

# RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RX*-A178A/E	Rev.	1.00
Title	Added junction temperature, recommended operational conditions, and thermal resistance value (reference value)		Information Category	Technical Notification		
Applicable Product	RX64M Group, RX71M Group	Lot No.	Reference Document	RX64M Group User's Manual Hardware Rev1.10 (R01UH0377EJ0110) RX71M Group User's Manual Hardware Rev1.00 (R01UH0493EJ0100)		
		All				

Junction temperature, recommended operational conditions, and thermal resistance value (reference value) are added as electrical characteristics of RX64M group and RX71M group User's Manual.

## ■ Revisions

- ① Junction temperature is added to "Table 64.1 Absolute maximum rating". Also, the operating temperature range section is moved to "Recommended Operational Condition" which is newly added.

【In RX64M Before】

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Table 64.1 Absolute maximum rating

Condition : VSS = AVSS0 = AVSS1 = VREFLO = VSS\_USB = VSS1\_USBA = VSS2\_USBA  
= PVSS\_USBA = AVSS\_USBA = 0V

Item	Symbol	Value	Unit
Operating temperature	Topr	-40 to +85	°C
Operating temperature (high-temperature products)	Topr	-40 to +105 (Under planning)	°C

【In RX64M After】

Table 64.1 Absolute maximum rating

Condition : VSS = AVSS0 = AVSS1 = VREFLO = VSS\_USB = VSS1\_USBA = VSS2\_USBA  
= PVSS\_USBA = AVSS\_USBA = 0V

Item	Symbol	Rated value	Unit
Junction temperature	Tj	-40 ~ +105	°C
		-40 ~ +125 (under planning)	

The following recommended operational conditions is added newly.

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Table 64.2 recommended operational condition

Item	Symbol	Min	Typ	Max	Unit
Power supply voltage	VCC	2.7	—	3.6	V
	VSS	—	0	—	V
V <sub>BATT</sub> power supply voltage	V <sub>BATT</sub>	2.0	—	3.6	V
Reference power voltage	VREFH0	2.7	—	AVCC0	V
	VREFL0	—	0	—	V
Analog power supply voltage	AVCC0	—	VCC	—	V
	AVSS0	—	0	—	V
	AVCC1	—	VCC	—	V
	AVSS1	—	0	—	V
USB power supply voltage	VCC_USB	—	VCC	—	V
	VSS_USB	—	0	—	V
USBA power supply voltage	VCC_USBA	3.0	—	3.6	V
	VSS1_USBA	—	0	—	V
	VSS2_USBA	—	0	—	V
USBA analog power supply voltage	AVCC_USBA	3.0	—	3.6	V
	AVSS_USBA	—	0	—	V
	PVSS_USBA	—	0	—	V
Operating temperature	Topr	-40	—	85	°C
Operating temperature (high-temperature products)	Topr	-40	—	105 (Under planning)	°C

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Table 64.1 Absolute maximum rating

Condition : VSS = AVSS0 = AVSS1 = VREFLO = VSS\_USB = VSS1\_USBA = VSS2\_USBA  
 = PVSS\_USBA = AVSS\_USBA = 0V

Item	Symbol	Value	Unit
Operating temperature	T <sub>opr</sub>	-40 to +85	°C
Operating temperature (high-temperature products)	T <sub>opr</sub>	-40 to +105 (Under planning)	°C

【In RX71M After】

Table 64.1 Absolute maximum rating

Condition : VSS = AVSS0 = AVSS1 = VREFLO = VSS\_USB = VSS1\_USBA = VSS2\_USBA  
 = PVSS\_USBA = AVSS\_USBA = 0V

Item	Symbol	Value	Unit
Junction temperature	T <sub>j</sub>	D version	-40 to +105
		G version	-40 to +125 (Under planning)

The following recommended operational conditions is added newly

【In RX71M】

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Table 64.2 Recommended operational condition

Item	Symbol	Min	Typ	Max	Unit
Power supply voltage	VCC	2.7	—	3.6	V
	VSS	—	0	—	V
V <sub>BATT</sub> power supply voltage	V <sub>BATT</sub>	2.0	—	3.6	V
Reference power voltage	VREFH0	2.7	—	AVCC0	V
	VREFLO	—	0	—	V
Analog power supply voltage	AVCC0	—	VCC	—	V
	AVSS0	—	0	—	V
	AVCC1	—	VCC	—	V
	AVSS1	—	0	—	V
USB power supply voltage	VCC_USB	—	VCC	—	V
	VSS_USB	—	0	—	V
USBA power supply voltage	VCC_USBA	3.0	—	3.6	V
	VSS1_USBA	—	0	—	V
	VSS2_USBA	—	0	—	V
USBA analog power supply voltage	AVCC_USBA	3.0	—	3.6	V
	AVSS_USBA	—	0	—	V
	PVSS_USBA	—	0	—	V
Operating temperature	Topr	-40	—	85	°C
Operating temperature (high-temperature products)	Topr	-40	—	105 (under planning)	°C

② The thermal resistance values (reference values) measured by methods of the JEDEC standards is added to DC characteristics.

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Table 64.7 Thermal resistance value (reference value)

Item	Package	Symbol	Value	Unit	Test Conditions
Thermal resistance value (reference value)	PLQP0176KB-A	$\theta_{ja}$	39.4	°C/W	JESD51-2 JESD51-7 conformant
	PLQP0144KA-A		40.7		
	PLQP0100KB-A		41.7		
	PLBG0176GA-A		28.5		
	PTLG0177KA-A		29.4		
	PTLG0145KA-A		29.9		
	PTLG0100JA-A	21.4	$\Psi_{jt}$	°C/W	JESD51-2 JESD51-9 conformant
	PLQP0176KB-A	0.5			
	PLQP0144KA-A	0.5			
	PLQP0100KB-A	0.5			
	PLBG0176GA-A	0.2			
	PTLG0177KA-A	0.2			
	PTLG0145KA-A	0.2			
	PTLG0100JA-A	0.2			

\* : The above values are when using a 4-layer mounting board. Thermal resistance may change depending on usage environments such as the number of layers and board size. For more details on environment, see the JEDEC standards

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Table 64.7 Thermal resistance value (reference value)

Item	Package	Symbol	Value	Unit	Test Conditions
Thermal resistance value (reference value)	PLQP0176KB-A	$\theta_{ja}$	39.1	°C/W	JESD51-2 JESD51-7 conformant
	PLQP0144KA-A		40.4		
	PLQP0100KB-A		41.3		
	PLBG0176GA-A		28.4		
	PTLG0177KA-A		27.7		
	PTLG0145KA-A		28.2		
	PTLG0100JA-A		20.6		
	PLQP0176KB-A	$\Psi_{jt}$	0.5	°C/W	JESD51-2 JESD51-7 conformant
	PLQP0144KA-A		0.5		
	PLQP0100KB-A		0.5		
	PLBG0176GA-A		0.2		
	PTLG0177KA-A		0.2		
	PTLG0145KA-A		0.2		
	PTLG0100JA-A		0.2		

\* : The above values are when using a 4-layer mounting board. Thermal resistance may change depending on usage environments such as the number of layers and board size. For more details on environment, see the JEDEC standards

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