



SANYO Semiconductors

# DATA SHEET

## LA7693X Series

Monolithic Linear IC

For NTSC/PAL/SECAM Color TVs

— Built-in CTV Microcontroller

Video and Sound Processing ICs  
(VIF/SIF/Y/C/Deflection/CbCr IN)

### Overview

The LA7693X series is a single-chip video and sound processor IC with a built-in microcontroller that supports all of the different worldwide broadcasting systems. The IC provides fully integrated solution to rationalize the design of color TV sets, increase productivity, and reduce total costs.

### Functions

- I<sup>2</sup>C bus control system with a built-in microcontroller
- VIF/SIF/Y/C/Deflection/CbCr IN
- Adjustment-free VIF/SIF
- 1X'tal multi-system that supports all broadcasting systems
- No VCO coil required
- Internal sound carrier BPF, 4-system sound carrier trap
- Digital AFT system
- Supports EW (LA76933J, LA76938Y)
- Supports SECAM (LA76936Y, LA76938Y)

### Line-up

Type name	NTSC	PAL	SECAM	Deflection	CbCr input	E/W
LA76931K	○	○	×	○	○	×
LA76933J	○	○	×	○	○	○
LA76936Y	○	○	○	○	○	×
LA76938Y	○	○	○	○	○	○

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## LA7693X series

### Specifications

#### Maximum Ratings (BIP Chip) at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_8$ max		7.0	V
	$V_{43}$ max		7.0	V
	$V_{55}$ max		7.0	V
Maximum supply current	$I_{11}$ max		25	mA
	$I_{19}$ max		35	mA
Allowable power dissipation	$P_d$ max	$T_a \leq 65^\circ\text{C}^*$	1.6	W
Operating temperature	$T_{opr}$		-10 to +65	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

\* Mounted on a substrate : 213mm×140mm×1.6mm, glass epoxy board.

#### Absolute Maximum Ratings (Micro-computer Chip) at $T_a = 25^\circ\text{C}$ , $V_{SS} = 0\text{V}$

Parameter	Symbol	Pins	Conditions	Ratings			Unit
				min	typ	max	
Maximum supply voltage	$V_{DD}$ max	$V_{DD}$	Mask	-0.3		+6.0	V
			Flash	-0.3		+6.5	V
Input voltage	$V_I$	$\overline{RES}$		-0.3		$V_{DD}+0.3$	V
Output voltage	$V_O$	FILT		-0.3		$V_{DD}+0.3$	V
Input/output voltage	$V_{IO}$	Ports0, 1		-0.3		$V_{DD}+0.3$	V
High level output current	Peak output current *2	$I_{OPH}$	Ports04 to 07, 1		-4		mA
	Total output current	$\Sigma I_{OAH}$	Ports04 to 07, 1		-15		mA
Low level output current	Peak output current *2	$I_{OPL}$	Ports0, 1			20	mA
	Total output current	$\Sigma I_{OAL}$	Ports0, 1			30	mA

\*1 J : unted on a MASKROM = 24KB, K : MASKROM = 28KB, L : MASKROM = 32KB, M : MASKROM = 40KB, N : MASKROM = 48KB  
 FB : FLASHROM = 48KB (This production is produced and sold by SANYO under license of the Silicon Storage Technology Inc.)

\*2 The average current for each pin must not be over 1mA.

#### Operating Conditions (Bip Chip) at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_8$		5.0	V
	$V_{43}$		5.0	V
	$V_{55}$		5.0	V
Recommended supply current	$I_{11}$		19	mA
	$I_{19}$		31	mA
Operating supply voltage range	$V_8$ op		4.7 to 5.3	V
	$V_{43}$ op		4.7 to 5.3	V
	$V_{55}$ op		4.7 to 5.3	V
Operating supply current range	$I_{11}$ op		28 to 34	mA
	$I_{19}$ op		17 to 21	mA

## LA7693X series

**Recommended Operating Range (Micro-computer Chip)** at  $T_a = -10^{\circ}\text{C}$  to  $+65^{\circ}\text{C}$ ,  $V_{SS} = 0\text{V}$

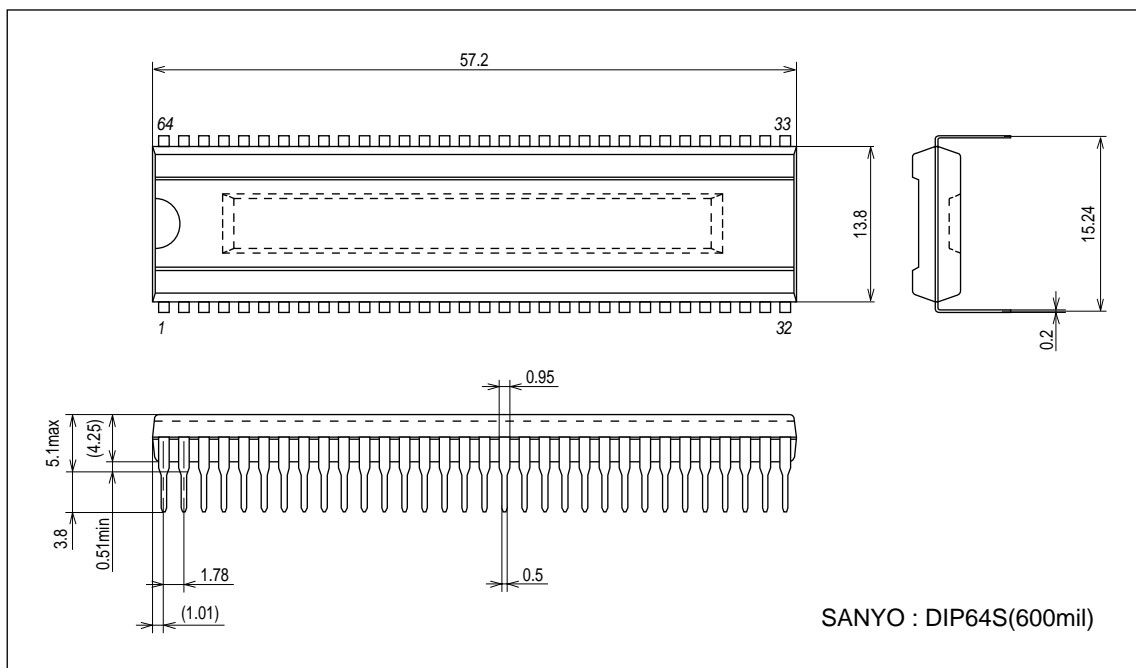
Parameter	Symbol	Pins	Conditions	$V_{DD}$ [V]	Ratings			Unit
					min	typ	max	
Operating supply voltage	$V_{DD}$	$V_{DD}$ max			4.5		5.5	V
Hold voltage	$V_{HD}$	$V_{DD}$	RAMs and the registers data are kept in HOLD mode.		2.0		5.5	V
High level input voltage	$V_{IH}$ (1)	Ports04 to 07	Output disable	4.5 to 5.5	$0.75V_{DD}$		$V_{DD}$	V
	$V_{IH}$ (2)	Ports00 to 03, 1 (Schmitt) $\overline{\text{RES}}$ (Schmitt)	Output disable	4.5 to 5.5	$0.75V_{DD}$		$V_{DD}$	V
Low level input voltage	$V_{IL}$ (1)	Ports0	Output disable	4.5 to 5.5	$V_{SS}$		$0.25V_{DD}$	V
	$V_{IL}$ (2)	Ports00 to 03, 1 (Schmitt) $\overline{\text{RES}}$ (Schmitt)	Output disable	4.5 to 5.5	$V_{SS}$		$0.25V_{DD}$	V
Operation cycle time	$t_{CYC}$ (1)		All functions operating	4.5 to 5.5	0.844	0.848	0.852	$\mu\text{s}$
	$t_{CYC}$ (2)		OSD and Data slicer are not operating	4.5 to 5.5	0.844		400	$\mu\text{s}$
Oscillation frequency range	$F_{mRC}$		Internal RC oscillation	4.5 to 5.5	0.4	0.8	3.0	MHz

(Note) FLASH-ROM erase/write temperature range :  $T_a = 25 \pm 2^{\circ}\text{C}$  ( $V_{DD} = 4.5$  to  $5.5\text{V}$ )

### Package Dimensions

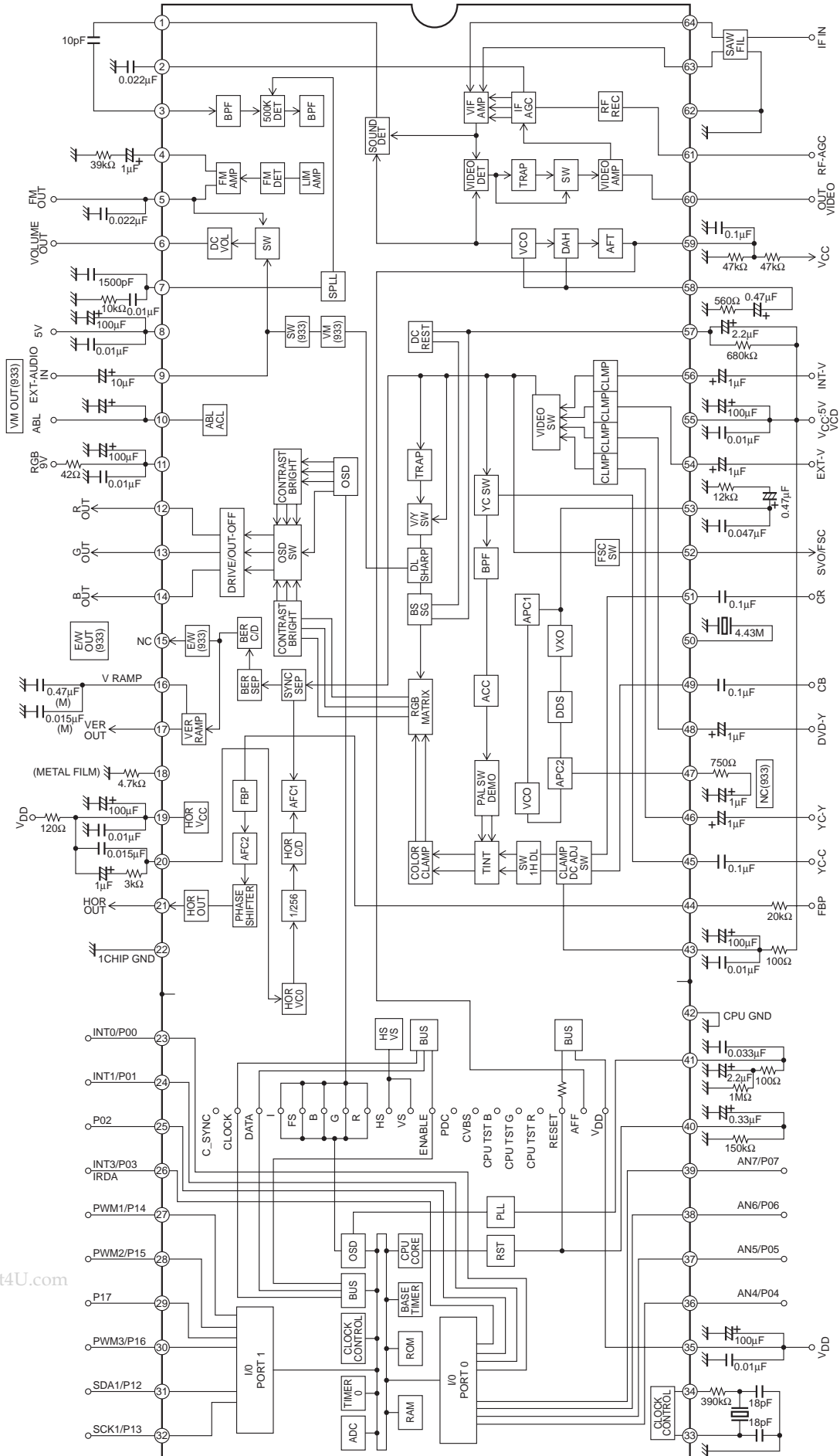
unit : mm (typ)

3300



# LA7693X series

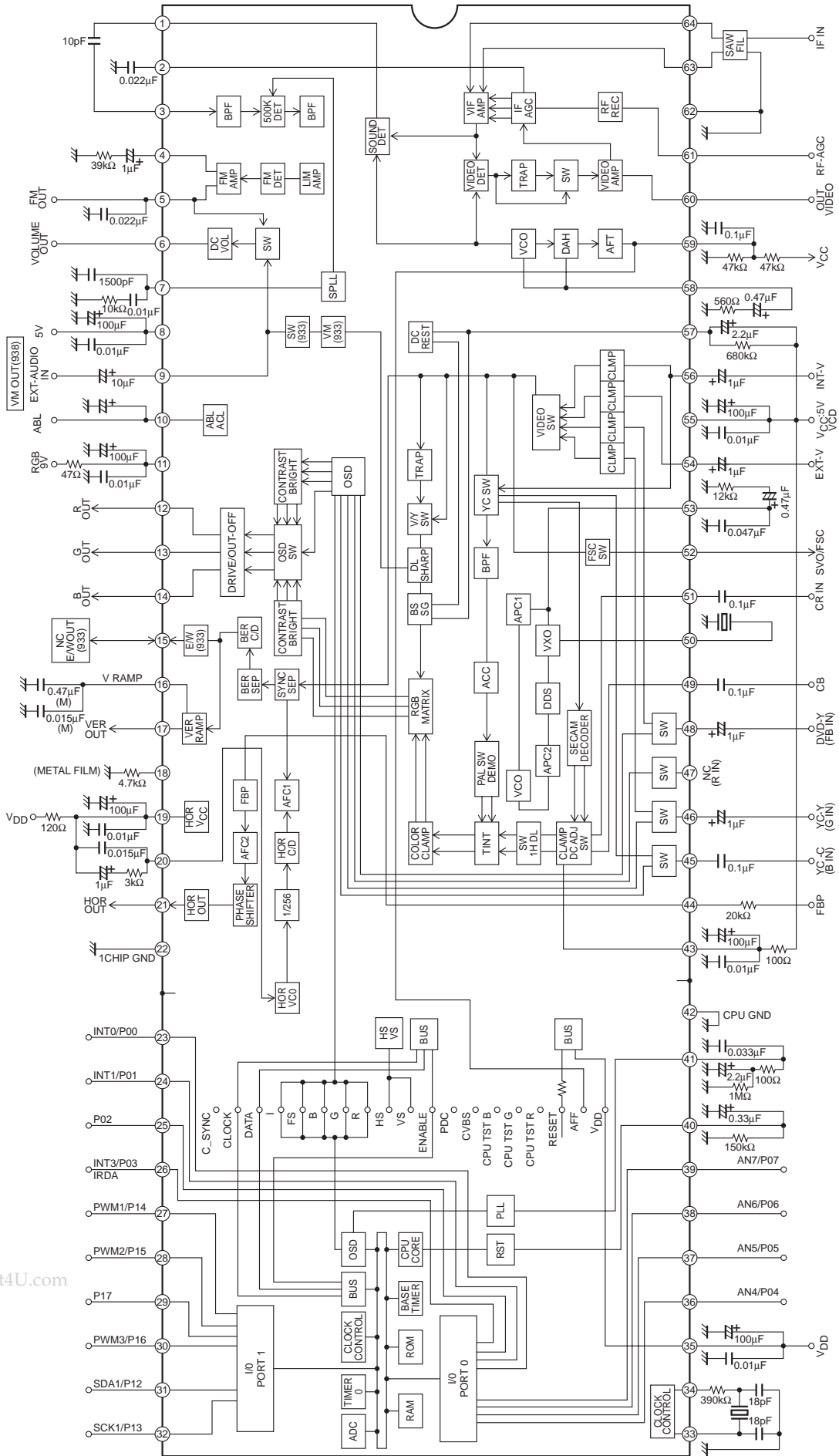
## Block Diagram 1 LA76931K/933J



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# LA7693X series

## Block Diagram 2 LA76936Y/938Y



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