

TENTATIVE TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA2150FN

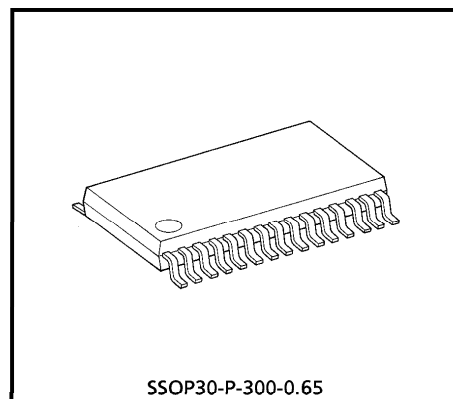
RF AMPLIFIER FOR DIGITAL SERVO CD SYSTEM

TA2150FN is a 3-beam type PUH compatible RF Amplifier for Digital Servo to be used in the CD system.

In combination with a CMOS single chip processor TC9462F/TC9495F, a CD system can be composed very simply.

FEATURES

- Built-in amplifier for reference (VRO, 2VRO) supply.
- Built-in Auto Laser Power Control circuit.
- Built-in RF amplifier.
- Built-in AGC amplifier.
- Built-in focus error amp and tracking error amp.
- Built-in sub-beam adder signal amplifier.
- Built-in gain change circuit for CD-RW.
- Capable of tracking balance control with TC9462F/TC9495F.
- Capable of RF gain adjustment circuit with TC9462F/TC9495F.
- Built-in signal amplifier for track counter.
- Capable of 4times speed operation.
- 30 pin mini flat package.



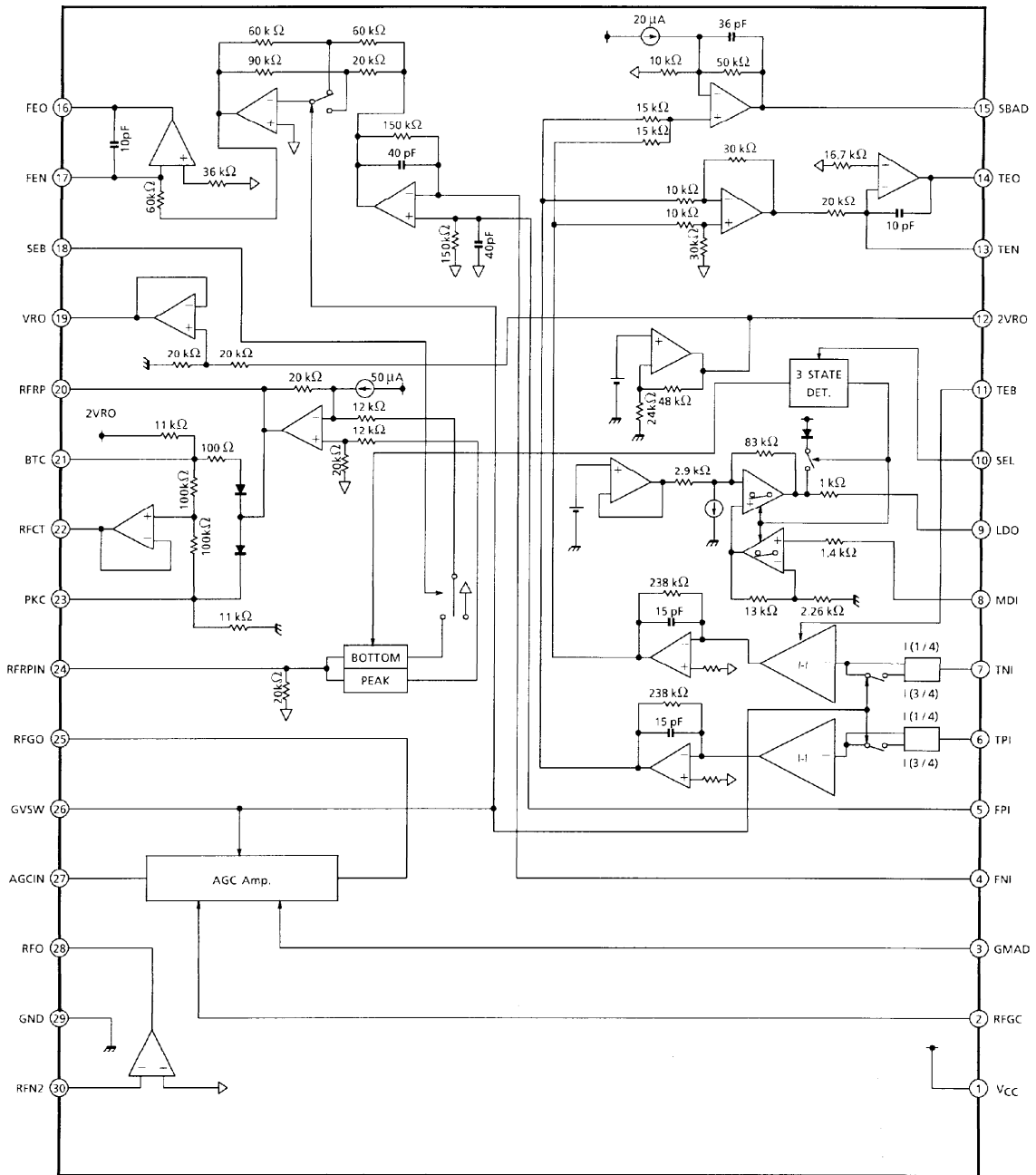
SSOP30-P-300-0.65

Weight : 0.17 g (Typ.)

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BLOCK DIAGRAM



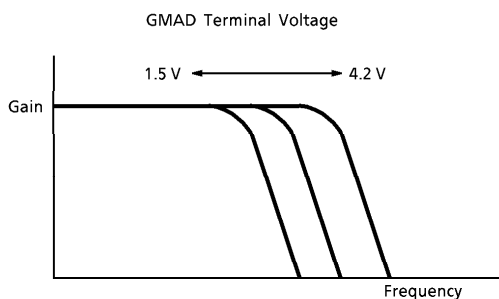
PIN FUNCTION

PIN No.	SYMBOL	I/O	FUNCTION DESCRIPTION	REMARKS																
1	V _{CC}	—	Power supply input terminal.	—																
2	RFGC	I	RF amplitude adjustment control signal input terminal. Controlled by 3-PWM signals. (PWM carrier = 88.2 kHz)	3 signals input. (2VRO, VRO, GND)																
3	GMAD	I	Open loop gain adjustment terminal for AGC amp.	(Note 1)																
4	FNI	I	Main beam I-V amp input terminal.	Connected to pin diode output B + D (through resistor).																
5	FPI	I	Main beam I-V amp input terminal.	Connected to pin diode output A + C (through resistor).																
6	TPI	I	Sub beam I-V amp input terminal.	Connected to pin diode output F.																
7	TNI	I	Sub beam I-V amp input terminal.	Connected to pin diode output E.																
8	MDI	I	Monitor photo diode amp input terminal.	Connected to monitor photo diode.																
9	LDO	O	Laser diode amp input terminal.	Connected to laser diode control circuit.																
10	SEL	I	Laser diode control signal input terminal and APC circuit ON/OFF control signal terminal. <table border="1" style="margin: 5px auto;"> <thead> <tr> <th>SEL LEVEL</th> <th>APC CIRCUIT</th> <th>LDO</th> <th>DETECT FREQUENCY</th> </tr> </thead> <tbody> <tr> <td>GND</td> <td>OFF</td> <td>Connected to V_{CC} through resister (1 kΩ)</td> <td>Low</td> </tr> <tr> <td>Hiz</td> <td>ON</td> <td>Control signal output</td> <td>Low</td> </tr> <tr> <td>V_{CC}</td> <td>ON</td> <td>Control signal output</td> <td>High</td> </tr> </tbody> </table>	SEL LEVEL	APC CIRCUIT	LDO	DETECT FREQUENCY	GND	OFF	Connected to V _{CC} through resister (1 kΩ)	Low	Hiz	ON	Control signal output	Low	V _{CC}	ON	Control signal output	High	3 signals input. (V _{CC} , Hiz, GND)
SEL LEVEL	APC CIRCUIT	LDO	DETECT FREQUENCY																	
GND	OFF	Connected to V _{CC} through resister (1 kΩ)	Low																	
Hiz	ON	Control signal output	Low																	
V _{CC}	ON	Control signal output	High																	
11	TEB	I	Tracking error balance adjustment signal input terminal. Controlled by 3-PWM signal. (PWM carrier = 88.2 kHz)	3 signals input. (2VRO, VRO, GND)																
12	2VRO	O	Reference voltage (2VRO) output terminal. 2VRO = 4.2 V when V _{CC} = 5 V	—																
13	TEN	I	TE amp negative input terminal.	Connected to TEO through feedback resistor.																
14	TEO	O	TE error signal output terminal.	—																
15	SBAD	O	Sub beam adder signal output terminal.	—																
16	FEO	O	Focus error signal output terminal.	—																
17	FEN	I	FE amp negative input terminal.	Connected to FEO through feedback resistor.																
18	SEB	I	RFRP output circuit switching terminal. <table border="1" style="margin: 5px auto;"> <thead> <tr> <th>SEB LEVEL</th> <th>BOTTOM DETECTION</th> <th>PEAK DETECTION</th> </tr> </thead> <tbody> <tr> <td>GND</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>V_{CC}</td> <td>OFF</td> <td>ON</td> </tr> </tbody> </table>	SEB LEVEL	BOTTOM DETECTION	PEAK DETECTION	GND	ON	ON	V _{CC}	OFF	ON	Low (GND) is for normal use.							
SEB LEVEL	BOTTOM DETECTION	PEAK DETECTION																		
GND	ON	ON																		
V _{CC}	OFF	ON																		

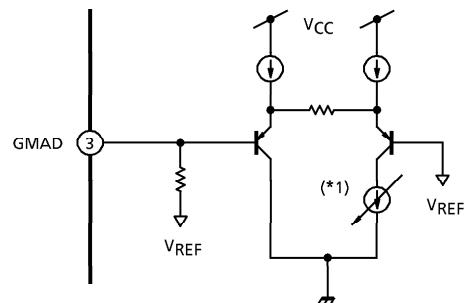
PIN FUNCTION

PIN No.	SYMBOL	I/O	FUNCTION DESCRIPTION	REMARKS								
19	VRO	O	Reference signal (VRO) output terminal. VRO = 2.1 V when V _{CC} = 5 V	—								
20	RFRP	O	Track count signal output terminal.	—								
21	BTC	I	Time constant adjustment terminal for bottom detection.	Adjusted by capacitance.								
22	RFCT	O	RFRP signal center level output terminal.	—								
23	PKC	I	Time constant adjustment terminal for peak detection.	Adjusted by capacitance.								
24	RFRPIN	I	Input terminal for track count signal output amp.	—								
25	RFGO	O	Output terminal for RF signal amplitude adjustment amp.	—								
26	GVSW	I	Amp (AGC, FE, TE) gain switching terminal. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>GVSW</th> <th>MODE</th> </tr> </thead> <tbody> <tr> <td>GND</td> <td>CD-RW</td> </tr> <tr> <td>Hiz</td> <td>Normal</td> </tr> <tr> <td>V_{CC}</td> <td>Normal</td> </tr> </tbody> </table>	GVSW	MODE	GND	CD-RW	Hiz	Normal	V _{CC}	Normal	Low (GND) is for 5 times gain.
GVSW	MODE											
GND	CD-RW											
Hiz	Normal											
V _{CC}	Normal											
27	AGCIN	I	Input terminal for RF signal amplitude adjustment amp.	Connected to RFO through capacitance.								
28	RFO	O	Output terminal RF signal amp.	—								
29	GND	—	Ground terminal.	—								
30	RFN2	I	Input terminal for RF signal amp.	Connected to pin-diode output A + B + C + D (through resistor).								

(Note 1) : Pin No.3 (GMAD) is gm adjustment terminal for AGC amp by applying a voltage (between 1.5 V and 4.2 V).
 If Pin No.3 (GMAD) is open, voltage of this terminal is fixed VRO by IC interior.
 Characteristic of frequency (open-loop characteristic) and voltage is as below.

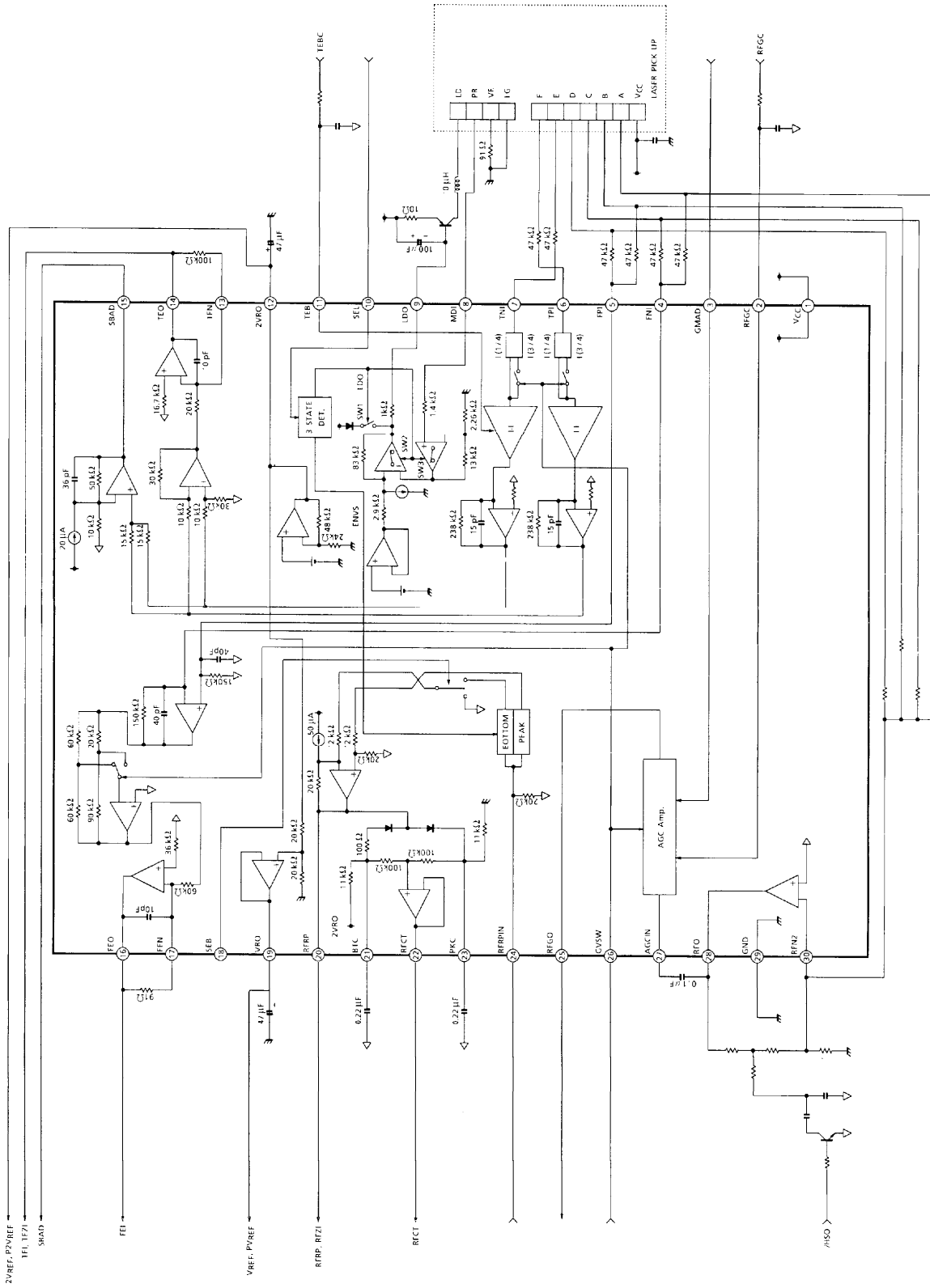


By changing a voltage (Pin No.3) between 1.5 V and 4.2 V, frequency band width is changed.



(*1) : Current is changed by 3 pin (GMAD) voltage.

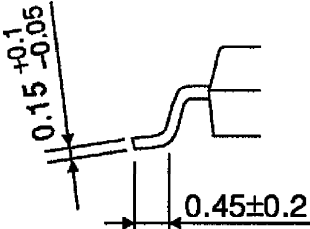
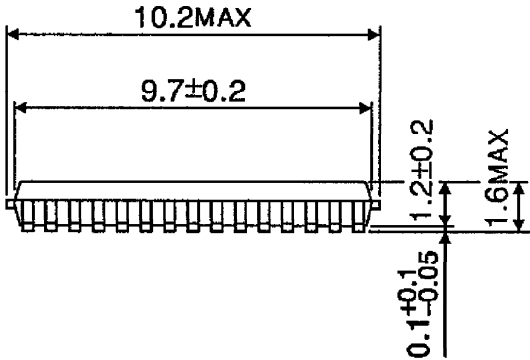
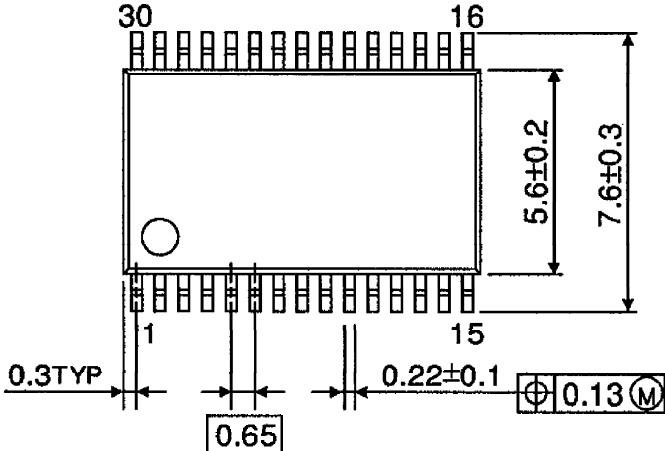
APPLICATION CIRCUIT



TA2150FN-5

PACKAGE DIMENSIONS
SSOP30-P-300-0.65

Unit : mm



Weight : 0.17 g (Typ.)