HHW e MMC Specification

e MMC5.1

杭州瀚海微科技有限公司
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Product List

Revision History

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Table of Contents

1. Description ..... - 5 -

2. Product

7. Product Specifications ..... - 15 -

7-1 Power & R Q V X P S.W.L.R.Q ..... - 15 -

7-2 Performance ..... - 15 -

7-3 Operating & R Q G L W.L.R.Q.V ..... - 15 -

7-4 Physical Specification ..... - 16 -

8. Interface Description ..... - 18 -

8-1 H Â 0 0 ***Interface ball array*** ..... - 18 -

8-2 Pins and Signal Description ..... - 19 -

9. Device Resisters ..... - 20 -

9.1 Operating & R Q G L ***Resister*** 2 & 5 ..... - 20 -

9.2 & D U ***Identification Resister*** & , ' ..... - 20 -

9-3 & D U ***Specific Data Resister*** & 6 ' ..... - 20 -

9-4 Extended & 6 ' ***Resister*** ..... - 22 -

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1. Description

3. Features

- 6XSSRUW -('(& H&RP&OLDQW
- 6XSSRUW 9 V9XSSRUW
- 6XSSRUW ZLUH EXV &/. '&7> 'DQQ6DUUGZEHUH UHVHW 567B
- 8S WR0+] FORFN VSHHG
- 6XSSRUW 6LQJOH 'DWD 5DWH6DPHQG 'XDO 'DWD
- 6XSSRUW GLIIHUHQW %XVZLGWK ELW ELW
- 6XSSRUW 2ULJLQDO %RRWRGHV $OWHUQDWLYH %RRW
- 6XSSRUW 'DWD 5HPRYDQGUQLWH]H
- 6XSSRUW 5HSOD\ 3URWHFNG5HP%RU\
- 6XSSRUW 0XOWLSOH 3DUWLWLRQV ZLWK HQKDQFHG DWWULEX
- 6XSSRUW /RFN 8QORFWDWQLWH
- 6XSSRUW 'DWD 3URWHFDWQHU 3RZHU
- 6XSSRUW 3RZHU 6DYLQJ 6OHHS
- 6XSSRUW +LJK9ULRUXSW +3,
- 6XSSRUW %DFNJURXQGQG
- 6XSSRUWHPPDQGV
- 6XSSRUW 6DPSOLQJ7XQLQJ
- 6XSSRUW '\QDPLF 3RZHU 0DQDJHPDQG VOHHS
- 6XSSRUW &RPPDQGQG
- 6XSSRUW 6HFXULWLRQ

- 3DFNDJH

7\S

- 2SHUDWLQJ 9ROWDJH UDQJH
  - 9a 9 W\SL9FDO
  - 9a 9 W\SLFDO 9 9a9 9 W\SLFDO

- 7HPSHUDWXUH
  - 2SHUDWL/Qa /
  - 6WRUDJH a /

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4. Functional Block Diagram

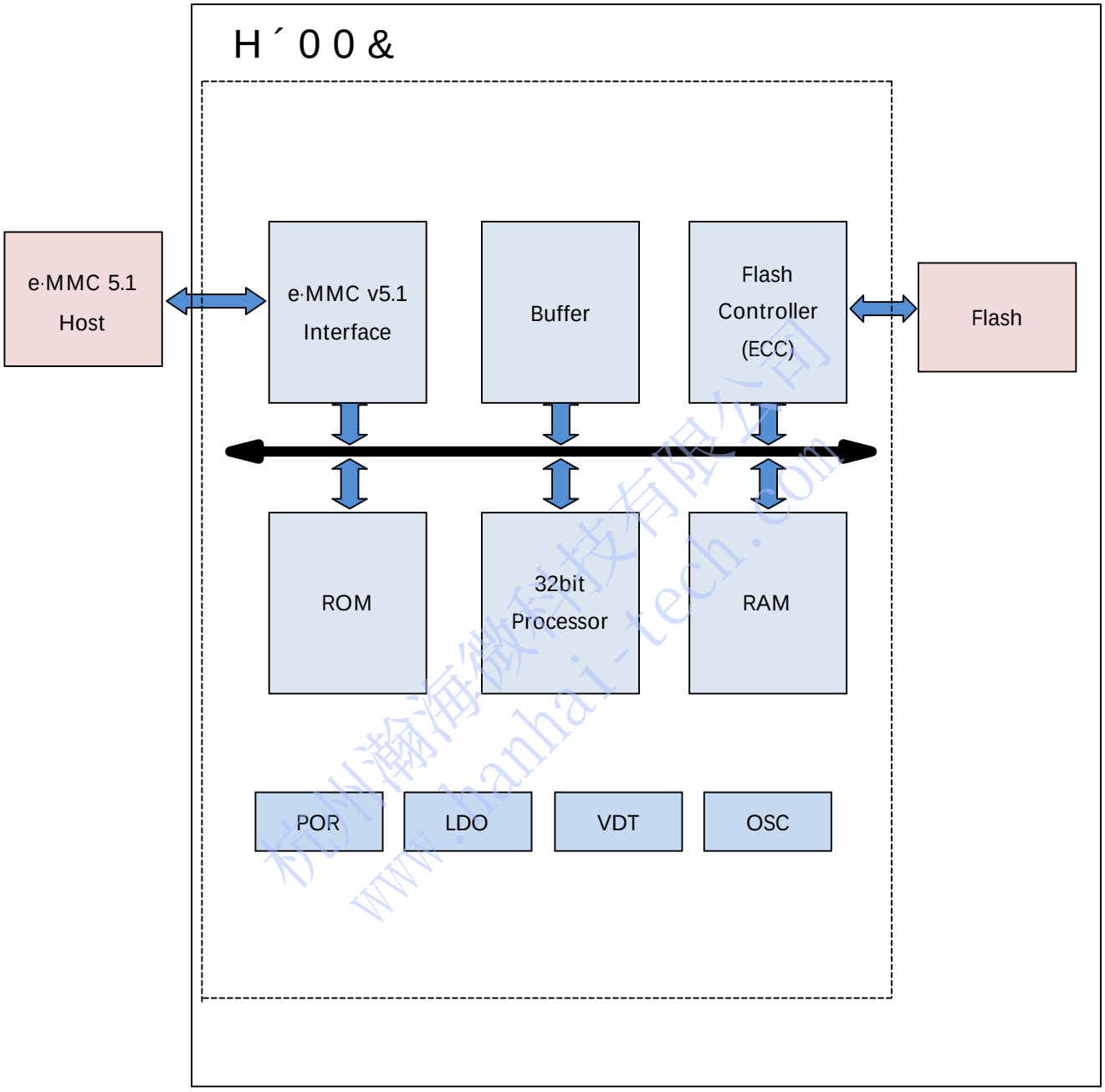


Figure 1 - HÂ00& %ORFN 'LDJUDP

HÂ00& 'HYLFH DQG System

5.1 HÂ00& 6\VWHP Overview

7KH H´00& VSHFLILFDWLRQ GHVFULEHV WKH EHKDYLRU RI WKH LQWHUIDFH DQG W
HG (&& $6 SDUW RI WKLV VSHFLILFDWLRQ WKH H[LVWHQFH RI D K
(&& DQG D PHPRU\ VWRUDJH DUUD\ DUH LPSOLHG EXW WKH RSHUDWLO

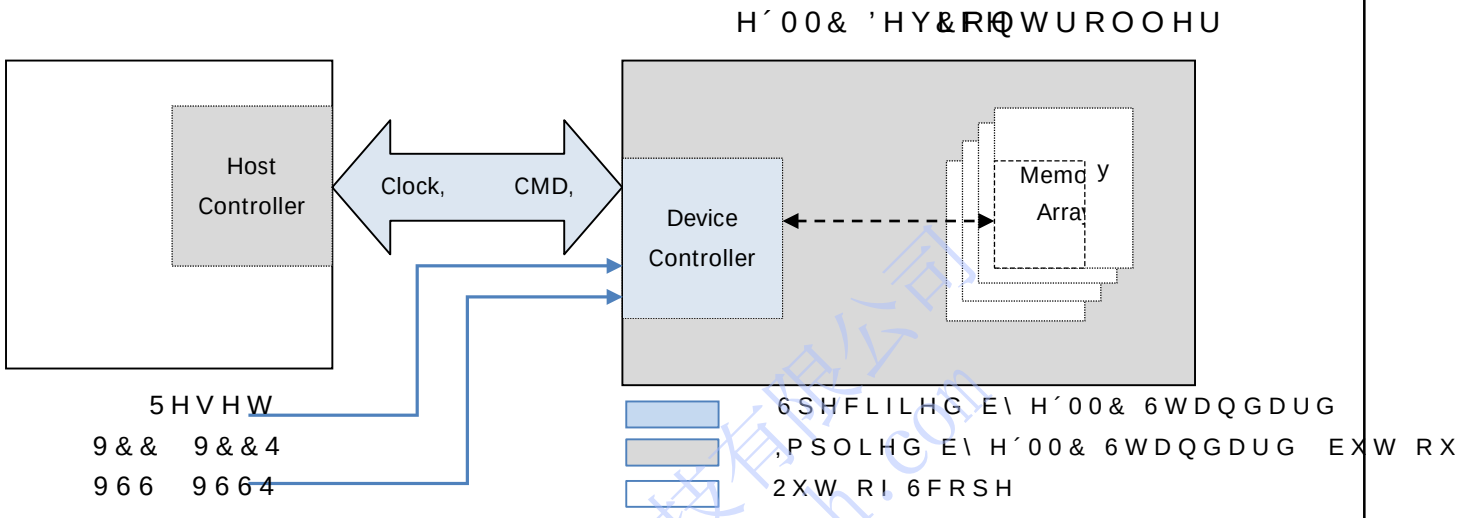


Figure 2 - HÂ00& 6\VWHP 2YHUYLHZ

5.2 HÂ00& 'HYLFH Overview

7KH H´00& EXV KDV WKH IROORZLQJ FRPPXQLFDWLRQ DQG SRZHU OLQ

- &/. &ORFN input
- '6 'DWD VWUREH XVHG IRU GDWD RXWSXW LQ +6
- &0' &RPPDQG LV D ELGLUHFWLRQDO VLJQDO 7KH KRVW DQG H´
  DQG GXVWKXOO
- '$7 a'$7 'DWD OLQHV DUH ELGLUHFWLRQDO VLJQDOV XVHG WR W DQG H
- 567BQ +DUGZDUH UHVHW input
- 9&& 9&& LV WKH SRZHU VXSSO\ IRU FRUH DQG IODVK
- 9&&4 9&&4 LV WKH SRZHU VXSSO\ IRU LQSXW EXIIHU IRU KRVW
- 966 9664 *URXQGV

Name	Type	Description
&/.	,	&ORFN
’6	2 33	’DWD 6WUREH
’$7	, 2 33	
’$7	, 2 33	
’$7	, 2 33	
’$7	, 2 33	
’$7	, 2 33	
’$7	, 2 33	
’$7	, 2 33	
’$7	, 2 33	
	, 2 33 2’	&RPPDQG 5HVSRQVH
567BQ	,	+DUGZDUH UHVHW
	6	6XSSO\ YROWDJH IRU &RUH
	6	6XSSO\ YROWDJH IRU , 2
966	6	6XSSO\ YROWDJH JURXQG IRU &RUH
9664	6	6XSSO\ YROWDJH JURXQG IRU ,
, LQSXW 2 RXWSXW O3 32 ’ SXW RXW 1& 1RW FRQQHFWHG 6 SRZHU VXSS		

Table 1 - HÂ00 Interface

Name	Width (bytes)	Description	Implementation
&,’		’HYLFH ,GHQWLILFDWLRQ QXPEHU DQ LQGLYLGXDO QXP ,GHQWLILFDWLRQ	0DQGDWRU\
5&$		5HODWLYH ’HYLFH $GGUHVV LV WKH GHYLFH V\VWHP DG ’\QDPLFDOO\ DVVLJQHG E\ WKH KRVW GXULQJ LQLWLDO	0DQGDWRU\
’65		’ULYHU VWDJH 5HVLVWHU WR FRQILJXUH WKH ’HYLFH¶V	2SWLRQDO
&6’		’HYLFH 6SHFLILF ’DWD LQIRUPDWLRQ DERXW WKH ’HYLF &RQGLWLRQV	0DQGDWRU\
2&5		2SHUDWLRQ &RQGLWLRQV 5HVLVWHU 8VHG E\ D VSHFLDO FRPPDQG WR LGHQWLI\ WKH YROWDJH W\SH RI WKH ’HYLF	0DQGDWRU\
(;7B&6’		([WHQGHG ’HYLFH 6SHFLILF ’DWD &RQWDLQV LQIRUPDW WKH ’HYLFH FDSDELOLWLHV DQG VHOHFWDEOH RSWLRQV ,QWURGXFHG LQ VWDQGDUG Y	0DQGDWRU\

Table 2 - HÂ00 registers

H Â 0 0 &) H D W X U H 2 Y H U Y L H Z

6.1 Boot

H´00& VXSSRUWV%-(6 ’ERRW RSHUDWLRQ PRGH ERWK PDQGDWRU\ DV
VXSSRUWHG

6.2 Sleep &0'

$ ’HYLFH PD\ EH VZLWFKHG EHWZHHQ D 6OHHS VWDWH DQG D 6WD
6OHHS 6WDWH WKH SRZHU FRQVXPSWLRQ RI WKH PHPRU\ GHYL
RQO\ FRPPDQG5G(V(7 &0’ DUJXPHQW ;))) I +:
UHVHW6/DQG$:.(&0’ $OO WKH RWKHU FRPPDQGV DUH GLVFDUGHG E\ WK
7KH 9FF SRZHU VXSSO\ PD\ EH VZLWFKHG RII LQ 6OHHS VWDWH LV W
XPSWLRQ VDYLQJ

)RU GGLWLRQDO LQIRUPDWLRQ $SHDVH UHIHU -(6’

'HYLFH 6WDW	2SHUDWLRQ PF	%XV PRGH
,QDFWLYH 6WDWH	,QDFWLYH PRGH	2SHQUDLQ
3UHGOH 6WDWH	%RRW PRGH	
3UHBRRW 6WDWH		
,GOH 6WDWH		
,GHQWLILFDWLRQ 6'WDWH	,GHQWLILFDWLRQ PRGH	
6WDQGE\6WDWH		
6OHHS 6WDWH		3XVKXOO
7UDQVIHU 6WDWH		
%XIVHW 6WDWH		
6HQGLQJ'DWD 6WDWH	'DWD WUDQVIHU PRGH	
5HFHLYLQJ'DWD 6WDWH		
3URJUDPPLQJ 6WDWH		
'LVFRQQHFW 6WDWH		
%RRW 6WDWH	%RRW PRGH	
,54 6WDWH	,QWHUUXSW PRGH	2SHQUDLQ

Table 3 - %XV PRGH¶V RYHUYLHZ

6.4 Reliable Write

H´00& VXSSRUWV % UHOLDEOH ZULWH DV GHILQHG LQ H´00& V

5HOLDEOH ZULWH[ULWH WR VHOHFWHG ZKLFK WKH ROG GDWD SRLQWHG WR

XQFKDQJHG GDWD ORJLFDGGUHVVHV QHZ FHVSUXRJUDPPHG

WR HQVXUH WKDW WKH WDUJHW DGGUHVV XSGDWHG EORFNV DUH

ZULWWHQ ZDLW YDOLGDWHG VXGGHQ ORVV FXUUHQJRJUDPPLQJ

6.5 Secure Erase

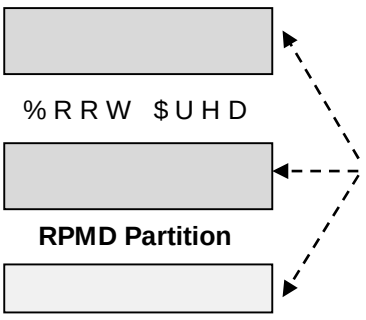
,Q DGGLWLRQ WR WKH VWDQGDUG (UDVH FRP6HFXUH WKHRP´PDQGVXSS

6HFXUH FRPPDQGG IIHUURP EDVLF FRPPDQG UHTXLUHVHYDFHG

WR ZDLW XQWLO WKH RSHUDWLRQ LV FRPSOHWH EHIRUH PRYLQJ

)RU DGGLWLRQDO LQIRUPDWLRQ$SSOHDVH UHIHU -(6'

V H F X U H H U D V H F R P P D Q G U H T X L U H V G H Y L F H W R S H U I R U P D V H F X U H
D Q G F R S \ L W H P V L G H Q W L I L H G I R U H U D V H L Q W K R V H H U D V H J U R X S V
$ S X U J H o o)# Àp Q B Q ia Q‘u ´!ðmca dt PUpH z r h



6.9 High priority interrupt + 3 ,

0DQ RSHUDW LQJ HPEHGGHG XQFK UHTXHVW HXGVH, Q HHGV
IHWSFKJHV PLGRO H RSHUDWLRQTXHLVEWGHODXHQGWLFRPSOHWLRQ
ZULWH FRPPDQG ZKLFK LQ WKH ZRUVW FDVH VFHQDULR FDQ WD
7KH KLJK SULRULW\ LQWHUUXSW %+3$ HQVDEOHVQHZLQH-QG' ODWH
VXVSHQGLQJ D ORZHU SULRULW\ RSHUDWLRQ EHIRUH LW LV DFWX
ODWHQF\ LQ W\SLFDO FRQGLWLRQ WR PVHF

)RU DGGLWLRQDO LQIRUPDWL%RQ$SSOHDVH UHIHU -(6'

6.10 Background Operations

'HYLFHV KDYH YDULRXV PDLQWHQDQFH RSHUDWLRQVVXFKDWDVWXKDU
FROOHFWLRQG ,QRUGHUUHGXFHWHQGXUDQFHOLIHWLQJFULWLFDOQV EHWWHU
H[HFXWH PDLQWHQDQFH RSHUDWLRQV ZKHQ WKH GHYLFH LV QRW V

2SHUDWLRQV DUH WKHQ VHSDUDWHG LQWR VXZRKWDVSHUVHDGRURHUZRXQG
DQG EDFNJURXQGRSHUDWLRQVWKDW WKH GHYLFH FDQ H[HFXWH Z

)RU DGGLWLRQDO LQIRUPDWL%RQ$SSOHDVH UHIHU -(6'

6.11 H/W Reset

+DUGZDUHPD\EHXVHG GHYLFHRHYLQJFDUG 3UHGOH DQGLVDEOLQ
RQ SHULRG ZULWH SURWHFW RQ EORRFXULWKDSWUZDVHWHWEHDYRU
DVVHUWHG

)RU DGGLWLRQDO LQIRUPDWL%RQ$SSOHDVH UHIHU -(6'

6.12 Packed &RPPDQGV

5HDGQG FRPPDQGVEHSDFNHGURXSHVRPPDQHLVWDKHHDGZULWHWUDQVIHU
WKH GDWD IRU DOO FRPPDQGV LQ WKH JURXSYHLQKRQEHWUDQVIHU

7. Product Specifications

7-1 Power &RQVXPSWLRQ

3RZHU &RQVXPSWLRQ		8QLWV
6WDQGE\ 9&&4 9&& RQ		X$
6OHHS 9&&4 RQ 9&& RII		X$
+6 5HDG 9&&		P$
+6 5HDG 9&&4		P$
+6 :ULWH 9&&		P$
+6 :ULWH 9&&4		P$

Table 4 -

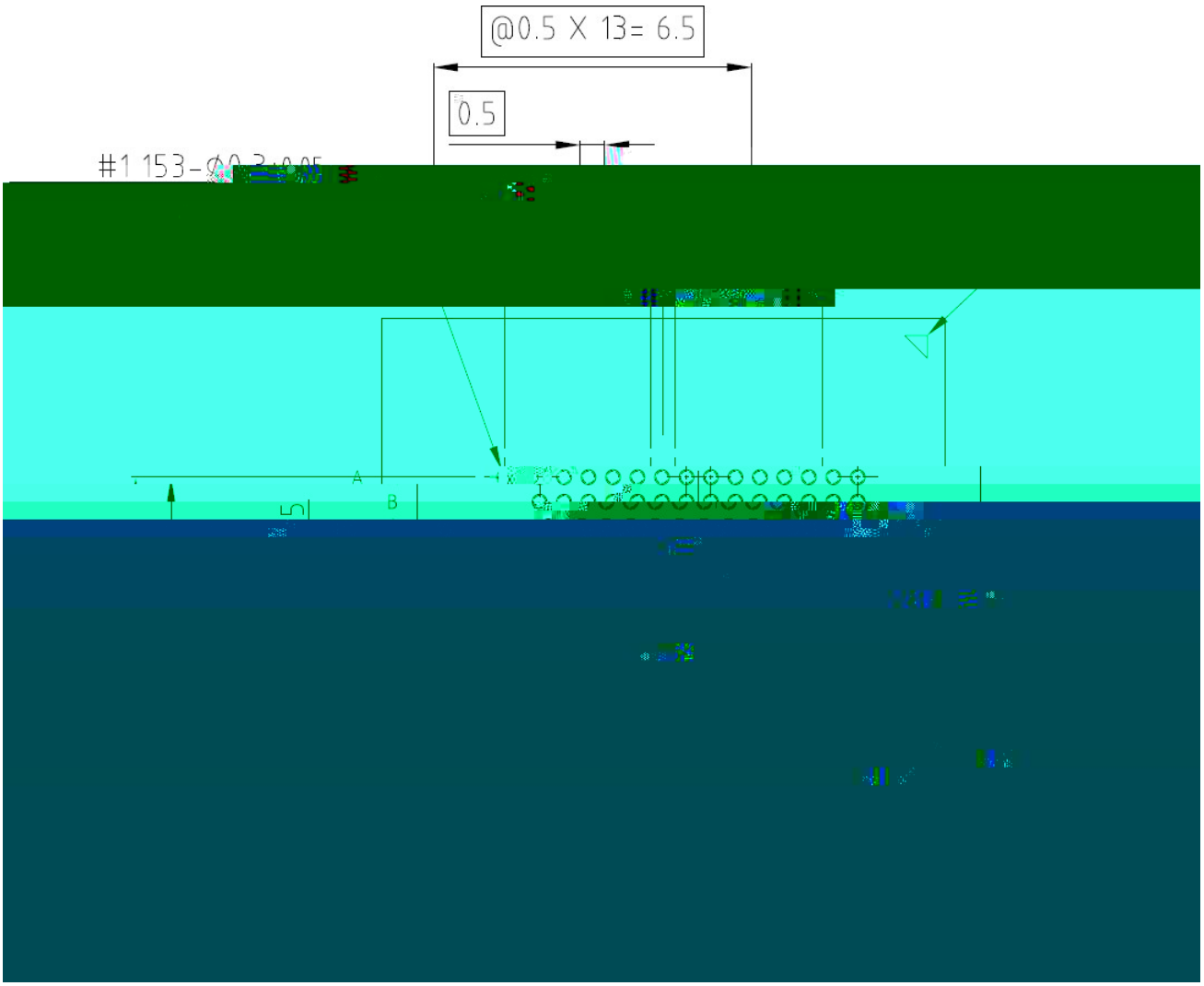


Figure 5 – [[PP %RWWRP VLGH 9LHZ

8-2

(UDVH JURXS VL]H PX(GWL(SBC5H08/7 5 > @)K

Name	Field	Cell type	CSD Slice	EXT_ CSD Value	Remark
&0' 4XHXLQJ 'HSWK	&K0'4B'(37+	5	> @		
5HVHUYHG			> @		
1XPEHU RI): VHFWRUV FRUUHFWO\ SURJUDPPHG	180%(5B2)B):B 6(&725256B&255(1XP%HU2*5$00	5	>	@	
9HQGRU SURSULHWDU\	9(1'25B35235(7$5<B+($7+B5(3257	5	>	@	
'HYLFH OLIH WLPH W\SH %	+(9,&(B/,)(B7,0(B(67B7<3B%	5	> @		
'HYLFH OLIH WLPH W\SH $	+(9,&(B/,)(B7,0(B(67B7<3B$	5	> @		
3UH (2/ LQIRUPDWLRQ	5(6(5 9('B2/B,1)2	5	> @		
2SWLPDO UHDG VL]H	237,0$/B5($'B6, =(	5	> @	K	
2SWLPDO ZULWH VL]H	237,0$/B:5,7(B6 ,=(	5	> @	K	
2SWLPDO WULP XQLW VL]H	237,0$/B75,0B81 ,7B6,=(	5	> @	K	
'HYLFH YHUVLRQ	'(9,&(B9(56,21	5	>	@	
)LUPZDUH YHUVLRQ	)50:$5(B9(56, 21	5	>	@	
3RZHU FODVV IRU ''5 DW 9&& 9	3:5B0&+/B''5B B	5	> @		
	&$&+(B6,=(	5	>	@	
*HQHULF &0' WLPHRXW	*(1(5 &B&0' B7,	5	> @		1RW GHILQHG

Name	Field	Cell type	CSD Slice	EXT_ CSD Value	Remark

Name	Field	Cell type	CSD Slice	EXT_CSD Value	Remark
8VHU DUHD ZULWH SURWHFWLRQ UHJLVWHU	86(5B:3	5 : 5 : &B3 5: (B3	> @		
5HVHUYHG	5(6(59('		> @		
): FRQILJXUDWLRQ	QB&21),*	5 :	> @		): XSGDWHV HQDEOHG
530% 6L]H	530%B6,=(B08/7	5	> @		530% VL]H .%
UHOLDEOH :ULWH UHJLVWHU	:5B5(/B6(7	5 :	> @		
:ULWH UHOLDELOLW\ SDUDPHWHU UHJLVWHU	:5B5(/B3$5$0	5	> @		(QKDQFHG GHILQLWLRQ RI UHOLD $OO :5B5(/B6(/ UHJLV :HU DUH
6WDUW 6DQLWL]H	6 1,7 (B6 7 ; (B3		> @		
0DQXDOO\ VWDUW EDFNJURXQG RSHUDWLRQV	% 236B(1	: (B3	> @		
(QDEOH EDFNJURXQG RSHUDWLRQV KDQGVKDNH	% 236B(1	5 :	> @		
+ : UHVHW IXQFWLRQ	1R7B QB)81&7,21	1 :	> @		
+3, PDQDJHPHQW	+3,B0*07	5 : (B3	> @		
3DUWLWLRQLQJ 6XSSRUW	3$57 7 21,1*B68 3257	5	> @	K	&DQ KDYH H[WHQGHG SDUWLWLRQ &DQ KDYH HQKDQFHG IHDWXUHV 'HYLFH VXSSRUWV HQKDQFHG
0D[(QKDQFHG $UHD 6L]H	0$;B(1+B6,=(B0 8/7	5	>	@	*% K
3DUWLWLRQV DWWULEXWH	3$57 7 216B$775 8%87(	5 :	> @		%LW> @ 5HVHUYHG %LW> @ 6HW (QKDQFHG DWWULE 3XUSRVH SDUWLWLRQ %LW> @ 6HW (QKDQFHG DWWULE 3XUSRVH SDUWLWLRQ %LW> @ 6HW (QKDQFHG DWWULE 3XUSRVH SDUWLWLRQ %LW> @ 6HW (QKDQFHG DWWULE 3XUSRVH SDUWLWLRQ
3DUWLWLRQLQJ 6HWWLQJ	3$57 721B6(77,1 *B &203/(7('	5 :	> @		

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