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	Pd	450*	mW
Operating temperature	Topr	−40～+85	℃
Storage temperature	Tstg	−55～+125	℃
Voltage range for inputs	V_{IN}	−0.3～+7.0	V
Voltage range for BATT	V_{BATT}	−0.3～+18.0	V

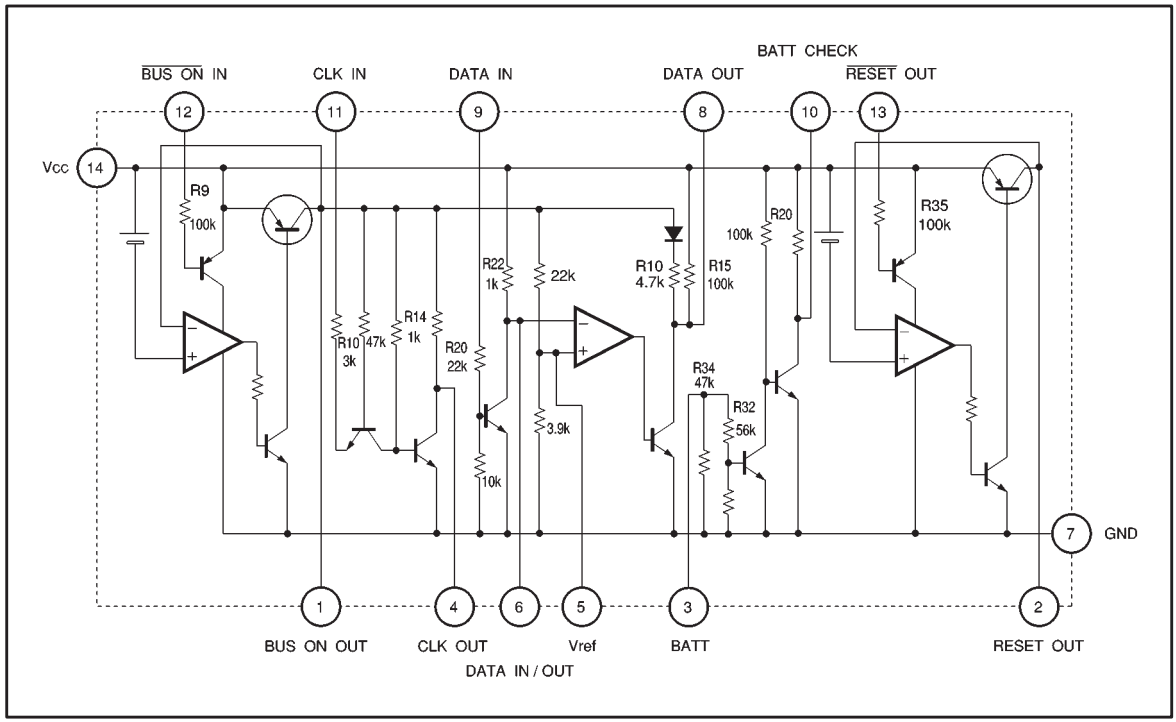
* Operating temperature range is for I_{L1}=50mA, and I_{L2}=5mA.
* Reduced by 5mW for each increase in Ta of 1℃ over 25℃ (board size 50mm × 50mm × 1.6mm).

●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℃.)

●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, $\overline{\text{BUS ON}}$ 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	$\overline{\text{BUS ON}}$ 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	$\overline{\text{RESET}}$ 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 $\overline{\text{BUS ON}}$ 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

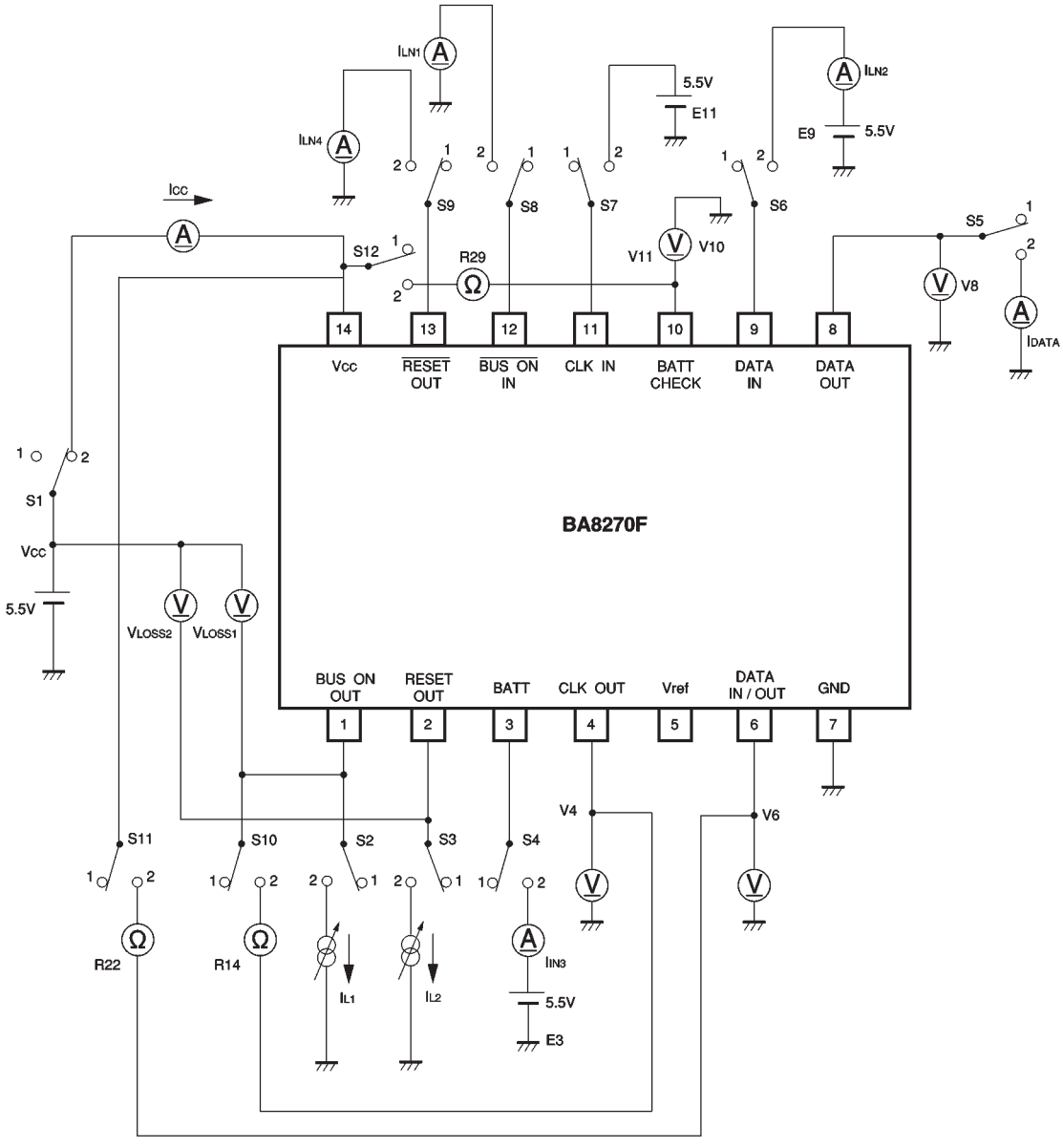
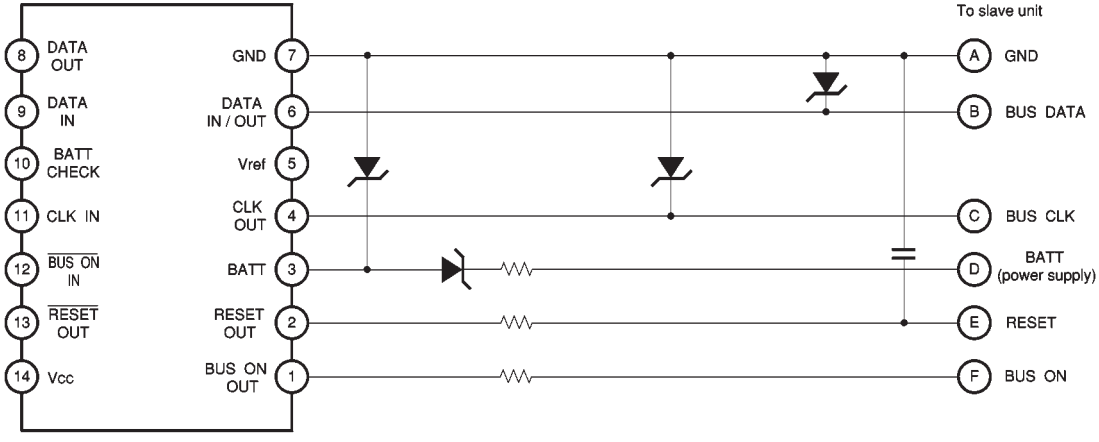


Fig.1

●Measurement circuit switch operation table

Parameter	Symbol	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	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

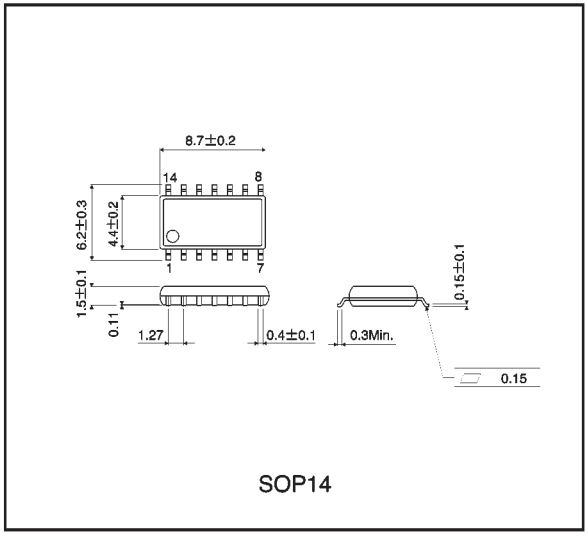
●Operation notes

(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 = 200pF and R = 0Ω), the withstanding voltage of pins 9 and 11 has been determined to be 200V or less. Take due care.

●External dimensions (Units: mm)



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