## Old Company Name in Catalogs and Other Documents

On April 1<sup>st</sup>, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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## HITACHI SEMICONDUCTOR TECHNICAL UPDATE

DATE	11 January 2001	TN-SH7-291A/E		
ТНЕМЕ	SH3/SH3DSP usage notice about using TLB			
CLASSIFICATION	☐ Spec. change ☐ Limitation on Use ☐ Supplement of Documents			
PRODUCT NAME	HD6417708/HD6417708S/HD6417708R/HD6417718R/HD6417707/HD641770 HD6417709A/HD6417729/HD6417729R/HD6417709S			
REFERENCE	SH7708 Hardware manual SH7707 Hardware manual SH7709 Hardware manual SH7709A Hardware manual SH7729 Hardware manual SH7729R Hardware manual		Effective Date Eternity	
DOCUMENTS			From	

SH3/SH3DSP have followed usage notice.

## 1. condition and phenomenon

- 1) Using MMU (MMUCR.AT=1)
- 2) A TLB entry has same VPN's in different ways.
- 3) Occurring an exception on TLB.

Under all above conditions, MMUCR.RC may be set incorrectly.

The VPN is not initialized at power-on/manual reset. Therefore, two or more VPN's may be the same value.

For example, a TLB entry has VPN "12345" in way0 and way3 after reset and the VPN "12345" is set into the way3(V:0->1). In this case the condition (2) is satisfied, since both way0's and way3's VPN are the same.

after reset				after set way3			
WAY	VPN	V		WAY	VPN	V	
0	12345	0	->	0	12345	0	
3	12345	0		3	12345	1	

A TLB control program may also make the above conditions, for example, a way(way0) is invalidated (V:1->0) and the same VPN is set to the same entry but a different way(way3). The condition (2) is satisfied, since both way0's and way3's VPN are the same.

after invalidated way0				after set way3			
WAY	VPN	V	->	WAY	VPN	V	
0	12345	0		0	12345	0	
3	11111	0		3	12345	1	

## 2. work around

The followings are work around.

- (1) Please initialize the top four bits of VPN (all entries of TLB) to "1". before you set MMUCR.AT as "1".
- (2) When you invalidate an entry, please set V to "0" and the top four bits of VPN to "1".

This work around can avoid the condition (3), because VPN is not applied for address translation.