

User Manual

DA7280 Daughterboard 359-06-X

UM-HA-003

Abstract

This document describes the functionality of DA7280 haptic driver daughterboard. This board can be used standalone or attached to a DA728X motherboard for evaluation.

DA7280 Daughterboard 359-06-X

Contents

Abstract	1
Contents	2
Figures.....	2
Tables	2
1 Terms and Definitions.....	3
2 References	3
3 Introduction.....	4
4 359-06-X PCB Layout and Connections.....	4
5 Board Setup for VDD Supply to Device	6
5.1 Standalone Operation	6
5.2 Motherboard Setup	7
6 Board Setup for BOOST Supply to Device	8
6.1 Standalone Operation	8
6.2 Motherboard Setup	9
7 359-06-X Schematic.....	10
8 359-06-X Layout.....	11
Revision History	18

Figures

Figure 1: 359-06-X PCB	4
Figure 2: Standalone Operation from VDD Supply	6
Figure 3: Motherboard Operation with VDD Supply	7
Figure 4: Standalone Operation from BOOST Supply	8
Figure 5: Motherboard Operation from BOOST Supply	9
Figure 6: 359-06-X Schematic.....	10
Figure 7: 359-06-X Composite View	11
Figure 8: 359-06-X Top Layer Silkscreen.....	12
Figure 9: 359-06-X Top Layer Routing	13
Figure 10: 359-06-X Inner Layer 2	14
Figure 11: 359-06-X Inner Layer 3	15
Figure 12: 359-06-X Bottom Layer Routing.....	16
Figure 13: 359-06-X Bottom Layer Silkscreen	17

Tables

Table 1: Jumper Connections and Descriptions	5
--	---

DA7280 Daughterboard 359-06-X

1 Terms and Definitions

NOTE: "X" can denote different version of boards such as A and B variants

359-05-x	DA728x Motherboard, containing LRA as well as the digital and analogue accelerometer circuitry
359-06-x	DA7280 Daughterboard
359-07-x	DA7281 Daughterboard
359-08-x	DA7282 Daughterboard
359-09-x	DA7283 Daughterboard
DA7280	Dialog Semiconductor's haptic driver integrated circuit
DA7281	DA7280 variant with I2C address select
DA7282	DA7280 variant with ultra-low power shutdown
DA7283	DA7280 variant without I2C control and with ultra-low power shutdown
DUT	Device under test
ERM	Eccentric Rotating Mass
GUI	Graphical User Interface
I ² C	Inter-Integrated Circuit Communication Standard
LRA	Linear Resonant Actuator
PCB	Printed Circuit Board
PWM	Pulse Width Modulation
BEMF	Back Electro-Motive Force
GPI	General purpose input
PCB	Printed circuit board
DCDC	Direct current to direct current convertor
IRQ	Interrupt request

2 References

- [1] DA7280, Datasheet, Dialog Semiconductor.
- [2] DA7281, Datasheet, Dialog Semiconductor.
- [3] DA7282, Datasheet, Dialog Semiconductor.
- [4] DA7283, Datasheet, Dialog Semiconductor.
- [5] UM-HA-003, DA7280 Daughterboard User Manual, User Manual, Dialog Semiconductor.
- [6] UM-HA-004, DA7281 Daughterboard User Manual, User Manual, Dialog Semiconductor.
- [7] UM-HA-005, DA7282 Daughterboard User Manual, User Manual, Dialog Semiconductor.
- [8] UM-HA-006, DA7283 Daughterboard User Manual, User Manual, Dialog Semiconductor.
- [9] DA728x GUI software
- [10] UM-HA-001, DA728x Motherboard 359-05-A User Manual, User Manual, Dialog Semiconductor.
- [11] UM-HA-002, DA728x Generating LRA configuration script

3 Introduction

4 359-06-X PCB Layout and Connections

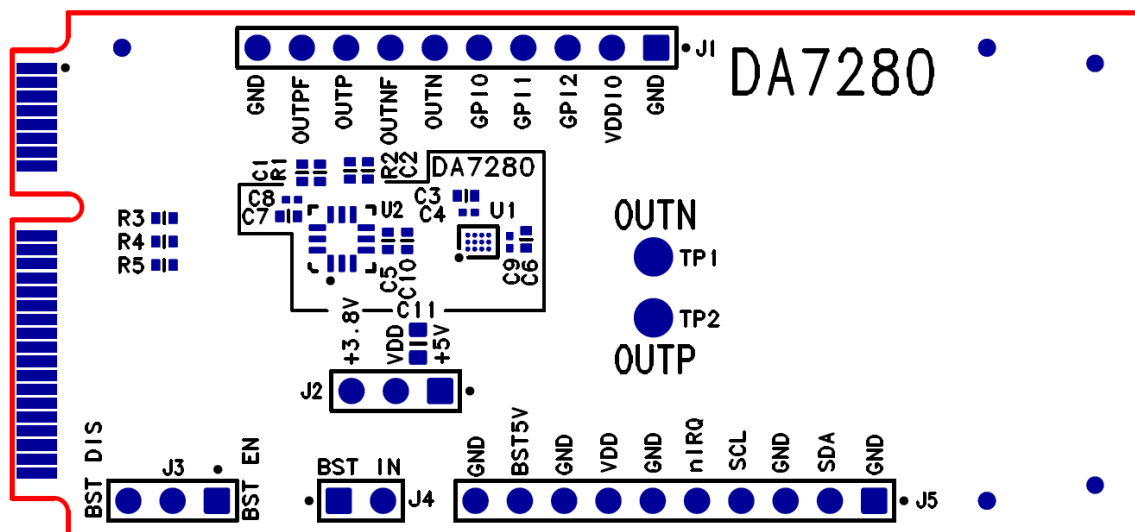


Figure 1: 359-06-X PCB

DA7280 Daughterboard 359-06-X

Table 1: Jumper Connections and Descriptions

Jumper/ Test Point	Pin/Connection	Description
J1	GND	Ground connection
	VDDIO	VDDIO supply for digital logic Supply range = 1.35 V to 5.5 V, 1.8 V typical
	GPI2	General purpose input pin 2
	GPI1	General purpose input pin 1
	GPI0	General purpose input pin 0
	OUTN	Negative output for LRA connection - TP1 can also be used
	OUTNF	Filtered version of negative output Bandwidth limited to 3.38 kHz for output waveform analysis via an oscilloscope
	OUTP	Positive output for LRA connection - TP2 can also be used
	OUTPF	Filtered version of positive output Bandwidth limited to 3.38 kHz for output waveform analysis via an oscilloscope
	GND	Ground connection
J2	SHORT 1 to 2 (default)	Selects VDD supply to device to be from the boost output at 5 V
	SHORT 2 to 3	Selects VDD supply to device to be from J5-VDD or J4-pin 2
J3	SHORT 1 to 2 (default)	Selects on board boost DCDC to be enabled
	SHORT 2 to 3	Selects on board boost DCDC to be disabled
J4	SHORT (default)	Selects on board boost DCDC input supply to be driven from main motherboard (3V8) when the daughter board is inserted
	OPEN	Removes power to the on-board DCDC from motherboard Pin 1 can be used for direct supply of the DCDC if standalone operation is required
J5	GND	Ground connection
	SDA	I2C Data line, pullup (R3) fitted with a 2K2 resistor as default
	GND	Ground connection
	SCL	I2C Clock line, pullup (R4) fitted with a 2K2 resistor as default
	nIRQ	Interrupt request output, 5K6 (R5) pullup fitted, driven low when IRQ triggered
	GND	Ground connection
	VDD	VDD supply line to device Supply range = 2.8 V to 5.5 V input
	GND	Ground connection
	BST5V	On board DCDC output voltage for monitoring, set to 5V as default
	GND	Ground connection

DA7280 Daughterboard 359-06-X

Jumper/ Test Point	Pin/Connection	Description
TP1	TP1	Test point for OUTN
TP2	TP2	Test point for OUTP

5 Board Setup for VDD Supply to Device

5.1 Standalone Operation

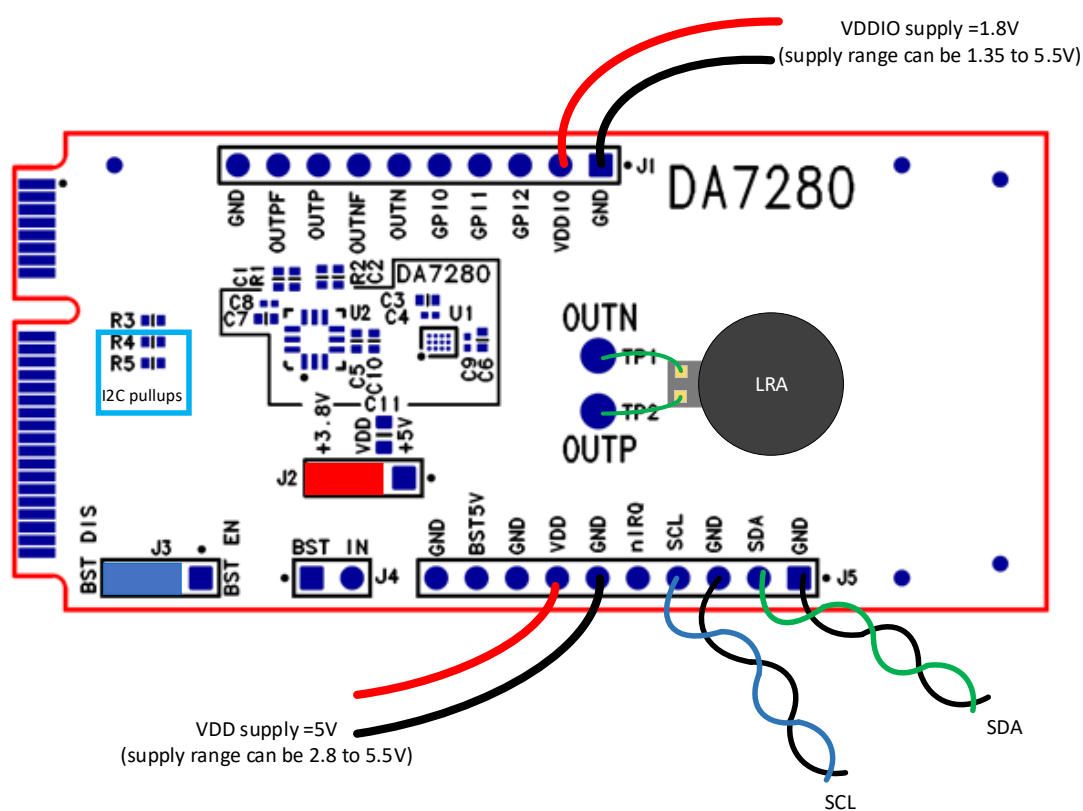


Figure 2: Standalone Operation from VDD Supply

DA7280 Daughterboard 359-06-X

5.2 Motherboard Setup

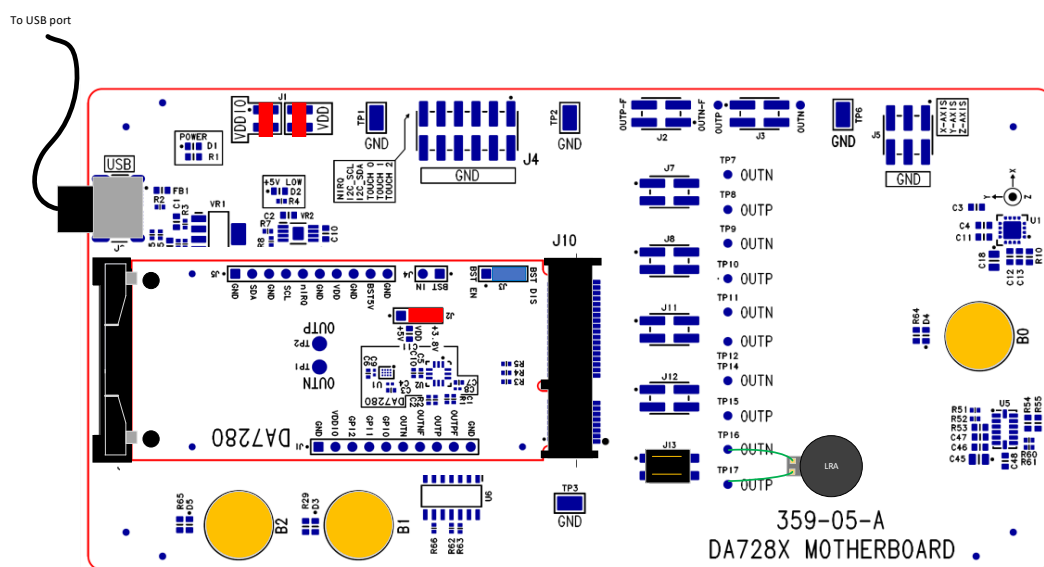


Figure 3: Motherboard Operation with VDD Supply

DA7280 Daughterboard 359-06-X

6 Board Setup for BOOST Supply to Device

6.1 Standalone Operation

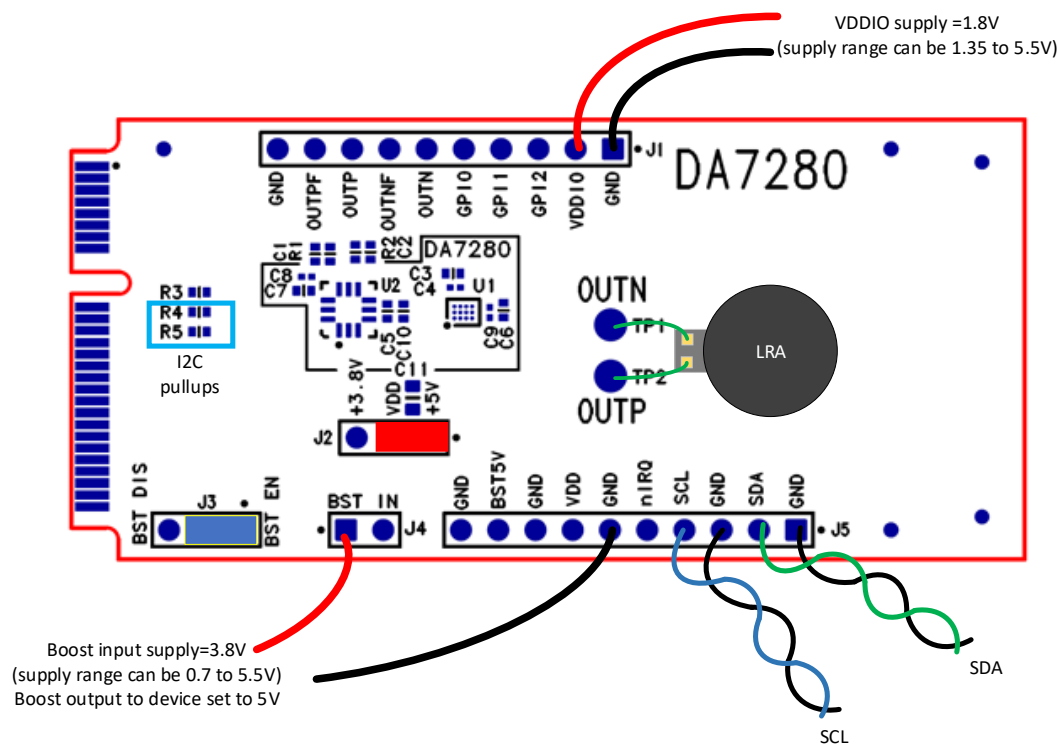


Figure 4: Standalone Operation from BOOST Supply

6.2 Motherboard Setup



DA7280 Daughterboard 359-06-X

7 359-06-X Schematic

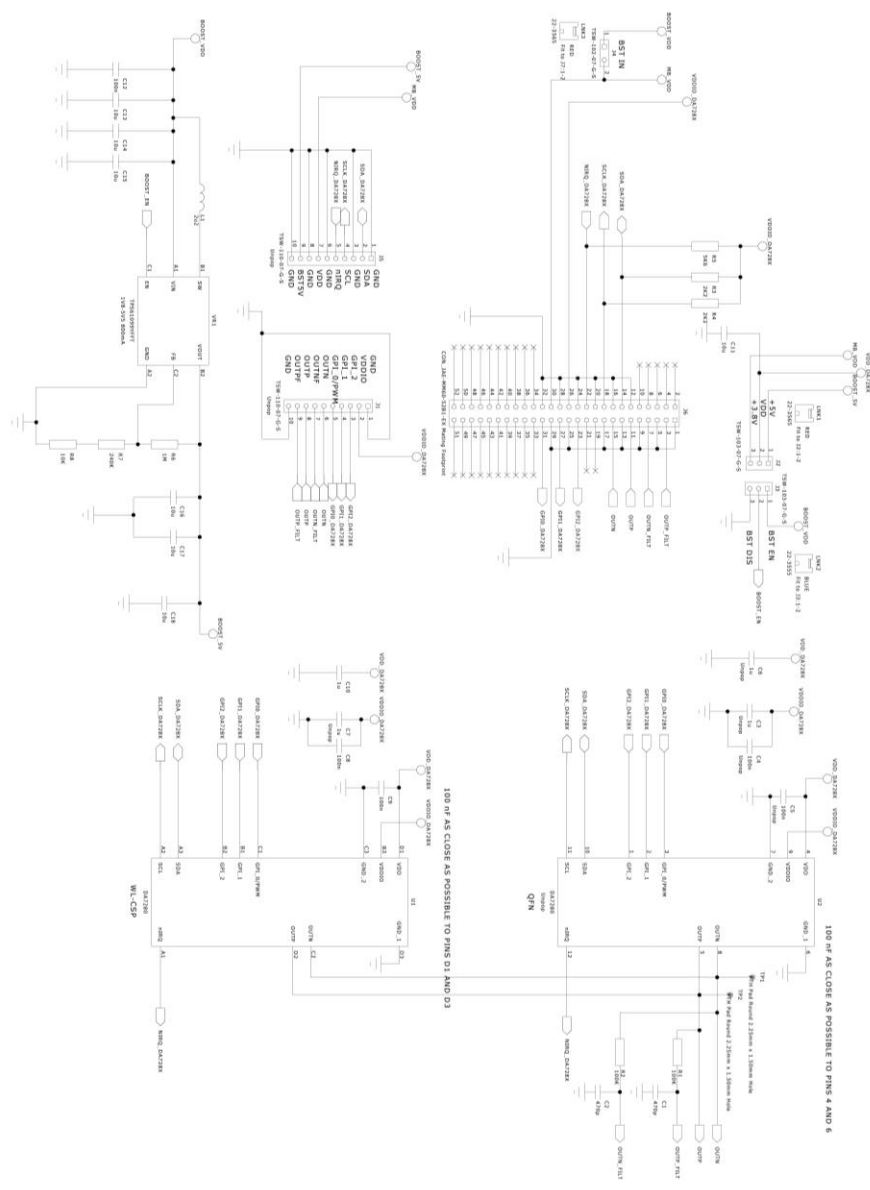


Figure 6: 359-06-X Schematic

8 359-06-X Layout

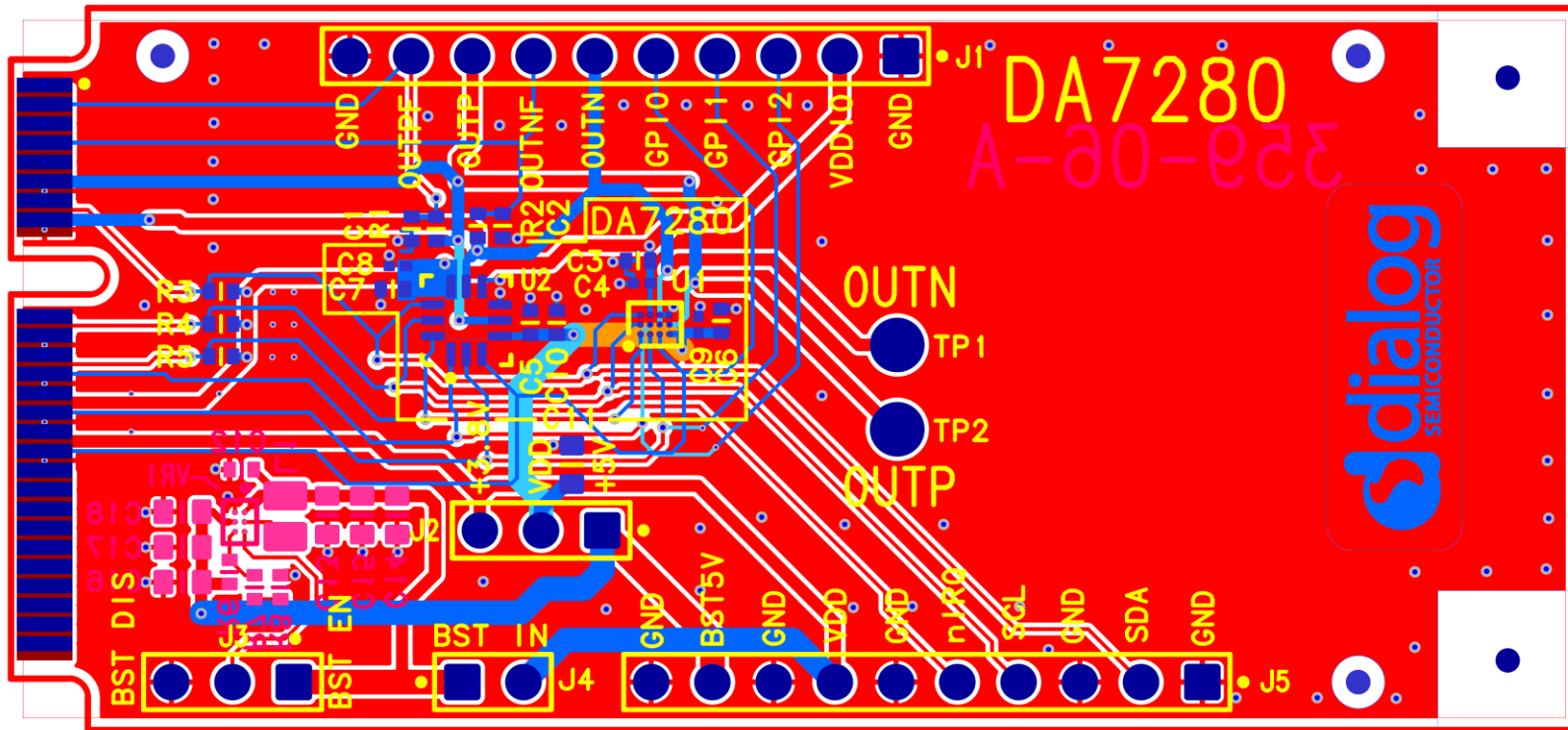


Figure 7: 359-06-X Composite View

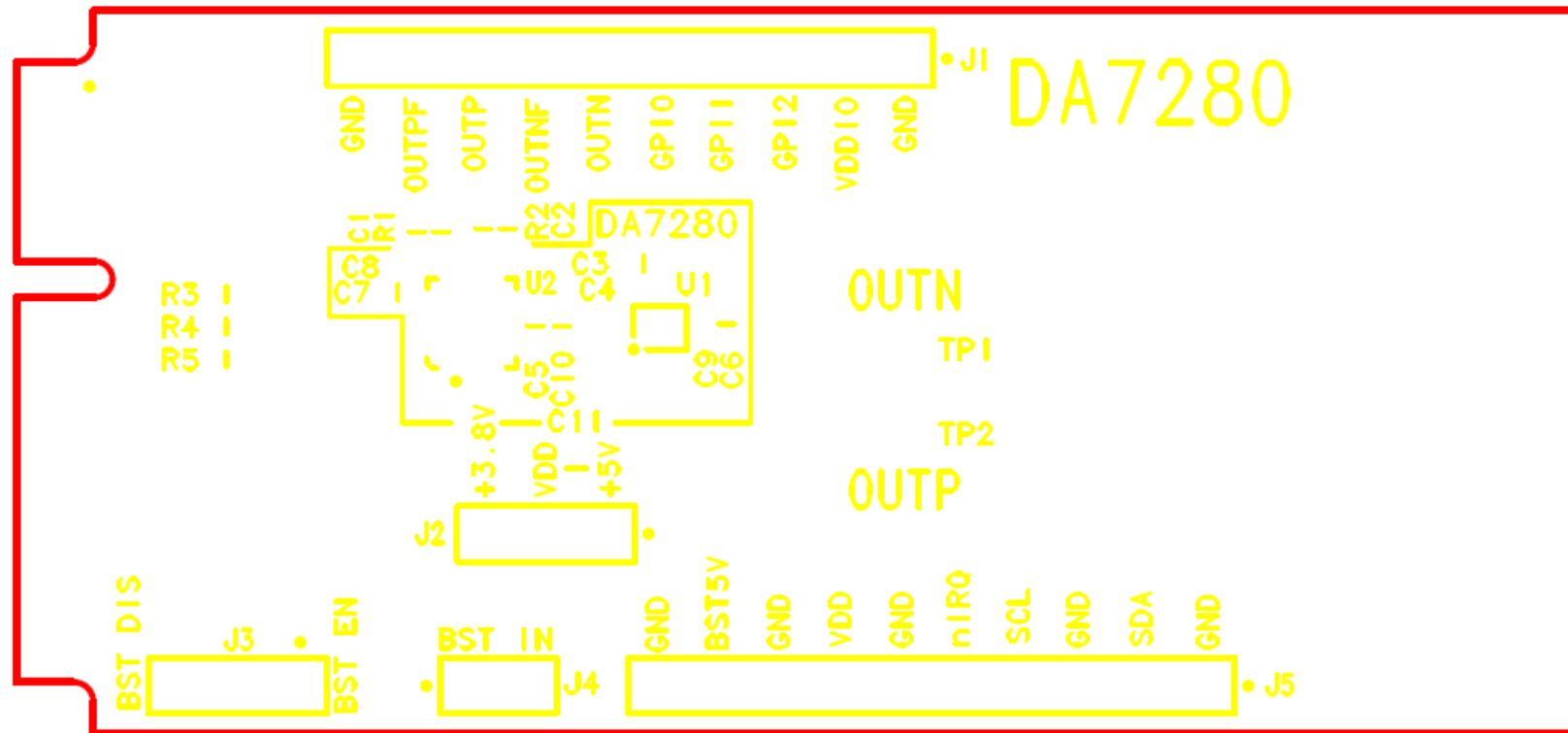


Figure 8: 359-06-X Top Layer Silkscreen

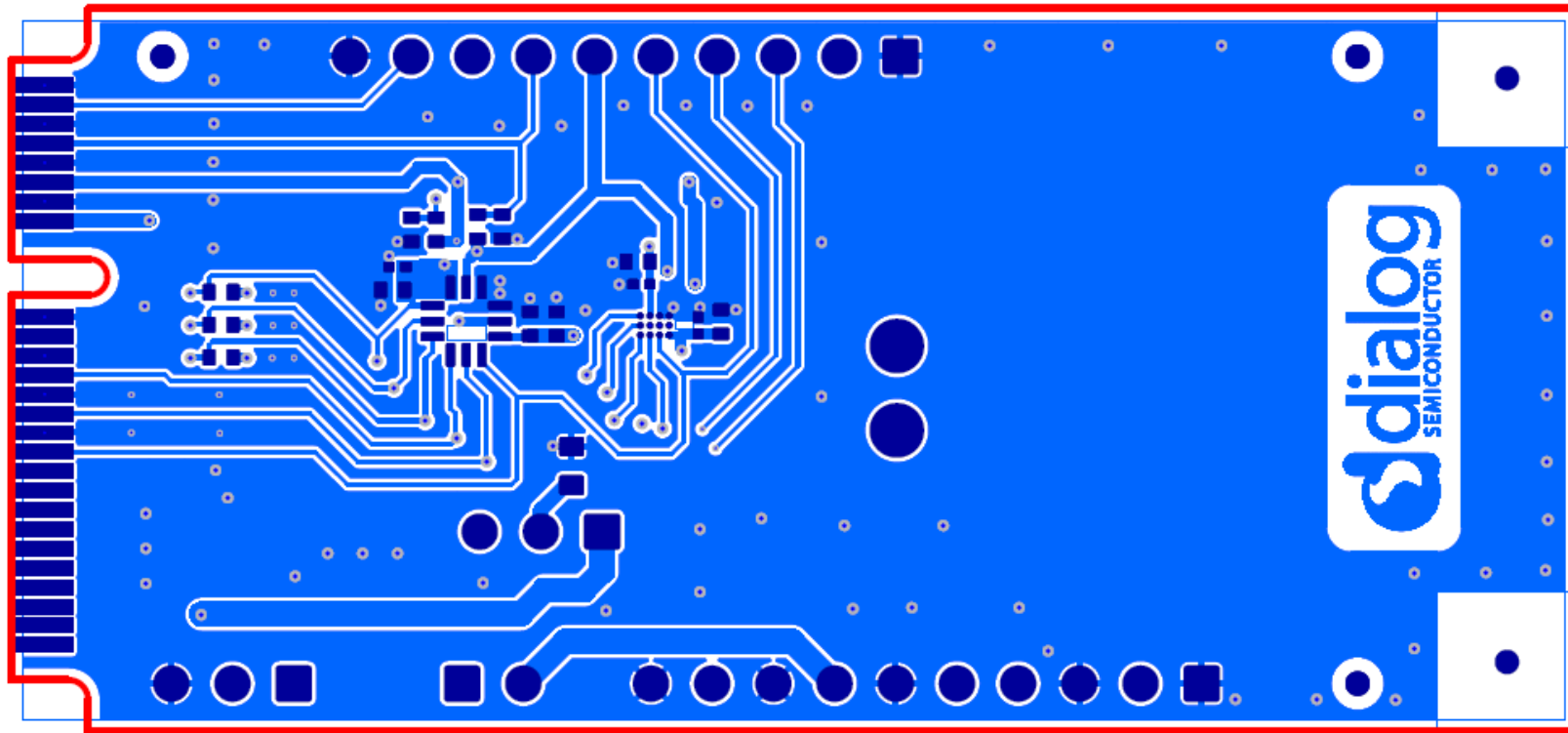


Figure 9: 359-06-X Top Layer Routing

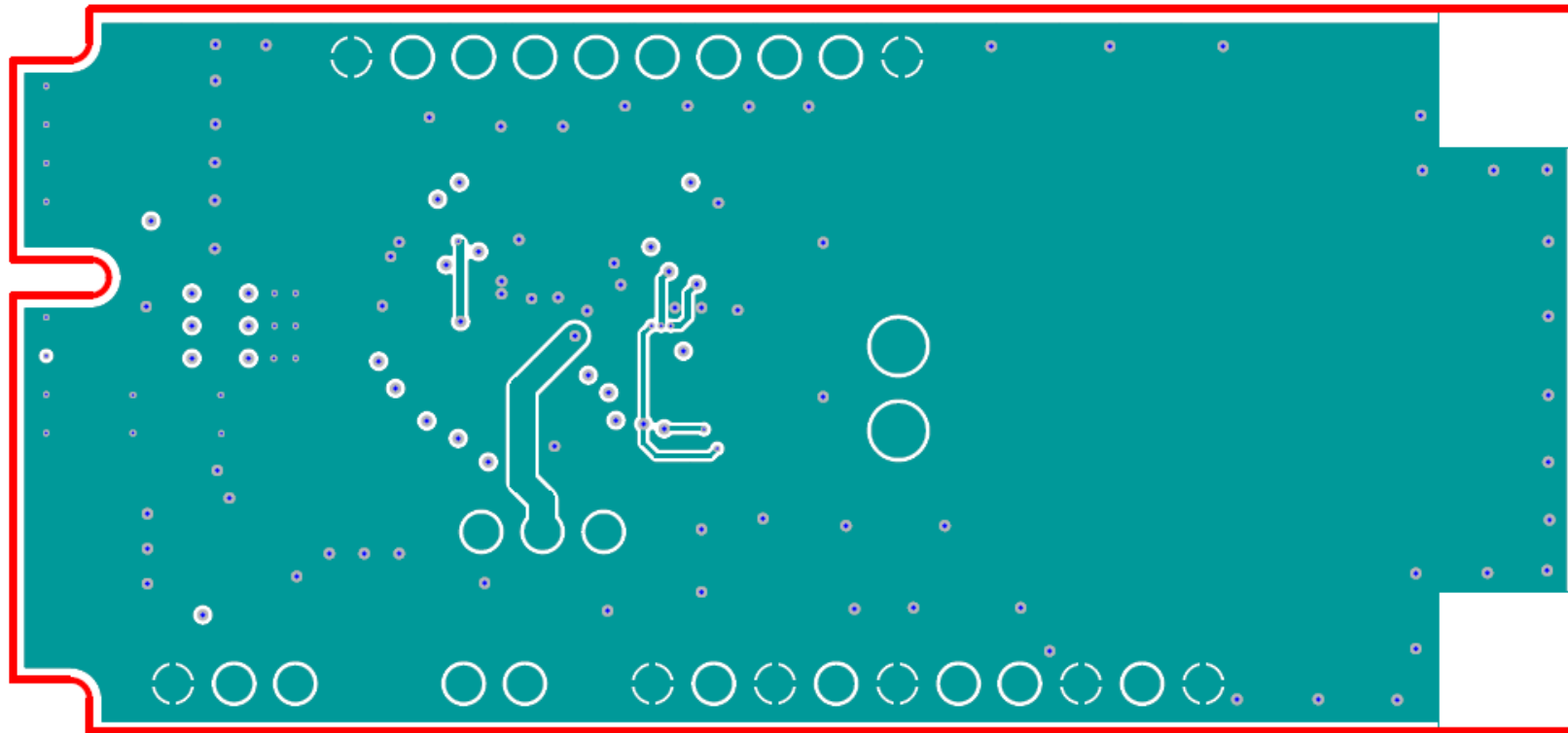


Figure 10: 359-06-X Inner Layer 2

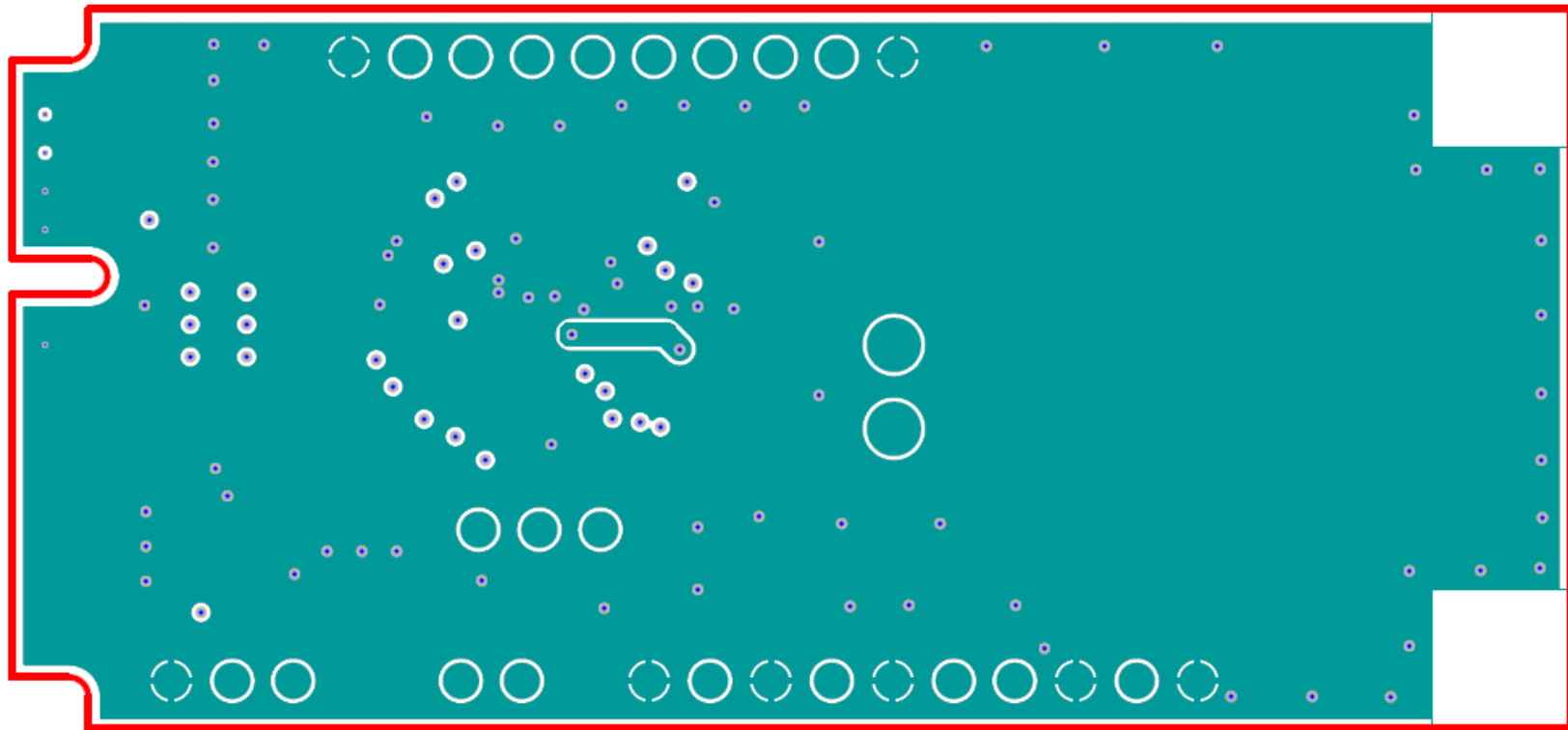


Figure 11: 359-06-X Inner Layer 3

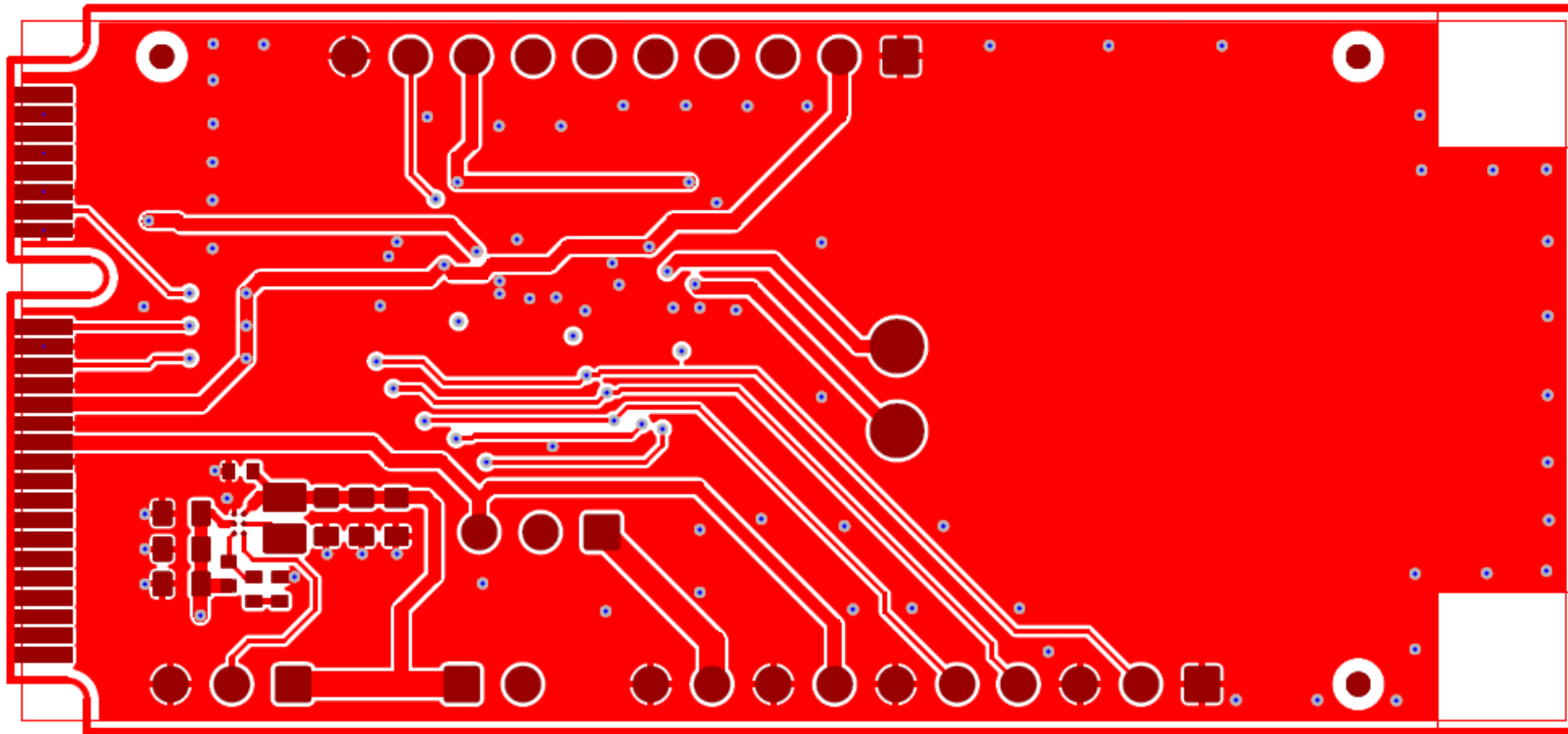


Figure 12: 359-06-X Bottom Layer Routing

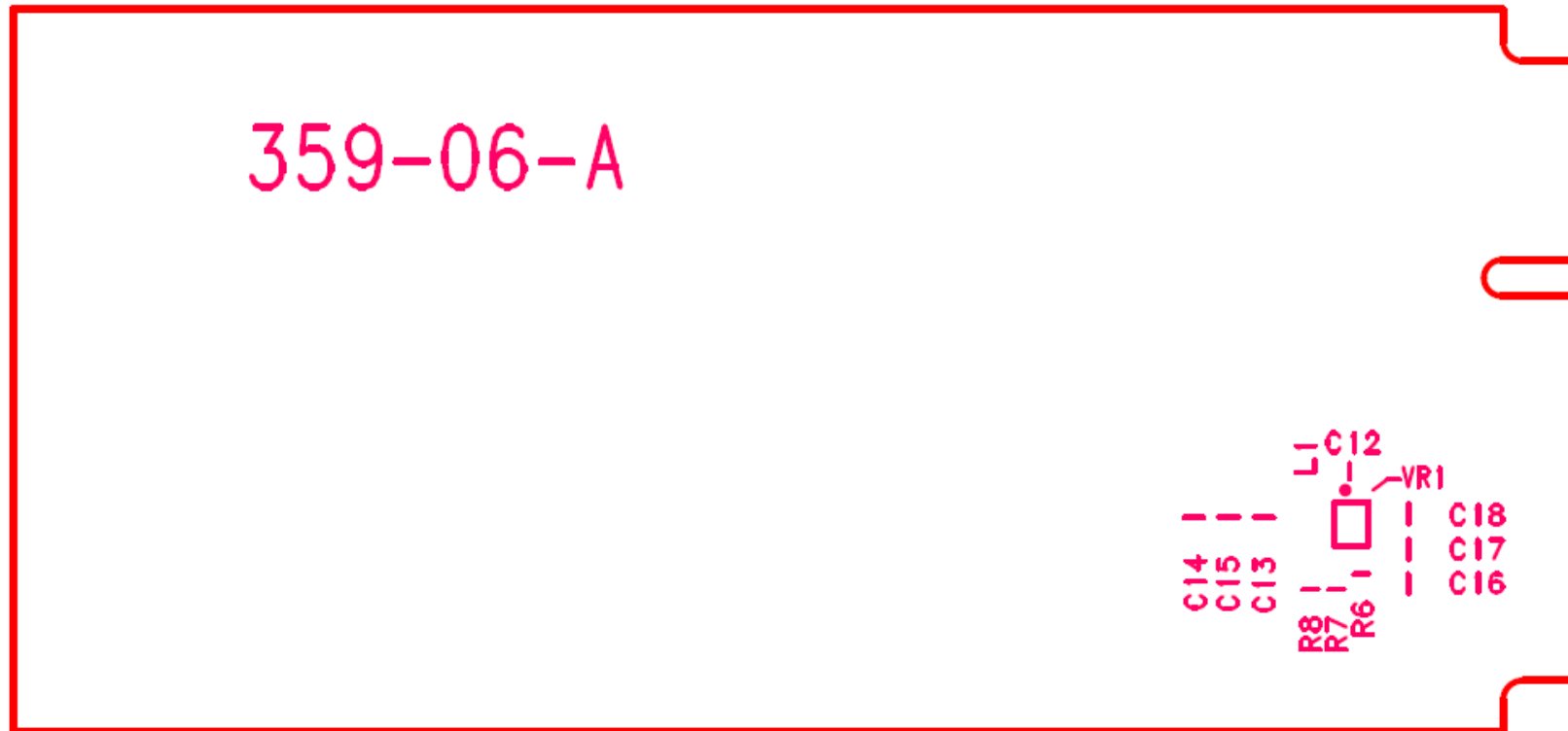


Figure 13: 359-06-X Bottom Layer Silkscreen

Revision History

Revision	Date	Description
1.1	08-Jun-2022	Rebranded to Renesas.
1.0	15-Apr-2020	Initial version.

DA7280 Daughterboard 359-06-X

Status Definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.

DA7280 Daughterboard 359-06-X

Important Notice and Disclaimer

RENESAS ELECTRONICS CORPORATION AND ITS SUBSIDIARIES ("RENESAS") PROVIDES TECHNICAL SPECIFICATIONS AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for developers skilled in the art designing with Renesas products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. Renesas grants you permission to use these resources only for development of an application that uses Renesas products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Renesas intellectual property or to any third party intellectual property. Renesas disclaims responsibility for, and you will fully indemnify Renesas and its representatives against, any claims, damages, costs, losses, or liabilities arising out of your use of these resources. Renesas' products are provided only subject to Renesas' Terms and Conditions of Sale or other applicable terms agreed to in writing. No use of any Renesas resources expands or otherwise alters any applicable warranties or warranty disclaimers for these products.

© 2022 Renesas Electronics Corporation. All rights reserved.

(Rev. 1.0 Mar 2020)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu

Koto-ku, Tokyo 135-0061, Japan

www.renesas.com

Contact Information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:

<https://www.renesas.com/contact/>

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.