

**Typical Features**

- ◆ Baud rate up to 500Kbps
- ◆ Integrated isolated power supply
- ◆ Bus protection
- ◆ Two-port isolated voltage 4000VDC
- ◆ Operating temperature from -40°C to +85°C
- ◆ The bus supports 256 nodes max.



**Application**

**RS485-XXHSSV** series of products are RS485 transceiver modules integrated with isolated power supplies (built-in), electrical isolation, RS485 interface and bus protector. It can be an alternative to simplify the normal isolated RS485 circuit which includes a power supply module and a RS485 transceiver, its compact size is convenient for the application with RS485 function achieved in the consumer facility.

**Product List**

Part No.	Input Voltage Range (VDC)
RS485-3V3HSSV	3.15V-3.45V
RS485-05HSSV	4.75V-5.25V

**Input Specifications**

Item		Operation Conditions		Value
Power input	Static current	Power on, no communication	RS485-3V3HSSV	≤40mA
			RS485-05HSSV	≤50mA
	Sending current	500Kbps square wave communication	RS485-3V3HSSV	≤130mA
			RS485-05HSSV	≤130mA
Signal input	Series interface	RS485-3V3HSSV		Compatible with +3.3V UART interface only
		RS485-05HSSV		Compatible with +5V UART interface only
	Pin currents			

**Bus Interface**

Item			Value
Output	RS485 Bus interface		Standard RS485 interface, 5.1KΩ pull-up & pull-down resistors built-in A & B Bus
Output isolated voltage	Output isolated power pin	3.3Vdc	3.2-3.6Vdc (only for external pull up & down resistors, not available for other usage)
		5Vdc	4.9-5.3Vdc (only for external pull up & down resistors, not available for other usage)

### Transmission Specifications

Transmission rate	500Kbps Max				
Switching delay	≤30uS				
Number of nodes	256 nodes Max				
Transceiver control	Reversed comparing with the common RS485 transceiver control voltage level				
Sending status	Control	Input	Output		
	CON	TXD	A	B	Line state
	0	1	1	0	Normal
	0	0	0	1	Normal
Receiving status	Control	Input	Output		
	CON	$V_A - V_B$	RXD		
	1	≥0.2V	1		
	1	≤-0.2V	0		
	1	-0.2V < $V_A - V_B$ < 0.2V	Uncertain state		

Note: The receiving threshold value may have slight deviation with the change of  $V_{CC}$ .

### General Characteristics

Item	Test Conditions	Value
Electric Isolation		Two-port isolation (Isolated between input & output)
Isolation voltage	I/P-O/P, Test 1 Min, leakage current ≤0.5mA	4000VDC
Operating temperature		-40°C to +85°C
Shortage temperature		-55°C to +105°C
Relative Humidity		10% - 90%
Safety standard		IEC/EN62368
Safety Class		CLASS III
Application Environment		Dust, hard vibration, strong impact/shock and corrosive gas may damage the product

### EMC Performances

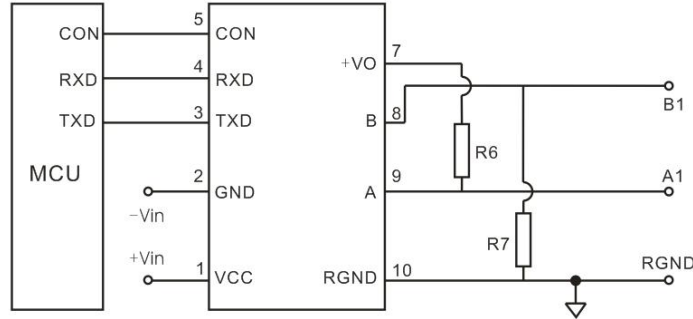
Items		Test Standard	Performance/Class	
EMC	EMI	CE	CISPR32/EN55032 CLASS A (with the recommended circuit 2-②)	
		RE	CISPR32/EN55032 CLASS A (with the recommended circuit 2-②)	
	EMS	ESD	IEC/EN61000-4-2	Contact ±4KV Perf. Criteria B
		EFT	IEC/EN61000-4-4	Power port ±2KV, Perf. Criteria B (with the recommended circuit 2-①)
				Signal port ±1KV, Perf. Criteria B (with the recommended circuit 2-①)
		Surge	IEC/EN61000-4-5	Power port ±1KV(line to line) Perf. Criteria B (with the recommended circuit 2-①)
				Signal port ±2KV(line to line) / ±4KV(ling to ground) Perf. Criteria B (with the recommended circuit 2-④)
	CS	IEC/EN61000-4-6	3Vr.m.s Perf. Criteria A	

**Recommended Circuits for the Application**

**1. Typical application**

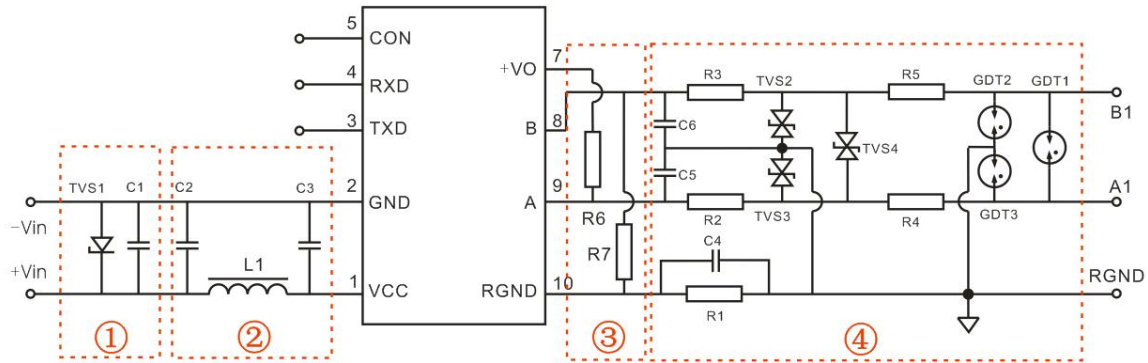
This RS485 isolated transceiver module integrates 5.1KΩ pull-up & pull-down resistors built-in, the typical circuit diagram shown below, R6 & R7 are external pull-up & pull-down resistors which values can be defined according to the actual situation.

RS485-05HSSV input voltage should be 5V, 3.3V is not available. RS485-3V3HSSV input voltage should be 3.3V, 5V is not available.



**Figure – Circuit 1**

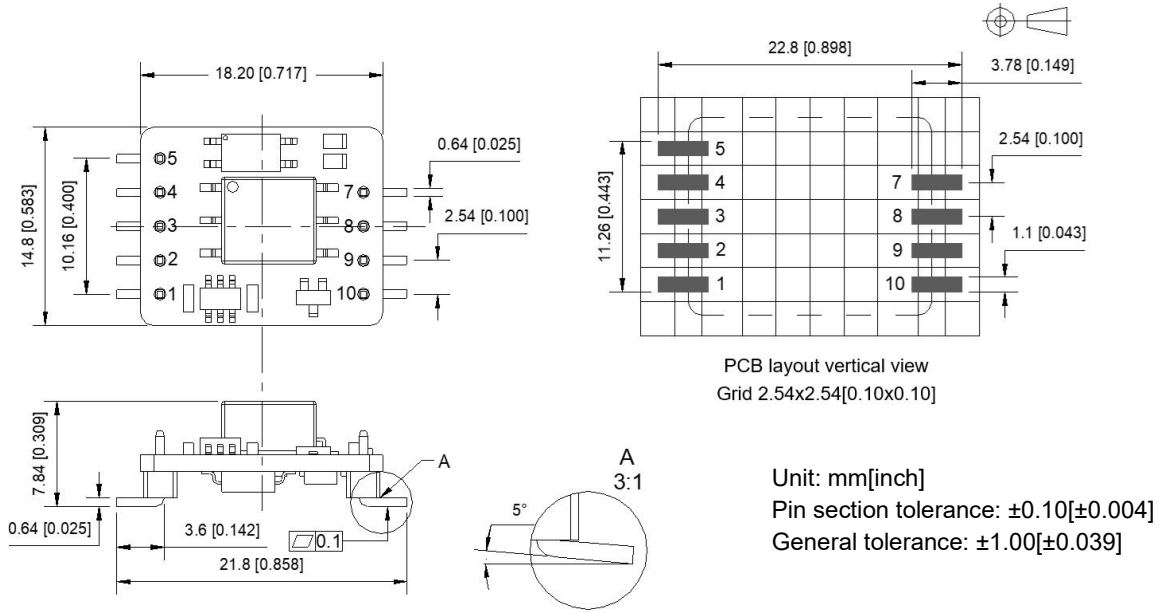
**2. Recommended EMC circuit diagram**



**Figure – Circuit 2**

Component No.	RS485-3V3HSSV		RS485-05HSSV		
C1	220uF/10V (Electrolytic capacitor)				
TVS1	SMCJ5.0A		SMCJ6.5A		
C2, C3	1uF/50V				
L1	10uH				
C5, C6	100pF/100V				
C4	1nF/2KV				
R1	1MΩ				
TVS2, TVS3, TVS4	SMBJ15CA				
R6, R7	TBD according to the actual situation				
R4, R5	-		Wire-wound resistor 10Ω/2W		
R2, R3	Wire-wound resistor 10Ω/1W	Wire-wound resistor 10Ω/2W	-		
GDT1, GDT2, GDT3	-		G30-A90X	S30-A90X	S50-A90X

**Mechanical Dimensions**



**Pin-out Function Description**

Pin No.	Function mark	Function description
1	+Vin	Positive power input
2	-Vin	Power input GND
3	TXD	Sending terminal
4	RXD	Receiving terminal
5	CON	Control terminal
7	+Vo	Positive power output
8	B	RS485H B terminal
9	A	RS485H A terminal
10	RGND	Power output GND

**Application Notice**

1. The product should be used as the specifications, hot plugging is not available, otherwise it could be permanently damaged.
2. RS485-05HSSV is not available for 3.3V, RS485-3V3HSSV is not available for 5V.
3. Pin 7 should be used only for external pull-up resistor, it should be no connection when there is no pull-up resistor.
4. The product performance cannot be guaranteed if it works under over-load condition.
5. Unless otherwise specified, all values or indicators on this datasheet are tested at Ta=25°C, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
6. All values or indicators on this datasheet have been tested based on Aipupower test specifications.
7. Aipupower can provide customization service.

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