

SH7210 Series (SH-2)

- Realizes high-performance (160MHz/320MIPS))
- Large-capacity Flash memory
- Numerous peripheral functions

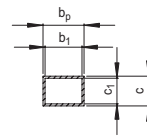
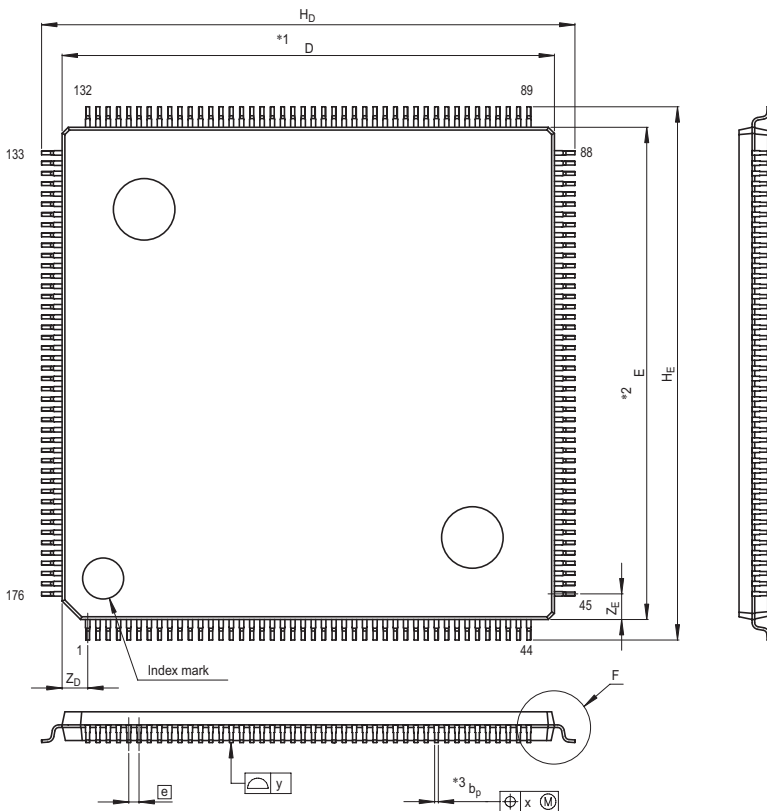
SH7080 Series (SH-2)

- High-speed operation (80MHz)
- Large-capacity Flash memory
- Numerous peripheral functions

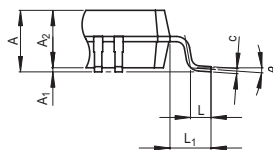
• Specifications (SH7210, SH7080 Series)

Series		SH7210		SH7080															
Group		SH7211		SH7083				SH7084			SH7085			SH7086					
Type No.		RF72115D160FPV**		RF70834AD80FPV**	RF70834AN80FPV**	RF70835AD80FPV**	RF70835AN80FPV**	RF70844AD80FPV**	RF70844AN80FPV**	RF70845AD80FPV**	RF70845AN80FPV**	RF70854AD80FPV**	RF70854AN80FPV**	RF70855AD80FPV**	RF70855AN80FPV**	RF70865AD80FPV**	RF70865AN80FPV**		
Memory	ROM(Bytes)	512K		256K		512K		256K		512K		256K		512K		32K			
	RAM(Bytes)	32K		16K		32K		16K		32K		16K		32K		16K			
	ROM Type*	F																	
	Cache Memory	-																	
Program Security		Yes																	
CPU	CPU	SH-2A Core				SH-2 Core													
	Basic Instructions	91				62													
	Minimum Instruction Execution Time (ns)	6.25 (@160MHz)				12.5 (@80MHz)													
	Dhrystone Performance	320MIPS (160MHz)				104MIPS (80MHz)													
	Multiplier	32 × 32 - 64																	
	Multiply-Accumulate Instruction	32 × 32 + 64 - 64																	
	Barrel Shifter	Yes				-													
	FPU	-																	
MMU		-																	
DMA	DMAC (Channels)	8 (4 of them are available externally)				4 (externally available)													
	DTC/DMAC II	-				DTC													
External Bus Expansion	Address Space (Bytes)	512M (64M × 8)		192M (64M × 3)				512M (64M × 8)				1.5G (64M × 8, G × 1)							
	Bus State Controller	Direct connection to ROM/SRAM/SDRAM/MPX I/O is supported																	
	Bus Structure	Separate bus (8/16-bit)																	
	SDRAM Controller	Yes		-															
	DRAM Controller	-																	
	PCI Controller	-																	
Clock	Endian Conversion	Yes		-															
	Host Interface	-																	
	Clock Generation Circuit	1 circuit																	
	PLL	Yes																	
	RTC	-																	
	Oscillation Stop Detection	-				Yes													
	Frequency Divider	1/n (n = 1, 2, 4, 8)		1/n (n = 1, 2, 3, 4, 8)															
Power Save		Sleep/software standby/module standby																	
Power-On Reset/POR		-																	
A/D Converter	Resolution × Channels	12-bit × 8		10-bit × 8												10-bit × 16			
	Sample and Hold	Yes (1 circuit)		Yes (2 circuits)												Yes (3 circuits)			
	Multi-Channel Sample and Hold	Yes (3 units)		-															
D/A Converter	Resolution × Channels	8-bit × 2		-															
	8-bit	-																	
Timer	16-bit	11 (MTU2 × 6, MTU2S × 3, CMT × 2)																	
	32-bit	-																	
	Input Capture	30 (shared with MTU2 × 19, MTU2S × 11)																	
	Output Compare	24 (shared with MTU2 × 16, MTU2S × 8)																	
	PWM Output	24 (shared with MTU2 × 16, MTU2S × 8)																	
	Event Counter	11 (shared with MTU2, MTU2S, CMT)																	
	2-Phase Encoder Input	2 (shared with MTU2)																	
	3-Phase Inverter Control	2 (shared with MTU2, MTU2S)																	
Watchdog Timer		1																	
Serial Interface	Clock Sync./ Clock Async.	4 (SCIF)		4 (SCI × 3, SCIF × 1)															
	Clock Sync. Only	-																	
	Clock Async. Only	-																	
FC-bus	1		-														Yes		
Smart Card/SIM		-																	
SSU/Special Serial I/O		-		-														1 (SSU)	
CAN	Channels	-																	
	Message Box (Numbers)	-																	
Ethernet		-																	
USB HOST		-																	
USB Function		-																	
IrDA		-																	
LCD		-																	
I/O Ports	Input Only (Numbers)	-				8								16					
	CMOS I/O (Numbers)	73		65		76				100				118					
	High Voltage Port (Numbers)	-																	
	N-Channel Open Drain Port (Numbers)	2 (IFC)		-														2 (IFC)	
	High Current Drive Port	12 (MTU2 × 6, MTU2S × 6)																	
	Pull-Up Resistor	-																	
External Interrupts Pins		9 (NMI + IRQ × 8)				9 (NMI, IRQ × 8)													
Debugging Function	Boundary Scan/JTAG	-																	
	On-Chip Debug	Yes (User debugging interface/ advanced user debugger)				Yes (User Debug Interface)													
	On-Board Flash Program	Yes																	
Other Functions		ROM Correction Function																	
Package		PLQP0144KA-A (FP-144LV)		PTQP0100KA-A (TFP-100BV)				PLQP0112JA-A (FP-112EV)			PLQP0144KA-A (FP-144LV)			PLQP0176KB-A (FP-176EV)					
Operating Frequency/Supply Voltage		160MHz/1.4 to 1.6V, 3.0 to 3.6V (I/O)				80MHz/4.5 to 5.5V or 3.0 to 3.6V													
Operating Ambient Temperature (°C)		-40 to 85		-20 to 85		-40 to 85		-20 to 85		-40 to 85		-20 to 85		-40 to 85		-20 to 85			

* F : Flash memory version, L : ROM-less version, M : Mask ROM version, O : One time PROM version, Qz : QzROM version ★ : New product ★★ : Under development



Terminal cross section



Detail F

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	23.9	24.0	24.1
E	23.9	24.0	24.1
A ₂	—	1.4	—
H _D	25.8	26.0	26.2
H _E	25.8	26.0	26.2
A	—	—	1.7
A ₁	0.05	0.1	0.15
b _p	0.15	0.20	0.25
b ₁	—	0.18	—
c	0.09	0.145	0.20
c ₁	—	0.125	—
θ	0°	—	8°
Ⓜ	—	0.5	—
x	—	—	0.08
y	—	—	0.10
Z _D	—	1.25	—
Z _E	—	1.25	—
L	0.35	0.5	0.65
L ₁	—	1.0	—

JEITA Package Code

RENESAS Code

Previous Package Code

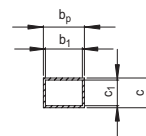
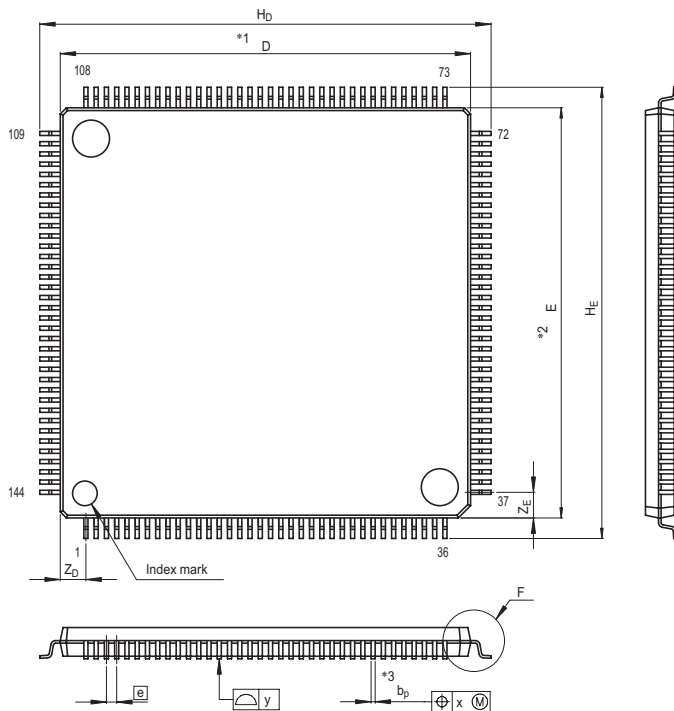
MASS[Typ.]

P-LQFP144-20x20-0.50

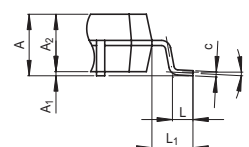
PLQP0144KA-A

144P6Q-A / FP-144L / FP-144LV

1.2g



Terminal cross section



Detail F

NOTE)

1. DIMENSIONS **1* AND **2* DO NOT INCLUDE MOLD FLASH.
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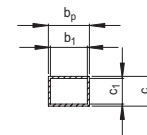
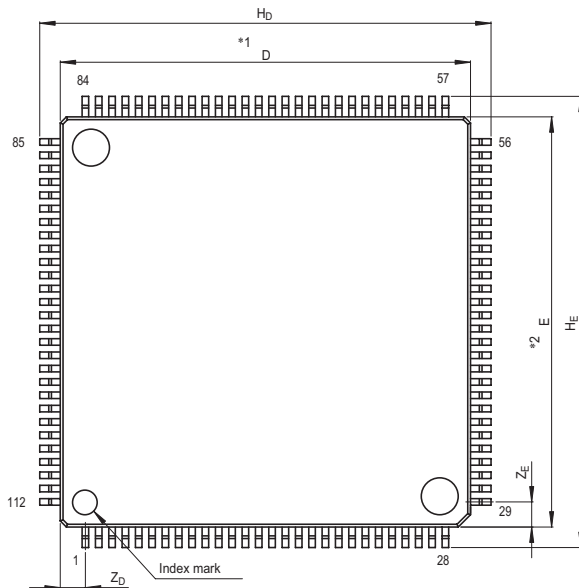
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	19.9	20.0	20.1
E	19.9	20.0	20.1
A ₂	—	1.4	—
H _D	21.8	22.0	22.2
H _E	21.8	22.0	22.2
A	—	—	1.7
A ₁	0.05	0.1	0.15
b _p	0.17	0.22	0.27
b ₁	—	0.20	—
c	0.09	0.145	0.20
c ₁	—	0.125	—
θ	0°	—	8°
Ⓜ	—	0.5	—
x	—	—	0.08
y	—	—	0.10
Z _D	—	1.25	—
Z _E	—	1.25	—
L	0.35	0.5	0.65
L ₁	—	1.0	—

JEITA Package Code
P-LQFP112-20x20-0.65

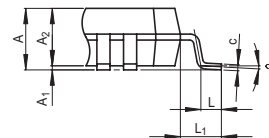
RENESAS Code
PLQP0112JA-A

Previous Code
FP-112E / FP-112EV

MASS[Typ.]
1.2g



Terminal cross section

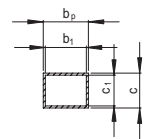
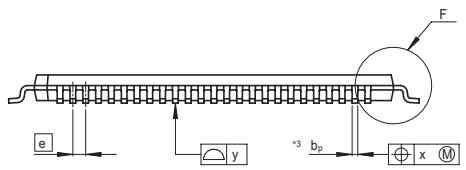
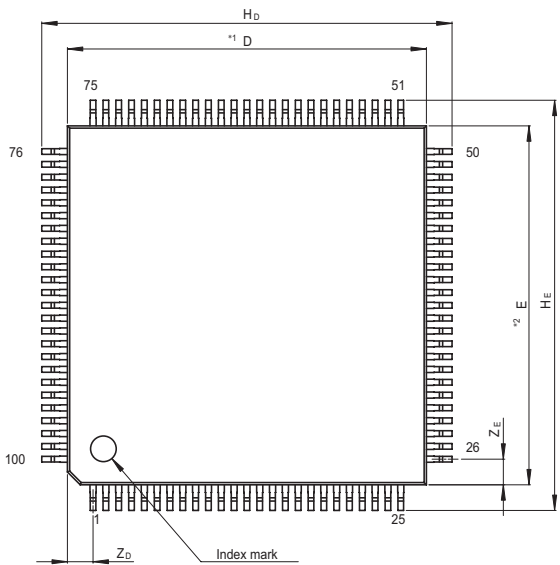


Detail F

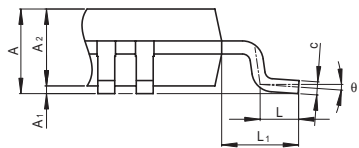
- NOTE)
1. DIMENSIONS **1* AND **2* DO NOT INCLUDE MOLD FLASH.
 2. DIMENSION **3* DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	19.9	20.0	20.1
E	19.9	20.0	20.1
A ₂	—	1.4	—
H _D	21.8	22.0	22.2
H _E	21.8	22.0	22.2
A	—	—	1.7
A ₁	0.05	0.1	0.15
b _p	0.27	0.32	0.37
b ₁	—	0.30	—
c	0.09	0.145	0.20
c ₁	—	0.125	—
θ	0°	—	8°
Ⓜ	—	0.65	—
x	—	—	0.13
y	—	—	0.10
Z _D	—	1.225	—
Z _E	—	1.225	—
L	0.35	0.5	0.65
L ₁	—	1.0	—

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-TQFP100-14x14-0.50	PTQP0100KA-A	TFP-100B/TFP-100BV	0.5g



Terminal cross section



Detail F

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	—	14	—
E	—	14	—
A_2	—	1.00	—
H_D	15.8	16.0	16.2
H_E	15.8	16.0	16.2
A	—	—	1.20
A_1	0.00	0.10	0.20
b_p	0.17	0.22	0.27
b_1	—	0.20	—
c	0.12	0.17	0.22
c_1	—	0.15	—
θ	0°	—	8°
e	—	0.5	—
x	—	—	0.08
y	—	—	0.10
Z_D	—	1.00	—
Z_E	—	1.00	—
L	0.4	0.5	0.6
L_1	—	1.0	—