

Front end for CD players

BA6354BFS

The BA6354BFS is an analog front end LSI developed for CD players and CD-ROMs.

With a shared equalizer for normal and multiple speeds, and an input stage that supports hologram picks, the need for external components is minimized and the package size is greatly reduced.

●Applications

CD players, car navigation CD-ROMs

●Features

- 1) Supports hologram picks.
- 2) Internal APC circuit for laser control.
- 3) DC control enables balance adjustment for focus error and tracking error.
- 4) Maintains the output amplitude at a constant value with an RF AGC circuit.
- 5) Switchable equalizer (internal normal speed and multiple speed equalizer).

●Absolute maximum ratings (Ta = 25°C)

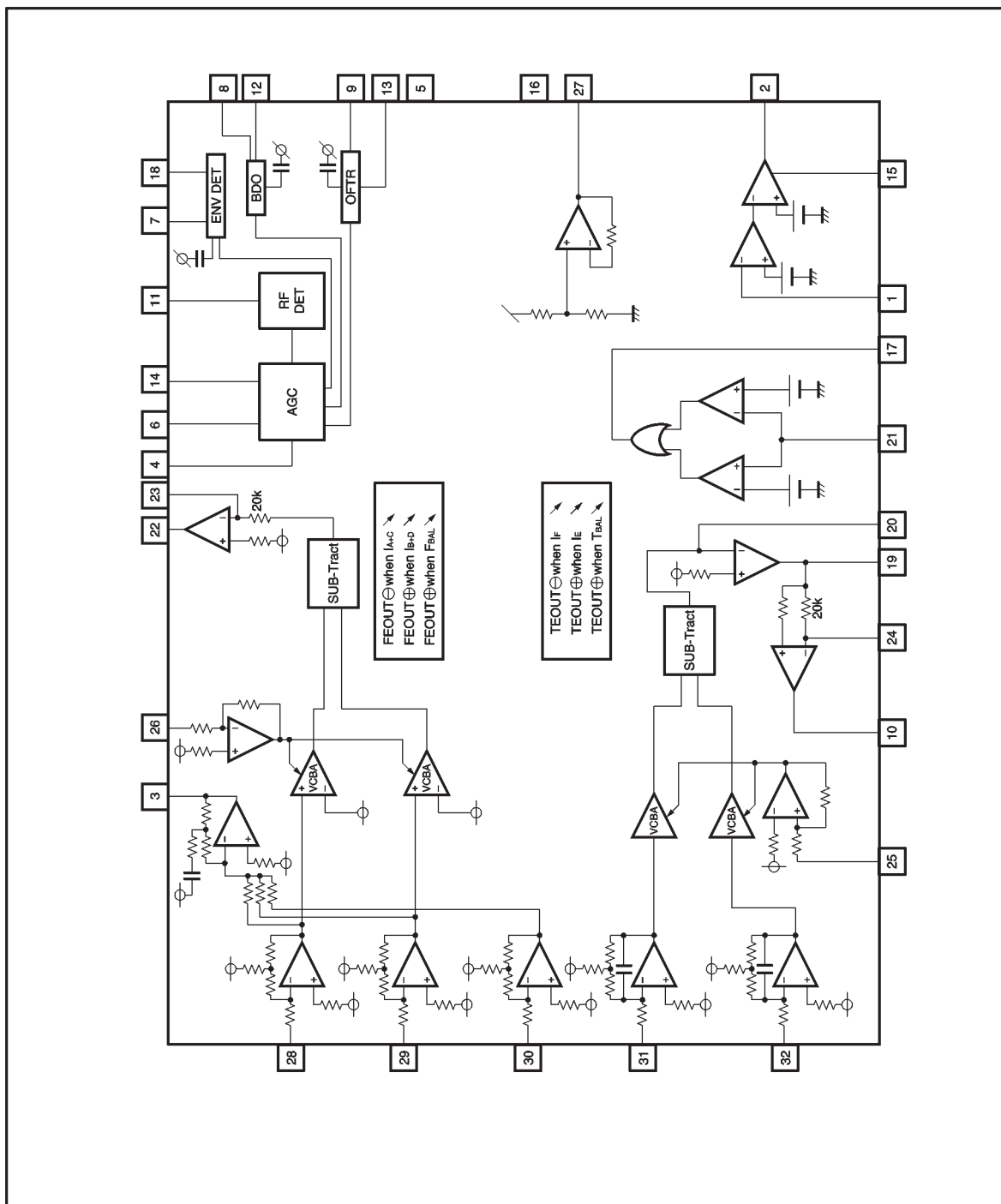
Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	6	V
Power dissipation	P _d	850	mW
Operating temperature	T _{opr}	−30~+85	°C
Storage temperature	T _{stg}	−55~+125	°C

* Reduced by 8.5mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	3.4~5.5	V

● Block diagram



●Electrical characteristics (unless otherwise noted, Ta = 25°C, V_{CC} = 5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current	I _Q	8	13	18	mA	
V _{ref} output voltage	V _{ref}	2.2	2.5	2.8	V	
〈Focus error amplifier〉						
Output offset voltage	V _{FEOF}	−63	0	63	mV	
Balance crosstalk amount	V _{FEB}	−300	—	100	mV	V _{FB} =V _{ref} ±1V applied
I-V conversion gain	R _{FO}	63	90	117	kΩ	V _{FB} =V _{ref}
I-V conversion relative gain	ΔR _{FO}	−15	0	15	%	V _{FB} =V _{ref}
High level variable range 1	B _{F1H}	0.21	0.35	0.49	—	V _{FB} =V _{ref} +1V
Low level variable range 1	B _{F1L}	1.19	1.70	2.21	—	V _{FB} =V _{ref} −1V
High level variable range 2	B _{F2H}	1.19	1.70	2.21	—	V _{FB} =V _{ref} +1V
Low level variable range 2	B _{F2L}	0.21	0.35	0.49	—	V _{FB} =V _{ref} −1V
Frequency characteristics	G _{FO}	−5.0	−3	−1.0	dB	f=1kHz, 30kHz
〈Tracking error amplifier〉						
Output offset voltage	V _{TROF}	−63	0	63	mV	
Balance crosstalk amount	V _{TRBC}	−200	—	200	mV	V _{TB} =V _{ref} ±1V applied
I-V conversion gain	R _{TR}	420	600	780	kΩ	V _{TB} =V _{ref}
I-V conversion relative gain	ΔR _{TR}	−15	0	15	%	V _{TB} =V _{ref}
High level variable range 1	B _{T1H}	0.21	0.35	0.49	—	V _{TB} =V _{ref} +1V
Low level variable range 1	B _{T1L}	1.20	1.75	2.30	—	V _{TB} =V _{ref} −1V
High level variable range 2	B _{T2H}	1.20	1.75	2.30	—	V _{TB} =V _{ref} +1V
Low level variable range 2	B _{T2L}	0.21	0.35	0.49	—	V _{TB} =V _{ref} −1V
Frequency characteristics	G _{TR}	−5.0	−3	−1.0	dB	f=1kHz, 40kHz
〈CROSS detector〉						
CROSS output high level	V _{CRH}	4.2	—	—	V	V _{TB} =V _{ref} , f=2kHz
CROSS output low level	V _{CTL}	—	—	0.8	V	V _{TB} =V _{ref} , f=2kHz
〈RF-AMP〉						
Offset voltage	V _{RFOF}	−75	0	75	mV	
I-V conversion gain	R _{RF}	42.8	53.5	69.6	kΩ	
I-V conversion relative gain 1	ΔR _{RF1}	−10	0	10	%	
I-V conversion relative gain 2	ΔR _{RF2}	−10	0	10	%	
Frequency characteristics	G _{RF}	−6.8	−2.8	0.2	dB	f=500kHz, 3MHz
EQ characteristics	ΔG _{EQ}	−0.8	1.7	4.2	dB	f=1MHz, 1.5MHz

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
〈AGC〉						
AGC maximum gain	G _{AGC}	10.0	14.5	19.0	dB	f=500kHz
AGC operating gain	G _{OPAGC}	2.0	5.0	8.0	dB	f=500kHz, V _{IN} =500mV _{P-P}
AGC compression	G _{CmAGC}	1.5	4.5	7.5	dB	f=500kHz, V _{IN} =100mV _{P-P}
AGC frequency characteristics	G _{IAGC}	−3.0	0	3.0	dB	f=3MHz, V _{IN} =500mV _{P-P}
〈RFDET〉						
RFDET detection level	V _{RFDET}	0.091	0.130	0.175	V _{P-P}	f=500kHz (RFIN level)
RFDET high level	V _{RFH}	4.2	—	—	V	f=500kHz (RFIN level)
RFDET low level	V _{RFL}	—	—	0.8	V	f=500kHz (RFIN level)
〈BDO〉						
BDO detection current	I _{BDO}	0.6	1.0	1.4	μA	
BDO high level	V _{BDOH}	4.2	—	—	V	f=2kHz, rectangular wave
BDO low level	V _{BDO L}	—	—	0.8	V	f=2kHz, rectangular wave
〈OFTR〉						
OFTR detection current	I _{OFTR}	0.6	1.0	1.4	μA	
OFTR high level	V _{OFTRH}	4.2	—	—	V	f=2kHz, rectangular wave
OFTR low level	V _{OFTRL}	—	—	0.8	V	f=2kHz, rectangular wave
〈LD-APC〉						
LD ON high level input	V _{LDH}	3.5	—	—	V	
LD OFF low level input	V _{LDL}	—	—	1.5	V	
LD ON operating voltage	V _{LD}	145	180	215	mV	DC sweep
〈VDET detector〉						
VDET detection level 1	V _{DET1}	56	80	104	mV	DC sweep
VDET detection level 2	V _{DET2}	−104	−80	−56	mV	DC sweep
VDET high level	V _{DETH}	4.2	—	—	V	DC sweep
VDET low level	V _{DETL}	—	—	0.8	V	DC sweep
〈3T ENV〉						
CEA-ENV propagation characteristics	G _{ENV}	21	23	25	dB	
CEA input impedance	R _{CEA}	6.4	8.0	9.6	kΩ	
ENV output impedance	R _{ENV}	6.0	7.5	9.0	kΩ	
ENV-AMP offset voltage	V _{ENVOF}	−150	0	150	mV	
CEA-AMP operating voltage	V _{OPCEA}	90	150	210	mV	

● Measurement circuit

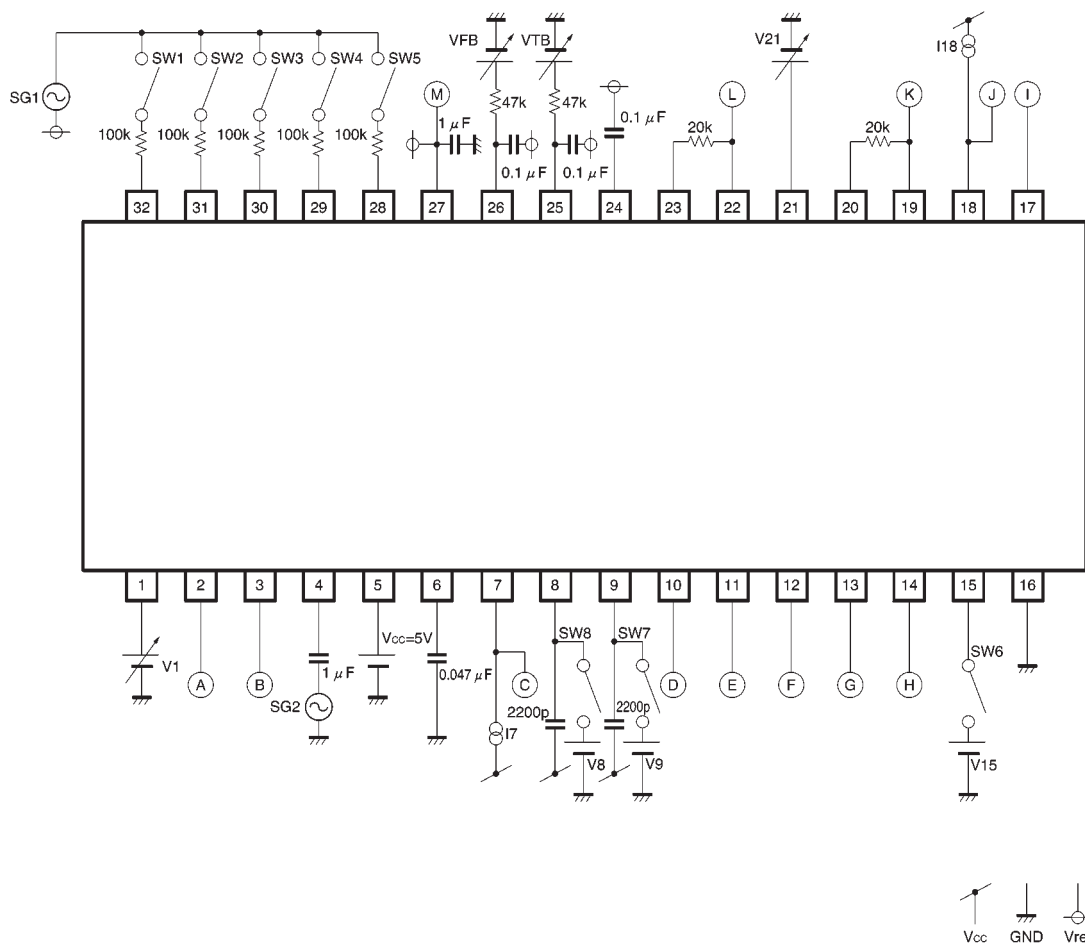


Fig.1

● Application example

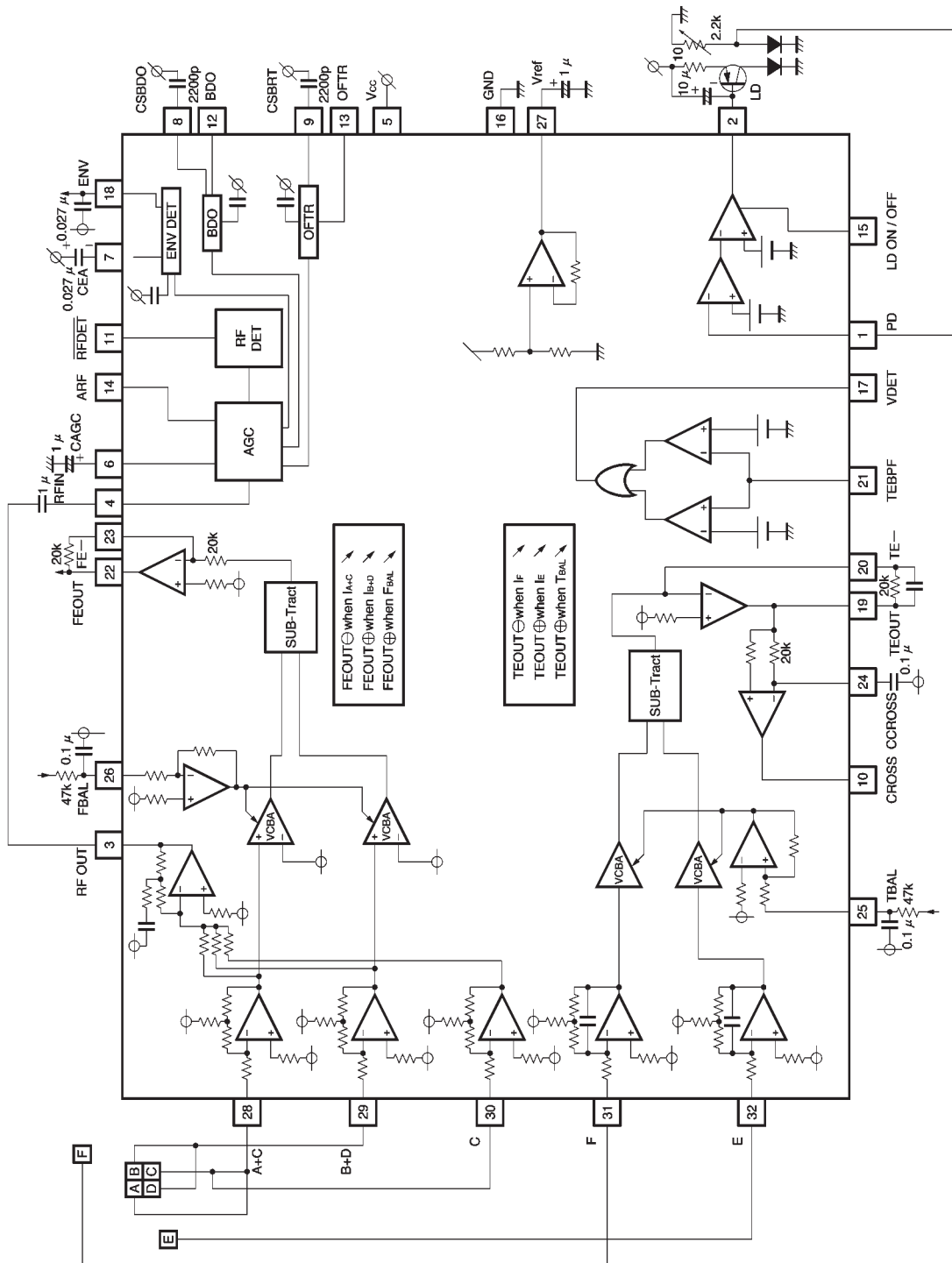


Fig.2

● Electrical characteristics curve

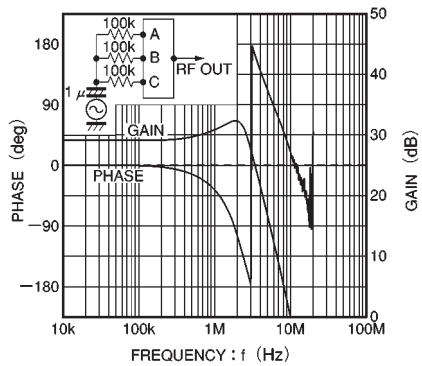
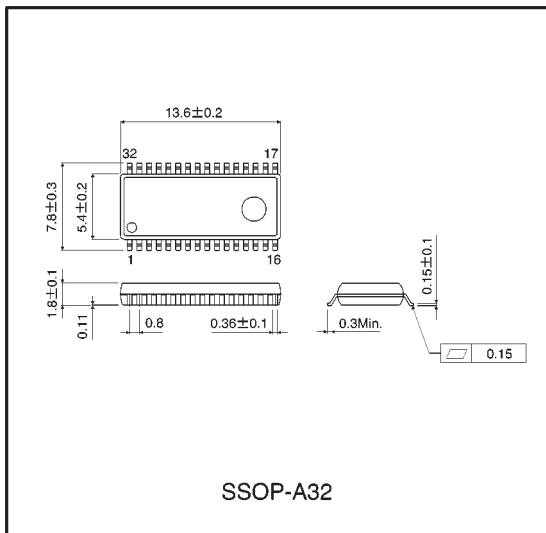


Fig.3 RF amplifier frequency characteristics

● External dimensions (Units: mm)





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