

AMIS-42670

High-Speed CAN Transceiver for Long Networks

Description

The AMIS-42670 CAN transceiver is the interface between a controller area network (CAN) protocol controller and the physical bus and may be used in both 12 V and 24 V systems. The transceiver provides differential transmit capability to the bus and differential receive capability to the CAN controller. Due to the wide common-mode voltage range of the receiver inputs, the AMIS-42670 is able to reach outstanding levels of electromagnetic susceptibility (EMS). Similarly, extremely low electromagnetic emission (EME) is achieved by the excellent matching of the output signals.

The AMIS-42670 is the industrial version of the AMIS-30660 and primarily intended for applications where long network lengths are mandatory. Examples are elevators, in-building networks, process control and trains. To cope with the long bus delay the communication speed needs to be low. AMIS-42670 allows low transmit data rates down to 10 kbit/s or lower.

Features

- Fully Compatible with the ISO 11898-2 Standard
- Certified “Authentication on CAN Transceiver Conformance (d1.1)”
- Wide Range of Bus Communication Speed (0 Mbit/s up to 1 Mbit/s)
- Allows Low Transmit Data Rate in Networks Exceeding 1 km
- Ideally Suited for 12 V and 24 V Industrial and Automotive Applications
- Low Electromagnetic Emission (EME) Common-Mode Choke is No Longer Required
- Differential Receiver with Wide Common-Mode Range (± 35 V) for High EMS
- No Disturbance of the Bus Lines with an Unpowered Node
- Thermal Protection
- Bus Pins Protected Against Transients
- Silent Mode in which the Transmitter is Disabled
- Short Circuit Proof to Supply Voltage and Ground
- Logic Level Inputs Compatible with 3.3 V Devices
- These are Pb-Free Devices*

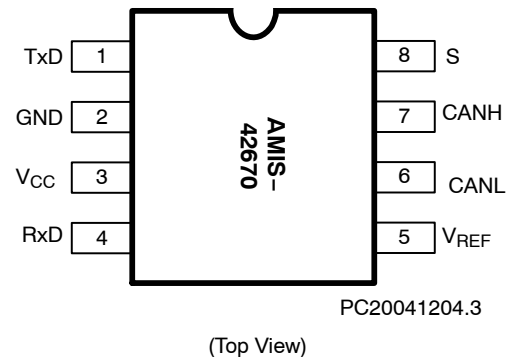
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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PIN ASSIGNMENT



ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 9 of this data sheet.

Table 1. TECHNICAL CHARACTERISTICS

Symbol	Parameter	Condition	Max	Max	Unit
V_{CANH}	DC Voltage at Pin CANH	$0 < V_{CC} < 5.25 \text{ V}$; no time limit	-45	+45	V
V_{CANL}	DC Voltage at Pin CANL	$0 < V_{CC} < 5.25 \text{ V}$; no time limit	-45	+45	V
$V_{o(dif)(bus_dom)}$	Differential Bus Output Voltage in Dominant State	$42.5 \Omega < R_{LT} < 60 \Omega$	1.5	3	V
$t_{pd(rec-dom)}$	Propagation Delay TxD to RxD	See Figure 6	70	245	ns
$t_{pd(dom-rec)}$	Propagation Delay TxD to RxD	See Figure 6	100	245	ns
$C_{M-range}$	Input Common-Mode Range for Comparator	Guaranteed Differential Receiver Threshold and Leakage Current	-35	+35	V
$V_{CM-peak}$	Common-Mode Peak	See Figures 7 and 8 (Note 1)	-500	500	mV
$V_{CM-step}$	Common-Mode Step	See Figures 7 and 8 (Note 1)	-150	150	mV

1. The parameters $V_{CM-peak}$ and $V_{CM-step}$ guarantee low electromagnetic emission.

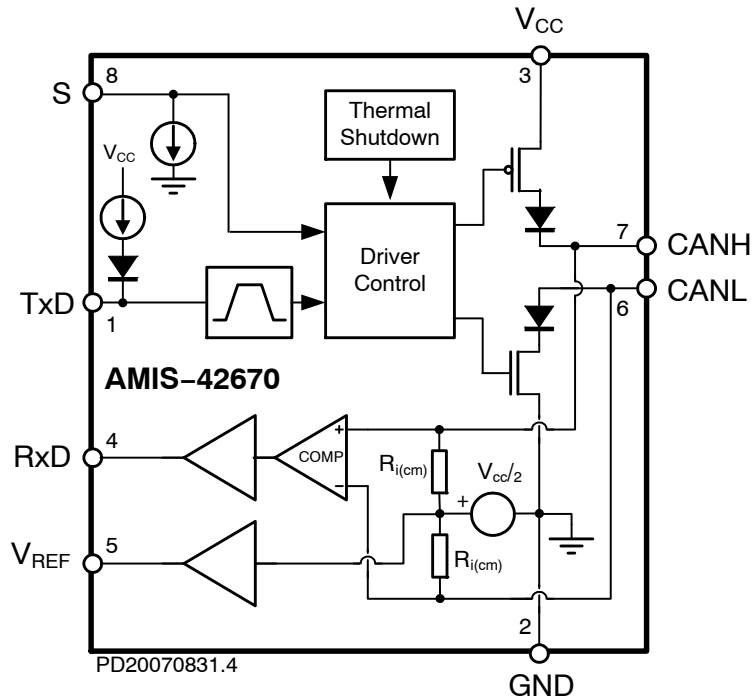


Figure 1. Block Diagram

Table 2. PIN DESCRIPTION

Pin	Name	Description
1	TxD	Transmit Data Input; Low Input → Dominant Driver; Internal Pullup Current
2	GND	Ground
3	VCC	Supply Voltage
4	RxD	Receive Data Output; Dominant Transmitter → Low Output
5	VREF	Reference Voltage Output
6	CANL	Low-Level CAN Bus Line (Low in Dominant Mode)
7	CANH	High-Level CAN Bus Line (High in Dominant Mode)
8	S	Silent Mode Control Input; Internal Pulldown Current

Table 3. ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Min.	Max.	Unit
V _{CC}	Supply Voltage		-0.3	+7	V
V _{CANH}	DC Voltage at Pin CANH	0 < V _{CC} < 5.25 V; no time limit	-45	+45	V
V _{CANL}	DC Voltage at Pin CANL	0 < V _{CC} < 5.25 V; no time limit	-45	+45	V
V _{TxD}	DC Voltage at Pin TxD		-0.3	V _{CC} + 0.3	V
V _{RxD}	DC Voltage at Pin RxD		-0.3	V _{CC} + 0.3	V
V _S	DC Voltage at Pin S		-0.3	V _{CC} + 0.3	V
V _{REF}	DC Voltage at Pin V _{REF}		-0.3	V _{CC} + 0.3	V
V _{tran} (CANH)	Transient Voltage at Pin CANH	Note 2	-150	+150	V
V _{tran} (CANL)	Transient Voltage at Pin CANL	Note 2	-150	+150	V
V _{esd}	Electrostatic Discharge Voltage at All Pins	Note 3 Note 5	-4 -750	+4 +750	kV V
Latch-up	Static Latch-up at All Pins	Note 4		100	mA
T _{stg}	Storage Temperature		-55	+155	°C
T _A	Ambient Temperature		-40	+125	°C
T _J	Maximum Junction Temperature		-40	+150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

- Applied transient waveforms in accordance with ISO 7637 part 3, test pulses 1, 2, 3a, and 3b (see Figure 3).
- Standardized human body model ESD pulses in accordance to MIL883 method 3015.7.
- Static latch-up immunity: static latch-up protection level when tested according to EIA/JESD78.
- Standardized charged device model ESD pulses when tested according to EOS/ESD DS5.3-1993.

Table 4. THERMAL CHARACTERISTICS

Symbol	Parameter	Conditions	Value	Unit
R _{th} (vj-a)	Thermal Resistance from Junction-to-Ambient in SOIC-8 Package	In Free Air	150	k/W
R _{th} (vj-s)	Thermal Resistance from Junction-to-Substrate of Bare Die	In Free Air	45	k/W

APPLICATION INFORMATION

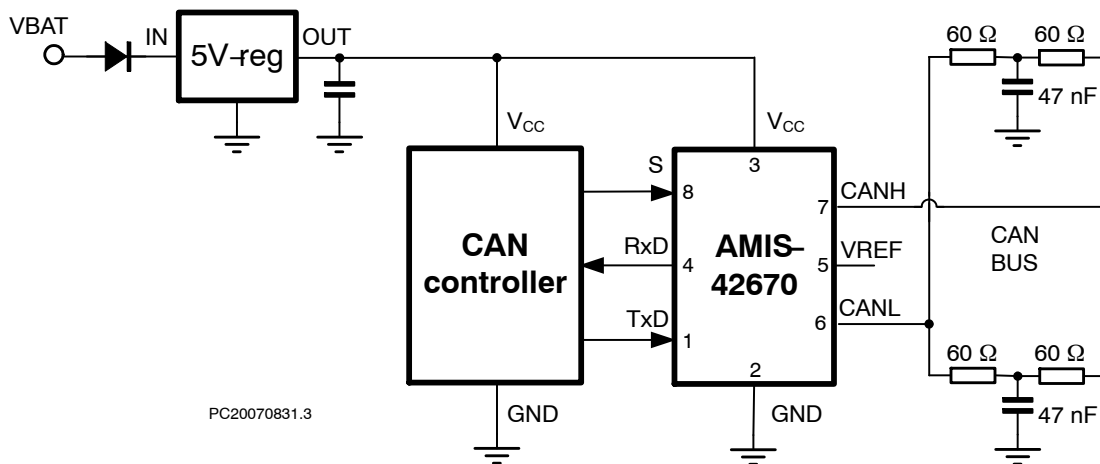


Figure 2. Application Diagram

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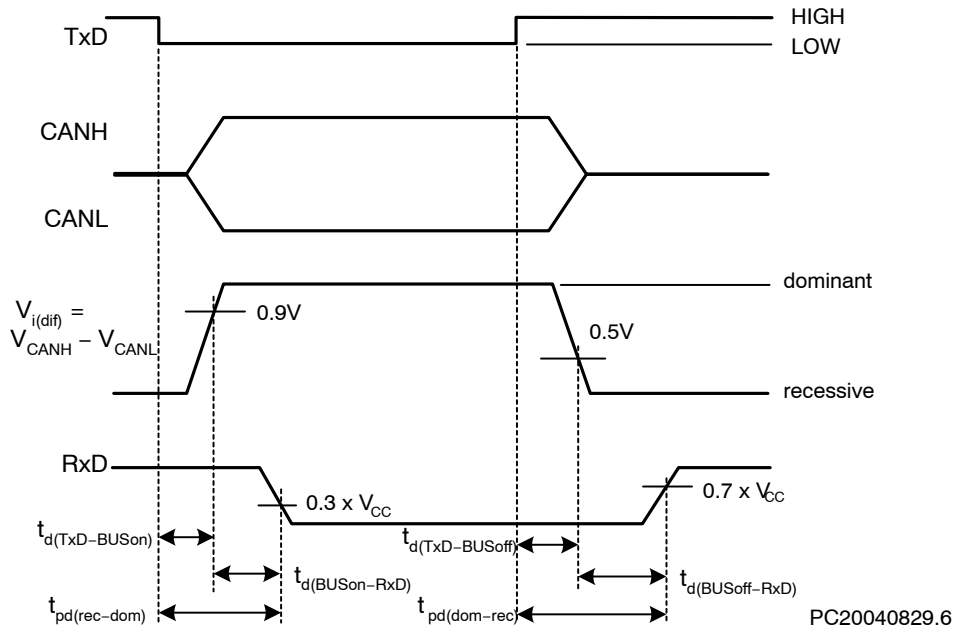


Figure 6. : Timing Diagram for AC Characteristics

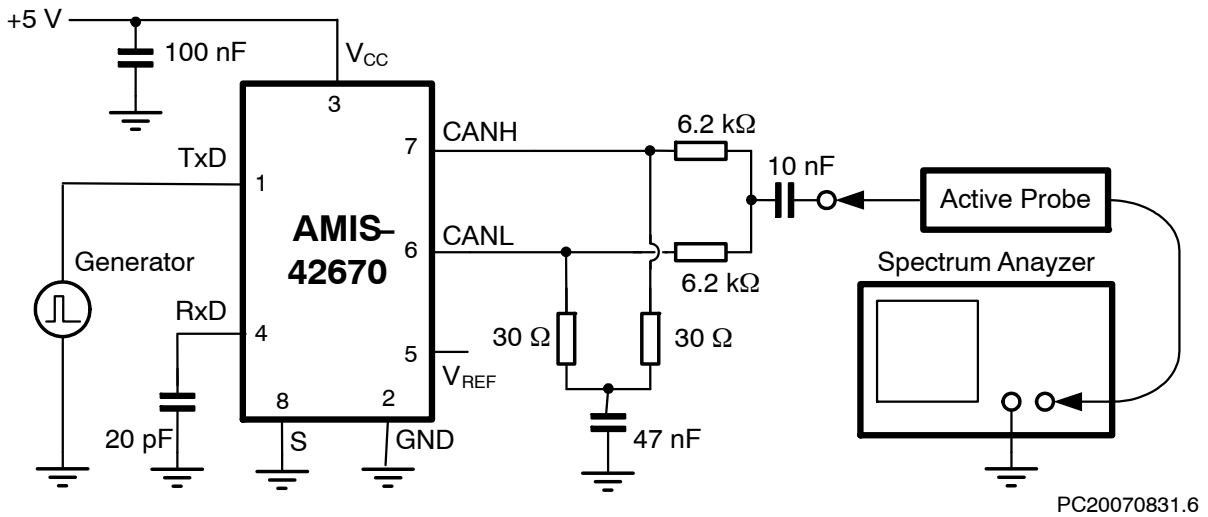


Figure 7. Basic Test Setup for Electromagnetic Measurement

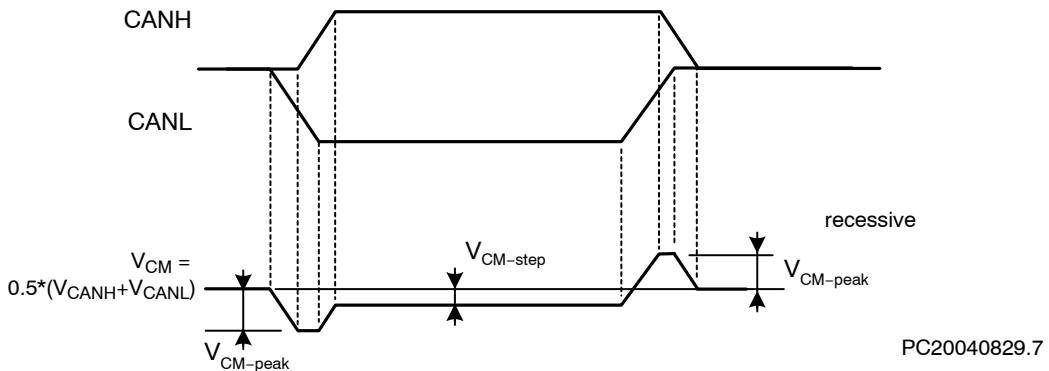


Figure 8. Common-Mode Voltage Peaks (See Measurement Setup Figure 7)

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DEVICE ORDERING INFORMATION

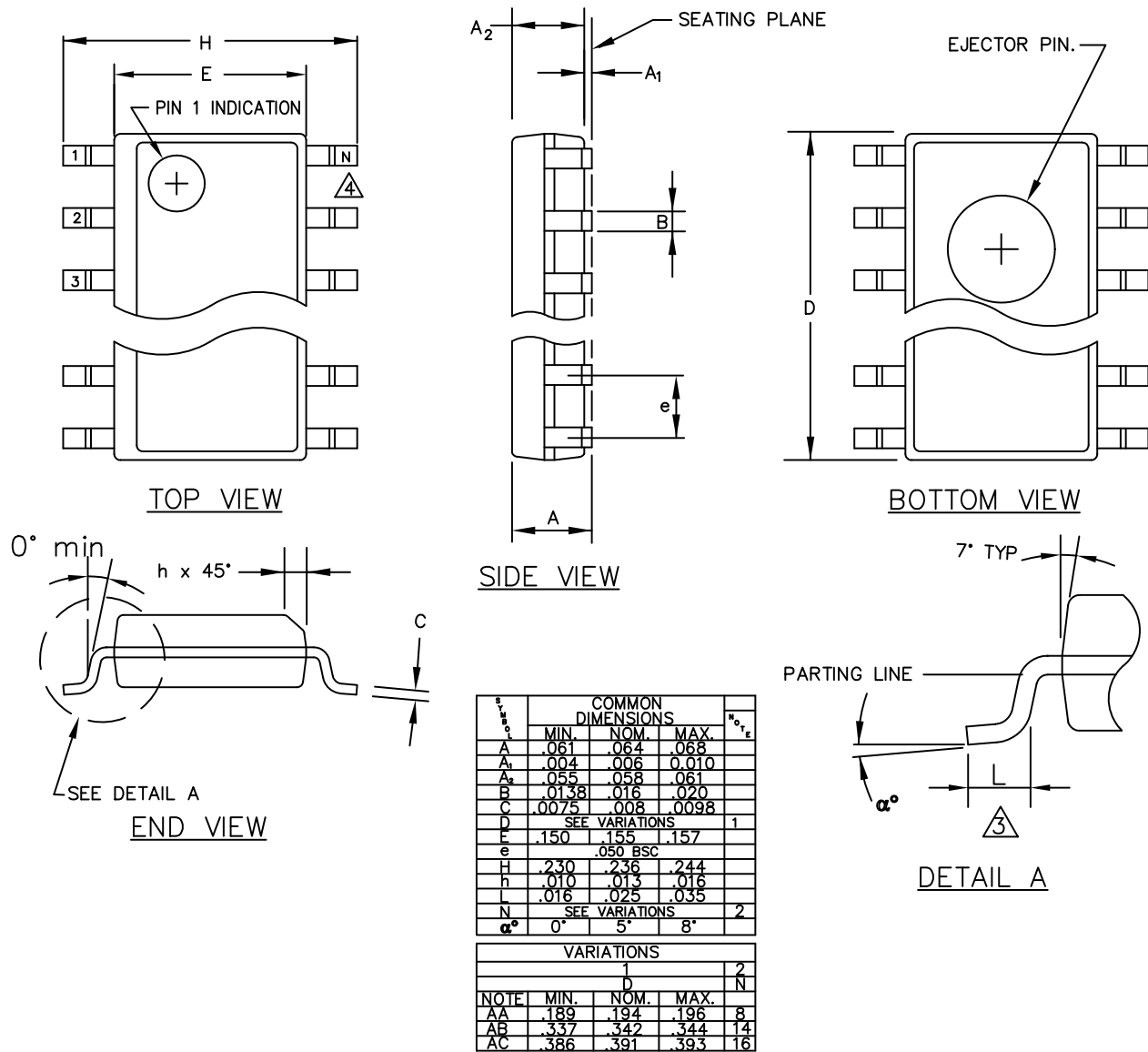
Part Number	Temperature Range	Package Type	Shipping [†]
AMIS42670ICAH2G	-40°C - 125°C	SOIC-8 (Pb-Free)	96 Tube / Tray
AMIS42670ICAH2RG	-40°C - 125°C	SOIC-8 (Pb-Free)	3000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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PACKAGE DIMENSIONS

SOIC 8
CASE 751AZ-01
ISSUE O



1. ALL DIMENSIONS ARE IN MILLIMETERS.

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