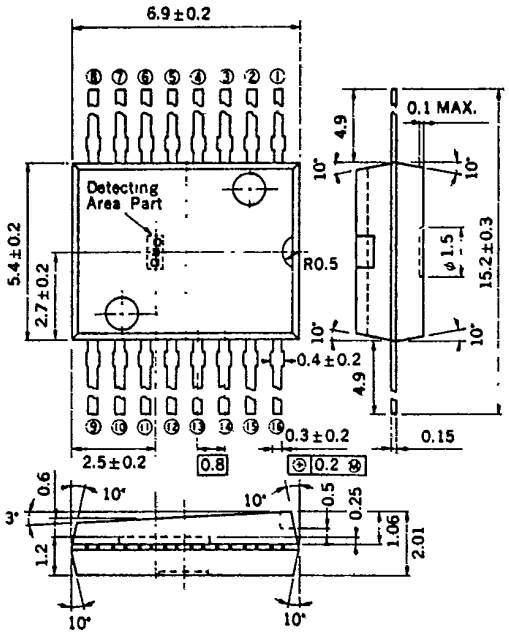
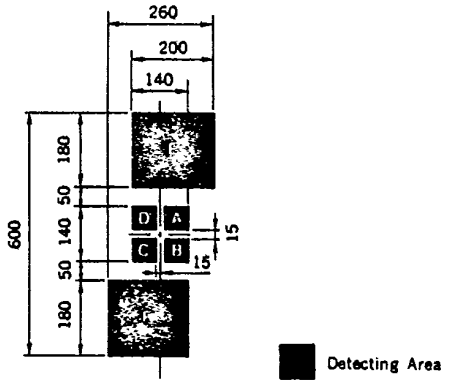
PHOTO DIODE
PH503

PIN PHOTO DIODE BUILT IN I-V AMPLIFIER DETECTOR FOR CD, OPTICAL DISC MEMORY

PACKAGE DIMENSIONS
(Unit : mm)



CHIP PATTERN
(Unit : μm)



PH503 is 6 elements PIN Photo Diode built in I-V Amplifiers.
Photo Diodes and Amplifiers are integrated in one chip, so external noise can be reduced extremely.
Then by using together with μPC1339G (RF Amplifier and Error Amplifier) and μPD6353G (Servo Processor), it is possible to compose RF and Servo block of Compact Disc Player the most suitably.

FEATURES

- PIN Photo Diodes and I-V Amplifiers are integrated in one chip, so external noise can be reduced.
- +5 V Single supply operation.
- It is easy to adjust the center of beam spot by using the Focus and Tracking Input terminal.
- Connecting two resistor can set up stable reference voltage.
- Small transparent 16 Pin plastic package.

APPLICATIONS

- 3 beam pick up circuit of Compact Disc Player and Optical Disc Memory

PH503

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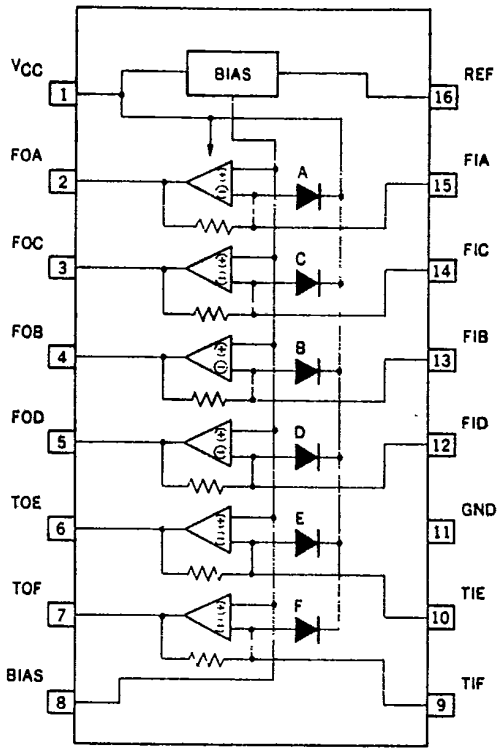
BLOCK DIAGRAM



TERMINAL CONNECTION

TERMINAL NUMBER	SYMBOL	CONNECTION
1	V_{CC}	Supply Voltage
2	FOA	Focus Output A
3	FOC	Focus Output C
4	FOB	Focus Output B
5	FOD	Focus Output D
6	TOE	Tracking Output E
7	TOF	Tracking Output F
8	BIAS	Bias Voltage
9	TIF	Tracking Input F
10	TIE	Tracking Input E
11	GND	Ground
12	FID	Focus Input D
13	FIB	Focus Input B
14	FIC	Focus Input C
15	FIA	Focus Input A
16	REF	Reference Voltage

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Supply Voltage	V_{CC}	6	V
Circuit Current	I_{CC}	22	mA
Package Dissipation	P_D	150	mW
Operating Temperature	T_{opt}	−20 to +80	°C
Storage Temperature	T_{stg}	−40 to +100	°C

RECOMMENDED OPERATING CONDITIONS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	4.5	5.0	5.5	V
Operating Temperature	T_{opt}	−10	+25	+70	°C

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Circuit Current	I_{CC}		14.1	22.0	mA	
BIAS CIRCUIT						
Bias Voltage (8 PIN)	V_{BIAS}	2.4	2.5	2.6	V	R_1 = 18 kΩ, R_2 = 13 kΩ
Reference Voltage (16 PIN)	V_{REF}		1.4		V	R_1 = 18 kΩ, R_2 = 13 kΩ
Load Regulation (8 PIN)	REG_L			15	mV	$-10\ \mu A \leq I_O \leq 0$
Line Regulation (8 PIN)	REG_{IN}			15	mV	$4.5\ V \leq V_{CC} \leq 5.5\ V$
I-V AMPLIFIER						
Input Offset Voltage	V_{IO}		0.3	5.0	mV	
Input Bias Current	I_B			100	nA	
Supply Voltage Rejection Ratio	SVRR	60	70		dB	
Maximum Output Voltage (High) (2 to 7 PIN)	$V_{om}{}^H$	3.2	3.5		V	R_L = 4.7 kΩ
Maximum Output Voltage (Low) (2 to 7 PIN)	$V_{om}{}^L$		1.3	1.6	V	R_L = 4.7 kΩ
Gain Bandwidth Product	GBWP	2			MHz	
Output Amplitude Voltage	V_O	80			mV	I_{IN} = 0 to 1.7 μA Focus A, B, C D
						I_{IN} = 0 to 0.7 μA Tracking E, F
Channel Separation	CS		120		dB	f = 20 Hz to 20 kHz
Phase Margin	ϕ		60		deg	
PIN PHOTO DIODE						
Sensitivity	S		0.3		A/W	λ_0 = 780 nm
Maximum Sensitivity Wavelength	λp		900		nm	
Resistance between Each Element	R	1			MΩ	

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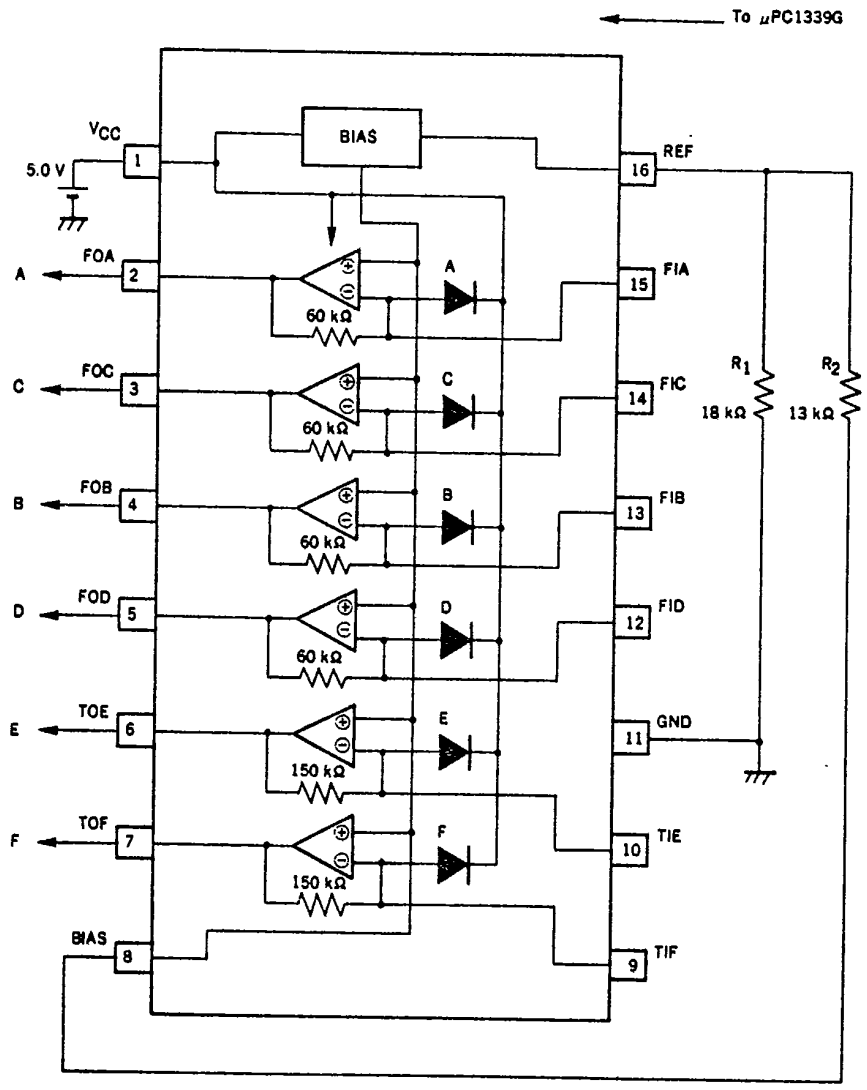
APPLICATION CIRCUIT



NOTE) FIA to FID, TIE to TIF are used only when you adjust the center of beam spot.

COMPACT DISC BLOCK DIAGRAM