

Features

- Current-controlled Output Current Source, 3 Input Channels
- Two Selectable Outputs for Grounded Laser Diodes
- Output Current per Channel up to 250 mA
- Total Output Current to 300 mA (Minimum)
- Rise Time 1.0 ns, Fall Time 1.1 ns
- On-chip RF Oscillator
- Control of 2 Different Swings by Use of 2 external Resistors
- Oscillator Frequency Range from 200 MHz to 600 MHz
- Oscillator Swing to 100 mA
- Single 5 V Power Supply
- Common Enable/Disable Input
- TTL/CMOS Control Signals
- Small PB-free QFN16 (4 mm × 4 mm) or SSO16 Package

Applications

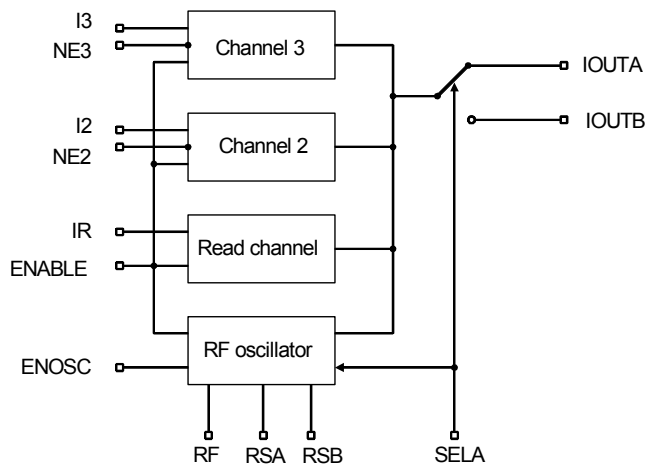
- DVD-ROM with CD-RW Capability (Combo Drives)
- Combo Drives with CD and DVD Writing Capability

Description

The T0806 is a laser diode driver for the operation of two different grounded laser diodes for DVD-RAM (650 nm) and CD-RW (780 nm) drives. 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 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 outputs IOUTA or IOUTB by the select input SELA. Each channel can contribute up to 250 mA to the total output current of up to 300 mA. A total gain of 100 is 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.

Figure 1. Block Diagram



3-Channel Laser Driver with RF Oscillator and 2 Outputs

T0806

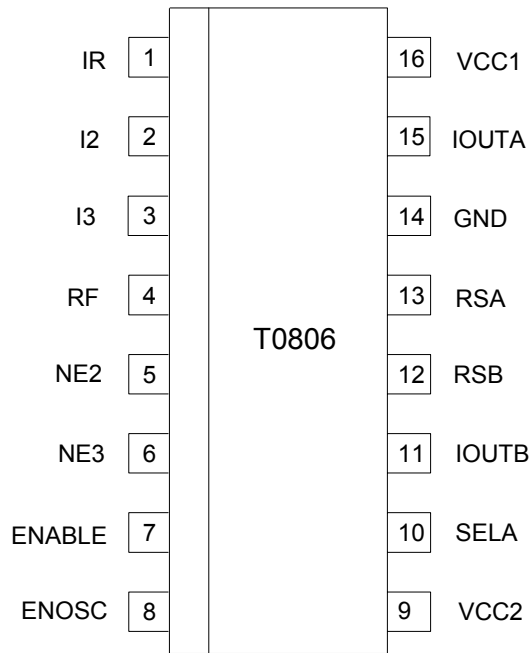
Summary

Rev. 4522ES-DVD-01/04



Pin Configuration

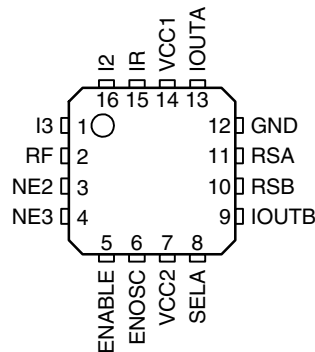
Figure 2. Pinning SSO16



Pin Description SSO16

| 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 oscillator frequency of oscillator A |
| 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 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 |

Figure 3. Pinning QFN16



Pin Description QFN16

| Pin | Symbol | Type | Function |
|--------|--------|---------|---|
| 1 | I3 | Analog | Input current, bias voltage approximately GND |
| 2 | RF | Analog | External resistor to GND sets oscillator frequency |
| 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 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 IOUT and 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 IR, I2, I3 | V_{IN1} | -0.5 to +1.0 | V |
| Input voltage at NE2, NE3, ENOSC | V_{IN2} | -0.5 to $V_{CC} + 0.5$ | V |
| Output voltage | V_{OUT} | -0.5 to $V_{CC} - 1$ | V |
| Total output current | I_{OUT} | 350 | mA |
| Output current per channel | $I_{OUT (IR, I2, I3)}$ | 300 | mA |
| Power dissipation | P_{MAX} | 0.7 ⁽¹⁾ to 1 ⁽²⁾ | W |
| Junction temperature | T_J | 150 | °C |
| Storage temperature range | T_{Stg} | -65 to +125 | °C |

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

Thermal Resistance

| Parameters | Symbol | Value | Unit |
|------------------|------------|-------|------|
| Junction ambient | R_{thJA} | 135 | K/W |

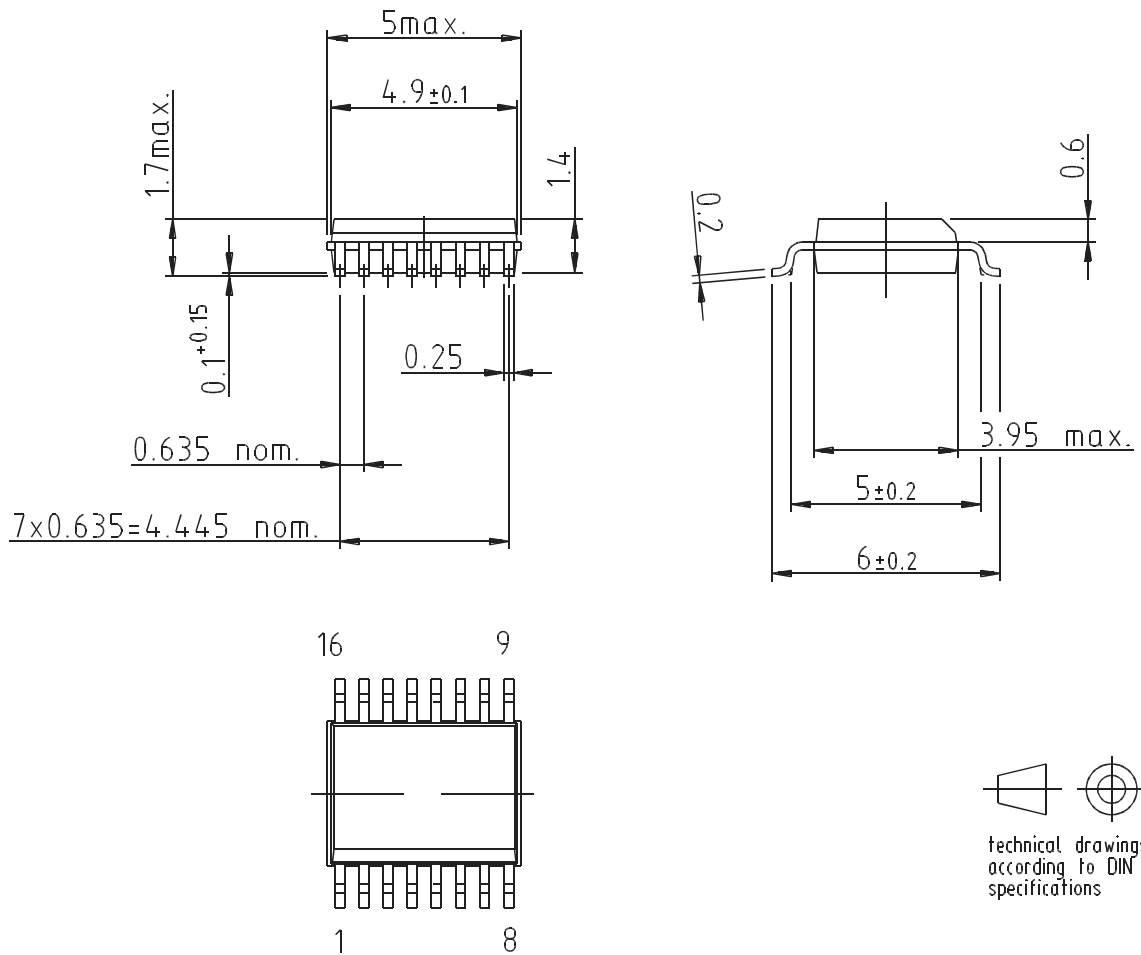
Recommended Operating Conditions

| Parameters | Symbol | Value | Unit |
|--|------------------------|------------|------------|
| Supply voltage range | V_{CC} | 4.5 to 5.5 | V |
| Input current | $I_{IR}/I_{I2}/I_{I3}$ | < 3.0 | mA |
| External resistor to GND to set oscillator frequency | RF | > 3 | k Ω |
| External resistor to GND to set oscillator swing | RSA, RSB | > 1 | k Ω |
| Operating temperature range | T_{amb} | 0 to +70 | °C |

Ordering Information

| Extended Type Number | Package | Remarks |
|----------------------|-----------------------------|------------------|
| T0806-TCQ | SSO16 | Taped and reeled |
| T0806-PEQG | Pb-free QFN16 (4 mm × 4 mm) | Taped and reeled |

Package Information

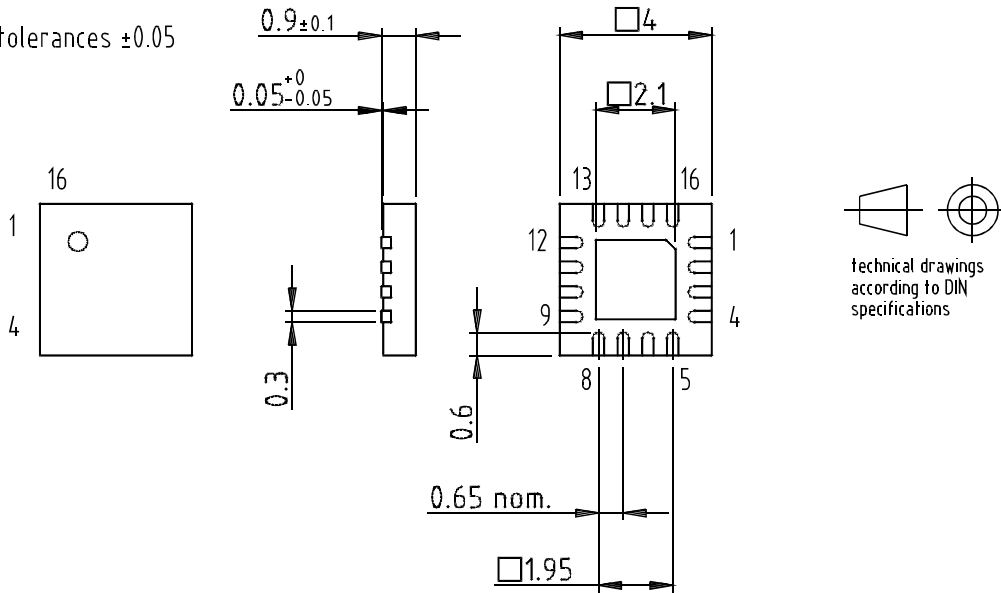


Drawing refers to following types: SS016
 Package acc. JEDEC MO 137 AB

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

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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