DomoSIP Version 12 V Product Data Sheet

The DomoSIP™ PL network interface is a circuit board that implements the Physical and Data Link layers of the CEBus® standard (EIA-600) over the power line. The DomoSIP integrates a CEWay™ PL-III chip and discrete power line interface components. It is the ideal device for prototype development or for insertion into mid to high-end electronic appliances, such as central controllers. The designer must add a host processor to perform the protocol's upper layers functions and to run the user application.

Features

- Compact integration of CEWay PL-III and PL interface components on Single In-line Package (SIP)
- CEBus Power Line (PL) Physical Layer and Data Link Layer
- Proprietary DSP for superior signal reception in noisy environments
- Acknowledged and Unacknowledged services with or without addressed services
- Up to 10 receive/transmit elements
- Up to 27 group addresses
- Parallel or serial interface to host
- 20-pin SIP connector
- Industrial operating temperature range
- CEBus signal output available, up to 7.0 Vp-p

DomoSIP System Block Diagram

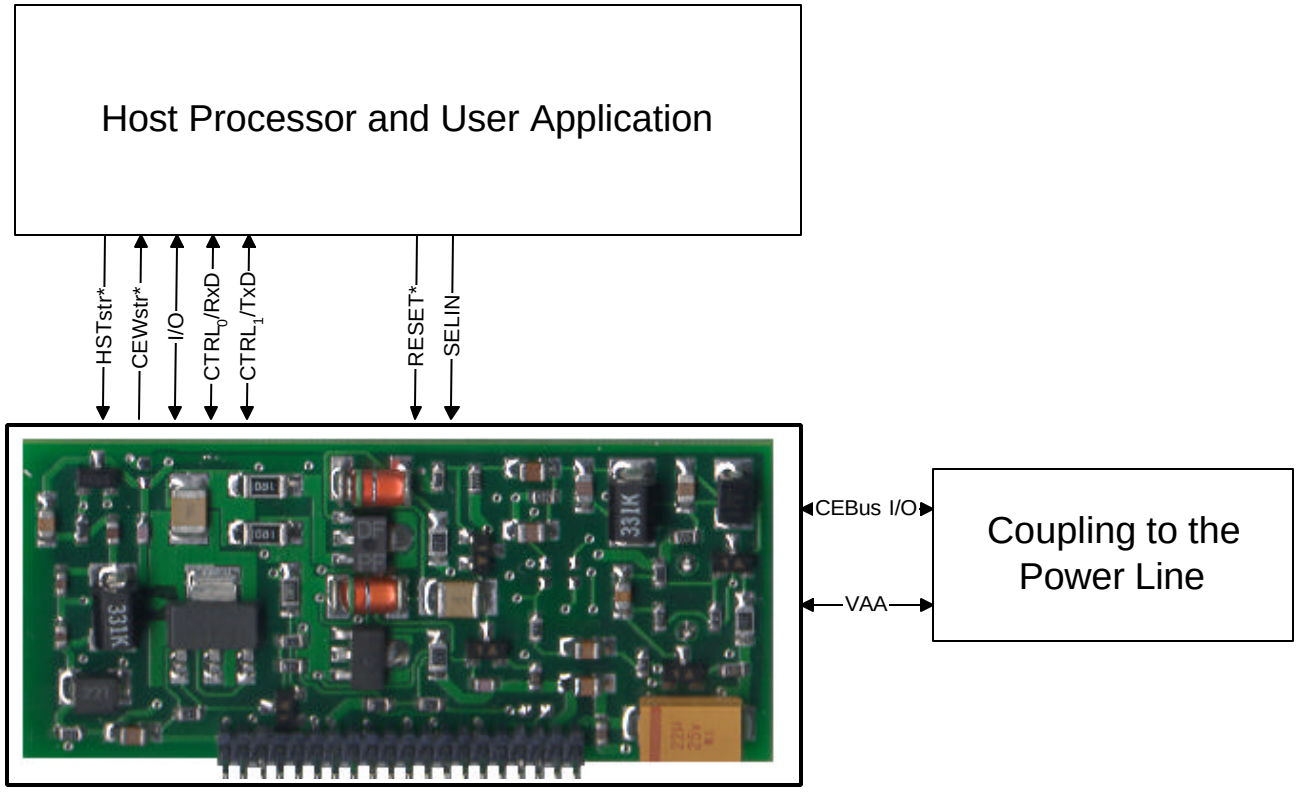

Figure 1 DomoSIP System Block Diagram

Pin Description

Table 1 DomoSIP Pin Description

Pin	Name	Description
1	**VAA**	Amplifier Power Supply +12 volts
2	**VSS**	Ground Reference
3	**VDD**	Power Supply +5 volts
4	**RESET***	Reset: A LOW-level input signal on this pin for 24 clock cycles (1.68 µs) while the oscillator is running resets the device. This pin has an internal pull-up resistor.
5	**SELIN**	Select Host Interface: This input pin selects the interface to be used for the communication with the host processor. A HIGH applied to this pin selects the parallel interface. A LOW applied to this pin selects the serial interface. This pin has an internal pull-up resistor. Choosing the serial interface can significantly reduce pin count for communication with the host processor.
6	**CEWstr***	CEWay Strobe is an output bit used for parallel communication with the host. This pin has an external 4.7 kΩ pull up resistor.
7	**HSTstr***	Host Strobe is an input bit used for parallel communication with the CEWay PL-III.
8	**CTRL1/TxD**	Control Status Line 1: Bi-directional pin for control information when using the parallel host interface. Transmit pin for the serial host interface. This pin has an external 4.7 kΩ pull up resistor.
9	**CEBAM**	Output signal coming from PL-III. This signal is used only to monitor power line transmission.
10	**CTRL0/RxD**	Control Status Line 0: Bi-directional pin for control information when using the parallel host interface. Receive pin for the serial host interface. This pin has an external 4.7 kΩ pull up resistor.
11	**I/O_0**	Digital Bi-Directional Data Bus Bit 0 / Baud Rate Selection Input Bit 0
12	**I/O_1**	Digital Bi-Directional Data Bus Bit 1 / Baud Rate Selection Input Bit 1
13	**I/O_2**	Digital Bi-Directional Data Bus Bit 2 / Baud Rate Selection Input Bit 2
14	**I/O_3**	Digital Bi-Directional Data Bus Bit 3
15	**I/O_4**	Digital Bi-Directional Data Bus Bit 4
16	**I/O_5**	Digital Bi-Directional Data Bus Bit 5
17	**I/O_6**	Digital Bi-Directional Data Bus Bit 6
18	**I/O_7**	Digital Bi-Directional Data Bus Bit 7
19	**VSS**	Ground Reference.
20	**CEBUS_I/O**	Bi-Directional CEBus Signal Line

Note: I/O_{0-7} have an external pull up resistor of 4.7 kΩ

Electrical Specifications

Absolute Maximum Ratings[1]

Table 2 DomoSIP Maximum Ratings

Parameter	Sym	Min	Max	Units
Supply Voltage - V_{DD}	V_{DD}- V_{ss}	-0.3	7	V
Supply Voltage - V_{AA}	V_{AA}	-0.3	20	V
Duty Cycle[2]	DC		20	%
DC Input Voltage	V_{IN}	-0.3	VDD +0.3	V
DC Input Current	I_{IN}	-10	+10	mA
Storage Temperature	T_{STG}	-40	+125	^{O}C

[1] Exceeding these values may cause permanent damage. Functional operation under these conditions is not implied.

[2] The DomoSIP is designed for a power line transmission duty cycle not exceeding 20 % in average. Exceeding this value may cause permanent damage.

Recommended Operating Conditions

Table 3 DomoSIP Recommended Operating Conditions

Parameter	Sym	Min	Typ	Max	Units
Supply Voltage[3] - V_{DD}	V_{DD}	4.75	5	5.25	V
Supply Voltage[3] - V_{AA}	V_{AA}	11	12	13	V
Operating Temperature[4]	T_O	-40		+85	^{O}C

[3] Regulated

[4] Components temperature

DC Electrical Characteristics - Voltages are with respect to V_{SS} unless stated otherwise

Table 4 DomoSIP DC Electrical Characteristics(V_{AA} = 12 volts)

Parameter	Sym	Min	Typ[5-6]	Max	Units
Digital Input Voltage (high)	V_{IH}	0.7V_{DD}		V_{DD}+0.3	V
Digital Input Voltage (low)	V_{IL}	V_{SS}-0.3		0.3V_{DD}	V
Digital Output Voltage (high)	V_{OH}	2.4			V
Digital Output Voltage (low)	V_{OL}			0.4	V
Operating Current V_{DD} Idle	I_{DD}		28		mA
Operating Current V_{AA} Idle	I_{AA}		31		mA
Operating Current V_{DD} TX[7]	I_{DD}		32		mA
Operating Current V_{AA} TX[7]	I_{AA}		130		mA

[5] Typical figures are at 25°C and are for design aid only.

[6] DC Electrical Characteristics are over recommended temperature range & recommended power supply voltages.

[7] Test conditions: Rload = 10 Ω

AC Electrical Characteristics

Table 5 DomoSIP - AC Electrical Characteristics: V_{AA} = 11 volts

Parameter	Sym	Typ[8]	Units	Conditions
CEBus_I/O Output Voltage[9]	CEBus_I/O	4.9	Vp-p	Rl = 2 kO
		3.5	Vp-p	Rl = 10 O
		2.0	Vp-p	Rl = 1 O
Input Pin Capacitance	C_I	8	pF	
Output Pin Capacitance	C_o	8	pF	

Table 6 DomoSIP - AC Electrical Characteristics: V_{AA} = 12 volts

Parameter	Sym	Typ[8]	Units	Conditions
CEBus_I/O Output Voltage[9]	CEBus_I/O	6.3	Vp-p	Rl = 2 kO
		4.8	Vp-p	Rl = 10 O
		2.9	Vp-p	Rl = 1 O
Input Pin Capacitance	C_I	8	pF	
Output Pin Capacitance	C_o	8	pF	

Table 7 DomoSIP - AC Electrical Characteristics: V_{AA} = 13 volts

Parameter	Sym	Typ[8]	Units	Conditions
CEBus_I/O Output Voltage[9]	CEBus_I/O	7.0	Vp-p	Rl = 2 kO
		5.4	Vp-p	Rl = 10 O
		3.0	Vp-p	Rl = 1 O
Input Pin Capacitance	C_I	8	pF	
Output Pin Capacitance	C_o	8	pF	

[8] Typical figures are at 25°C and are for design aid only: not guaranteed and not subject to production testing.

General Information

Some conditions have the potential to change power line communication's performance. For a proper power line communication with the DomoSIP, there are some rules to follow and remember.

The first thing is supply regulation. You must not neglect this part, because your results are directly proportional to it. The power line message is built around a spread spectrum signal from 100 kHz to 400 kHz. Your supply must be able to react very fast to current demand; otherwise there will be a degradation of your signal.

The second rule or “phenomenon” to remember is the DomoSIP's temperature. When you are transmitting continuously for a long period (minutes) or if your ambient temperature is high, the DomoSIP component’s temperature (DomoSIP amplification and output section) will increase and, after some time, your communication's efficiency will decrease, even though it can operate on its whole temperature range.

The AC line impedance can have a great influence on the power line communication's result. The impedance of the AC line can act as a filter or can constitute a high load for the frequency range you are working with. For example, the Operating Current V_{AA} TX can have any value in the 50 mA to 220 mA range, depending on the AC load.

Mechanical Specifications

Connector mates with Samtec SMS Series

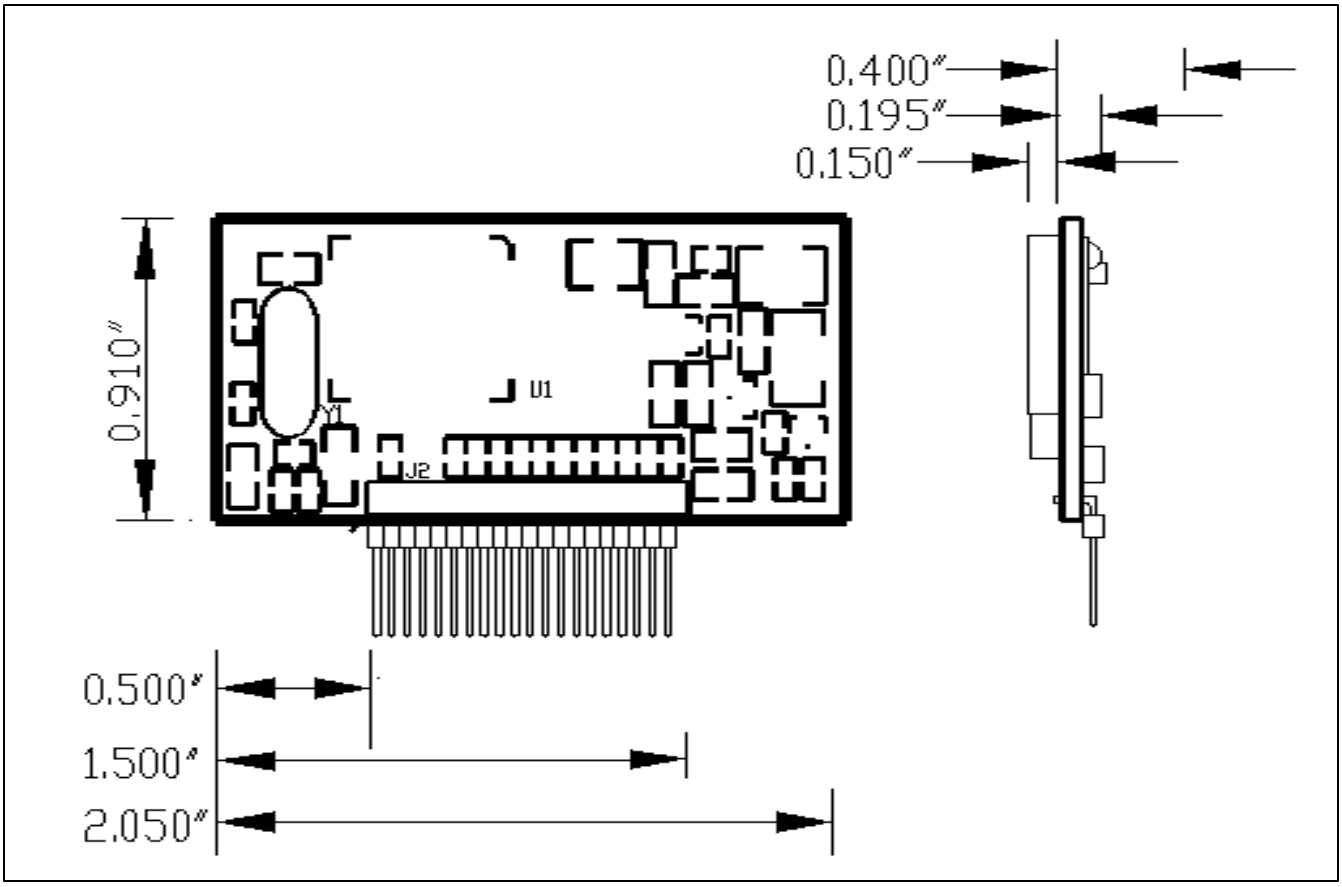

Figure 2 DomoSIP Mechanical Specifications

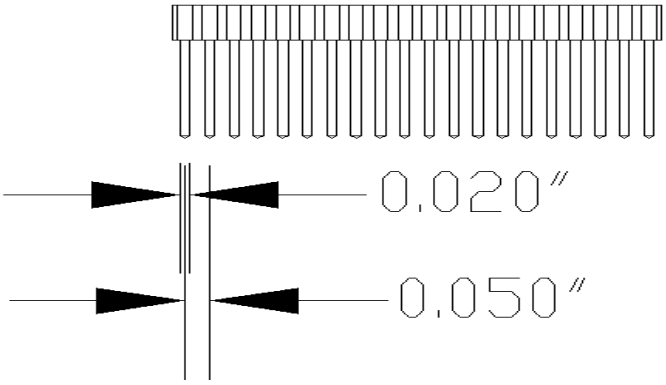

Figure 3 Connectors

20 pins / 50mils connector Ref: Samtec no TMS-120-01-T-S-RA

Ordering Information

Table 8 DomoSIP Ordering Information

Part Number	Description
DSIP-000-01B	DomoSIP 12V

Refer to the CEWay PL-III data sheet for information on the interface and the communication primitives.

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