

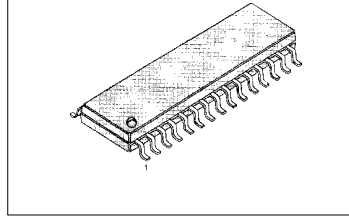
KA7302D

CDS, AGC, GAMMA CORRECTION

INTRODUCTION

The KA7302D is a bipolar monolithic integrated circuit for CCD Color Video Camera. It also provides functions of Correlated Double Sampling, Automatic Gain Control and Gamma Correction.

30-SSOP-375



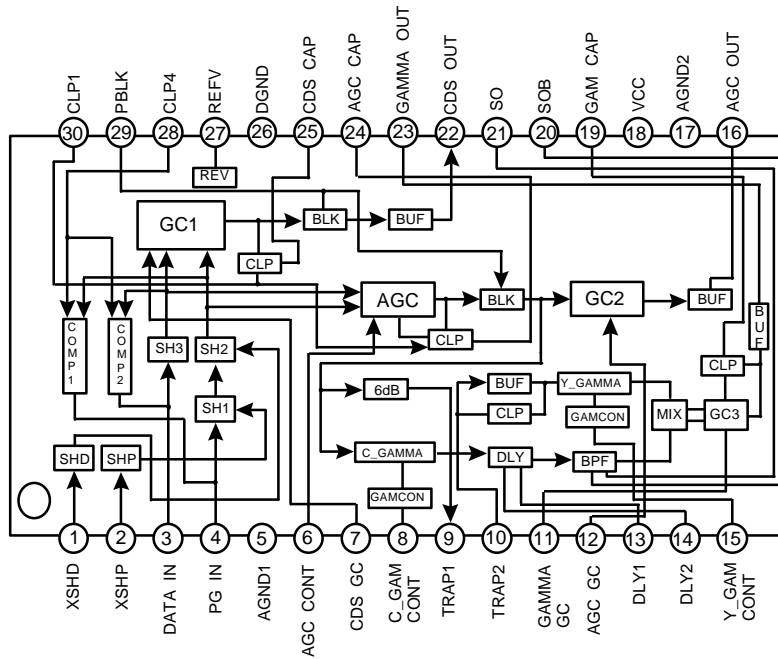
FEATURES

- CDS (Correlated Double Sampling)
- AGC (Automatic Gain Control)
- Gamma Compensation
- +5V Single Power Supply
- Low Power < 400 mW
- Dual Power Down Mode
 - AGC Part stand-by mode (AGC OUT : GND)
- Maximum Operational Frequency > 20 MHz

ORDERING INFORMATION

Device	Package	Operating Temperature
KA7302D	30-SSOP-375	-20°C ~ +75 °C

BLOCK DIAGRAM



PIN DESCRIPTION

No	Symbol	I/O	Description	Active
1	XSHD	I	Sample & Hold DATA Pulse	LOW
2	XSHP	I	Sample & Hold Pre - Charge Pulse	LOW
3	DATA IN	I	CCD Signal Input	
4	PG IN	I	CCD Signal Input	
5	AGND1	-	Analog Ground	
6	AGC CONT	I	AGC Gain Control	
7	CDS GC1	I	CDS Gain Control	
8	C γ CONT	I	C γ Gamma Control	
9	TRAP1	O	A Luminance trap filter is tied between this pin & Trap2	
10	TRAP2	I	Y γ Gamma Control	
11	γ GC3	I	GC3 Gain Control	
12	AGC GC2	I	GC2 Gain Control	
13	DLY1	I	Output for Delay (Chroma Signal)	
14	DLY2	O	Input for Delay (Chroma Signal)	
15	Y γ CONT	I	Y Gamma Curve Control	
16	AGC OUT	O	AGC Signal Output	
17	AGND2	-	Analog Ground	
18	VCC	-	Power Supply	
19	γ CAP	O	Gamma Clamp Capacitor	
20	SOB	O	Connected to BPF	
21	SO	O	Connected to BPF	
22	CDS OUT	O	CDS Signal Output	
23	γ OUT	O	Gamma Signal Output	
24	AGC CAP	O	AGC Clamp Capacitor	
25	CDS CAP	O	CDS Clamp Capacitor	
26	DGND	-	Digital Ground	
27	REFV	O	Reference Voltage Output	HIGH
28	CLP4	I	Clamp Pulse 4 Input	
29	PBLK	I	Pre - Blanking Pulse Input	LOW
30	CLP1	I	Clamp Pulse 1 Input	HIGH

* HIGH(H): 4.0V \uparrow , LOW(L): 4.0V \downarrow

ABSOLUTE MAXIMUM RATINGS(Ta = 25°C)

Characteristics	Symbol	Value	Unit
Power Source Voltage	Vcc	7	V
Power Dissipation	Pd	900	mW
Operating Temperature	Topr	-20 ~ 75	°C
Storage Temperature	Tstg	-65 ~ 150	°C

RECOMMENDED OPERATING CONDITIONS(Ta = 25°C)

Characteristics	Symbol	Value	Unit
Supply Voltage	Vcc	4.5 ~ 5.5	V

ELECTRICAL CHARACTERISTICS(V_{cc} = 4.5 ~ 5.5 V , T_a = 25 °C)

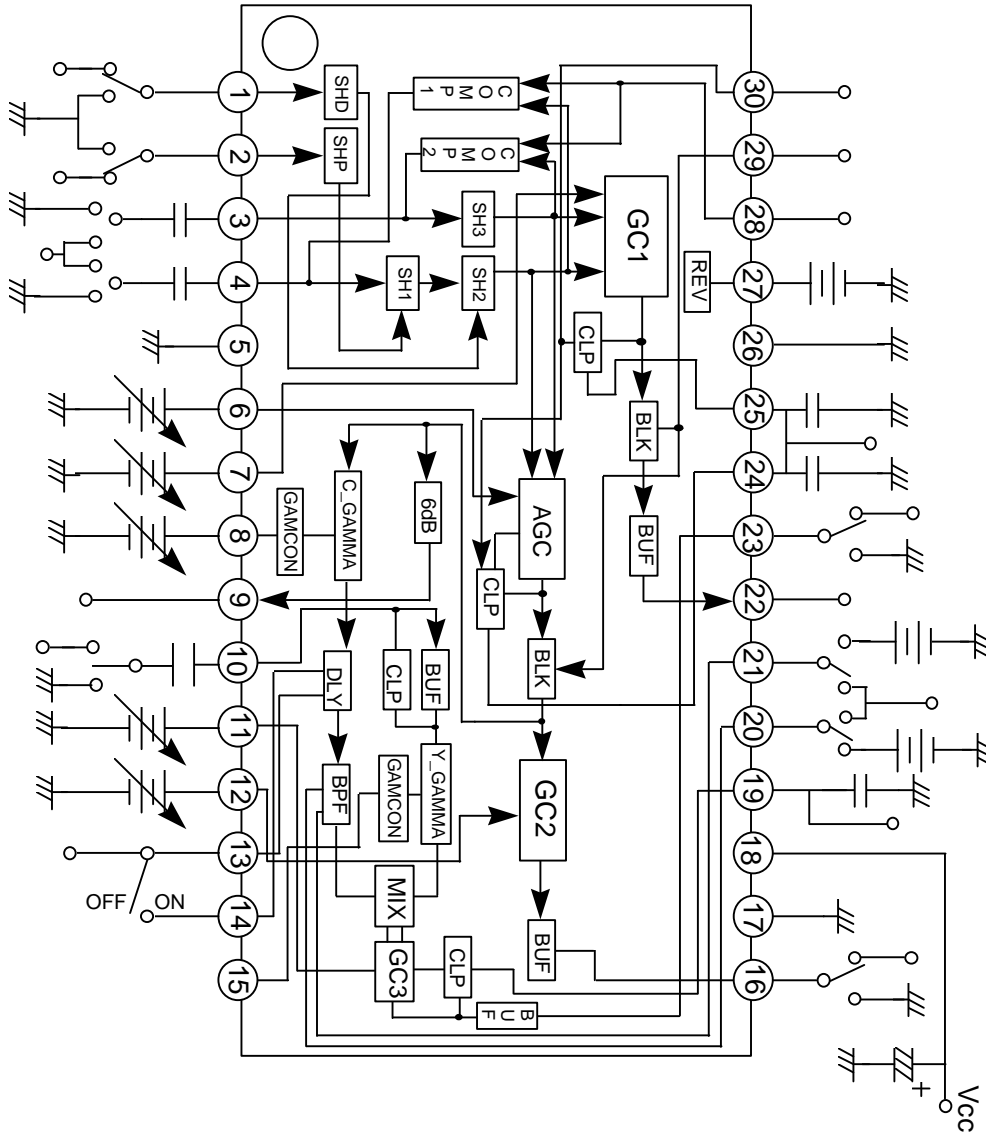
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
SUPPLY CURRENT	ICCR1	AGC OUT & GAM OUT → OPEN V _{cc} =5V	61	73	88	mA
	ICC1	AGC OUT → GND V _{cc} =5V	55	64	78	mA
GC1 CONT.Min	GC1A Min	CDS OUT/DATA IN CDS GC=1.5V	-	-6	-4	dB
GC1 CONT.Max	GC1A Max	CDS OUT/DATA IN CDS GC=4.5V	14	18	-	dB
CDS OUT Maximum Voltage Swing	CDR1	DATA IN = 400mV (Peak to Peak)	2.0	-	-	V
GC1 AMP CMRR	CMR1	15.75KHz	-	-4.0	-36	dB
GC1 AMP Bandwidth	FC1A	10MHz	-3	-	-	dB
AGC CONT.Min	AGC1 Min	TRAP1 OUT/DATA IN AGC CONT =1.5V Cal :AGC Gain -6dB	4.0	6.0	8.0	dB
AGC CONT.Max	AGC1 Max	TRAP1 OUT/DATA IN AGC CONT = 4.5V Cal: AGC Gain -6dB	30	32	-	dB
AGC AMP CMRR	CMRA	15.75KHz	-	-40	-36	dB
AGC AMP Bandwidth	FCA1	20MHz	-3	-	-	dB
GC3 AMP CMRR	CMR3	15.75KHz	-	-40	-36	dB
GC3 AMP Bandwidth	FC3A	10MHz	-3	-	-	dB
GC3 CONT.Min	GC3A Min	Y OUT/SO Y GC=1.5V	-	-6	-4	dB
GC3 CONT.Max	GC3A Max	Y OUT/SO Y GC=4.5V	14	18	-	dB
Y OUT Maximum Voltage Swing	GDR1	SO Input = 400mV (Peak to Peak)	2.0	-	-	V

ELECTRICAL CHARACTERISTICS

(Vcc = 4.5 ~ 5.5 V , Ta = 25 °C)

Characteristics		Symbol	Test Condition	Min	Typ	Max	Unit
γY	$\gamma Y1.0$ (Typ)	$\gamma Y T.1$	TRAP2 input=0.4V _{pp} Gamma GC=2.6V Measure : Gamma Output	400	525	650	mV
	$\gamma Y2.0/\gamma Y1.0$	$\gamma Y 2.0A$	TRAP2 input=0.8V _{pp} Gamma GC = 2.6V Cal.:Gamma Output / $\gamma Y T1$	1.2	1.4	1.6	-
	$\gamma Y3.0/\gamma Y1.0$	$\gamma Y 3.0A$	TRAP2 input=1.2V _{pp} Gamma GC = 2.6V Cal.:Gamma Output / $\gamma Y T1$	1.4	1.6	1.8	-
	$\gamma Y0.5/\gamma Y1.0$	$\gamma Y 0.5A$	TRAP2 input=0.2V _{pp} Gamma GC = 2.6V Cal.:Gamma Output / $\gamma Y T1$	0.68	0.74	0.80	-
	$\gamma Y0.5$ (Max)	$\gamma Y Max$	TRAP2 input=0.2/0.4V _{pp} Gamma GC = 2.6V Y_Gamcont = 1.8V Cal.:Gamma Output (0.2 V _{pp} / 0.4 V _{pp})	0.78	0.85	0.92	-
	$\gamma Y 0.5$ (Min)	$\gamma Y Min$	TRAP2 input=0.2/0.4V _{pp} Gamma GC = 2.6V Y_Gamcont = 5.0V Cal.:Gamma Output (0.2 V _{pp} / 0.4 V _{pp})	0.55	0.62	0.70	-
γC	$\gamma C 1.0$ (Typ)	$\gamma CT1 Typ.$	TRAP1 output=0.8V _{pp} C_GAMCONT = 0.0V Measure, : DL1 Output	270	310	350	mV
	$\gamma C 1.0$ (Max)	$\gamma CT1 Max$	TRAP1 output=0.8V _{pp} C_GAMCONT = 1.8V Measure, : DL1 Output	300	340	380	mV
	$\gamma C 1.0$ (Min)	$\gamma CT1 Min$	TRAP1 output=0.8V _{pp} C_GAMCONT = 5.0V Measure, : DL1 Output	240	275	310	mV
	$\gamma C 0.5/\gamma C 1.0$	$\gamma C 0.5 A$	TRAP1 output=0.4V _{pp} C_GAMCONT = 0.0V Measure, : DL1 Output Cal. : DL1 output / $\gamma CT1 Typ.$	0.5	0.6	0.7	-
	$\gamma C 2.0 / \gamma C 1.0$	$\gamma C 2.0 A$	TRAP1 output=1.6V _{pp} C_GAMCONT = 0.0V Measure, : DL1 Output Cal. : DL1 output / $\gamma CT1 Typ.$	1.38	1.55	1.72	-

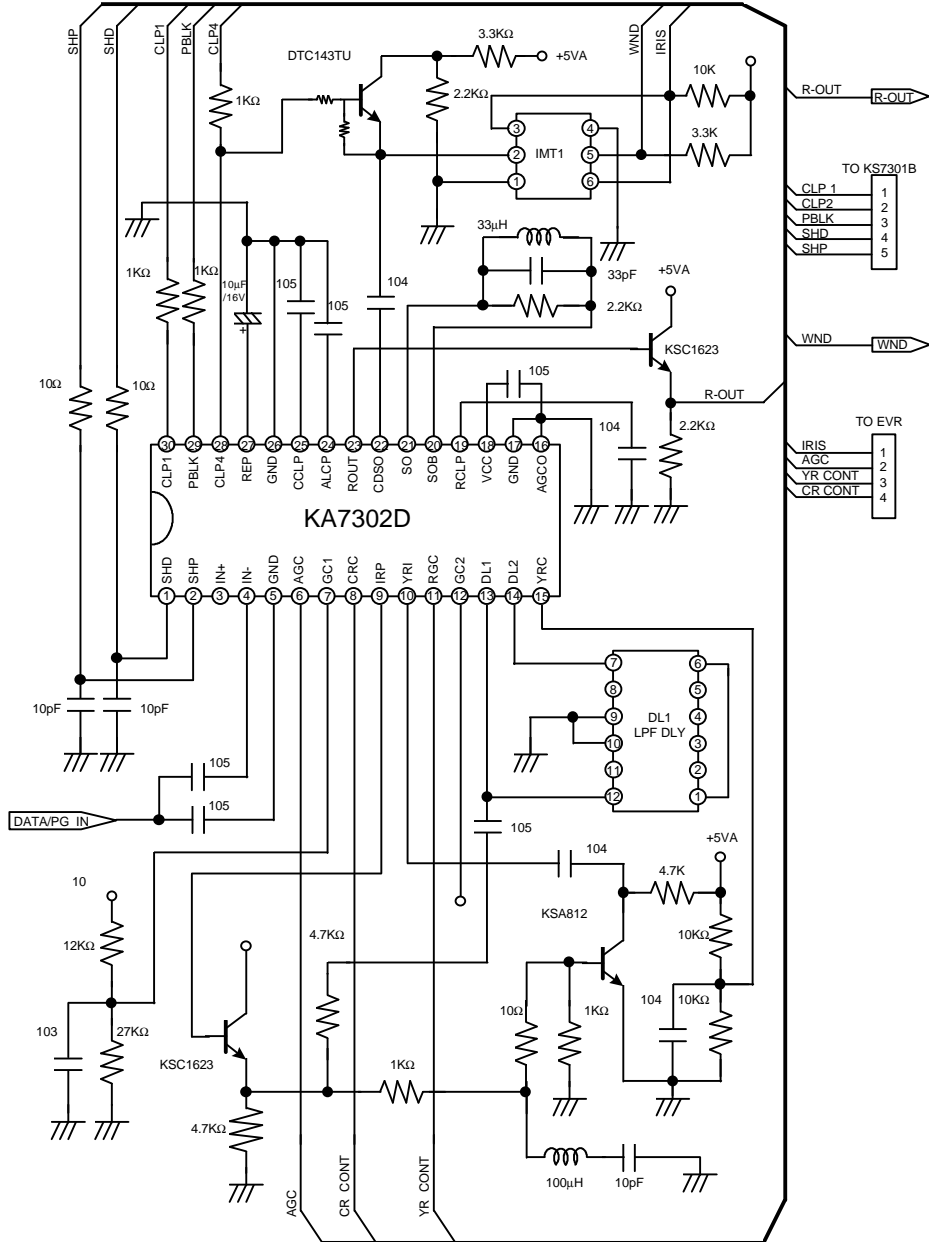
TEST CIRCUIT



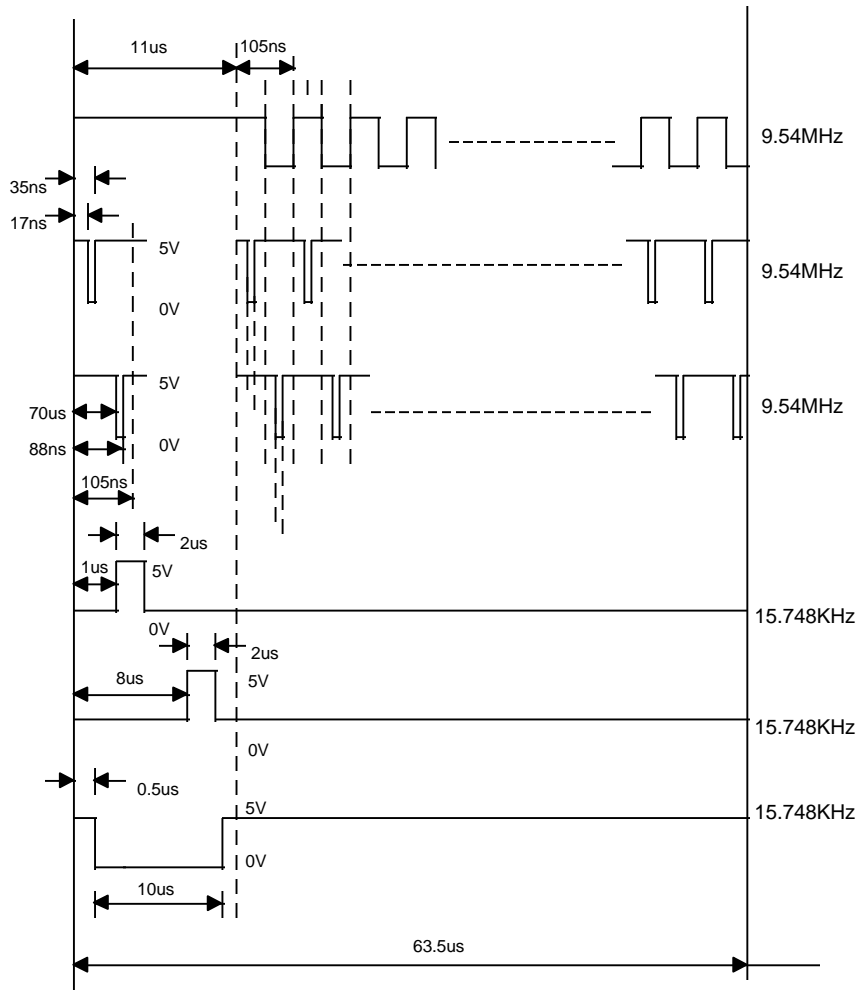
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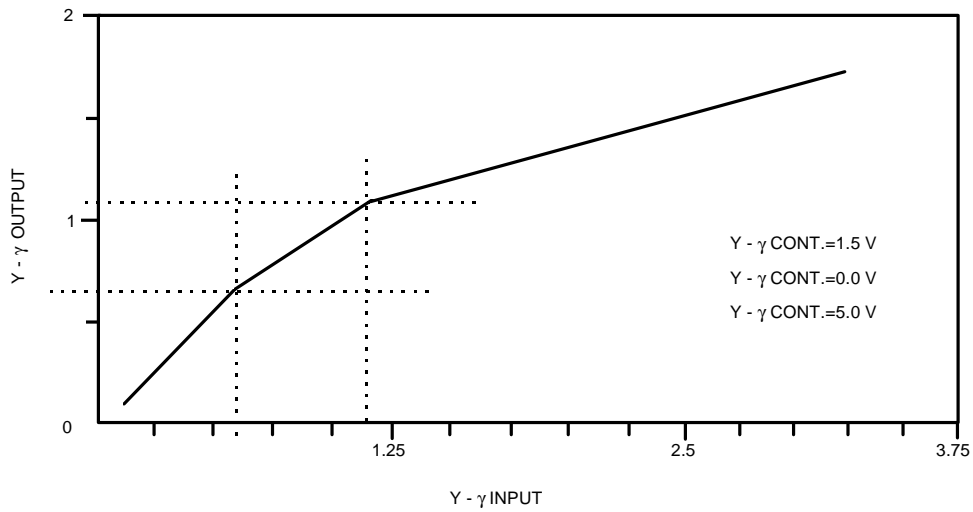
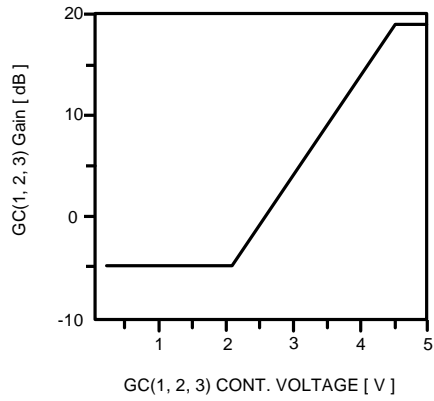
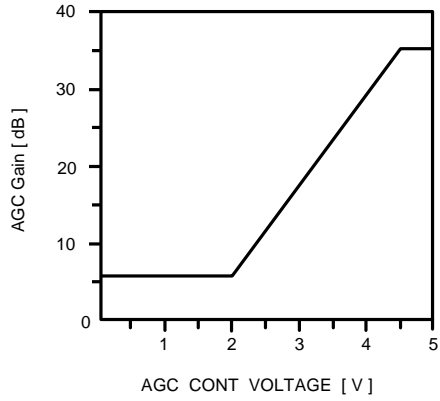
APPLICATION CIRCUIT



TIMING CHART



AMP CHARACTERISTIC GRAPHS



PACKAGE DIMENSIONS

30-SSOP-375

unit:mm

