Single wire CAN transceiver | AU5790

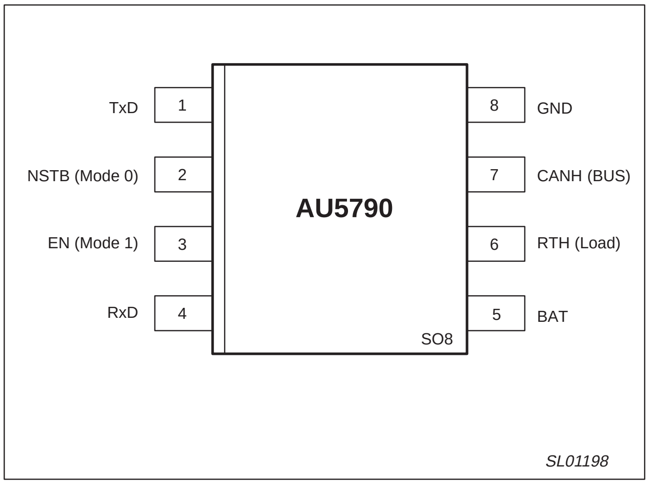
FEATURES

- Supports in-vehicle class B multiplexing via a single bus line with ground return
- 33 kbps CAN bus speed with loading as per J2411, up to 41.6 kbps with modified loading
- 83 or 100 kbps high-speed transmission mode
- Low RFI due to output waveshaping
- Direct battery operation with protection against load dump, jump start and transients
- Bus terminal protected against short-circuits and transients in the automotive environment
- Built-in loss of ground protection
- Thermal overload protection
- Supports communication between control units even when network in low-power state
- 70 µA typical power consumption in sleep mode
- 8-pin SOIC
- Fully integrated receiver filter
- ±8kV ESD protection on bus and battery pins

DESCRIPTION

The AU5790 is a line transceiver, primarily intended for in-vehicle multiplex applications. The device provides interfacing between a CAN data link controller and a single wire physical bus line. The achievable bus speed is primarily a function of the network time constant and bit timing, e.g., up to 41.6 kbps with a network including 32 bus nodes. The AU5790 provides advanced sleep-/wake-up functions to minimize power consumption when a vehicle is parked, while offering the desired control functions of the network at the same time. Fast transfer of larger blocks of data is supported using the high-speed data transmission mode.

PIN CONFIGURATION



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{BAT}	Operating supply voltage		5.5	12	27	V
T_{amb}	Operating ambient temperature		–40		+125	°C
V_{BATD}	Battery voltage	load dump; 1s			+45	V
V_{CAN_N}	Bus output voltage		3.6		4.55	V
V_T	Bus input threshold		1.8		2.2	V
t_{BO}	Bus output delay				7.2	µs
t_{BI}	Bus input delay				1	µs
I_{BATS}	Sleep mode supply current			70		µA

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
SO8: 8-pin plastic small outline package; packed in tubes	–40° to +125°C	AU5790D	SOT96–1
SO8: 8-pin plastic small outline package; packed on tape and reel	–40° to +125°C	AU5790D–T	SOT96–1

BLOCK DIAGRAM

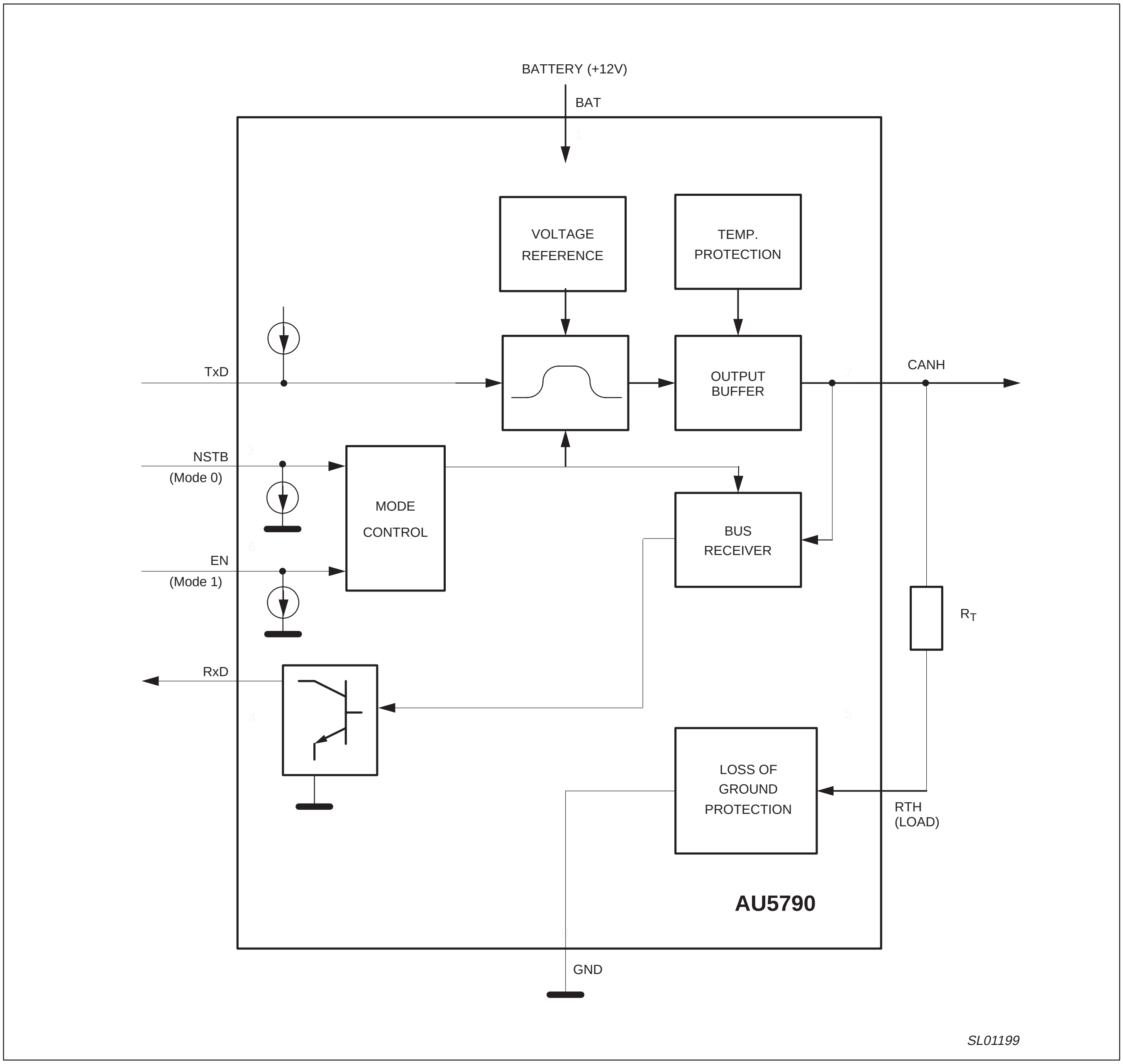


Figure 1. Block Diagram

PIN DESCRIPTION

SYMBOL	PIN	DESCRIPTION
TxD	1	Transmit data input; high: transmitter passive; low: transmitter active
NSTB (Mode 0)	2	Stand-by control; high: normal and high-speed mode; low: sleep and wake-up mode
EN (Mode 1)	3	Enable control; high: normal and wake-up mode; low: sleep and high-speed mode
RxD	4	Receive data output; low: active bus condition detected; float/high: passive bus condition detected
BAT	5	Battery supply input (12V nom.)
RTH	6	Switched ground pin, pulls the load to ground, except in case the module ground is disconnected
CANH	7	Bus line transmit input/output
GND	8	Ground

FUNCTIONAL DESCRIPTION

The AU5790 is an integrated line transceiver IC that interfaces a CAN protocol controller to the vehicle's multiplexed bus line. It is primarily intended for automotive "Class B" multiplexing applications in passenger cars using a single wire bus line with ground return. The achievable bit rate is primarily a function of the network time constant and the bit timing parameters. For example, the maximum bus speed is 33 kbps with bus loading as specified in J2411 for a full 32 node bus, while 41.6 kbps is possible with modified bus loading. The AU5790 also supports a low-power sleep mode to help meet ignition-off current draw requirements.

The protocol controller feeds the transmit data stream to the transceiver's TxD input. The AU5790 transceiver converts the TxD data input to a bus signal with controlled slew rate and waveshaping to minimize emissions. The bus output signal is transmitted via the CANH in/output, connected to the physical bus line. If TxD is low, then a typical voltage of 4V is output at the CANH pin. If TxD is high, then the CANH output is pulled passive low via the local bus load resistance R_T. To provide protection against disconnection of the module ground, the resistor R_T is connected to the RTH pin of the AU5790. By providing this switched ground pin, no current can flow from the floating module ground to the bus. The bus receiver detects the data stream on the bus line. The data signal is output at the RxD pin being connected to a CAN controller. The AU5790 provides appropriate filtering to ensure low susceptibility against electromagnetic interference. Further enhancement is possible by applying an external capacitor between CANH and ground potential. The device features low bus output leakage current at power supply failure situations.

If the NSTB and EN control inputs are pulled low or floating, the AU5790 enters a low-power or "sleep" mode. This mode is dedicated to minimizing ignition-off current drain, to enhance system efficiency. In sleep mode, the bus transmit function is disabled, e.g., the CANH output is inactive even when TxD is pulled low. An internal network active detector monitors the bus for any occurrence of signal edges on the bus line. If such edges are detected, this will be signalled to the CAN controller via the RxD output. Normal transmission mode will be entered again upon a high level being applied to the NSTB and EN control inputs. These signals are typically being provided by a controller device.

Sleeping bus nodes will generally ignore normal communication on the bus. They should be activated using the dedicated wake-up mode. When NSTB is low and EN is high the AU5790 enters wake-up mode, i.e., it sends data with an increased signal level. This will result in an activation of other bus nodes being attached to the network.

The AU5790 also provides a high-speed transmission mode, supporting bit rates up to 100 kbps. If the NSTB input is pulled high and the EN input is low, then the internal waveshaping function is disabled, i.e., the bus driver is turned on and off as fast as possible to support high-speed transmission of data. Consequently, the EMC performance is degraded in this mode compared to the normal transmission mode. In high-speed transmission mode the AU5790 supports the bus signal levels as specified for the CANH output of the fault-tolerant CAN transceiver TJA1054.

The AU5790 features special robustness at its BAT and CANH pins. Hence the device is well suited for applications in the automotive environment. The BAT input is protected against 45V load dump and jump start conditions. The CANH output is protected against wiring fault conditions, e.g., short circuit to ground or battery voltage as well as typical automotive transients. In addition, an over-temperature shutdown function with hysteresis is incorporated protecting the device under system fault conditions. In case of the chip temperature reaching the trip point, the AU5790 will latch-off the transmit function. The transmit function is available again after a small decrease of the chip temperature.

Table 1. Control Input Summary

NSTB	EN	TxD	Description	CANH	RxD
0	0	don't care	Sleep mode	0V	float (high)
0	1	Tx-data	Wake-up transmission mode	0V, 12V	bus state[1]
1	0	Tx-data	High-speed transmission mode	0V, 4V	bus state[1]
1	1	Tx-data	Normal transmission mode	0V, 4V	bus state[1]

NOTE:
1. RxD outputs the bus state. If the bus level is below the receiver threshold (i.e., all transmitters passive), then RxD will be floating (i.e., high, considering external pull-up resistance). Otherwise, if the bus level is above the receiver threshold (i.e., at least one transmitter is active), then RxD will be low.

TEST CIRCUITS

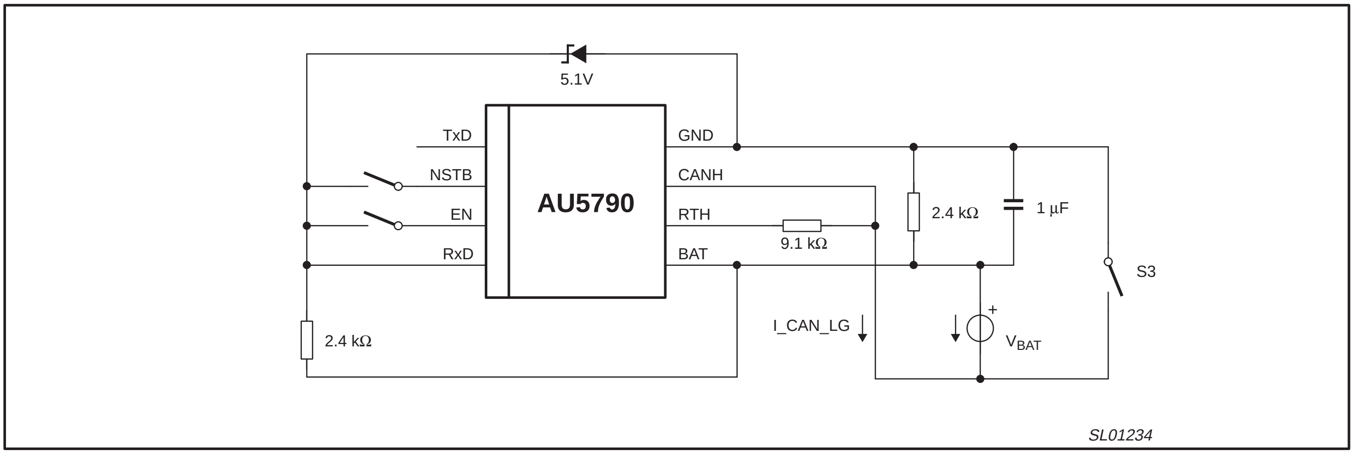


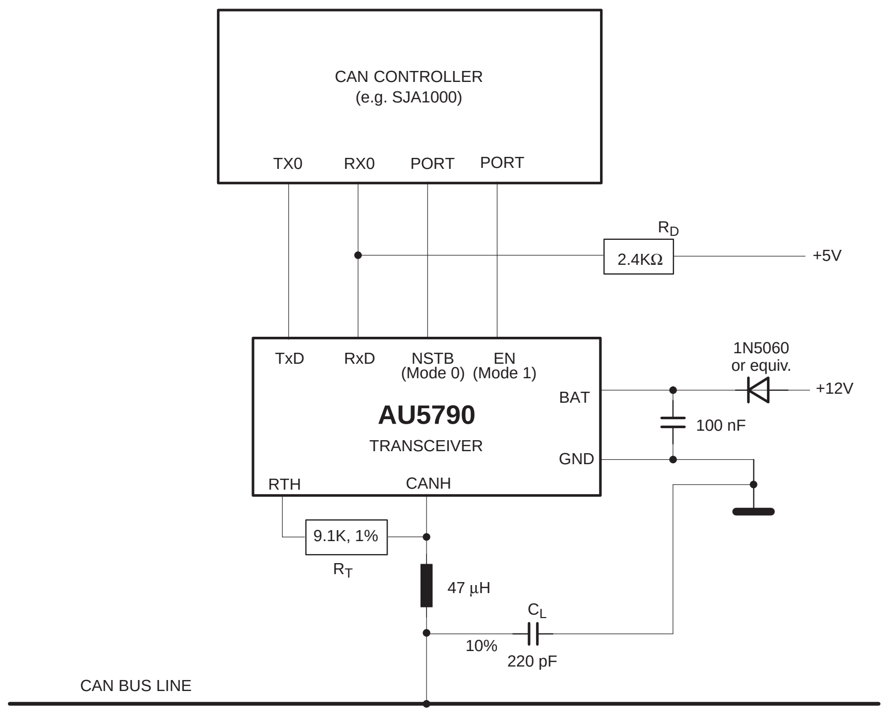
Figure 2. Loss of ground test circuit

NOTES:
Opening S3 simulates loss of module ground.
Check I_CAN_LG with the following switch positions:

1. S1 = open = S2
2. S1 = open, S2 = closed
3. S1 = closed, S2 = open
4. S1 = closed = S2

APPLICATION INFORMATION

The information provided in this Section is not part of the IC specification, but is presented for information purpose only.



Note 1 TX0 should be configured to push-pull operation, active low; e.g., Output Control Register = 1E hex.

Note 2 Recommended range for the load resistor is 3k < R_T < 11k.

SL01200

Figure 3. Application Example for the AU5790 with High-Speed Capability Through the EN Input

Table 2. Maximum CAN Bit Rate

MODE	MAXIMUM BIT RATE AT 0.2% CLOCK ACCURACY	MAXIMUM BIT RATE AT 0.35% CLOCK ACCURACY
Normal transmission	41.6 kbps	33.3 kbps
High-speed transmission	100 kbps	83.3 kbps
Sample point as % of bit time	85%	85%
Bus Time constant, normal mode	1.0 to 3.7µS	1.0 to 4.6 µS

ABSOLUTE MAXIMUM RATINGS

According to the IEC 134 Absolute Maximum System: operation is not guaranteed under these conditions; all voltages are referenced to pin 8 (GND); positive currents flow into the IC, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{BAT}	Supply voltage		–0.3	+27	V
V_{BATld}	Short-term supply voltage	Load dump; ISO7637/1 test pulse 5 (SAE J1113, test pulse 5), T < 1s		+45	V
V_{BATtr2}	Transient supply voltage	ISO 7637/1 test pulse 2 (SAE J1113, test pulse 2), with series diode and bypass cap of 100 nF between BAT and GND pins, Note 2.		+100	V
V_{BATtr3}	Transient supply voltage	ISO 7637/1 pulses 3a and 3b (SAE J1113 test pulse 3a and 3b), Note 2.	–150	+100	V
V_{CANH_1}	CANH voltage	V_{BAT} > 2 V	–10	+18	V
V_{CANH_2}	CANH voltage	V_{BAT} < 2 V	–16	+18	V
$V_{CANHtr1}$	Transient bus voltage	ISO 7637/1 test pulse 1, Notes 1 and 2	–100		V
$V_{CANHtr2}$	Transient bus voltage	ISO 7637/1 test pulse 2, Notes 1 and 2		+100	V
$V_{CANHtr3}$	Transient bus voltage	ISO 7637/1 test pulses 3a, 3b, Notes 1 and 2	–150	+100	V
V_{RTH1}	DC voltage on pin RTH	V_{BAT} > 2 V, voltage applied to pin RTH via a 2 kΩ series resistor	–10	+18	V
V_{RTH0}	DC voltage on pin RTH	V_{BAT} > 2 V, voltage applied to pin RTH via a 2 kΩ series resistor	–16	+18	V
V_I	DC voltage on pins TxD, EN, RxD, NSTB		–0.3	+7	V
ESD_{BAHB}	ESD capability of pin BAT	Direct contact discharge, R=1.5 kΩ, C=100 pF	–8	+8	kV
ESD_{CHHB}	ESD capability of pin CANH	Direct contact discharge, R=1.5 kΩ, C=100 pF	–8	+8	kV
ESD_{RTHB}	ESD capability of pin RTH	Direct contact discharge, R=1.5 kΩ + 3 kΩ, C=100 pF	–8	+8	kV
ESD_{LGHB}	ESD capability of pins TxD, NSTB, EN, RxD and RTH	Direct contact discharge, R=1.5 kΩ , C=100 pF	–2	+2	kV
R_{Tmin}	Bus load resistance R_T being connected to pin RTH		3		kΩ
P_{tot}	Maximum power dissipation	at T_{amb} = +125 °C with 25 sqmm of copper area being attached to GND pin		180	mW
Θ_{JA1}	Thermal impedance	Without copper area being attached to GND pin		t.b.f.	K/W
Θ_{JA2}	Thermal impedance	With 10 sqmm of copper area being attached to GND pin		152	K/W
Θ_{JA3}	Thermal impedance	With 25 sqmm of copper area being attached to GND pin		138	K/W
T_{amb}	Operating ambient temperature		–40	+125	°C
T_{stg}	Storage temperature		–40	+150	°C
T_{vj}	Junction temperature		–40	+150	°C

NOTES:
1. Test pulses are applied to CANH through a series capacitance of 1 nF.
2. Rise time for test pulse 1: t_r < 1 µs; pulse 2: t_r < 100 ns; pulses 3a/3b: t_r < 5 ns.

DC CHARACTERISTICS

–40°C < T_{amb} < +125°C; 5.5V < V_{BAT} < 16V; –0.3V < V_{TxD} < 5.5V; –0.3V < V_{NTSB} < 5.5V; –0.3V < V_{EN} < 5.5V; –0.3V < V_{RxD} < 5.5V; –1V < V_{CANH} < +16V; bus load resistor at pin RTH: 3 kΩ < R_T < 11 kΩ; total bus load resistance 270 Ω < R_L < 11 kΩ; C_L < 11 nF; 1µs < $R_L * C_L$ < 3.7µs; RxD pull-up resistor 2.2 kΩ < R_d < 2.6 kΩ; RxD: loaded with C_{LR} < 30pF to GND; all voltages are referenced to pin 8 (GND); positive currents flow into the IC; typical values reflect the approximate average value at V_{BAT} = 13V and T_{amb} = 25°C, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Pin BAT						
V_{BAT}	Operating supply voltage	Note 3	5.5	12	27	V
V_{BATL}	Low battery state	Part functional or in undervoltage lockout state	2.5		5.5	V
V_{BATLO}	Supply undervoltage lockout state	TxD = 1 or 0; check CANH and RxD are floating			2.5	V
I_{BATPN}	Passive state supply current in normal mode	NSTB = 5V, EN = 5V, TxD = 5V			2	mA
I_{BATPW}	Passive state supply current in wake-up mode	NSTB = 5V, EN = 5V, TxD = 5V, Note 4			3	mA
I_{BATPH}	Passive state supply current in high speed mode	NSTB = 5V, EN = 0V, TxD = 5V, Note 4			4	mA
I_{BATN}	Active state supply current in normal mode	NSTB = 5V, EN = 5V, TxD = 0V, R_L = 270 Ω			35	mA
I_{BATW}	Active state supply current in wake-up mode	NSTB = 0V, EN = 5V, TxD = 0V, R_L = 270 Ω, Note 4			45	mA
I_{BATH}	Active state supply current in high speed mode	NSTB = 5V, EN = 0V, TxD = 0V, R_L = 100 Ω, Note 4			t.b.d.	mA
I_{BATS}	Sleep mode supply current	NSTB = 0V, EN = 0V, TxD = 5V, RxD = 5V, –1V < V_{CANH} < +1V, 5.5V < V_{BAT} < 14V, –40°C < T_j < 125°C		70	100	µA
Pin CANH						
V_{CANHN}	Bus output voltage in normal mode	NSTB = 5V, EN = 5V, R_L > 270Ω; 5.5V < V_{BAT} < 27V	3.6		4.55	V
V_{CANHW}	Bus output voltage in wake-up mode	NSTB = 0V, EN = 5V, R_L > 270Ω; 11.3V < V_{BAT} < 16V	9.85		min (V_{BAT}, 14)	V
V_{CANHWL}	Bus output voltage in wake-up mode, low battery	NSTB = 0V, EN = 5V, R_L > 270Ω; 5.5V < V_{BAT} < 11.3V	V_{BAT} – 1.45		V_{BAT}	V
V_{CANHH}	Bus output voltage in high-speed transmission mode	NSTB = 5V, EN = 0V, R_L > 100Ω; 8V < V_{BAT} < 16V	3.6		4.55	V
I_{CANHRR}	Recessive state output current, bus recessive	Recessive state or sleep mode, V_{CANH} = –1V; 0V < V_{BAT} < 27V	–10		10	µA
I_{CANHRD}	Recessive state output current, bus dominant	Recessive state or sleep mode, V_{CANH} = 10V; 0V < V_{BAT} < 16V	–20		100	µA
I_{CANHDD}	Dominant state output current, bus dominant	TxD = 0V, normal mode, high-speed mode and sleep mode; V_{CANH} = 10V; 0V < V_{BAT} < 16V	–20		100	µA
$–I_{CANH\_N}$	Bus short circuit current, normal mode	V_{CANH} = –1V, TxD = 0V; NSTB = 5V; EN = 5V	30		150	mA
$–I_{CANHW}$	Bus short circuit current, wake-up mode	V_{CANH} = –1V, TxD = 0V; NSTB = 0V; EN = 5V	60		150	mA
$–I_{CANHH}$	Bus short circuit current, high-speed mode	V_{CANH} = –1V, TxD = 0V; NSTB = 5V; EN = 0V; 8V < V_{BAT} < 16V	50		150	mA
I_{CANLG}	Bus leakage current at loss of ground (I_CAN_LG = I_CANH + I_RTH)	0V < V_{BAT} < 16V; see figure in the test circuits section	–50		50	µA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
T_{sd}	Thermal shutdown	Note 4	155		190	°C
T_{hys}	Thermal shutdown hysteresis	Note 4	5		15	°C
V_T	Bus input threshold	$5.8V < V_{BAT} < 27V$, all modes except sleep mode	1.8		2.2	V
V_{TL}	Bus input threshold, low battery	$5.5V < V_{BAT} < 5.8V$, all modes except sleep mode	1.5		2.2	V
V_{TS}	Bus input threshold in sleep mode	NSTB = 0V, EN = 0V, $V_{BAT} > 11.3V$	6.15		8.1	V
V_{TSL}	Bus input threshold in sleep mode, low battery	NSTB = 0V, EN = 0V, $5.5V < V_{BAT} > 11.3V$	$V_{BAT} - 4.3$		$V_{BAT} - 3.25$	V
Pin RTH						
V_{RTH1}	Voltage on switched ground pin	$I_{RTH} = 1$ mA			0.1	V
V_{RTH2}	Voltage on switched ground pin	$I_{RTH} = 6$ mA			1	V
Pins NSTB, EN						
V_{ih}	High level input voltage	$5.5V < V_{BAT} < 27V$	3			V
V_{il}	Low level input voltage	$5.5V < V_{BAT} < 27V$			1	V
I_i	Input current	$V_i = 1V$ and $V_i = 5V$	15		50	µA
Pin TxD						
V_{itxd}	TxD input threshold	$5.5V < V_{BAT} < 27V$	1		3	V
$-I_{itxd}$	TxD low level input current	$V_{TxD} = 0V$	50		180	µA
$-I_{ihtxd}$	TxD high level input current in sleep mode	NSTB = 0V, EN = 0V, $V_{TxD} = 5V$; $5.5V < V_{BAT} < 14V$	–5		10	µA
Pin RxD						
V_{olrxd}	RxD low level output voltage	$I_{RxD} = 2.2$ mA; $V_{CANH} = 10V$, all modes			0.45	V
I_{rxd}	RxD low level output current	$V_{RxD} = 5V$; $V_{CANH} = 10V$	3		30	mA
I_{ohrxd}	RxD high level leakage	$V_{RxD} = 5V$; $V_{CANH} = 10V$, all modes	–10		+10	µA

NOTES:

3. Operation at battery voltages higher than 16V is recommended to be shorter than 2 minutes.
4. This parameter is characterized but not subject to production test.

Dynamic (AC) CHARACTERISTICS for 33 K bps operation

–40°C < T_{amb} < +125°C; 5.5V < V_{BAT} < 16V; –0.3V < V_{TxD} < 5.5V; –0.3V < V_{NTSB} < 5.5V; –0.3V < V_{EN} < 5.5V; –0.3V < V_{RxD} < 5.5V; –1V < V_{CANH} < +16V; bus load resistor at pin RTH: 3 kΩ < R_T < 11 kΩ; total bus load resistance 270 Ω < R_L < 11 kΩ; C_L < 11 nF; 1µs < $R_L * C_L$ < 3.7µs; RxD pull-up resistor 2.2 kΩ < R_d < 2.6 kΩ; RxD: loaded with C_{LR} < 30pF to GND; all voltages are referenced to pin 8 (GND); positive currents flow into the IC; typical values reflect the approximate average value at V_{BAT} = 13V and T_{amb} = 25°C, unless otherwise specified.

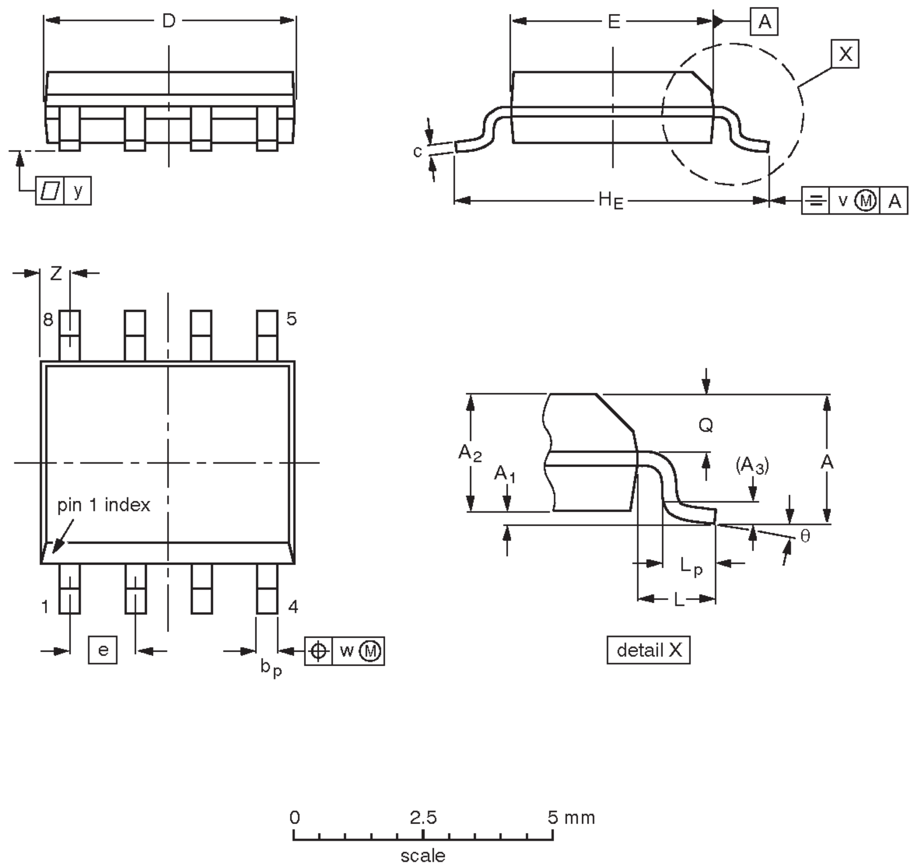
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Pin CANH						
t_{rN}	Normal mode bus output rise time (1V to 3V)	R_L = 250 Ω, C_L = 15 nF; 8V < V_{BAT} < 16V	1.8		3.6	µs
t_{fN}	Normal mode bus output fall time (3V to 1V)	R_L = 250 Ω, C_L = 15 nF; 8V < V_{BAT} < 16V	3		5	µs
t_{rW}	Wake-up mode bus output rise time (20% to 80%)	NSTB = 0V, EN = 5V; R_L = 250 Ω, C_L = 15 nF; 8V < V_{BAT} < 16V	3		14	µs
t_{fW}	Wake-up mode bus output fall time (80% to 20%)	NSTB = 0V, EN = 5V; R_L = 250 Ω, C_L = 15 nF; 8V < V_{BAT} < 16V	4		10	µs
t_{rH}	High-speed mode bus output rise time (1V to 3V)	NSTB = 5V, EN = 0V; R_L = 100 Ω, C_L = 15 nF; 8V < V_{BAT} < 16V; Note 6			1	µs
t_{fH}	High-speed mode bus output fall time (3V to 1V)	NSTB = 5V, EN = 0V; R_L = 100 Ω, C_L = 15 nF; 8V < V_{BAT} < 16V; Note 6			1.5	µs
V_{dbAMN}	CANH harmonic content in normal mode	NSTB = 5V, EN = 5V; R_L = 250 Ω, C_L = 15 nF; f_{TxD} = 20 kHz, 50% duty cycle; 8V < V_{BAT}< 16V; 0.53 MHz < f < 1.7 MHz, Note 6			70	dBµV
V_{dbAMW}	CANH harmonic content in wake-up mode	NSTB = 5V, EN = 0V; R_L = 250 Ω, C_L = 15 nF; f_{TxD} = 20 kHz, 50% duty cycle; 8V < V_{BAT}< 16V; 0.53 MHz < f < 1.7 MHz, Note 6			80	dBµV
Pins NSTB, EN						
t_{NH}	Normal mode to high-speed mode delay				30	µs
t_{NW}	Normal mode to wake-up mode delay	EN = 5V; measured from NSTB = 2.5V to V_{CANH} = 4V			30	µs
t_{NS}	Normal mode to sleep mode delay				500	µs
t_{SN}	Sleep mode to normal mode delay	V_{CANH} = 4V; measured from NSTB = 2.5V to RxD = 2.5V			50	µs

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Pin TxD						
t_{TrN}	Transmit delay in normal mode, bus rising edge	NSTB = 5V, EN = 5V; R_L = 250 Ω, C_L = 15 nF; 5.5V < V_{BAT}< 27V; measured from the falling edge on TxD to V_{CANH} = 3.0V	3		8	µs
t_{TfN}	Transmit delay in normal mode, bus falling edge	NSTB = 5V, EN = 5V; R_L = 250 Ω, C_L = 15 nF; 5.5V < V_{BAT}< 27V; measured from the rising edge on TxD to V_{CANH} = 1.0V	3		9	µs
t_{TrW}	Transmit delay in wake-up mode, bus rising edge	NSTB = 0V, EN = 5V; R_L = 250 Ω, C_L = 15 nF; 5.5V < V_{BAT}< 27V; measured from the falling edge on TxD to V_{CANH} = 3.0V	3		10	µs
t_{TfW}	Transmit delay in wake-up mode, bus falling edge	NSTB = 0V, EN = 5V; R_L = 250 Ω, C_L = 15 nF; 9V < V_{BAT}< 27V; measured from the rising edge on TxD to V_{CANH} = 5V	3		12	µs
t_{TfWL}	Transmit delay in wake-up mode, bus falling edge, low battery	NSTB = 0V, EN = 5V; R_L = 250 Ω, C_L = 15 nF; 5.5V < V_{BAT}< 9V; measured from the rising edge on TxD to V_{CANH} = 1V	3		12	µs
t_{TrHS}	Transmit delay in high-speed mode, bus rising edge	NSTB = 5V, EN = 0V; R_L = 100 Ω, C_L = 15 nF; 8V < V_{BAT}< 16V; measured from the falling edge on TxD to V_{CANH} = 3.0V	0.2		1.5	µs
t_{TfHS}	Transmit delay in high-speed mode, bus falling edge	NSTB = 5V, EN = 0V; R_L = 100 Ω, C_L = 15 nF; 8V < V_{BAT}< 16V; measured from the rising edge on TxD to V_{CANH} = 1.0V	0.2		2	µs
Pin RxD						
t_{DN}	Receive delay in normal mode, bus rising and falling edge	NSTB = 5V, EN = 5V; 5.5V < V_{BAT}< 27V; CANH to RxD time measured from V_{CANH} = 2.0V to V_{RxD} = 2.5V	0.3		1	µs
t_{DW}	Receive delay in wake-up mode, bus rising and falling edge	NSTB = 0V, EN = 5V; 5.5V < V_{BAT}< 27V; CANH to RxD time measured from V_{CANH} = 2.0V to V_{RxD} = 2.5V	0.3		1	µs
t_{DHS}	Receive delay in high-speed mode, bus rising and falling edge	NSTB = 5V, EN = 0V; 8V < V_{BAT}< 16V; CANH to RxD time measured from V_{CANH} = 2.0V to V_{RxD} = 2.5V	0.2		0.8	µs
t_{DS}	Receive delay in sleep mode, bus rising edge	NSTB = 0V, EN = 0V; CANH to RxD time, measured from V_{CANH} = min {(V_{BAT} – 3.78V), 7.13V} to V_{RxD} = 2.5V	10		50	µs

NOTES:

5. Operation at battery voltages higher than 16V is recommended to be shorter than 2 minutes.
6. This parameter is characterized but not subject to production test.

SO8: plastic small outline package; 8 leads; body width 3.9mm SOT96-1



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(2)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	5.0 4.8	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8° 0°
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.20 0.19	0.16 0.15	0.050	0.244 0.228	0.041	0.039 0.016	0.028 0.024	0.01	0.01	0.004	0.028 0.012	

Notes

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT96-1	076E03S	MS-012AA				~~95-02-04~~ 97-05-22

NOTES

Single wire CAN transceiver AU5790

Data sheet status

Data sheet status	Product status	Definition [1]
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
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[1] Please consult the most recently issued datasheet before initiating or completing a design.

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Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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