16-bit stereo D / A converter for audio applications

BU9480F

The BU9480F is a 16-bit stereo D / A converter designed for audio applications, and has an internal 2 × oversampling circuit.

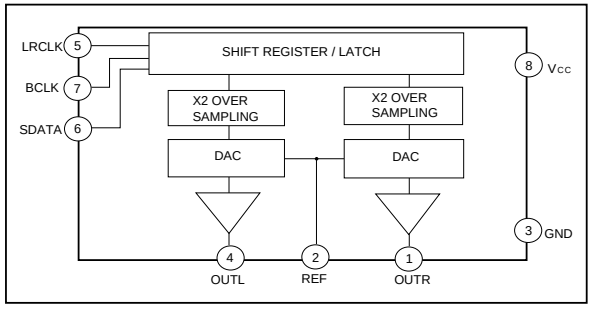
●Applications

16-bit stereo D / A converter for audio applications

●Features

1) 3.0 to 5.5V operating voltage.
2) Low current consumption because of the CMOS process.
3) Resistor strings method used.
4) 2-channel common phase output.
5) Internal 2 × oversampling interpolator.
6) 8 - pin plastic package.
7) Supports 4fs. (200kHz operation)

●Block diagram



●Pin descriptions

Pin No.	Pin name	Function	I / O	Voltage
1	ROUT	Right channel analog signal output	Low-impedance output	1 / 2VCC
2	REF	Connects the DA ref. voltage pin and ground	High-impedance input	1 / 2VCC
3	GND	Ground	—	—
4	LOUT	Left channel analog signal output	Low-impedance output	1 / 2VCC
5	LRCK	The signal that distinguishes between left and right channels for serial data (left channe = high level, right channel = low level).	Logic input	—
6	SDAT	Serial data input Input with 2' compliment, MSB first.	Logic input	—
7	BCLK	Serial data shift clock input	Logic input	—
8	VCC	Vcc	—	—

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	$V_{DDMax.}$	7.0	V
Power dissipation	Pd	450*	mW
Operating temperature	Topr	– 10 ~ + 70	°C
Storage temperature	Tstg	– 55 ~ + 125	°C
Input voltage	Topt	– 0.3 ~ V_{DD} + 0.3	V

* When unmounted, reduced by 4.5mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	3.0 ~ 5.5	V
Input low level voltage	V_{IL}	0.0 ~ 0.2 × V_{DD}	V
Input high level voltage	V_{IH}	0.8 × V_{DD} ~ V_{DD}	V

●Electrical characteristics (unless otherwise noted, Ta = 25°C, V_{DD} = + 5.0V)

Analog unit characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement circuit
Current dissipation	I_{DD}	—	3.6	6	mA	f = 1kHz, 0dB	Fig.6,7
Resolution	RES	—	—	16	BIT	—	Fig.6,7
Noise distortion 1	THD1	—	0.05	0.12	%	f = 1kHz, 0dB	Fig.6,7
Noise distortion 2	THD2	—	0.07	0.4	%	f = 1kHz, – 20dB	Fig.6,7
Full-scale output voltage	V_{FS}	1.8	2	2.2	V_{P-P}	—	Fig.6,7
Crosstalk	C.T	—	– 92	– 85	dB	Unmeasured channel output = 0 dB, f = 1kHz. DIN audio filter	Fig.6,7
S / N ratio	S / N	86	93	—	dB	DIN audio filter	Fig.6,7
Output pin load resistance	RL	10	—	—	kΩ	—	Fig.6,7

Logic input characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement circuit
Input high level voltage	V_{IH}	0.7 × V_{DD}	—	V_{DD}	V	Pins 5,6 and 7	Fig.6,7
Input low level voltage	V_{IL}	GND	—	0.3 × V_{DD}	V	Pins 5,6 and 7	Fig.6,7
Leakage current, high level	I_{IH}	—	—	– 10	µA	Pins 5,6 and 7 = V_{DD}	Fig.6,7
Leakage current, low level	I_{IL}	—	—	10	µA	Pins 5,6 and 7 = GND	Fig.6,7
DA conversion frequency	f_{SL}	—	—	200	kHz	—	Fig.6,7
BCLK period	T_{BCLK}	60	—	—	ns	—	Fig.6,7
SDAT.LRCK settling time	T_{ST}	60	—	—	ns	—	Fig.6,7
SDAT.LRCK holding time	T_{HD}	60	—	—	ns	—	Fig.6,7

●Pin equivalent circuits

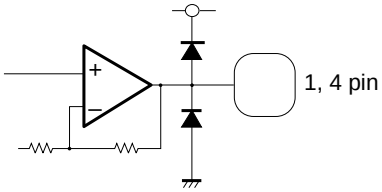


Fig.1

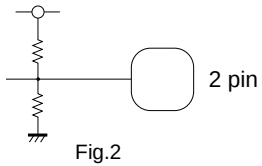


Fig.2

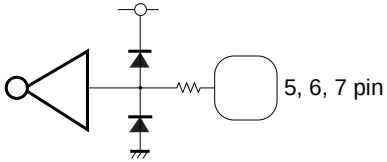


Fig.3

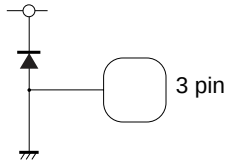


Fig.4

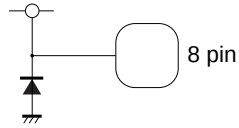


Fig.5

●Measurement circuits

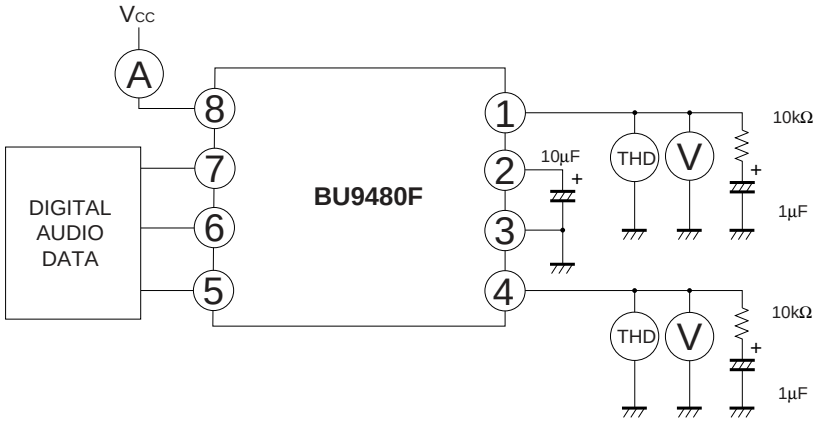


Fig. 6

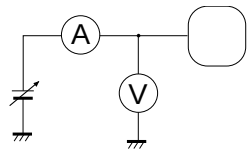
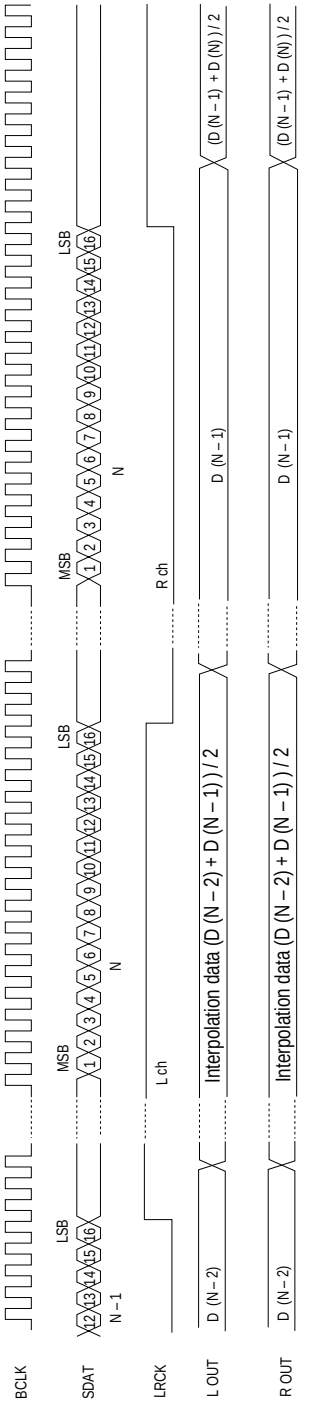


Fig. 7

●I / O signal timing chart



Note: Interpolation and original data output are timed respectively to the leading edge and leading edge of LRCK, and so LRCK should be set to a duty of 50%.

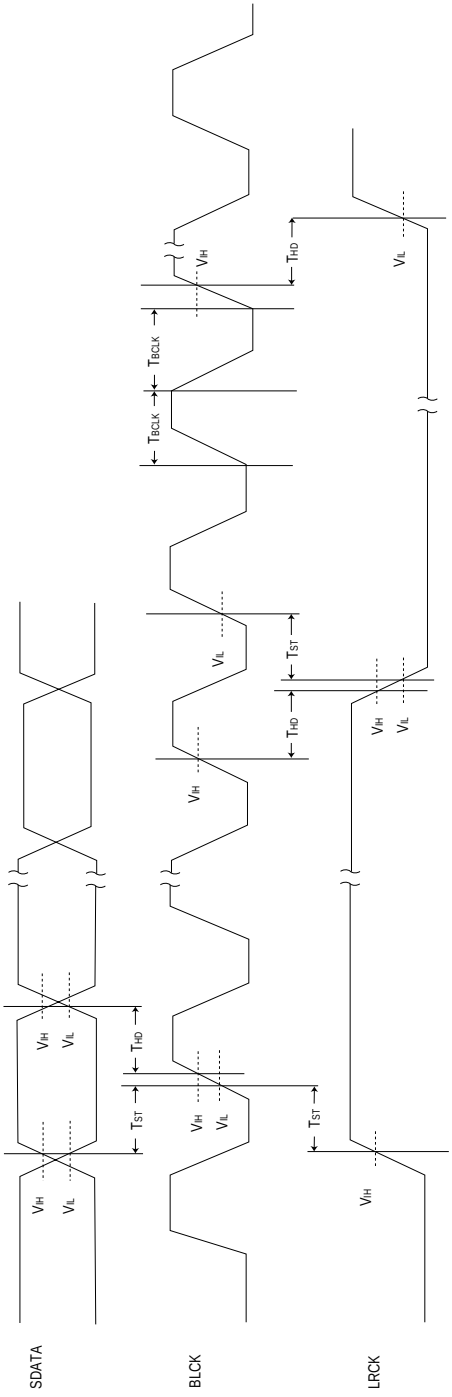
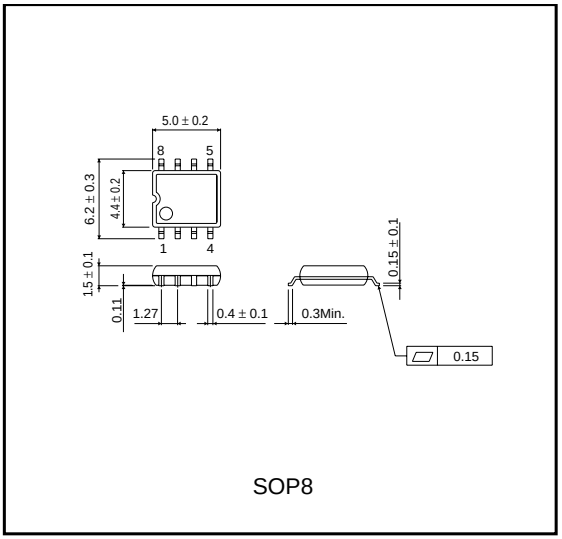


Fig. 8

●External dimensions (Units: mm)



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