

CMx01D485H-A Series



CE Report

RoHS



FEATURES

- Integrated high efficient isolated DC-DC converter
- High baud rate of up to 115200bps
- Two-port isolation test voltage (2.5kVDC)
- Operating ambient temperature range: -40°C to +85°C
- The bus supports maximum 32 nodes
- Set isolation and ESD bus protection in one
- Automatic send and receive data function

APPLICATIONS

- Industrial communication
- Power monitoring
- Coal mining industry
- Building automation

DESCRIPTION

The CM301D485H-A / CM501D485H-A modules primarily convert logic levels to RS-485 protocol differential levels while providing signal isolation. These are RS-485 protocol transceiver modules that integrate power isolation, signal isolation, RS-485 communication, and bus protection using IC integration technology. The product includes a built-in regulated isolated power supply, achieving 2500VDC electrical isolation. The module can be easily embedded into user equipment, enabling easy connection to an RS-485 protocol network.

SELECTION GUIDE

Product Model	Voltage Range (VDC)	Quiescent Current (mA, Typ)	Max. Operating Current (mA)	Transmission Baud Rate (bps)	Node Count (pcs)
CM301D485H-A	3.3 (3.17~3.45)	40	70	115200	32
CM501D485H-A	5 (4.75~5.25)	40	70	115200	32

RS-485 Transceiver

INPUT CHARACTERISTICS

Parameter		Symbol	Model	Min.	Typ.	Max.	Units
Input voltage		VCC	CM301D485H-A	3.17	3.3	3.45	VDC
			CM501D485H-A	4.75	5	5.25	VDC
TXD logic level	High Level	VIH	CM301D485H-A	0.7VCC	3.3	3.6	VDC
			CM501D485H-A	0.7VCC	5	5.5	VDC
	Low Level	VIL	CM301D485H-A, CM501D485H-A	0	--	0.8	VDC
RXD logic level	High Level	VOH	CM301D485H-A	VCC-0.4	3.1	--	VDC
			CM501D485H-A	VCC-0.4	4.8	--	VDC
	Low Level	VOL	CM301D485H-A, CM501D485H-A	0	0.2	0.4	VDC
Pin Current	ITXD≤2mA; IRXD≤2mA		CM301D485H-A	--	--	--	--
			CM501D485H-A	--	--	--	--
Serial Interface	Compatible with + 3.3V UART interface only		CM301D485H-A	--	--	--	--
	Compatible with + 5V UART interface only		CM501D485H-A	--	--	--	--

OUTPUT CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Units
Difference Level	Vdiff(d), No load	1.5	--	--	VDC
Difference Input Impedance	-7V≤VCM≤+12V	94	--	--	kΩ
Bus interface protection		ESD protection			

TRANSMISSION CHARACTERISTICS

Parameter	Min.	Typ.	Max.	Units
Transmission Rate	--	115200	--	bps
Number of Nodes	--	--	32	Nos
Transceiver Control	Half duplex, automatic transmission			
Output Port	RS485 Bus Interface	Standard RS485 interface, pull-up and pull-down resistors with 5.1kΩ each on A and B channels.		

RS-485 Transceiver

TRUTH TABLE

Parameter	Input	Output	
Transmit function	TXD	A	B
	1	1	0
	0	0	1
Receive function	A-B	RXD	
	$\geq -20\text{mV}$	1	
	$\leq -220\text{mV}$	0	
	$-200\text{mV} < \text{VA} - \text{VB} < -20\text{mV}$	Undefined state	

GENERAL CHARACTERISTICS

Parameter	Operating Conditions	Min.	Typ.	Max.	Units
Electrical isolation		Two-terminal isolation (input and output are mutually isolated)			
Isolation voltage	Test time 1 minute, leakage <5mA	--	2.5K	--	VDC
Working temperature	Full load	-40	--	+85	°C
Storage temperature	--	-50	--	+105	
Storage humidity	Non-condensing	10	--	90	%
Case temperature rise during operation	Ta=25°C	--	25	--	°C
Safety Standard		EN62368-1			
Safety Class		Class III			
Operating environment	The presence of dust, severe vibration, shock and corrosive gas may cause damage to the product				

PHYSICAL CHARACTERISTICS

Parameter	Operating Conditions
Housing material	Black flame-retardant heat-resistant plastic (UL94-V0)
Package size	DIP10
Weight	4.0g (Nominal)
Cooling method	Natural air cooling

RS-485 Transceiver

EMC CHARACTERISTICS

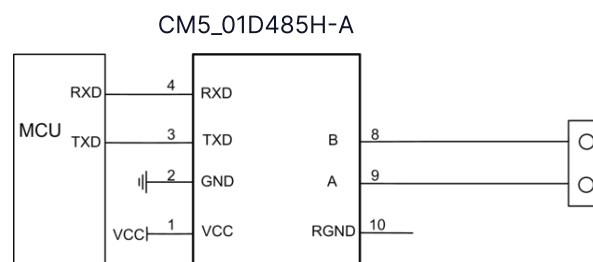
Parameter	Category	Content		
EMI	CE	CISPR32/EN55032	CLASS A (see Fig.2)	
	RE	CISPR32/EN55032	CLASS A (see Fig.2)	
EMS	ESD	IEC/EN61000-4-2	Contact ±4kV	Perf.Criteria B
		IEC/EN61000-4-4	Power supply port ±2kV (see Fig.2)	Perf.Criteria B
	EFT	IEC/EN61000-4-4	Signal port ±1kV (see Fig.2)	Perf.Criteria B
	Surge	IEC/EN61000-4-5	Power supply port ±1kV (line to line) (see Fig.2)	Perf.Criteria B
			Signal port ±2kV (line to line)/ ±4kV (line to ground)	Perf.Criteria B

PRODUCT USAGE NOTES

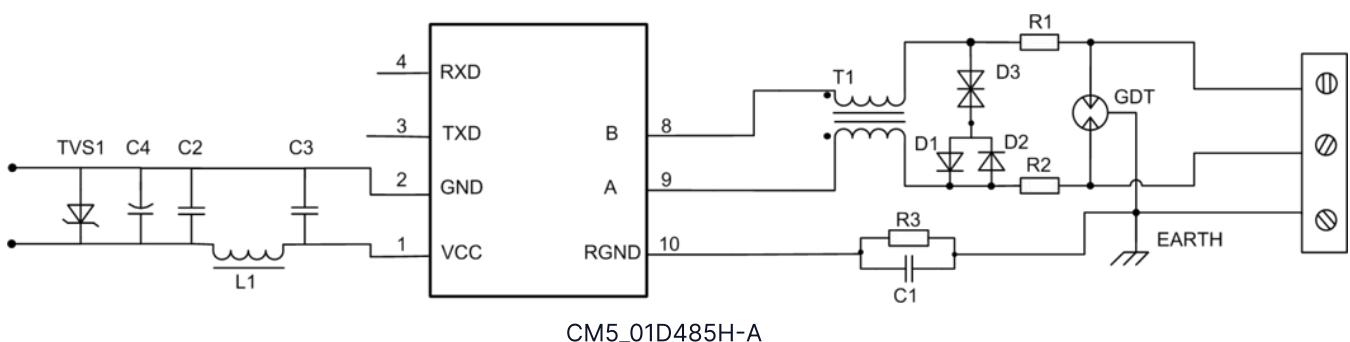
1. Carefully read and follow the instructions before use; contact our technical support if you have any question;
2. Do not use the product in hazardous areas;
3. Use only DC power supply source for this product. 220V AC power supply is prohibited;
4. It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction;
5. Hot-swap is not supported;
6. If the external input of TXD is insufficient, the pull-up resistor should be added according to the situation.

DESIGN REFERENCE

1. Typical Application Circuit



2. Recommended port protection circuit

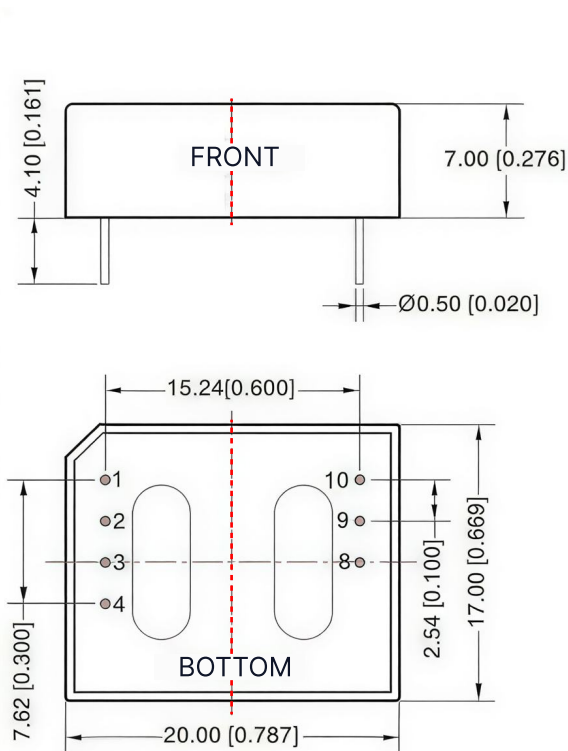


RS-485 Transceiver

Components	Models	Components	Models
R3	1M Ω	R1, R2	2.7 Ω /2W
C1	1nF, 2kV	D1, D2	1N4007
T1	ACM2520-301-2P	D3	SMBJ8.5CA
GDT	B3D090L	L1	10uH
C2, C3	1uF/50V	TVS1	SMCJ5.0A (CM301D485H-A) / SMCJ6.5A(CM501D485H-A)
C4	220uF/10V (Electrolytic capacitor)		

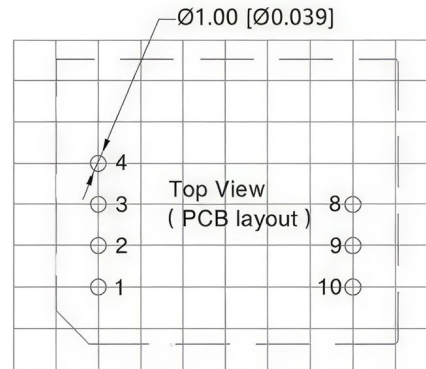
Table 1. EMC Recommended Parameters

OVERALL DIMENSIONS AND PIN FUNCTIONS



Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10 [± 0.004]
General tolerances: ± 0.50 [± 0.020]
The layout of the device is for reference only, please refer to the actual product

THIRD ANGLE PROJECTION 



Note: Grid 2.54*2.54mm

Pin	Mark	Function
1	VCC	Input Power
2	GND	GND
3	TXD	CM_D485H Sending Pin
4	RXD	CM_D485H Receiving Pin
8	B	CM_D485H B Pin
9	A	CM_D485H A Pin
10	RGND	Isolation Power Output RGND

NOTES

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
3. Suggested dual output module load imbalance: $\leq \pm 5\%$. If it exceeds $\pm 5\%$, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
4. The maximum capacitive load is tested within the input voltage range and under full load conditions;
5. Unless otherwise specified, all indicators in this manual are measured at $T_a=25\text{ }^{\circ}\text{C}$, humidity $<75\%$ RH, nominal input voltage, and output rated load;