XL1326-A

Dual CAN FD Industrial Connectivity Controller

2 × CAN FD | USB 2.0 Full-Speed | LQFP48

7 mm × 7 mm | 0.50 mm pitch | –40 °C to +105 °C

Product Datasheet

Version V1.00 | September 2026

DOCUMENT STATUS This document defines the customer-visible XL1326-A device interface. Software versions and USB identity shall be confirmed against the controlled release package and production configuration.

XL1326-A Datasheet Control

Table 1. Datasheet revision history

Version	Date	Revision history
V1.00	September 2026	Initial release; defines dual CAN FD, composite USB, host protocol, driver matrix, pins, electrical limits and package.

Scope

This datasheet defines the XL1326-A pin functions, dual CAN FD capability, USB device interface, host transports, electrical limits, application requirements and LQFP48 package. The device is used as a fixed-function industrial connectivity controller.

Important use limitations

- CAN_TX, CAN_RX and CAN_STB are logic-level signals. Each CAN channel requires an external CAN FD transceiver rated for the target data rate and common-mode range.
- IC-level ESD ratings do not replace connector-level ESD, EFT, surge, isolation or EMC protection in the finished product.
- Pins marked NC shall remain unconnected; RSV1 and RSV2 shall each connect to VSS through a dedicated 10 kΩ resistor.
- The device is not intended for life-support, flight-critical, nuclear-control or other safety-critical use unless separately qualified in writing.

Terms and conventions

Table 2. Terms and conventions

Term	Meaning
RSV	Reserved connection; apply only the specified fixed bias.
NC	No Connect; do not attach the package land to traces, test points, pull-ups or pull-downs.
XILUME-MUX-V1	Dual-channel USB framing used by the Linux vendor-specific Bulk interface.
BRS	CAN FD bit-rate switching during the data phase.

Contents

Document navigation

- Hardware design: begin with Sections 3, 4, 7, 8, 9 and 10.
- Windows integration: focus on Sections 6.1, 6.2, 6.3, 6.6 and 6.8.
- Linux integration: focus on Sections 6.2, 6.3, 6.4, 6.5, 6.6 and 6.8.

INTERFACE BOUNDARY This datasheet specifies the device-level interface. Driver installation steps, release-package hashes and test-utility instructions are maintained in the corresponding software release notes.

1. General Description

1.1 Product overview

XL1326-A is a dual-channel CAN FD industrial connectivity controller. It integrates two independent CAN/CAN FD control channels and a USB 2.0 Full-Speed device interface in an LQFP48 package for diagnostics, logging, automation, gateways and test equipment.

1.2 Key features

- Two independent CAN FD channels supporting Classical CAN, CAN FD and BRS
- Nominal bit rate from 10 kbit/s to 1 Mbit/s; data phase up to 8 Mbit/s
- 11-bit standard and 29-bit extended identifiers; 0 to 64-byte CAN FD payloads
- USB 2.0 Full-Speed composite device with two CDC functions and one vendor Bulk MUX interface
- Two independent COM ports on Windows; two SocketCAN network interfaces on Linux
- Unique 12-character uppercase hexadecimal USB serial number
- 8.000 MHz main crystal; 160 MHz CAN timing reference
- 2.4 V to 3.6 V operating supply; complete USB electrical limits from 3.0 V to 3.6 V
- LQFP48, 7 mm × 7 mm, 0.50 mm pitch; –40 °C to +105 °C

1.3 Device boundary

Table 3. Device boundary

Integrated function	Required external function
Dual CAN/CAN FD control, protocol processing, USB device, clock/reset management and device identity	Two CAN FD line transceivers, bus termination and connector protection; isolation as required by the system

LOGIC LEVELS CAN1_TX/CAN1_RX, CAN2_TX/CAN2_RX and CAN_STB connect only to the logic side of external transceivers and shall never be connected directly to CANH or CANL.

2. Functional Architecture

2.1 Functional block diagram

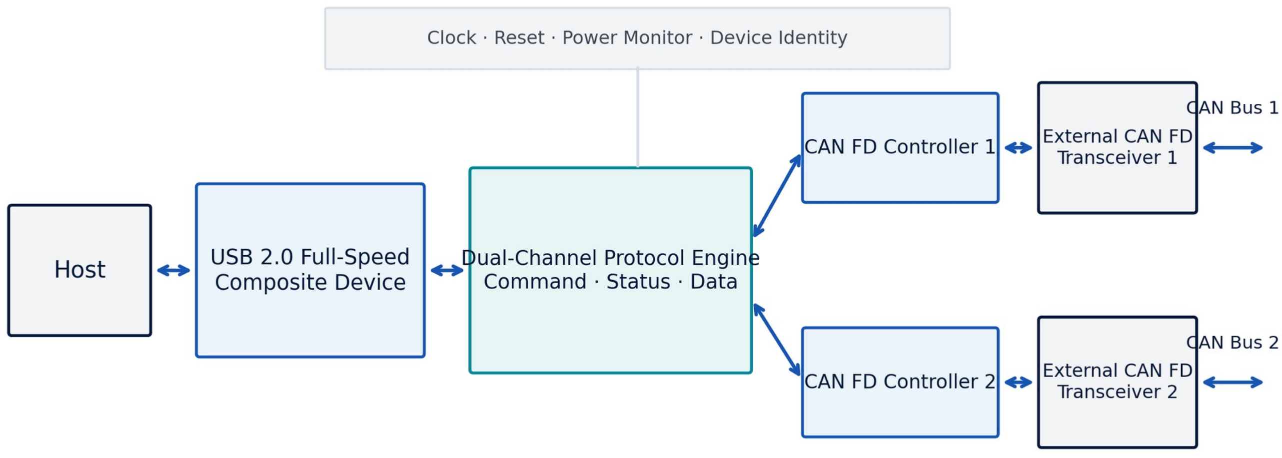


Figure 1. XL1326-A functional block diagram

2.2 Interface summary

Table 4. Interface summary

Interface	Count	Rate / type	Function
CAN FD	2	1 Mbit/s nominal; 8 Mbit/s data	Independent data-frame channels
USB device	1	12 Mbit/s line rate	Composite host interface
Main clock	1	8.000 MHz	Communication timing reference
Aux clock	1	32.768 kHz typical	Optional low-frequency time base
CAN_STB	1	Static control	External transceiver normal-mode control

2.3 Channel independence

The two CAN FD controllers have independent transmit, receive, timing configuration and status counters. USB is the shared host link; host software shall service the receive path continuously so traffic on one channel does not block the other.

3. Pin Configuration

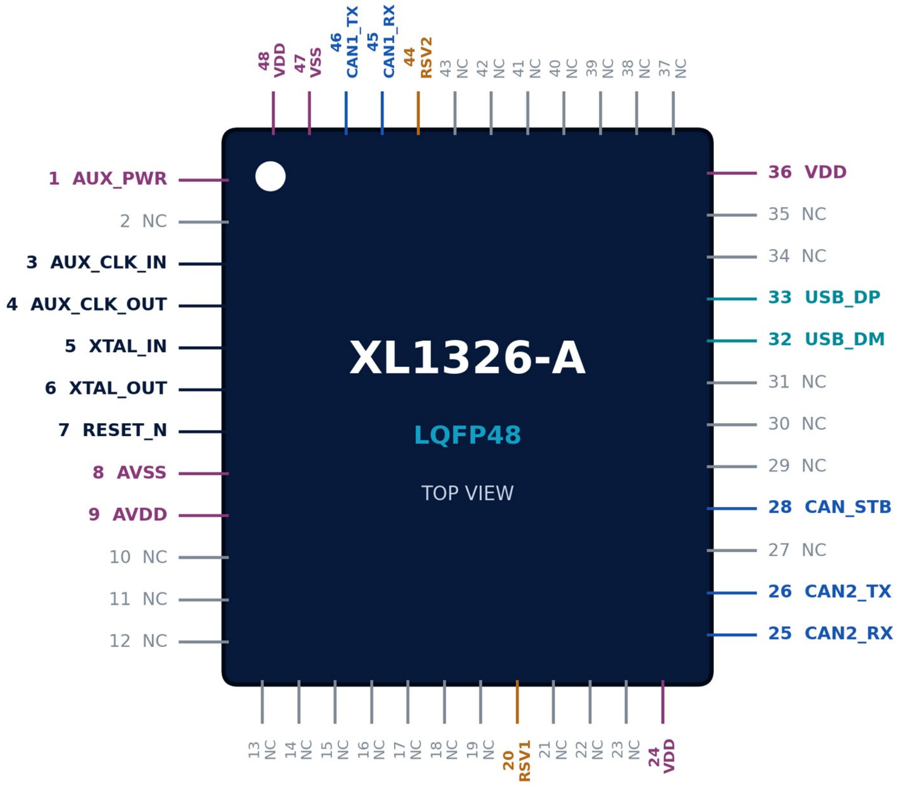


Figure 2. XL1326-A LQFP48 pin configuration (top view)

Table 5. Pin-type legend

Type	Meaning
P	Power or ground
I	Digital input
O	Digital output
I/O	Bidirectional interface
A	Oscillator or analog connection
RSV	Reserved connection; apply specified bias
NC	No Connect; leave open

The molded index mark identifies pin 1. Figure 2 is a top view; verify package and PCB land orientation before assembly.

4. Pin Description

4.1 Pins 1 to 24

Table 6. Pin description — pins 1 to 24

No.	Name	Type	Description
1	AUX_PWR	P	Auxiliary supply; tie to VDD when an independent auxiliary supply is not used.
2	NC	NC	No Connect. Leave unconnected.
3	AUX_CLK_IN	A	Optional low-frequency crystal or clock input.
4	AUX_CLK_OUT	A	Optional low-frequency crystal output.
5	XTAL_IN	A	8.000 MHz main-crystal input.
6	XTAL_OUT	A	8.000 MHz main-crystal output.
7	RESET_N	I	Active-low device reset input.
8	AVSS	P	Analog ground; connect to VSS.
9	AVDD	P	Analog supply; connect to VDD and decouple locally.
10	NC	NC	No Connect. Leave unconnected.
11	NC	NC	No Connect. Leave unconnected.
12	NC	NC	No Connect. Leave unconnected.
13	NC	NC	No Connect. Leave unconnected.
14	NC	NC	No Connect. Leave unconnected.
15	NC	NC	No Connect. Leave unconnected.
16	NC	NC	No Connect. Leave unconnected.
17	NC	NC	No Connect. Leave unconnected.
18	NC	NC	No Connect. Leave unconnected.
19	NC	NC	No Connect. Leave unconnected.
20	RSV1	RSV	Connect to VSS through a dedicated 10 kΩ resistor. Do not connect to any other signal.
21	NC	NC	No Connect. Leave unconnected.
22	NC	NC	No Connect. Leave unconnected.
23	NC	NC	No Connect. Leave unconnected.
24	VDD	P	Digital supply. Connect every VDD pin.

NC RULE Do not attach NC lands to traces, test points, pull-ups, pull-downs or external logic.

4. Pin Description (continued)

4.2 Pins 25 to 48

Table 7. Pin description — pins 25 to 48

No.	Name	Type	Description
25	CAN2_RX	I	CAN channel 2 receive input from an external transceiver.
26	CAN2_TX	O	CAN channel 2 transmit output to an external transceiver.
27	NC	NC	No Connect. Leave unconnected.
28	CAN_STB	O	Common external-transceiver standby control. Driven low in normal operation; use only with active-high STB inputs.
29	NC	NC	No Connect. Leave unconnected.
30	NC	NC	No Connect. Leave unconnected.
31	NC	NC	No Connect. Leave unconnected.
32	USB_DM	I/O	USB Full-Speed D– line.
33	USB_DP	I/O	USB Full-Speed D+ line.
34	NC	NC	No Connect. Leave unconnected.
35	NC	NC	No Connect. Leave unconnected.
36	VDD	P	Digital supply. Connect every VDD pin.
37	NC	NC	No Connect. Leave unconnected.
38	NC	NC	No Connect. Leave unconnected.
39	NC	NC	No Connect. Leave unconnected.
40	NC	NC	No Connect. Leave unconnected.
41	NC	NC	No Connect. Leave unconnected.
42	NC	NC	No Connect. Leave unconnected.
43	NC	NC	No Connect. Leave unconnected.
44	RSV2	RSV	Connect to VSS through a dedicated 10 kΩ resistor. Do not connect to any other signal.
45	CAN1_RX	I	CAN channel 1 receive input from an external transceiver.
46	CAN1_TX	O	CAN channel 1 transmit output to an external transceiver.
47	VSS	P	Digital ground reference.
48	VDD	P	Digital supply. Connect every VDD pin.

NC pins: 2, 10–19, 21–23, 27, 29–31, 34–35 and 37–43. RSV1 (pin 20) and RSV2 (pin 44) each connect to VSS through an independent 10 kΩ resistor.

CAN_STB Pin 28 remains low after firmware initialization to keep active-high-standby CAN FD transceivers in normal mode. It may be high-impedance during reset and power-up; add a 10 kΩ pull-down at the transceiver side when a defined state is required.

5. Functional Description

5.1 CAN FD controllers

Table 8. CAN FD capabilities

Item	Support
Channels	Two independent channels
Frame formats	Classical CAN data frames; CAN FD data frames
Identifiers	11-bit standard; 29-bit extended, subject to Section 6.8
Payload	0–8 bytes Classical CAN; 0–64 bytes CAN FD
Bit rate	10 kbit/s–1 Mbit/s nominal; data phase up to 8 Mbit/s
BRS	Supported
Default timing	500 kbit/s nominal; 2 Mbit/s data; 75% / 75% sample points
Physical layer	External CAN FD transceiver required per channel

5.2 External physical layer

CAN1_TX/CAN1_RX and CAN2_TX/CAN2_RX connect to two external CAN FD transceivers. Select the transceivers for bus voltage, temperature, common-mode range, isolation and EMC targets. Install termination only at the two physical bus ends.

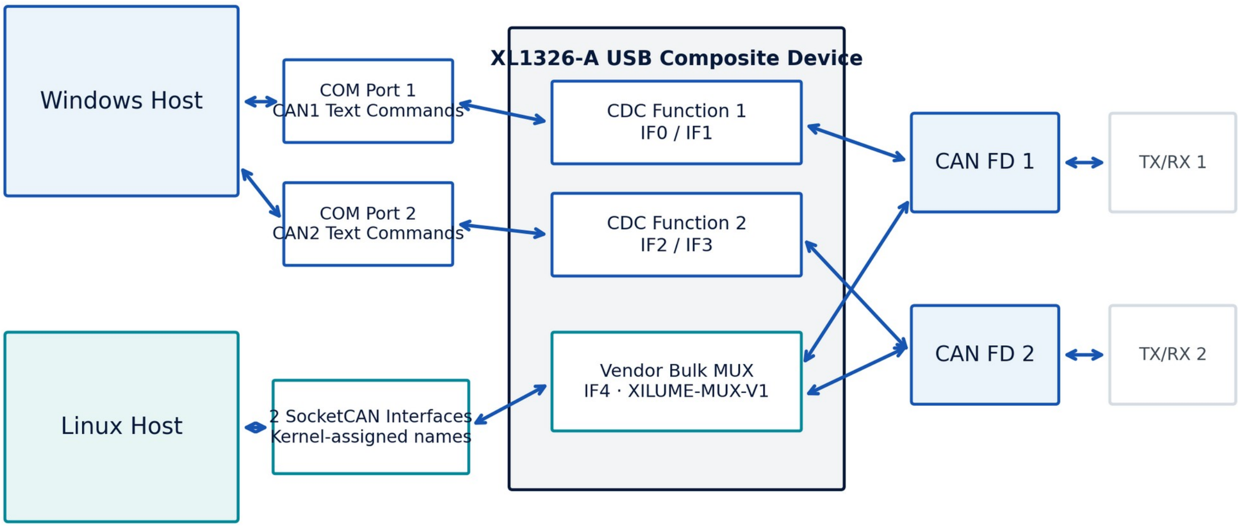
5.3 Transmit confirmation and status

The text command interface returns TX_DONE or TXFD_DONE after bus transmission completes, rather than merely confirming queue admission. GET_STATUS reports transmit and receive error counters, bus-off, error-passive, error-warning and transmit state.

SHARED CONTROL OUTPUT CAN_STB may drive two transceivers that use active-high standby inputs. If control polarity or electrical requirements differ, leave CAN_STB open and set each transceiver mode locally.

6. Host Interface and USB Protocol

6.1 USB data paths



CDC and vendor Bulk interfaces coexist; the host selects the operating-system data path.

Figure 3. USB composite interfaces and dual CAN FD channel mapping

The USB configuration provides two CDC functions and one vendor-specific Bulk interface. The Windows driver binds the two CDC functions; the Linux SocketCAN driver binds interface 4 only. Both paths access the same CAN1/CAN2 controllers.

Table 9. Host channel mapping

Environment	Host object	Device channel	Transport
Windows	COM port 1	CAN1	CDC IF0/1
Windows	COM port 2	CAN2	CDC IF2/3
Linux	SocketCAN dev_port 0	CAN1	MUX logical 0
Linux	SocketCAN dev_port 1	CAN2	MUX logical 1

NAMING RULE Windows COM numbers are assigned dynamically. Linux network-interface names are kernel-assigned; software shall use dev_port or driver attributes to identify channels and shall not assume can0/can1.

6. Host Interface and USB Protocol (continued)

6.2 Software version matrix

Table 10. Interface baseline for this revision

Component	Version	Scope	Notes
Device firmware source	7.3.1	USB, dual CAN FD and command protocol	Source-defined revision
Windows driver	1.0.0.1	Two CDC COM ports	Windows 10 2004+ / Windows 11 x64
Linux driver	2.0.2	Two SocketCAN interfaces	Linux kernel 5.4+; DKMS module xilume_dualcanfd

Windows behavior

- The INF matches MI_00 and MI_02 of the USB composite device and uses the system usbser driver.
- Device Manager presents Xilume CAN/CANFD 1 and Xilume CAN/CANFD 2; the COM numbers in parentheses vary by host.
- Applications send the case-sensitive text commands in Section 6.6 directly on the corresponding COM port.

Linux behavior

- xilume_dualcanfd binds only IF4 (FF/00/00) and creates two SocketCAN network interfaces.
- During probe, the driver completes HELLO and validates logical-channel count, CAN-channel count, maximum payload and protocol version.
- The driver translates between SocketCAN frames and the device text command stream.

RELEASE BOUNDARY Firmware binaries, signed drivers, installers and hashes are not embedded in this datasheet. Confirm versions against the controlled software release package before manufacturing or deployment.

6. Host Interface and USB Protocol (continued)

6.3 USB descriptors

Table 11. USB device and configuration descriptors

Field	Value	Field	Value
USB specification	2.00	Speed	Full-Speed
Class/Subclass/Protocol	EF/02/01	EP0	64 bytes
VID	0x2E3C	PID	0x5742
bcdDevice	0x0201 (2.01)	Configurations	1
Interfaces	5	Total length	164 bytes
Power	Self-powered	Declared MaxPower	100 mA
Remote wake-up	Not advertised	Language ID	0x0409

Table 12. USB interfaces and endpoints

Interface	Class/Subclass/Protocol	Endpoints	Max packet / interval
IF0 CDC1 Control	02/02/01	0x82 Interrupt IN	8 B / 16
IF1 CDC1 Data	0A/00/00	0x81 Bulk IN; 0x01 Bulk OUT	64 B
IF2 CDC2 Control	02/02/01	0x84 Interrupt IN	8 B / 16
IF3 CDC2 Data	0A/00/00	0x83 Bulk IN; 0x03 Bulk OUT	64 B
IF4 Vendor MUX	FF/00/00	0x85 Bulk IN; 0x05 Bulk OUT	64 B

Table 13. USB strings

Index	Content	Description
1	Xilume	Manufacturer
2	Xilume Dual CAN FD	Product
3	12 uppercase hexadecimal characters	Unique device-derived identifier
4	Xilume Dual CAN FD Config	Configuration string, available by explicit request
5	Xilume CAN FD Interface	Interface string, available by explicit request

USB ID CONTROL VID/PID are descriptor values in the current interface baseline. Before release, confirm consistency and authorization across controlled firmware, the driver INF and production configuration. bcdDevice 2.01 is the USB device-release field; it is not a firmware or driver version.

6. Host Interface and USB Protocol (continued)

6.4 XILUME-MUX-V1 framing

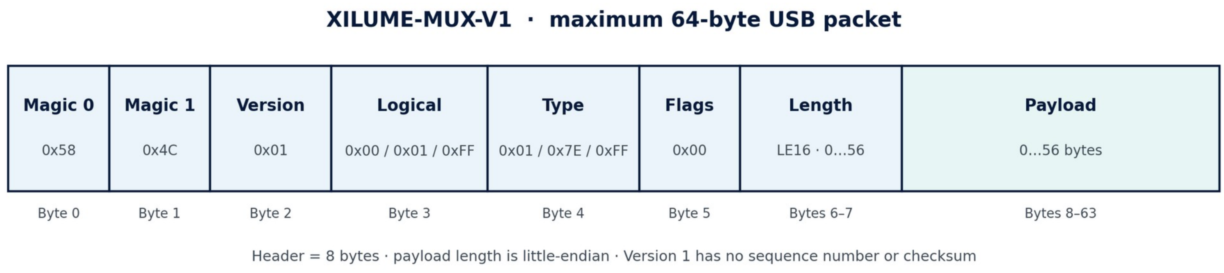


Figure 4. XILUME-MUX-V1 header

Table 14. MUX header

Offset	Size	Field	Definition
0	1	Magic 0	0x58
1	1	Magic 1	0x4C
2	1	Protocol version	0x01
3	1	Logical channel	0x00, 0x01 or 0xFF for HELLO
4	1	Frame type	0x01 DATA; 0x7E HELLO; 0xFF ERROR
5	1	Flags	Shall be 0x00 in Version 1
6	2	Payload length	0x0000–0x0038, little-endian

Logical channels

Table 15. MUX logical channels

Channel	Function	DATA payload
0	CAN FD 1	CAN ASCII command and response stream
1	CAN FD 2	CAN ASCII command and response stream
0xFF	Device control	HELLO only

IMPLEMENTED TYPES The current receive path supports DATA (0x01) and HELLO (0x7E). Other types are not supported functions; an unknown type returns ERROR (0xFF), error code 7.

6. Host Interface and USB Protocol (continued)

6.5 HELLO transaction

After claiming IF4, the Linux driver sends a zero-length HELLO before opening data channels. The host shall validate the complete response to confirm topology, maximum payload, protocol and firmware revision. A repeated HELLO starts a new MUX session.

```
Host:   58 4C 01 FF 7E 00 00 00
Device: 58 4C 01 FF 7E 00 0C 00  01 02 02 00 00 00 01 38 07 03 01 03
```

Table 16. HELLO response payload

Offset	Field	Value
0	Protocol version	1
1	Logical channel count	2
2	CAN channel count	2
3	Reserved	0
4	Reserved	0
5	Reserved	0
6	Physical Bulk transport count	1
7	Maximum MUX payload	56
8	Firmware major	7
9	Firmware minor	3
10	Firmware patch	1
11	Capability flags	0x03

Table 17. HELLO capability flags

Bit	Meaning
0	CAN ASCII stream supported
1	Bus-transmit completion confirmation supported
7:2	Reserved; host ignores unknown capability bits

6. Host Interface and USB Protocol (continued)

6.6 CAN ASCII commands

Commands are case-sensitive and terminate with CR, LF or CRLF. The CDC path carries text directly; the MUX path carries the same stream in DATA payloads. A command may span multiple DATA frames and the device retains partial lines per channel.

Table 18. CAN ASCII commands

Command	Syntax	Function
PING	PING	Connection test
GET_INFO	GET_INFO	Return firmware and capabilities
GET_STATUS	GET_STATUS	Return CAN status and error counters
GET_BITRATE	GET_BITRATE [CAN1|CAN2|1|2]	Read nominal and data bit rate
GET_TIMING	GET_TIMING [CAN1|CAN2|1|2]	Read complete active timing
SET_FD_BITRATE	SET_FD_BITRATE CANx nominal data	Set bit rates
SET_TIMING	SET_TIMING CANx nominal NSP NSJW data DSP DSJW SSP	Set calculated timing
SET_TIMING_RAW	SET_TIMING_RAW CANx DIV NBTS1 NBTS2 NSJW DBTS1 DBTS2 DSJW SSPOFF	Set raw timing fields
RESET_CAN	RESET_CAN [CANx]	Reset selected channel
TX	TX id length [data...]	Transmit Classical CAN data frame
TX2	TX2 id length [data...]	CAN2 port alias
TXFD	TXFD CANx id length BRS|NOBRS [data...]	Transmit CAN FD data frame

Identifier and payload rules

- Identifier range is 0x00000000 to 0x1FFFFFFF; decimal and 0x-prefixed hexadecimal forms are accepted.
- Classical CAN length is 0–8; CAN FD lengths are 0–8, 12, 16, 20, 24, 32, 48 or 64 bytes.
- Data bytes are hexadecimal; BRS enables data-phase switching and NOBRS disables it.

6. Host Interface and USB Protocol (continued)

6.7 CAN timing and responses

Table 19. CAN timing limits

Parameter	Range / rule
Nominal bit rate	10,000–1,000,000 bit/s
Data bit rate	10,000–8,000,000 bit/s
Nominal/data sample point	50.0%–95.0%
NSJW / DSJW	AUTO or 1–128 TQ
SSP	AUTO or 0–255 TQ
DIV	1–32; common to nominal and data phases
NBTS1 / NBTS2	2–513 / 1–128
DBTS1 / DBTS2	2–257 / 1–128
Timing reference	160,000,000 Hz; reported by GET_TIMING
Default	500 kbit/s nominal; 2 Mbit/s data; 75.0% / 75.0% sample points

NSJW shall not exceed NBTS2 and DSJW shall not exceed DBTS2. SSP=AUTO or a non-zero manual SSPOFF requires DIV 1 or 2. Requested bit rates must be exactly realizable from the 160 MHz reference using legal segment values; otherwise ERR UNSUPPORTED_TIMING is returned. Timing changes remain active until device reset or power removal.

Table 20. Response and receive formats

Operation / frame	ASCII format
PING	PONG CAN1 | PONG CAN2
GET_BITRATE / SET_FD_BITRATE	OK FD_BITRATE CANx NOMINAL=<decimal> DATA=<decimal>
RESET_CAN	OK RESET_CAN CANx
TX	OK TX_DONE CANx
TXFD	OK TXFD_DONE CANx
CAN1 Classical receive	RX 0xID length [data...]
CAN2 Classical receive	RX2 0xID length [data...]
CAN FD receive	RXFD CANx 0xID length BRS|NOBRS [data...]

6. Host Interface and USB Protocol (continued)

6.8 Host rules, limitations and examples

Table 21. Protocol Version 1 limitations

Item	Definition
Classical remote frames	Not represented; RTR is not supported
Extended-ID indication	No explicit IDE field; IDs above 0x7FF are interpreted as extended
Low-number extended ID	An extended frame with numeric ID ≤0x7FF cannot be distinguished from a standard frame
CAN FD ESI	ESI is not encoded in the ASCII receive format
MUX integrity	No sequence number or checksum; relies on USB Bulk transport
Aggregate throughput	Both channels share one USB Full-Speed link; simultaneous saturation is not guaranteed

Host transfer rules

- A complete MUX frame shall not be divided across USB OUT transfers; one frame per transfer is recommended.
- Multiple complete frames may share one transfer when their combined length does not exceed 64 bytes.
- The host shall continuously service Bulk IN and serialize Bulk OUT writes.
- CDC ports and MUX logical channels reassemble text lines independently for CAN1/CAN2.

Examples

```
CAN1 ping:
PING\r\n
→ PONG CAN1\r\n

CAN FD transmit on CAN1:
TXFD CAN1 0x123 12 BRS 00 01 02 03 04 05 06 07 08 09 0A 0B\r\n
→ OK TXFD_DONE CAN1\r\n
```

LINUX DRIVER RULE The SocketCAN driver explicitly rejects RTR and extended frames with numeric IDs ≤0x7FF because the current text protocol cannot represent them losslessly.

7. Clock, Reset and Power

7.1 Supply connections

Table 22. Supply connections

Supply	Pins	Range	Connection guidance
VDD	24, 36, 48	2.4–3.6 V	Connect all; 100 nF at each pin and 4.7 µF nearby
VSS	47	0 V	Digital ground reference
AVDD	9	Same as VDD	Connect to VDD; decouple with 100 nF + 1 µF
AVSS	8	Same as VSS	Connect directly to ground plane
AUX_PWR	1	1.62–3.6 V	Tie to VDD when no independent auxiliary supply is used

7.2 Clock inputs

Table 23. Clock inputs

Clock	Pins	Range / use
Main crystal	XTAL_IN 5; XTAL_OUT 6	8.000 MHz crystal or resonator
Auxiliary clock	AUX_CLK_IN 3; AUX_CLK_OUT 4	32.768 kHz crystal when required

7.3 Reset and defined states

RESET_N (pin 7) is active low. Keep the trace short and away from switching nodes. An external supervisor may be used when required by the system ramp or brownout environment. RSV1 and RSV2 each require 10 kΩ to VSS. CAN_STB remains low after initialization; a 10 kΩ pull-down at the transceiver side maintains normal mode during reset.

7.4 Decoupling

Place a 100 nF ceramic capacitor at each VDD pin, 100 nF at AUX_PWR, and 100 nF plus 1 µF at AVDD. Add 4.7 µF near the device supply entry. Minimize each capacitor-to-pin-to-ground current loop.

USB SUPPLY RANGE USB operation is functional from 2.7 V, but the complete USB electrical limits in this datasheet apply only from VDD=3.0 V to 3.6 V.

8. Electrical Characteristics

Unless otherwise stated, limits apply over the recommended VDD and ambient-temperature range. Absolute maximum ratings are stress limits only and do not imply functional operation.

8.1 Absolute maximum ratings

Table 24. Absolute maximum ratings

Symbol	Parameter	Min	Max	Unit
VDDx–VSS	Main and analog supply voltage	–0.3	4.0	V
VAUX–VSS	Auxiliary supply voltage	–0.3	4.0	V
VIN	Customer-visible signal-pin voltage	VSS–0.3	4.0	V
|ΔVDDx|	Difference between supply pins	—	50	mV
|VSSx–VSS|	Difference between ground pins	—	50	mV
IVDD	Total current into supply pins	—	150	mA
IVSS	Total current out of ground pins	—	150	mA
IIO-SINK	Sink current per output/control pin	—	25	mA
IIO-SOURCE	Source current per output/control pin	–25	—	mA
TSTG	Storage temperature	–60	+150	°C
TJ	Maximum junction temperature	—	125	°C

8.2 Recommended operating conditions

Table 25. Recommended operating conditions

Symbol	Parameter	Min	Typ	Max	Unit
VDD	Digital and analog supply	2.4	3.3	3.6	V
AUX_PWR	Auxiliary-domain supply; does not power main device	1.62	3.3	3.6	V
VDD	Supply for complete USB electrical limits	3.0	3.3	3.6	V
fXTAL	Main external crystal or resonator	—	8.000	—	MHz
TA	Ambient operating temperature	–40	—	+105	°C

8.3 Power-on and reset

Table 26. Power-on and reset characteristics

Symbol	Parameter	Min	Typ	Max	Unit
tVDD-RISE	VDD rise rate	0	—	unbounded	ms/V
tVDD-FALL	VDD fall rate	20	—	unbounded	µs/V
VPOR	Power-on reset threshold	1.73	2.06	2.40	V
VLVR	Low-voltage reset threshold	1.62	1.88	2.16	V
VLVR-HYS	Low-voltage reset hysteresis	—	180	—	mV
tRESET	Reset release delay after VDD exceeds VPOR	—	830	—	µs

8. Electrical Characteristics (continued)

8.4 Digital and USB interface characteristics

Table 27. Digital and USB interface characteristics

Symbol	Parameter / condition	Min	Typ	Max	Unit
VIL	CAN_RX input-low voltage	—	—	0.28 VDD + 0.1	V
VIH	CAN_RX input-high voltage	0.31 VDD + 0.8	—	VDD + 0.3	V
VIL-RST	RESET_N input-low voltage	–0.3	—	0.72	V
VIH-RST	RESET_N input-high voltage	2.0	—	VDD + 0.3	V
RPU-RST	RESET_N internal pull-up	30	40	50	kΩ
tRST-REJ	RESET_N low pulse that may be rejected	—	—	40	µs
tRST-MIN	Guaranteed RESET_N low pulse width	80	—	—	µs
VOL	Output low; VDD=2.7–3.6 V, IOL=4 mA	—	—	0.4	V
VOH	Output high; VDD=2.7–3.6 V, IOH=–4 mA	VDD–0.4	—	—	V
VOL-LV	Output low; VDD=2.4–<2.7 V, IOL=2 mA	—	—	0.4	V
VOH-LV	Output high; VDD=2.4–<2.7 V, IOH=–2 mA	VDD–0.4	—	—	V
tSTARTUP	USB transceiver startup	—	—	1	µs
VDI	USB differential input sensitivity	0.2	—	—	V
VCM	USB differential common-mode range	0.8	—	2.5	V
VSE	USB single-ended receiver threshold	1.3	—	2.0	V
VOL-USB	USB static output-low voltage	—	—	0.3	V
VOH-USB	USB static output-high voltage	2.8	—	3.6	V
RPU	USB_DP internal pull-up, idle	0.97	1.24	1.58	kΩ
RPU	USB_DP internal pull-up, receive	1.66	2.26	3.09	kΩ
tr / tf	USB rise / fall time, CL≤50 pF	4	—	20	ns
trfm	USB rise/fall-time matching	90	—	110	%
VCRS	USB output crossover voltage	1.3	—	2.0	V
VESD-HBM	Human-body-model ESD, all pins	±2000	—	—	V
VESD-CDM	Charged-device-model ESD, all pins	±1000	—	—	V
ILATCH	Latch-up immunity, JESD78F Class II/A	±200	—	—	mA

8.5 System qualification boundary

Connector-level surge, EFT, ESD, radiated or conducted immunity, isolation and regulatory compliance depend on external circuitry, PCB, connectors and complete product construction. Supply current and concurrent communication performance shall be measured in defined end-system operating states.

9. Application Information

9.1 Minimum connection checklist

1. Connect VDD pins 24, 36 and 48 and place 100 nF decoupling at each pin.
2. Connect AVDD to VDD and AVSS to VSS; tie AUX_PWR to VDD when no independent auxiliary supply is used.
3. Connect RSV1 pin 20 and RSV2 pin 44 individually to VSS through 10 kΩ.
4. Connect a qualified 8.000 MHz crystal or resonator between XTAL_IN and XTAL_OUT.
5. Route USB_DP and USB_DM as a controlled-impedance differential pair; add low-capacitance connector-side protection only as required by the system target.
6. Use an external CAN FD transceiver per channel; place termination only at physical bus ends.
7. When required, connect CAN_STB to active-high standby inputs and add a 10 kΩ pull-down at the transceiver side.
8. Leave every NC pin open.

9.2 USB layout

Route USB_DP and USB_DM as a short, length-matched 90 Ω differential pair. Avoid stubs, test pads and reference-plane discontinuities. Optional 0 Ω to 22 Ω series-tuning footprints may be placed near XL1326-A; determine final values by signal-integrity validation.

9.3 CAN physical layer

Select transceivers rated for the target voltage, temperature, common-mode range and data rate. Isolated designs shall maintain creepage and clearance across the complete PCB, connector and enclosure path. CANH/CANL shall never connect directly to device logic pins.

9.4 Validation

- Exercise both CAN FD channels concurrently under the expected host load.
- Verify USB enumeration, disconnect/reconnect, host reboot, reset and brownout recovery.
- Validate temperature, EMC, transient immunity and bus termination on the complete product.

9. Application Information (continued)

9.5 Generic minimum connection

Figure 5 shows device power, main clock, reset, reserved bias, USB and dual CAN FD logic connections for a 3.3 V system. Transceiver type, protection, isolation and connectors are selected for the target system.

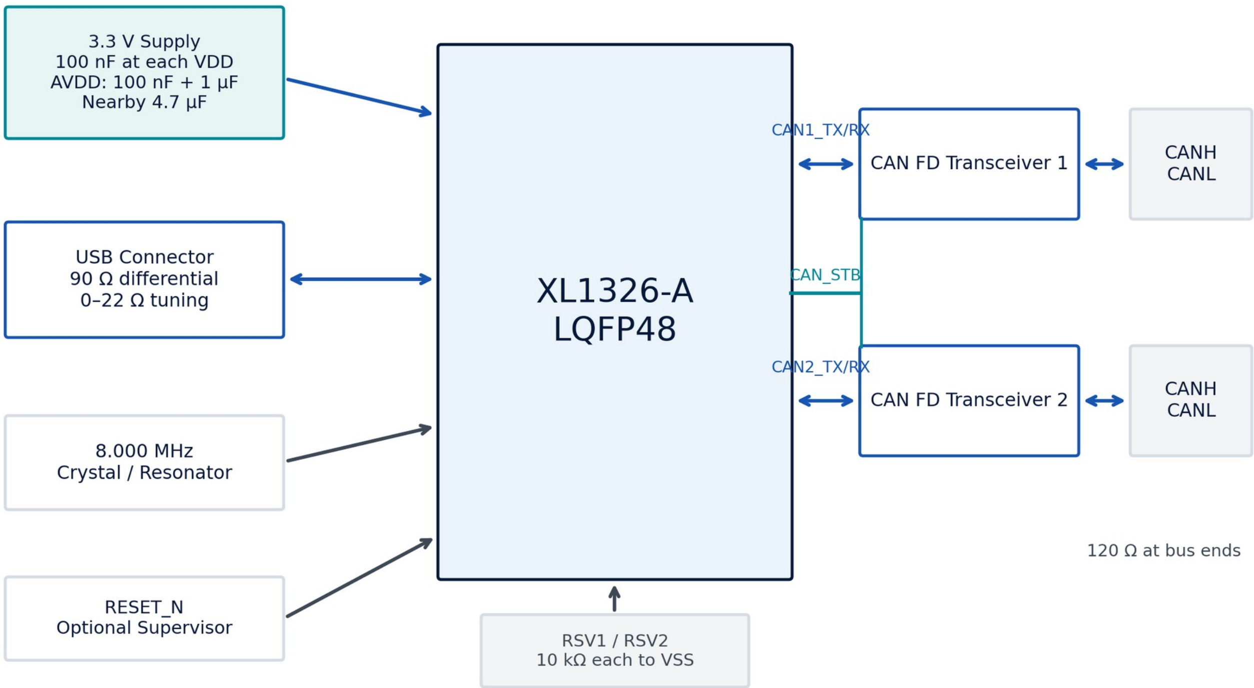


Figure 5. Generic XL1326-A minimum connection example

- Connect CAN1_TX/CAN1_RX and CAN2_TX/CAN2_RX to the logic side of the corresponding transceivers.
- CAN_STB is intended only for active-high standby inputs; other control polarities require external logic.
- Install 120 Ω termination only at physical bus ends, not unconditionally at every node.
- USB series resistors are tuning footprints; determine final values through board-level validation.

SCHEMATIC BOUNDARY Figure 5 is not a complete safety or EMC design. Interface protection, common-mode components, isolated power, connector shielding and grounding strategy are system-design decisions.

10. Package Information

10.1 LQFP48 mechanical drawing

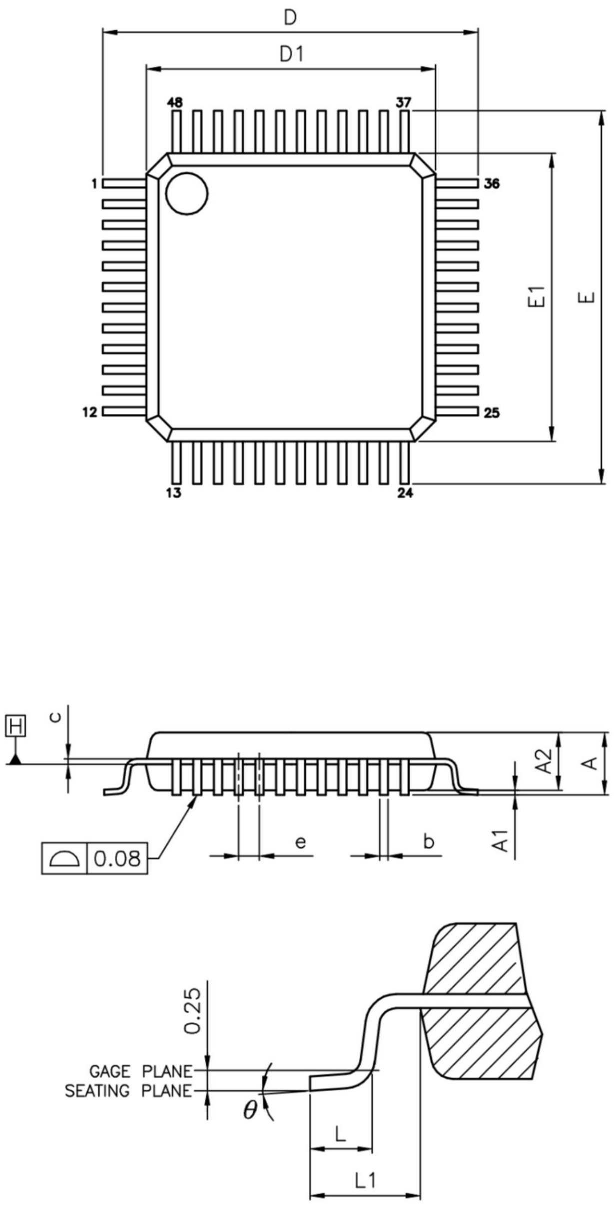


Figure 6. LQFP48 7 mm × 7 mm package mechanical drawing (top, side and lead detail)

PACKAGE DEFINITION The package has 48 leads and no exposed pad. Dimensions are in millimetres; the drawing is not to scale.

10.2 Land pattern and assembly

Figure 6 defines package geometry only and is not a PCB land pattern. Use a validated LQFP48 7 mm × 7 mm, 0.50 mm-pitch footprint and confirm copper, solder-mask and paste dimensions for the assembly process.

10. Package Information (continued)

10.3 Mechanical dimensions

Table 28. LQFP48 package dimensions

Symbol	Description	Min	Typ	Max	Unit
A	Overall package height	—	—	1.60	mm
A1	Standoff	0.05	—	0.15	mm
A2	Body thickness	1.35	1.40	1.45	mm
b	Lead width	0.17	0.22	0.27	mm
c	Lead thickness	0.09	—	0.20	mm
D	Overall horizontal span	8.80	9.00	9.20	mm
D1	Molded body width	6.90	7.00	7.10	mm
E	Overall vertical span	8.80	9.00	9.20	mm
E1	Molded body length	6.90	7.00	7.10	mm
e	Lead pitch	—	0.50 BSC	—	mm
θ	Lead angle	0°	3.5°	7°	degree
L	Lead length	0.45	0.60	0.75	mm
L1	Lead reference length	—	1.00 REF	—	mm

The 0.08 mm geometric callout in Figure 6 is the maximum lead coplanarity/profile limit.

10.4 Thermal reference

The LQFP48 junction-to-ambient thermal-resistance reference is 87.4 °C/W, based on a simulated 1.6 mm two-layer glass-epoxy board. At TA=+105 °C and TJ=+125 °C, that reference model gives a 229 mW thermal-design limit. This is a package/board reference, not measured device operating power; copper area, airflow, placement and PCB construction affect the result.

10.5 Assembly, packaging and compliance

The applicable order or production lot is accompanied by the controlled packaging and compliance statement. Reflow profile, moisture sensitivity, tape orientation and material declarations are governed by that controlled document.

11. Ordering and Marking

11.1 Ordering information

Table 29. Ordering information

Orderable code	Package	Temperature range	Status
XL1326-A-LQ48	LQFP48, 7 mm × 7 mm, 0.50 mm pitch	–40 °C to +105 °C	Active

11.2 Top marking

XILUME
XL1326-A
YYWW LOT

Table 30. Top marking legend

Line	Content
1	XILUME brand identifier
2	Device code XL1326-A
3	Date and traceability code; exact format may vary by production lot

11.3 Related documentation

Section 6 defines the device-level host interface. Platform driver installation, APIs, release notes, firmware build records and test utilities are maintained as separate integration documents.

Important notice

Information in this document is provided in connection with Xilume products. Xilume may revise specifications or product descriptions through document control. Designers remain responsible for validating the complete end product, including external physical layers, protection, isolation, regulatory compliance and fitness for the intended application.

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