

Bus interface for car audio

BA8272F

The BA8272F is a bus interface IC (slave side) developed for car audio applications. When used with the BA8272F (master side), it is possible to construct a communication system for the deck and components such as power amplifiers, CD and MD changers, tuners and TVs using BUS ON, DATA, CLOCK and RESET signals.

●Applications

Car audio systems

●Features

- 1) Allows construction of a communication system with BUS ON, DATA, CLOCK and RESET signals when used with the BA8270F (master side).
- 2) Ideal for car audio systems.

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	7.0	V
Power dissipation	P _d	450*	mW
Operating temperature	T _{opr}	-40~+85	°C
Storage temperature	T _{stg}	-55~+125	°C
Voltage range for inputs	V _{IN}	-0.3~+7.0	V

*Operating temperature range is for I_L=50mA.

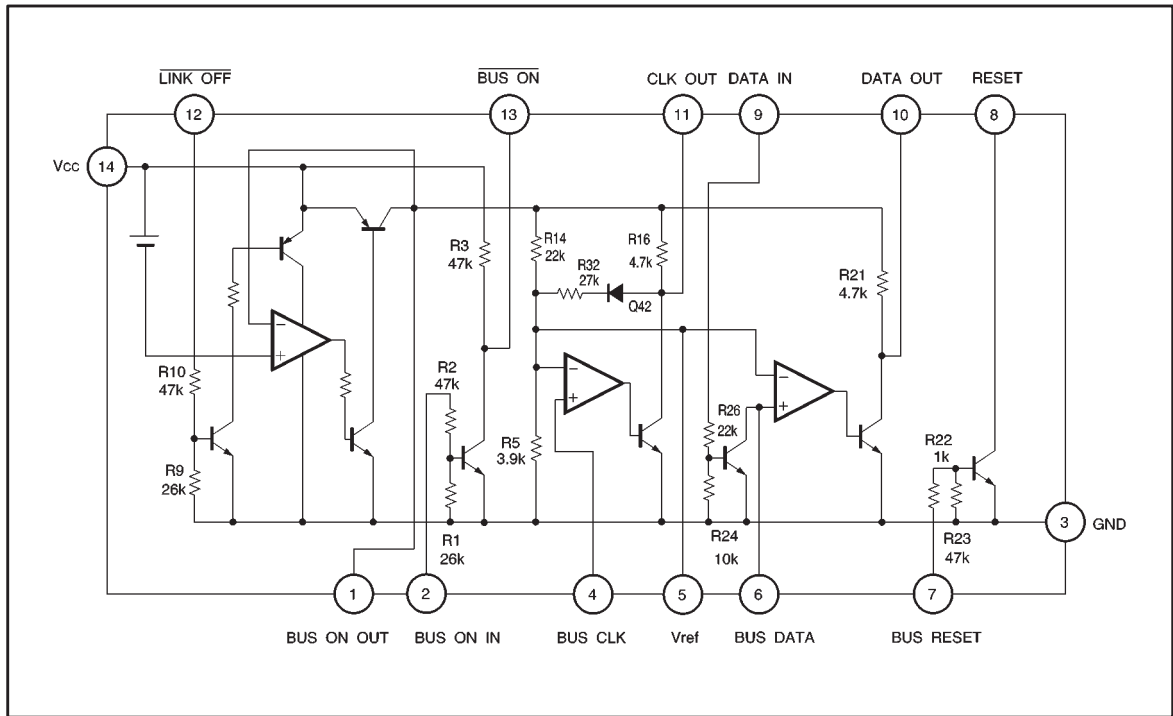
*Reduced by 5mW for each increase in Ta of 1°C over 25°C (board size 5.0mm×5.0mm×1.6mm).

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V _{CC}	4.0	—	7.0	V

(For basic operation at Ta=25°C.)

● Block diagram



●Electrical characteristics (unless otherwise noted, Ta = 25°C and V_{CC} = 5.5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Coniditions
Circuit current 1	I _{CC1}	—	—	10	μA	No load and all pins off
Circuit current 2	I _{CC2}	—	1.1	3.0	mA	No load, LINK OFF=5.5V
Circuit current 3	I _{CC3}	—	5.0	13.0	mA	I _L =50mA
Voltage 1 between V _{CC} and BUS ON OUT	V _{LOSS1}	—	0.15	0.35	V	I _L =100mA
Voltage 2 between V _{CC} and BUS ON OUT	V _{LOSS2}	—	0.09	0.2	V	I _L =40mA
Input pin current 1	I _{IN1}	75	100	140	μA	BUS ON input pin, 5.5V input
Input pin current 2	I _{IN2}	75	100	140	μA	LINK OFF pin, 5.5V input
Input pin current 3	I _{IN3}	10	25	40	μA	BUS CLK pin, 5.5V input
Input pin current 4	I _{IN4}	10	25	40	μA	BUS DATA pin, 5.5V input
Input pin current 5	I _{IN5}	175	220	300	μA	DATA IN pin, 5.5V input
Input pin current 6	I _{IN6}	3.5	4.8	6.4	mA	BUS RESET pin, 5.5V input
Output internal resistor 1	R ₃	35.2	47	58.8	kΩ	BUS ON pin
Output internal resistor 2	R ₂₁	3.52	4.7	5.88	kΩ	DATA OUT pin
Output saturation voltage 1	V _{SAT1}	—	0.2	0.4	V	BUS ON, CLK OUT, DATA OUT
Output saturation voltage 2	V _{SAT2}	—	0.1	0.25	V	BUS DATA pull-up resistor 1kΩ
Reset output voltage	V _{8ON}	—	0.2	0.4	V	I ₈ =1mA, BUS RESET pin 5.5V
CLK OUT output high level	V _{HBA}	V _{HI} —0.3	V _{HI} —0.5	V _{HI} —0.7	V	0V input to BUS CLK pin, High level for BUS ON OUT pin is set to V _{HI} (V _{HBA} =V _{HI} —V _{H3})
BUS CLK input threshold	V _{TH}	0.75	0.80	0.85	V	 Seen from CLK OUT pin side
BUS CLK input hysteresis width	V _{HYS}	300	400	500	mV	 Seen from CLK OUT pin side

©Not designed for radiation resistance.

● Measurement circuit

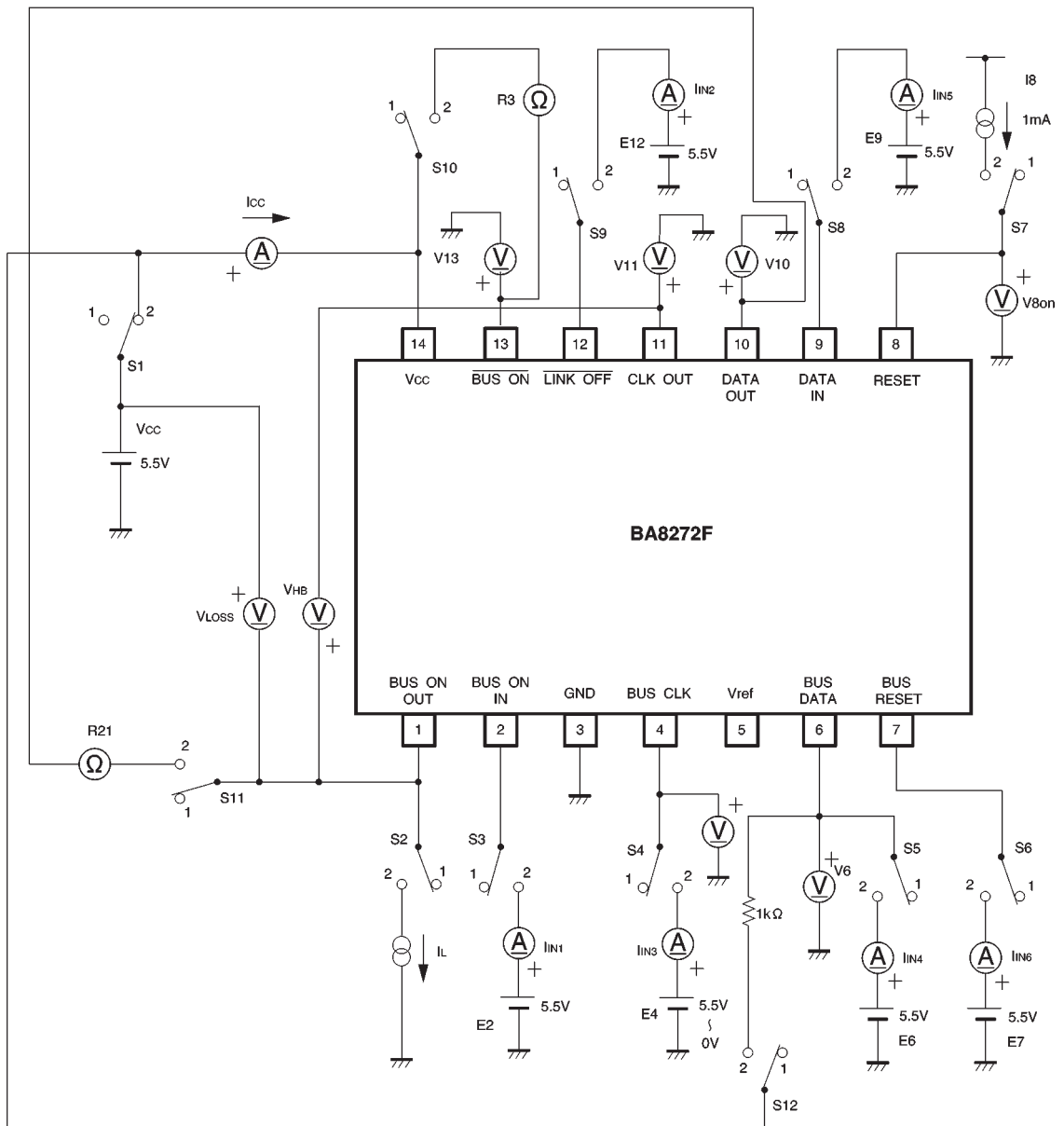
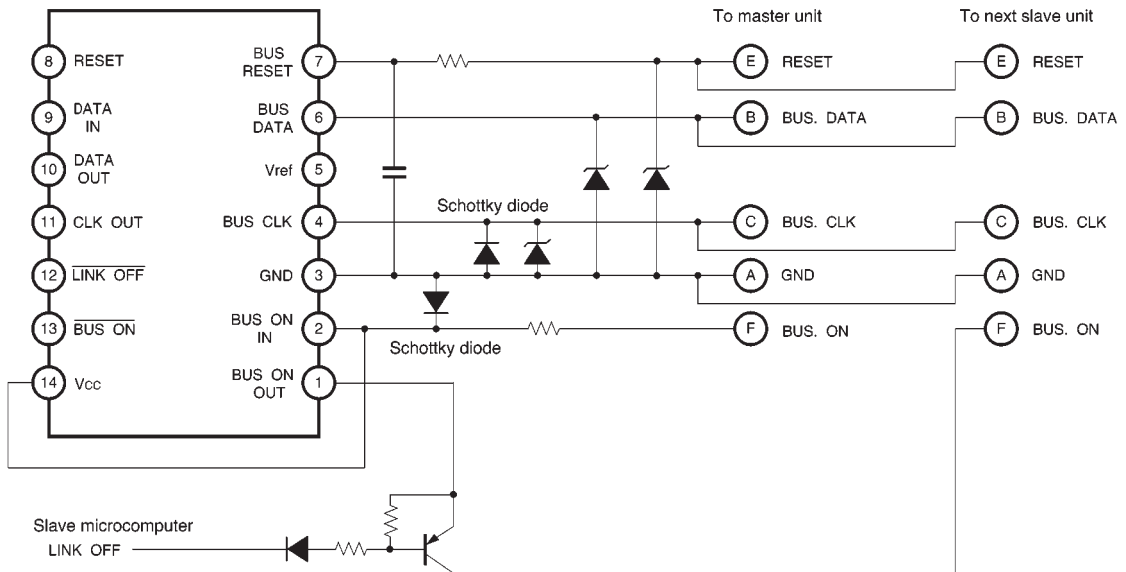


Fig.1

● Measurement circuit switch operation table

Parameter	Symbol	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	Measured pin	Conditions
Circuit current 1	I _{CC1}	2	1	1	1	1	1	1	1	1	1	1	1	14pin	—
Circuit current 2	I _{CC2}		↓							2				14pin	E ₁₂ =5.5V
Circuit current 3	I _{CC3}		2											14pin	E ₁₂ =5.5V, I _L =50mA
Voltage 1 between V _{CC} and BUS ON OUT	V _{LOSS1}													1pin-14pin	E ₁₂ =5.5V, I _L =100mA
Voltage 2 between V _{CC} and BUS ON OUT	V _{LOSS2}		↓	↓						↓				1pin-14pin	E ₁₂ =5.5V, I _L =40mA
Input pin current 1	I _{IN1}		1	2						1				2pin	E ₂ =5.5V
Input pin current 2	I _{IN2}			1	↓					2				12pin	E ₁₂ =5.5V
Input pin current 3	I _{IN3}				2	↓				1				4pin	E ₄ =5.5V
Input pin current 4	I _{IN4}				1	2			↓					6pin	E ₆ =5.5V
Input pin current 5	I _{IN5}					1	↓		2					9pin	E ₉ =5.5V
Input pin current 6	I _{IN6}	↓					2		1		↓			7pin	E ₇ =5.5V
Output internal resistor 1	R ₃	1					1				2	↓		13pin-14pin	—
Output internal resistor 2	R ₂₁	↓		↓	↓						1	2		1pin-10pin	—
Output saturation voltage 1	V _{SAT1}	2		2	1	↓				↓		1		13pin	E ₂ =5.5V, BUS ON pin
Output saturation voltage 1	V _{SAT1}			1	2	2				2				11pin	E ₄ =5.5V, CLK OUT pin, E ₁₂ =5.5V
Output saturation voltage 1	V _{SAT1}				1	1				↓			↓	10pin	E ₆ =5.5V, DATA OUT pin, E ₁₂ =5.5V
Output saturation voltage 2	V _{SAT2}						↓	↓		1			2	6pin	E ₉ =5.5V, BUS DATA pin
Reset output voltage	V _{8ON}				↓	↓	2	2		2			1	8pin	E ₇ =5.5V, RESET pin
CLK OUT output high level	V _{HBA}				2	2	1	1						1pin-11pin	E ₄ =0V, E ₁₂ =5.5V
BUS CLK input threshold level	V _{TH}													4pin	E ₄ =0 to 3V, sweep, E ₁₂ =5.5V
BUS CLK input hysteresis width	V _{HYS}	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	4pin	E ₄ =0 to 3V, sweep, E ₁₂ =5.5V

●Application example



- Construct Schottky barrier diode circuits to prevent erroneous operation due to noise of potentials lower than BUS ON and BUS CLK grounds.
- Construct Zener diode circuits to provide over-voltage protection for DATA.

Fig.2

●Operation notes

(1) We guarantee the application circuit design, but recommend that you thoroughly check its characteristics in actual use. If you change any of the external component values, check both the static and transient characteristics of the circuit, and allow sufficient margin in your selections to take into account variations in the components and ICs.

Note that Rohm has not fully investigated patent rights regarding this product.

(2) Based on the EIAJ static electric destruction voltage measurement ($C = 200\text{pF}$ and $R = 0\Omega$), the with-standing voltage of pins 4, 5 and 12 has been determined to be 200V or less. Take due care.

●External dimensions (Units: mm)

