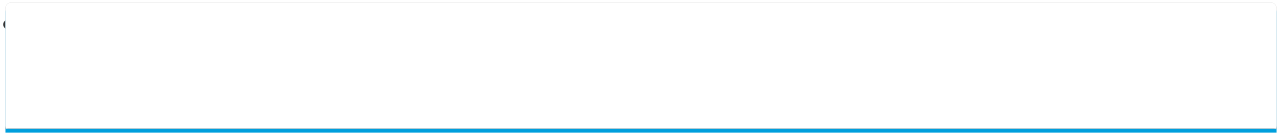
TOSHIBA

Toshiba TA1218N Manual

Udio/video switching ic for tvs

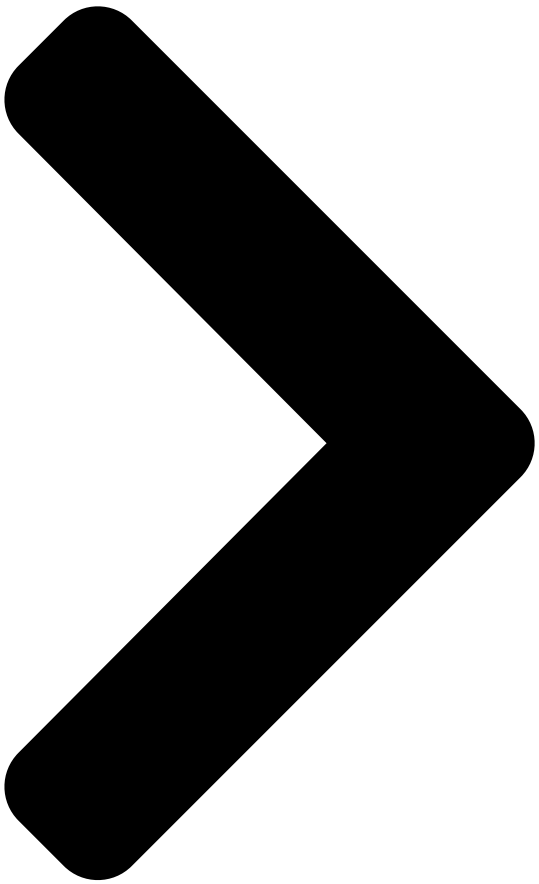
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40



-

Bookmarks



TOSHIBA

Audio/Video Switching IC for TVs

The TA1218N/F is an audio/video switching IC for TV sets.
2
Conforming to I
C bus standards, it allows you to perform
various switching operations through the bus lines by using a microcomputer. Thanks to its 2-channel outputs, the TA1218N/F can also be used for the PIP systems. Furthermore, since the presence of a signal on its sync signal output pin can be determined by a microcomputer, it is possible to check each input/output channel (self-diagnosis).
This IC has the same pin assignments as the TA1219AN (SDIP36), a 1-channel output version of the TA1218N/F, so these chips are pin compatible on pins 3 to 20 and 23 to 40.

•

I

C bus control

•

Video : 5-channel inputs and 2-channel outputs
(2 channels conforming to S system)

•

Audio : 5-channel inputs and 3-channel outputs

Self-diagnostic function

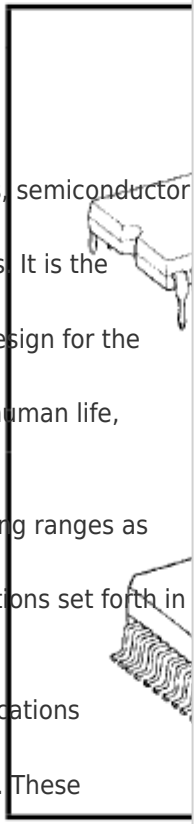
•

ADC inputs based on European 21-pin standards

•

Switchable subaddress

•



• TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general
can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the
buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and
to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or
damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the
most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling
Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
• The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal
equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are
neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or
failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy
control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control
instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document
shall be made at the customer's own risk.
• The products described in this document are subject to the foreign exchange and foreign trade laws.
• The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by
TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its
use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or
others.
• The information contained herein is subject to change without notice.

TA1218N, TA1218F

TA1218N
TA1218F
Weight
SDIP42-P-600-1.78 : 4.13 g (typ.)
QFP48-P-1014-0.80 : 0.83 g (typ.)

TA1218N/F

000707EBA1

Table of Contents

Next Page

Summary of Contents for Toshiba TA1218N

Page 1 It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.

Page 2: Block Diagram

TA1218N/F Block Diagram Det Select (46) (33) Det in (45) (21) −6dB (26) (38) (42) (12) (36) (32) (10) (34) (15) (30) Mute Sync (22) separator (23) Address Pulse (25) conver- Sync out I/O1 (3 level) (24) (16) I/O2 (3 level)

Page 3: Pin Assignment

TA1218N/F Pin Assignment TA1218N Det in Det Select TA1218N Address Sync out I/O1 I/O2 I/O3 2000-09-11 3/40...

Page 4 TA1218N/F TA1218F TA1218F Address 2000-09-11 4/40...

Page 5 TA1218N/F Pin Description (( ): the pin number of TA1218F) Name Function Interface This pin is for output a sub-channel left audio signal. The signals fed into the chip via L V1, L V2, L S2, or L TV is output from this pin.

Page 6 TA1218N/F Name Function Interface This pin is for input a left audio signal from the main demodulator in the TV set. The signal fed into this pin is presented to L TV, L 1.5 kΩ and L (47) 1.5 kΩ...

Page 7 TA1218N/F Name Function Interface This pin is for input a right audio signal from an external source (V1 channel). This pin can also be used for PIP signal input. The signal fed 1.5 kΩ into this pin is presented to R and R 1.5 kΩ...

Page 8 TA1218N/F Name Function Interface This pin is for input a right audio signal from an external source (S1 channel). The signal fed into this pin 1.5 kΩ is presented to R 1 and R 1.5 kΩ The input dynamic range of this pin is 6.5 V...

Page 9 TA1218N/F Name Function Interface This pin is for input a right audio signal from an external source (S2 channel). The signal fed into this pin 1.5 kΩ is presented to R 1 and R (13) 1.5 kΩ The input dynamic range of this pin (13) is 6.5 V...

Page 10 TA1218N/F Name Function Interface This is an ADC input/DAC output pin. The ADC is a 2-level detection type (1 bit). The threshold level is 2.25 V. I/O3 (18) The DAC (1 bit) is an open-collector (18) output. Make sure that the current flowing into this pin is 2.0 mA or...

Page 11 TA1218N/F Name Function Interface This pin is for output a self-diagnostic sync signal. The signal separated from V TV V Output select V2, Y/V S1, V 1, V 2, Y <Det in> or C is outputted from this pin. In <Sound>...

Page 12 TA1218N/F Name Function Interface This pin is for input a luminance signal from an external comb filter. The signal fed into this pin is 1.5 kΩ presented to Y (28) The input dynamic range of this pin (28) is 5.5 V and the input resistance is <Y...

Page 13 TA1218N/F Name Function Interface This pin is for output the main channel right audio signal. The signal fed into R V1, R V2, R S2, or R TV is outputted from this pin. The output resistance of this pin is 45 Ω.

Page 14 TA1218N/F Name Function Interface This pin is for output only the signal that is forwarded from R TV. The output resistance of this pin is 45 Ω. (39) This output can be muted in

(39) combination with L TV by bus control.

Page 15 TA1218N/F Bus Data Specifications Data Structure Write Slave address Data 1 Data 2 Data 3 (90H or 92H) Read Slave address Data 4 (91H or 93H) Note2: Slave address is switched by the voltage applied to pin 27 (address). Switched to 90H when low (GND);...

Page 16 TA1218N/F Main Video Select: Terminal 38 (38) Output Signal Bus Data S Input Mode Output Signal Discrimination Input Select (main) Input S1 + Open S2 + Open (Note5) Do not use [100] for the input select data. Note5: FV: Forced Video Mode.

Page 17 TA1218N/F Sub (PIP) Video Select: Terminal 42 (42) Output Signal Bus Data S Input Mode Output Signal Discrimination Input Select (sub) INPUT out2 S1 + Open Y/VinS1 S2 + Open Do not use [100] for the input select data. Sub L/R Select: Terminal 37 and 35 (37 and 35) Output Signal...

Page 18 TA1218N/F Y Output Select: Terminal 30 (32) Output Signal Bus Data Y Output Mode Main V Select Mode Signal Y Output Switching (see table 2-2.) Input Through V or FV V through Y through V or FV V through Y through...

Page 19 TA1218N/F Sync Detection Select: Terminal 4 (46) Output Signal Bus Data Detection Sync Output Select Mode Sync Switching Sync Detection Switching Det Select Sync Out Video Input Sync Video Output Sync ★ ★ Audio Output ★ ★ For Det Select marked by ★, the video input or video output corresponding to data B15, B14, and B13 is selected.

Page 20: Audio Mute

TA1218N/F Audio Mute Bus Data Mode Audio Mute Output Mute DAC Output Switching Bus Data Mode DAC Output Switching Output State Open I/O1 Open I/O2 Open I/O3 Open Open 2000-09-11 20/40...

Page 21 TA1218N/F Read Mode Power-On Reset Discrimination Bus Data Mode Power-On Reset Reset S Input Discrimination Bus Data Mode S Input Discrimination Input Voltage High (open) High (open) ADC Input Discrimination Bus Data Mode ADC Input Discrimination Input Voltage High I/O1...

Page 22 TA1218N/F Outline of I C Bus Control Format The TA1218N/F's bus control format conforms to the Philips I C bus control format. Start and stop conditions Start condition Stop condition Bit transfer SDA must not be SDA can be changed...

Page 23: Maximum Ratings

Note6: When using the device at temperatures above Ta = 25°C, reduce the rated power dissipation by 14.4 mW at TA1218N or 11.1 mW TA1218F per degree of centigrade. (see the diagram below.) Note7: This device is not proof enough against a strong E-M field by CRT which may cause function errors and/or poor characteristics.

Page 24: Electrical Characteristics

TA1218N/F Recommended Operating Conditions, ( ): The Terminal Number of TA1218F Characteristics Test Condition Typ. Unit Remark — Supply voltage 33 (33) 7, 10, 12, 16, 28 □ □ Composite signal input amplitude 100IRE (2, 6, 8, 12, 26) □...

Page 25 TA1218N/F Pin Voltage Pin No. Test Pin Name Symbol Typ. Unit Circuit □ □ □ Det in □ Det Select □...

Page 26 TA1218N/F DC Characteristics Test Characteristics Measured Pin Symbol Min. Typ. Max. Unit Remark Circuit □ Det in kΩ □ kΩ □ kΩ □ kΩ □ kΩ □ kΩ □ kΩ □ kΩ Measure a change ΔI in the current flowing □...

Page 27 TA1218N/F Test Characteristics Measured Pin Symbol Min. Typ. Max. Unit Remark Circuit Mid-Low threshold □ I/O1 VthI1L 1.75 2.25 2.75 level of I/O1 input (pin 19 (16)). Hig-Mid threshold level □ I/O1 VthI1M of I/O1 input (pin 19 (16)). Mid-Low threshold ADC input discrimination □...

Page 28 TA1218N/F AC Characteristics Test Characteristics Select Mode Symbol Min. Typ.

Max. Unit Test Method Circuit □ □ VDR7V1 (1) Apply a 15 kHz sine wave to each □ □ VDR10V1 input pin. □ □ VDR28V1 (2) In each select □...

Page 29 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit □ G7V2 (1) Apply a 15 kHz, □ G10V2 1.0 V sine wave □ G28V2 to each input pin. □ G12V2 (2) In each select Gain mode, find the gain □...

Page 30 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit (1) Apply a 1.0 V □ □ □ sine wave to each □ □ □ input pin. F10Y (2) In each select □ □ □ F28Y mode, measure a...

Page 31 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit □ □ □ (1) Apply a 1.0 V sine wave to each □ □ □ F10C input pin. □ □ □ F28C (2) In each select □...

Page 32 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit (1) Apply a 1 kHz sine □ □ VDR5L1 wave to each input pin. □ □ VDR8L1 (2) In each select □ □ mode, measure an VDR29L1...

Page 33 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit (1) Apply a 1 kHz sine □ □ VDR6R1 wave to each input pin. □ □ VDR9R1 (2) In each select □ □ mode, measure an VDR31R1...

Page 34 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit (1) Apply a 1 kHz sine □ □ VDR5L2 wave to each input pin. □ □ VDR8L2 (2) In each select □ □ mode, measure an VDR29L2...

Page 35 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit (1) Apply a 1 kHz sine □ □ VDR6R2 wave to each input pin. □ □ VDR9R2 (2) In each select □ □ mode, measure an VDR31R2...

Page 36 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit While applying a 1 kHz, 1.0 V sine □ −0.5 G5LTV wave to pin 5 (47), find Gain the gain between pins 5 (47) and 40 (40).

Page 37 TA1218N/F Test Characteristics Select Mode Symbol Min. Typ. Max. Unit Test Method Circuit (1) Apply a 1 kHz, □ □ CT6RTV 1.0 V sine wave □ □ to each input pin. CT9RTV (2) Compare the □ □ output amplitude CT31RTV...

Page 38: Application Circuit

TA1218N/F Application Circuit = 9 V (43) (42) 4.7 kΩ (44) (41) Det in (45) (40) Det Select (46) (39) 2.2 µF (47) (38) 2.2 µF (48) (37) 47 µF (36) 2.2 µF (35) 2.2 µF (34) TA1218N/F 47 µF (33) 0.01 µF...

Page 39: Package Dimensions

TA1218N/F Package Dimensions Weight: 4.13 g (typ.) 2000-09-11 39/40...

Page 40 TA1218N/F Package Dimensions Weight: 0.83 g (typ.) 2000-09-11 40/40...

This manual is also suitable for:

Ta1218f