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RENESAS TECHNICAL UPDATE

TOYOSU FORESIA, 3-2-24, Toyosu, Koto-ku, Tokyo 135-0061, Japan
Renesas Electronics Corporation

Product Category	MPU/MCU		Document No.	TN-RZ*-A0065A/E	Rev.	1.00
Title	Note on reconnecting the RZ/A2M USB2.0 host device to the peer-device		Information Category	Technical Notification		
Applicable Product	RZ/A2M Group	Lot No. All	Reference Document	RZ/A2M Group User's Manual: Hardware Rev.3.00 (R01UH0746EJ0300)		

This document is a cautionary note regarding reconnecting to the peer-device for the USB2.0 host device in products of the RZ/A2M Groups.

1. Note

1) If peer-device is connected at Full Speed or Low Speed and a device disconnection occurs just before the frame boundary, subsequent peer-device connection may not be recognized.
2) If peer-device is connected at Full Speed or Low Speed and executes OHCI suspend instruction after disconnection of the device, subsequent peer-device connection may not be recognized.

2. Measures

If device disconnection occurs just before the frame boundary, or executes OHCI suspend instruction after disconnection of the device, Check the NPS and the PSM of the HcRhDescriptorA register, and the PPCM[1] of the HcRhDescriptorB register. Execute the flow according to the register value.

Register value			Flow	
HcRhDescriptorA		HcRhDescriptorB		
NPS (bit9)	PSM (bit8)	PPCM[1] (bit17)	In case it can finish the sequence within 4msec from device disconnect or suspend instruction	In case it can NOT finish the sequence within 4msec from device disconnect or suspend instruction
0	1	1	Flow1	Flow5
0	1	0	Flow2	Flow6
0	0	-	Flow2	Flow6
1	1	1	Flow3	Flow7
1	1	0	Flow4	Flow8
1	0	-	Flow4	Flow8

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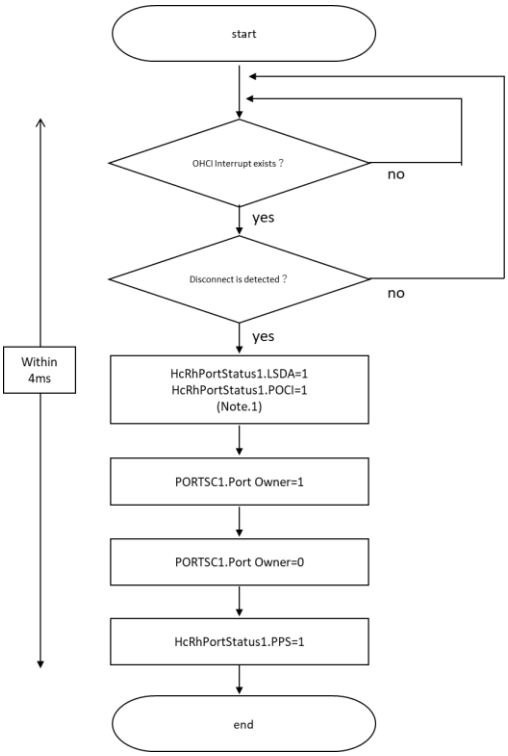
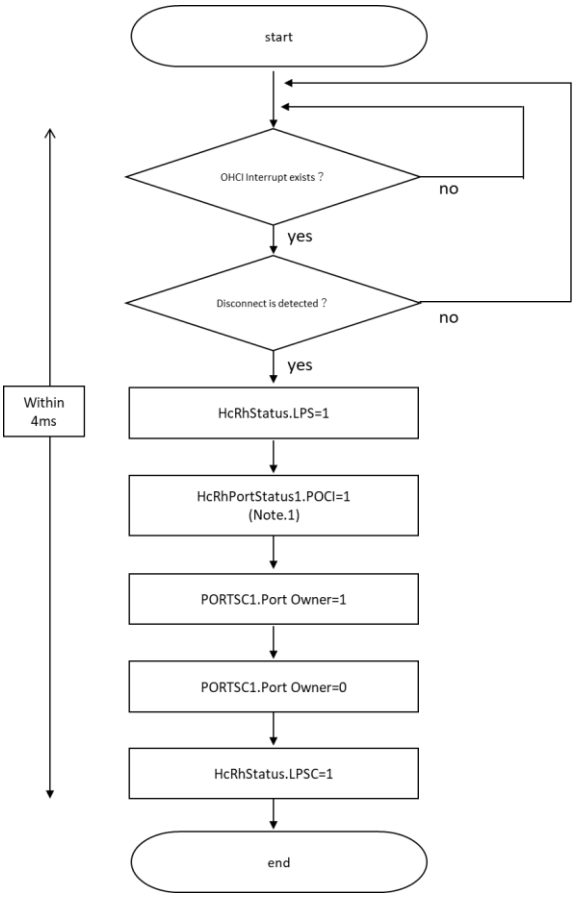
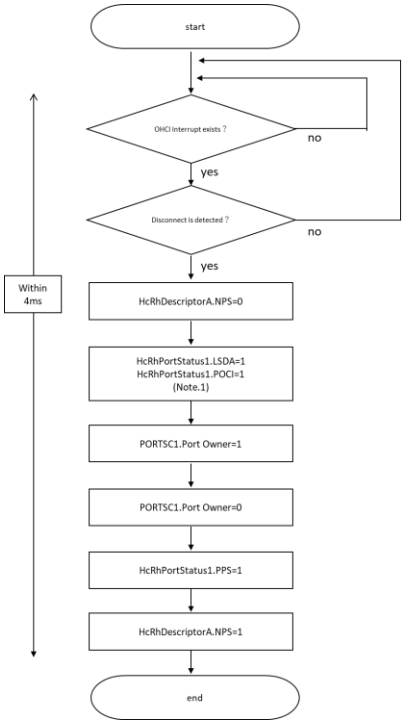
Flow1


start
OHCI Interrupt exists ?
no
yes
Disconnect is detected ?
no
yes
Within 4ms
HcRhPortStatus1.LSDA=1
HcRhPortStatus1.POCI=1
(Note.1)
PORTSC1.Port Owner=1
PORTSC1.Port Owner=0
HcRhPortStatus1.PPS=1
end

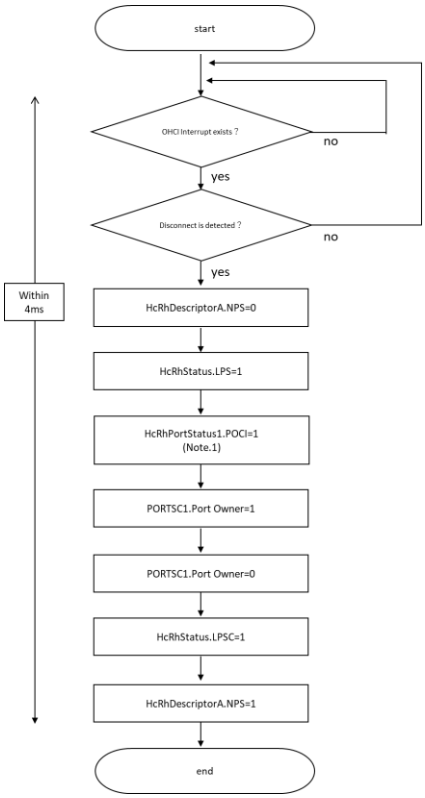
Flow2


start
OHCI Interrupt exists ?
no
yes
Disconnect is detected ?
no
yes
Within 4ms
HcRhStatus.LPS=1
HcRhPortStatus1.POCI=1
(Note.1)
PORTSC1.Port Owner=1
PORTSC1.Port Owner=0
HcRhStatus.LPSC=1
end

Flow3



Flow4



Note on Flow1, Flow2, Flow3 and Flow4

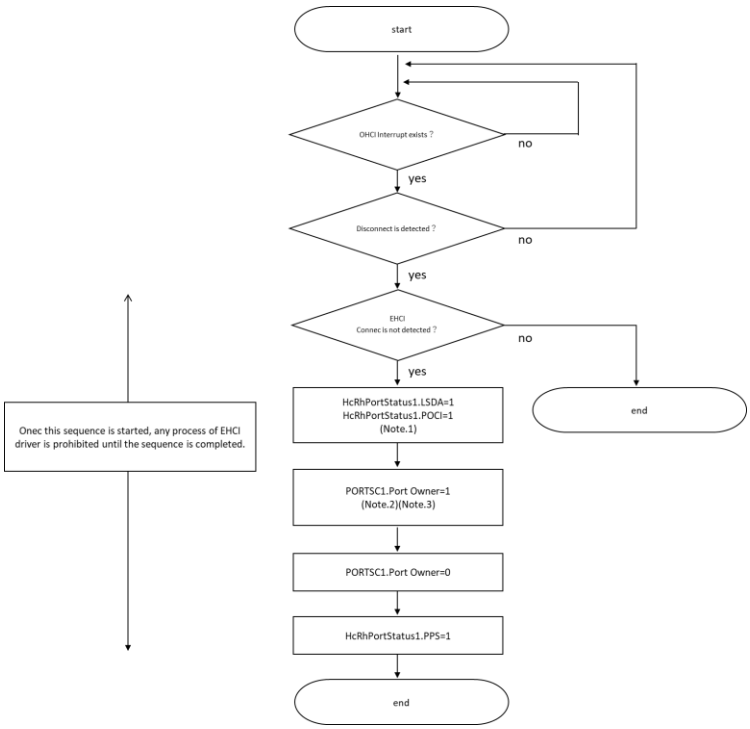
Note.1 This setting causes the HcInterruptStatus.RHSC bit to be set to 1, and an OHCI interrupt is generated.

Please only clear the factor because it is an unnecessary interruption.

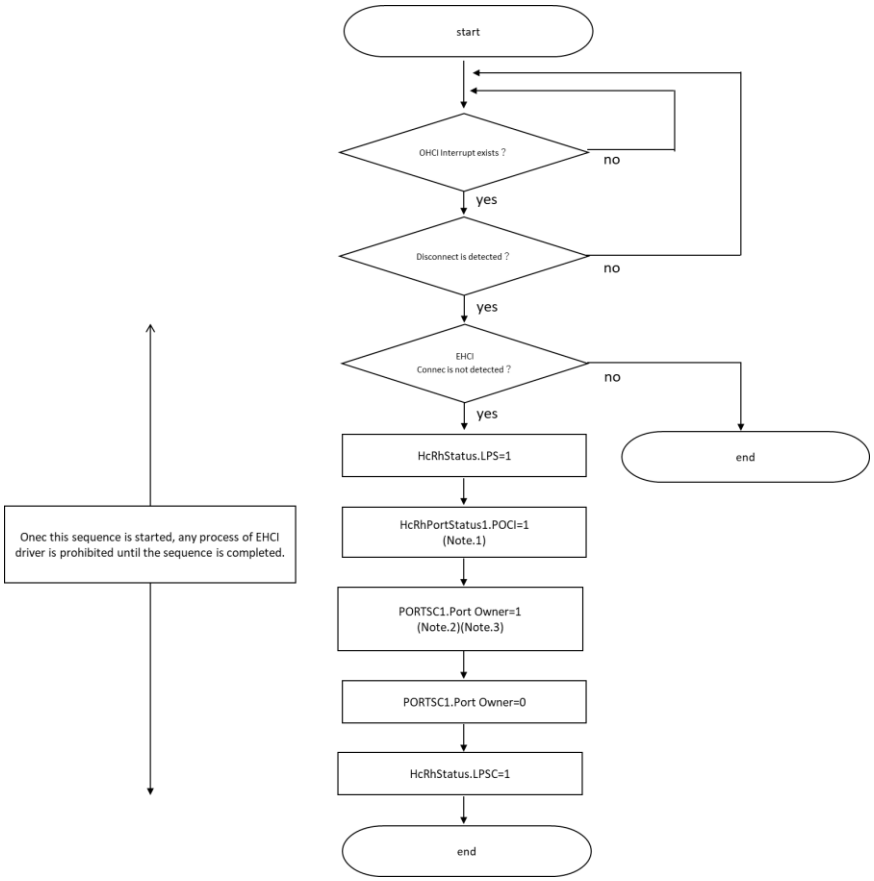
The status of OHCI HcRhPortStatus1 register at this time as follows.

CCS=0, PES=0, CSC=1, PESC=0

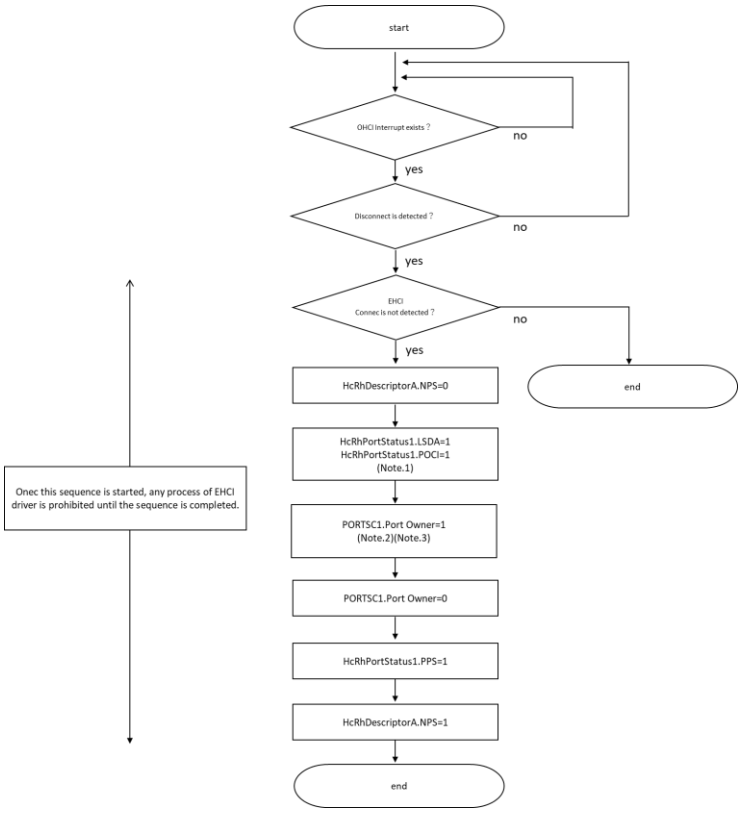
Flow5


start
OHCI Interrupt exists ?
no
yes
Disconnect is detected ?
no
yes
EHCI
Connec is not detected ?
no
yes
end
HcRhPortStatus1.LSDA=1
HcRhPortStatus1.POCI=1
(Note.1)
PORTSC1.Port Owner=1
(Note.2)(Note.3)
PORTSC1.Port Owner=0
HcRhPortStatus1.PPS=1
end
Onec this sequence is started, any process of EHCI driver is prohibited until the sequence is completed.

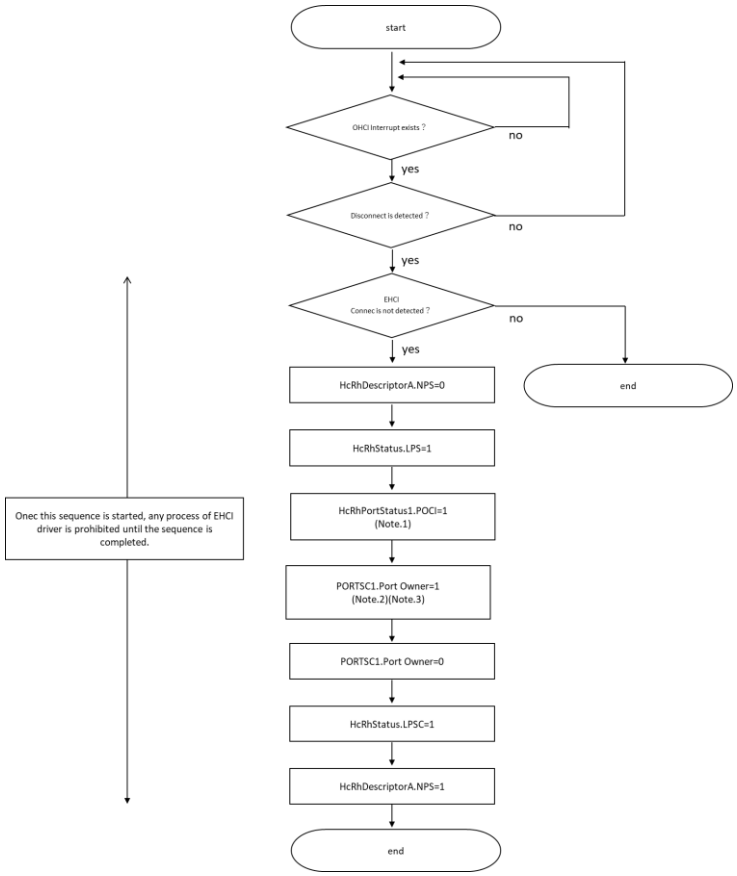
Flow6


start
OHCI Interrupt exists ?
no
yes
Disconnect is detected ?
no
yes
EHCI
Connec is not detected ?
no
yes
end
HcRhStatus.LPS=1
HcRhPortStatus1.POCI=1
(Note.1)
PORTSC1.Port Owner=1
(Note.2)(Note.3)
PORTSC1.Port Owner=0
HcRhStatus.LPSC=1
end
Onec this sequence is started, any process of EHCI driver is prohibited until the sequence is completed.

Flow7


start
OHCI Interrupt exists ?
no
yes
Disconnect is detected ?
no
yes
EHCI
Connec Is not detected ?
no
yes
end
HcRhDescriptorA.NPS=0
HcRhPortStatus1.LSDA=1
HcRhPortStatus1.POCI=1
(Note.1)
PORTSC1.Port Owner=1
(Note.2)(Note.3)
PORTSC1.Port Owner=0
HcRhPortStatus1.PPS=1
HcRhDescriptorA.NPS=1
end
Onec this sequence is started, any process of EHCI driver is prohibited until the sequence is completed.

Flow8


start
OHCI Interrupt exists ?
no
yes
Disconnect is detected ?
no
yes
EHCI
Connec Is not detected ?
no
yes
end
HcRhDescriptorA.NPS=0
HcRhStatus.LPS=1
HcRhPortStatus1.POCI=1
(Note.1)
PORTSC1.Port Owner=1
(Note.2)(Note.3)
PORTSC1.Port Owner=0
HcRhStatus.LPSC=1
HcRhDescriptorA.NPS=1
end
Onec this sequence is started, any process of EHCI driver is prohibited until the sequence is completed.

Note on Flow5, Flow6, Flow7 and Flow8

Note.1 This setting causes the HcInterruptStatus.RHSC bit to be set to 1, and an OHCI interrupt is generated.
Please only clear the factor because it is an unnecessary interruption.
The status of OHCI HcRhPortStatus1 register at this time as follows.
CCS=0, PES=0, CSC=1, PESC=0

Note.2

This flow is not time constraint. It also supports when a peer-device is reconnected during the flow.
If this setting and re-connection occur at the same time, the HcInterruptStatus.RHSC bit becomes 1 and an OHCI interrupt may occur, but it is an unnecessary interrupt. Please only clear the factor.
The status of OHCI HcRhPortStatus1 register at this time as follows.
CCS=0, PES=0, CSC=1, PESC=0

Note.3

If PortOwner is changed to OHCI after detecting peer-device's re-connection, the USBSTS.PortChangeDetect bit becomes 1 and EHCI interrupt is generated,but the any process of EHCI driver is prohibited until the sequence is conmpleted.