

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)

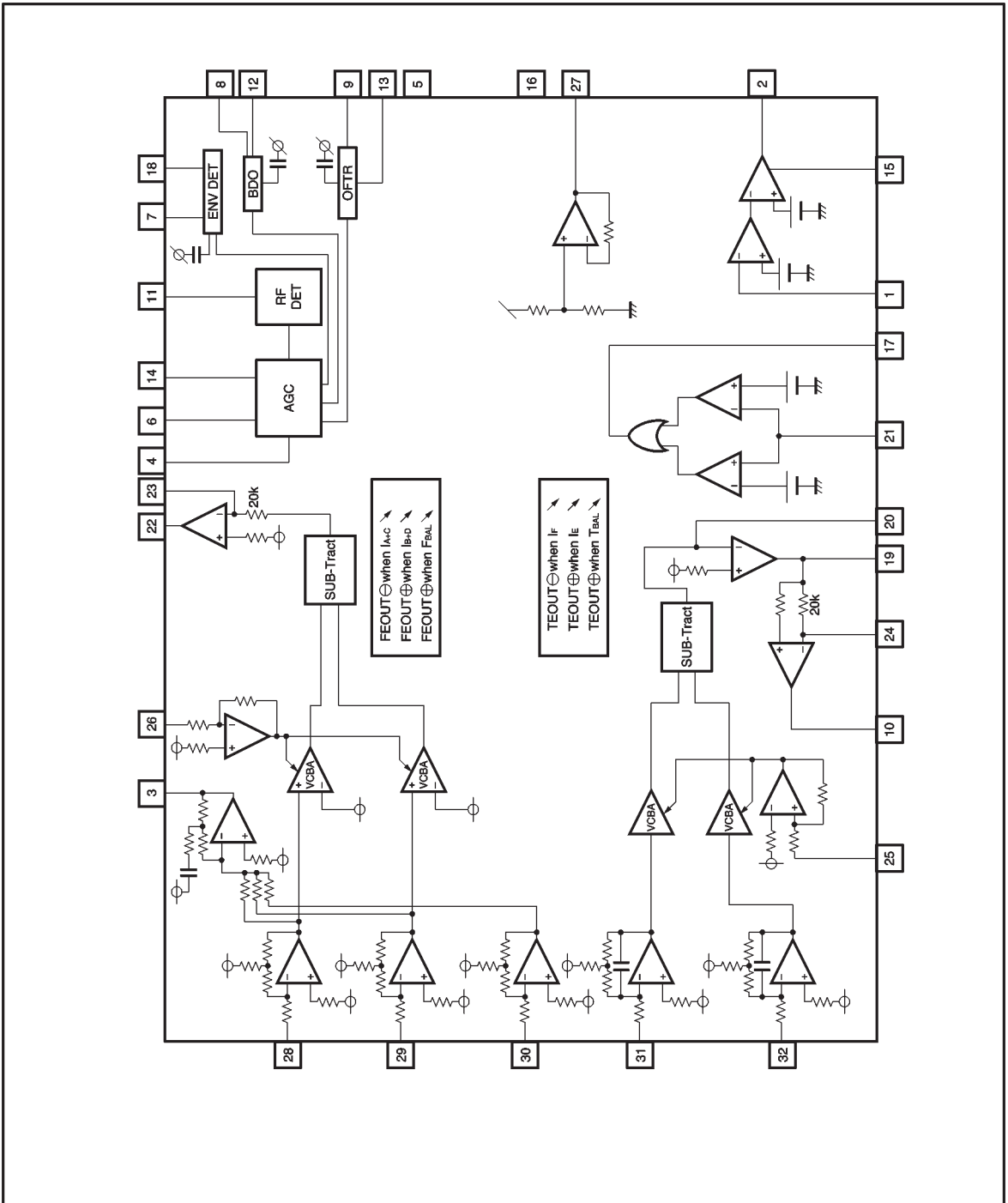
Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	6	V
Power dissipation	P _d	850	mW
Operating temperature	T _{opr}	-30~+85	°C
Storage temperature	T _{stg}	-55~+125	°C

* 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, $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$)

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_{FEBC}	-300	-	100	mV	$V_{FB} = V_{ref} \pm 1\text{V}$ applied
I-V conversion gain	R_{FO}	63	90	117	$k\Omega$	$V_{FB} = V_{ref}$
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	-	$V_{FB} = V_{ref} + 1\text{V}$
Low level variable range 1	B_{F1L}	1.19	1.70	2.21	-	$V_{FB} = V_{ref} - 1\text{V}$
High level variable range 2	B_{F2H}	1.19	1.70	2.21	-	$V_{FB} = V_{ref} + 1\text{V}$
Low level variable range 2	B_{F2L}	0.21	0.35	0.49	-	$V_{FB} = V_{ref} - 1\text{V}$
Frequency characteristics	G_{FO}	-5.0	-3	-1.0	dB	$f = 1\text{kHz}, 30\text{kHz}$
〈Tracking error amplifier〉						
Output offset voltage	V_{TROF}	-63	0	63	mV	
Balance crosstalk amount	V_{TRBC}	-200	-	200	mV	$V_{TB} = V_{ref} \pm 1\text{V}$ applied
I-V conversion gain	R_{TR}	420	600	780	$k\Omega$	$V_{TB} = V_{ref}$
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	-	$V_{TB} = V_{ref} + 1\text{V}$
Low level variable range 1	B_{T1L}	1.20	1.75	2.30	-	$V_{TB} = V_{ref} - 1\text{V}$
High level variable range 2	B_{T2H}	1.20	1.75	2.30	-	$V_{TB} = V_{ref} + 1\text{V}$
Low level variable range 2	B_{T2L}	0.21	0.35	0.49	-	$V_{TB} = V_{ref} - 1\text{V}$
Frequency characteristics	G_{TR}	-5.0	-3	-1.0	dB	$f = 1\text{kHz}, 40\text{kHz}$
〈CROSS detector〉						
CROSS output high level	V_{CRH}	4.2	-	-	V	$V_{TB} = V_{ref}, f = 2\text{kHz}$
CROSS output low level	V_{CRL}	-	-	0.8	V	$V_{TB} = V_{ref}, f = 2\text{kHz}$
〈RF-AMP〉						
Offset voltage	V_{RFOF}	-75	0	75	mV	
I-V conversion gain	R_{RF}	42.8	53.5	69.6	$k\Omega$	
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	$f = 500\text{kHz}, 3\text{MHz}$
EQ characteristics	ΔG_{EQ}	-0.8	1.7	4.2	dB	$f = 1\text{MHz}, 1.5\text{MHz}$

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

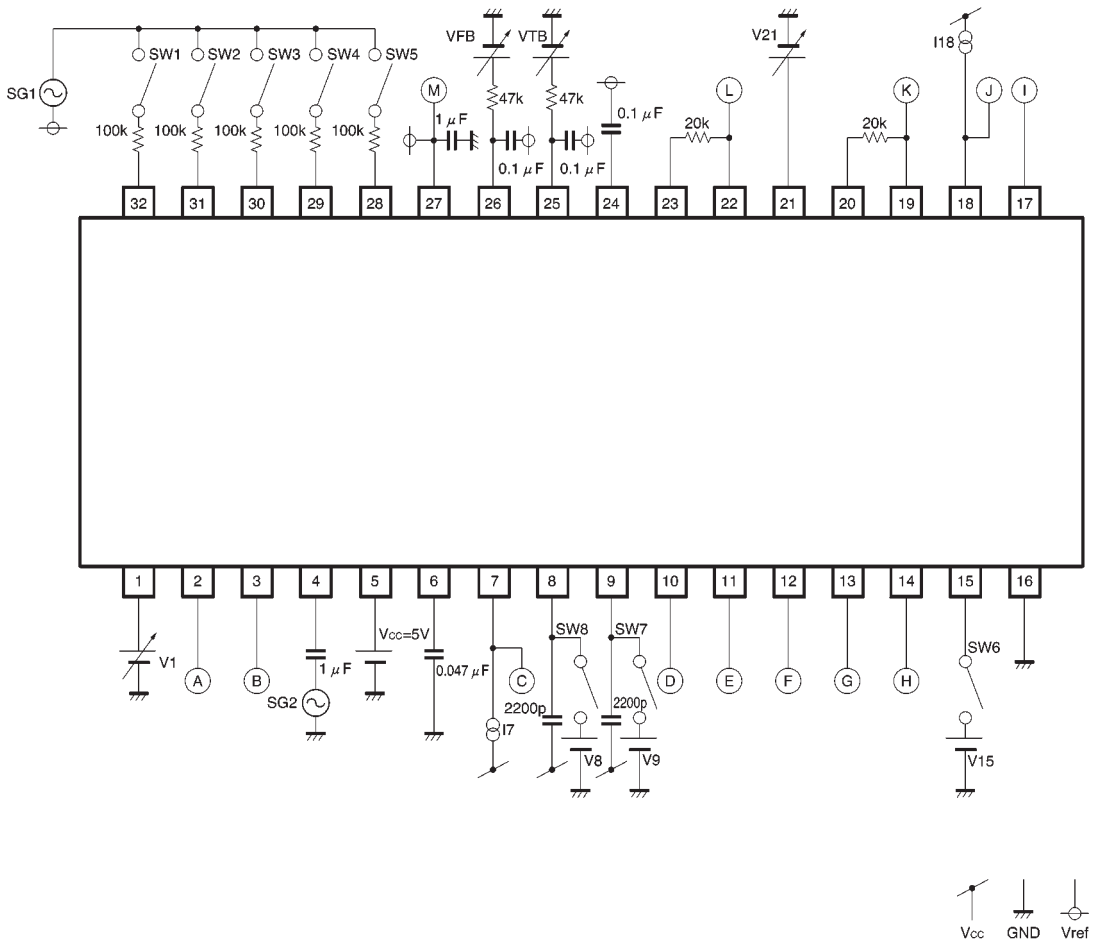


Fig.1

● Application example

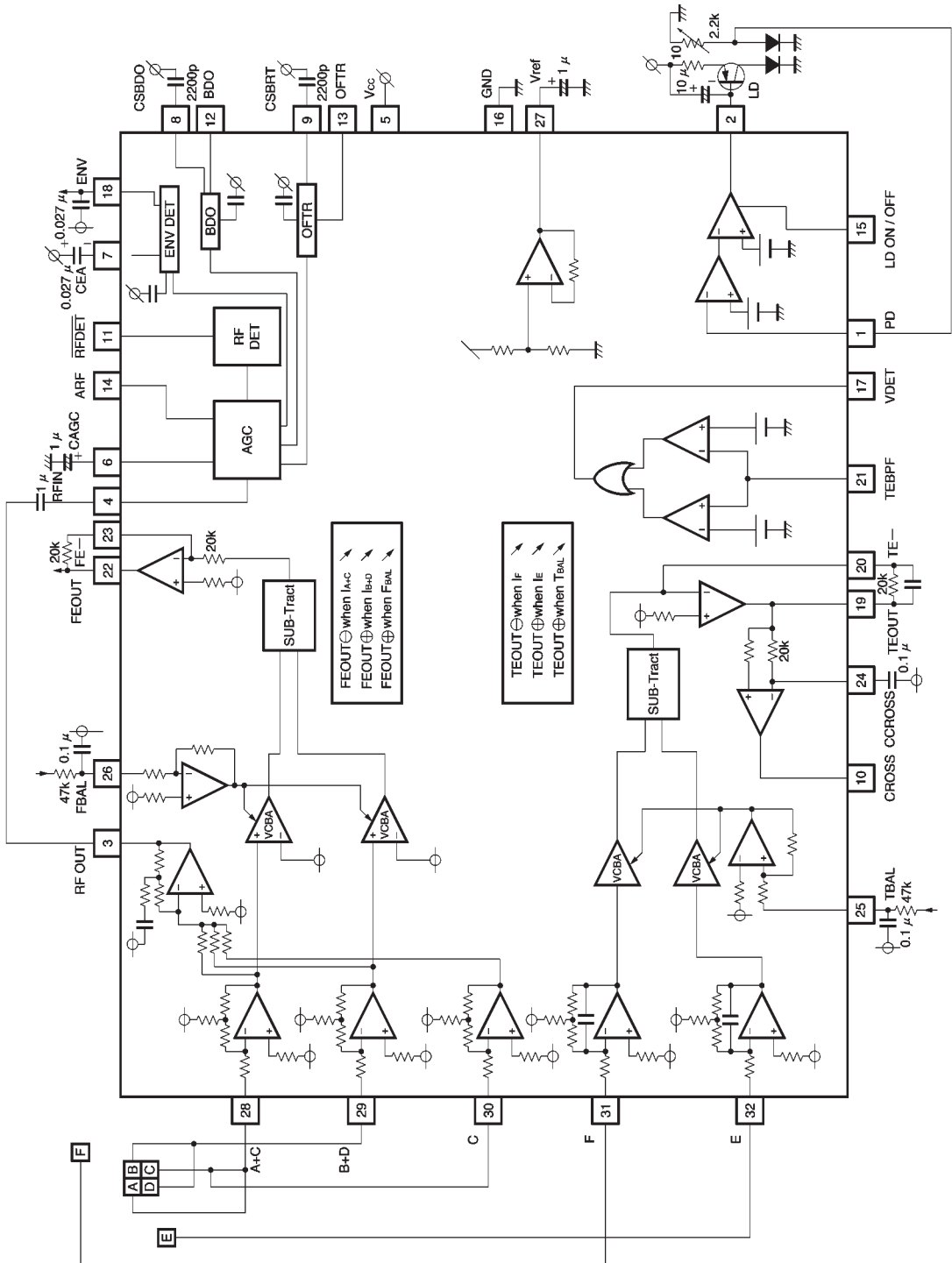


Fig.2

● Electrical characteristics curve

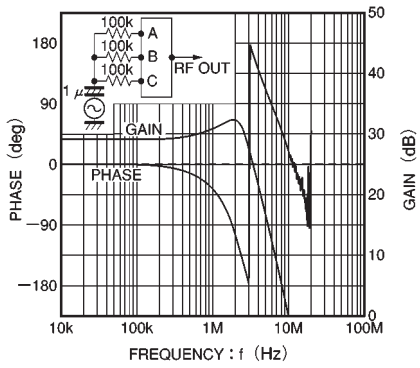


Fig.3 RF amplifier frequency characteristics

● External dimensions (Units: mm)

