

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

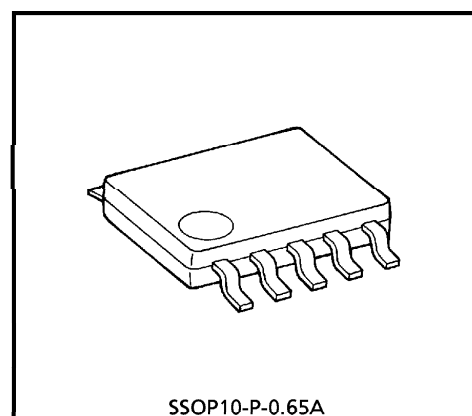
# TA8573FN

## High-Frequency Modulation IC for Laser Diode

The TA8573FN is a high frequency modulation IC for laser diode. This product is designed for PUH (Pick Up Head) of optical disc drive.

### FEATURES

- The TA8573FN operates with a single 5V power supply.
- The TA8573FN is suitable to connect with a cathode-common laser diode.
- Modulation frequency is adjustable from 150MHz to 400MHz.
- Modulation amplitude is adjustable from 0mAp-p to 50mAp-p.
- The TA8573FN can drive until 30mAp-p.
- The TA8573FN monitors LD-pin connection. When LD voltage is lower than 1.25V, power save mode is selected ( $I_{CC} = 3.5\text{mA}$  (Typ.)).
- Low current consumption = 7mA (Typ.).
- The TA8573FN is suitable to design a PUH circuit with a few external parts.
- Small package : SSOP10-P-0.65A



Weight : 0.04g (Typ.)

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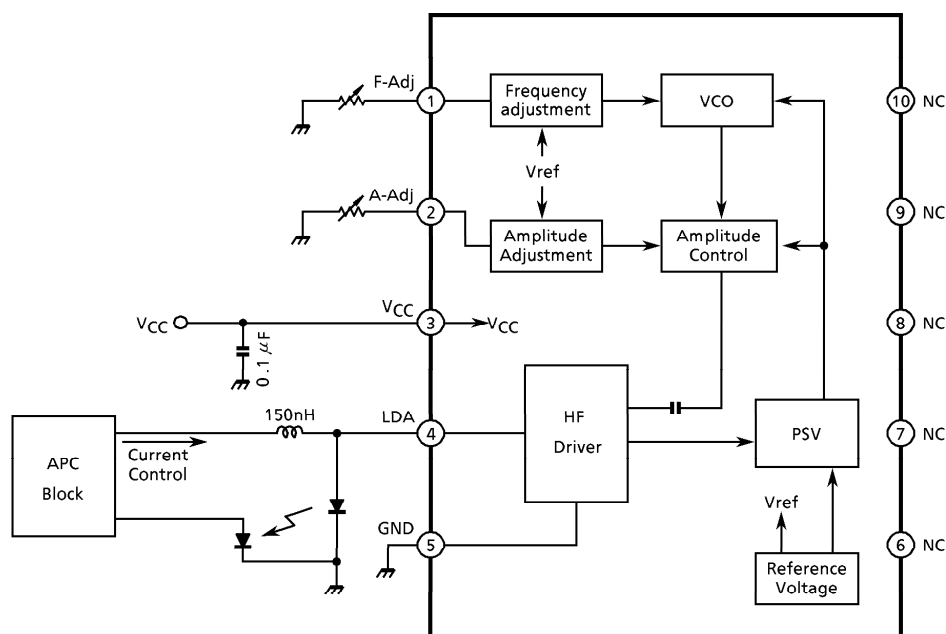
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## BLOCK DIAGRAM



## DESCRIPTION

## 1. High frequency modulation

- The TA8573FN suppresses a laser diode noise by high frequency current. So this high frequency current is supplied from APC block, a lower consumption system of high frequency modulation is realized.
- The frequency of modulation is adjustable by an external resistor (R F-Adj).  
Adjustable range of  $f_{(HFM)} = 150\text{MHz} \sim 400\text{MHz}$   
Accuracy of setting frequency  $\leq \pm 20\%$
- The amplitude of modulation is adjustable by an external resistor (R A-Adj).  
Adjustable range of  $I_{(HFM)} = 0 \sim 50\text{mA}_{p-p}$

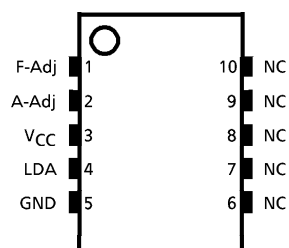
## 2. Power save mode

The TA8573FN monitors a laser diode voltage (LDA-pin voltage). When this voltage is lower than 1.25V, VCO circuit function stops and power save mode is selected. ( $I_{CC} = 3.5\text{mA}$  (Typ.))

## PIN FUNCTION

PIN No.	PIN NAME	FUNCTION
1	F-Adj	Frequency of modulation adjusting pin (An external resistor is connected between this pin and ground.)
2	A-Adj	Amplitude of modulation adjusting pin (An external resistor is connected between this pin and ground.)
3	V <sub>CC</sub>	Power supply pin
4	LDA	Output pin (Anode of laser diode is connecting with this pin.)
5	GND	Ground pin
6	NC	Non connection pin
7	NC	Non connection pin
8	NC	Non connection pin
9	NC	Non connection pin
10	NC	Non connection pin

## PIN ASSIGNMENT (TOP VIEW)



**MAXIMUM RATING** (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	V <sub>CC</sub>	7	V
Input Pin Voltage	V <sub>IN</sub>	-0.3~V <sub>CC</sub> +0.3	V
Output Drive Current (LDA)	I <sub>OUT</sub>	30	mA
Consumption Current	I <sub>CC</sub>	9	mA
Storage Temperature	T <sub>STG</sub>	-55~150	°C

**RECOMMENDED OPERATION CONDITION**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	V <sub>CC</sub>	4.5~5.5	V
Operating Temperature	T <sub>OPR</sub>	-20~85	°C

**ELECTRICAL CHARACTERISTICS** (Unless otherwise specified, V<sub>CC</sub> = 5V, Ta = 25°C)

## 1. Current Consumption

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Power Supply Current (Active Mode)	I <sub>CC</sub>	1	V <sub>LDA</sub> = 2.3V		7	9	mA
Power Supply Current (Power Save Mode)	I <sub>PSV</sub>	2	V <sub>LDA</sub> = 1.0V		3.5	5	mA

## 2. Output Block

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
DC Current of HFM	I <sub>osc</sub> (DC)	3	V <sub>LDA</sub> = 2.3V	-13	-22	-30	mA
*Current Amplitude of Modulation	I <sub>osc</sub>	—	R <sub>A-Adj</sub> = 5kΩ	20			mAp-p
*Output Voltage of LDA Pin	V <sub>op</sub>	—		1.9	2.3	2.7	V

## 3. Oscillator Block

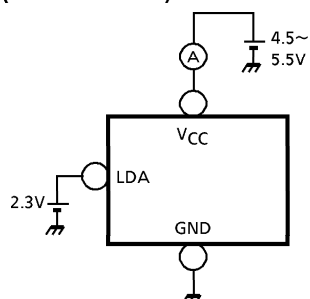
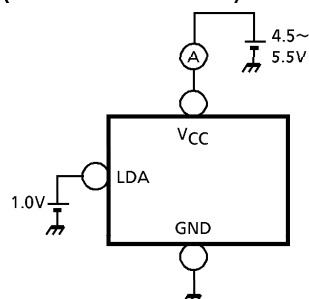
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
*Frequency Adjustable Rang	f <sub>osc</sub>	—		150		400	MHz
Accuracy of Setting Frequency	T <sub>fosc</sub>	4	215MHz (R <sub>F-Adj</sub> = 20kΩ) 300MHz (R <sub>F-Adj</sub> = 11kΩ) 350MHz (R <sub>F-Adj</sub> = 9.1kΩ)	-20		+20	%

## 4. Power Save Block

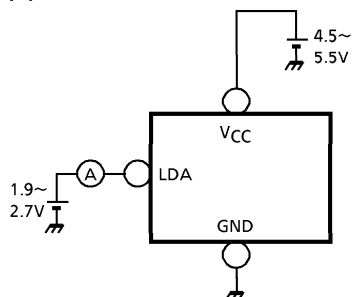
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Monitoring Voltage of LDA pin	V <sub>ref</sub>	5		1.0	1.25	1.5	V

The data marked by an asterisk (\*) are shown for only reference purpose.

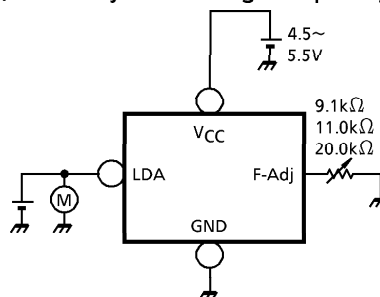
## TEST CIRCUIT

(1) Power Supply Current  
(Active Mode)(2) Power Supply Current  
(Power Save Mode)

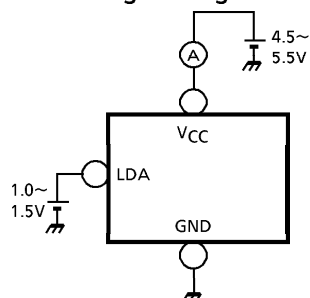
(3) DC Current of HFM



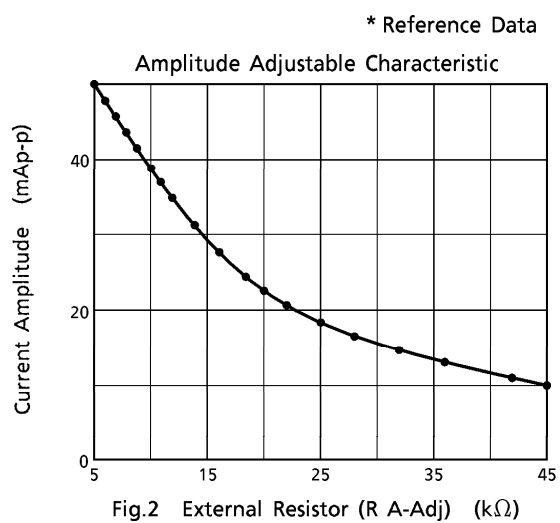
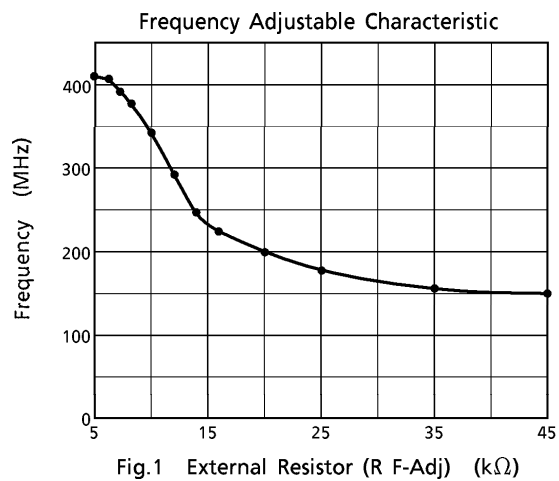
(4) Accuracy of Setting Frequency



(5) Monitoring Voltage of LDA Pin

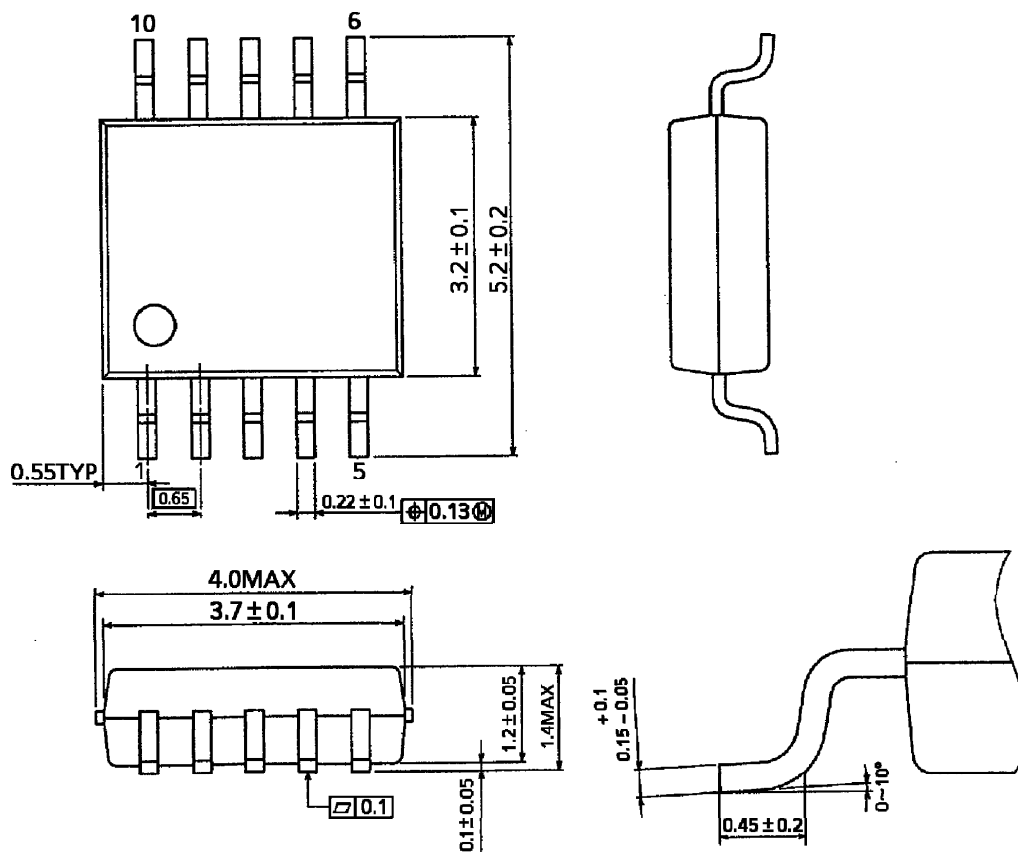


## HFM CHARACTERISTICS



**OUTLINE DRAWING**  
SSOP10-P-0.65A

Unit : mm



Weight : 0.04g (Typ.)