

Product Change Notice (PCN)

Subject: Cu wire for RL78/F13, F14 series Y-grade(150degC) products

Publication Date: 12/15/2023

Effective Date: 6/28/2024

Revision Description:

Initial release

Description of Change:

The following changes will be applied to RL78/F13, F14 series Y-grade(150degC) products.

[Details of change]

	Item	New	Current
1	Changing the bonding wire material	Cu, ϕ 23um	Au, ϕ 20um
2	Changing the lead frame Tab shape	Cross Tab	Square Tab
3	Changing the mold resin material	Resin for Cu wire	Resin for Au wire
4	Changing the die attach material	Renesas Standard material	Existing material

Affected Product List:

Applicable products to be changed is shown in the Table 1

Please refer to pages 3 onwards for the list of applicable products.

Table 1: Applicable products for this PCN

RL78/	48pinLQFP (7x7/0.5)	64pinLQFP (10x10/0.5)	80pinLQFP (12x12/0.5)	100pinLQFP (14x14/0.5)
F13(LIN)	○	○	○	—
F13(CAN/LIN)	○	○	○	—
F14	○	○	○	○

Reason for Change:

To maintain a stable supply and raise productivity.

Impact on Fit, Form, Function, Quality & Reliability:

Fit, Form, Function, Quality, Reliability: None

Product Identification:

The products to be changed can be identify by part number, product marking and packing label.

Qualification Status: Please refer to the attached reliability data.

Sample Availability Date: 4/1/2024

Device Material Declaration: Please contact your Renesas sales representative.

Note:

1. Acknowledgement must be received by Renesas within 30 days or Renesas will consider the change as approved.
2. If timely acknowledgement is provided by Customer, then Customer shall have 90 days from the date of receipt of this PCN to make any objections to this PCN. If Customer fails to make objections to this PCN within 90 days of the receipt of the PCN then Renesas will consider the PCN changes as approved.
3. If customer cannot accept the PCN then customer must provide Renesas with a last time buy demand and purchase order.

For additional information regarding this notice, please contact your Renesas sales representative.

Appendix

■Part number specification

-The code “C” representing Cu wire is inserted in part number of Cu wire products for distinguishing from Au wire products.

-Cu wire products and Au wire products have different suffix.

	Before Au-wire	After Cu-wire
Tray (Full Carton)	#H5, #H5Q	#15, #15Q
Tray	#V5, V5Q	#35, #35Q
Tape&Reel	#X5, X5Q	#55, #55Q

Ex)

Au wire: R5F10BMGYFB#X5

Cu wire: R5F10BMGCYFB#55

Applicable product list

Before Au-wire	After Cu-wire	Nickname	Memory size	PKG outline	Packing
R5F10AGAYFB#H5	R5F10AGACYFB#15	F13(LIN)	16kB	LQFP 48pin-0.5p	Full Carton
R5F10AGAYFB#H5Q	R5F10AGACYFB#15Q	F13(LIN)	16kB	LQFP 48pin-0.5p	Full Carton
R5F10AGAYFB#V5	R5F10AGACYFB#35	F13(LIN)	16kB	LQFP 48pin-0.5p	Tray
R5F10AGAYFB#V5Q	R5F10AGACYFB#35Q	F13(LIN)	16kB	LQFP 48pin-0.5p	Tray
R5F10AGAYFB#X5	R5F10AGACYFB#55	F13(LIN)	16kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGAYFB#X5Q	R5F10AGACYFB#55Q	F13(LIN)	16kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGCYFB#H5	R5F10AGCCYFB#15	F13(LIN)	32kB	LQFP 48pin-0.5p	Full Carton
R5F10AGCYFB#H5Q	R5F10AGCCYFB#15Q	F13(LIN)	32kB	LQFP 48pin-0.5p	Full Carton
R5F10AGCYFB#V5	R5F10AGCCYFB#35	F13(LIN)	32kB	LQFP 48pin-0.5p	Tray
R5F10AGCYFB#V5Q	R5F10AGCCYFB#35Q	F13(LIN)	32kB	LQFP 48pin-0.5p	Tray
R5F10AGCYFB#X5	R5F10AGCCYFB#55	F13(LIN)	32kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGCYFB#X5Q	R5F10AGCCYFB#55Q	F13(LIN)	32kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGDYFB#H5	R5F10AGDCYFB#15	F13(LIN)	48kB	LQFP 48pin-0.5p	Full Carton
R5F10AGDYFB#H5Q	R5F10AGDCYFB#15Q	F13(LIN)	48kB	LQFP 48pin-0.5p	Full Carton
R5F10AGDYFB#V5	R5F10AGDCYFB#35	F13(LIN)	48kB	LQFP 48pin-0.5p	Tray
R5F10AGDYFB#V5Q	R5F10AGDCYFB#35Q	F13(LIN)	48kB	LQFP 48pin-0.5p	Tray
R5F10AGDYFB#X5	R5F10AGDCYFB#55	F13(LIN)	48kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGDYFB#X5Q	R5F10AGDCYFB#55Q	F13(LIN)	48kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGEYFB#H5	R5F10AGECYFB#15	F13(LIN)	64kB	LQFP 48pin-0.5p	Full Carton
R5F10AGEYFB#H5Q	R5F10AGECYFB#15Q	F13(LIN)	64kB	LQFP 48pin-0.5p	Full Carton
R5F10AGEYFB#V5	R5F10AGECYFB#35	F13(LIN)	64kB	LQFP 48pin-0.5p	Tray
R5F10AGEYFB#V5Q	R5F10AGECYFB#35Q	F13(LIN)	64kB	LQFP 48pin-0.5p	Tray
R5F10AGEYFB#X5	R5F10AGECYFB#55	F13(LIN)	64kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGEYFB#X5Q	R5F10AGECYFB#55Q	F13(LIN)	64kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGFYFB#H5	R5F10AGFCYFB#15	F13(LIN)	96kB	LQFP 48pin-0.5p	Full Carton
R5F10AGFYFB#H5Q	R5F10AGFCYFB#15Q	F13(LIN)	96kB	LQFP 48pin-0.5p	Full Carton
R5F10AGFYFB#V5	R5F10AGFCYFB#35	F13(LIN)	96kB	LQFP 48pin-0.5p	Tray
R5F10AGFYFB#V5Q	R5F10AGFCYFB#35Q	F13(LIN)	96kB	LQFP 48pin-0.5p	Tray
R5F10AGFYFB#X5	R5F10AGFCYFB#55	F13(LIN)	96kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGFYFB#X5Q	R5F10AGFCYFB#55Q	F13(LIN)	96kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGGYFB#H5	R5F10AGGCYFB#15	F13(LIN)	128kB	LQFP 48pin-0.5p	Full Carton
R5F10AGGYFB#H5Q	R5F10AGGCYFB#15Q	F13(LIN)	128kB	LQFP 48pin-0.5p	Full Carton
R5F10AGGYFB#V5	R5F10AGGCYFB#35	F13(LIN)	128kB	LQFP 48pin-0.5p	Tray
R5F10AGGYFB#V5Q	R5F10AGGCYFB#35Q	F13(LIN)	128kB	LQFP 48pin-0.5p	Tray
R5F10AGGYFB#X5	R5F10AGGCYFB#55	F13(LIN)	128kB	LQFP 48pin-0.5p	Tape&Reel
R5F10AGGYFB#X5Q	R5F10AGGCYFB#55Q	F13(LIN)	128kB	LQFP 48pin-0.5p	Tape&Reel

R5F10ALCYFB#H5	R5F10ALCCYFB#15	F13(LIN)	32kB	LQFP 64pin-0.5p	Full Carton
R5F10ALCYFB#H5Q	R5F10ALCCYFB#15Q	F13(LIN)	32kB	LQFP 64pin-0.5p	Full Carton
R5F10ALCYFB#V5	R5F10ALCCYFB#35	F13(LIN)	32kB	LQFP 64pin-0.5p	Tray
R5F10ALCYFB#V5Q	R5F10ALCCYFB#35Q	F13(LIN)	32kB	LQFP 64pin-0.5p	Tray
R5F10ALCYFB#X5	R5F10ALCCYFB#55	F13(LIN)	32kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALCYFB#X5Q	R5F10ALCCYFB#55Q	F13(LIN)	32kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALDYFB#H5	R5F10ALDCYFB#15	F13(LIN)	48kB	LQFP 64pin-0.5p	Full Carton
R5F10ALDYFB#H5Q	R5F10ALDCYFB#15Q	F13(LIN)	48kB	LQFP 64pin-0.5p	Full Carton
R5F10ALDYFB#V5	R5F10ALDCYFB#35	F13(LIN)	48kB	LQFP 64pin-0.5p	Tray
R5F10ALDYFB#V5Q	R5F10ALDCYFB#35Q	F13(LIN)	48kB	LQFP 64pin-0.5p	Tray
R5F10ALDYFB#X5	R5F10ALDCYFB#55	F13(LIN)	48kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALDYFB#X5Q	R5F10ALDCYFB#55Q	F13(LIN)	48kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALEYFB#H5	R5F10ALECYFB#15	F13(LIN)	64kB	LQFP 64pin-0.5p	Full Carton
R5F10ALEYFB#H5Q	R5F10ALECYFB#15Q	F13(LIN)	64kB	LQFP 64pin-0.5p	Full Carton
R5F10ALEYFB#V5	R5F10ALECYFB#35	F13(LIN)	64kB	LQFP 64pin-0.5p	Tray
R5F10ALEYFB#V5Q	R5F10ALECYFB#35Q	F13(LIN)	64kB	LQFP 64pin-0.5p	Tray
R5F10ALEYFB#X5	R5F10ALECYFB#55	F13(LIN)	64kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALEYFB#X5Q	R5F10ALECYFB#55Q	F13(LIN)	64kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALFYFB#H5	R5F10ALFCYFB#15	F13(LIN)	96kB	LQFP 64pin-0.5p	Full Carton
R5F10ALFYFB#H5Q	R5F10ALFCYFB#15Q	F13(LIN)	96kB	LQFP 64pin-0.5p	Full Carton
R5F10ALFYFB#V5	R5F10ALFCYFB#35	F13(LIN)	96kB	LQFP 64pin-0.5p	Tray
R5F10ALFYFB#V5Q	R5F10ALFCYFB#35Q	F13(LIN)	96kB	LQFP 64pin-0.5p	Tray
R5F10ALFYFB#X5	R5F10ALFCYFB#55	F13(LIN)	96kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALFYFB#X5Q	R5F10ALFCYFB#55Q	F13(LIN)	96kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALGYFB#H5	R5F10ALGCYFB#15	F13(LIN)	128kB	LQFP 64pin-0.5p	Full Carton
R5F10ALGYFB#H5Q	R5F10ALGCYFB#15Q	F13(LIN)	128kB	LQFP 64pin-0.5p	Full Carton
R5F10ALGYFB#V5	R5F10ALGCYFB#35	F13(LIN)	128kB	LQFP 64pin-0.5p	Tray
R5F10ALGYFB#V5Q	R5F10ALGCYFB#35Q	F13(LIN)	128kB	LQFP 64pin-0.5p	Tray
R5F10ALGYFB#X5	R5F10ALGCYFB#55	F13(LIN)	128kB	LQFP 64pin-0.5p	Tape&Reel
R5F10ALGYFB#X5Q	R5F10ALGCYFB#55Q	F13(LIN)	128kB	LQFP 64pin-0.5p	Tape&Reel
R5F10AMEYFB#H5	R5F10AMECYFB#15	F13(LIN)	64kB	LQFP 80pin-0.5p	Full Carton
R5F10AMEYFB#H5Q	R5F10AMECYFB#15Q	F13(LIN)	64kB	LQFP 80pin-0.5p	Full Carton
R5F10AMEYFB#V5	R5F10AMECYFB#35	F13(LIN)	64kB	LQFP 80pin-0.5p	Tray
R5F10AMEYFB#V5Q	R5F10AMECYFB#35Q	F13(LIN)	64kB	LQFP 80pin-0.5p	Tray
R5F10AMEYFB#X5	R5F10AMECYFB#55	F13(LIN)	64kB	LQFP 80pin-0.5p	Tape&Reel
R5F10AMEYFB#X5Q	R5F10AMECYFB#55Q	F13(LIN)	64kB	LQFP 80pin-0.5p	Tape&Reel
R5F10AMFYFB#H5	R5F10AMFCYFB#15	F13(LIN)	96kB	LQFP 80pin-0.5p	Full Carton
R5F10AMFYFB#H5Q	R5F10AMFCYFB#15Q	F13(LIN)	96kB	LQFP 80pin-0.5p	Full Carton
R5F10AMFYFB#V5	R5F10AMFCYFB#35	F13(LIN)	96kB	LQFP 80pin-0.5p	Tray

R5F10AMFYFB#V5Q	R5F10AMFCYFB#35Q	F13(LIN)	96kB	LQFP 80pin-0.5p	Tray
R5F10AMFYFB#X5	R5F10AMFCYFB#55	F13(LIN)	96kB	LQFP 80pin-0.5p	Tape&Reel
R5F10AMFYFB#X5Q	R5F10AMFCYFB#55Q	F13(LIN)	96kB	LQFP 80pin-0.5p	Tape&Reel
R5F10AMGYFB#H5	R5F10AMGCYFB#15	F13(LIN)	128kB	LQFP 80pin-0.5p	Full Carton
R5F10AMGYFB#H5Q	R5F10AMGCYFB#15Q	F13(LIN)	128kB	LQFP 80pin-0.5p	Full Carton
R5F10AMGYFB#V5	R5F10AMGCYFB#35	F13(LIN)	128kB	LQFP 80pin-0.5p	Tray
R5F10AMGYFB#V5Q	R5F10AMGCYFB#35Q	F13(LIN)	128kB	LQFP 80pin-0.5p	Tray
R5F10AMGYFB#X5	R5F10AMGCYFB#55	F13(LIN)	128kB	LQFP 80pin-0.5p	Tape&Reel
R5F10AMGYFB#X5Q	R5F10AMGCYFB#55Q	F13(LIN)	128kB	LQFP 80pin-0.5p	Tape&Reel
R5F10BG CYFB#H5	R5F10BGCCYFB#15	F13(CAN/LIN)	32kB	LQFP 48pin-0.5p	Full Carton
R5F10BG CYFB#H5Q	R5F10BGCCYFB#15Q	F13(CAN/LIN)	32kB	LQFP 48pin-0.5p	Full Carton
R5F10BG CYFB#V5	R5F10BGCCYFB#35	F13(CAN/LIN)	32kB	LQFP 48pin-0.5p	Tray
R5F10BG CYFB#V5Q	R5F10BGCCYFB#35Q	F13(CAN/LIN)	32kB	LQFP 48pin-0.5p	Tray
R5F10BG CYFB#X5	R5F10BGCCYFB#55	F13(CAN/LIN)	32kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG CYFB#X5Q	R5F10BGCCYFB#55Q	F13(CAN/LIN)	32kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG DYFB#H5	R5F10BGDCYFB#15	F13(CAN/LIN)	48kB	LQFP 48pin-0.5p	Full Carton
R5F10BG DYFB#H5Q	R5F10BGDCYFB#15Q	F13(CAN/LIN)	48kB	LQFP 48pin-0.5p	Full Carton
R5F10BG DYFB#V5	R5F10BGDCYFB#35	F13(CAN/LIN)	48kB	LQFP 48pin-0.5p	Tray
R5F10BG DYFB#V5Q	R5F10BGDCYFB#35Q	F13(CAN/LIN)	48kB	LQFP 48pin-0.5p	Tray
R5F10BG DYFB#X5	R5F10BGDCYFB#55	F13(CAN/LIN)	48kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG DYFB#X5Q	R5F10BGDCYFB#55Q	F13(CAN/LIN)	48kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG EYFB#H5	R5F10BGECYFB#15	F13(CAN/LIN)	64kB	LQFP 48pin-0.5p	Full Carton
R5F10BG EYFB#H5Q	R5F10BGECYFB#15Q	F13(CAN/LIN)	64kB	LQFP 48pin-0.5p	Full Carton
R5F10BG EYFB#V5	R5F10BGECYFB#35	F13(CAN/LIN)	64kB	LQFP 48pin-0.5p	Tray
R5F10BG EYFB#V5Q	R5F10BGECYFB#35Q	F13(CAN/LIN)	64kB	LQFP 48pin-0.5p	Tray
R5F10BG EYFB#X5	R5F10BGECYFB#55	F13(CAN/LIN)	64kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG EYFB#X5Q	R5F10BGECYFB#55Q	F13(CAN/LIN)	64kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG FYFB#H5	R5F10BGFCYFB#15	F13(CAN/LIN)	96kB	LQFP 48pin-0.5p	Full Carton
R5F10BG FYFB#H5Q	R5F10BGFCYFB#15Q	F13(CAN/LIN)	96kB	LQFP 48pin-0.5p	Full Carton
R5F10BG FYFB#V5	R5F10BGFCYFB#35	F13(CAN/LIN)	96kB	LQFP 48pin-0.5p	Tray
R5F10BG FYFB#V5Q	R5F10BGFCYFB#35Q	F13(CAN/LIN)	96kB	LQFP 48pin-0.5p	Tray
R5F10BG FYFB#X5	R5F10BGFCYFB#55	F13(CAN/LIN)	96kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG FYFB#X5Q	R5F10BGFCYFB#55Q	F13(CAN/LIN)	96kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG GYFB#H5	R5F10BGGCYFB#15	F13(CAN/LIN)	128kB	LQFP 48pin-0.5p	Full Carton
R5F10BG GYFB#H5Q	R5F10BGGCYFB#15Q	F13(CAN/LIN)	128kB	LQFP 48pin-0.5p	Full Carton
R5F10BG GYFB#V5	R5F10BGGCYFB#35	F13(CAN/LIN)	128kB	LQFP 48pin-0.5p	Tray
R5F10BG GYFB#V5Q	R5F10BGGCYFB#35Q	F13(CAN/LIN)	128kB	LQFP 48pin-0.5p	Tray
R5F10BG GYFB#X5	R5F10BGGCYFB#55	F13(CAN/LIN)	128kB	LQFP 48pin-0.5p	Tape&Reel
R5F10BG GYFB#X5Q	R5F10BGGCYFB#55Q	F13(CAN/LIN)	128kB	LQFP 48pin-0.5p	Tape&Reel

R5F10BLCYFB#H5	R5F10BLCCYFB#15	F13(CAN/LIN)	32kB	LQFP 64pin-0.5p	Full Carton
R5F10BLCYFB#H5Q	R5F10BLCCYFB#15Q	F13(CAN/LIN)	32kB	LQFP 64pin-0.5p	Full Carton
R5F10BLCYFB#V5	R5F10BLCCYFB#35	F13(CAN/LIN)	32kB	LQFP 64pin-0.5p	Tray
R5F10BLCYFB#V5Q	R5F10BLCCYFB#35Q	F13(CAN/LIN)	32kB	LQFP 64pin-0.5p	Tray
R5F10BLCYFB#X5	R5F10BLCCYFB#55	F13(CAN/LIN)	32kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLCYFB#X5Q	R5F10BLCCYFB#55Q	F13(CAN/LIN)	32kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLDYFB#H5	R5F10BLDCYFB#15	F13(CAN/LIN)	48kB	LQFP 64pin-0.5p	Full Carton
R5F10BLDYFB#H5Q	R5F10BLDCYFB#15Q	F13(CAN/LIN)	48kB	LQFP 64pin-0.5p	Full Carton
R5F10BLDYFB#V5	R5F10BLDCYFB#35	F13(CAN/LIN)	48kB	LQFP 64pin-0.5p	Tray
R5F10BLDYFB#V5Q	R5F10BLDCYFB#35Q	F13(CAN/LIN)	48kB	LQFP 64pin-0.5p	Tray
R5F10BLDYFB#X5	R5F10BLDCYFB#55	F13(CAN/LIN)	48kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLDYFB#X5Q	R5F10BLDCYFB#55Q	F13(CAN/LIN)	48kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLEYFB#H5	R5F10BLECYFB#15	F13(CAN/LIN)	64kB	LQFP 64pin-0.5p	Full Carton
R5F10BLEYFB#H5Q	R5F10BLECYFB#15Q	F13(CAN/LIN)	64kB	LQFP 64pin-0.5p	Full Carton
R5F10BLEYFB#V5	R5F10BLECYFB#35	F13(CAN/LIN)	64kB	LQFP 64pin-0.5p	Tray
R5F10BLEYFB#V5Q	R5F10BLECYFB#35Q	F13(CAN/LIN)	64kB	LQFP 64pin-0.5p	Tray
R5F10BLEYFB#X5	R5F10BLECYFB#55	F13(CAN/LIN)	64kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLEYFB#X5Q	R5F10BLECYFB#55Q	F13(CAN/LIN)	64kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLFYFB#H5	R5F10BLFCYFB#15	F13(CAN/LIN)	96kB	LQFP 64pin-0.5p	Full Carton
R5F10BLFYFB#H5Q	R5F10BLFCYFB#15Q	F13(CAN/LIN)	96kB	LQFP 64pin-0.5p	Full Carton
R5F10BLFYFB#V5	R5F10BLFCYFB#35	F13(CAN/LIN)	96kB	LQFP 64pin-0.5p	Tray
R5F10BLFYFB#V5Q	R5F10BLFCYFB#35Q	F13(CAN/LIN)	96kB	LQFP 64pin-0.5p	Tray
R5F10BLFYFB#X5	R5F10BLFCYFB#55	F13(CAN/LIN)	96kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLFYFB#X5Q	R5F10BLFCYFB#55Q	F13(CAN/LIN)	96kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLGYFB#H5	R5F10BLGCRYFB#15	F13(CAN/LIN)	128kB	LQFP 64pin-0.5p	Full Carton
R5F10BLGYFB#H5Q	R5F10BLGCRYFB#15Q	F13(CAN/LIN)	128kB	LQFP 64pin-0.5p	Full Carton
R5F10BLGYFB#V5	R5F10BLGCRYFB#35	F13(CAN/LIN)	128kB	LQFP 64pin-0.5p	Tray
R5F10BLGYFB#V5Q	R5F10BLGCRYFB#35Q	F13(CAN/LIN)	128kB	LQFP 64pin-0.5p	Tray
R5F10BLGYFB#X5	R5F10BLGCRYFB#55	F13(CAN/LIN)	128kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BLGYFB#X5Q	R5F10BLGCRYFB#55Q	F13(CAN/LIN)	128kB	LQFP 64pin-0.5p	Tape&Reel
R5F10BMEYFB#H5	R5F10BMECYFB#15	F13(CAN/LIN)	64kB	LQFP 80pin-0.5p	Full Carton
R5F10BMEYFB#H5Q	R5F10BMECYFB#15Q	F13(CAN/LIN)	64kB	LQFP 80pin-0.5p	Full Carton
R5F10BMEYFB#V5	R5F10BMECYFB#35	F13(CAN/LIN)	64kB	LQFP 80pin-0.5p	Tray
R5F10BMEYFB#V5Q	R5F10BMECYFB#35Q	F13(CAN/LIN)	64kB	LQFP 80pin-0.5p	Tray
R5F10BMEYFB#X5	R5F10BMECYFB#55	F13(CAN/LIN)	64kB	LQFP 80pin-0.5p	Tape&Reel
R5F10BMEYFB#X5Q	R5F10BMECYFB#55Q	F13(CAN/LIN)	64kB	LQFP 80pin-0.5p	Tape&Reel
R5F10BMFYFB#H5	R5F10BMFCYFB#15	F13(CAN/LIN)	96kB	LQFP 80pin-0.5p	Full Carton
R5F10BMFYFB#H5Q	R5F10BMFCYFB#15Q	F13(CAN/LIN)	96kB	LQFP 80pin-0.5p	Full Carton
R5F10BMFYFB#V5	R5F10BMFCYFB#35	F13(CAN/LIN)	96kB	LQFP 80pin-0.5p	Tray

R5F10BMFYFB#V5Q	R5F10BMFCYFB#35Q	F13(CAN/LIN)	96kB	LQFP 80pin-0.5p	Tray
R5F10BMFYFB#X5	R5F10BMFCYFB#55	F13(CAN/LIN)	96kB	LQFP 80pin-0.5p	Tape&Reel
R5F10BMFYFB#X5Q	R5F10BMFCYFB#55Q	F13(CAN/LIN)	96kB	LQFP 80pin-0.5p	Tape&Reel
R5F10BMGYFB#H5	R5F10BMGCYFB#15	F13(CAN/LIN)	128kB	LQFP 80pin-0.5p	Full Carton
R5F10BMGYFB#H5Q	R5F10BMGCYFB#15Q	F13(CAN/LIN)	128kB	LQFP 80pin-0.5p	Full Carton
R5F10BMGYFB#V5	R5F10BMGCYFB#35	F13(CAN/LIN)	128kB	LQFP 80pin-0.5p	Tray
R5F10BMGYFB#V5Q	R5F10BMGCYFB#35Q	F13(CAN/LIN)	128kB	LQFP 80pin-0.5p	Tray
R5F10BMGYFB#X5	R5F10BMGCYFB#55	F13(CAN/LIN)	128kB	LQFP 80pin-0.5p	Tape&Reel
R5F10BMGYFB#X5Q	R5F10BMGCYFB#55Q	F13(CAN/LIN)	128kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PGDYFB#H5	R5F10PGDCYFB#15	F14	48kB	LQFP 48pin-0.5p	Full Carton
R5F10PGDYFB#H5Q	R5F10PGDCYFB#15Q	F14	48kB	LQFP 48pin-0.5p	Full Carton
R5F10PGDYFB#V5	R5F10PGDCYFB#35	F14	48kB	LQFP 48pin-0.5p	Tray
R5F10PGDYFB#V5Q	R5F10PGDCYFB#35Q	F14	48kB	LQFP 48pin-0.5p	Tray
R5F10PGDYFB#X5	R5F10PGDCYFB#55	F14	48kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGDYFB#X5Q	R5F10PGDCYFB#55Q	F14	48kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGEYFB#H5	R5F10PGECYFB#15	F14	64kB	LQFP 48pin-0.5p	Full Carton
R5F10PGEYFB#H5Q	R5F10PGECYFB#15Q	F14	64kB	LQFP 48pin-0.5p	Full Carton
R5F10PGEYFB#V5	R5F10PGECYFB#35	F14	64kB	LQFP 48pin-0.5p	Tray
R5F10PGEYFB#V5Q	R5F10PGECYFB#35Q	F14	64kB	LQFP 48pin-0.5p	Tray
R5F10PGEYFB#X5	R5F10PGECYFB#55	F14	64kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGEYFB#X5Q	R5F10PGECYFB#55Q	F14	64kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGFYFB#H5	R5F10PGFCYFB#15	F14	96kB	LQFP 48pin-0.5p	Full Carton
R5F10PGFYFB#H5Q	R5F10PGFCYFB#15Q	F14	96kB	LQFP 48pin-0.5p	Full Carton
R5F10PGFYFB#V5	R5F10PGFCYFB#35	F14	96kB	LQFP 48pin-0.5p	Tray
R5F10PGFYFB#V5Q	R5F10PGFCYFB#35Q	F14	96kB	LQFP 48pin-0.5p	Tray
R5F10PGFYFB#X5	R5F10PGFCYFB#55	F14	96kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGFYFB#X5Q	R5F10PGFCYFB#55Q	F14	96kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGGYFB#H5	R5F10PGGCYFB#15	F14	128kB	LQFP 48pin-0.5p	Full Carton
R5F10PGGYFB#H5Q	R5F10PGGCYFB#15Q	F14	128kB	LQFP 48pin-0.5p	Full Carton
R5F10PGGYFB#V5	R5F10PGGCYFB#35	F14	128kB	LQFP 48pin-0.5p	Tray
R5F10PGGYFB#V5Q	R5F10PGGCYFB#35Q	F14	128kB	LQFP 48pin-0.5p	Tray
R5F10PGGYFB#X5	R5F10PGGCYFB#55	F14	128kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGGYFB#X5Q	R5F10PGGCYFB#55Q	F14	128kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGHYFB#H5	R5F10PGHCYFB#15	F14	192kB	LQFP 48pin-0.5p	Full Carton
R5F10PGHYFB#H5Q	R5F10PGHCYFB#15Q	F14	192kB	LQFP 48pin-0.5p	Full Carton
R5F10PGHYFB#V5	R5F10PGHCYFB#35	F14	192kB	LQFP 48pin-0.5p	Tray
R5F10PGHYFB#V5Q	R5F10PGHCYFB#35Q	F14	192kB	LQFP 48pin-0.5p	Tray
R5F10PGHYFB#X5	R5F10PGHCYFB#55	F14	192kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGHYFB#X5Q	R5F10PGHCYFB#55Q	F14	192kB	LQFP 48pin-0.5p	Tape&Reel

R5F10PGJYFB#H5	R5F10PGJCYFB#15	F14	256kB	LQFP 48pin-0.5p	Full Carton
R5F10PGJYFB#H5Q	R5F10PGJCYFB#15Q	F14	256kB	LQFP 48pin-0.5p	Full Carton
R5F10PGJYFB#V5	R5F10PGJCYFB#35	F14	256kB	LQFP 48pin-0.5p	Tray
R5F10PGJYFB#V5Q	R5F10PGJCYFB#35Q	F14	256kB	LQFP 48pin-0.5p	Tray
R5F10PGJYFB#X5	R5F10PGJCYFB#55	F14	256kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PGJYFB#X5Q	R5F10PGJCYFB#55Q	F14	256kB	LQFP 48pin-0.5p	Tape&Reel
R5F10PLEYFB#H5	R5F10PLECYFB#15	F14	64kB	LQFP 64pin-0.5p	Full Carton
R5F10PLEYFB#H5Q	R5F10PLECYFB#15Q	F14	64kB	LQFP 64pin-0.5p	Full Carton
R5F10PLEYFB#V5	R5F10PLECYFB#35	F14	64kB	LQFP 64pin-0.5p	Tray
R5F10PLEYFB#V5Q	R5F10PLECYFB#35Q	F14	64kB	LQFP 64pin-0.5p	Tray
R5F10PLEYFB#X5	R5F10PLECYFB#55	F14	64kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLEYFB#X5Q	R5F10PLECYFB#55Q	F14	64kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLFYFB#H5	R5F10PLFCYFB#15	F14	96kB	LQFP 64pin-0.5p	Full Carton
R5F10PLFYFB#H5Q	R5F10PLFCYFB#15Q	F14	96kB	LQFP 64pin-0.5p	Full Carton
R5F10PLFYFB#V5	R5F10PLFCYFB#35	F14	96kB	LQFP 64pin-0.5p	Tray
R5F10PLFYFB#V5Q	R5F10PLFCYFB#35Q	F14	96kB	LQFP 64pin-0.5p	Tray
R5F10PLFYFB#X5	R5F10PLFCYFB#55	F14	96kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLFYFB#X5Q	R5F10PLFCYFB#55Q	F14	96kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLGYFB#H5	R5F10PLGICYFB#15	F14	128kB	LQFP 64pin-0.5p	Full Carton
R5F10PLGYFB#H5Q	R5F10PLGICYFB#15Q	F14	128kB	LQFP 64pin-0.5p	Full Carton
R5F10PLGYFB#V5	R5F10PLGICYFB#35	F14	128kB	LQFP 64pin-0.5p	Tray
R5F10PLGYFB#V5Q	R5F10PLGICYFB#35Q	F14	128kB	LQFP 64pin-0.5p	Tray
R5F10PLGYFB#X5	R5F10PLGICYFB#55	F14	128kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLGYFB#X5Q	R5F10PLGICYFB#55Q	F14	128kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLHYFB#H5	R5F10PLHCYFB#15	F14	192kB	LQFP 64pin-0.5p	Full Carton
R5F10PLHYFB#H5Q	R5F10PLHCYFB#15Q	F14	192kB	LQFP 64pin-0.5p	Full Carton
R5F10PLHYFB#V5	R5F10PLHCYFB#35	F14	192kB	LQFP 64pin-0.5p	Tray
R5F10PLHYFB#V5Q	R5F10PLHCYFB#35Q	F14	192kB	LQFP 64pin-0.5p	Tray
R5F10PLHYFB#X5	R5F10PLHCYFB#55	F14	192kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLHYFB#X5Q	R5F10PLHCYFB#55Q	F14	192kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLJYFB#H5	R5F10PLJCYFB#15	F14	256kB	LQFP 64pin-0.5p	Full Carton
R5F10PLJYFB#H5Q	R5F10PLJCYFB#15Q	F14	256kB	LQFP 64pin-0.5p	Full Carton
R5F10PLJYFB#V5	R5F10PLJCYFB#35	F14	256kB	LQFP 64pin-0.5p	Tray
R5F10PLJYFB#V5Q	R5F10PLJCYFB#35Q	F14	256kB	LQFP 64pin-0.5p	Tray
R5F10PLJYFB#X5	R5F10PLJCYFB#55	F14	256kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PLJYFB#X5Q	R5F10PLJCYFB#55Q	F14	256kB	LQFP 64pin-0.5p	Tape&Reel
R5F10PMEYFB#H5	R5F10PMECYFB#15	F14	64kB	LQFP 80pin-0.5p	Full Carton
R5F10PMEYFB#H5Q	R5F10PMECYFB#15Q	F14	64kB	LQFP 80pin-0.5p	Full Carton
R5F10PMEYFB#V5	R5F10PMECYFB#35	F14	64kB	LQFP 80pin-0.5p	Tray

R5F10PMEYFB#V5Q	R5F10PMECYFB#35Q	F14	64kB	LQFP 80pin-0.5p	Tray
R5F10PMEYFB#X5	R5F10PMECYFB#55	F14	64kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMEYFB#X5Q	R5F10PMECYFB#55Q	F14	64kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMFYFB#H5	R5F10PMFCYFB#15	F14	96kB	LQFP 80pin-0.5p	Full Carton
R5F10PMFYFB#H5Q	R5F10PMFCYFB#15Q	F14	96kB	LQFP 80pin-0.5p	Full Carton
R5F10PMFYFB#V5	R5F10PMFCYFB#35	F14	96kB	LQFP 80pin-0.5p	Tray
R5F10PMFYFB#V5Q	R5F10PMFCYFB#35Q	F14	96kB	LQFP 80pin-0.5p	Tray
R5F10PMFYFB#X5	R5F10PMFCYFB#55	F14	96kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMFYFB#X5Q	R5F10PMFCYFB#55Q	F14	96kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMGYFB#H5	R5F10PMGCYFB#15	F14	128kB	LQFP 80pin-0.5p	Full Carton
R5F10PMGYFB#H5Q	R5F10PMGCYFB#15Q	F14	128kB	LQFP 80pin-0.5p	Full Carton
R5F10PMGYFB#V5	R5F10PMGCYFB#35	F14	128kB	LQFP 80pin-0.5p	Tray
R5F10PMGYFB#V5Q	R5F10PMGCYFB#35Q	F14	128kB	LQFP 80pin-0.5p	Tray
R5F10PMGYFB#X5	R5F10PMGCYFB#55	F14	128kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMGYFB#X5Q	R5F10PMGCYFB#55Q	F14	128kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMHYFB#H5	R5F10PMHCYFB#15	F14	192kB	LQFP 80pin-0.5p	Full Carton
R5F10PMHYFB#H5Q	R5F10PMHCYFB#15Q	F14	192kB	LQFP 80pin-0.5p	Full Carton
R5F10PMHYFB#V5	R5F10PMHCYFB#35	F14	192kB	LQFP 80pin-0.5p	Tray
R5F10PMHYFB#V5Q	R5F10PMHCYFB#35Q	F14	192kB	LQFP 80pin-0.5p	Tray
R5F10PMHYFB#X5	R5F10PMHCYFB#55	F14	192kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMHYFB#X5Q	R5F10PMHCYFB#55Q	F14	192kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMJYFB#H5	R5F10PMJCYFB#15	F14	256kB	LQFP 80pin-0.5p	Full Carton
R5F10PMJYFB#H5Q	R5F10PMJCYFB#15Q	F14	256kB	LQFP 80pin-0.5p	Full Carton
R5F10PMJYFB#V5	R5F10PMJCYFB#35	F14	256kB	LQFP 80pin-0.5p	Tray
R5F10PMJYFB#V5Q	R5F10PMJCYFB#35Q	F14	256kB	LQFP 80pin-0.5p	Tray
R5F10PMJYFB#X5	R5F10PMJCYFB#55	F14	256kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PMJYFB#X5Q	R5F10PMJCYFB#55Q	F14	256kB	LQFP 80pin-0.5p	Tape&Reel
R5F10PPEYFB#H5	R5F10PPECYFB#15	F14	64kB	LQFP 100pin-0.5p	Full Carton
R5F10PPEYFB#H5Q	R5F10PPECYFB#15Q	F14	64kB	LQFP 100pin-0.5p	Full Carton
R5F10PPEYFB#V5	R5F10PPECYFB#35	F14	64kB	LQFP 100pin-0.5p	Tray
R5F10PPEYFB#V5Q	R5F10PPECYFB#35Q	F14	64kB	LQFP 100pin-0.5p	Tray
R5F10PPEYFB#X5	R5F10PPECYFB#55	F14	64kB	LQFP 100pin-0.5p	Tape&Reel
R5F10PPEYFB#X5Q	R5F10PPECYFB#55Q	F14	64kB	LQFP 100pin-0.5p	Tape&Reel
R5F10PPFYFB#H5	R5F10PPFCYFB#15	F14	96kB	LQFP 100pin-0.5p	Full Carton
R5F10PPFYFB#H5Q	R5F10PPFCYFB#15Q	F14	96kB	LQFP 100pin-0.5p	Full Carton
R5F10PPFYFB#V5	R5F10PPFCYFB#35	F14	96kB	LQFP 100pin-0.5p	Tray
R5F10PPFYFB#V5Q	R5F10PPFCYFB#35Q	F14	96kB	LQFP 100pin-0.5p	Tray
R5F10PPFYFB#X5	R5F10PPFCYFB#55	F14	96kB	LQFP 100pin-0.5p	Tape&Reel
R5F10PPFYFB#X5Q	R5F10PPFCYFB#55Q	F14	96kB	LQFP 100pin-0.5p	Tape&Reel

R5F10PPGYFB#H5	R5F10PPGICYFB#15	F14	128kB	LQFP 100pin-0.5p	Full Carton
R5F10PPGYFB#H5Q	R5F10PPGICYFB#15Q	F14	128kB	LQFP 100pin-0.5p	Full Carton
R5F10PPGYFB#V5	R5F10PPGICYFB#35	F14	128kB	LQFP 100pin-0.5p	Tray
R5F10PPGYFB#V5Q	R5F10PPGICYFB#35Q	F14	128kB	LQFP 100pin-0.5p	Tray
R5F10PPGYFB#X5	R5F10PPGICYFB#55	F14	128kB	LQFP 100pin-0.5p	Tape&Reel
R5F10PPGYFB#X5Q	R5F10PPGICYFB#55Q	F14	128kB	LQFP 100pin-0.5p	Tape&Reel
R5F10PPHYFB#H5	R5F10PPHCYFB#15	F14	192kB	LQFP 100pin-0.5p	Full Carton
R5F10PPHYFB#H5Q	R5F10PPHCYFB#15Q	F14	192kB	LQFP 100pin-0.5p	Full Carton
R5F10PPHYFB#V5	R5F10PPHCYFB#35	F14	192kB	LQFP 100pin-0.5p	Tray
R5F10PPHYFB#V5Q	R5F10PPHCYFB#35Q	F14	192kB	LQFP 100pin-0.5p	Tray
R5F10PPHYFB#X5	R5F10PPHCYFB#55	F14	192kB	LQFP 100pin-0.5p	Tape&Reel
R5F10PPHYFB#X5Q	R5F10PPHCYFB#55Q	F14	192kB	LQFP 100pin-0.5p	Tape&Reel
R5F10PPJYFB#H5	R5F10PPJCYFB#15	F14	256kB	LQFP 100pin-0.5p	Full Carton
R5F10PPJYFB#H5Q	R5F10PPJCYFB#15Q	F14	256kB	LQFP 100pin-0.5p	Full Carton
R5F10PPJYFB#V5	R5F10PPJCYFB#35	F14	256kB	LQFP 100pin-0.5p	Tray
R5F10PPJYFB#V5Q	R5F10PPJCYFB#35Q	F14	256kB	LQFP 100pin-0.5p	Tray
R5F10PPJYFB#X5	R5F10PPJCYFB#55	F14	256kB	LQFP 100pin-0.5p	Tape&Reel
R5F10PPJYFB#X5Q	R5F10PPJCYFB#55Q	F14	256kB	LQFP 100pin-0.5p	Tape&Reel

Report No. MCR-23-0530

Date: 7/Dec./2023

RENESAS SEMICONDUCTOR RELIABILITY REPORT

SERIES : RL78/F13,F14

DEVICE : Please see [Device list]

APPLICATION : Automobile

<Wefer Fabrication>

Renesas Semiconductor Manufacturing Co., Ltd. Kawashiri Factory

<Assembly>

Renesas Semiconductor KL Sdn. Bhd.

Quality Assurance Div.

Renesas Electronics Corporation

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(Rev.5.0-2 October 2020)

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Q100 Qualification Test Results

[Note : Basically qualification tests were performed using a representative product with the same wafer process and the same package structure .]

Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results (Fail of Total)	Comments: (N/A =Not Applicable)
TEST GROUP A – ACCELERATED ENVIRONMENT STRESS TESTS								
PC	A1	JESD22 A113 J-STD-020	Preconditioning: (Test @ Rm) SMD only; Moisture Preconditioning for THB/HAST, AC/UHST, TC ; Peak Reflow Temp=260°C	Min MSL=3			MSL=3	-
THB or HAST	A2	JESD22 A101	Temperature Humidity Bias: (Test @ Rm/Hot) Ta=85°C, RH=85%, T=1000hrs	3	77	231	0 of 231	-
AC or UHST or TH	A3	JESD22 A118	Unbiased Highly Accelerated Stress Test: (Test @ Rm) Ta=110°C, RH=85%, T=264hrs	3	77	231	0 of 231	-
TC	A4	JESD22 A104	Temperature Cycle: (Test@Hot) Ta=-55°C to 150°C, T=2000cyc Wire Bond Pull: (0 Fails after TC)	3	77	231	0 of 231	-
PTC	A5	JESD22 A105	Power Temperature Cycle: (Test @ Rm/Hot) Ta=-40°C to 125°C, T=1000cyc	-	-	-	-	N/A
HTSL	A6	JESD22 A103	High Temp Storage Life: (Test@Rm/Hot) Ta=175°C, T=1000hrs	1	45	45	0 of 45	-
TEST GROUP B – ACCELERATED LIFETIME SIMULATION TESTS								
HTOL	B1	JESD22 A108	High Temp Operating Life: (Test @ Rm/Hot/Cold) Ta=150°C, T=1000h	3	77	231	0 of 231	-
ELFR	B2	AEC-Q100-008	Early Life Failure Rate: (Test@Rm/Hot) Ta=150°C, T=48hrs	3	800	2400	0 of 2400	-
EDR	B3	AEC-Q100-005	NVM Endurance & Data Retention Test: (Test @ Rm/Hot)	For HTOL	3	77	231	0 of 231
			For HTSL	1	45	45	0 of 45	-

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Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results (Fail of Total)	Comments: (N/A =Not Applicable)
TEST GROUP C – PACKAGE ASSEMBLY INTEGRITY TESTS								
WBS	C1	AEC-Q100-001 AEC-Q003	Wire Bond Shear Test: (Cpk > 1.67)	30 bonds	5 parts Min.	30 bonds	0 of 30 bonds	Ppk>1.67
WBP	C2	Mil-STD-883 Method 2011 AEC-Q003	Wire Bond Pull: (Cpk > 1.67); Each bonder used	30 bonds	5 parts Min.	30 bonds	0 of 30 bonds	Ppk>1.67
SD	C3	JESD22 B102 JSTD-002D	Solderability: (>95% coverage) 8 hr steam aging prior to testing	1	15	15	0 of 15	-
PD	C4	JESD22 B100 JESD22 B108 AEC-Q003	Physical Dimensions: (Cpk > 1.67)	3	10	30	0 of 30	Cpk>1.67
SBS	C5	AEC-Q100-010 AEC-Q003	Solder Ball Shear: (Cpk > 1.67); 5 balls from min. of 10 devices	-	-	-	-	N/A
LI	C6	JESD22 B105	Lead Integrity: (No lead cracking or breaking); Through-hole only; 10 leads from each of 5 devices	-	-	-	-	N/A
TEST GROUP D – DIE FABRICATION RELIABILITY TESTS								
EM	D1	JESD61	Electromigration:	-	-	-	-	Confirmed by process TEG
TDDDB	D2	JESD35	Time Dependent Dielectric Breakdown:	-	-	-	-	Confirmed by process TEG
HCI	D3	JESD60 & 28	Hot Carrier Injection:	-	-	-	-	Confirmed by process TEG
NBTI	D4	JESD90	Negative Bias Temperature Instability:	-	-	-	-	Confirmed by process TEG
SM	D5	JESD61,87 & 202	Stress Migration:	-	-	-	-	Confirmed by process TEG

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Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results (Fail of Total)	Comments: (N/A =Not Applicable)
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TEST GROUP E- ELECTRICAL VERIFICATION

TEST	E1	User/Supplier Specification	Pre and Post Stress Electrical Test:	All	All	All	0 of All	-
HBM	E2	AEC-Q100-002	Electrostatic Discharge, Human Body Model: (Test @ Rm/Hot); (2KV HBM / Class 2 or better)	1	3	3	0 of 3 ESD Level=H2	HBM>2KV
CDM	E3	AEC-Q100-011	Electrostatic Discharge, Charged Device Model: (Test @ Rm/Hot); (750V corner leads, 500V all other leads)	1	3	3	0 of 3 ESD Level=C4B	Corner leads: 750V Pass All other leads:500V Pass
LU	E4	AEC-Q100-004	Latch-Up: (Test @ Rm/Hot)	1	6	6	0 of 6	-
ED	E5	AEC-Q100-009 AEC-Q003	Electrical Distributions: (Test @ Rm/Hot/Cold) (CPk > 1.33, Ppk >1.67)	3	30	90	0 of 90	Ppk>1.67
FG	E6	AEC-Q100-007	Fault Grading:	-	-	-	98.00%	-
CHAR	E7	AEC-Q003	Characterization: (Test @ Rm/Hot/Cold)	-	-	-	-	According to Renesas standard procedure
EMC	E9	SAE J1752/3	Electromagnetic Compatibility (Radiated Emissions)	1	1	1	0 of 1	
SC	E10	AEC Q100-012	Short Circuit Characterization	-	-	-	-	N/A
SER	E11	JESD89-1 JESD89-2 JESD89-3	Soft Error Rate	-	-	-	-	N/A
LF	E12	AEC-Q005	Lead (Pb) Free: (see AEC-Q005)	-	-	-	Pass	Solderability: See SD (C3) result. Solder heat resistance: N/A (Wave Solder is Not recommended.) Whisker: Performed on product TEG with test method based on JESD201.

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Test	#	Reference	Test Conditions	Lots	S.S.	Total	Results (Fail of Total)	Comments: (N/A =Not Applicable)
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TEST GROUP F – DEFECT SCREENING TESTS

PAT	F1	AEC-Q001	Process Average Testing: (see AEC-Q001)	All	All	All	Reject units outside PAT limits	Apply to mass production according to Renesas standard procedure
SBA	F2	AEC-Q002	Statistical Bin/Yield Analysis: (see AEC-Q002)	All	All	All	Reject units outside criteria	Apply to mass production according to Renesas standard procedure

TEST GROUP G – CAVITY PACKAGE INTEGRITY TESTS (for Ceramic Package testing only)

MS	G1	JESD22 B104	Mechanical Shock: (Test @ Rm)	-	-	-	-	N/A
VFV	G2	JESD22 B103	Variable Frequency Vibration: (Test @ Rm)	-	-	-	-	N/A
CA	G3	MIL-STD-883 Method 2001	Constant Acceleration: (Test @ Rm)	-	-	-	-	N/A
GFL	G4	MIL-STD-883 Method 1014	Gross and Fine Leak:	-	-	-	-	N/A
DROP	G5	-----	Drop Test: (Test @ Rm) MEMS cavity parts only. Drop part on each of 6 axes once from a height of 1.2m onto a concrete surface.	-	-	-	-	N/A
LT	G6	MIL-STD-883 Method 2004	Lid Torque:	-	-	-	-	N/A
DS	G7	MIL-STD-883 Method 2019	Die Shear:	-	-	-	-	N/A
IWV	G8	MIL-STD-883 Method 1018	Internal Water Vapor:	-	-	-	-	N/A

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Calculation method of standard failure rate

Target : 0.13um CMOS process product (RL78 series Automobile)

Operating reliability is decided by inherent reliability of device and environment condition of use (See below).

Calculation method of standard failure rate (λ)

$$\lambda = \lambda_b \times \pi T \quad (\text{FIT})$$

λ_b → (1) Basic failure rate
 πT → (2) Temperature parameter

(1) Basic failure rate (λ_b)

λ_b : 0.18 (FIT)

(2) Temperature parameter

$$\pi T = \exp \left\{ 11600 \times E_a \times \left(\frac{1}{273+55} - \frac{1}{273+T_a} \right) \right\}$$

E_a : Activation energy (eV)

T_a : ambient temperature

πT Simplified chart ($E_a=0.7\text{eV}$)

$T_a(^{\circ}\text{C})$	40	50	55	60	65	70	75	80	85	90	100	110
πT	0.31	0.68	1	1.45	2.08	2.95	4.15	5.77	7.96	10.88	19.82	34.99

-Confidence level 60% -Standard temperature $T_a=55^{\circ}\text{C}$

(3) MTTF (Mean Time To Failure)

$$\text{MTTF} = \frac{1}{\lambda}$$

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Device List

[RL78/F13,F14 series]

	RL78/F13(LIN)		RL78/F13(CAN/LIN)		RL78/F14
1	R5F10AGACYFB	1	R5F10BGCCYFB	1	R5F10PGDCYFB
2	R5F10AGCCYFB	2	R5F10BGDCYFB	2	R5F10PGECYFB
3	R5F10AGDCYFB	3	R5F10BGECYFB	3	R5F10PGFCYFB
4	R5F10AGECYFB	4	R5F10BGFCYFB	4	R5F10PGGCYFB
5	R5F10AGFCYFB	5	R5F10BGGCYFB	5	R5F10PGHCYFB
6	R5F10AGGCYFB	6	R5F10BLCCYFB	6	R5F10PGJCYFB
7	R5F10ALCCYFB	7	R5F10BLDCYFB	7	R5F10PLECYFB
8	R5F10ALDCYFB	8	R5F10BLECYFB	8	R5F10PLFCYFB
9	R5F10ALECYFB	9	R5F10BLFCYFB	9	R5F10PLGCYFB
10	R5F10ALFCYFB	10	R5F10BLGCRYFB	10	R5F10PLHCYFB
11	R5F10ALGCRYFB	11	R5F10BMECYFB	11	R5F10PLJCYFB
12	R5F10AMECYFB	12	R5F10BMFCYFB	12	R5F10PMECYFB
13	R5F10AMFCYFB	13	R5F10BMGCYFB	13	R5F10PMFCYFB
14	R5F10AMGCYFB	14	Blank below	14	R5F10PMGCYFB
15	Blank below	15		15	R5F10PMHCYFB
16		16		16	R5F10PMJCYFB
17		17		17	R5F10PPECYFB
18		18		18	R5F10PPFCYFB
19		19		19	R5F10PPGCYFB
20		20		20	R5F10PPHCYFB
21		21		21	R5F10PPJCYFB