Audio digital key controller
BU9260FS

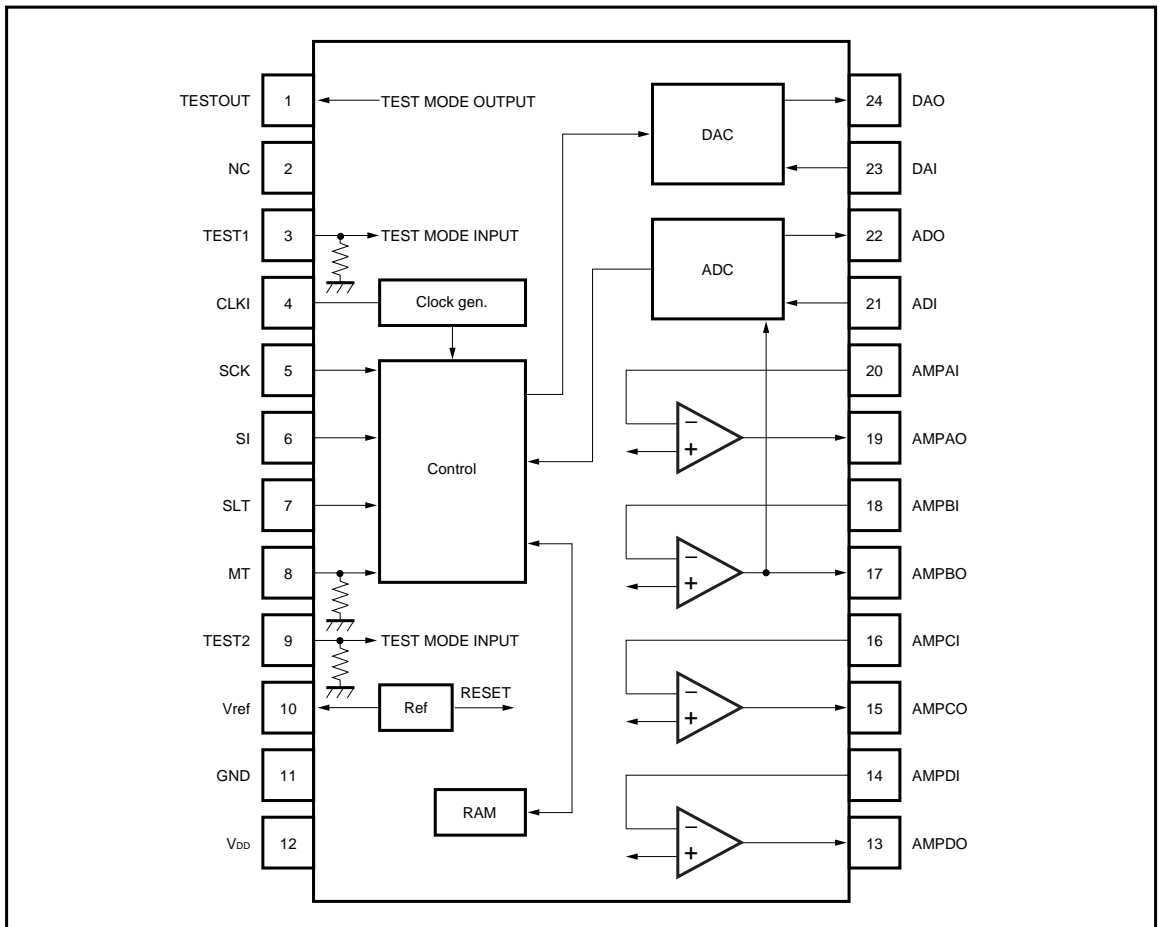The BU9260FS is designed for key control, an essential feature for karaoke systems.

●Applications
Mini-component stereos, radio cassette recorders, karaoke and other audio devices

●Features
1) Internal I / O filter and mixing operational amplifier.
2) Internal ADC and DAC.
3) 16 k bit of internal RAM.
4) Controls serial data.

●Block diagram

●Pin descriptions

Pin No.	Pin name	Function	Type
1	TESTOUT	Low-level test output	LO
2	N.C.	No connected	—
3	TEST1	Test input (the low level is normally input)	LIP
4	CLKI	Connecting the clock resistor	CLK
5	SCK	Serial clock input	LI
6	SI	Serial data input	LI
7	SLT	Serial latch input	LI
8	MT	Input of output control muting	LIP
9	TEST2	Test input (the low level is normally input)	LIP
10	Vref	Analog reference voltage	VRO
11	GND	Ground	—
12	V_{DD}	Power supply	—
13	AMPDO	Operational amplifier input / output	AO
14	AMPDI		AI
15	AMPCO	Operational amplifier input / output	AO
16	AMPCI		AI
17	AMPBO	Operational amplifier input / output	AO
18	AMPBI		AI
19	AMPAO	Operational amplifier input / output	AO
20	AMPAI		AI
21	ADI	Connecting the ADC capacitor	ADMI
22	ADO		ADMO
23	DAI	Connecting the DAC capacitor	ADMI
24	DAO		ADMO

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	V_{DD}	− 0.3 ~ + 7.0	V
Input voltage	V_{IN}	GND − 0.3 ~ V_{DD} + 0.3	V
Power dissipation	Pd	650	mW
Operating temperature	Topr	− 10 ~ + 70	°C
Storage temperature	Tstg	− 55 ~ + 125	°C

＊ Reduced by 6.5mW for each increase in Ta of 1°C over 25°C.
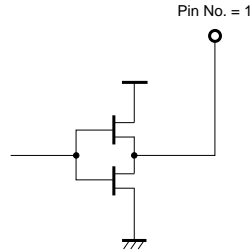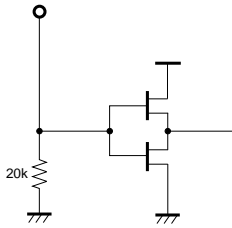
●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	4.5 ~ 5.5	V

ROHM

●Input / output circuits

Pin types

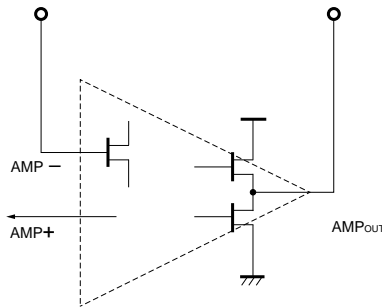Type: Logic input and output (LI, LO and LIP – LIP has pull-down)

Pins 3, 5, 6, 7, 8 and 9 (no pull-down for pins 5, 6 or 7)   Pin No. = 1

20k

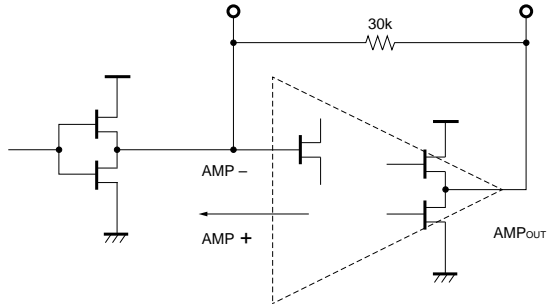Type: Amplifier input and output (AI and AO)

Pin No. = 14,16,18,20   Pin No. = 13,15,17,19

AMP −

AMP+   AMP$_{OUT}$

Type: ADM input and output (ADMI and ADMO)

Pin No. = 21, 23   Pin No. = 22, 24

30k

AMP −

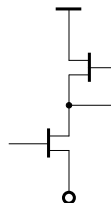AMP +   AMP$_{OUT}$

Type: Reference voltage pin (VRO)   Type: Clock pin (CLK)

Pin No. = 10   Pin No. = 4

5k

5k

●Electrical characteristics (unless otherwise noted, Ta = 25°C, V_{DD} = 5V, f_{IN} = 1kHz, f + 0 mode, V_{IN} = 100mVrms)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating supply current	I_{DD}	—	7	14	mA	No signal
⟨Linear⟩						
Input / output gain	GV	− 3	0	+ 3	dB	—
Output distortion	THD	—	1.3	3.0	%	30kHz − LPF
Output noise voltage	No	—	− 80	− 65	dBV	DIN − Audio
Maximum output voltage	$V_{Max.}$	0.7	1.5	—	Vrms	THD = 10%, LPF gain = 1
⟨Logic⟩						
Input voltage, High level	V_{IH}	3.8	—	—	V	—
Input voltage, Low level	V_{IL}	—	—	1.2	V	—
Pull-down resistance	Rd	12	25	50	kΩ	V_{IN} = 5V
⟨Serial data⟩						
Clock width	twCK	2.0	—	—	μs	—
Latch width	twLT	2.0	—	—	μs	—
Data setup	tdsu	1.0	—	—	μs	—
Data hold	th	1.0	—	—	μs	—
Latch setup	tlsu	1.0	—	—	μs	—

●Application example

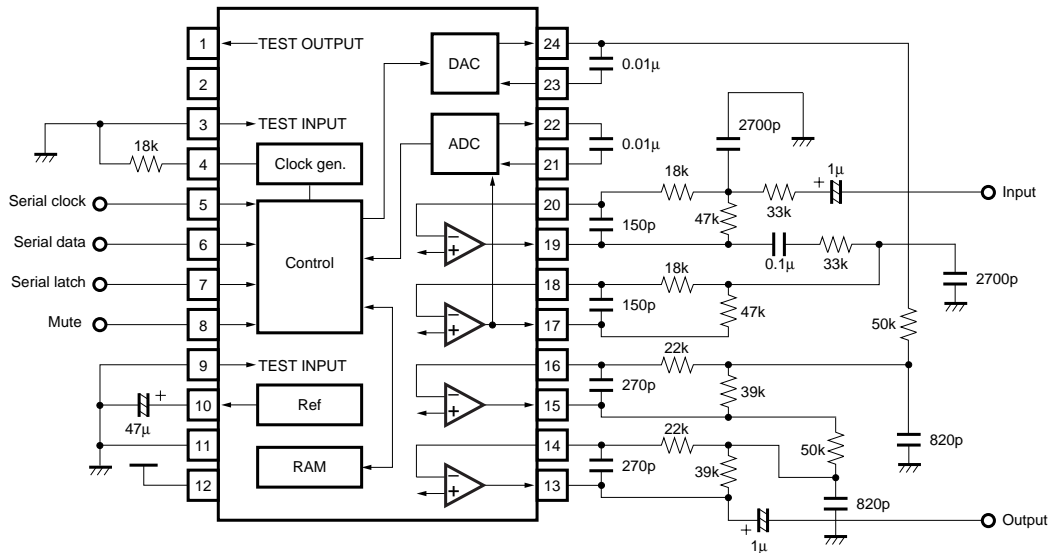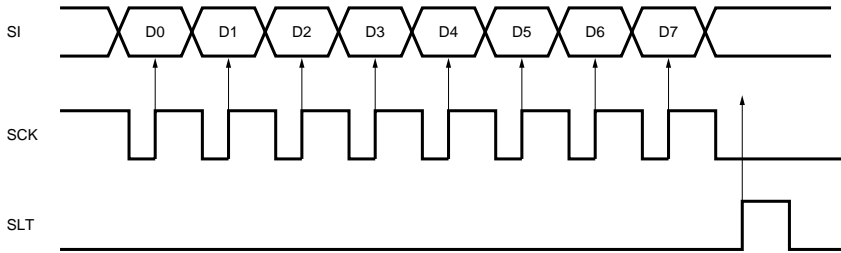
Fig. 1

●Operation notes

(1) Operating mode

 1) Serial data mode

Function: Setting the key according to SCK, SI and SLT
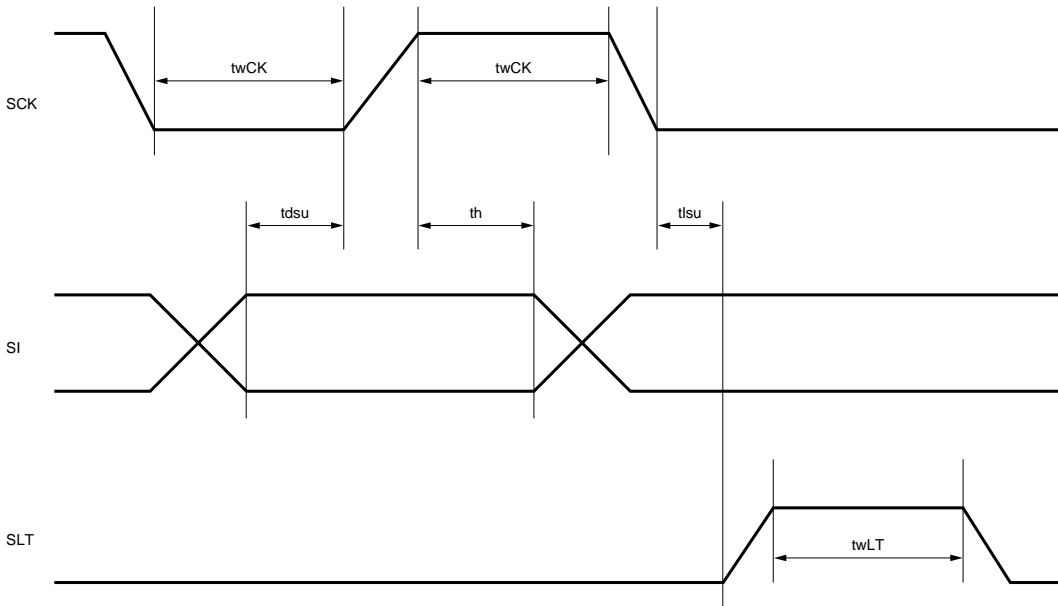
 1. Serial data

The signal value is input with the rise of SCK. Input data are latched with the fall of SLT. However, data are canceled unless D6 = high and D7 = low.

 2. Serial timing

For standard values, refer to "Electrical Characteristics."

3. Serial data

Key setting	D4	D3	D2	D1	D0
+ 8	H	H	L	L	L
+ 7	H	L	H	H	H
+ 6	H	L	H	H	L
+ 5	H	L	H	L	H
+ 4	H	L	H	L	L
+ 3	H	L	L	H	H
+ 2	H	L	L	H	L
+ 1	H	L	L	L	H
0	H	L	L	L	L
− 1	L	H	H	H	H
− 2	L	H	H	H	L
− 3	L	H	H	L	H
− 4	L	H	H	L	L
− 5	L	H	L	H	H
− 6	L	H	L	H	L
− 7	L	H	L	L	H
− 8	L	H	L	L	L

D5	Output mute control
L	Output is not muted. When MT = high, output is forcibly muted.
H	Output is muted.

D6	D7	Data latch control
H	L	Data is latched with the rise of SLT.
Other than above		Data is not latched, even with the rise of SLT.

(2) Output mute
Output can be forcibly muted according to MT.

MT	Output mute control
L	Output is not muted. However, output is muted when muting is activated by the serial data.
H	Output is muted.

ROHM

●External dimensions (Units: mm)

SSOP-A24