

RH850/F1K, RH850/F1KM

User's Manual: Hardware

Renesas microcontroller
RH850 Family

Addendum for additional products

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The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. Handling of unused pins

Unconnected CMOS device inputs can be cause of malfunction. If an input pin is unconnected, it is possible that an internal input level may be generated due to noise, etc., causing malfunction. CMOS devices behave differently than Bipolar or NMOS devices. Input levels of CMOS devices must be fixed high or low by using pull-up or pull-down circuitry. Each unused pin should be connected to power supply or GND via a resistor if there is a possibility that it will be an output pin. All handling related to unused pins must be judged separately for each device and according to related specifications governing the device.

5. Voltage application waveform at input pin

Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

6. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

7. Power ON/OFF sequence

In the case of a device that uses different power supplies for the internal operation and external interface, as a rule, switch on the external power supply after switching on the internal power supply. When switching the power supply off, as a rule, switch off the external power supply and then the internal power supply. Use of the reverse power on/off sequences may result in the application of an overvoltage to the internal elements of the device, causing malfunction and degradation of internal elements due to the passage of an abnormal current. The correct power on/off sequence must be judged separately for each device and according to related specifications governing the device.

How to Use This Manual

1. Purpose and Target Readers

This manual is designed to provide the user with an understanding of the hardware functions and electrical characteristics of the MCU. It is intended for users designing application systems incorporating the MCU. A basic knowledge of electric circuits, logical circuits, and MCUs is necessary in order to use this manual. The manual comprises only Overview, Electrical Characteristics section and package Dimensions.

Particular attention should be paid to the precautionary notes when using the manual. These notes occur within the body of the text, at the end of each section, and in the Usage Notes section.

The following documents apply to the RH850/F1K, RH850/F1KM Group. Make sure to refer to the latest versions of these documents. The newest versions of the documents listed may be obtained from the Renesas Electronics Web site.

To understand the overall functions of the RH850/F1K, RH850/F1KM.

→ The part names of the additional products are shown in this document including the correspondence table between the general products and the additional products.

The specification of the additional products is the same as the general product except the specification items shown in this document.

Read the following manuals according to its content.

Document Type	Description	Document Title	Document No.
User's manual for Hardware	Hardware specifications (pin assignments, memory maps, peripheral function specification, electrical characteristics, timing charts) and operational description	RH850/F1K Group User's Manual: Hardware	R01UH0562EJxxxx
User's manual for Hardware	Hardware specifications (pin assignments, memory maps, peripheral function specifications, electrical characteristics, timing charts) and operation description	RH850/F1KH, RH850/F1KM User's Manual: Hardware	R01UH0684EJxxxx
User's manual for Hardware	Hardware function and electrical characteristics	RH850/F1KM-S4 User's Manual: Hardware Addendum for the high temperature products (Ta = 125°C)	R01UH0957EJxxxx
User's manual for Hardware	Hardware function and electrical characteristics	RH850/F1KM-S1 User's Manual: Hardware Addendum for the high temperature products (Tj = 160°C)	R01UH0956EJxxxx

Conventions Data significance: Higher digits on the left and lower digits on the right

Active low representation: xxx (overscore over pin or signal name)

Memory map address: Higher addresses on the top and lower addresses on the bottom

Note: Footnote for item marked with Note in the text

Caution: Information requiring particular attention Remark:

Supplementary information

Numeric representation: Binary ... xxxx or xxxx_B

Decimal ... xxxx

Hexadecimal ... xxxx_H

Prefix indicating power of 2 (address space, memory capacity):

K (kilo): $2^{10} = 1,024$

M (mega): $2^{20} = 1,024^2$

G (giga): $2^{30} = 1,024^3$

Section 1 Overview

The specification of the additional products is the same as the general product.

1.1 Product Lineup

Table 1.1 Product Lineup of F1K

F1K		Memory				Line Name	Part Name (general product)		Part Name (additional product 1)		Part Name (additional product 2)	
Pin Count	CPU frequency	Code Flash	Local RAM	Data Flash	Retention RAM (RRAM)		Operating Temperature (Ta)		Operating Temperature (Ta)		Operating Temperature (Ta)	
							-40°C to +105°C	-40°C to +125°C	-40°C to +105°C	-40°C to +125°C	-40°C to +105°C	-40°C to +125°C
144 pins	80 MHz max.	768 KB	32 KB	64 KB	64 KB	ECO	R7F7016023AFP-C	R7F7016024AFP-C	R7F7016023AFE	R7F7016024AFE	R7F7016023AFD	R7F7016024AFD
		1024 KB	64 KB				R7F7016023AFE-C	R7F7016024AFE-C	R7F7016023AFD-C	R7F7016024AFD-C		
		1536 KB	96 KB				R7F7016033AFP-C	R7F7016034AFP-C	R7F7016033AFE	R7F7016034AFE	R7F7016033AFD	R7F7016034AFD
		2048 KB	128 KB				R7F7016033AFE-C	R7F7016034AFE-C	R7F7016033AFD-C	R7F7016034AFD-C		
176 pins	80 MHz max.	1024 KB	64 KB	64 KB	64 KB	ECO	R7F7015423AFP-C	R7F7015424AFP-C	R7F7015423AFE	R7F7015424AFE	R7F7015423AFD	R7F7015424AFD
		1536 KB	96 KB				R7F7015423AFE-C	R7F7015424AFE-C	R7F7015423AFD-C	R7F7015424AFD-C		
		2048 KB	128 KB				R7F7015433AFP-C	R7F7015434AFP-C	R7F7015433AFE	R7F7015434AFE	R7F7015433AFD	R7F7015434AFD
							R7F7015433AFE-C	R7F7015434AFE-C	R7F7015433AFD-C	R7F7015434AFD-C		
100 pins	120 MHz max.	768 KB	32 KB	64 KB	64 KB	ADVANCED	R7F7015573AFP-C	R7F7015574AFP-C	R7F7015573AFE	R7F7015574AFE	R7F7015573AFD	R7F7015574AFD
		1536 KB	96 KB				R7F7015573AFE-C	R7F7015574AFE-C	R7F7015573AFD-C	R7F7015574AFD-C		
		2048 KB	128 KB				R7F7015463AFP-C	R7F7015464AFP-C	R7F7015463AFE	R7F7015464AFE	R7F7015463AFD	R7F7015464AFD
							R7F7015463AFE-C	R7F7015464AFE-C	R7F7015463AFD-C	R7F7015464AFD-C		
100 pins	120 MHz max.	768 KB	32 KB	64 KB	64 KB	ADVANCED	R7F7015473AFP-C	R7F7015474AFP-C	R7F7015473AFE	R7F7015474AFE	R7F7015473AFD	R7F7015474AFD
		1024 KB	64 KB				R7F7015473AFE-C	R7F7015474AFE-C	R7F7015473AFD-C	R7F7015474AFD-C		
		1536 KB	96 KB				R7F7016103AFP-C	R7F7016104AFP-C	R7F7016103AFE	R7F7016104AFE	R7F7016103AFD	R7F7016104AFD
		2048 KB	128 KB				R7F7016103AFE-C	R7F7016104AFE-C	R7F7016103AFD-C	R7F7016104AFD-C		
144 pins	120 MHz max.	768 KB	32 KB	64 KB	64 KB	ADVANCED	R7F7016113AFP-C	R7F7016114AFP-C	R7F7016113AFE	R7F7016114AFE	R7F7016113AFD	R7F7016114AFD
		1024 KB	64 KB				R7F7016113AFE-C	R7F7016114AFE-C	R7F7016113AFD-C	R7F7016114AFD-C		
		1536 KB	96 KB				R7F7015603AFP-C	R7F7015604AFP-C	R7F7015603AFE	R7F7015604AFE	R7F7015603AFD	R7F7015604AFD
		2048 KB	128 KB				R7F7015603AFE-C	R7F7015604AFE-C	R7F7015603AFD-C	R7F7015604AFD-C		
144 pins	120 MHz max.	768 KB	32 KB	64 KB	64 KB	ADVANCED	R7F7015613AFP-C	R7F7015614AFP-C	R7F7015613AFE	R7F7015614AFE	R7F7015613AFD	R7F7015614AFD
		1024 KB	64 KB				R7F7015613AFE-C	R7F7015614AFE-C	R7F7015613AFD-C	R7F7015614AFD-C		
		1536 KB	96 KB				R7F7016123AFP-C	R7F7016124AFP-C	R7F7016123AFE	R7F7016124AFE	R7F7016123AFD	R7F7016124AFD
		2048 KB	128 KB				R7F7016123AFE-C	R7F7016124AFE-C	R7F7016123AFD-C	R7F7016124AFD-C		
176 pins	120 MHz max.	1024 KB	64 KB	64 KB	64 KB	ADVANCED	R7F7016133AFP-C	R7F7016134AFP-C	R7F7016133AFE	R7F7016134AFE	R7F7016133AFD	R7F7016134AFD
		1536 KB	96 KB				R7F7016133AFE-C	R7F7016134AFE-C	R7F7016133AFD-C	R7F7016134AFD-C		
		2048 KB	128 KB				R7F7015623AFP-C	R7F7015624AFP-C	R7F7015623AFE	R7F7015624AFE	R7F7015623AFD	R7F7015624AFD
							R7F7015623AFE-C	R7F7015624AFE-C	R7F7015623AFD-C	R7F7015624AFD-C		
176 pins	120 MHz max.	1024 KB	64 KB	64 KB	64 KB	ADVANCED	R7F7015633AFP-C	R7F7015634AFP-C	R7F7015633AFE	R7F7015634AFE	R7F7015633AFD	R7F7015634AFD
		1536 KB	96 KB				R7F7015633AFE-C	R7F7015634AFE-C	R7F7015633AFD-C	R7F7015634AFD-C		
		2048 KB	128 KB				R7F7015773AFP-C	R7F7015774AFP-C	R7F7015773AFE	R7F7015774AFE	R7F7015773AFD	R7F7015774AFD
							R7F7015773AFE-C	R7F7015774AFE-C	R7F7015773AFD-C	R7F7015774AFD-C		
100 pins	120 MHz max.	768 KB	32 KB	64 KB	64 KB	PREMIUM	R7F7015663AFP-C	R7F7015664AFP-C	R7F7015663AFE	R7F7015664AFE	R7F7015663AFD	R7F7015664AFD
		1024 KB	64 KB				R7F7015663AFE-C	R7F7015664AFE-C	R7F7015663AFD-C	R7F7015664AFD-C		
		1536 KB	96 KB				R7F7015673AFP-C	R7F7015674AFP-C	R7F7015673AFE	R7F7015674AFE	R7F7015673AFD	R7F7015674AFD
		2048 KB	128 KB				R7F7015673AFE-C	R7F7015674AFE-C	R7F7015673AFD-C	R7F7015674AFD-C		
100 pins	120 MHz max.	768 KB	32 KB	64 KB	64 KB	PREMIUM	R7F7016203AFP-C	R7F7016204AFP-C	R7F7016203AFE	R7F7016204AFE	R7F7016203AFD	R7F7016204AFD
		1024 KB	64 KB				R7F7016203AFE-C	R7F7016204AFE-C	R7F7016203AFD-C	R7F7016204AFD-C		
		1536 KB	96 KB				R7F7016213AFP-C	R7F7016214AFP-C	R7F7016213AFE	R7F7016214AFE	R7F7016213AFD	R7F7016214AFD
		2048 KB	128 KB				R7F7016213AFE-C	R7F7016214AFE-C	R7F7016213AFD-C	R7F7016214AFD-C		
144pins	120 MHz max.	768 KB	32 KB	64 KB	64 KB	PREMIUM	R7F7015803AFP-C	R7F7015804AFP-C	R7F7015803AFE	R7F7015804AFE	R7F7015803AFD	R7F7015804AFD
		1024 KB	64 KB				R7F7015803AFE-C	R7F7015804AFE-C	R7F7015803AFD-C	R7F7015804AFD-C		
		1536 KB	96 KB				R7F7015813AFP-C	R7F7015814AFP-C	R7F7015813AFE	R7F7015814AFE	R7F7015813AFD	R7F7015814AFD
		2048 KB	128 KB				R7F7015813AFE-C	R7F7015814AFE-C	R7F7015813AFD-C	R7F7015814AFD-C		
176pins	120 MHz max.	1024 KB	64 KB	64 KB	64 KB	PREMIUM	R7F7016223AFP-C	R7F7016224AFP-C	R7F7016223AFE	R7F7016224AFE	R7F7016223AFD	R7F7016224AFD
		1536 KB	96 KB				R7F7016223AFE-C	R7F7016224AFE-C	R7F7016223AFD-C	R7F7016224AFD-C		
		2048 KB	128 KB				R7F7016233AFP-C	R7F7016234AFP-C	R7F7016233AFE	R7F7016234AFE	R7F7016233AFD	R7F7016234AFD
							R7F7016233AFE-C	R7F7016234AFE-C	R7F7016233AFD-C	R7F7016234AFD-C		
176pins	120 MHz max.	1024 KB	64 KB	64 KB	64 KB	PREMIUM	R7F7015823AFP-C	R7F7015824AFP-C	R7F7015823AFE	R7F7015824AFE	R7F7015823AFD	R7F7015824AFD
		1536 KB	96 KB				R7F7015823AFE-C	R7F7015824AFE-C	R7F7015823AFD-C	R7F7015824AFD-C		
		2048 KB	128 KB				R7F7015833AFP-C	R7F7015834AFP-C	R7F7015833AFE	R7F7015834AFE	R7F7015833AFD	R7F7015834AFD
							R7F7015833AFE-C	R7F7015834AFE-C	R7F7015833AFD-C	R7F7015834AFD-C		
176pins	120 MHz max.	1024 KB	64 KB	64 KB	64 KB	PREMIUM	R7F7015883AFP-C	R7F7015884AFP-C	R7F7015883AFE	R7F7015884AFE	R7F7015883AFD	R7F7015884AFD
		1536 KB	96 KB				R7F7015883AFE-C	R7F7015884AFE-C	R7F7015883AFD-C	R7F7015884AFD-C		
		2048 KB	128 KB				R7F7015973AFP-C	R7F7015974AFP-C	R7F7015973AFE	R7F7015974AFE	R7F7015973AFD	R7F7015974AFD
							R7F7015973AFE-C	R7F7015974AFE-C	R7F7015973AFD-C	R7F7015974AFD-C		
176pins	120 MHz max.	1024 KB	64 KB	64 KB	64 KB	PREMIUM	R7F7015863AFP-C	R7F7015864AFP-C	R7F7015863AFE	R7F7015864AFE	R7F7015863AFD	R7F7015864AFD
		1536 KB	96 KB				R7F7015863AFE-C	R7F7015864AFE-C	R7F7015863AFD-C	R7F7015864AFD-C		
		2048 KB	128 KB				R7F7015873AFP-C	R7F7015874AFP-C	R7F7015873AFE	R7F7015874AFE	R7F7015873AFD	R7F7015874AFD
							R7F7015873AFE-C	R7F7015874AFE-C	R7F7015873AFD-C	R7F7015874AFD-C		

Table 1.2 Product Lineup of F1KM-S4

F1KM-S4		Memory				Part Name (general product)		Part Name (additional product 1)		Part Name (additional product 2)		
Pin Count	CPU Frequency	Code Flash	Data Flash	Local RAM (LDRAM)	Global RAM (GRAM)	Retention RAM (RRAM)	Operating Temperature (Ta)		Operating Temperature (Ta)		Operating Temperature (Ta)	
							-40°C to +105°C	-40°C to +125°C	-40°C to +105°C	-40°C to +125°C	-40°C to +105°C	-40°C to +125°C
100 pin	240 MHz max.	3 MB	128 KB	192 KB	128 KB	64 KB	R7F7016443AFP-C	R7F701A554AFP-C	R7F7016443AFE-C	R7F701A554AFE-C	R7F7016443AFD-C	R7F701A554AFD-C
		4 MB		256 KB	192KB		R7F7016453AFP-C	R7F701A564AFP-C	R7F7016453AFE-C	R7F701A564AFE-C	R7F7016453AFD-C	R7F701A564AFD-C
144 pin	240 MHz max.	3 MB	128 KB	192 KB	128 KB	64 KB	R7F7016463AFP-C	R7F701A574AFP-C	R7F7016463AFE-C	R7F701A574AFE-C	R7F7016463AFD-C	R7F701A574AFD-C
		4 MB		256 KB	192KB		R7F7016473AFP-C	R7F701A584AFP-C	R7F7016473AFE-C	R7F701A584AFE-C	R7F7016473AFD-C	R7F701A584AFD-C
176 pin	240 MHz max.	3 MB	128 KB	192 KB	128 KB	64 KB	R7F7016483AFP-C	R7F701A594AFP-C	R7F7016483AFE-C	R7F701A594AFE-C	R7F7016483AFD-C	R7F701A594AFD-C
		4 MB		256 KB	192KB		R7F7016493AFP-C	R7F701A604AFP-C	R7F7016493AFE-C	R7F701A604AFE-C	R7F7016493AFD-C	R7F701A604AFD-C
233 pin	240 MHz max.	3 MB	128 KB	192 KB	128 KB	64 KB	R7F7016503ABG-C	R7F7016504ABG-C	R7F7016503ABE-C	R7F7016504ABE-C	—	—
		4 MB		256 KB	192KB		R7F7016513ABG-C	R7F7016514ABG-C	R7F7016513ABE-C	R7F7016514ABE-C	—	—

Table 1.3 Product Lineup of F1KM-S2

F1KM-S2		Memory				Part Name (general product)		Part Name (additional product 1)		Part Name (additional product 2)		
Pin Count	CPU Frequency	Code Flash	Data Flash	Local RAM (LDRAM)	Global RAM (GRAM)	Retention RAM (RRAM)	Operating Temperature (Ta)		Operating Temperature (Ta)		Operating Temperature (Ta)	
							-40°C to +105°C	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C		
100 pin	240 MHz max.	2 MB	128 KB	128 KB	96 KB	32 KB	R7F7017603AFP-C		R7F7017603AFE-C		R7F7017603AFD-C	
144 pin	240 MHz max.	2 MB	128 KB	128 KB	96 KB	32 KB	R7F7017623AFP-C		R7F7017623AFE-C		R7F7017623AFD-C	
176 pin	240 MHz max.	2 MB	128 KB	128 KB	96 KB	32 KB	R7F7017643AFP-C		R7F7017643AFE-C		R7F7017643AFD-C	

Table 1.4 Product Lineup of F1KM-S1

F1KM-S1		Memory				Part Name (general product)		Part Name (additional product 1)		Part Name (additional product 2)	
Pin Count	CPU Frequency	Code Flash	Data Flash	Local RAM (LDRAM)	Retention RAM (RRAM)	Operating Temperature (Ta)		Operating Temperature (Ta)		Operating Temperature (Ta)	
						-40°C to +105°C	-40°C to +125°C	-40°C to +105°C	-40°C to +125°C	-40°C to +105°C	-40°C to +125°C
100 pin	120 MHz max.	1024 KB	64 KB	96 KB	32 KB	R7F7016843AFP-C	R7F7016844AFP-C	R7F7016843AFE-C	R7F7016844AFE-C	R7F7016843AFD-C	R7F7016844AFD-C
		768 KB		64 KB		R7F7016853AFP-C	R7F7016854AFP-C	R7F7016853AFE-C	R7F7016854AFE-C	R7F7016853AFD-C	R7F7016854AFD-C
		512 KB		32 KB		R7F7016863AFP-C	R7F7016864AFP-C	R7F7016863AFE-C	R7F7016864AFE-C	R7F7016863AFD-C	R7F7016864AFD-C
F1KM-S1		Memory				Part Name (general product)		Part Name (additional product 1)		Part Name (additional product 2)	
Pin Count	CPU Frequency	Code Flash	Data Flash	Local RAM (LDRAM)	Retention RAM (RRAM)	Operating Temperature (Tj)		Operating Temperature (Tj)		Operating Temperature (Tj)	
						-40°C to +160°C	-40°C to +160°C	-40°C to +160°C	-40°C to +160°C		
100 pin	80 MHz max.	1024 KB	64 KB	96 KB	32 KB	R7F701684FAFP-C		R7F701684FAFE-C		R7F701684FAFD-C	
		768 KB		64 KB		R7F701685FAFP-C		R7F701685FAFE-C		R7F701685FAFD-C	
		512 KB		32 KB		R7F701686FAFP-C		R7F701686FAFE-C		R7F701686FAFD-C	

Section 2 Electrical Characteristics

The specification of the additional products is the same as the general product.

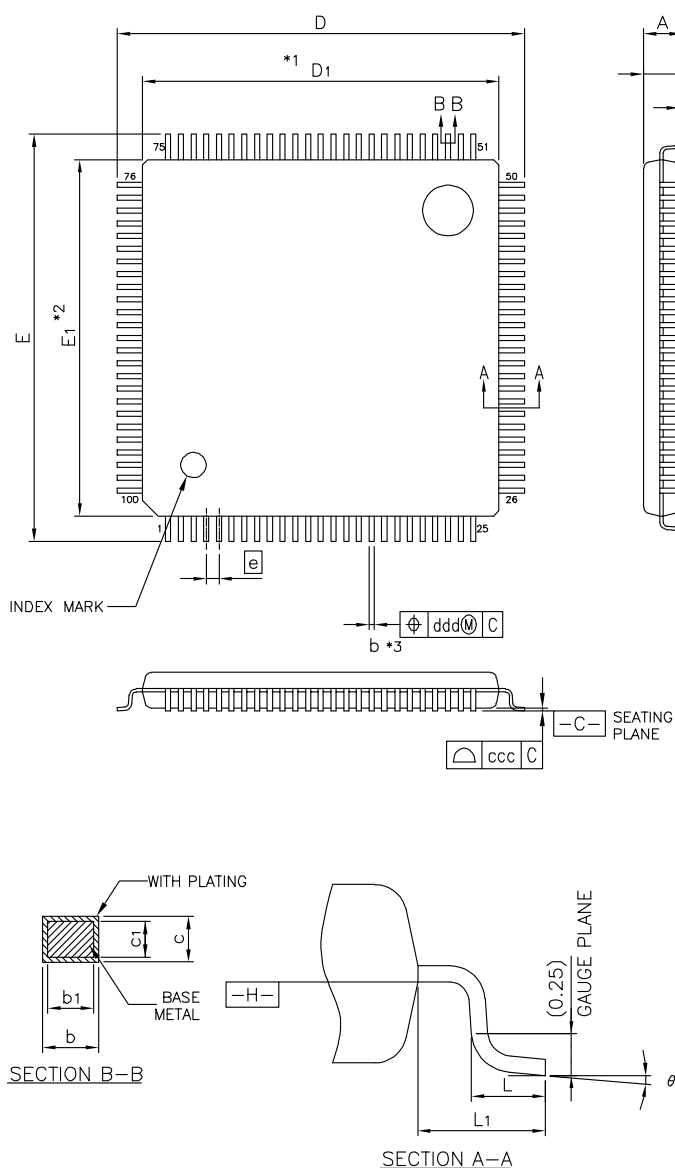
Appendix A Package

A.1 Package Dimensions

A.1.1 100 Pins (R7F701xxxxAFE)

JEITA Package code	RENESAS code	MASS(TYP.)[g]
P-LFQFP100-14x14-0.50	PLQP0100KL-A	0.7

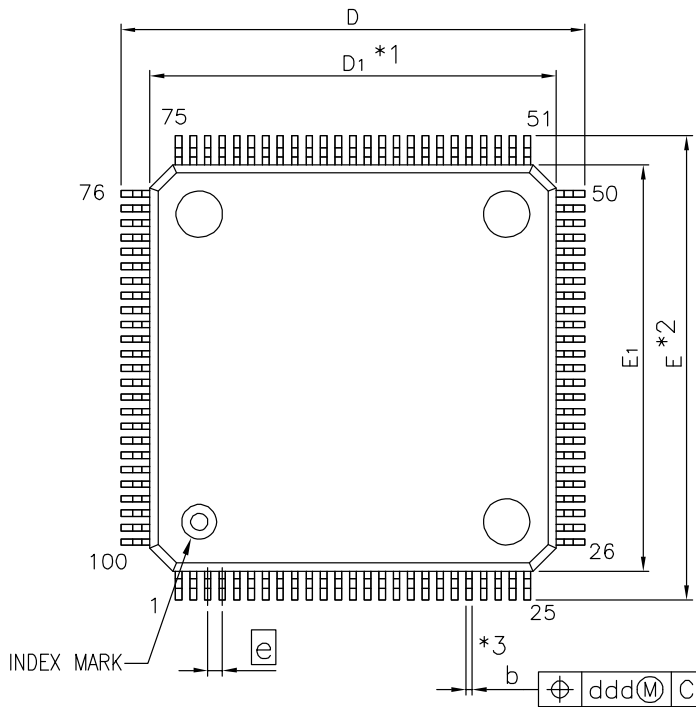
NOTE)
 1.DIMENSIONS "*1 "AND "*2 "DO NOT INCLUDE MOLD FLASH.
 2.DIMENSION"*3" DOES NOT INCLUDE TRIM OFFSET.



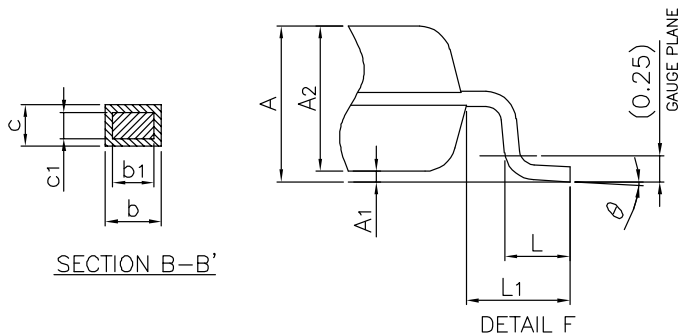
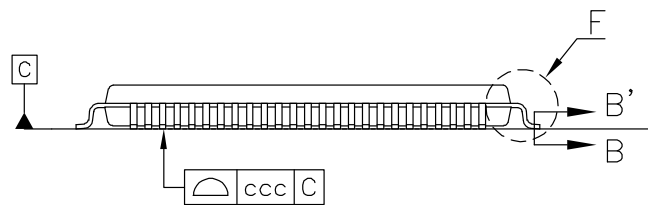
Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
D ₁	13.80	14.00	14.20
E ₁	13.80	14.00	14.20
A ₂	—	1.40	—
D	15.80	16.00	16.20
E	15.80	16.00	16.20
A	—	—	1.60
A ₁	0.05	—	0.15
b	0.17	0.22	0.27
b ₁	0.17	0.20	0.23
c	0.09	—	0.20
c ₁	0.09	—	0.16
□	0°	—	7°
e	—	0.50	—
L	0.45	0.60	0.75
L ₁	—	1.00	—
ccc	—	—	0.08
ddd	—	—	0.08

A.1.2 100 Pins (R7F701xxxxAFD)

JEITA Package code	RENESAS code	MASS(TYP.)[g]
P-LFQFP100-14x14-0.50	PLQP0100KM-A	0.6



NOTE)
 1. DIMENSIONS "*1" AND "*2"
 DO NOT INCLUDE MOLD FLASH.
 2. DIMENSIONS "*3"
 DO NOT INCLUDE TRIM OFFSET.

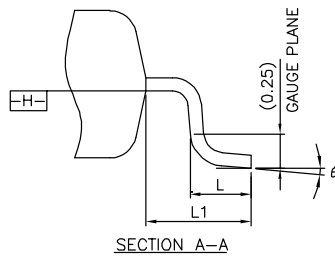
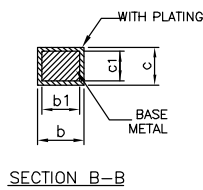
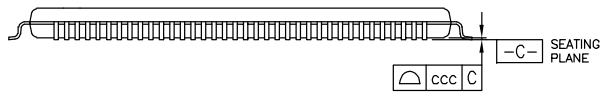
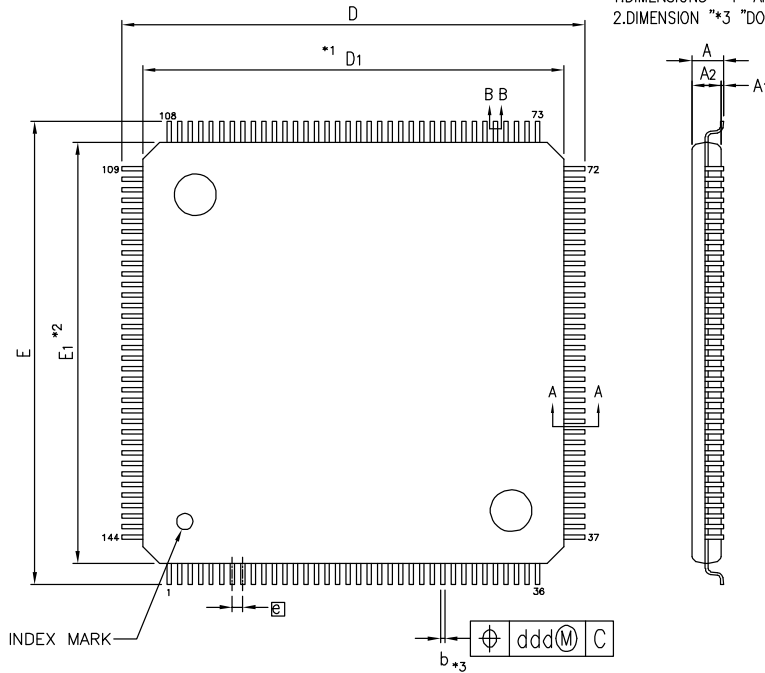


Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
D ₁	13.80	14.00	14.20
E ₁	13.80	14.00	14.20
A ₂	—	1.40	—
D	15.80	16.00	16.20
E	15.80	16.00	16.20
A	—	—	1.60
A ₁	0.05	—	0.15
b	0.17	0.22	0.27
b ₁	0.17	0.20	0.23
c	0.09	—	0.20
c ₁	0.09	—	0.16
θ	0°	—	7°
e	—	0.50	—
L	0.45	0.60	0.75
L ₁	—	1.00	—
ccc	—	—	0.08
ddd	—	—	0.08

A.1.3 144 Pins (R7F701xxxxAFE)

JEITA Package code	RENESAS code	MASS(TYP.)[g]
P-LFQFP144-20x20-0.50	PLQP0144KF-A	1.4

NOTE)
 1.DIMENSIONS "*1" AND "*2" DO NOT INCLUDE MOLD FLASH.
 2.DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.



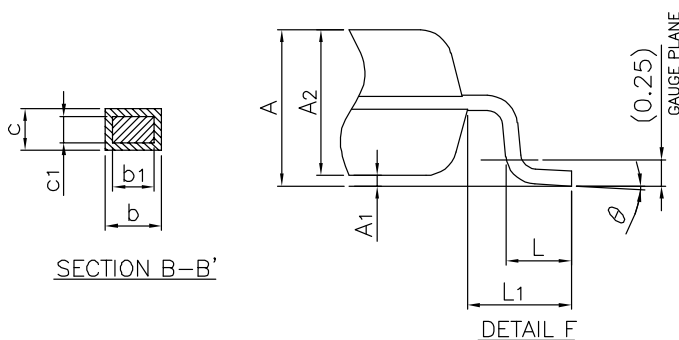
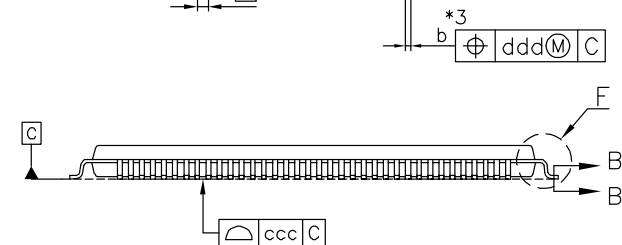
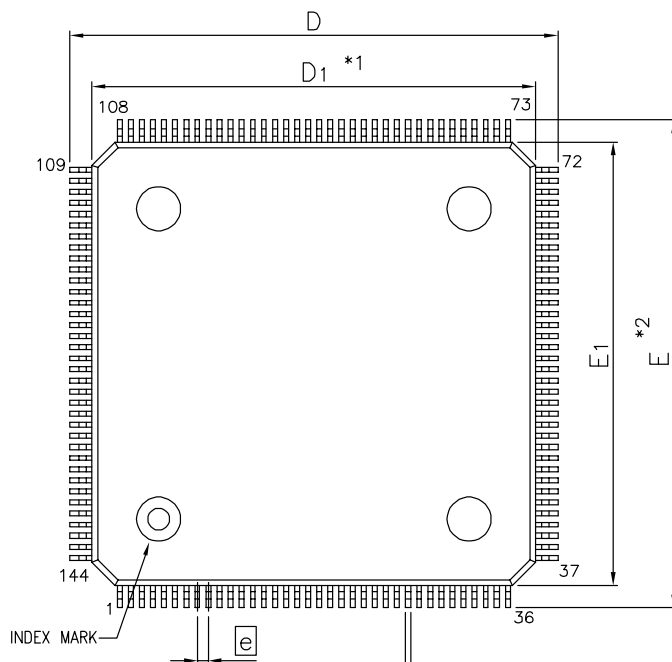
Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
D ₁	19.80	20.00	20.20
E ₁	19.80	20.00	20.20
A ₂	—	1.40	—
D	21.80	22.00	22.20
E	21.80	22.00	22.20
A	—	—	1.60
A ₁	0.05	—	0.15
b	0.17	0.22	0.27
b ₁	0.17	0.20	0.23
c	0.09	—	0.20
c ₁	0.09	—	0.16
□	0°	—	7°
e	—	0.50	—
L	0.45	0.60	0.75
L ₁	—	1.00	—
ccc	—	—	0.08
ddd	—	—	0.08

A.1.4 144 Pins (R7F701xxxxAFD)

JEITA Package code	RENESAS code	MASS(TYP.)[g]
P-LFQFP144-20x20-0.50	PLQP0144KG-A	1.3

NOTE)

1. DIMENSIONS "*1" AND "*2"
DO NOT INCLUDE MOLD FLASH.
2. DIMENSIONS "*3"
DO NOT INCLUDE TRIM OFFSET.

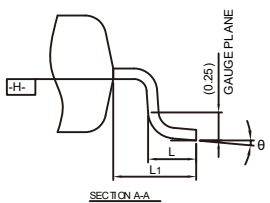
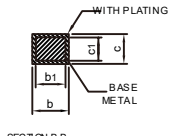
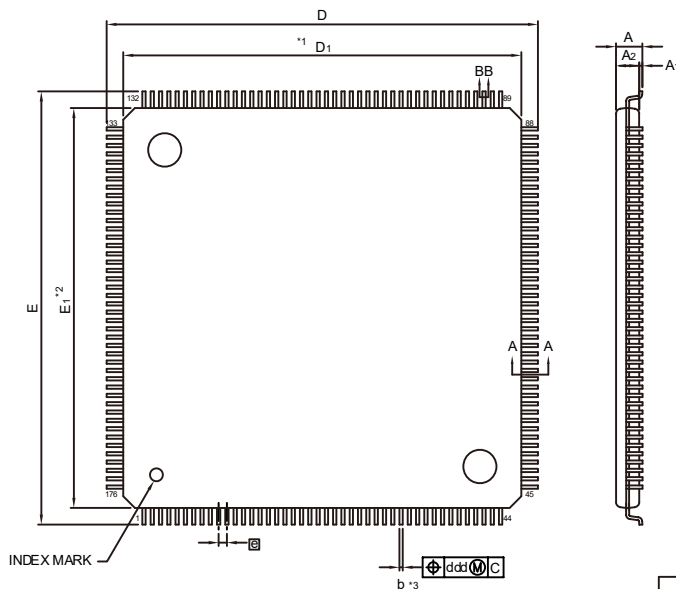


Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
D ₁	19.80	20.00	20.20
E ₁	19.80	20.00	20.20
A ₂	—	1.40	—
D	21.80	22.00	22.20
E	21.80	22.00	22.20
A	—	—	1.60
A ₁	0.05	—	0.15
b	0.17	0.22	0.27
b ₁	0.17	0.20	0.23
c	0.09	—	0.20
c ₁	0.09	—	0.16
θ	0°	—	7°
e	—	0.50	—
L	0.45	0.60	0.75
L ₁	—	1.00	—
ccc	—	—	0.08
ddd	—	—	0.08

A.1.5 176 Pins (R7F701xxxxAFE)

JEITA Package code	RENESAS code	MASS(TYP.)(g)
P-LFQFP176-24x24-0.50	PLQP0176KG-A	1.9

NOTE)
 1. DIMENSIONS "1" AND "2" DO NOT INCLUDE MOLD FLASH.
 2. DIMENSION "3" DOES NOT INCLUDE TRIM OFFSET.

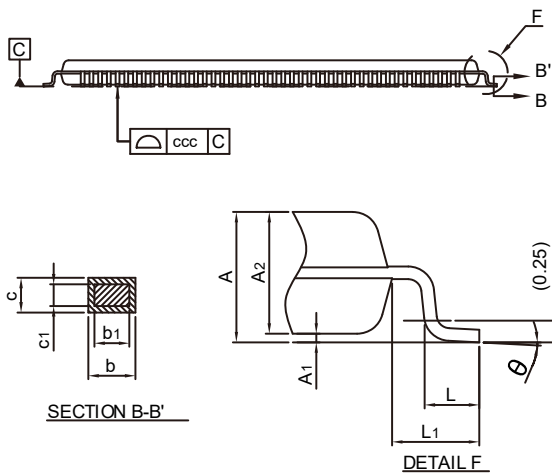
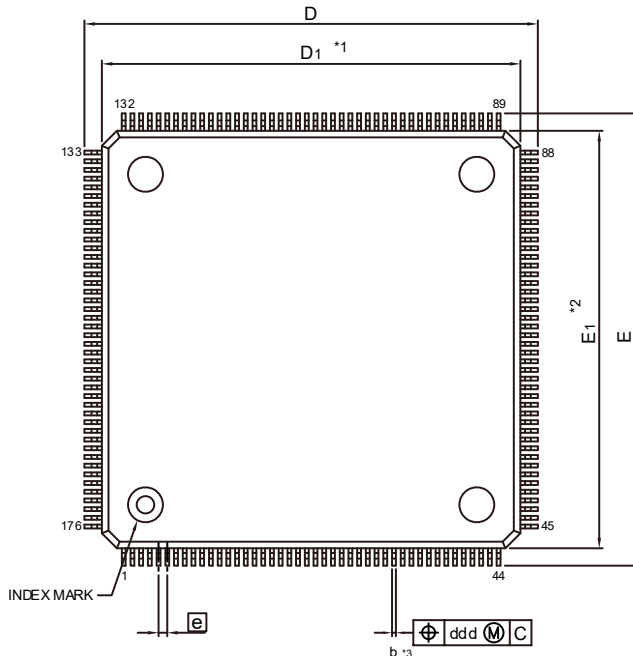


Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
D ₁	23.80	24.00	24.20
E ₁	23.80	24.00	24.20
A ₂	—	1.40	—
D	25.80	26.00	26.20
E	25.80	26.00	26.20
A	—	—	1.60
A ₁	0.05	—	0.15
b	0.17	0.22	0.27
b ₁	0.17	0.20	0.23
c	0.09	—	0.20
c ₁	0.09	—	0.16
θ	0°	—	7°
e	—	0.50	—
L	0.45	0.60	0.75
L ₁	—	1.00	—
ccc	—	—	0.08
ddd	—	—	0.08

A.1.6 176 Pins (R7F701xxxxAFD)

JEITA Package code	RENESAS code	MASS(TYP.)[g]
P-LFQFP176-24x24-0.50	PLQP0176KH-A	1.9

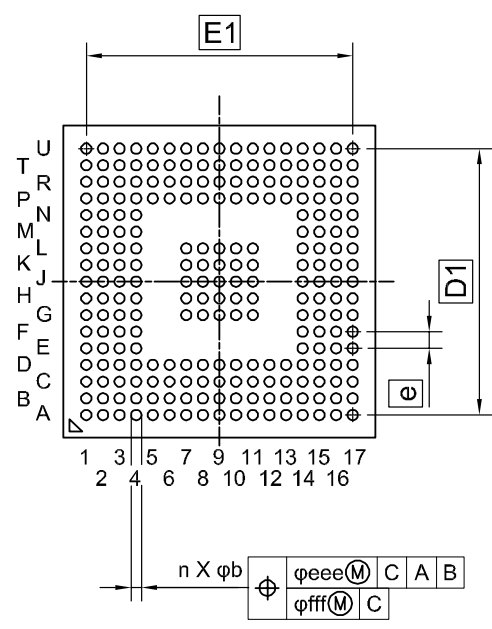
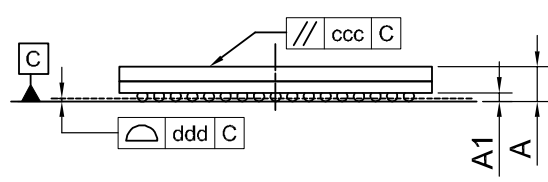
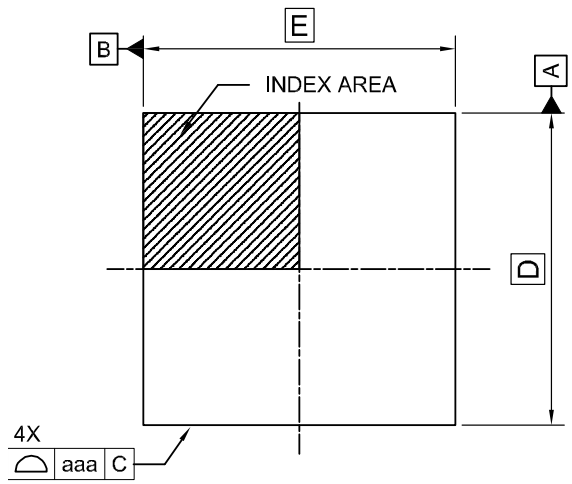
NOTE)
 1. DIMENSIONS *1*AND *2*
 DO NOT INCLUDE MOLD FLASH.
 2. DIMENSIONS *3*
 DO NOT INCLUDE TRIM OFFSET.



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
D ₁	23.80	24.00	24.20
E ₁	23.80	24.00	24.20
A ₂	—	1.40	—
D	25.80	26.00	26.20
E	25.80	26.00	26.20
A	—	—	1.60
A ₁	0.05	—	0.15
b	0.17	0.22	0.27
b ₁	0.17	0.20	0.23
c	0.09	—	0.20
c ₁	0.09	—	0.16
θ	0°	—	7°
e	—	0.50	—
L	0.45	0.60	0.75
L ₁	—	1.00	—
ccc	—	—	0.08
ddd	—	—	0.08

A.1.7 233 Pins (R7F701xxxxABE-C)

JEITA Package code	RENESAS code	MASS(TYP.)[g]
P-FBGA233-15x15-0.80	PRBG0233GB-A	0.70



Reference Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
D	-	15.00	-
E	-	15.00	-
D1	-	12.80	-
E1	-	12.80	-
A	-	-	1.90
A1	0.36	0.41	0.46
b	0.49	0.54	0.59
e	-	0.80	-
aaa	-	-	0.15
ccc	-	-	0.20
ddd	-	-	0.10
eee	-	-	0.20
fff	-	-	0.08
n	-	233	-

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