DP83EC315-Q1 100Base-T1 Remote Control Edge (RCE) for Automotive Applications

1 Features

- Ultra-low latency 100M Ethernet remote control edge (RCE) ASIC
- High speed output streaming interfaces for uLED projections
  - HS-UART, QSPI
- Remote controlled serial interfaces
  - UART, SPI, I2C
- Transport protocol format: IEEE 1722-2025, aligned with OA TC18 RCP draft v0.5
- TSN Ready: Integrated gPTP and 802.1AS HW
- RCE configuration for fast startup
- Safe operation support
- TC10 Sleep/Wake support
- AEC-Q100 grade 1 qualified (-40ºC to 125ºC)

2 Applications

- High-definition Adaptive Driving Beam (ADB)
- Dynamic Ground Projection (DGP)
- Head lamp controls: low/high beam, DRL, turn, dimming
- Active suspension: low latency sensing/actuation
- Door, seat ECU, rear ECU for tail gate and rear lighting

3 Description

The DP83EC315-Q1 is a 100Mbps, ultra-low latency Remote Control Edge (RCE) device designed for automotive ECU applications, including lighting, door, seat and tailgate. The device supports the control of multiple analog drivers using SPI, I2C, QSPI and UART interfaces. These interfaces feature programmable baud rates and configurable timing parameters to meet diverse analog driver requirements. To enhance functional safety, a hardware-based state machine is integrated to mitigate risks associated with firmware/flash tampering and the safety qualification of operating systems or firmware.

DP83EC315-Q1 Transport protocol is based on IEEE1722-2025 ABB/GBB protocol and aligned with OA TC18 RCP draft v0.5 specifications. DP83EC315-Q1 supports Layer 2 frame header decode and offers ingress filters for DMAC, VLAN and stream-id.

DP83EC315-Q1 can interface with micro LED (uLED) controllers and TI's DLP® controllers at frame rates as high as 120fps along with controlling complete HD Headlamp functions (low beam, high beam, DRL, Tail Indicator, leveling). The RCE supports streaming serial peripherals including High Speed UART (HS-UART) and QSPI to suit different pixel uLEDs from 4K up to 100K pixels.

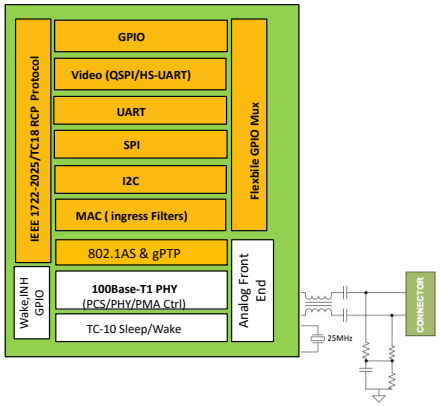
The DP83EC315-Q1 has inbuilt safe state manager to monitor communication health and perform preconfigured safe state operation in event of communication failure. DP83ED315-Q1 also can download initialization configuration for fast start-up time.

The DP83EC315 has integrated 100Base-T1 PHY and fully interoperable with PHYs and Switches compliant to 100Base-T1 standards. DP83EC315 is also compliant to Open Alliance EMC specification of the 100Base-T1 PHY.

Package Information

PART NUMBER	PACKAGE(1)	PACKAGE SIZE(2)
DP83EC315-Q1	VQFN (40)	6.00mm × 6.00mm

(1) For all available packages, see Section 6.
(2) The package size (length × width) is a nominal value and includes pins, where applicable.



DP83EC315-Q1 Simple Application Diagram

ADVANCE INFORMATION

An IMPORTANT NOTICE at the end of this data sheet addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers. ADVANCE INFORMATION for preproduction products; subject to change without notice.

ADVANCE INFORMATION

4 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

4.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

4.2 Support Resources

TI E2E™ support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's Terms of Use.

4.3 Trademarks

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4.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.5 Glossary

TI Glossary	This glossary lists and explains terms, acronyms, and definitions.

5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
November 2026	*	Initial Release

6 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

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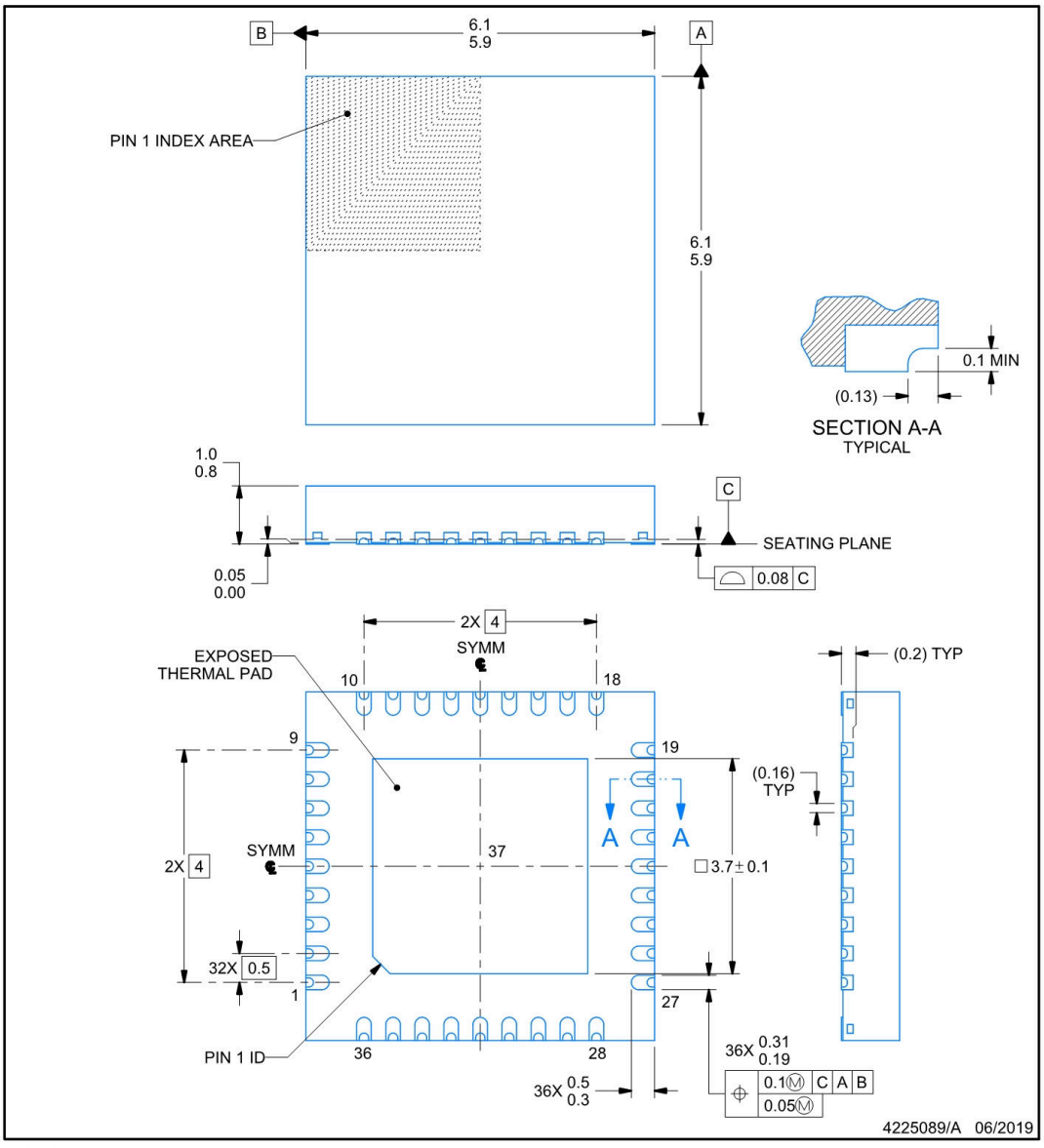
6.1 Package Drawings

RHA0036A

PACKAGE OUTLINE

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

ADVANCE INFORMATION

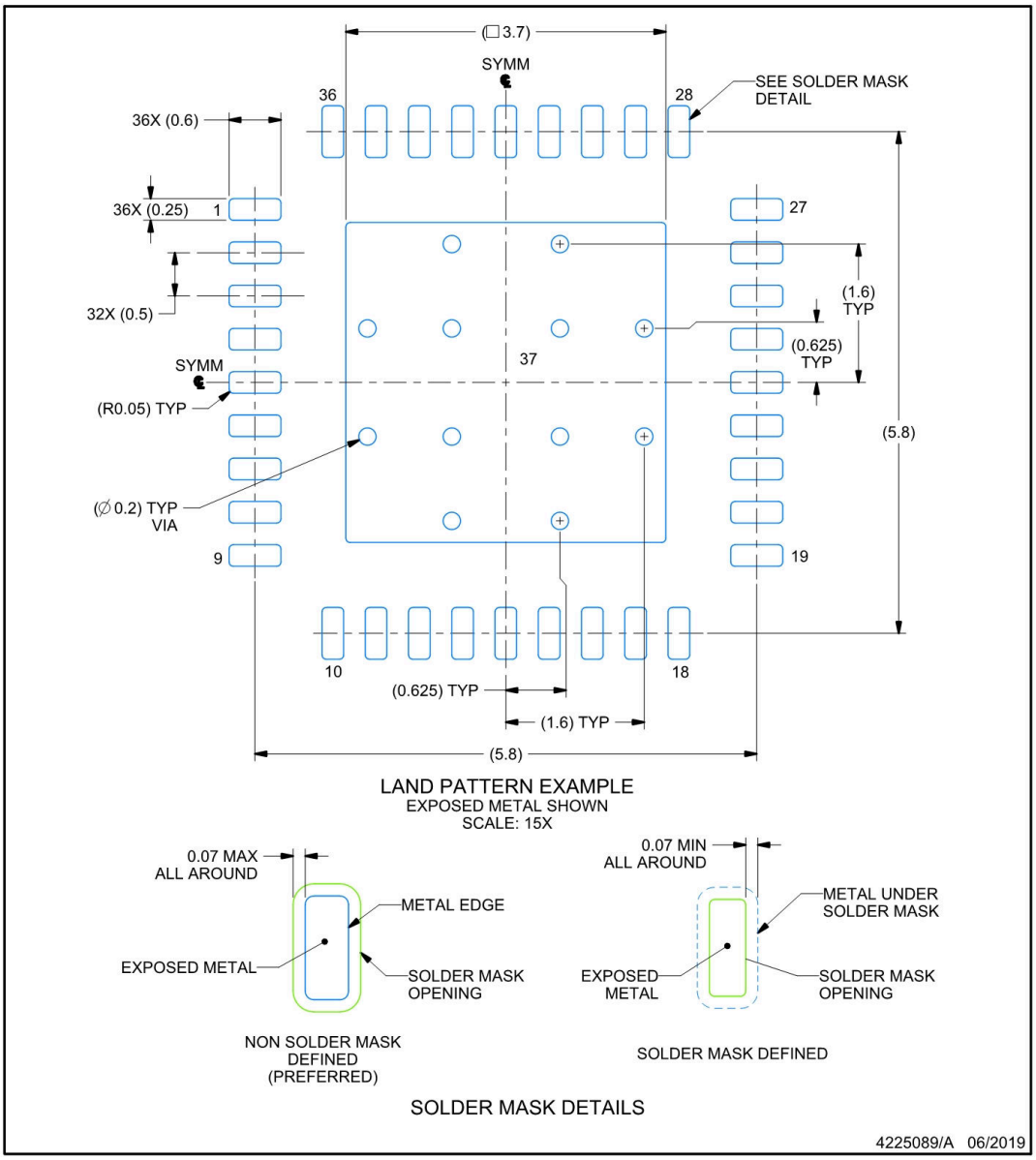
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ADVANCE INFORMATION

EXAMPLE BOARD LAYOUT

RHA0036A — **VQFN - 1 mm max height**

PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

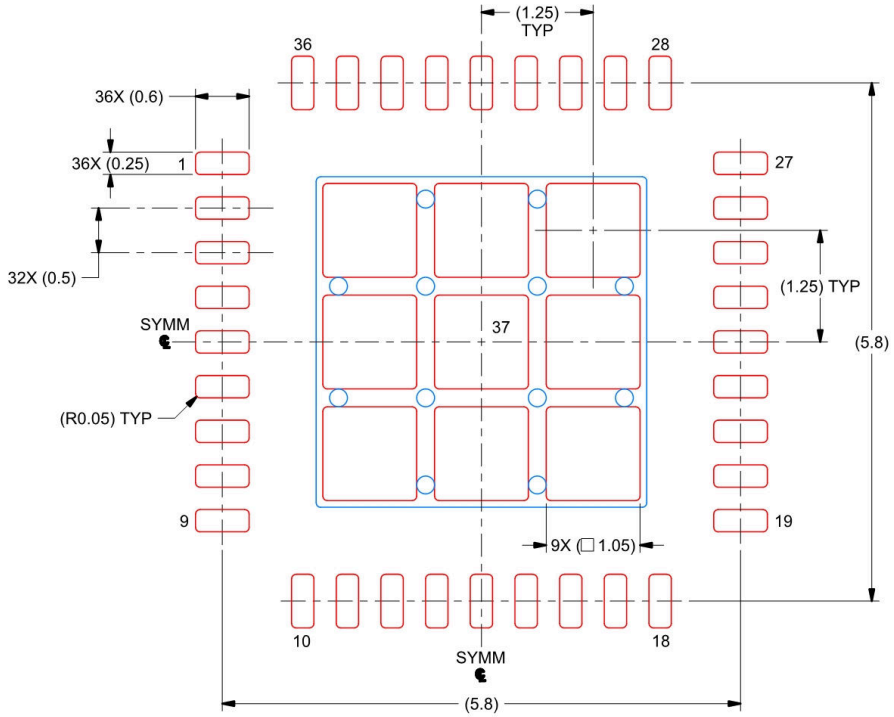
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.

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EXAMPLE STENCIL DESIGN

RHA0036A — **VQFN - 1 mm max height**

PLASTIC QUAD FLATPACK - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.125 MM THICK STENCIL
SCALE: 15X

EXPOSED PAD 37
72% PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE

4225089/A 06/2019

NOTES: (continued)

6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

ADVANCE INFORMATION

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PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
PDP83EC315RHARQ1	Active	Preproduction	VQFN (RHA) | 40	2500 | LARGE T&R	-	Call TI	Call TI	-	

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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