SGS-THOMSON MICROELECTRONICS

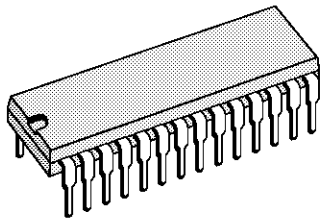
SAA5231

DATA SLICER FOR TELETEXT PROCESSOR

- SEPARATION OF TELETEXT DATA FROM THE COMPOSITE VIDEO SIGNAL
- SEPARATION OF HORIZONTAL AND VERTICAL SYNCHRONIZATION SIGNALS FROM THE COMPOSITE VIDEO SIGNAL
- EXTERNAL OSCILLATOR GENERATING 6MHz SIGNAL SYNCHRONIZED TO A MULTIPLE OF THE LINE FREQUENCY BY PLL
- A 6.9375MHz CLOCK GENERATED FROM AN EXTERNAL QUARTZ CRYSTAL
- "AFTER-HOURS" SYNCHRONIZATION OPTION
- PROGRAMMABLE LEVELS FOR THE INPUT COMPOSITE VIDEO SIGNAL (1V OR 2.5V)
- PROCESSING OF EXTERNAL TELETEXT DATA
- OUTPUT OF POSITIVE OR NEGATIVE SYNCHRONIZING SIGNALS
- 28 PIN DIP PACKAGE
- HDS2P2 TECHNOLOGY

DESCRIPTION

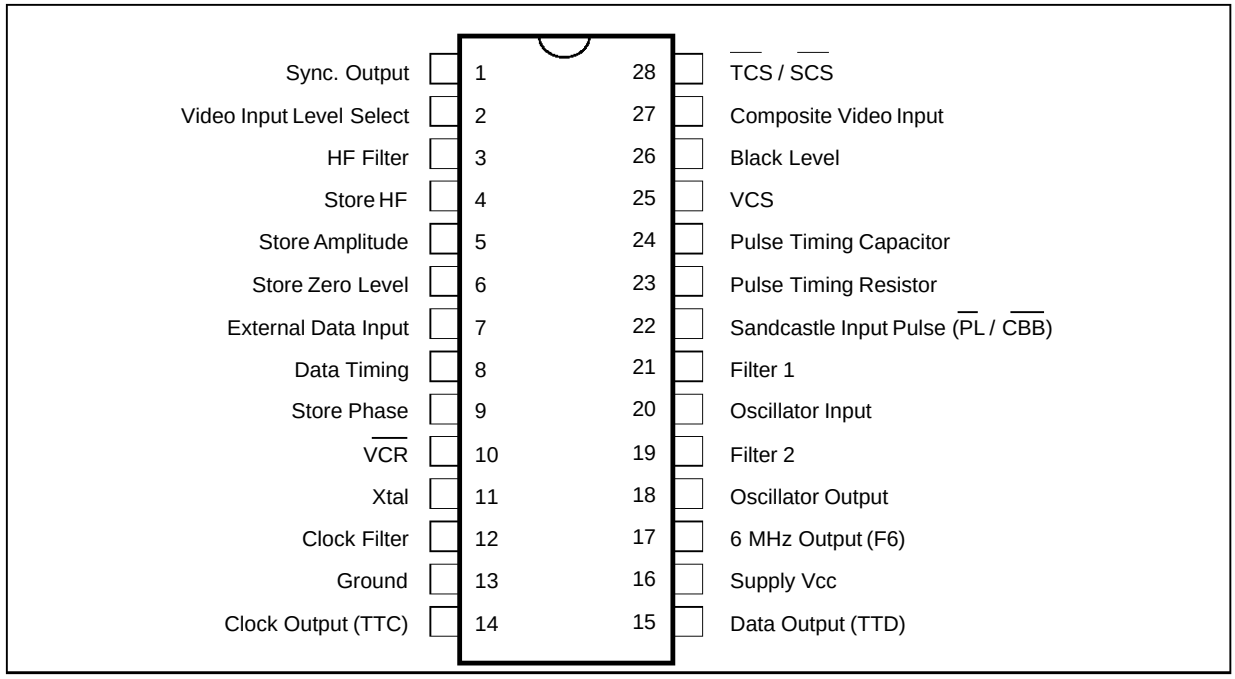
The SAA5231 is a monolithic integrated circuit in 28 Pin DIP package designed to separate Teletext signals from TV signal.



DIP28
(Plastic Package)

ORDER CODE : SAA5231

PIN CONNECTIONS



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PIN DESCRIPTION

Pin	Function	Description
1	Display Synchronization Outputs	Synchronization signal output available as positive or negative
2	Input video signal level	Input level selected as 1V (Pin 2 low) or 2.5V (Pin 2 not connected)
3	H.F. filter	Video signal filtering using an external capacitor of 15pF
4-5-6	"Store HF" "Store amplitude" "Store zero level"	Three external capacitors used to store : 1/ HF amplitude 2/ Amplitude of adaptative data slicer 3/ Zero level
7	External data input	"Teletext data slice" input from external circuit
8	Data timing	Connection of an external 270pF capacitor for the timing of the adaptative data slicer
9	Store phase	Storage on an external capacitor of the output signal "Clock phase detector"
10	"Video Tape Recorder" mode ($\overline{VCR}$)	Control signal for the PLL in the low-time constant mode
11	Crystal	External connection for a 13.875MHz crystal. This frequency, divided by 2, yields the 6.9375MHz cloc
12	Clock filter	Filter for 6.9375MHz clock
13	Ground	
14	Teletext clock output	Clock output for the SDA5243
15	Teletext data output	Output of Teletext data for the SDA5243
16	Supply V_{CC}	
17	6MHz clock output	6MHz clock output for the SDA5243
18/20	Oscillator output/input	An external resonant circuit between Pins 18 and 20 is connected to the 6MHz internal V_{CO}
19	Filter 2	Low time constant filter for phase detection of the horizontal signal
21	Filter 1	High time constant filter for phase detection of the horizontal signal
22	"Sandcastle" input pulse	Input of the sandcastle signal produced by the SDA5243 from the PL and CBB signals
23	Pulse timing resistor	External resistor of 68 kohms used to define the current for the pulse generator
24	Pulse timing capacitor	External capacitor of 270pF to define the timing of the pulse generator
25	Composite video synchronizing output (VCS)	Synchronizing output for the SDA5243
26	Black level	Storage of the black level for the adaptive sync. Separator on an external 68nF capacitor
27	Composite video input	Composite video signal input for the adaptive sync. Separator via an external capacitor of 2.2µF
28	Teletext composite sync. input ($\overline{TCS}$) or Scan composite sync. input ($\overline{SCS}$)	$\overline{TCS}$ input from the SDA5243 or $\overline{SCS}$ input from an alternative synchronizing circuit.

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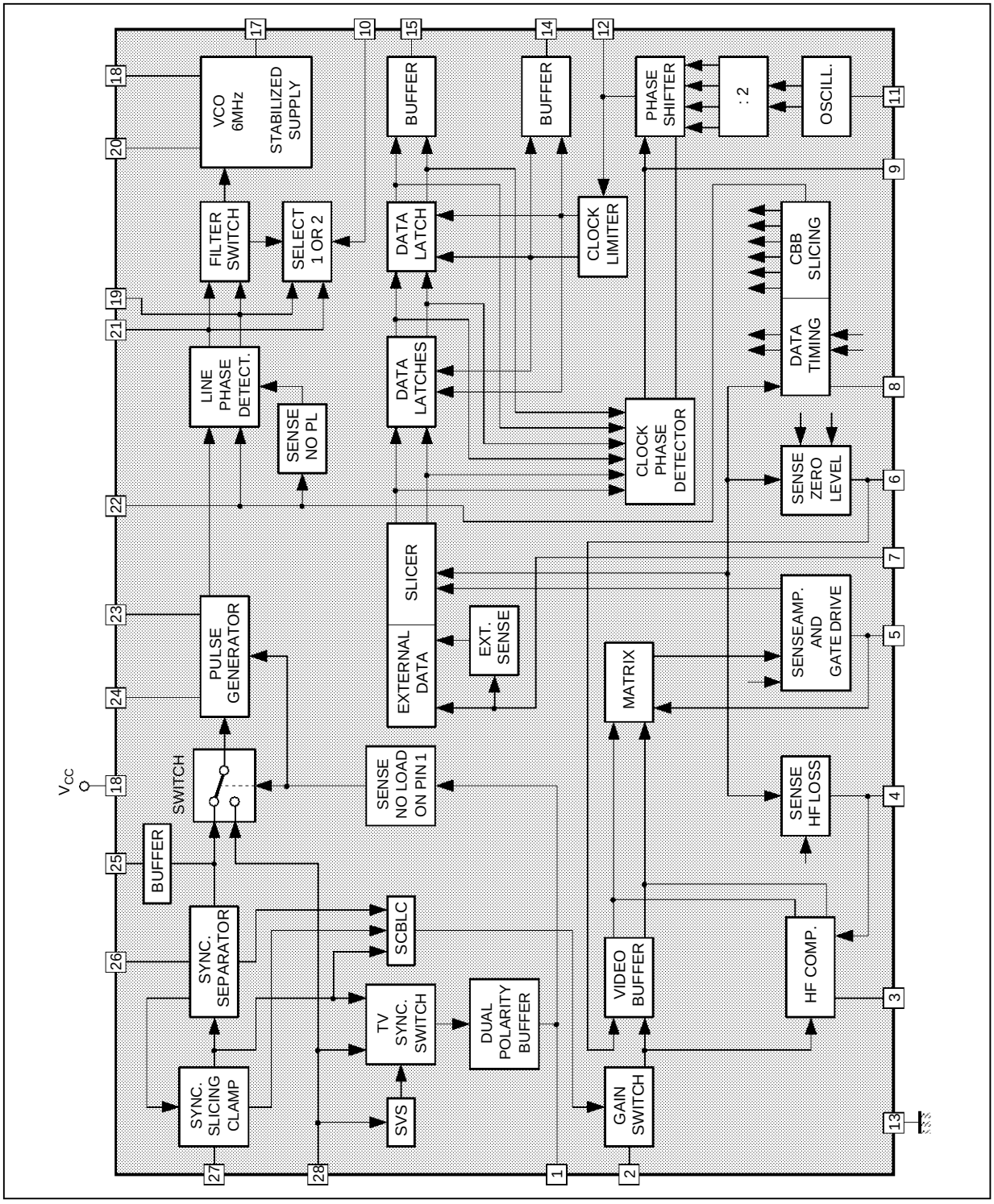
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{16}	Supply Voltage	13.2	V
$-I_{25}$	Output Current VCS	5	mA
$-I_{15}$	Output Current TTD	10	mA
$-I_{14}$	Output Current TTC	10	mA
$-I_{17}$	Output Current F6	10	mA
I_1	Output Current Sync.	5	mA
T_{stg}	Storage Temperature	-40, +150	^oC
T_j	Junction	0, +150	^oC
T_{amb}	Ambient Temperature	0, +70	^oC

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THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ (j-a)}$	Thermal Resistance Junction-Ambient	Max.	70	$^oC/W$

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ELECTRICAL CHARACTERISTICS (V_S = 12 V , T_A = 25^oC , unless otherwise specified)

Symbol	Parameter	Min	Typ	Max	Unit
POWER SUPPLY (Pin 16)					
V_S	Supply Voltage	10.8	12	13.2	V
I_S	Supply Current		70		mA
CVBS INPUT (Pin 27)					
V_{27}	Input Signal Level Pin 2 to ground Pin 2 open	 0.7 1.75	 1 2.5	 1.4 3.5	 v v
$V_{27(p-p)}$	Synchronism Signal Amplitude	0.1	-	1	V
$V_{27(txt)}$	Teletext Data Level Pin 2 to ground Pin 2 open	 0.3 0.75	 0.46 1.15	 0.7 1.75	 v v
R_{G27}	Generator Resistance			250	Ω
VIDEO INPUT LEVEL SELECT (Pin 2)					
V_{2L}	Low Voltage (V_{27} = 1V)	0		0.8	V
V_{2H}	High Voltage (V_{27} = 2.5V)	2		5.5	V
$-I_{2L}$	Low Current	0		150	µA
I_{2H}	High Current	0		1.3	mA
TELETEXT DATA (Pin 5)					
$V_{15(p-p)}$	Signal TTD Output	2.5	3.5	4.5	V
t_r , t_f	Transition Times	20	30	45	ns
C_{15}	Load Capacitance			40	pF
V_{15DC}	DC Voltage at Output		4		V
DATA CLOCK (Pin 14)					
$V_{14(p-p)}$	Signal TTC	2.5	3.5	4.5	V
t_r , t_f	Transition Times	20	30	45	ns
C_{14}	Load Capacitance			40	pF
t_D	Time Deviation with Respect to TTD	-20	0	20	ns
V_{14DC}	DC Voltage at Output		4		V
SYNC. PULSE SEPARATION VCS (to SDA5243) (Pin 25)					
V_{25L}	Low Output Voltage	0		0.4	V
V_{25H}	High Output Voltage	2.1		5.5	V

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ELECTRICAL CHARACTERISTICS (V_S = 12 V , T_A = 25°C ,unless otherwise specified) (continued)

Symbol	Parameter	Min	Typ	Max	Unit
SYNC. PULSE SEPARATION VCS (to SDA5243) (Pin 25)					
I_{25L}	Low Output Current			0.5	mA
$-I_{25H}$	HighOutput Current			1.5	mA
t_D	Delay with respect to CVBS sync.		0.5		µs
SYNC. OUTPUT DRIVER (to TV set) (Pin 1)					
$V_{1(p-p)}$	Output Voltage TCS Operation CVBS Operation		0.45	 1	 V V
V_{1DC}	DC voltage with load resistor to ground (positive synchronous signal)		1.4		V
$-I_1$	Output Current			3	mA
V_{1DC}	DC voltage with load resistor to V_S (negative synchrononous signal)		10.1		V
I_1	Output Current			3	mA
6MHz CLOCK F6 (Pin 7)					
$V_{17(p-p)}$	F6 Output Signal (negligible harmonic content)	1	2	3	V
t_r , t_f	Transition Times	20		40	ns
C_{17}	Load Capacitance			40	pF
V_{17DC}	DC Voltage	4		8.5	V
SYNCHRONIZATION SELECTION (Pin 28)					
$-I_{28}$	Input Current $\overline{TCS}$ Operation (V_{28} = 0 to 7 V)	40	70	100	µA
I_{28}	Input Current CVBS Operation (V_{28} = 10 to V_S)	-5	0	5	µA
V_{28L}	Low Input voltage ($\overline{TCS}$ operation) (load resistor at Pin 1)	0		0.8	V
V_{28H}	High Input voltage ($\overline{TCS}$ operation) (load resistor at Pin 1)	2		6.1	V
V_{28L}	Low Input Voltage ($\overline{SCS}$ operation) (Pin 1 open)	0		1.5	V
V_{28H}	High Input Voltage ($\overline{SCS}$ operation) (Pin 1 open)	3.5		6.1	V
t_p	Line Synchronous Pulse Width $\overline{TCS}$ Operation SCS Operation		 2 3		 µs µs
VCR OPERATION (Pin 10)					
V_{10L}	Low Input Voltage VCR Operation	0		0.8	V
V_{10H}	High Input Voltage Standard Operation	2		V_S	V
I_{10}	Input Current	-10	0	10	A
SANDCASTLE PULSE INPUT (Pin 22)					
V_{22L}	Phase Locked Mode Input Low Voltage PL	0		3	V
V_{22H}	Phase Locked Mode Input High Voltage PL	3.9		5.5	V
t_{pl}	PL - low time for free-wheeling oscillator	100			ms
V_{22L}	Reset Pulse for Data Separation Input Low Voltage CBB	0		0.5	V
V_{22H}	Reset Pulse for Data Separation Input High Voltage CBB	1		5.5	V
I_{22}	Input Current	-10		10	µA
EXTERNAL DATA INPUT (CURRENT SOURCE DRIVING) (Pin 7)					
	Internal Data Processing Input				
I_7	Current	-10	0	100	µA
V_7	Voltage (I_7 = -10 to 100µA)		10		V
	External Data Processing Input				
I_{7L}	Current for low Level	-175	-40	-25	µA
I_{7H}	Current for High Level	-1000	-500	-325	µA
V_7	Voltage (I_7 = -1000 to -25µA)	7	8		V

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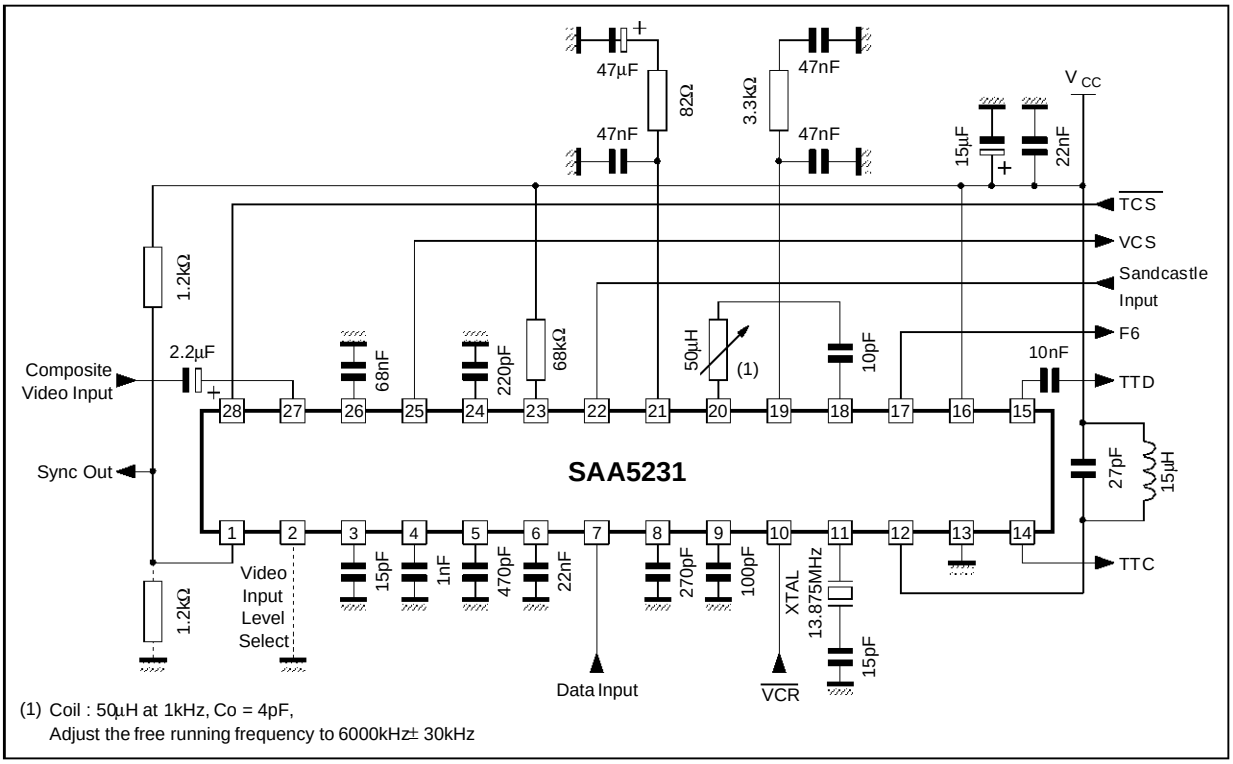
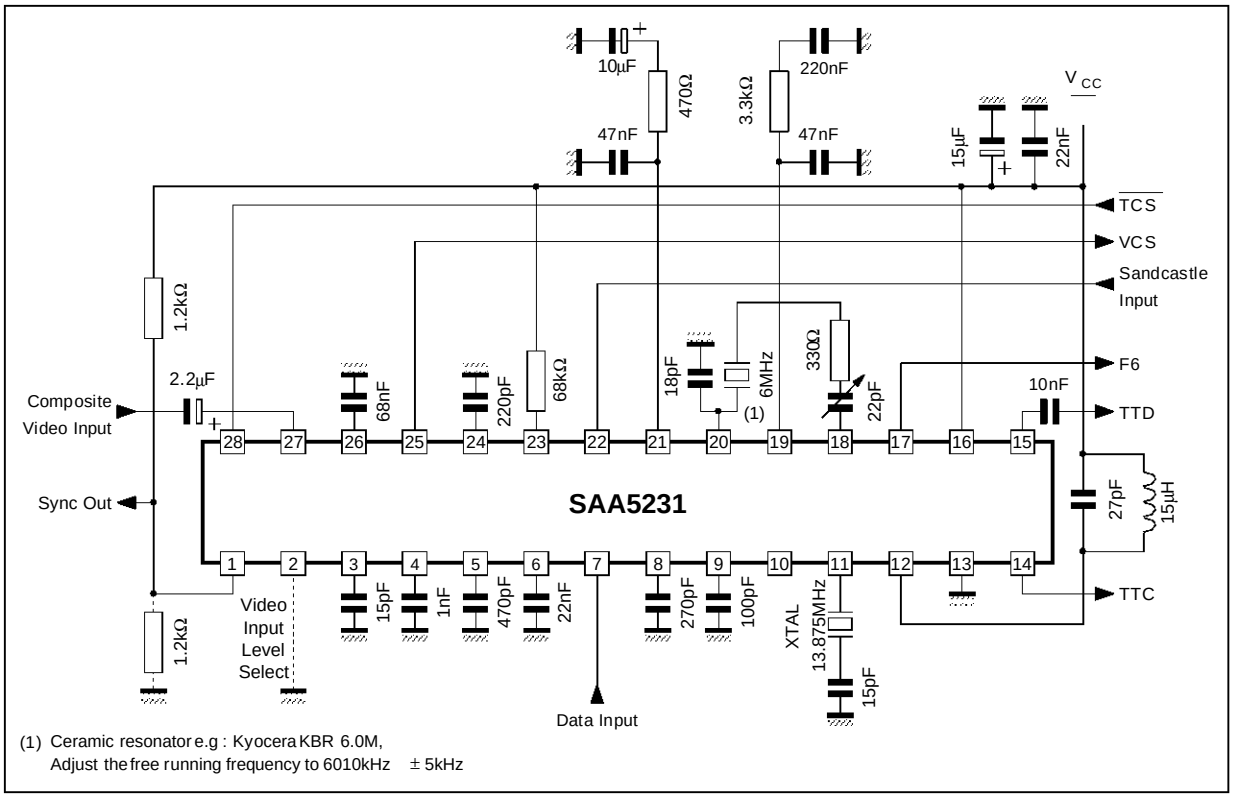
APPLICATION DIAGRAMS

Figure 1a : Application Diagram with LC Circuit in 6MHz PLL



(1) Coil : 50µH at 1kHz, Co = 4pF,
Adjust the free running frequency to 6000kHz± 30kHz

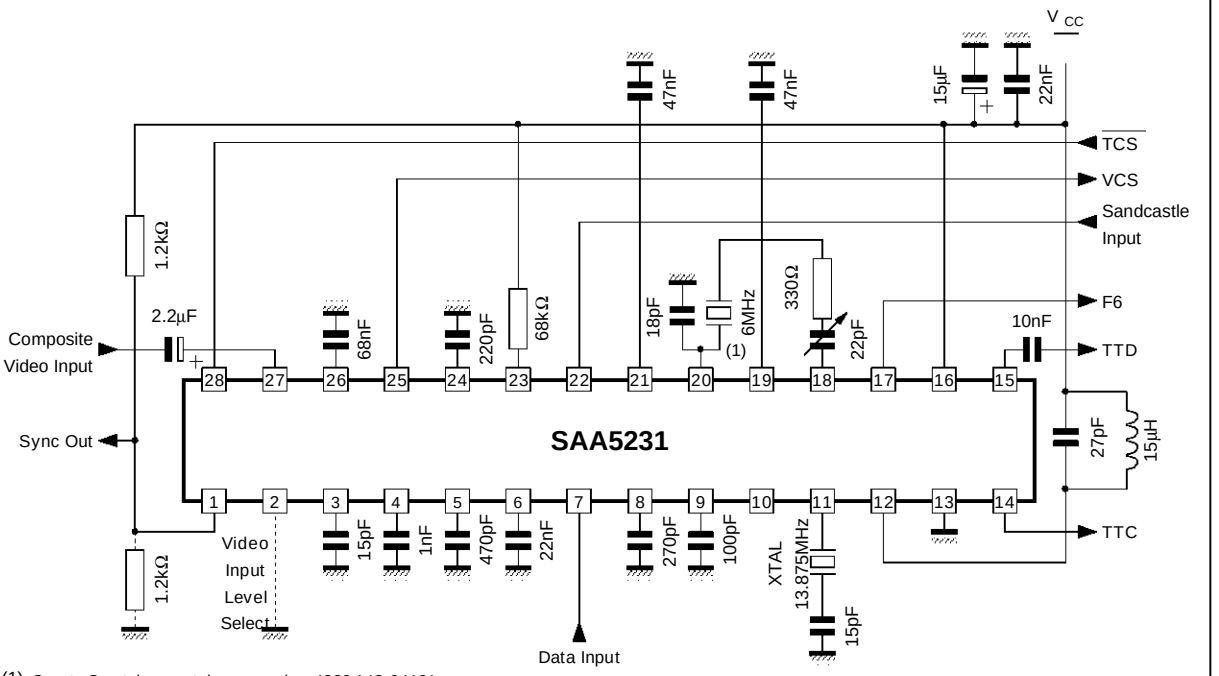
Figure 1b : Application Diagram with Ceramic Resonator in 6MHz PLL



(1) Ceramic resonator e.g : Kyocera KBR 6.0M,
Adjust the free running frequency to 6010kHz ± 5kHz

APPLICATION DIAGRAMS (continued)

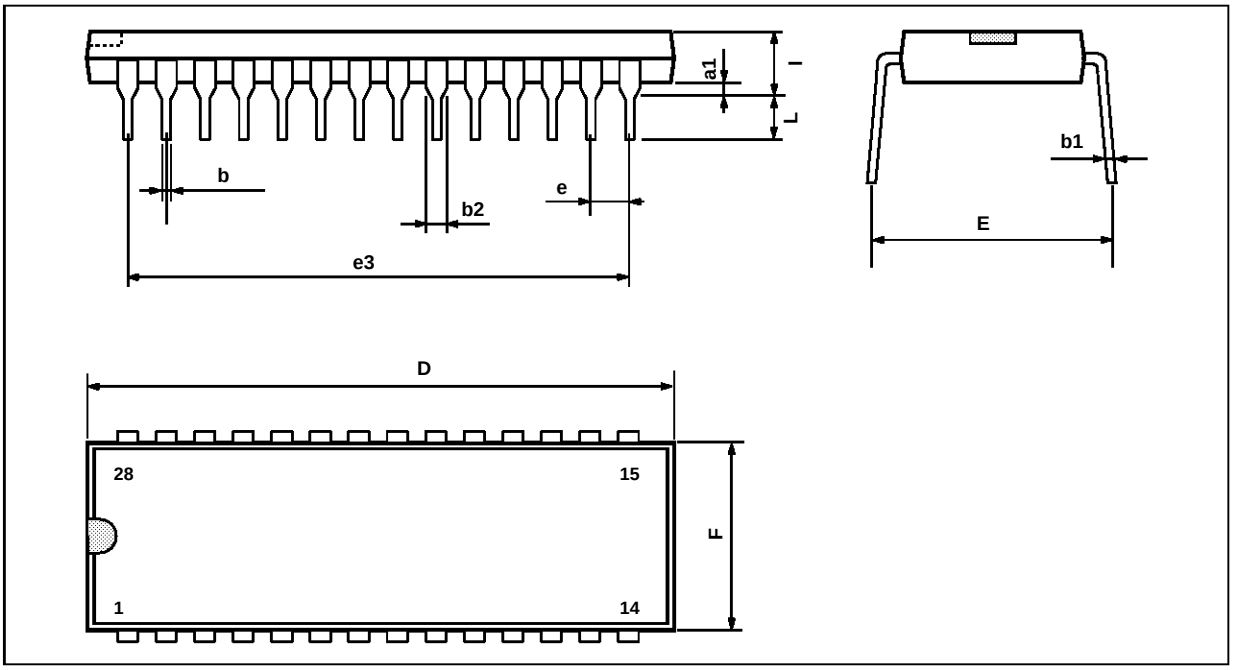
Figure 1c : Application Diagram with Quartz Crystal in 6MHz PLL



(1) Quartz Crystal e.g catalogue number 4322 143 04101,
Adjust the free running frequency to 6000.2kHz ± 0.2kHz

PACKAGE MECHANICAL DATA

28 PINS - PLASTIC DIP



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Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1		0.63			0.025	
b		0.45			0.018	
b1	0.23		0.31	0.009		0.012
b2		1.27			0.050	
D			37.4			1.470
E	15.2		16.68	0.598		0.657
e		2.54			0.100	
e3		33.02			1.300	
F			14.1			0.555
i		4.445			0.175	
L		3.3			0.130	

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