# **HBS-Compatible Driver and Receiver**

# Monolithic IC MM1007

### **Outline**

This IC conforms to the HBS (Home Bus) specification (Electronic Industries Association of Japan), and has functions for the reception and transmission of data. AMI is adopted for the waveforms of signals handled by the transmission and reception units, designed for connection to twisted-pair lines. Telephone equipment, security devices, audio or video equipment, air-conditioning equipment, and a wide range of other devices can be connected to a bus line to enable mutual communications.

#### **Features**

- 1. Compact design
- 2. High reliability
- 3. Replaces pulse transformers
- 4. Low cost
- 5. Easy circuit design
- 6. Few external components

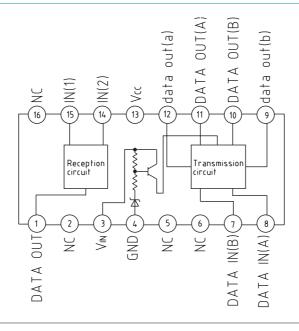
### **Applications**

- 1. Telephony equipment
- 2. Security equipment
- 3. Audio and video devices
- 4. Air-conditioning equipment
- 5. Wide range of other equipment and devices

### Package

DIP-16A (MM1007XD) SOP-16A (MM1007XF)

### **Block Diagram**



### Absolute Maximun Ratings (Ta=25°C)

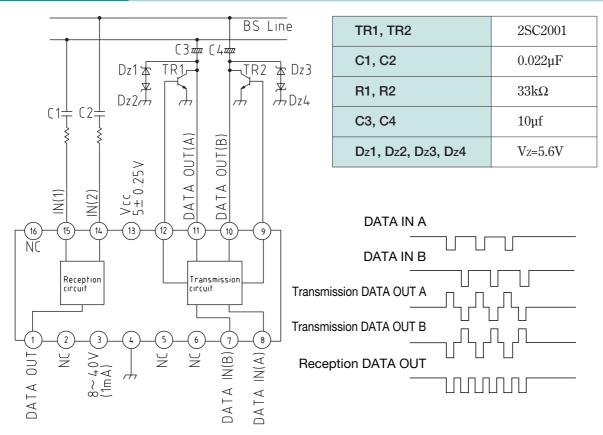
Item	Symbol	Ratings	Units
Operating temperature	Tstg	-40~+125	°C
Storage temperature	Торг	-20~+175	°C
Bias voltage	V <sub>B</sub> max.	-0.3~+41	V
Power voltage	Vcc max.	-0.3~+7	V
Allowable loss	Pd	450	mW
Recommended power supply voltage range	Vccop	4.75~5.25	V
Recommended bias voltage range	VBOP	8~40	V
Operating power supply voltage range	Vccop2	4.5~5.5	V

### Electrical Characteristics (Except where noted therwise, Ta=25°C, Vcc=5V, VB=30V, Ftransmit=10kHz (DUTY=50%))

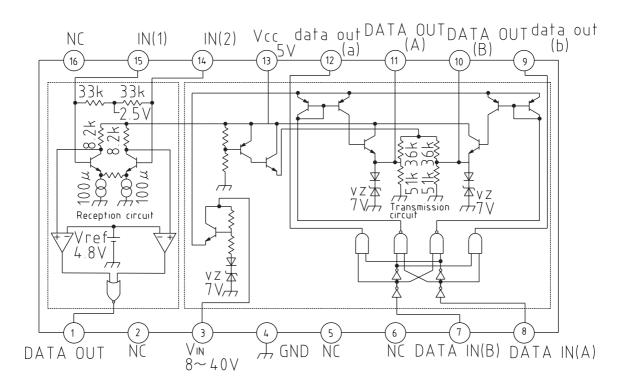
Item	Symbol	Measurement conditions	Min.	Тур.	Max.	Units
Power supply current	Icco	No signal (7-8PIN=H)		7	10	mA
Power supply current	Iccon	In transmission F <sub>L</sub> =10k, R <sub>L</sub> =36Ω		65	75	mA
Bias current pin 3	Іво	No signal (7-8PIN=H)		220	350	μА
Bias current pin 3	Ibon	In transmission F <sub>L</sub> =10k, R <sub>L</sub> =36Ω		1.5	2.2	mA
Transmission output voltage	VTO	Both pins 10 and 11	3.8	4.2	4.6	V <sub>P-P</sub>
Transmission waveform symmetry	VTR	VT01/VT02	0.75	1.0	1.25	
Reception sensitivity	Vrs		0.65	0.75	0.85	V <sub>P-P</sub>
Noise resistance	Vrn	Level at which no errors are output	0.55			V <sub>P-P</sub>
Input impedance	Rin	Both pins 14 and 15	25	36	46	kΩ
Transmission delay time 1	Td1	cf. transmit/receive waveform diagrams		0.2		μS
Transmission delay time 2	Td2	cf. transmit/receive waveform diagrams		0.4		μS
Transmission delay time 3	Td3	cf. transmit/receive waveform diagrams		0.7		μS
Transmission delay time 4	Td4	cf. transmit/receive waveform diagrams		1.0		μS
Reception output H voltage	Vroh		4.5		Vcc	V
Reception output L voltage	Vrol				0.5	V
Transmission waveform LOSS1	VTLS1	H level input voltage	4.5			V
Transmission waveform LOSS2	VTLS2	L level input voltage	4.5			V
H level input voltage	VLIH		2.4			V
L level input voltage	VLIL				0.8	V
H level input current	Ішн	V <sub>IN</sub> =2.4V			10	μА
L level input current	Ilil	$V_{\mathrm{IN}}$ =0.4 $V$			-300	μА

When a negative voltage is applied to pins 10 and 11, there should be no abnormal operation of internal circuits between 0 and 6V. However, if a negative voltage exceeding -6V is applied, thyristor operation may result, so it is recommended that an external clamping diode be added.

### **Application Circuits**

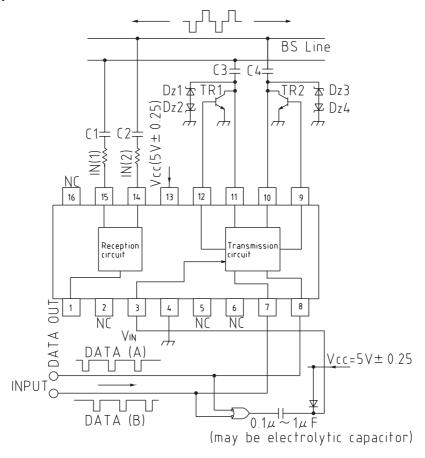


## Circuit Diagram



#### MM1007 When used with a single +5V power supply

#### **APPLICATION 1**



#### **APPLICATION 2**

