MCP2551

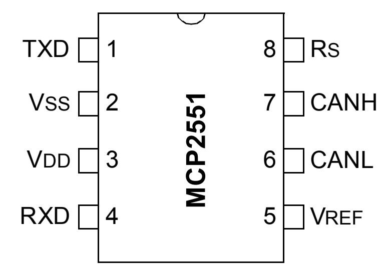
High-Speed CAN Transceiver

Features

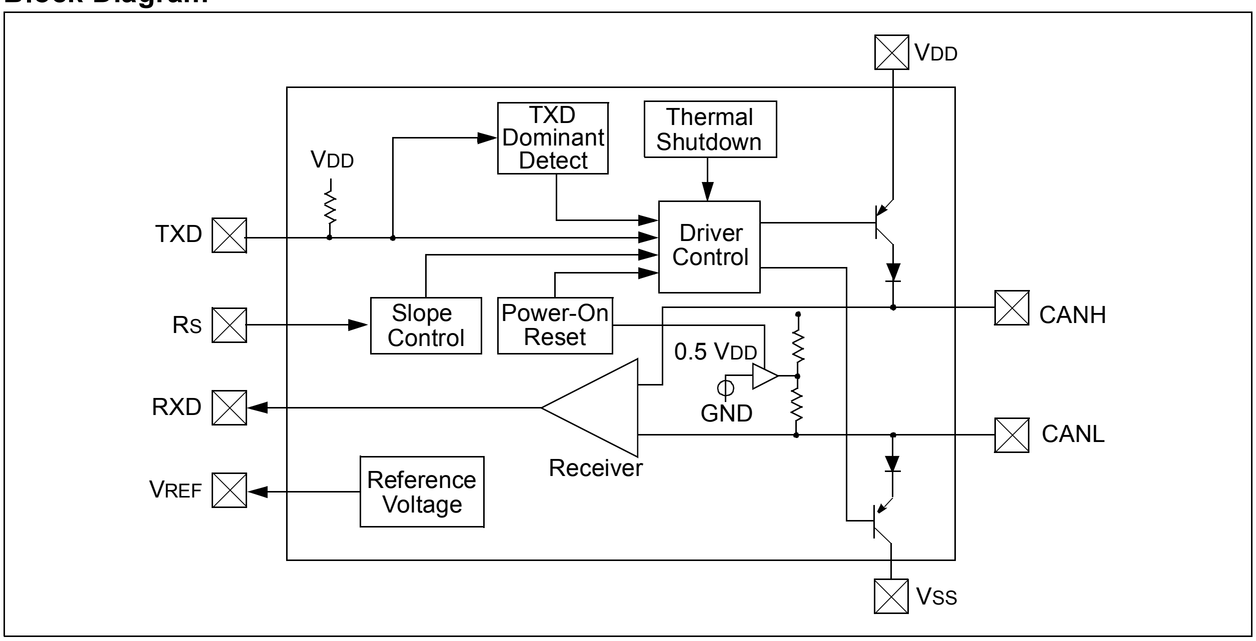
- Supports 1 Mb/s operation
- Implements ISO-11898 standard physical layer requirements
- Suitable for 12V and 24V systems
- Externally-controlled slope for reduced RFI emissions
- Detection of ground fault (permanent dominant) on TXD input
- Power-on reset and voltage brown-out protection
- An unpowered node or brown-out event will not disturb the CAN bus
- Low current standby operation
- Protection against damage due to short-circuit conditions (positive or negative battery voltage)
- Protection against high-voltage transients
- Automatic thermal shutdown protection
- Up to 112 nodes can be connected
- High noise immunity due to differential bus implementation
- Temperature ranges:
  - Industrial (I): -40°C to +85°C
  - Extended (E): -40°C to +125°C

Package Types

PDIP/SOIC



Block Diagram



NOTES:

1.0 DEVICE OVERVIEW

The MCP2551 is a high-speed CAN, fault-tolerant device that serves as the interface between a CAN protocol controller and the physical bus. The MCP2551 provides differential transmit and receive capability for the CAN protocol controller and is fully compatible with the ISO-11898 standard, including 24V requirements. It will operate at speeds of up to 1 Mb/s.

Typically, each node in a CAN system must have a device to convert the digital signals generated by a CAN controller to signals suitable for transmission over the bus cabling (differential output). It also provides a buffer between the CAN controller and the high-voltage spikes that can be generated on the CAN bus by outside sources (EMI, ESD, electrical transients, etc.).

1.1 Transmitter Function

The CAN bus has two states: Dominant and Recessive. A dominant state occurs when the differential voltage between CANH and CANL is greater than a defined voltage (e.g.,1.2V). A recessive state occurs when the differential voltage is less than a defined voltage (typically 0V). The dominant and recessive states correspond to the low and high state of the TXD input pin, respectively. However, a dominant state initiated by another CAN node will override a recessive state on the CAN bus.

1.1.1 MAXIMUM NUMBER OF NODES

The MCP2551 CAN outputs will drive a minimum load of 45Ω, allowing a maximum of 112 nodes to be connected (given a minimum differential input resistance of 20 kΩ and a nominal termination resistor value of 120Ω).

1.2 Receiver Function

The RXD output pin reflects the differential bus voltage between CANH and CANL. The low and high states of the RXD output pin correspond to the dominant and recessive states of the CAN bus, respectively.

1.3 Internal Protection

CANH and CANL are protected against battery short-circuits and electrical transients that can occur on the CAN bus. This feature prevents destruction of the transmitter output stage during such a fault condition.

The device is further protected from excessive current loading by thermal shutdown circuitry that disables the output drivers when the junction temperature exceeds a nominal limit of 165°C. All other parts of the chip remain operational and the chip temperature is lowered due to the decreased power dissipation in the transmitter outputs. This protection is essential to protect against bus line short-circuit-induced damage.

1.4 Operating Modes

The RS pin allows three modes of operation to be selected:

- High-Speed
- Slope-Control
- Standby

These modes are summarized in Table 1-1.

When in High-speed or Slope-control mode, the drivers for the CANH and CANL signals are internally regulated to provide controlled symmetry in order to minimize EMI emissions.

Additionally, the slope of the signal transitions on CANH and CANL can be controlled with a resistor connected from pin 8 (RS) to ground, with the slope proportional to the current output at RS, further reducing EMI emissions.

1.4.1 HIGH-SPEED

High-speed mode is selected by connecting the RS pin to VSS. In this mode, the transmitter output drivers have fast output rise and fall times to support high-speed CAN bus rates.

1.4.2 SLOPE-CONTROL

Slope-control mode further reduces EMI by limiting the rise and fall times of CANH and CANL. The slope, or slew rate (SR), is controlled by connecting an external resistor (REXT) between RS and VOL (usually ground). The slope is proportional to the current output at the RS pin. Since the current is primarily determined by the slope-control resistance value REXT, a certain slew rate is achieved by applying a respective resistance. Figure 1-1 illustrates typical slew rate values as a function of the slope-control resistance value.

1.4.3 STANDBY MODE

The device may be placed in standby or “SLEEP” mode by applying a high-level to RS. In SLEEP mode, the transmitter is switched off and the receiver operates at a lower current. The receive pin on the controller side (RXD) is still functional but will operate at a slower rate. The attached microcontroller can monitor RXD for CAN bus activity and place the transceiver into normal operation via the RS pin (at higher bus rates, the first CAN message may be lost).

TABLE 1-1: MODES OF OPERATION

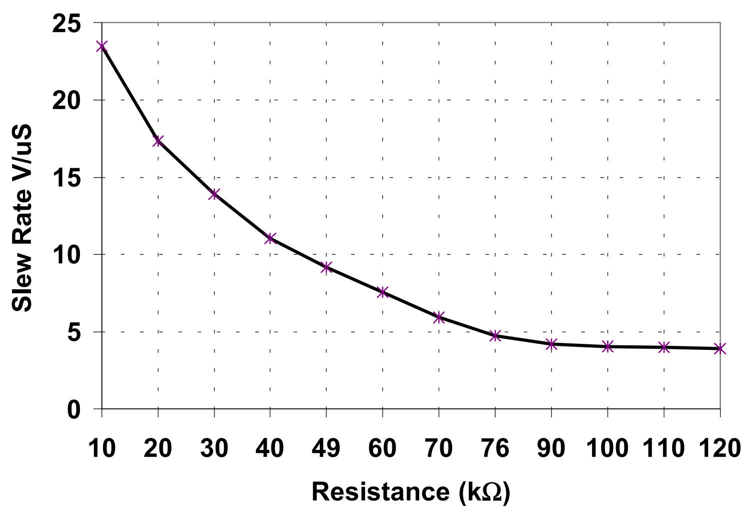
Mode	Current at R_S Pin	Resulting Voltage at RS Pin
Standby	$-I_{RS} < 10\ \mu A$	$V_{RS} > 0.75\ V_{DD}$
Slope-control	$10\ \mu A < -I_{RS} < 200\ \mu A$	$0.4\ V_{DD} < V_{RS} < 0.6\ V_{DD}$
High-speed	$-I_{RS} < 610\ \mu A$	$0 < V_{RS} < 0.3 V_{DD}$

TABLE 1-2: TRANSCEIVER TRUTH TABLE

VDD	VRS	TXD	CANH	CANL	Bus State[1]	RXD[1]
$4.5V \le V_{DD} \le 5.5V$	$V_{RS} < 0.75\ V_{DD}$	0	HIGH	LOW	Dominant	0
		1 or floating	Not Driven	Not Driven	Recessive	1
	$V_{RS} > 0.75\ V_{DD}$	X	Not Driven	Not Driven	Recessive	1
$V_{POR} < V_{DD} < 4.5V$ (See **Note 3**)	$V_{RS} < 0.75\ V_{DD}$	0	HIGH	LOW	Dominant	0
		1 or floating	Not Driven	Not Driven	Recessive	1
	$V_{RS} > 0.75\ V_{DD}$	X	Not Driven	Not Driven	Recessive	1
$0 < V_{DD} < V_{POR}$	X	X	Not Driven/ No Load	Not Driven/ No Load	High Impedance	X

Note 1: If another bus node is transmitting a dominant bit on the CAN bus, then RXD is a logic ‘0’.
2: X = “don’t care”.
3: Device drivers will function, although outputs are not ensured to meet the ISO-11898 specification.

FIGURE 1-1: SLEW RATE VS. SLOPE-CONTROL RESISTANCE VALUE



1.5 TXD Permanent Dominant Detection

If the MCP2551 detects an extended low state on the TXD input, it will disable the CANH and CANL output drivers in order to prevent the corruption of data on the CAN bus. The drivers are disabled if TXD is low for more than 1.25 ms (minimum). This implies a maximum bit time of 62.5 µs (16 kb/s bus rate), allowing up to 20 consecutive transmitted dominant bits during a multiple bit error and error frame scenario. The drivers remain disabled as long as TXD remains low. A rising edge on TXD will reset the timer logic and enable the CANH and CANL output drivers.

1.6 Power-on Reset

When the device is powered on, CANH and CANL remain in a high-impedance state until V_{DD} reaches the voltage-level V_{PORH}. In addition, CANH and CANL will remain in a high-impedance state if TXD is low when V_{DD} reaches V_{PORH}. CANH and CANL will become active only after TXD is asserted high. Once powered on, CANH and CANL will enter a high-impedance state if the voltage level at V_{DD} falls below V_{PORL}, providing voltage brown-out protection during normal operation.

1.7 Pin Descriptions

The 8-pin pinout is listed in Table 1-3.

TABLE 1-3: MCP2551 PINOUT

Pin Number	Pin Name	Pin Function
1	TXD	Transmit Data Input
2	V_{SS}	Ground
3	V_{DD}	Supply Voltage
4	RXD	Receive Data Output
5	V_{REF}	Reference Output Voltage
6	CANL	CAN Low-Level Voltage I/O
7	CANH	CAN High-Level Voltage I/O
8	R_S	Slope-Control Input

1.7.1 TRANSMITTER DATA INPUT (TXD)

TXD is a TTL-compatible input pin. The data on this pin is driven out on the CANH and CANL differential output pins. It is usually connected to the transmitter data output of the CAN controller device. When TXD is low, CANH and CANL are in the dominant state. When TXD is high, CANH and CANL are in the recessive state, provided that another CAN node is not driving the CAN bus with a dominant state. TXD has an internal pull-up resistor (nominal 25 kΩ to V_{DD}).

1.7.2 GROUND SUPPLY (V_{SS})

Ground supply pin.

1.7.3 SUPPLY VOLTAGE (V_{DD})

Positive supply voltage pin.

1.7.4 RECEIVER DATA OUTPUT (RXD)

RXD is a CMOS-compatible output that drives high or low depending on the differential signals on the CANH and CANL pins and is usually connected to the receiver data input of the CAN controller device. RXD is high when the CAN bus is recessive and low in the dominant state.

1.7.5 REFERENCE VOLTAGE (V_{REF})

Reference Voltage Output (Defined as $V_{DD}/2$).

1.7.6 CAN LOW (CANL)

The CANL output drives the low side of the CAN differential bus. This pin is also tied internally to the receive input comparator.

1.7.7 CAN HIGH (CANH)

The CANH output drives the high-side of the CAN differential bus. This pin is also tied internally to the receive input comparator.

1.7.8 SLOPE RESISTOR INPUT (R_S)

The R_S pin is used to select High-speed, Slope-control or Standby modes via an external biasing resistor.

NOTES:

2.0 ELECTRICAL CHARACTERISTICS

2.1 Terms and Definitions

A number of terms are defined in ISO-11898 that are used to describe the electrical characteristics of a CAN transceiver device. These terms and definitions are summarized in this section.

2.1.1 BUS VOLTAGE

V_{CANL} and V_{CANH} denote the voltages of the bus line wires CANL and CANH relative to ground of each individual CAN node.

2.1.2 COMMON MODE BUS VOLTAGE RANGE

Boundary voltage levels of V_{CANL} and V_{CANH} with respect to ground, for which proper operation will occur, if up to the maximum number of CAN nodes are connected to the bus.

2.1.3 DIFFERENTIAL INTERNAL CAPACITANCE, C_{DIFF} (OF A CAN NODE)

Capacitance seen between CANL and CANH during the recessive state when the CAN node is disconnected from the bus (see Figure 2-1).

2.1.4 DIFFERENTIAL INTERNAL RESISTANCE, R_{DIFF} (OF A CAN NODE)

Resistance seen between CANL and CANH during the recessive state when the CAN node is disconnected from the bus (see Figure 2-1).

2.1.5 DIFFERENTIAL VOLTAGE, V_{DIFF} (OF CAN BUS)

Differential voltage of the two-wire CAN bus, value $V_{DIFF} = V_{CANH} - V_{CANL}$.

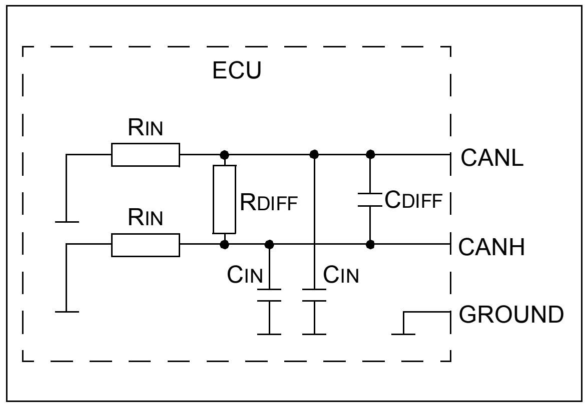
2.1.6 INTERNAL CAPACITANCE, C_{IN} (OF A CAN NODE)

Capacitance seen between CANL (or CANH) and ground during the recessive state when the CAN node is disconnected from the bus (see Figure 2-1).

2.1.7 INTERNAL RESISTANCE, R_{IN} (OF A CAN NODE)

Resistance seen between CANL (or CANH) and ground during the recessive state when the CAN node is disconnected from the bus (see Figure 2-1).

FIGURE 2-1: PHYSICAL LAYER DEFINITIONS



Absolute Maximum Ratings†

V_{DD}	7.0V
DC Voltage at TXD, RXD, V_{REF} and V_S	-0.3V to V_{DD} + 0.3V
DC Voltage at CANH, CANL (**Note 1**)	-42V to +42V
Transient Voltage on Pins 6 and 7 (**Note 2**)	-250V to +250V
Storage temperature	-55°C to +150°C
Operating ambient temperature	-40°C to +125°C
Virtual Junction Temperature, T_{VJ} (**Note 3**)	-40°C to +150°C
Soldering temperature of leads (10 seconds)	+300°C
ESD protection on CANH and CANL pins (**Note 4**)	6 kV
ESD protection on all other pins (**Note 4**)	4 kV

Note 1: Short-circuit applied when TXD is high and low.

2: In accordance with ISO-7637.

3: In accordance with IEC 60747-1.

4: Classification A: Human Body Model.

† NOTICE: Stresses above those listed under “Maximum ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

2.2 DC Characteristics

DC Specifications			Electrical Characteristics: Industrial (I): T_{AMB} = -40°C to +85°C V_{DD} = 4.5V to 5.5V Extended (E): T_{AMB} = -40°C to +125°C V_{DD} = 4.5V to 5.5V			
Param No.	**Sym**	**Characteristic**	**Min**	**Max**	**Units**	**Conditions**
Supply						
D1	I_{DD}	Supply Current	—	75	mA	Dominant; V_{TXD} = 0.8V; V_{DD}
D2			—	10	mA	Recessive; V_{TXD} = +2V; R_S = 47 kΩ
D3			—	365	µA	-40°C ≤ T_{AMB} ≤ +85°C, Standby; **(Note 2)**
			—	465	µA	-40°C ≤ T_{AMB} ≤ +125°C, Standby; **(Note 2)**
D4	V_{PORH}	High-level of the power-on reset comparator	3.8	4.3	V	CANH, CANL outputs are active when V_{DD} > V_{PORH}
D5	V_{PORL}	Low-level of the power-on reset comparator	3.4	4.0	V	CANH, CANL outputs are not active when V_{DD} < V_{PORL}
D6	V_{PORD}	Hysteresis of power-on reset comparator	0.3	0.8	V	**Note 1**
Bus Line (CANH; CANL) Transmitter						
D7	$V_{CANH(r);}V_{CANL(r)}$	CANH, CANL Recessive bus voltage	2.0	3.0	V	V_{TXD} = V_{DD}; no load.
D8	$I_{O(CANH)(reces)}$ $I_{O(CANL)(reces)}$	Recessive output current	-2	+2	mA	-2V < $V_{(CAHL,CANH)}$ < +7V, 0V < V_{DD} < 5.5V
D9			-10	+10	mA	-5V < $V_{(CANL,CANH)}$ < +40V, 0V < V_{DD} < 5.5V
D10	$V_{O(CANH)}$	CANH dominant output voltage	2.75	4.5	V	V_{TXD} = 0.8V
D11	$V_{O(CANL)}$	CANL dominant output voltage	0.5	2.25	V	V_{TXD} = 0.8V
D12	$V_{DIFF(r)(o)}$	Recessive differential output voltage	-500	+50	mV	V_{TXD} = 2V; no load
D13	$V_{DIFF(d)(o)}$	Dominant differential output voltage	1.5	3.0	V	V_{TXD} = 0.8V; V_{DD} = 5V 40Ω < R_L < 60Ω **(Note 2)**
D14	$I_{O(SC)(CANH)}$	CANH short-circuit output current	—	-200	mA	V_{CANH} = -5V
D15			—	-100 (typical)	mA	V_{CANH} = -40V, +40V. **(Note 1)**
D16	$I_{O(SC)(CANL)}$l	CANL short-circuit output current	—	200	mA	V_{CANL} = -40V, +40V. **(Note 1)**
Bus Line (CANH; CANL) Receiver: [TXD = 2V; pins 6 and 7 externally driven]						
D17	$V_{DIFF(r)(i)}$	Recessive differential input voltage	-1.0	+0.5	V	-2V < $V_{(CANL, CANH)}$ < +7V **(Note 3)**
			-1.0	+0.4	V	-12V < $V_{(CANL, CANH)}$ < +12V **(Note 3)**
D18	$V_{DIFF(d)(i)}$	Dominant differential input voltage	0.9	5.0	V	-2V < $V_{(CANL, CANH)}$ < +7V **(Note 3)**
			1.0	5.0	V	-12V < $V_{(CANL, CANH)}$ < +12V **(Note 3)**
D19	$V_{DIFF(h)(i)}$	Differential input hysteresis	100	200	mV	see **Figure 2-3**. **(Note 1)**
D20	R_{IN}	CANH, CANL common-mode input resistance	5	50	kΩ	
D21	$R_{IN(d)}$	Deviation between CANH and CANL common-mode input resistance	-3	+3	%	V_{CANH} = V_{CANL}

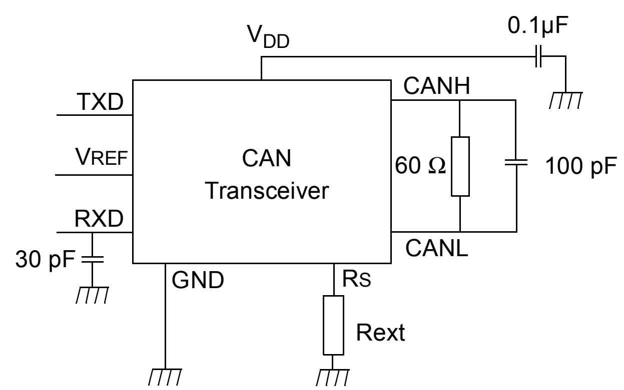
Note 1: This parameter is periodically sampled and not 100% tested.
2: I_{TXD} = I_{RXD} = I_{VREF} = 0 mA; 0V < V_{CANL} < V_{DD}; 0V < V_{CANH} < V_{DD}; V_{RS} = V_{DD}.
3: This is valid for the receiver in all modes; High-speed, Slope-control and Standby.

2.2 DC Characteristics (Continued)

DC Specifications (Continued)			Electrical Characteristics: Industrial (I): T_{AMB} = -40°C to +85°C V_{DD} = 4.5V to 5.5V Extended (E): T_{AMB} = -40°C to +125°C V_{DD} = 4.5V to 5.5V			
Param No.	**Sym**	**Characteristic**	**Min**	**Max**	**Units**	**Conditions**
Bus Line (CANH; CANL) Receiver: [TXD = 2V; pins 6 and 7 externally driven]						
D22	R_{DIFF}	Differential input resistance	20	100	kΩ	
D24	I_{LI}	CANH, CANL input leakage current	—	150	µA	$V_{DD} < V_{POR}$; $V_{CANH} = V_{CANL}$ = +5V
Transmitter Data Input (TXD)						
D25	V_{IH}	High-level input voltage	2.0	V_{DD}	V	Output recessive
D26	V_{IL}	Low-level input voltage	V_{SS}	+0.8	V	Output dominant
D27	I_{IH}	High-level input current	-1	+1	µA	$V_{TXD} = V_{DD}$
D28	I_{IL}	Low-level input current	-100	-400	µA	V_{TXD} = 0V
Receiver Data Output (RXD)						
D31	V_{OH}	High-level output voltage	0.7 V_{DD}	—	V	I_{OH} = 8 mA
D32	V_{OL}	Low-level output voltage	—	0.8	V	I_{OL} = 8 mA
Voltage Reference Output (V_{REF})						
D33	V_{REF}	Reference output voltage	0.45 V_{DD}	0.55 V_{DD}	V	-50 µA < I_{VREF} < 50 µA
Standby/Slope-Control (R_S pin)						
D34	V_{STB}	Input voltage for standby mode	0.75 V_{DD}	—	V	
D35	I_{SLOPE}	Slope-control mode current	-10	-200	µA	
D36	V_{SLOPE}	Slope-control mode voltage	0.4 V_{DD}	0.6 V_{DD}	V	
Thermal Shutdown						
D37	$T_{J(sd)}$	Shutdown junction temperature	155	180	°C	**Note 1**
D38	$T_{J(h)}$	Shutdown temperature hysteresis	20	30	°C	-12V < V(CANL, CANH) < +12V **(Note 3)**

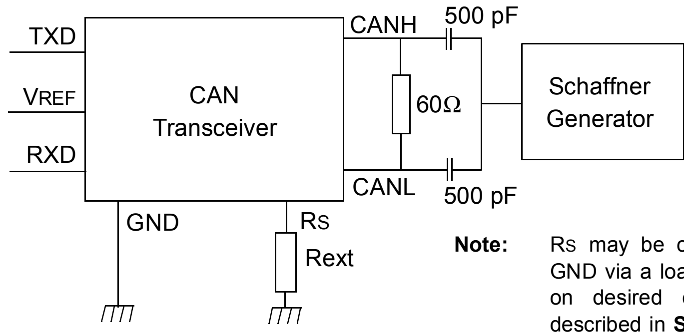
Note 1: This parameter is periodically sampled and not 100% tested.
2: $I_{TXD} = I_{RXD} = I_{VREF}$ = 0 mA; 0V < V_{CANL} < V_{DD}; 0V < V_{CANH} < V_{DD}; $V_{RS} = V_{DD}$.
3: This is valid for the receiver in all modes; High-speed, Slope-control and Standby.

FIGURE 2-1: TEST CIRCUIT FOR ELECTRICAL CHARACTERISTICS



Note: R_S may be connected to V_{DD} or GND via a load resistor depending on desired operating mode as described in **Section 1.7.8, "Slope Resistor Input (Rs)"**.

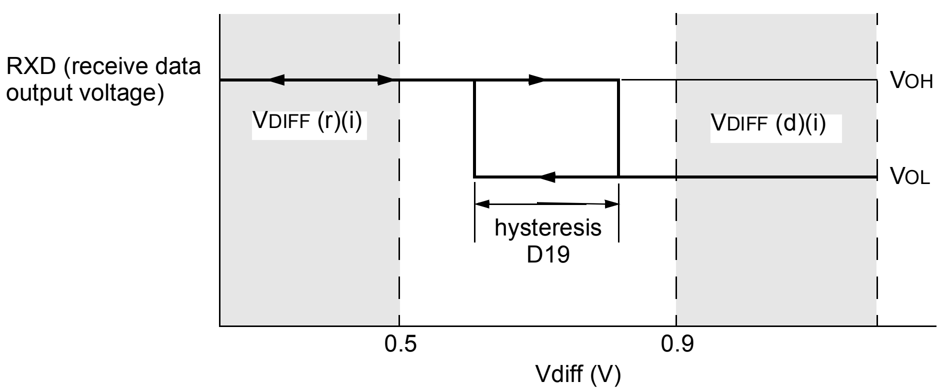
FIGURE 2-2: TEST CIRCUIT FOR AUTOMOTIVE TRANSIENTS



Note: RS may be connected to VDD or GND via a load resistor depending on desired operating mode as described in **Section 1.7.8, "Slope Resistor Input (Rs)"**

The wave forms of the applied transients shall be in accordance with "ISO-7637, Part 1", test pulses 1, 2, 3a and 3b.

FIGURE 2-3: HYSTERESIS OF THE RECEIVER



2.3 AC Characteristics

AC Specifications			Electrical Characteristics: Industrial (I): T_{AMB} = -40°C to +85°C V_{DD} = 4.5V to 5.5V Extended (E): T_{AMB} = -40°C to +125°C V_{DD} = 4.5V to 5.5V			
Param No.	**Sym**	**Characteristic**	**Min**	**Max**	**Units**	**Conditions**
1	t_{BIT}	Bit time	1	62.5	µs	V_{RS} = 0V
2	f_{BIT}	Bit frequency	16	1000	kHz	V_{RS} = 0V
3	TtxL2bus(d)	Delay TXD to bus active	—	70	ns	-40°C ≤ T_{AMB} ≤ +125°C, V_{RS} = 0V
4	TtxH2bus(r)	Delay TXD to bus inactive	—	125	ns	-40°C ≤ T_{AMB} ≤ +85°C, V_{RS} = 0V
			—	170	ns	-40°C ≤ T_{AMB} ≤ +125°C, V_{RS} = 0V
5	TtxL2rx(d)	Delay TXD to receive active	—	130	ns	-40°C ≤ T_{AMB} ≤ +125°C, V_{RS} = 0V
			—	250	ns	-40°C ≤ T_{AMB} ≤ +125°C, R_S = 47 kΩ
6	TtxH2rx(r)	Delay TXD to receiver inactive	—	175	ns	-40°C ≤ T_{AMB} ≤ +85°C, V_{RS} = 0V
			—	225	ns	-40°C ≤ T_{AMB} ≤ +85°C, R_S = 47 kΩ
			—	235	ns	-40°C ≤ T_{AMB} ≤ +125°C, V_{RS} = 0V
			—	400	ns	-40°C ≤ T_{AMB} ≤ +125°C, R_S = 47 kΩ
7	SR	CANH, CANL slew rate	5.5	8.5	V/µs	Refer to Figure 1-1; R_S = 47 kΩ, (**Note 1)**
10	t_{WAKE}	Wake-up time from standby (Rs pin)	—	5	µs	see Figure 2-5
11	TbusD2rx(s)	Bus dominant to RXD Low (Standby mode)	—	550	ns	V_{RS} = +4V; (see **Figure 2-2**)
12	$C_{IN(CANH)}$ $C_{IN(CANL)}$	CANH; CANL input capacitance	—	20 (typical)	pF	1 Mbit/s data rate; V_{TXD} = V_{DD}, **(Note 1)**
13	C_{DIFF}	Differential input capacitance	—	10 (typical)	pF	1 Mbit/s data rate **(Note 1)**
14	TtxL2busZ	TX Permanent Dominant Timer Disable Time	1.25	4	ms	
15	TtxR2pdt(res)	TX Permanent Dominant Timer Reset Time	—	1	µs	Rising edge on TXD while device is in permanent dominant state

Note 1: This parameter is periodically sampled and not 100% tested.

2.4 Timing Diagrams and Specifications

FIGURE 2-4: TIMING DIAGRAM FOR AC CHARACTERISTICS

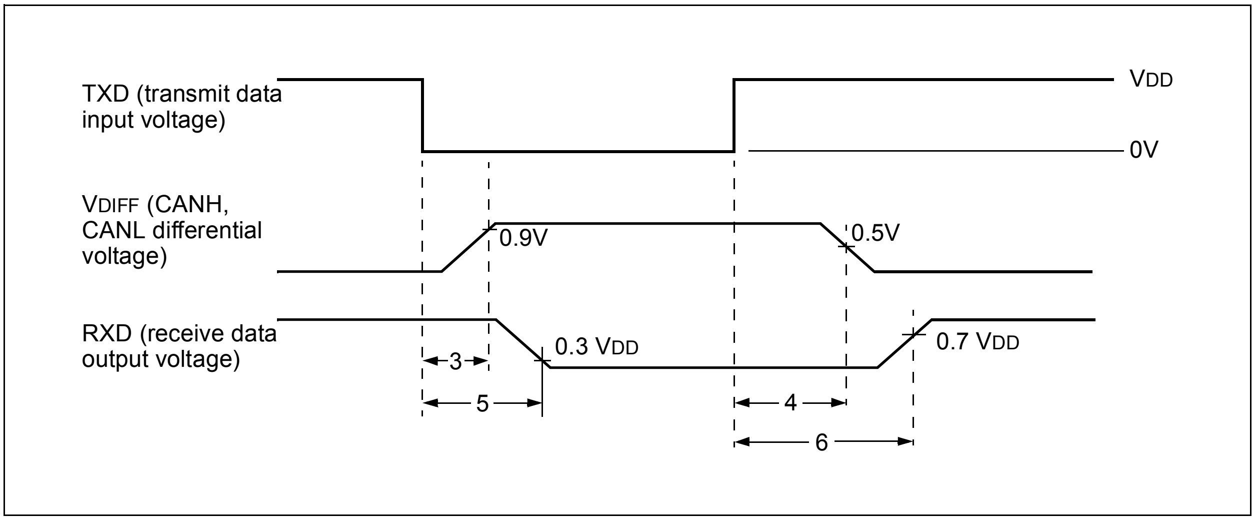


FIGURE 2-5: TIMING DIAGRAM FOR WAKE-UP FROM STANDBY

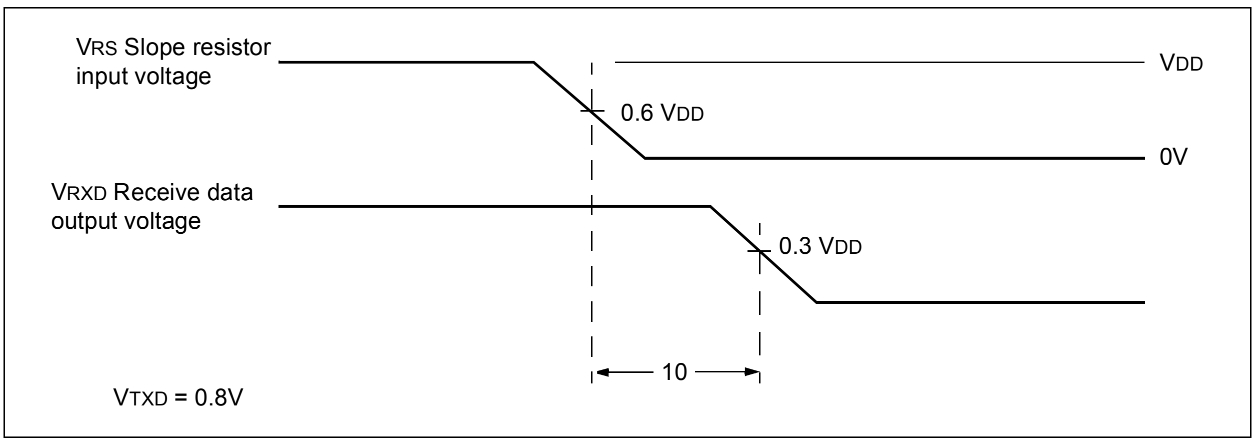
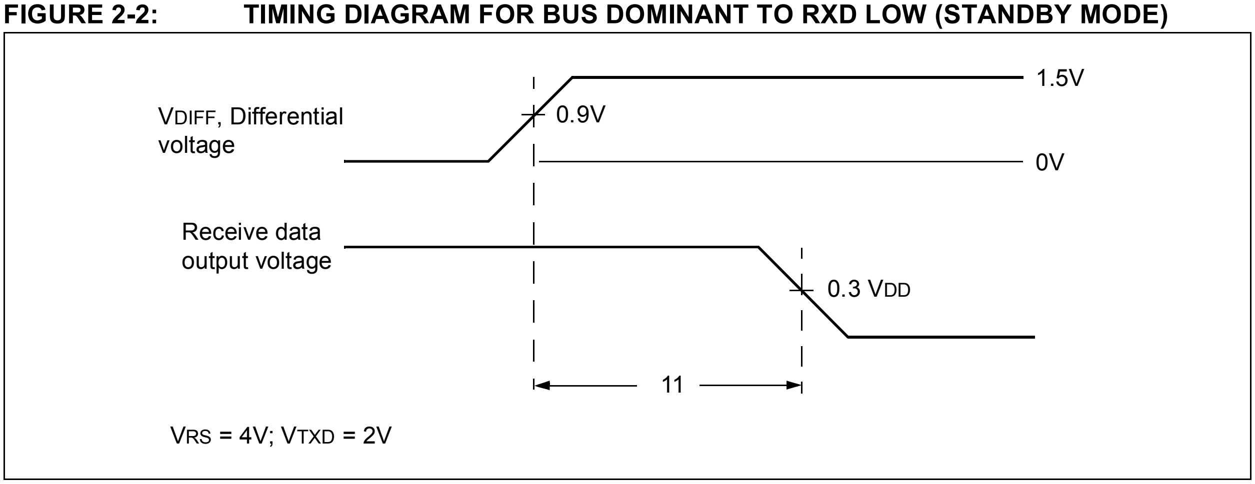


FIGURE 2-2: TIMING DIAGRAM FOR BUS DOMINANT TO RXD LOW (STANDBY MODE)

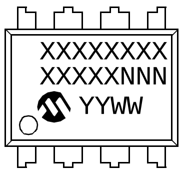


NOTES:

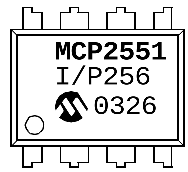
3.0 PACKAGING INFORMATION

3.1 Package Marking Information

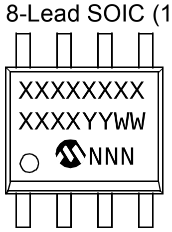
8-Lead PDIP (300 mil)



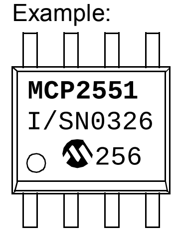
Example:



8-Lead SOIC (150 mil)



Example:

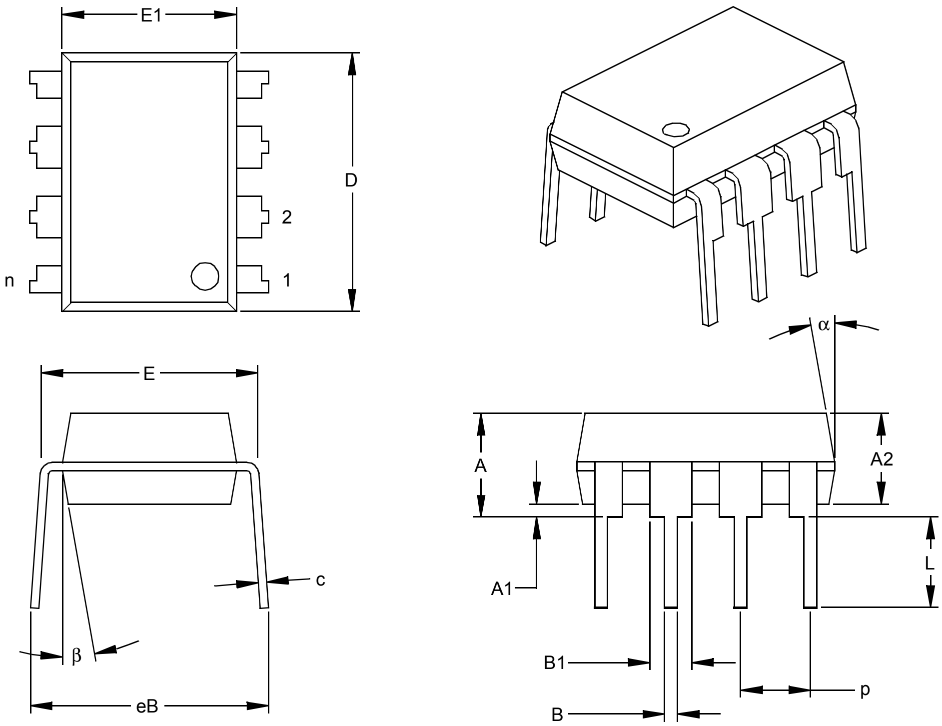


Legend:	XX...X	Customer specific information*
	YY	Year code (last 2 digits of calendar year)
	WW	Week code (week of January 1 is week '01')
	NNN	Alphanumeric traceability code

Note: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line thus limiting the number of available characters for customer specific information.

* Standard marking consists of Microchip part number, year code, week code, traceability code (facility code, mask rev#, and assembly code). For marking beyond this, certain price adders apply. Please check with your Microchip Sales Office.

8-Lead Plastic Dual In-line (P) – 300 mil (PDIP)

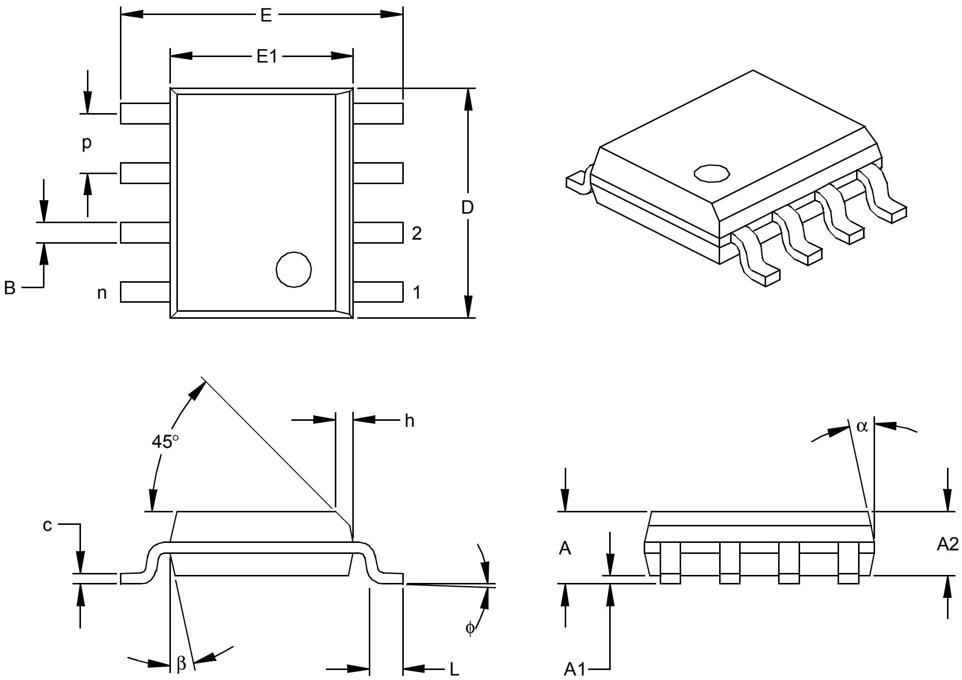


Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	p		.100			2.54	
Top to Seating Plane	A	.140	.155	.170	3.56	3.94	4.32
Molded Package Thickness	A2	.115	.130	.145	2.92	3.30	3.68
Base to Seating Plane	A1	.015			0.38		
Shoulder to Shoulder Width	E	.300	.313	.325	7.62	7.94	8.26
Molded Package Width	E1	.240	.250	.260	6.10	6.35	6.60
Overall Length	D	.360	.373	.385	9.14	9.46	9.78
Tip to Seating Plane	L	.125	.130	.135	3.18	3.30	3.43
Lead Thickness	c	.008	.012	.015	0.20	0.29	0.38
Upper Lead Width	B1	.045	.058	.070	1.14	1.46	1.78
Lower Lead Width	B	.014	.018	.022	0.36	0.46	0.56
Overall Row Spacing §	eB	.310	.370	.430	7.87	9.40	10.92
Mold Draft Angle Top	α	5	10	15	5	10	15
Mold Draft Angle Bottom	β	5	10	15	5	10	15

* Controlling Parameter
§ Significant Characteristic

Notes:
Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010” (0.254mm) per side.
JEDEC Equivalent: MS-001
Drawing No. C04-018

8-Lead Plastic Small Outline (SN) – Narrow, 150 mil (SOIC)



	Units	INCHES*			MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	p		.050			1.27	
Overall Height	A	.053	.061	.069	1.35	1.55	1.75
Molded Package Thickness	A2	.052	.056	.061	1.32	1.42	1.55
Standoff §	A1	.004	.007	.010	0.10	0.18	0.25
Overall Width	E	.228	.237	.244	5.79	6.02	6.20
Molded Package Width	E1	.146	.154	.157	3.71	3.91	3.99
Overall Length	D	.189	.193	.197	4.80	4.90	5.00
Chamfer Distance	h	.010	.015	.020	0.25	0.38	0.51
Foot Length	L	.019	.025	.030	0.48	0.62	0.76
Foot Angle	φ	0	4	8	0	4	8
Lead Thickness	c	.008	.009	.010	0.20	0.23	0.25
Lead Width	B	.013	.017	.020	0.33	0.42	0.51
Mold Draft Angle Top	α	0	12	15	0	12	15
Mold Draft Angle Bottom	β	0	12	15	0	12	15

* Controlling Parameter
§ Significant Characteristic

Notes:
Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010” (0.254mm) per side.
JEDEC Equivalent: MS-012
Drawing No. C04-057

NOTES:

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

PART NO.	X	/XX
Device	Temperature Range	Package

Device:	MCP2551= High-Speed CAN Transceiver	
Temperature Range:	I = -40°C to +85°C E = -40°C to +125°C	
Package:	P = Plastic DIP (300 mil Body) 8-lead SN = Plastic SOIC (150 mil Body) 8-lead	

Examples:

a) MCP2551-I/P: Industrial temperature, PDIP package.

b) MCP2551-E/P: Extended temperature, PDIP package.

c) MCP2551-I/SN: Industrial temperature, SOIC package.

d) MCP2551T-I/SN: Tape and Reel, Industrial Temperature, SOIC package.

e) MCP2551T-E/SN: Tape and Reel, Extended Temperature, SOIC package.

Sales and Support

Data Sheets

Products supported by a preliminary Data Sheet may have an errata sheet describing minor operational differences and recommended workarounds. To determine if an errata sheet exists for a particular device, please contact one of the following:

1. Your local Microchip sales office
2. The Microchip Corporate Literature Center U.S. FAX: (480) 792-7277
3. The Microchip Worldwide Site (www.microchip.com)

Please specify which device, revision of silicon and Data Sheet (include Literature #) you are using.

Customer Notification System

Register on our web site (www.microchip.com/cn) to receive the most current information on our products.

NOTES:

Microchip received QS-9000 quality system certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona in July 1999 and Mountain View, California in March 2002. The Company’s quality system processes and procedures are QS-9000 compliant for its PICmicro® 8-bit MCUs, KEELOQ® code hopping devices, Serial EEPROMs, microperipherals, non-volatile memory and analog products. In addition, Microchip’s quality system for the design and manufacture of development systems is ISO 9001 certified.

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07/28/03