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RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RL*-A0113A/E	Rev.	1.00
Title	Correction for Incorrect Description Notice RL78/G11 Descriptions in the User's Manual: Hardware Rev. 2.40 Changed		Information Category	Technical Notification		
Applicable Product	RL78/G11 Group	Lot No. All lots	Reference Document	RL78/G11 User's Manual: Hardware Rev. 2.40 R01UH0637EJ0240 (Oct.2020)		

This document describes misstatements found in the RL78/G11 User's Manual: Hardware Rev. 2.40 (R01UH0637EJ0240).

Corrections

Applicable Item	Applicable Page	Contents
35.3.2 Supply current characteristics	Page 1006 to Page.1010	Incorrect descriptions revised
36.3.2 Supply current characteristics	Page 1072 to Page.1074	Incorrect descriptions revised

Document Improvement

The above corrections will be made for the next revision of the User's Manual: Hardware.

Corrections in the User's Manual: Hardware

No.	Corrections and Applicable Items			Pages in this document for corrections
	Document No.	English	R01UH0637EJ0240	
1	35.3.2 Supply current characteristics		Page 1006 to Page.1010	Page 3 to Page 6
2	36.3.2 Supply current characteristics		Page 1072 to Page.1074	Page 7 to Page 9

Incorrect: Bold with underline; Correct: Gray hatched

Revision History

RL78/G11 Correction for incorrect description notice

Document Number	Issue Date	Description
TN-RL*-A0113A/E	Jan. 20, 2023	First edition issued Corrections No.1 to No.2 revised (this document)

1. 35.3.2 Supply current characteristics (Page 1006 to Page.1010)

Incorrect:

35.3.2 Supply current characteristics

(T_A = −40 to +85°C, 1.6 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) **(1/4)**

Parameter	Symbol	Conditions						MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD1}	Operating mode	Basic operation	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V			1.7		mA
						V_{DD} = 3.0 V			1.7		
					f_{HOCO} = 24 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V			1.4		
						V_{DD} = 3.0 V			1.4		
			Normal operation	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V			3.5	6.9	mA
						V_{DD} = 3.0 V			3.5	6.9	
					f_{HOCO} = 24 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V			3.2	6.3	
						V_{DD} = 3.0 V			3.2	6.3	
					f_{HOCO} = 16 MHz Note 3 f_{IH} = 16 MHz Note 3	V_{DD} = 5.0 V			2.4	4.6	
						V_{DD} = 3.0 V			2.4	4.6	
			Normal operation	LS (low-speed main) mode (MCSEL = 0)	f_{IH} = 8 MHz Note 3	V_{DD} = 3.0 V			1.1	2.0	mA
						V_{DD} = 2.0 V			1.1	2.0	
			Normal operation	LS (low-speed main) mode (MCSEL = 1)	f_{IH} = 4 MHz Note 3	V_{DD} = 3.0 V			0.72	1.3	mA
						V_{DD} = 2.0 V			0.72	1.3	
					f_{IM} = 4 MHz Note 6	V_{DD} = 3.0 V			0.58	1.1	
						V_{DD} = 2.0 V			0.58	1.1	
			Normal operation	LV (low-voltage main) mode	f_{IH} = 4 MHz Note 3	V_{DD} = 3.0 V			1.2	1.8	mA
						V_{DD} = 2.0 V			1.2	1.8	
			Normal operation	LP (low-power main) mode (MCSEL = 1)	f_{IH} = 1 MHz Note 3	V_{DD} = 3.0 V			290	480	µA
						V_{DD} = 2.0 V			290	480	
					f_{IM} = 1 MHz Note 6	V_{DD} = 3.0 V			124	230	
						V_{DD} = 2.0 V			124	230	
			Normal operation	HS (high-speed main) mode	f_{MX} = 20 MHz Note 2	V_{DD} = 5.0 V	Square wave input		2.7	5.3	mA
							Resonator connection		2.8	5.5	
						V_{DD} = 3.0 V	Square wave input		2.7	5.3	
							Resonator connection		2.8	5.5	
					f_{MX} = 10 MHz Note 2	V_{DD} = 5.0 V	Square wave input		1.8	3.1	
							Resonator connection		1.9	3.2	
						V_{DD} = 3.0 V	Square wave input		1.8	3.1	
							Resonator connection		1.9	3.2	
			Normal operation	LS (low-speed main) mode (MCSEL = 0)	f_{MX} = 8 MHz Note 2	V_{DD} = 3.0 V	Square wave input		0.9	1.9	mA
							Resonator connection		1.0	2.0	
			Normal operation		f_{MX} = 8 MHz Note 2	V_{DD} = 2.0 V	Square wave input		0.9	1.9	
							Resonator connection		1.0	2.0	
			Normal operation	LS (low-speed main) mode (MCSEL = 1)	f_{MX} = 4 MHz Note 2	V_{DD} = 3.0 V	Square wave input		0.6	1.1	mA
							Resonator connection		0.6	1.2	
			Normal operation		f_{MX} = 4 MHz Note 2	V_{DD} = 2.0 V	Square wave input		0.6	1.1	
							Resonator connection		0.6	1.2	
			Normal operation	LP (low-power main) mode (MCSEL = 1)	f_{MX} = 1 MHz Note 2	V_{DD} = 3.0 V	Square wave input		100	190	µA
							Resonator connection		145	250	
			Normal operation		f_{MX} = 1 MHz Note 2	V_{DD} = 2.0 V	Square wave input		100	190	
							Resonator connection		145	250	

Correct:

35.3.2 Supply current characteristics

(T_A = −40 to +85°C, 1.6 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) **(1/4)**

Parameter	Symbol	Conditions						MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD1}	Operating mode	Basic operation	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V			1.7		mA
						V_{DD} = 3.0 V			1.7		
					f_{HOCO} = 24 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V			1.4		
						V_{DD} = 3.0 V			1.4		
			Normal operation	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V			3.5	6.9	mA
						V_{DD} = 3.0 V			3.5	6.9	
					f_{HOCO} = 24 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V			3.2	6.3	
						V_{DD} = 3.0 V			3.2	6.3	
					f_{HOCO} = 16 MHz Note 3 f_{IH} = 16 MHz Note 3	V_{DD} = 5.0 V			2.4	4.6	
						V_{DD} = 3.0 V			2.4	4.6	
			Normal operation	LS (low-speed main) mode (MCSEL = 0)	f_{IH} = 8 MHz Note 3	V_{DD} = 3.0 V			1.1	2.0	mA
						V_{DD} = 2.0 V			1.1	2.0	
			Normal operation	LS (low-speed main) mode (MCSEL = 1)	f_{IH} = 4 MHz Note 3	V_{DD} = 3.0 V			0.72	1.3	mA
						V_{DD} = 2.0 V			0.72	1.3	
					f_{IM} = 4 MHz Note 6	V_{DD} = 3.0 V			0.58	1.1	
						V_{DD} = 2.0 V			0.58	1.1	
			Normal operation	LV (low-voltage main) mode	f_{IH} = 4 MHz Note 3	V_{DD} = 3.0 V			1.2	1.8	mA
						V_{DD} = 2.0 V			1.2	1.8	
			Normal operation	LP (low-power main) mode (MCSEL = 1)	f_{IH} = 1 MHz Note 3	V_{DD} = 3.0 V			290	480	µA
						V_{DD} = 2.0 V			290	480	
					f_{IM} = 1 MHz Note 6	V_{DD} = 3.0 V			124	230	
						V_{DD} = 2.0 V			124	230	
			Normal operation	HS (high-speed main) mode	f_{MX} = 20 MHz Note 2	V_{DD} = 5.0 V	Square wave input		2.7	5.3	mA
							Resonator connection		2.8	5.5	
						V_{DD} = 3.0 V	Square wave input		2.7	5.3	
							Resonator connection		2.8	5.5	
					f_{MX} = 10 MHz Note 2	V_{DD} = 5.0 V	Square wave input		1.8	3.1	
							Resonator connection		1.9	3.2	
						V_{DD} = 3.0 V	Square wave input		1.8	3.1	
							Resonator connection		1.9	3.2	
			Normal operation	LS (low-speed main) mode (MCSEL = 0)	f_{MX} = 8 MHz Note 2	V_{DD} = 3.0 V	Square wave input		0.9	1.9	mA
							Resonator connection		1.0	2.0	
			Normal operation		f_{MX} = 8 MHz Note 2	V_{DD} = 2.0 V	Square wave input		0.9	1.9	
							Resonator connection		1.0	2.0	
			Normal operation	LS (low-speed main) mode (MCSEL = 1)	f_{MX} = 4 MHz Note 2	V_{DD} = 3.0 V	Square wave input		0.6	1.1	mA
							Resonator connection		0.6	1.2	
			Normal operation		f_{MX} = 4 MHz Note 2	V_{DD} = 2.0 V	Square wave input		0.6	1.1	
							Resonator connection		0.6	1.2	
			Normal operation	LP (low-power main) mode (MCSEL = 1)	f_{MX} = 1 MHz Note 2	V_{DD} = 3.0 V	Square wave input		100	190	µA
							Resonator connection		145	250	
			Normal operation		f_{MX} = 1 MHz Note 2	V_{DD} = 2.0 V	Square wave input		100	190	
							Resonator connection		145	250	

(T_A = −40 to +85°C, 1.6 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (2/4)

Parameter	Symbol	Conditions						MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD1}	Operating mode	Normal operation	Subsystem clock operation	f_{IL} = 15 kHz, T_A = -40°C Note 5	Normal operation			1.8	5.9	μA
					f_{IL} = 15 kHz, T_A = +25°C Note 5	Normal operation			1.9	5.9	
					f_{IL} = 15 kHz, T_A = +85°C Note 5	Normal operation			2.3	8.7	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. **The MAX values include the peripheral operating current. However, these values do not include the current flowing into the A/D converter, D/A converter, comparator, programmable gain amplifier, LVD circuit, I/O ports, and on-chip pull-up/pull-down resistors, and the current flowing during data flash rewrite.**

Note 2. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 3. When the high-speed system clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 4. When the high-speed system clock is stopped.

Note 5. When the high-speed system clock, high-speed on-chip oscillator clock and middle-speed on-chip oscillator clock are stopped.

Note 6. When the high-speed system clock, high-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Remark 1. f_{MX}: High-speed system clock frequency (X1 clock oscillation frequency or external main system clock frequency)

Remark 2. f_{IH}: High-speed on-chip oscillator clock frequency (24 MHz max.)

Remark 3. f_{IM}: Middle-speed on-chip oscillator clock frequency (4 MHz max.)

Remark 4. f_{IL}: Low-speed on-chip oscillator clock frequency

Remark 5. f_{SUB}: Subsystem clock frequency (Low-speed on-chip oscillator clock frequency)

Remark 6. Except subsystem clock operation, temperature condition of the TYP. value is T_A = 25°C

(T_A = −40 to +85°C, 1.6 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (2/4)

Parameter	Symbol	Conditions						MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD1}	Operating mode	Normal operation	Subsystem clock operation	f_{IL} = 15 kHz, T_A = -40°C Note 5	Normal operation			1.8	5.9	μA
					f_{IL} = 15 kHz, T_A = +25°C Note 5	Normal operation			1.9	5.9	
					f_{IL} = 15 kHz, T_A = +85°C Note 5	Normal operation			2.3	8.7	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. The following points apply in the HS (high-speed main), LS (low-speed main), LV (low-voltage main), and LP (low-power main) modes.
• The currents in the “TYP.” column do not include the operating currents of the peripheral modules.
• The currents in the “MAX.” column include the operating currents of the peripheral modules, except for those flowing into the A/D converter, D/A converter, comparator, programmable gain amplifier, LVD circuit, I/O port, and on-chip pull-up/pull-down resistors, and those flowing while the data flash memory is being rewritten.
In the subsystem clock operation, the currents in both the “TYP.” and “MAX.” columns do not include the operating currents of the peripheral modules.

Note 2. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 3. When the high-speed system clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 4. When the high-speed system clock is stopped.

Note 5. When the high-speed system clock, high-speed on-chip oscillator clock and middle-speed on-chip oscillator clock are stopped.

Note 6. When the high-speed system clock, high-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Remark 1. f_{MX}: High-speed system clock frequency (X1 clock oscillation frequency or external main system clock frequency)

Remark 2. f_{IH}: High-speed on-chip oscillator clock frequency (24 MHz max.)

Remark 3. f_{IM}: Middle-speed on-chip oscillator clock frequency (4 MHz max.)

Remark 4. f_{IL}: Low-speed on-chip oscillator clock frequency

Remark 5. f_{SUB}: Subsystem clock frequency (Low-speed on-chip oscillator clock frequency)

Remark 6. Except subsystem clock operation, temperature condition of the TYP. value is T_A = 25°C

(T_A = −40 to +85°C, 1.6 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (3/4)

Parameter	Symbol	Conditions				MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD2} Note 2	HALT mode	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 4	V_{DD} = 5.0 V		0.59	2.43	mA
				f_{IH} = 24 MHz Note 4	V_{DD} = 3.0 V		0.59	2.43	
				f_{HOCO} = 24 MHz Note 4	V_{DD} = 5.0 V		0.41	1.83	
				f_{IH} = 24 MHz Note 4	V_{DD} = 3.0 V		0.41	1.83	
			Subsystem clock operation	f_{IL} = 15 kHz, T_A = -40°C Note 5			0.48	1.22	μA
				f_{IL} = 15 kHz, T_A = +25°C Note 5			0.55	1.22	
				f_{IL} = 15 kHz, T_A = +85°C Note 5			0.80	3.30	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. **The MAX values include the peripheral operating current. However, these values do not include the current flowing into the A/D converter, D/A converter, comparator, programmable gain amplifier, LVD circuit, I/O ports, and on-chip pull-up/pull-down resistors, and the current flowing during data flash rewrite.**

Note 2. When the HALT instruction is executed in the flash memory.

Note 3. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 4. When the high-speed system clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 5. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and high-speed system clock are stopped.

Note 6. When the high-speed system clock, high-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Remark 1. f_{MX}: High-speed system clock frequency (X1 clock oscillation frequency or external main system clock frequency)

Remark 2. f_{IH}: High-speed on-chip oscillator clock frequency (24 MHz max.)

Remark 3. f_{IM}: Middle-speed on-chip oscillator clock frequency (4 MHz max.)

Remark 4. f_{IL}: Low-speed on-chip oscillator clock frequency

Remark 5. f_{SUB}: Subsystem clock frequency (Low-speed on-chip oscillator clock frequency)

Remark 6. Except subsystem clock operation, temperature condition of the TYP. value is T_A = 25°C

(T_A = −40 to +85°C, 1.6 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (3/4)

Parameter	Symbol	Conditions				MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD2} Note 2	HALT mode	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 4	V_{DD} = 5.0 V		0.59	2.43	mA
				f_{IH} = 24 MHz Note 4	V_{DD} = 3.0 V		0.59	2.43	
				f_{HOCO} = 24 MHz Note 4	V_{DD} = 5.0 V		0.41	1.83	
				f_{IH} = 24 MHz Note 4	V_{DD} = 3.0 V		0.41	1.83	
			Subsystem clock operation	f_{IL} = 15 kHz, T_A = -40°C Note 5			0.48	1.22	μA
				f_{IL} = 15 kHz, T_A = +25°C Note 5			0.55	1.22	
				f_{IL} = 15 kHz, T_A = +85°C Note 5			0.80	3.30	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. The following points apply in the HS (high-speed main), LS (low-speed main), LV (low-voltage main), and LP (low-power main) modes.
- The currents in the “TYP.” column do not include the operating currents of the peripheral modules.
- The currents in the “MAX.” column include the operating currents of the peripheral modules, except for those flowing into the A/D converter, D/A converter, comparator, programmable gain amplifier, LVD circuit, I/O port, and on-chip pull-up/pull-down resistors, and those flowing while the data flash memory is being rewritten.

In the subsystem clock operation, the currents in both the “TYP.” and “MAX.” columns do not include the operating currents of the peripheral modules.

Note 2. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 3. When the high-speed system clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 4. When the high-speed system clock is stopped.

Note 5. When the high-speed system clock, high-speed on-chip oscillator clock and middle-speed on-chip oscillator clock are stopped.

Note 6. When the high-speed system clock, high-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Remark 1. f_{MX}: High-speed system clock frequency (X1 clock oscillation frequency or external main system clock frequency)

Remark 2. f_{IH}: High-speed on-chip oscillator clock frequency (24 MHz max.)

Remark 3. f_{IM}: Middle-speed on-chip oscillator clock frequency (4 MHz max.)

Remark 4. f_{IL}: Low-speed on-chip oscillator clock frequency

Remark 5. f_{SUB}: Subsystem clock frequency (Low-speed on-chip oscillator clock frequency)

Remark 6. Except subsystem clock operation, temperature condition of the TYP. value is T_A = 25°C

(T_A = −40 to +85°C, 1.6 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) **(4/4)**

Parameter	Symbol	Conditions		MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD3}	STOP mode Note 3	T_A = -40°C		0.19	0.51	μA
	Note 2		T_A = +25°C		0.25	0.51	
			T_A = +50°C		0.28	1.10	
			T_A = +70°C		0.38	1.90	
			T_A = +85°C		0.60	3.30	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. **The MAX values include the peripheral operating current. However, these values do not include the current flowing into the A/D converter, comparator, Programmable gain amplifier, LVD circuit, I/O ports, and on-chip pullup/pull-down resistors, and the current flowing during data flash rewrite.**

Note 2. The values do not include the current flowing into the 12-bit interval timer and watchdog timer.

Note 3. For the setting of the current values when operating the subsystem clock in STOP mode, see the current values when operating the subsystem clock in HALT mode.

(T_A = −40 to +85°C, 1.6 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) **(4/4)**

Parameter	Symbol	Conditions		MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD3}	STOP mode Note 2	T_A = -40°C		0.19	0.51	μA
			T_A = +25°C		0.25	0.51	
			T_A = +50°C		0.28	1.10	
			T_A = +70°C		0.38	1.90	
			T_A = +85°C		0.60	3.30	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. In the STOP mode, the currents in both the “TYP.” and “MAX.” columns do not include the operating currents of the peripheral modules.

Note 2. For the setting of the current values when operating the subsystem clock in STOP mode, see the current values when operating the subsystem clock in HALT mode.

2. 36.3.2 Supply current characteristics (Page 1072 to Page.1074)

Incorrect:

36.3.2 Supply current characteristics

(T_A = −40 to +105°C, 2.4 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (1/3)

Parameter	Symbol	Conditions					MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD1}	Operating mode	Basic operation	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V		1.7		mA
						V_{DD} = 3.0 V		1.7		
					f_{HOCO} = 24 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V		1.4		
						V_{DD} = 3.0 V		1.4		
			Normal operation	Subsystem clock operation	f_{IL} = 15 kHz, T_A = -40°C Note 4			1.8	5.9	µA
					f_{IL} = 15 kHz, T_A = +25°C Note 4			1.9	5.9	
					f_{IL} = 15 kHz, T_A = +85°C Note 4			2.3	8.7	
					f_{IL} = 15 kHz, T_A = +105°C Note 4			3.0	20.9	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. **The MAX values include the peripheral operating current. However, these values do not include the current flowing into the A/D converter, comparator, programmable gain amplifier, LVD circuit, I/O ports, and on-chip pull-up/pull-down resistors, and the current flowing during data flash rewrite.**

Note 2. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 3. When the high-speed system clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 4. When the high-speed system clock, high-speed on-chip oscillator clock and middle-speed on-chip oscillator clock are stopped.

Remark 1. f_{MX}: High-speed system clock frequency (X1 clock oscillation frequency or external main system clock frequency)

Remark 2. f_{IH}: High-speed on-chip oscillator clock frequency (24 MHz max.)

Remark 3. f_{IM}: Middle-speed on-chip oscillator clock frequency (4 MHz max.)

Remark 4. f_{IL}: Low-speed on-chip oscillator clock frequency

Remark 5. f_{SUB}: Subsystem clock frequency (Low-speed on-chip oscillator clock frequency)

Remark 6. Except subsystem clock operation, temperature condition of the TYP. value is T_A = 25°C

Correct:

36.3.2 Supply current characteristics

(T_A = −40 to +105°C, 2.4 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (1/3)

Parameter	Symbol	Conditions					MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD1}	Operating mode	Basic operation	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V		1.7		mA
						V_{DD} = 3.0 V		1.7		
					f_{HOCO} = 24 MHz Note 3 f_{IH} = 24 MHz Note 3	V_{DD} = 5.0 V		1.4		
						V_{DD} = 3.0 V		1.4		
			Normal operation	Subsystem clock operation	f_{IL} = 15 kHz, T_A = -40°C Note 4			1.8	5.9	µA
					f_{IL} = 15 kHz, T_A = +25°C Note 4			1.9	5.9	
					f_{IL} = 15 kHz, T_A = +85°C Note 4			2.3	8.7	
					f_{IL} = 15 kHz, T_A = +105°C Note 4			3.0	20.9	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. The following points apply in the HS (high-speed main) modes.
- The currents in the “TYP.” column do not include the operating currents of the peripheral modules.
- The currents in the “MAX.” column include the operating currents of the peripheral modules, except for those flowing into the A/D converter, D/A converter, comparator, programmable gain amplifier, LVD circuit, I/O port, and on-chip pull-up/pull-down resistors, and those flowing while the data flash memory is being rewritten.

In the subsystem clock operation, the currents in both the “TYP.” and “MAX.” columns do not include the operating currents of the peripheral modules.

Note 2. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 3. When the high-speed system clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 4. When the high-speed system clock, high-speed on-chip oscillator clock and middle-speed on-chip oscillator clock are stopped.

Remark 1. f_{MX}: High-speed system clock frequency (X1 clock oscillation frequency or external main system clock frequency)

Remark 2. f_{IH}: High-speed on-chip oscillator clock frequency (24 MHz max.)

Remark 3. f_{IM}: Middle-speed on-chip oscillator clock frequency (4 MHz max.)

Remark 4. f_{IL}: Low-speed on-chip oscillator clock frequency

Remark 5. f_{SUB}: Subsystem clock frequency (Low-speed on-chip oscillator clock frequency)

Remark 6. Except subsystem clock operation, temperature condition of the TYP. value is T_A = 25°C

(T_A = −40 to +105°C, 2.4 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (2/3)

Parameter	Symbol	Conditions					MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD2} Note 2	HALT mode	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 3	V_{DD} = 5.0 V			0.59	3.45	mA
				f_{IH} = 24 MHz Note 4	V_{DD} = 3.0 V			0.59	3.45	
				f_{HOCO} = 24 MHz Note 3	V_{DD} = 5.0 V			0.41	2.85	
				f_{IH} = 16 MHz Note 4	V_{DD} = 3.0 V			0.41	2.85	
				f_{HOCO} = 16 MHz Note 3	V_{DD} = 5.0 V			0.39	2.08	
				f_{IH} = 16 MHz Note 4	V_{DD} = 3.0 V			0.39	2.08	
			HS (high-speed main) mode	f_{MX} = 20 MHz Note 3	V_{DD} = 5.0 V	Square wave input		0.20	2.45	mA
						Resonator connection		0.40	2.57	
					V_{DD} = 3.0 V	Square wave input		0.20	2.45	
						Resonator connection		0.40	2.57	
				f_{MX} = 10 MHz Note 3	V_{DD} = 5.0 V	Square wave input		0.15	1.28	
						Resonator connection		0.30	1.36	
					V_{DD} = 3.0 V	Square wave input		0.15	1.28	
						Resonator connection		0.30	1.36	
			Subsystem clock operation	f_{IL} = 15 kHz, T_A = -40°C Note 5				0.48	1.22	μA
				f_{IL} = 15 kHz, T_A = +25°C Note 5				0.55	1.22	
				f_{IL} = 15 kHz, T_A = +85°C Note 5				0.80	3.30	
				f_{IL} = 15 kHz, T_A = +105°C Note 5				2.00	17.3	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. **The MAX values include the peripheral operating current. However, these values do not include the current flowing into the A/D converter, comparator, programmable gain amplifier, LVD circuit, I/O ports, and on-chip pull-up/pull-down resistors, and the current flowing during data flash rewrite.**

Note 2. When the HALT instruction is executed in the flash memory.

Note 3. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 4. When the high-speed system clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 5. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and high-speed system clock are stopped.

Remark 1. f_{MX}: High-speed system clock frequency (X1 clock oscillation frequency or external main system clock frequency)

Remark 2. f_{IH}: High-speed on-chip oscillator clock frequency (24 MHz max.)

Remark 3. f_{IM}: Middle-speed on-chip oscillator clock frequency (4 MHz max.)

Remark 4. f_{IL}: Low-speed on-chip oscillator clock frequency

Remark 5. f_{SUB}: Subsystem clock frequency (Low-speed on-chip oscillator clock frequency)

Remark 6. Except subsystem clock operation, temperature condition of the TYP. value is T_A = 25°C

(T_A = −40 to +105°C, 2.4 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (2/3)

Parameter	Symbol	Conditions					MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD2} Note 2	HALT mode	HS (high-speed main) mode	f_{HOCO} = 48 MHz Note 3	V_{DD} = 5.0 V			0.59	3.45	mA
				f_{IH} = 24 MHz Note 4	V_{DD} = 3.0 V			0.59	3.45	
				f_{HOCO} = 24 MHz Note 3	V_{DD} = 5.0 V			0.41	2.85	
				f_{IH} = 16 MHz Note 4	V_{DD} = 3.0 V			0.41	2.85	
				f_{HOCO} = 16 MHz Note 3	V_{DD} = 5.0 V			0.39	2.08	
				f_{IH} = 16 MHz Note 4	V_{DD} = 3.0 V			0.39	2.08	
			HS (high-speed main) mode	f_{MX} = 20 MHz Note 3	V_{DD} = 5.0 V	Square wave input		0.20	2.45	mA
						Resonator connection		0.40	2.57	
					V_{DD} = 3.0 V	Square wave input		0.20	2.45	
						Resonator connection		0.40	2.57	
				f_{MX} = 10 MHz Note 3	V_{DD} = 5.0 V	Square wave input		0.15	1.28	
						Resonator connection		0.30	1.36	
					V_{DD} = 3.0 V	Square wave input		0.15	1.28	
						Resonator connection		0.30	1.36	
			Subsystem clock operation	f_{IL} = 15 kHz, T_A = -40°C Note 5				0.48	1.22	μA
				f_{IL} = 15 kHz, T_A = +25°C Note 5				0.55	1.22	
				f_{IL} = 15 kHz, T_A = +85°C Note 5				0.80	3.30	
				f_{IL} = 15 kHz, T_A = +105°C Note 5				2.00	17.3	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. The following points apply in the HS (high-speed main) modes.
- The currents in the “TYP.” column do not include the operating currents of the peripheral modules.
- The currents in the “MAX.” column include the operating currents of the peripheral modules, except for those flowing into the A/D converter, D/A converter, comparator, programmable gain amplifier, LVD circuit, I/O port, and on-chip pull-up/pull-down resistors, and those flowing while the data flash memory is being rewritten.

In the subsystem clock operation, the currents in both the “TYP.” and “MAX.” columns do not include the operating currents of the peripheral modules.

Note 2. When the HALT instruction is executed in the flash memory.

Note 3. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 4. When the high-speed system clock, middle-speed on-chip oscillator clock and low-speed on-chip oscillator clock are stopped.

Note 5. When the high-speed on-chip oscillator clock, middle-speed on-chip oscillator clock and high-speed system clock are stopped.

Remark 1. f_{MX}: High-speed system clock frequency (X1 clock oscillation frequency or external main system clock frequency)

Remark 2. f_{IH}: High-speed on-chip oscillator clock frequency (24 MHz max.)

Remark 3. f_{IM}: Middle-speed on-chip oscillator clock frequency (4 MHz max.)

Remark 4. f_{IL}: Low-speed on-chip oscillator clock frequency

Remark 5. f_{SUB}: Subsystem clock frequency (Low-speed on-chip oscillator clock frequency)

Remark 6. Except subsystem clock operation, temperature condition of the TYP. value is T_A = 25°C

(T_A = −40 to +105°C, 2.4 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (3/3)

Parameter	Symbol	Conditions		MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD3} Note 2	STOP mode Note 3	T_A = -40°C		0.19	0.51	μA
			T_A = +25°C		0.25	0.51	
			T_A = +50°C		0.28	1.10	
			T_A = +70°C		0.38	1.90	
			T_A = +85°C		0.60	3.30	
			T_A = +105°C		1.5	17.0	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. **The MAX values include the peripheral operating current. However, these values do not include the current flowing into the A/D converter, comparator, Programmable gain amplifier, LVD circuit, I/O ports, and on-chip pullup/pull-down resistors, and the current flowing during data flash rewrite.**

Note 2. The values do not include the current flowing into the 12-bit interval timer and watchdog timer.

Note 3. For the setting of the current values when operating the subsystem clock in STOP mode, see the current values when operating the subsystem clock in HALT mode.

(T_A = −40 to +105°C, 2.4 V ≤ EV_{DD0} ≤ V_{DD} ≤ 5.5 V, V_{SS} = 0 V) (3/3)

Parameter	Symbol	Conditions		MIN.	TYP.	MAX.	Unit
Supply current Note 1	I_{DD3}	STOP mode Note 3	T_A = -40°C		0.19	0.51	μA
			T_A = +25°C		0.25	0.51	
			T_A = +50°C		0.28	1.10	
			T_A = +70°C		0.38	1.90	
			T_A = +85°C		0.60	3.30	
			T_A = +105°C		1.5	17.0	

Note 1. Total current flowing into V_{DD} and EV_{DD}, including the input leakage current flowing when the level of the input pin is fixed to V_{DD} or V_{SS}. In the STOP mode, the currents in both the “TYP.” and “MAX.” columns do not include the operating currents of the peripheral modules.

Note 2. For the setting of the current values when operating the subsystem clock in STOP mode, see the current values when operating the subsystem clock in HALT mode.