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## 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 5V 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

## 1. 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.



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## 3-channel Laser Driver with RF Oscillator and 2 Outputs

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T0806

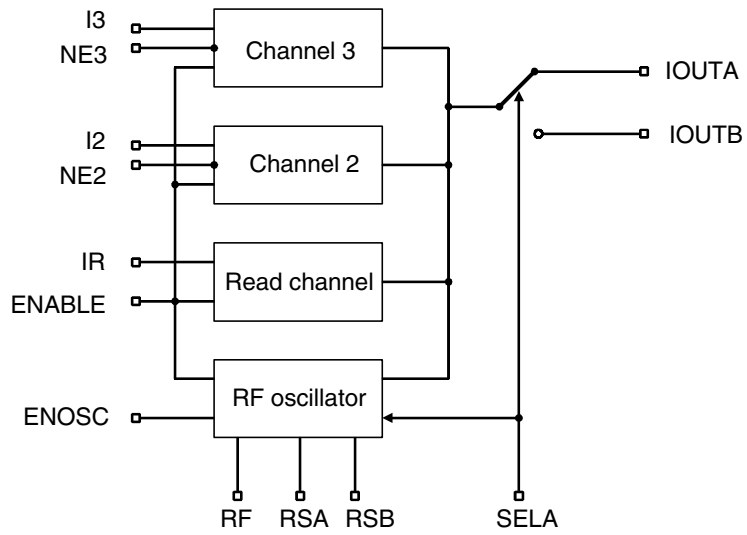
## Summary

Rev. 4522FS-DVD-11/05



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

**Figure 1-1.** Block Diagram



## 2. Pin Configuration

Figure 2-1. Pinning SSO16

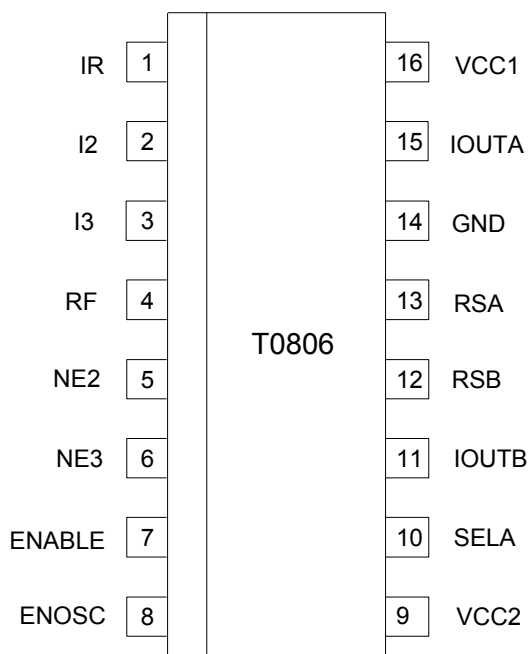
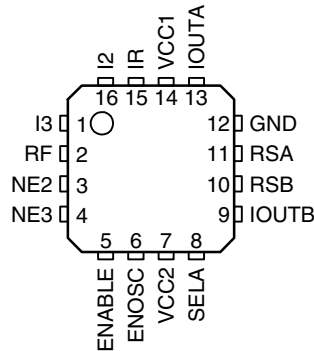


Table 2-1. Pin Description SSO16

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	+5V 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	+5V power supply for IOUT and circuit

**Figure 2-2.** Pinning QFN16



**Table 2-2.** 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	+5V 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	+5V 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

### 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	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 <sup>(1)</sup> to 1 <sup>(2)</sup>	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.  $R_{thJA} \leq 115 \text{ K/W}$ ,  $T_{amb} = 25^\circ \text{C}$

### 4. Thermal Resistance

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

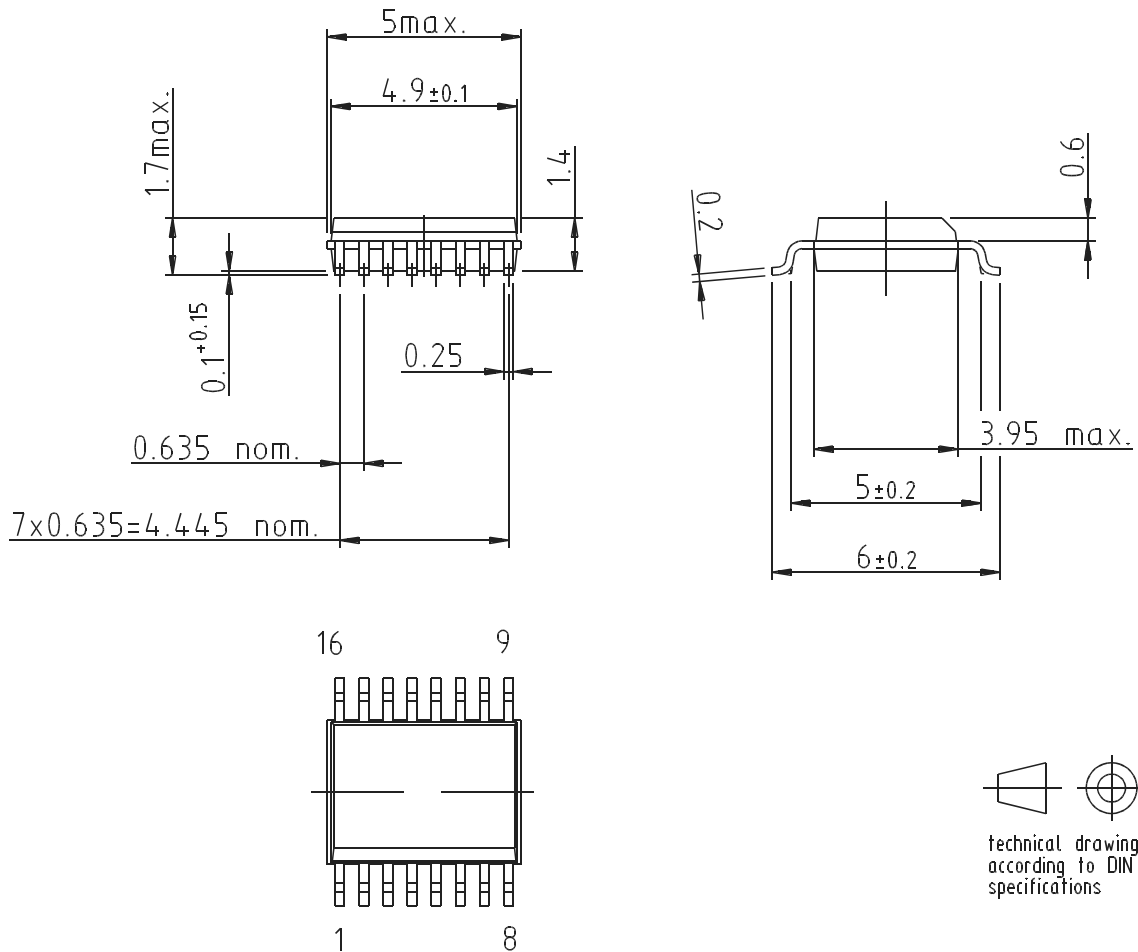
### 5. Recommended Operating Conditions

Parameters	Symbol	Value	Unit
Supply voltage range	$V_{CC}$	4.5 to 5.5	V
Input current	$I_{IR}/I_2/I_3$	< 3.0	mA
External resistor to GND to set oscillator frequency	RF	> 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

## 6. Ordering Information

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

## 7. Package Information

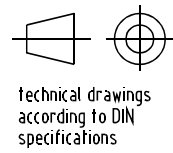
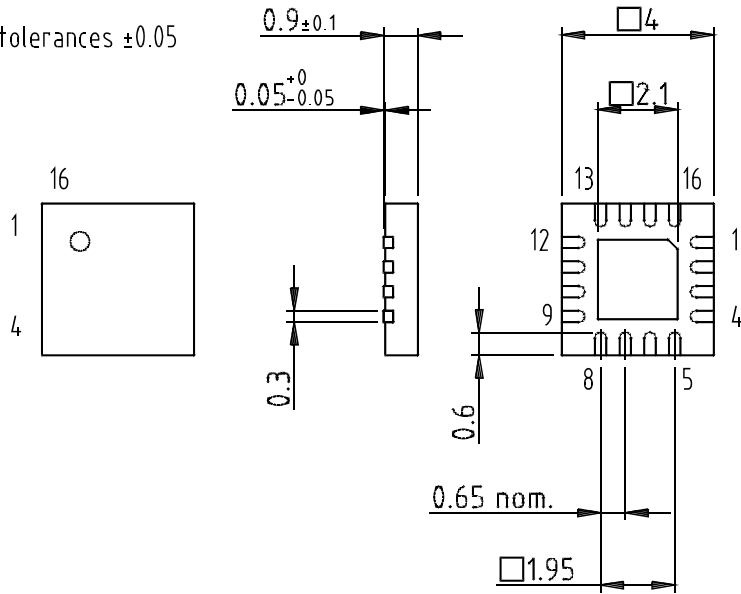


Drawing refers to following types: SSO16  
 Package acc. JEDEC MO 137 AB

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

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

Not indicated tolerances  $\pm 0.05$



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



## 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 Arsenaux 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

### ASIC/ASSP/Smart Cards

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

1150 East Cheyenne Mtn. Blvd.  
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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