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## AMIS-3066x - Difference Between 5 V and 3.3 V Versions



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### APPLICATION NOTE

#### Introduction

ON Semiconductor has two versions of the AMIS-3066x CAN high speed transceiver:

- AMIS-30660 full 5 V version
- AMIS-30663 version with 3.3 V interfacing towards CAN controller

The AMIS-30663 is a derivative of the AMIS-30660 silicon, with minor modifications at metal level. This application note describes the differences between the two products.

#### DIFFERENCES BETWEEN AMIS-30660 AND AMIS-30663

#### Block Diagrams

Both products are based on the same product specification and IP blocks. Detailed general block diagrams are shown in and Figures 1 and 2.

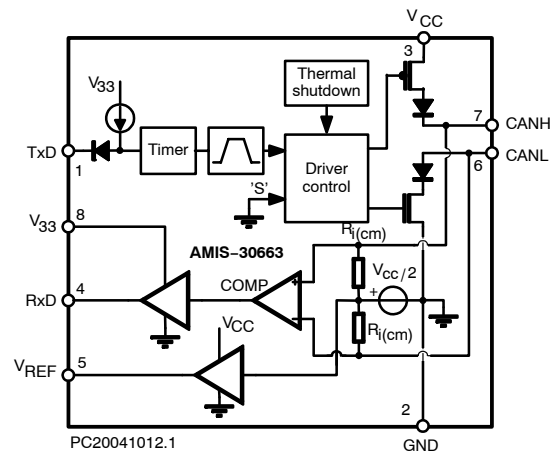


Figure 2. AMIS-30663 Block Diagram

#### Pinout Differences

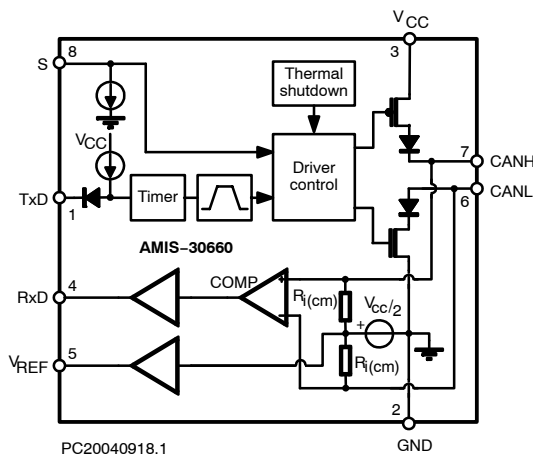
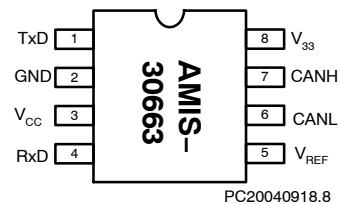
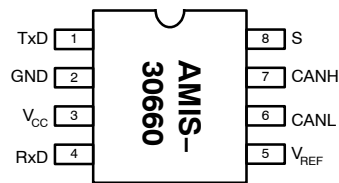


Figure 1. AMIS-30660 Block Diagram



PC20040918.8



PC20040918.3

**Table 1. PIN DESCRIPTION**

Pin	AMIS-30660	AMIS-30663	Description
1	TxD	TxD	Transmit Data Input; Low Input → Dominant Driver; Internal Pullup Current
2	GND	GND	Ground
3	V <sub>CC</sub>	V <sub>CC</sub>	Supply Voltage
4	RxD	RxD	Receive Data Output; Dominant Transmitter → Low Output
5	V <sub>REF</sub>	V <sub>REF</sub>	Reference Voltage Output
6	CANL	CANL	LOW-Level CAN Bus Line (Low in Dominant Mode)
7	CANH	CANH	HIGH-Level CAN Bus Line (High in Dominant Mode)
8	S	V <sub>33</sub>	Select Input for High Speed or Silent Mode; Internal Pulldown Current 3.3 V Supply for Digital I/O

The pin number 8 is a digital CMOS input pin (standby) on the AMIS-30660 device and is the I/O supply pin called V<sub>33</sub> for pin RxD on the AMIS-30663 product. Internally, on AMIS-30663, the stand-by signal is forced to ground. This means Pin 8 must be properly decoupled in application and treated as a supply pin while performing ESD and latch-up tests. The pullup on Pin TxD is connected via protection diode to V<sub>33</sub> and not to 5 V supply as in the AMIS-30660.

**3.3 V Interface**

The AMIS-30663 may be used to interface with 3.3 V or 5 V controllers by using the V<sub>33</sub> Pin. This pin may be supplied with 3.3 V or 5 V to correspond with digital interface voltage levels.

**ELECTRICAL CHARACTERISTICS**

**Table 2. AMIS-30660 (5 V VERSION)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>RECEIVER DATA OUTPUT (Pin RxD)</b>						
V <sub>OH</sub>	HIGH-Level Output Voltage	I <sub>RxD</sub> = -10 mA	0.6 x V <sub>CC</sub>	0.75 x V <sub>CC</sub>		V
V <sub>OL</sub>	LOW-Level Output Voltage	I <sub>RxD</sub> = 6 mA		0.25	0.45	V
<b>TRANSMITTER DATA INPUT (Pin TxD)</b>						
I <sub>IH</sub>	HIGH-Level Input Current	V <sub>TxD</sub> = V <sub>CC</sub>	-1	0	+1	μA
I <sub>IL</sub>	LOW-Level Input Current	V <sub>TxD</sub> = 0 V	-75	-200	-350	μA

**Table 3. AMIS-30663 (3.3 V VERSION)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>RECEIVER DATA OUTPUT (Pin RxD)</b>						
V <sub>OH</sub>	HIGH-Level Output Voltage	I <sub>RxD</sub> = -10 mA	0.7 x V <sub>33</sub>	0.75 x V <sub>33</sub>		V
V <sub>OL</sub>	LOW-Level Output Voltage	I <sub>RxD</sub> = 5 mA		0.18	0.35	V
<b>TRANSMITTER DATA INPUT (Pin TxD)</b>						
I <sub>IH</sub>	HIGH-Level Input Current	V <sub>TxD</sub> = V <sub>33</sub>	-1	0	+1	μA
I <sub>IL</sub>	LOW-Level Input Current	V <sub>TxD</sub> = 0 V	-50	-200	-300	μA

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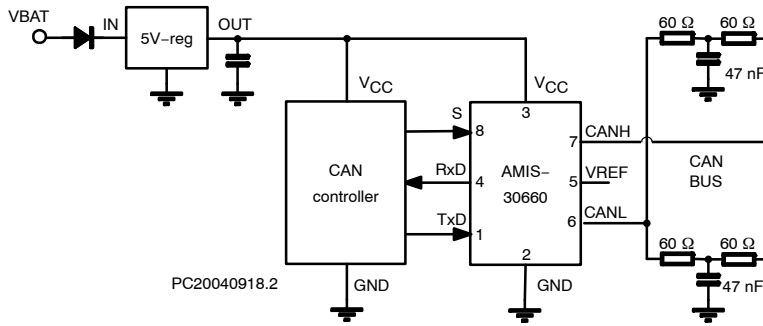


Figure 3. Typical Application Schematic for the AMIS-30660

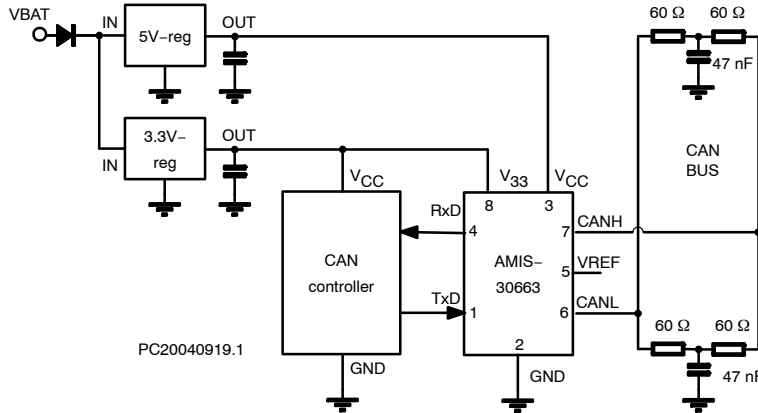


Figure 4. Typical Application Schematic for the AMIS-30663

## TIMING CHARACTERISTICS

Table 4. AMIS-30660 TIMING CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$t_{d(TxD-BUSon)}$	Delay TxD to Bus Active	$V_s = 0\text{ V}$	40	85	130	ns
$t_{d(TxD-BUSoff)}$	Delay TxD to Bus Inactive	$V_s = 0\text{ V}$	30	60	105	ns
$t_{d(BUSon-RxD)}$	Delay Bus Active to RxD	$V_s = 0\text{ V}$	25	55	105	ns
$t_{d(BUSoff-RxD)}$	Delay Bus Inactive to RxD	$V_s = 0\text{ V}$	65	100	135	ns
$t_{pd(rec-dom)}$	Propagation Delay TxD to RxD from Recessive to Dominant	$V_s = 0\text{ V}$	70		230	ns
$t_{d(dom-rec)}$	Propagation Delay TxD to RxD from Dominant to Recessive	$V_s = 0\text{ V}$	100		245	ns

Table 5. AMIS-30663 TIMING CHARACTERISTICS

Symbol	Parameter	Min	Typ	Max	Unit
$t_{d(TxD-BUSon)}$	Delay TxD to Bus Active	40	85	110	ns
$t_{d(TxD-BUSoff)}$	Delay TxD to Bus Inactive	30	60	110	ns
$t_{d(BUSon-RxD)}$	Delay Bus Active to RxD	25	55	110	ns
$t_{d(BUSoff-RxD)}$	Delay Bus Inactive to RxD	65	100	135	ns
$t_{pd(rec-dom)}$	Propagation Delay TxD to RxD from Recessive to Dominant	100		230	ns
$t_{d(dom-rec)}$	Propagation Delay TxD to RxD from Dominant to Recessive	100		245	ns

Table 6. SUPPLY VOLTAGE TO V<sub>33</sub> PIN

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>33</sub>	I/O Interface Voltage	Absolute Maximum Range	-0.3	+7	V
V <sub>33</sub>	I/O Interface Voltage	Operating Range of V <sub>33</sub> V Pin	2.9	3.6	V

All other characteristics can be found in the data sheet and are identical for both versions.

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