

The BA7281BS is an HQ adaptive VTR luminance single processor. It incorporates a detail enhancer CCD adaptive line noise canceller circuit. Recording and playback processes can be operated within this single chip.

Features

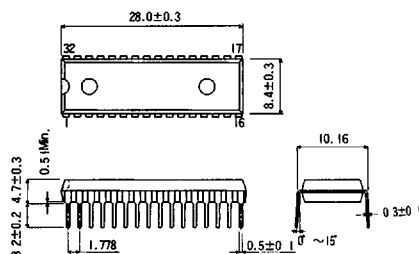
- available in an SDIP32 package
- this LSI integrates all circuits required for processing a luminance signal
- can be adapted to HQ system
- the limiter level of the detail enhancer can be set to on or off
- detail enhancer also cancels noise during playback
- non-linear circuit can shift carrier by $f_H/2$
- CCD adaptive line noise canceller circuit is built in
- a quadratic differential type picture control circuit is also incorporated
- mute and quasi V is insertable
- synchronous signal extension circuit is built in
- double limiter (LPF and HPF) is included
- $75\ \Omega$ driver included in video signal output unit

Applications

- Video cassette recorder

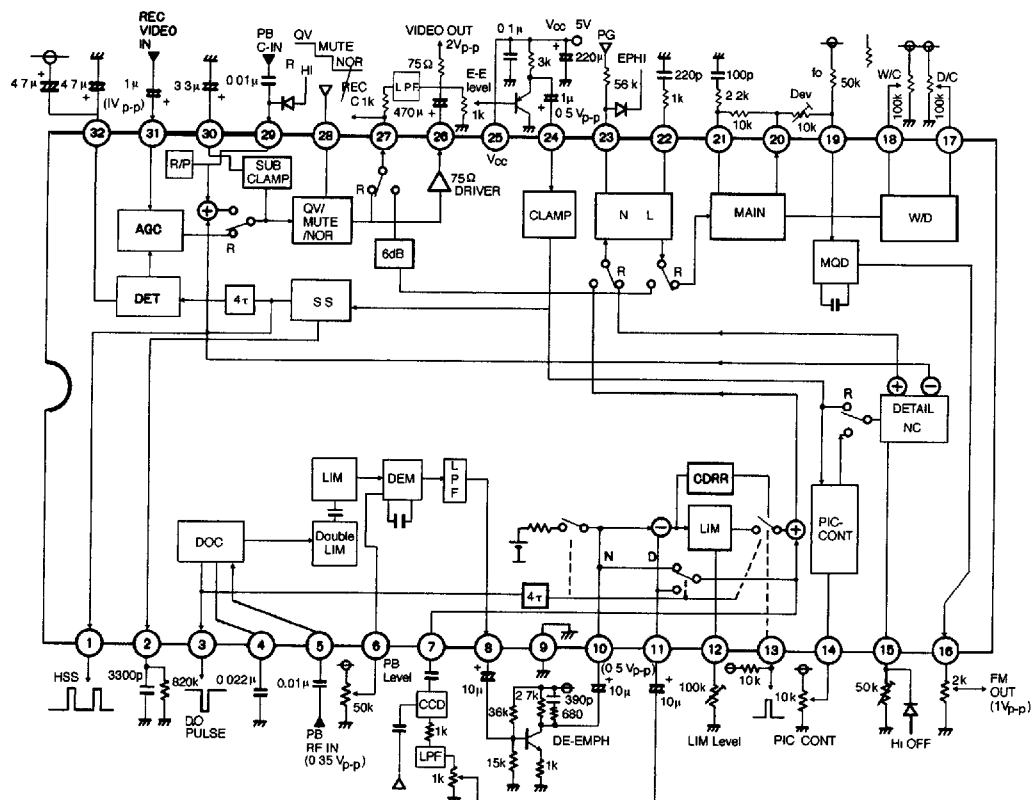
Dimensions (Units : mm)

BA7281BS (SDIP32)



BA7281BS Luminance signal processor

Block diagram



Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit	Conditions
Power supply voltage	V_{CC}	6	V	
Power dissipation	P_d	1100	mW	Reduce power by 11.0 mW for each degree above 25°C
Operating temperature	T_{opr}	$-20 \sim +70$	$^\circ\text{C}$	
Storage temperature	T_{stg}	$-55 \sim +125$	$^\circ\text{C}$	

Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{ V}$) (Sheet 1 of 2)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Power supply voltage	V_{CC}	5 ± 0.3			V	
Operating current REC	I_{CC-R}	32	50	68	mA	Pin 29 HIGH
Operating current PB	I_{CC-P}	32	50	68	mA	Pin 29 open
AGC output level	V_{AGC}	0.7		1.0	V_{pk-pk}	$V_{31} = 1 V_{pk-pk}$
AGC control characteristic	ΔV_{AGC}	-1.0	0.1	1.0	dB	$V_{31} = 0.5 \sim 2 V_{pk-pk}$
AGC frequency char.	f_{AGC}	-3	-1.5	0	dB	5 MHz/100 kHz
Sync-Sep input sensitivity	SS_{IN}	0.45			V_{pk-pk}	$V/S = 5/2$
NL emphasis response characteristic 1	NL_1	0	0.3	1	dB	$V_{24} = 0.5 V_{pk-pk}$ (0 dB), 100kHz
NL emphasis response characteristic 2	NL_2	0.5	1.5	3	dB	$V_{24} = 0.5 V_{pk-pk}$ (0 dB), 3 kHz
NL emphasis response characteristic 3	NL_3	2.5	4	5.5	dB	$V_{24} = -10\text{ dB}$, 3 MHz
NL emphasis response characteristic 4	NL_4	4.5	6	7.5	dB	$V_{24} = -20\text{ dB}$, 3 MHz
W/C variable range	V_W	160	190	240	%	
D/C variable range	V_D	-65	-50	-35	%	
FM modulation sensitivity	V_{FM}	12	14	16	kHz/ μA	
FM oscillator secondary	D_{FM}		-46	-37	dB	$f = 4\text{ MHz}$
DOC detector ON level	L_{DOC}	-18	-15		dB	0 dB = 350 mV $_{pk-pk}$
DOC detector OFF level	H_{DOC}		-13	-10	dB	
FM demodulation sensitivity	α	-0.5	-0.4	-0.3	V/MHz	
NL deemphasis response characteristic 1	NLD_1	-1	0	0	dB	$V_{10} = 0.5 V_{pk-pk}$ (0 dB), 100 kHz
NL deemphasis response characteristic 2	NLD_2	-2	-1	0	dB	$V_{10} = 0.5 V_{pk-pk}$ (0 dB), 3 MHz
NL deemphasis response characteristic 3	NLD_3	-5	-3	-1	dB	$V_{10} = -10\text{ dB}$, 3 MHz
NL deemphasis response characteristic 4	NLD_4	-10	-7.5	-5	dB	$V_{10} = -20\text{ dB}$, 3 MHz
DETAIL response characteristic 1	DE_1	0	1	2.5	dB	$V_{24} = 0.5 V_{pk-pk}$ (0 dB), 3 MHz LIM level max.
DETAIL response char 2	DE_2	0	0.1	1	dB	$V_{24} = -20\text{ dB}$, 100 kHz LIM level max.
DETAIL response char 3	DE_3	4.5	6	7.5	dB	$V_{24} = -20\text{ dB}$, 3 MHz, LIM level max
DETAIL response char 4	DE_4	3.5	5	6.5	dB	$V_{24} = -20\text{ dB}$, 1 MHz, LIM level max
DOC shift delay time	τ		0.2	0.5	μs	NORMAL to DELAY
DOC recovery delay time	$\Delta \tau$	1.5	2.5	3.5	μs	DELAY to NORMAL

BA7281BS Luminance signal processor**Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{ V}$) (Sheet 2 of 2)**

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
CCD buffer output level	V_C	0.45	0.5		$V_{\text{pk-pk}}$	
Line noise canceler LIM gain	G_{LIM}	3	5	7	dB	$V_{11} = 50\text{ mV}_{\text{pk-pk}}$, NL = OFF, LIM level max
Line correlation detector sensitivity ON level	V_{CORN}		60	75	mV	
Line correlation detection sensitivity level OFF level	V_{CORN}	35	50		mV	
NORMAL-DELAY dc offset	V_{ND}		1		mV	
PIC-CONT response characteristic 0	P_0	-2	-1	0	dB	$V_{14} = 2.5\text{ V}$, 2 MHz/100 kHz, $V_{24} = 0.1 V_{\text{pk-pk}}$, NC = OFF
PIC-CONT response characteristic 1	P_1	5	8	11	dB	$V_{14} = 4.0\text{ V}$, 2 MHz/100 kHz, $V_{24} = 0.1 V_{\text{pk-pk}}$, NC = OFF
PIC-CONT response characteristic 2	P_2	-1	0	1	dB	$V_{14} = 4.0\text{ V}$, 100 kHz, $V_{24} = 0.1 V_{\text{pk-pk}}$, NC = OFF
PIC-CONT response characteristic 3	P_3	-1	0	1	dB	$V_{14} = 1.0\text{ V}$, 100 kHz, $V_{24} = 0.1 V_{\text{pk-pk}}$, NC = OFF
PIC-CONT response characteristic 4	P_4	-13	-10	-7	dB	$V_{14} = 1.0\text{ V}$, 2 MHz/100 kHz, $V_{24} = 0.1 V_{\text{pk-pk}}$, NC = OFF
Chroma amp gain	G_{CNR}	9.5	11.5	13.5	dB	$V_{29} = 0.3 V_{\text{pk-pk}}$, 4 MHz
NC response characteristic 1	NC_1	-2	-1	0	dB	$V_{24} = 0.5 V_{\text{pk-pk}}$ (0 dB), 2 MHz, $V_{14} = 2.5\text{ V}$
NC response char 2	NC_2	-9.5	-7.5	-5.5	dB	$V_{24} = -20\text{ dB}$, 2 MHz, $V_{14} = 2.5\text{ V}$
NC response char 3	NC_3	-1.5	-0.5	0.5	dB	$V_{24} = -20\text{ dB}$, 100 MHz, $V_{14} = 2.5\text{ V}$
FM oscillation carrier interleave	Δf_0	6.9	7.9	8.9	kHz	
Pseudo-V offset	ΔQV	-100	0	100	mV	
Mute cross talk	CT		-46	-40	dB	1 MHz
REC/PB threshold voltage	V_{TR}	3.5	3.75	4.0	V	REC = HIGH
EP/SP threshold voltage	V_{ES}	1.0	1.5	2.0	V	SP = LOW
QV/MUTE threshold voltage	V_{QV}	3.0	3.5	4.0	V	
DETAIL/NOR threshold voltage	V_{MUTE}	1.0	1.5	2.0	V	
DETAIL/NC OFF-ON	V_{DC}	2.7	3.2	3.7	V	OFF = HIGH
DO pulse output voltage	V_{DC}	4	5		V	DO Mode = LOW
Uncorrelated pulse output voltage	V_{COR}	4	5		V	Uncorrelated = HIGH
PB output level	V_{PB}	0.75	0.95	1.15	$V_{\text{pk-pk}}$	$V_{10} = 0.4 V_{\text{pk-pk}}$
Copy guard AGC output	V_{cop}			40	%	