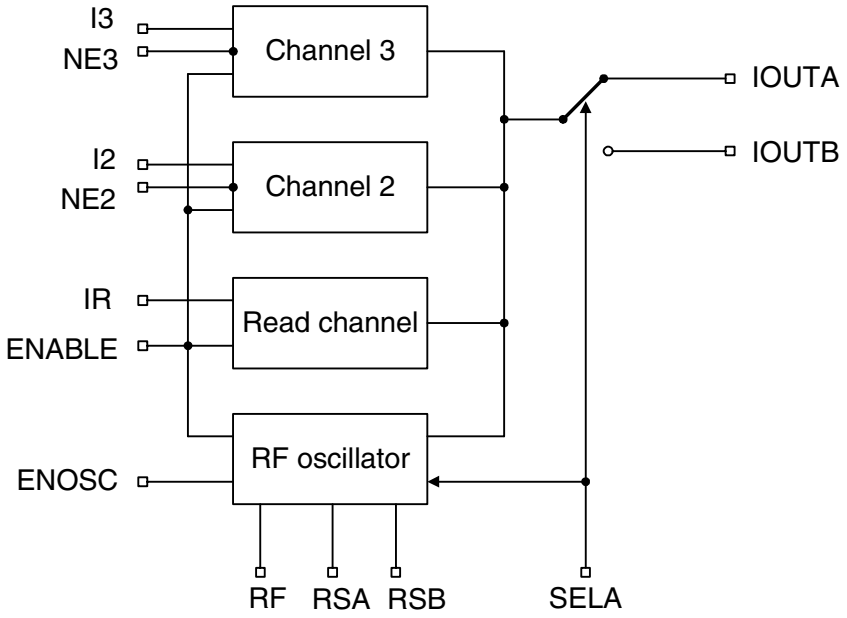
# Three Channel Laser Driver with RF Oscillator and Two Outputs

# ATR0807

# (Summary)

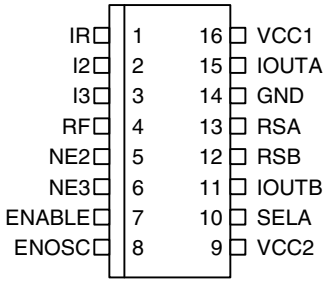
Rev. 4723CS–DVD–07/03

**Figure 1.** Block Diagram



## Pin Configuration SSO16

**Figure 2.** Pinning SSO16

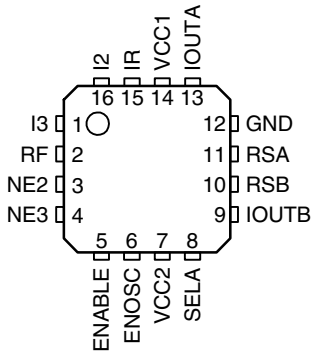



## Pin Description

| 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 | RF | Analog | External resistor to GND sets frequency of oscillator |
| 5 | NE2 | Digital | Digital control of channel 2 (low active) |
| 6 | NE3 | Digital | Digital control of channel 3 (low active) |
| 7 | ENABLE | Digital | Enables output current (high active) |
| 8 | ENOSC | Digital | Enables RF oscillator (high active) |
| 9 | VCC2 | Supply | +5 V power supply for IOUT |
| 10 | SELA | Digital | High: selects IOUTA, RSA<br>Low: selects IOUTB, RSB |
| 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 | VCC1 | Supply | +5 V power supply for IOUT and circuit |

## Pin Configuration QFN16

**Figure 3.** Pinning QFN16




## Pin Description

| Pin | Symbol | Type | Function |
|---|---|---|---|
| 1 | I3 | Analog | Input current, bias voltage approximately GND |
| 2 | RF | Analog | External resistor to GND sets frequency of oscillator |
| 3 | NE2 | Digital | Digital control of channel 2 (low active) |
| 4 | NE3 | Digital | Digital control of channel 3 (low active) |
| 5 | ENABLE | Digital | Enables output current (high active) |
| 6 | ENOSC | Digital | Enables RF oscillator (high active) |
| 7 | VCC2 | Supply | +5 V power supply for IOUT |
| 8 | SELA | Digital | High: selects IOUTA, RSA<br>Low: selects IOUTB, RSB |
| 9 | IOUTB | Analog | Output current source B for laser diode |
| 10 | RSB | Analog | External resistor to GND sets swing of oscillator B |
| 11 | RSA | Analog | External resistor to GND sets swing of oscillator A |
| 12 | GND | Supply | Ground |
| 13 | IOUTA | Analog | Output current source A for laser diode |
| 14 | VCC1 | Supply | +5 V power supply for circuit |
| 15 | IR | Analog | Input current, bias voltage approximately GND |
| 16 | I2 | Analog | Input current, bias voltage approximately GND |
| Paddle | GND | Supply | Ground |

## Absolute Maximum Ratings

| 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 ambient | $R_{thJA}$ | 115 (1) | K/W |

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

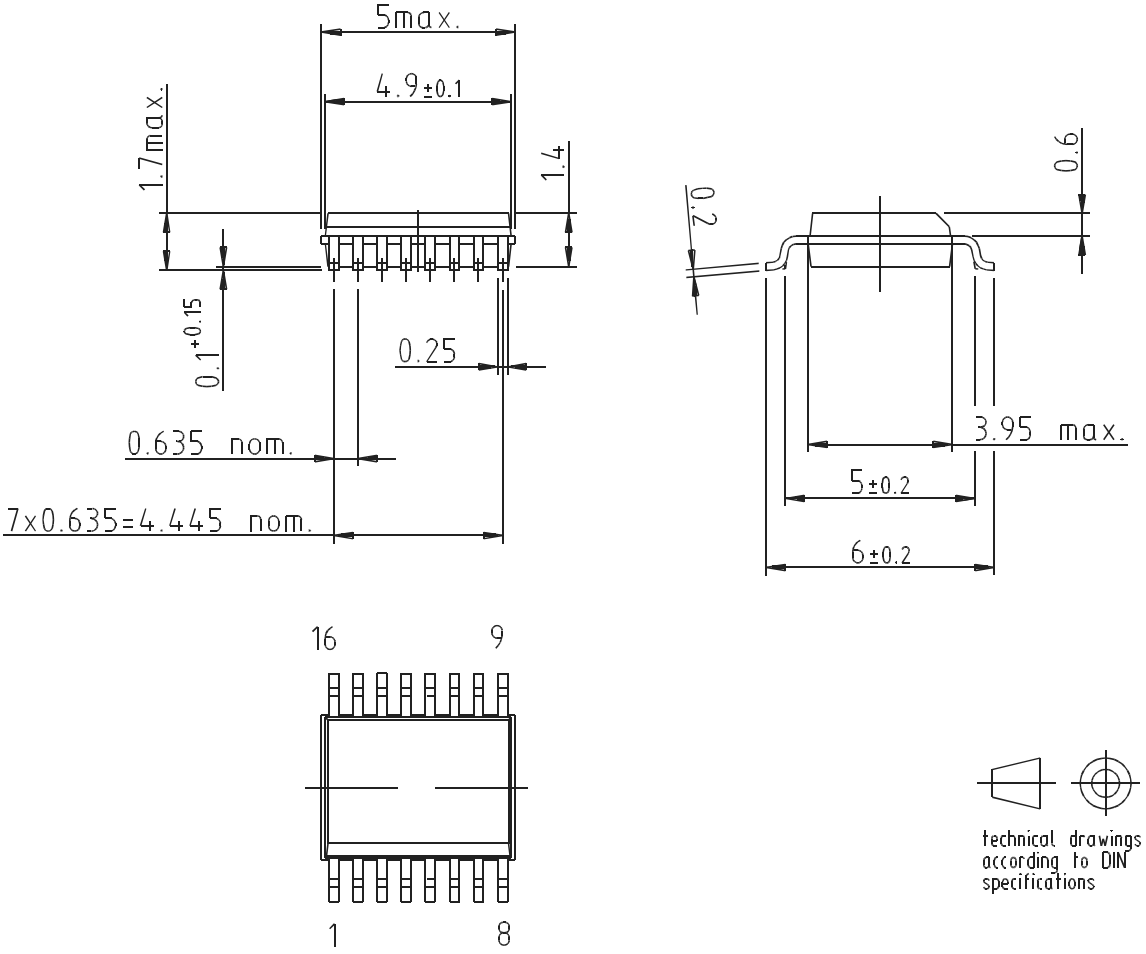
## Recommended Operating Conditions

| Parameters | Symbol | Value | Unit |
|---|---|---|---|
| Supply voltage | $V_{CC}$ | 4.5 to 5.5 | V |
| Input current | $I_{IR}$, $I_{I2}$, $I_{I3}$ | $I_{IR} < 2.0$, $I_{I2} = I_{I3} < 1.5$ | mA |
| External resistor to GND to set oscillator frequency | RF | > 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 |
|---|---|---|
| ATR0807-TCQ | Pb-free SSO16 | Taped and reeled |
| ATR0807-PEQ | Pb-free QFN16 (4 mm x 4 mm) | Taped and reeled |

## Package SSO16



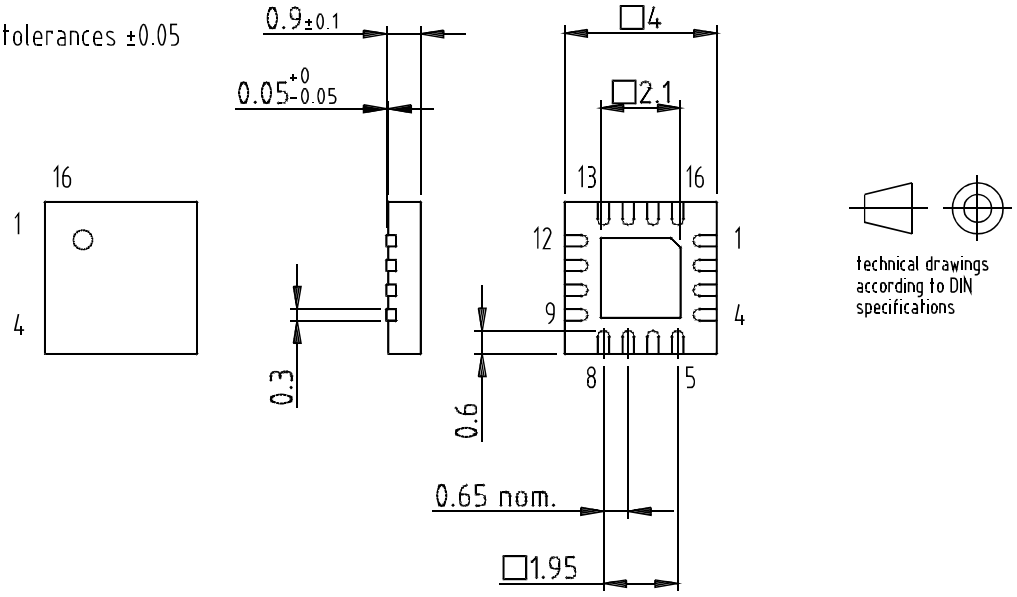

Drawing refers to following types: SSO16
Package acc. JEDEC MO 137 AB

Drawing-No.: 6.543-5060.01-4
Issue: 2; 05.02.99

## Package QFN16 (4 mm x 4 mm)

Package: QFN 16 - 4x4
Exposed pad 2.1x2.1
(acc. JEDEC OUTLINE No. MO-220)
Dimensions in mm

Not indicated tolerances ±0.05




Drawing-No.: 6.543-5090.01-4
Issue: 2; 24.01.03

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