

Bus interface for car audio

BA8270F

The BA8270F is a bus interface IC (master side) developed for car audio applications. When used with the BA8272F (slave 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 BA8272F (slave 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
Voltage range for BATT	V _{BATT}	-0.3~+18.0	V

* Operating temperature range is for I_{L1}=50mA, and I_{L2}=5mA.

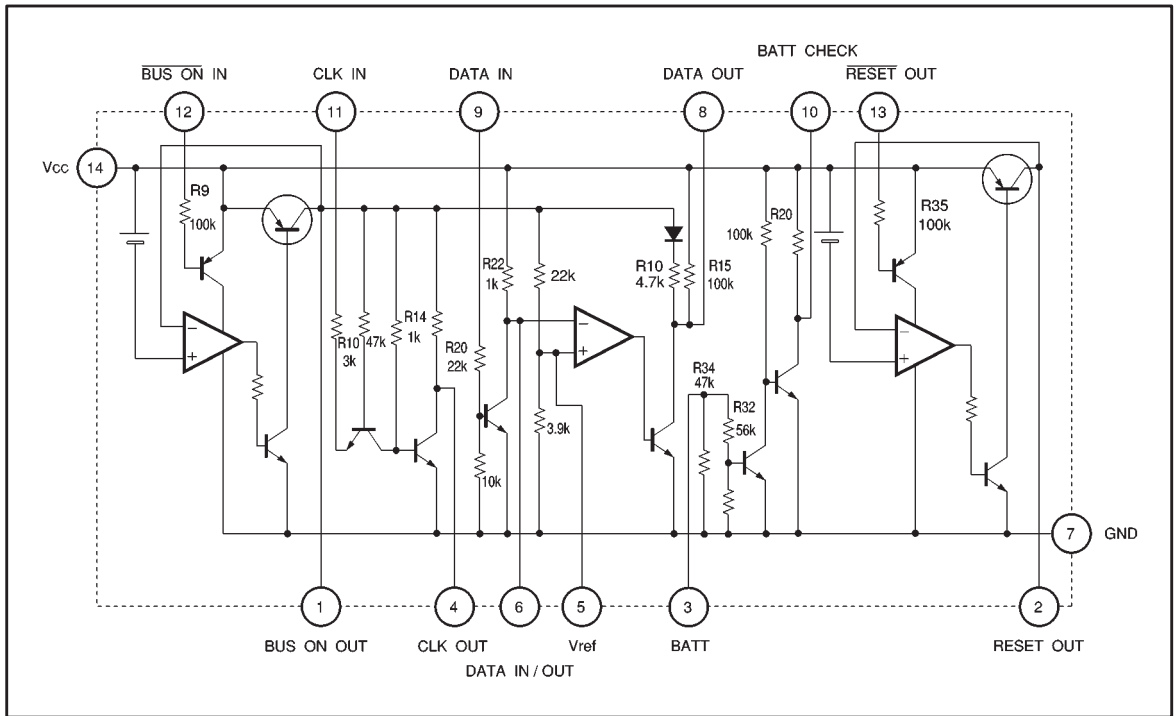
* Reduced by 5mW for each increase in Ta of 1°C over 25°C (board size 50mm × 50mm × 1.6mm).

●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	Conditions
Circuit current 1	I _{CC1}	—	—	300	μA	No load and BATT pin (pin 3)=5.5V. Other pins off (excluding the BATT input current)
Circuit current 2	I _{CC2}	—	8.5	15.0	mA	No load, BUS ON IN=1.0V
Circuit current 3	I _{CC3}	—	17	30	mA	I _{L1} =50mA, I _{L2} =50mA
Voltage 1 between V _{CC} and BUS ON OUT	V _{LOSS1}	—	0.25	0.35	V	I _{L1} =100mA
Voltage 2 between V _{CC} and BUS ON OUT	V _{LOSS2}	—	0.15	0.2	V	I _{L2} =40mA
Input pin current 1	I _{IN1}	32	48	70	μA	BUS ON IN pin, 0V input
Input pin current 2	I _{IN2}	175	220	300	μA	DATA IN pin, 5.5V input
Input pin current 3	I _{IN3}	150	190	300	μA	BATT pin, 5.5V input
Input pin current 4	I _{IN4}	38	48	70	μA	RESET OUT pin, 0V input
Output internal resistor 1	R ₁₄	0.75k	1k	1.25k	Ω	CLK OUT
Output internal resistor 2	R ₂₂	0.75k	1k	1.25k	Ω	DATA IN / OUT
Output internal resistor 3	R ₂₉	75k	100k	125k	Ω	BATT CHECK
DATA OUT pin output current	I _{DATA}	0.75	1.1	1.45	mA	5.5V applied to DATA IN 0V input to BUS ON IN
ON output voltage for each	V _{SAT}	—	0.2	0.4	V	CLK OUT, DATA OUT
DATA IN / OUT ON output voltage	V _{6ON}	—	0.1	0.25	V	DATA IN / OUT
BATT CHECK output voltage	V _{10ON}	—	—	0.4	V	—

©Not designed for radiation resistance.

● Measurement circuit

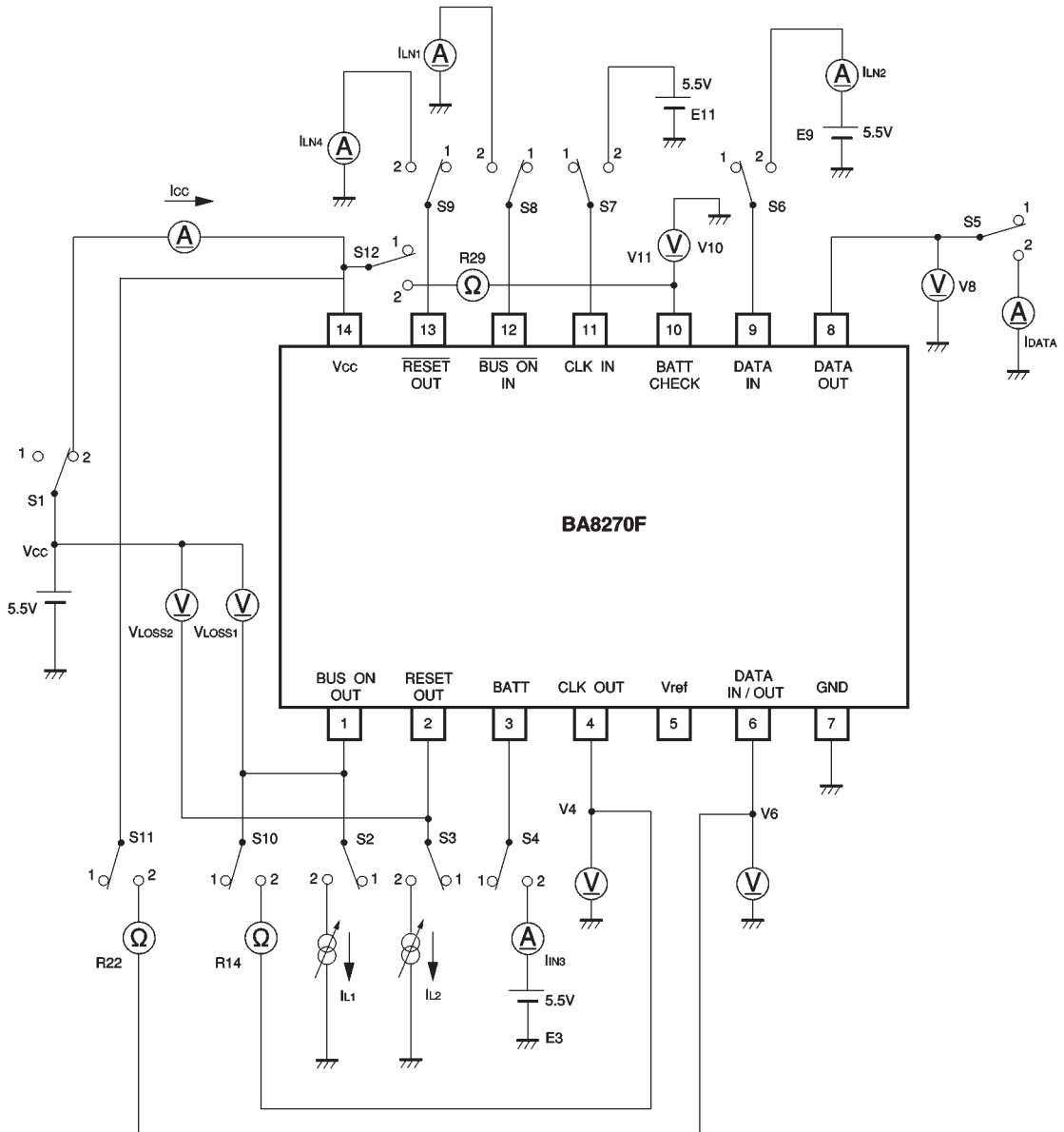
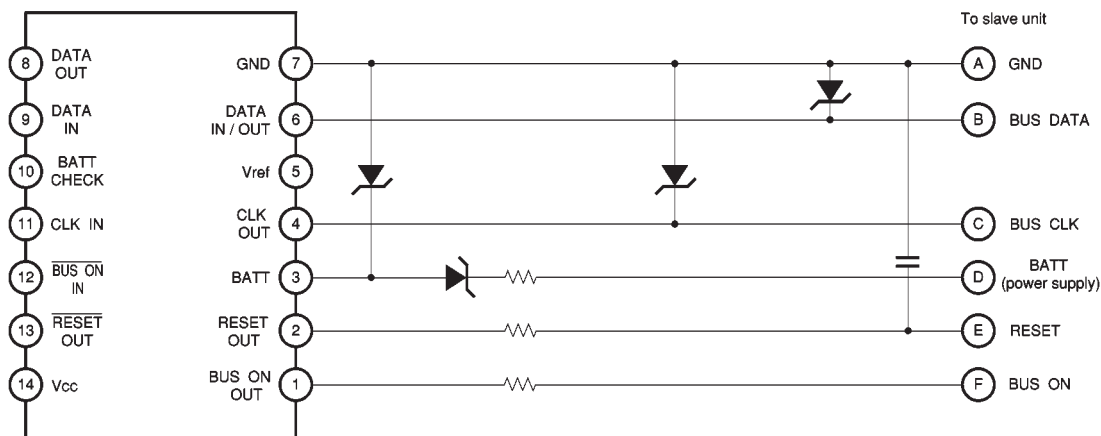


Fig.1

● Measurement circuit switch operation table

Parameter	Symbol	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 10	S 11	S 12	Measured pin	Conditions
Circuit current 1	I _{CC1}	2	1	1	2	1	1	1	1	1	1	1	1	14pin	3pin=5.5V
Circuit current 2	I _{CC2}		↓	↓					2	↓				14pin	12pin=0V
Circuit current 3	I _{CC3}		2	2						2				14pin	I _{L1} =50mA, I _{L2} =50mA
Voltage 1 between V _{CC} and BUS ON OUT	V _{LOSS1}		↓	1					↓	1				1pin-14pin	I _{L1} =100mA
Voltage 2 between V _{CC} and BUS ON OUT	V _{LOSS2}		1	2					1	2				2pin-14pin	I _{L2} =40mA
Input pin current 1	I _{IN1}			1			↓		2	1				12pin	—
Input pin current 2	I _{IN2}				↓		2		1					9pin	E ₉ =5.5V
Input pin current 3	I _{IN3}				2		1			↓				3pin	E ₃ =5.5V
Input pin current 4	I _{IN4}	↓			1					2				13pin	—
Output internal resistor 1	R ₁₄	1								1	2			1pin-4pin	—
Output internal resistor 2	R ₂₂										1	2		6pin-14pin	—
Output internal resistor 3	R ₂₉	↓				↓	↓		↓			1	2	10pin-14pin	—
DATA OUT pin output current	I _{DATA}	2				2	2	↓	2				1	8pin	E ₉ =5.5V
CLK OUT ON output voltage	V _{4ON}					1	1	2						4pin	E ₁₁ =5.5V
DATA OUT ON output voltage	V _{8ON}						2	1						8pin	E ₉ =5.5V
DATA IN / OUT ON output voltage	V _{6ON}				↓		↓		1					6pin	E ₉ =5.5V
BATT CHECK output voltage	V _{10ON}		↓	↓	↓	2		1	↓	↓	↓	↓	↓	10pin	E ₃ =5.5V

●Application example



• 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 withstanding voltage of pins 9 and 11 has been determined to be 200V or less. Take due care.

●External dimensions (Units: mm)

