Universal low cost CAN bus isolation transceiver

CAN bus communication interface signal isolation module: ISO CAN series

Features

●Power supply, signal input terminal and signal output terminal 3000VDC two isolation
●110 nodes can be connected, in line with ISO11898-24V standard
● Transmission rate up to 1Mbps
● It has high resistance to electromagnetic interference
● Built-in DC-DC module power supply anti-bus overvoltage protection function
● Built-in DC-DC can provide isolated power supply for other peripheral interface circuits
●Standard SIP 8 /SIP12 meet UL94V-0 flame retardant package
● Industrial temperature range:-40 ~ +85 ℃

Typical application

● Anti-jamming design of industrial field CAN bus communication interface
● CAN bus system power supply and signal ground wire circulation interference isolation
●Multi-channel data acquisition of Car CAN bus signal anti-interference isolation
●Industrial fieldbus high-precision data acquisition and anti-interference measurement
●Industrial automation equipment, robot anti-tamper control
●CNC machine tool,intelligent parking lot bus 485 anti-interference control
●Power supply isolation for bus communication interface of medical instruments and power meters
●Intelligent city, smart home bus control communication interface isolation

Summarize:

SunYuan ISO CAN is an isolated universal CAN bus transceiver module. The module has built-in CAN bus communication interface signal isolation and transceiver devices, which has the advantages of low cost, small size, and convenient use. Its main function is to isolate the logic level of the CAN bus controller into the differential level of the bus, and the isolation voltage is as high as 3000VDC during signal transmission.

ISO CAN bus communication interface signal isolation module, which integrates DC-DC power isolation circuit, high speed digital isolation chip, CAN bus transceiver, bus communication protection circuit, etc. In the actual application of the industrial field, in order to prevent the loss or distortion caused by interference during the data transmission and reception process, it is necessary to properly isolate the entire communication circuit. Isolation prevents some modules in the circuit from interfering with each other. For digital circuits, high speed level conversion will bring a lot of noise, and the ground wire network will also lead into noise, so isolation is required. An isolation system must be considered from three aspects: power supply, ground wire network, and signal transmission line.

The ISO CAN bus communication interface signal isolation module is easy to use and can realize the function of signal isolation and transmission. The 3KV isolation power supply between the input and output of its internal power isolation circuit, the output terminal has a long-term self-recovery overload short-circuit protection function, when the external communication line is short-circuited, the data acquisition communication workload changes greatly, or the CAN bus interface is suspended The output voltage has a small change and will not increase beyond the rated design voltage. It can effectively isolate the ground wire circulation interference, suppress the interference of the communication interface and enhance the antistatic protection function of the communication interface. The built-in DC-DC can provide a set of regulated isolated power supply for other peripheral interface circuits, especially for the industrial field CAN bus, RS232/ RS485 communication, Ethernet RJ45 communication and other interface power supply provide isolated power supply design. Products are widely used in car CAN bus control devices, industrial automation equipment, robots, CNC machine tools, parking lot intelligent control, smart home Ethernet Internet of Things communications, medical instruments, power meters, security data acquisition control and other industries.

The Maximum product rated value:

Shell temperature rise -------- ＜30℃	Baud rate --------- 100bps—1Mbps
Auxiliary power supply -------- 5VDC single power supply	Isolation --------- Input and output, power supply and output
Working temperature -------- -40 ~ +70℃	Number of nodes --------- ⩾110 nodes
Working humidity -------- 10 ~ 90% (non-condensing)	Leakage current --------- 1mA
Storage temperature -------- -55~ +105℃	CAN bus interface ---- Comply with ISO11898 standard, twisted pair output
Storage humidity -------- 10 ~ 90% (no condensation)	

General parameters

Continuous Isolation Voltage（Maximum continuous isolation voltage between input and output）--3000VDC/rms	
PW(Maximum power supply voltage input range)	±10%Vdd
Junction Temperature(Maximum range of woking environment temperature)	- 40℃ ~ + 85℃
Lead Temperature (Maximum soldering temperature and duration of pins <10S)	+300℃
The biggest dc voltage can bus pins(Maximum DC voltage of CAN bus pin)	-36V~+36V

Technical Parameters

Parameter name	Test condition	Minimum value	Typical value	Maximum value	Unit
Input power	Fixed voltage	+3.3	+5.0	+12.0	VDC
Quiescent Current			43		mA
Working current			65	72	mA
Isolation voltage		3000			VDC
Leakage current			1		mA
Pin current			I_{TXD}<2；I_{RXD}<2		mA
Serial interface			+5	5.5	V
VoH		4.0		5.0	VDC
VoL		0		1.0	VDC
Number of nodes			110		个
Operating temperature		-40		85	℃
storage temperature		-55		105	℃
humidity	No condensation	10		90	%
Package size	SIP8		22.0×9.0×11.0		mm
	SIP12		33.0×10.5×15.5		

Product selection example

Product model	Signal input	Signal output	Auxiliary power supply	Package	Distribution output
ISO CAN03	CAN controller transceiver	CAN-bus	3.3VDC	SIP8	No
ISO CAN05	CAN controller transceiver	CAN-bus	5VDC	SIP8	No
ISO CAN12	CAN controller transceiver	CAN-bus	12VDC	SIP8	No
ISO CAN05S3	CAN controller transceiver	CAN-bus	5VDC	SIP12	3.3VDC
ISO CAN05S5	CAN controller transceiver	CAN-bus	5VDC	SIP12	5VDC
ISO CAN12S3	CAN controller transceiver	CAN-bus	12VDC	SIP12	3.3VDC
ISO CAN12S5	CAN controller transceiver	CAN-bus	12VDC	SIP12	5VDC

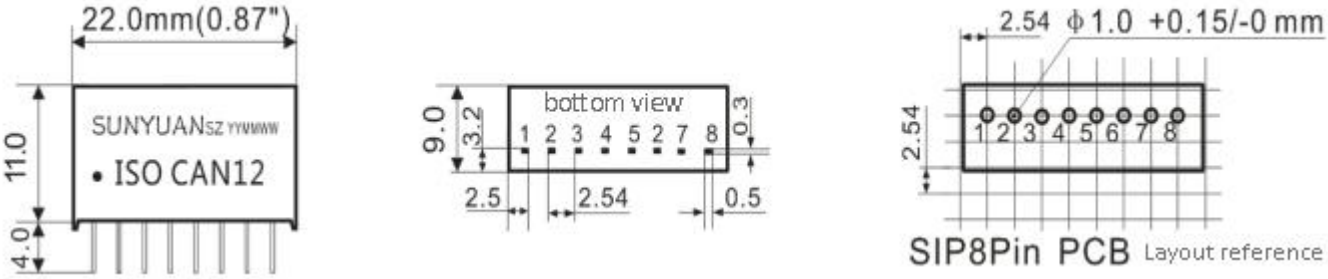
Product Image

Single in-line 8-pin package: SIP8 Pin

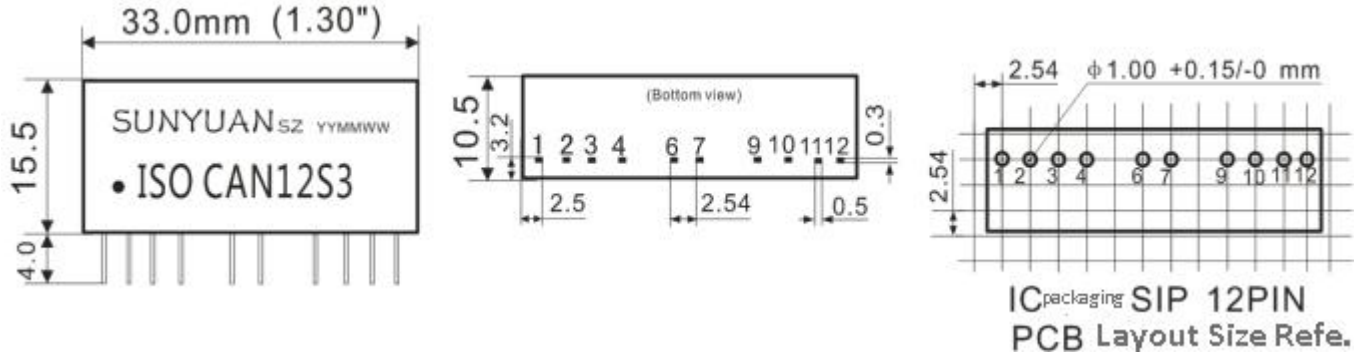
Single in-line 12-pin package: SIP12 Pin

Dimensions

1、Single in-line 8-pin package: SIP8 Pin



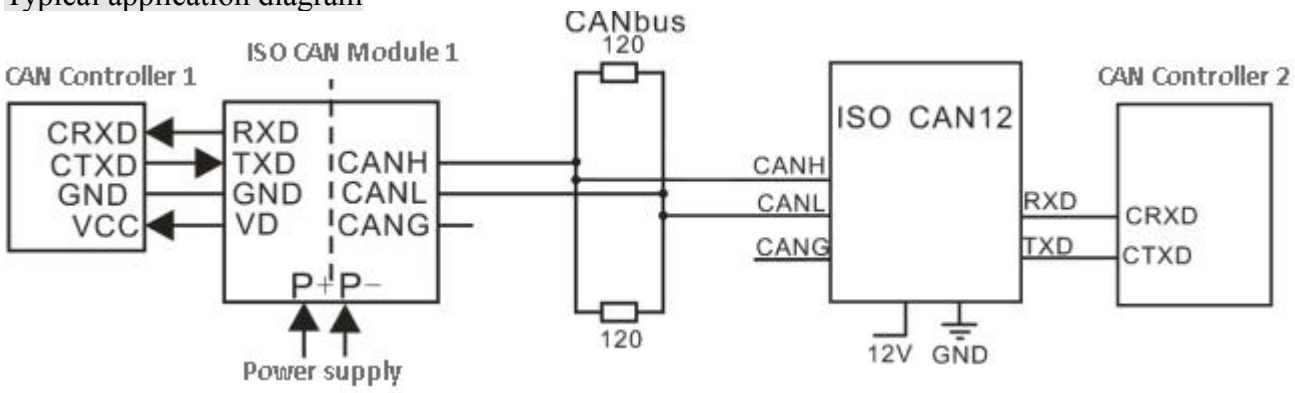
2、Single in-line 12-pin package: SIP12 Pin



Pin function description

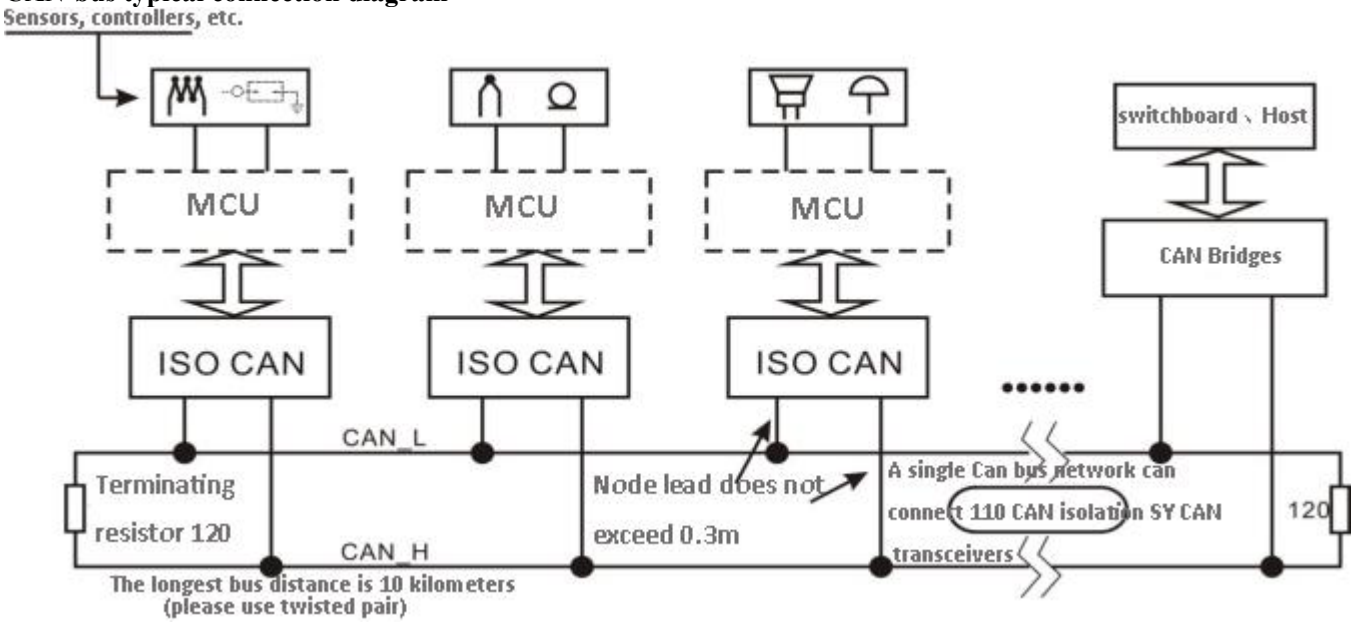
Pin	1	2	3	4	5	6	7	8	9	10	11	12
SIP8	Send TXD	receive RXD	Signal ground GND	Power supply PW+	Power supply PW-	Output ground CANG	Bus CANH	Bus CANL	—	—	—	—
SIP12	Send TXD	receive RXD	power distribution VD	Controller GND	Empty feet NC	Power supply PW+	Power supply PW-	Empty feet NC	5V output	Output ground CANG	Bus CANH	Bus CANL

Typical application diagram



The above picture is a typical application diagram of ISO CAN. Conventional circuits require CAN isolation transceivers that are realized by a combination of optocouplers, DC/DC isolated power supplies, CAN transceivers and other components. Now a low cost, small volume SIP8 packaged ISO CAN module can be completely replaced, and SIP12 packaged Isolated power distribution output 3.3V/5VDC, which can supply power to the board, making it easier to use.

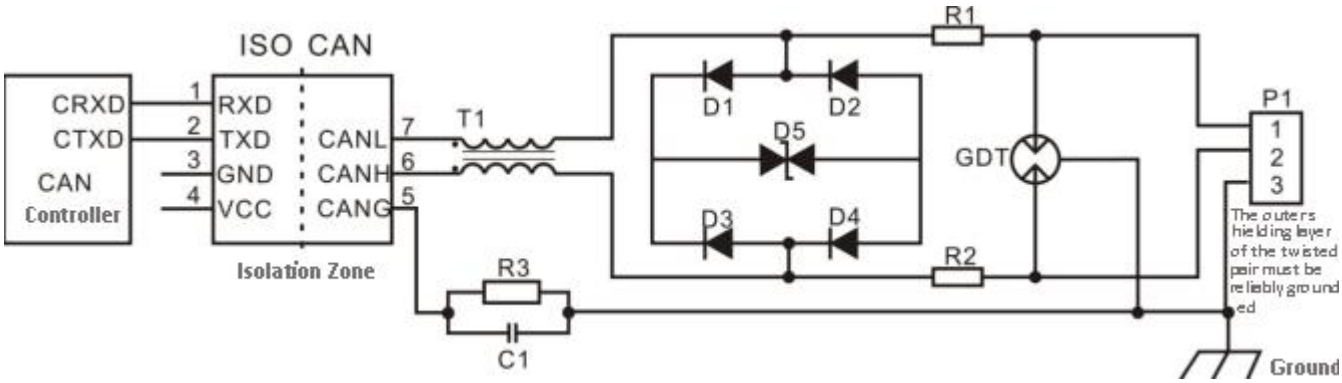
CAN-bus typical connection diagram



A typical CAN-bus network is shown in the figure above. Each network can be connected to 110 single-channel ISO CAN isolation bus transceiver modules. The longest communication distance of the universal module is 10km, and the high speed module supports the lowest baud rate of 40kbps and the longest communication distance. 1km. If you need to access more nodes or a longer communication distance, it can be expanded through CAN interrupters and other devices.

Remarks: The bus communication distance is related to the communication speed and field application. It can be designed according to the actual application and refer to relevant standards. The communication cable is best to choose shielded twisted pair and try to stay away from the interference source. In long distance communication, the terminal resistance value needs to be selected according to the communication distance, cable impedance and the number of nodes.

Recommended anti-surge protection circuit for CAN bus port



Component label	model parameter	Component label	model parameter
R1,R2	2.7ΩΩ/ 2W	**D5**	P6KE15CA
R3	1MΩ / 1206	**GDT**	B3D090L
C1	102 / 2KV	**T1**	B82793S0513N201
D1,D2,D3,D4	1N4007	**ISO CAN**	CAN bus interface isolation module

When the ISO CAN module encounters harsh environment applications, it is necessary to connect a protection circuit to the CAN interface to ensure that the module is not damaged and the bus communicates reliably, especially at nodes that are susceptible to interference. In addition, reliable grounding of the shielding layer is required when using shielded twisted wires. Single-point grounding is recommended.

Remarks: This recommended parameter is only a recommended value and needs to be selected according to the actual application on site. It is recommended to select PTC for R1 and R2, and fast recovery diodes for D1-D4.