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# HITACHI MICROCOMPUTER TECHNICAL UPDATE

DATE	11 January 2001	No.	TN-SH7-292A/E					
THEME	SH7615 two bugs of use Ethernet controller and Ethernet controller direct memory access controller, their countermeasures are shown below							
CLASSIFICATION	Spec change							
PRODUCTNAME	HD6417615ARF		Lot No.etc. ALL					
REFERENCE DOCUMENTS		EffectiveDate						
	SH7615 Hardware manual		Permanent					

There are two bugs of Ethernet controller and Ethernet controller direct memory access controller in SH7615, and their countermeasures are shown below.

#### <Phenomenon>

# 1. Inter Frame Gap Error

There is a case in half-duplex mode that SH7615 does not comply the inter frame gap time on transmission, which must be more than  $0.96\mu s$  at 100Mbps or  $9.6\mu s$  at 10Mbps according to IEEE802.3.

#### 2. Multicast Address Frame Status Error

There is a case in half-duplex mode that the RFS7(Receive Multicast Address Frame) bit in a Rx-descriptor and RMAF(Receive Multicast Address Frame) bit in a EESR(EtherC/E-DMAC Status Register), which shows a multicast address frame received, may be asserted thought a unicast address frame is received.

In this case, status of SH7615 is the following.

- (1) The RFS7 bit in a Rx-descriptor is asserted.
- (2) The RMAF bit in a EESR is asserted.
- (3) The MAFCR(Multicast Address Frame Counter Register) counts up.
- (4) The unicast frame is received normally.

# <Condition>

## 1. Condition of Inter Frame Gap Error

When all following conditions are valid, SH7615 does not comply the inter frame gap time on transmission.

- (1) More than three stations are connected on one Ethernet.
- (2) SH7615 works in half-duplex mode.
- (3) The transmission from station-A to station-B is completed, and SH7615 on station-C starts transmission immediately.

## 2. Condition of Multicast Address Frame Status Error

When all following conditions are valid, SH7615 shows a multicast address frame received.

- (1) Any of following errors occur when a multicast address frame is received, or a destination address in unicast frame is wrongly recognized as a multicast address because of collision and the receive transaction finishes as a broken frame reception.
- (1) CRC Error on Received Frame
- (2) RX-ER assert(PHY-LSI Receive Error)
- (3) Receive Too-Short Frame
- (4) Receive Too-Long Frame
- (5) Receive Residual-Bit Frame
- (2) The next frame is received normally.

## <Countermeasures>

- 1. We fix the above two errors on metal layers.
- 2. We change the part name.

HD6417615AF -> HD6417615ARF

3. We change a read data of a reserved bit in one of Watch Dog Timerregisters (RSTCSR) as below in order to easily recognize HD6417615ARF from HD6417615AF by software read.

RSTCSR (0xfffffe83)											
bit	7	6	5	4	3	2	1	0			
	WOVF	RSTE	RSTS					REV			
Initial value											
HD6417615AF	0	0	0	1	1	1	1	1			
HD6417615ARF	0	0	0	1	1	1	1	<u>0</u>			

4. We change Boundary Scan ID code for HD6417615ARF.

SDIDR ID code HD6417615AF 0x0001100F HD6417615ARF 0x0<u>1</u>01<u>0</u>00F

# <Modified MP>

We will fix the above two errors and provide new MP from Jan.2001.