

# MS-7115 *Version 0A*

Title	Page
COVER SHEET	1
BLOCK DIAGRAM	2
Intel LGA775	3 , 4 , 5
Intel Grantsdale	6 , 7 , 8 , 9
ICH6	10,11,12
ICS954119 Gen. & FWH	13
LPC I/O - W83627THF&LM86	14
Azalia Audio	15
RTL8110S(B)/8100C	16
DDR DIMM 1 & 2	17
DDR Termination Resistors	18
PCI -Express X16 Port	19
PCI Slot & MINI PCI	20
VIA-6307 IEEE1394 Controller	21
USB CONNECTORS	22
ATX ,Front Panel&LCM&IR	23
MS7 ACPI Controller	24
VRM10.1 Intersil 6565 4Phase	25
SATA1,2 , IDE1& Fan control	26
VGA Connector & Misc	27
EQ&SRS&FRONT AUDIO	28
POWER MAP	29
Clock Distribution Diagram	30
HISTORY	31

## PCI Routing Table

PCI Device	IDSEL	REQ/GNT	INTERRUPT
PCI Slot	AD17	1	B
MINI PCI	AD18	2	C
VT6307 IEEE1394	AD19	4	D
RTL8110SB/8100C LAN	AD22	3	C

Intel (R) Grantsdale (GMCH) + ICH6 Chipset  
Intel Prescott LGA775 Processor

## CPU:

Intel Prescott - 3.0G & Above

## System Chipset:

Intel Grantsdale - GMCH (North Bridge)  
Intel ICH6 (South Bridge)

## On Board Chipset:

BIOS -- FWH EEPROM  
AC'97 Codec -- ALC 880  
LPC Super I/O -- W83627THF  
LAN -- Realtek 8100C/8110SB  
EEE1394 -- VIA VT6307  
CLOCK -- ICS954119

## Main Memory:


DDR 1 \* 2 (Max 2GB)

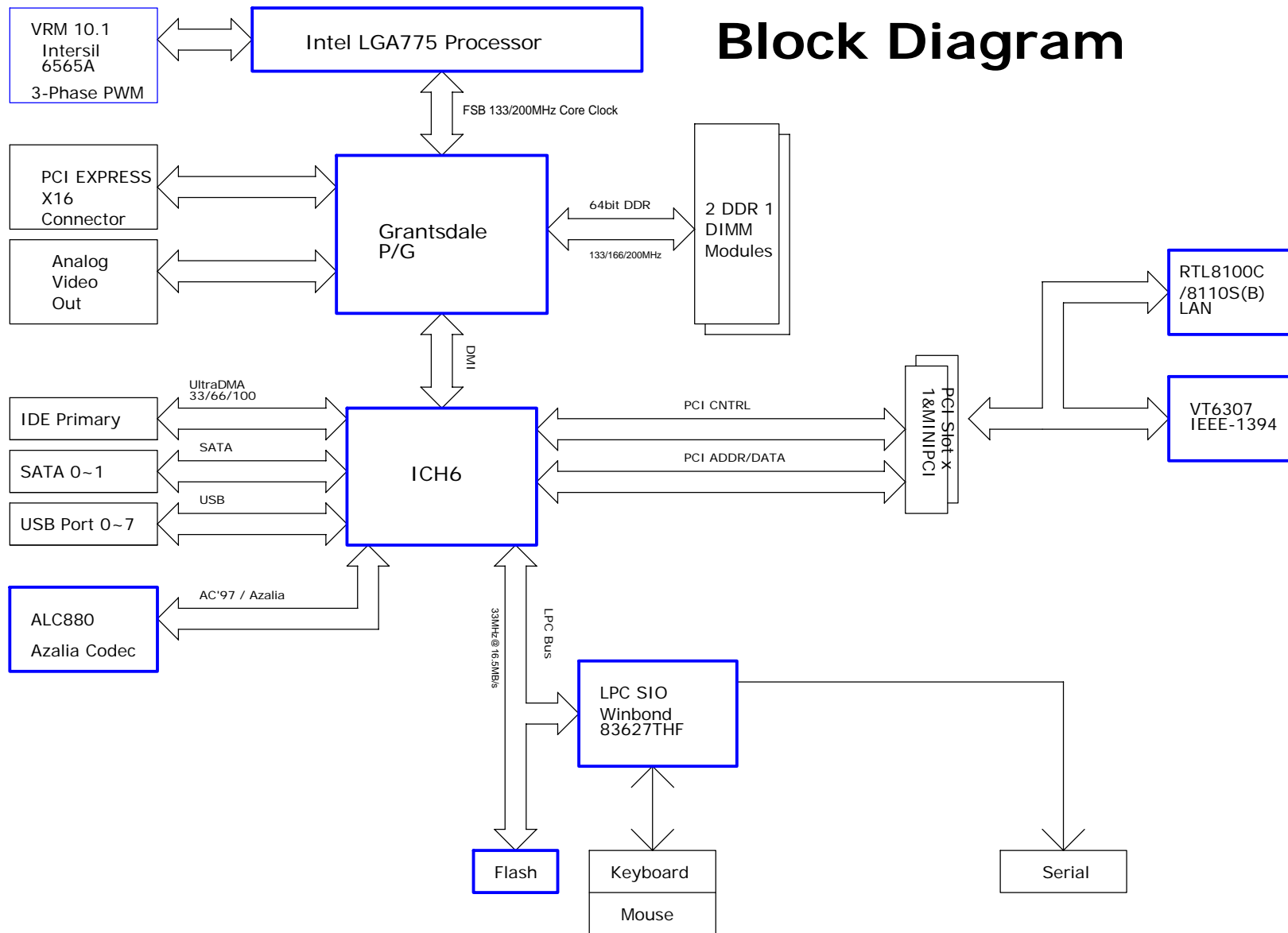
## Expansion Slots:

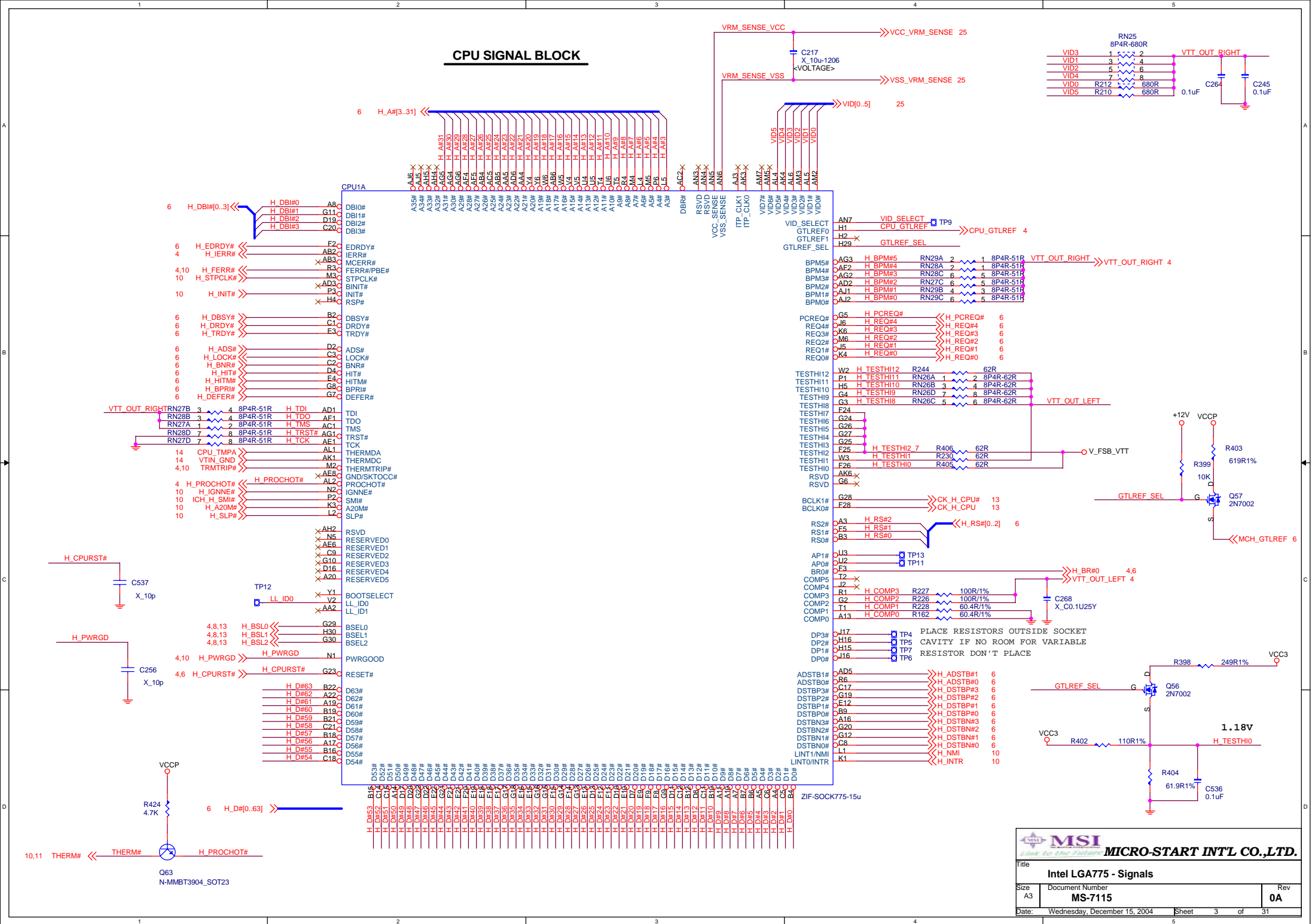
PCI EXPRESS X16 SLOT \* 1  
PCI 2.3 SLOT \* 1  
MINI PCI SLOT \* 1

## Intersil PWM:

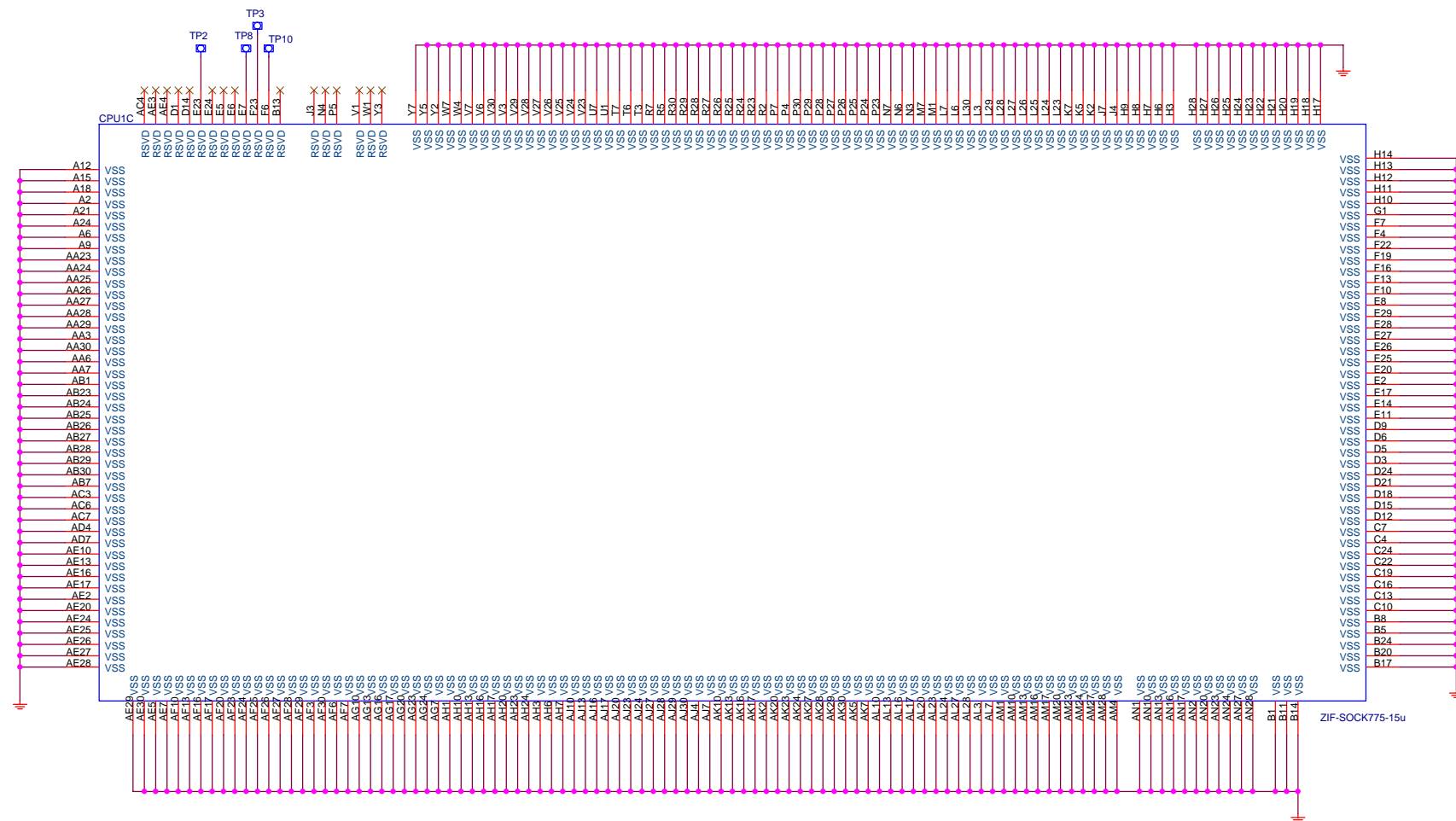
Controller: HIP6561 3 Phase  
Driver: HIP6602B \* 1 + HIP6601B \* 1

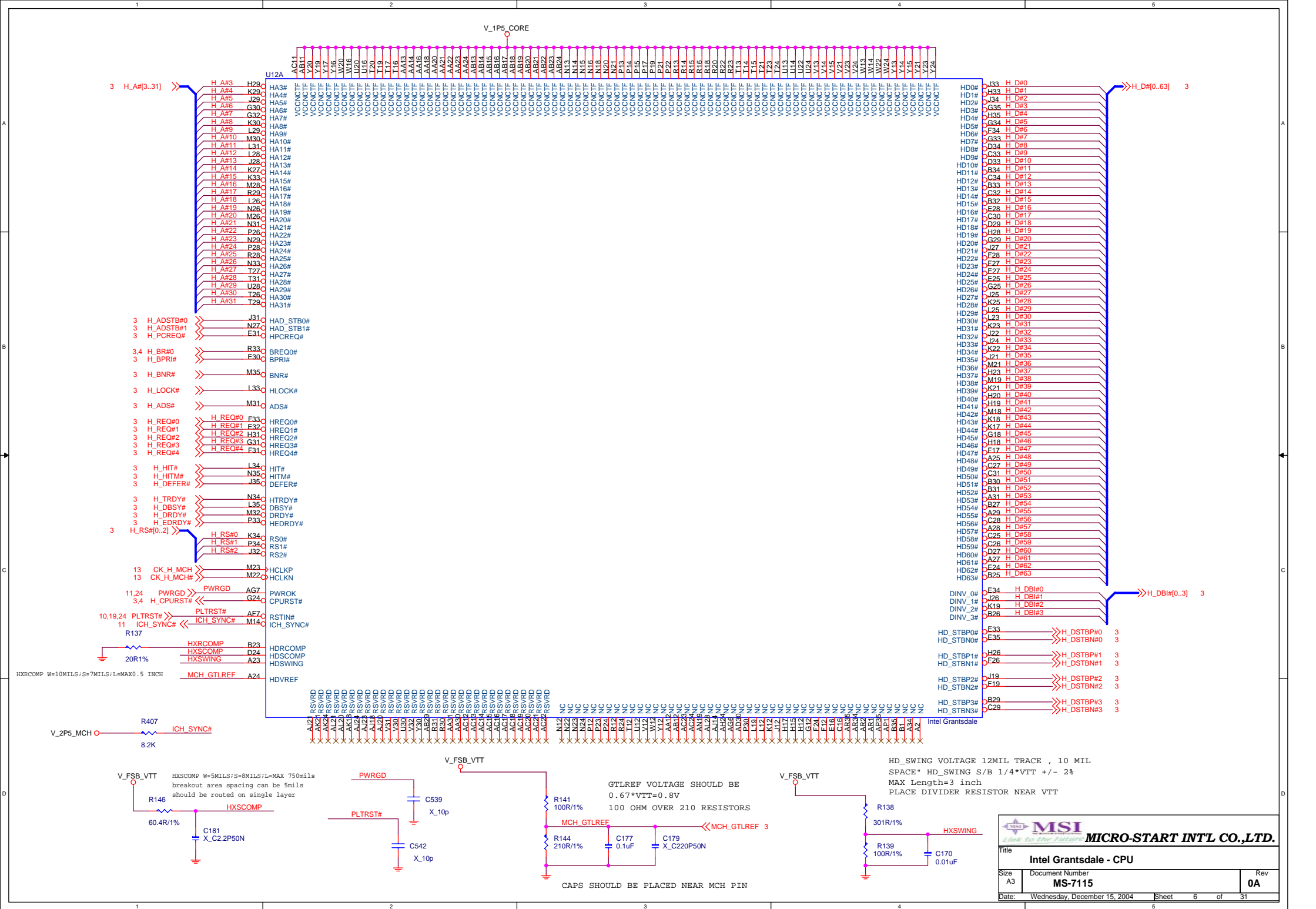
 <b>MICRO-START INT'L CO.,LTD.</b>			
Title <b>COVER SHEET</b>			
Size A3	Document Number <b>MS-7115</b>		Rev <b>0A</b>
Date: Wednesday, December 15, 2004	Sheet	1	of 31

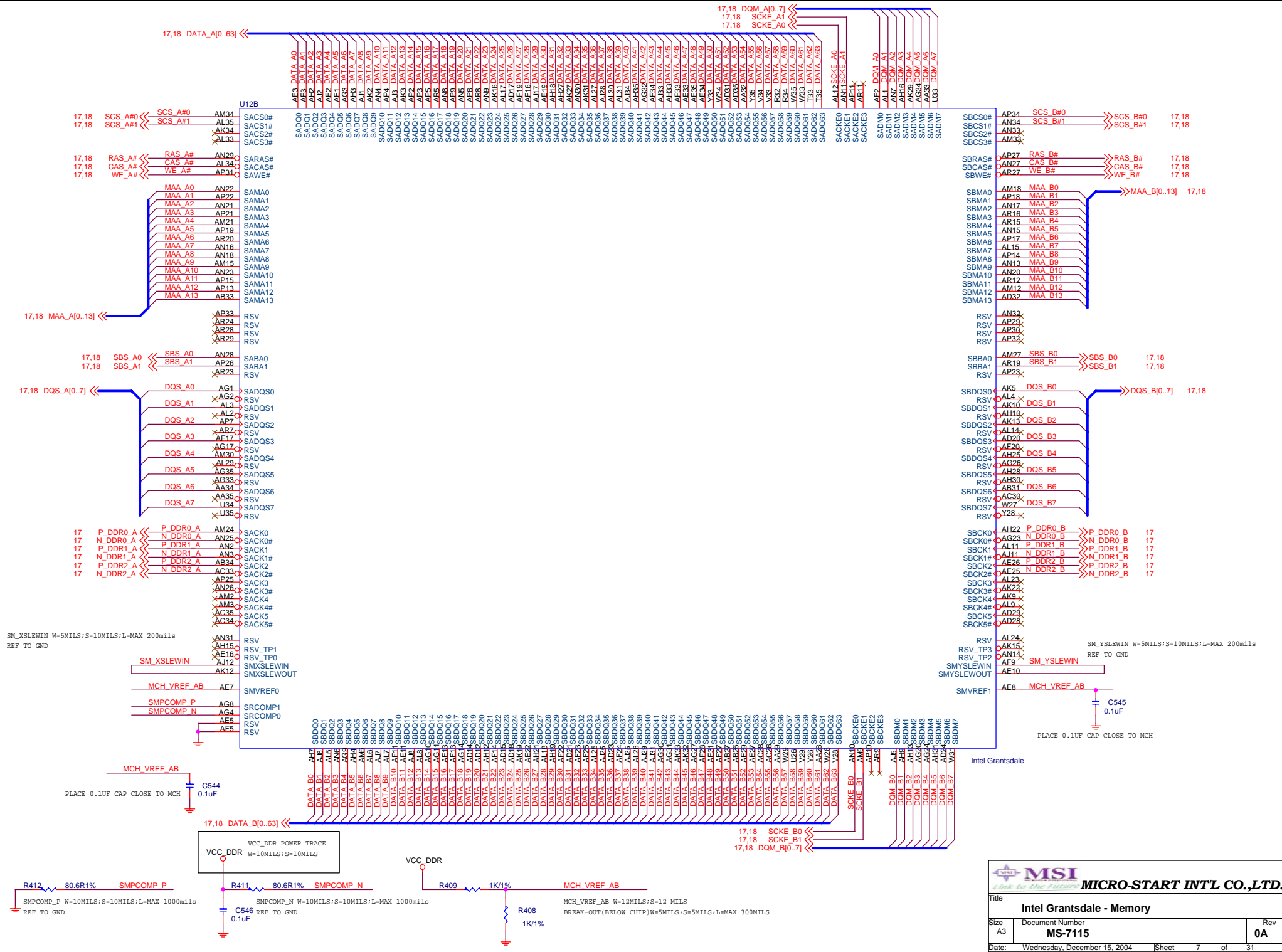


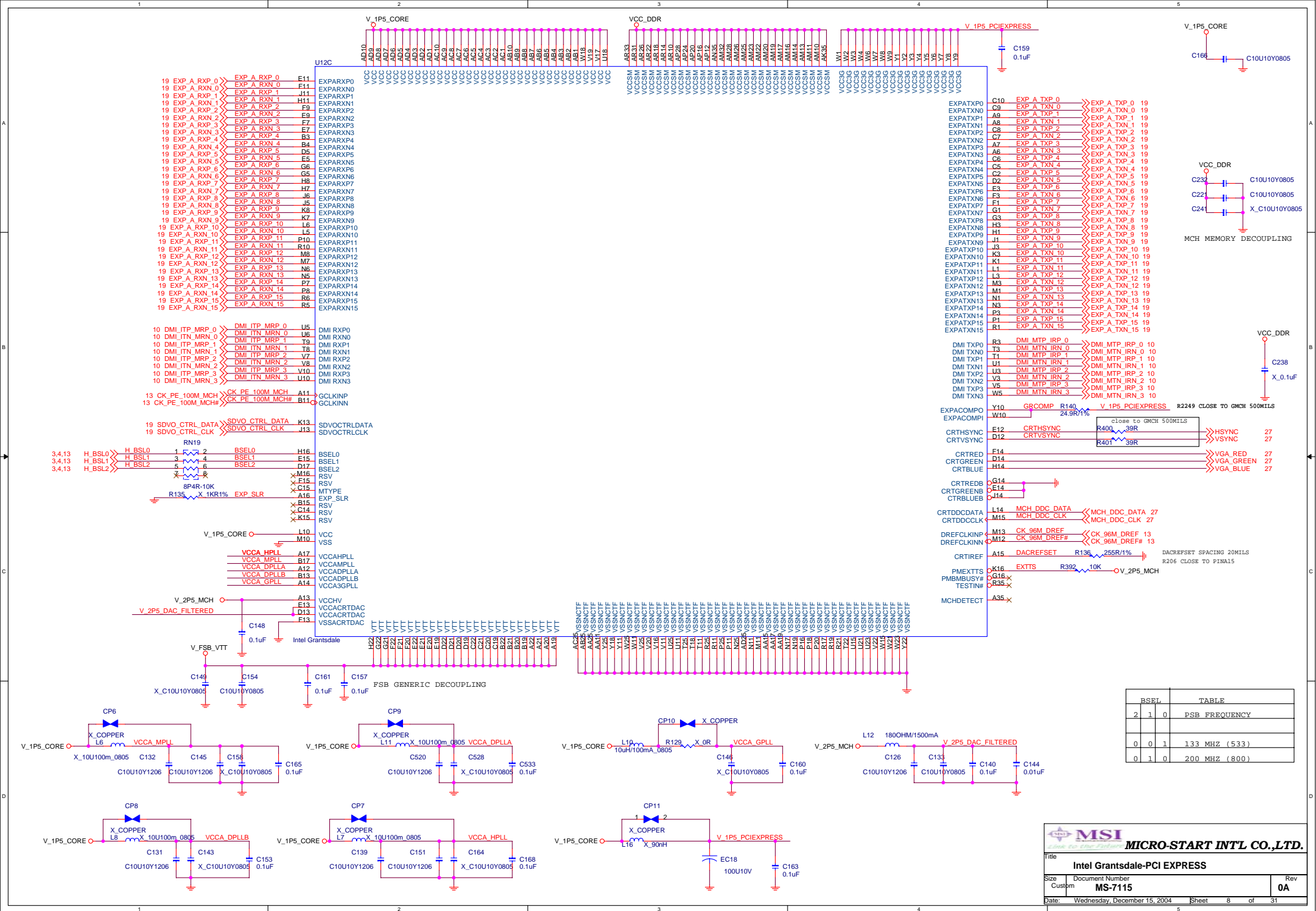




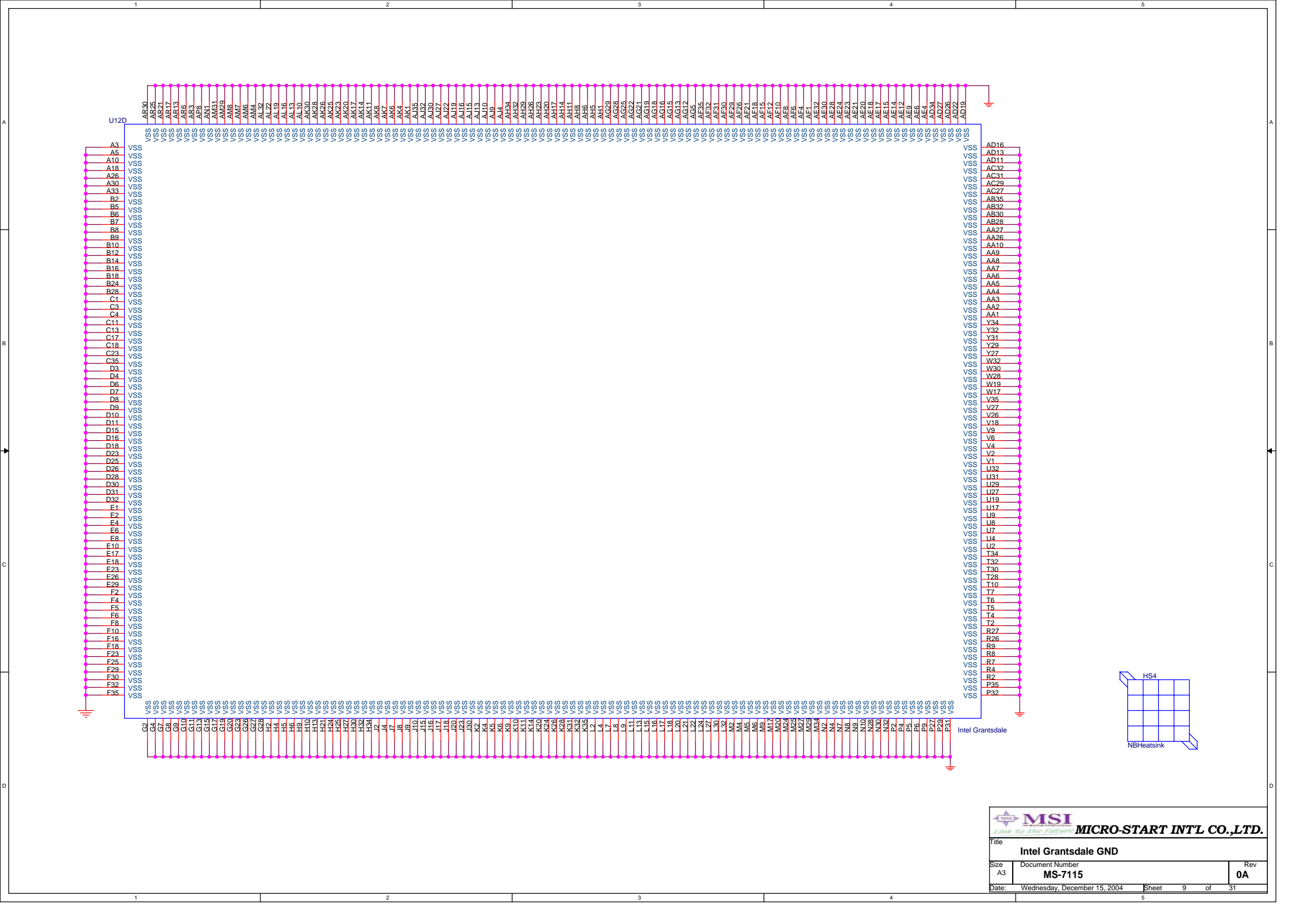


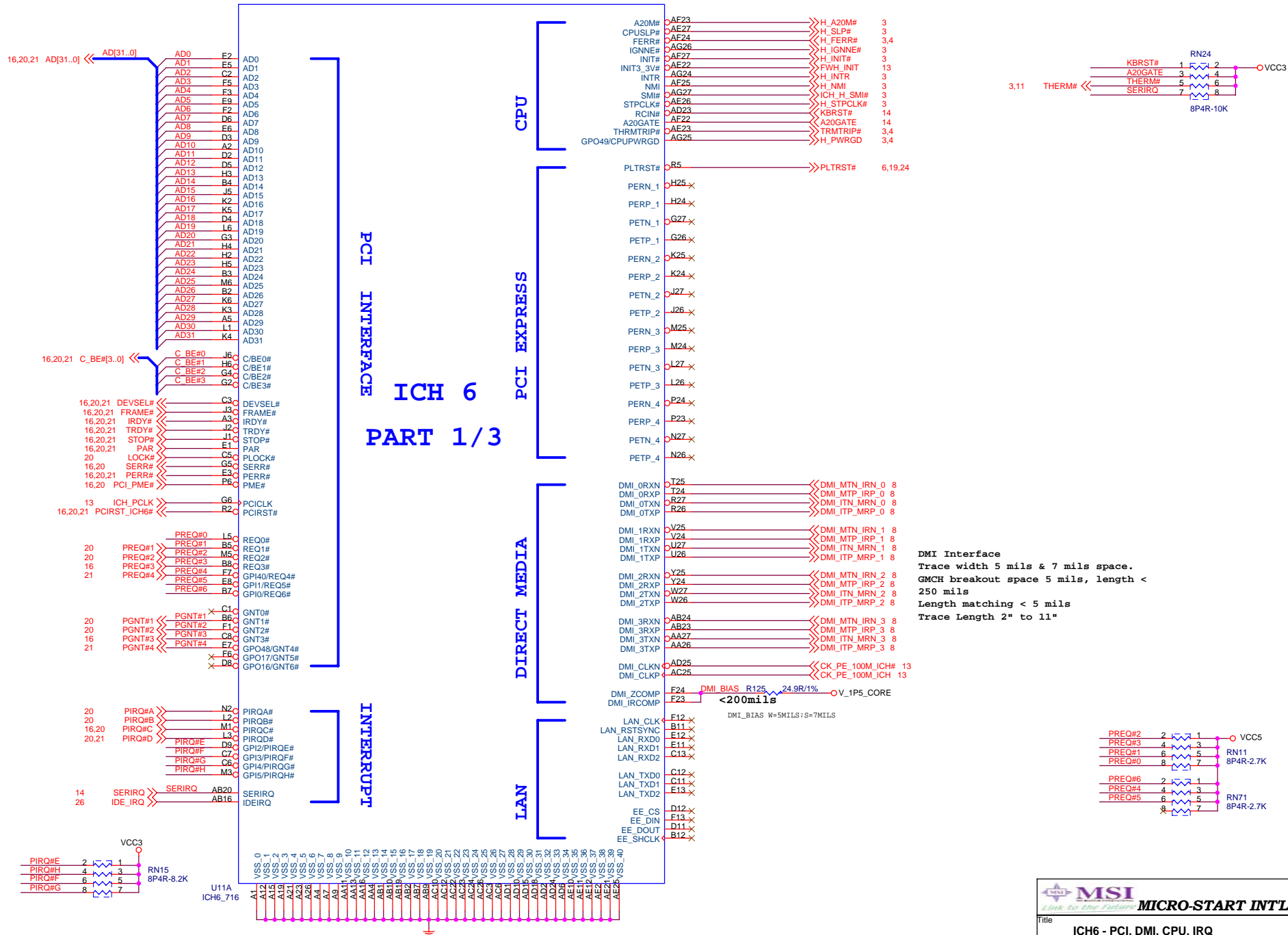




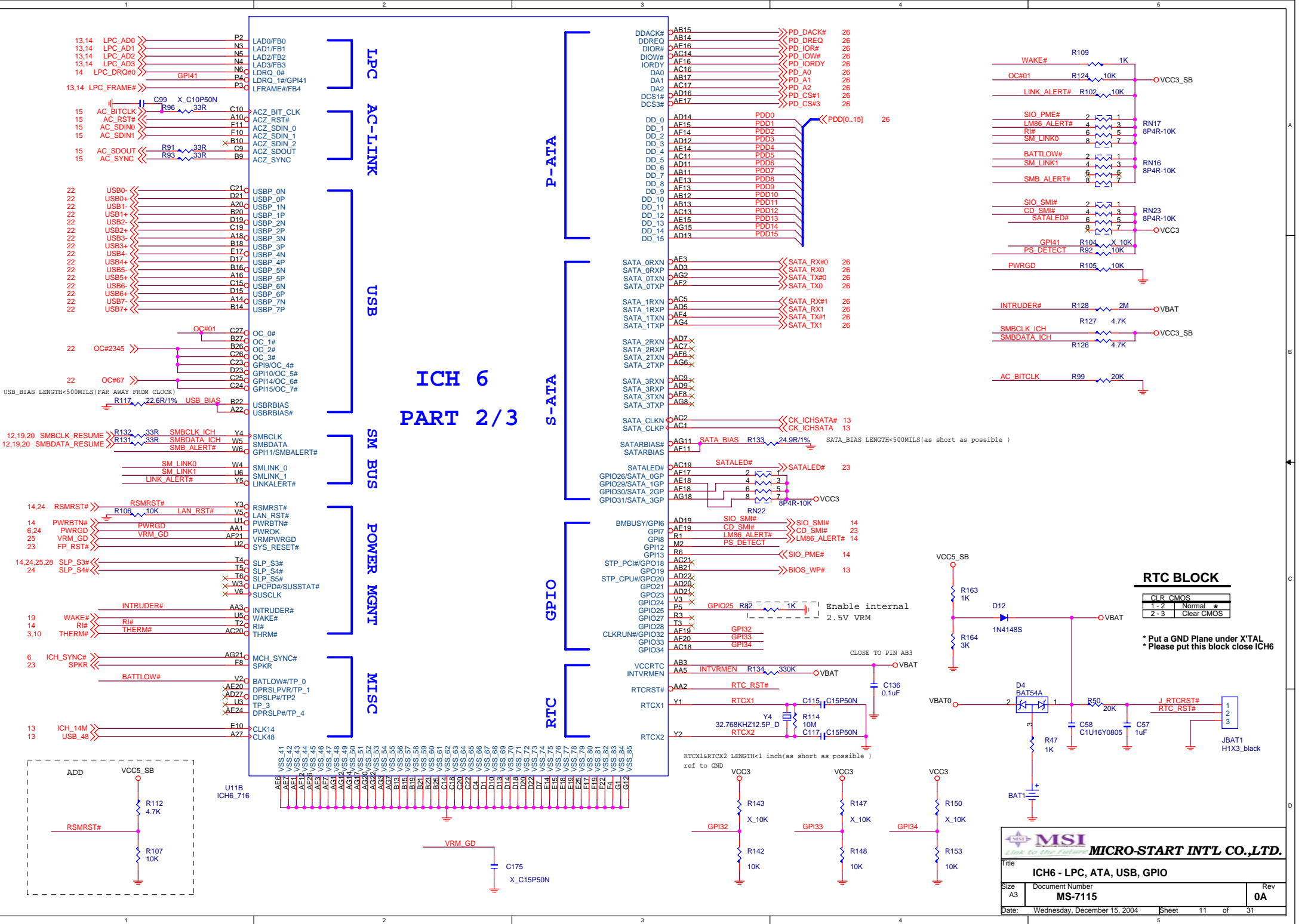


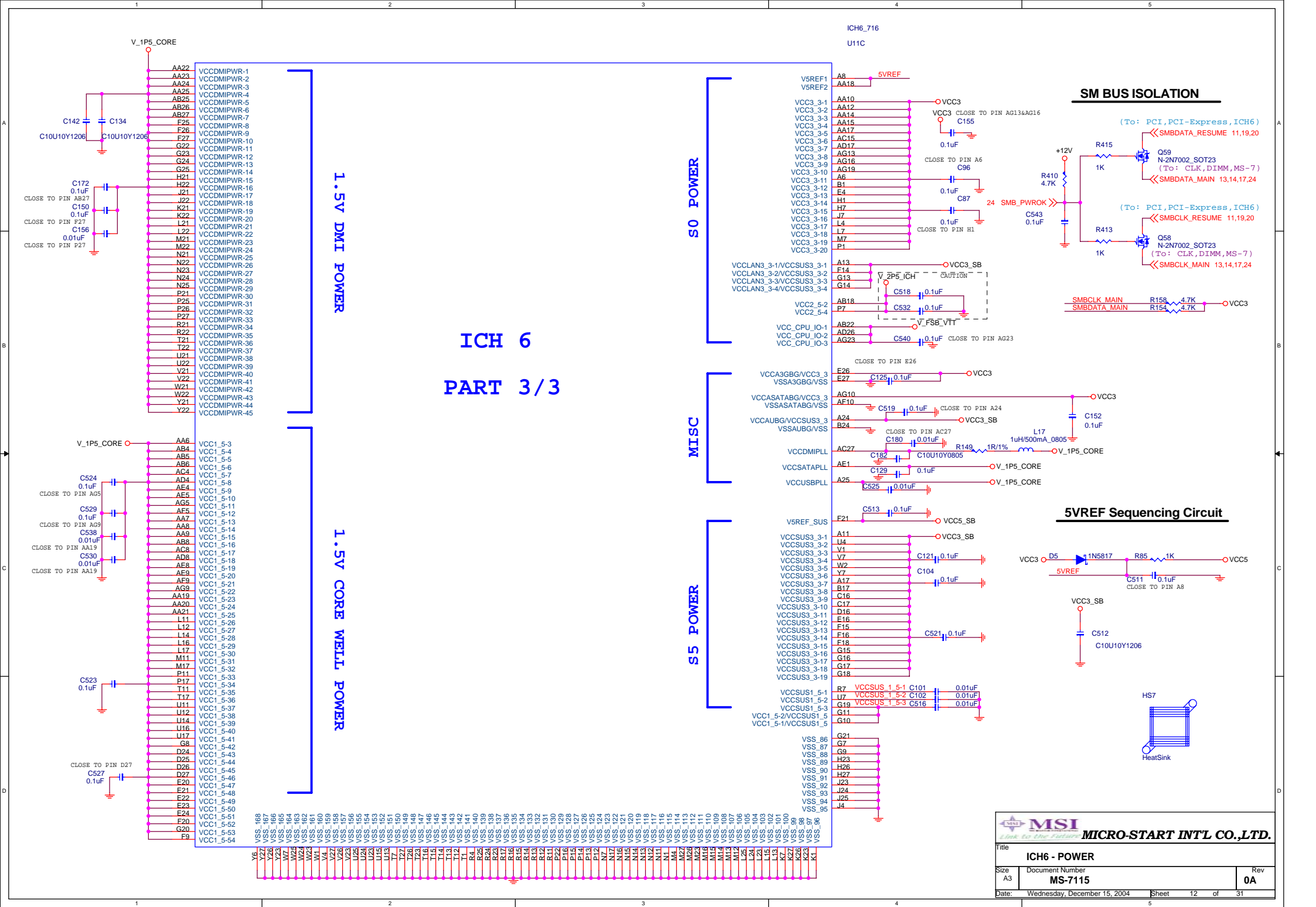






DMI Interface  
Trace width 5 mils & 7 mils space.  
GMCH breakout space 5 mils, length < 250 mils  
Length matching < 5 mils  
Trace Length 2" to 11"





Trace length less than 0.5inchs

VDD\_CPU CPUCLK0 CPUCLK0# CPUCLK1 CPUCLK1#

GND

VDDPCIE\_X PCIE\_XT0 PCIE\_XC0 PCIE\_XT1 PCIE\_XC1 PCIE\_XT2 PCIE\_XC2 PCIE\_XT3 PCIE\_XC3 PCIE\_XT4 PCIE\_XC4 SRCCLK1 SRCCLK0

GND

VDDA DOTT\_96MHZ DOTT\_96MHZ#

GNDA

VDDPCPI PCICLK\_F0 FSA/PCICLK\_F1 FSB/PCICLK\_F2 PCICLK0 PCICLK1 PCICLK2 PCICLK3 PCICLK4 PCICLK5

GND

VDD48 SEL24\_48#/24\_48MHZ USB\_48MHZ

GND

VDDREF REF0/FSC REF1 X1 X2

GND

SLK SDATA VTT\_PWRGD#/PD RESET#

IRF

IC954119DF

43 CPUCLK R63 33R CK H\_CPU 33R CK H\_CPU 33R CK H\_CPU# 33R CK H\_CPU#

42 CPUCLK# R66 33R CK H\_CPU# 33R CK H\_CPU#

40 CPUCLK1 R74 33R CK H\_MCH# 33R CK H\_MCH# 33R CK H\_MCH# 33R CK H\_MCH#

39 CPUCLK1# R79 33R CK H\_MCH# 33R CK H\_MCH# 33R CK H\_MCH# 33R CK H\_MCH#

17 18 21 22 23 24 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936

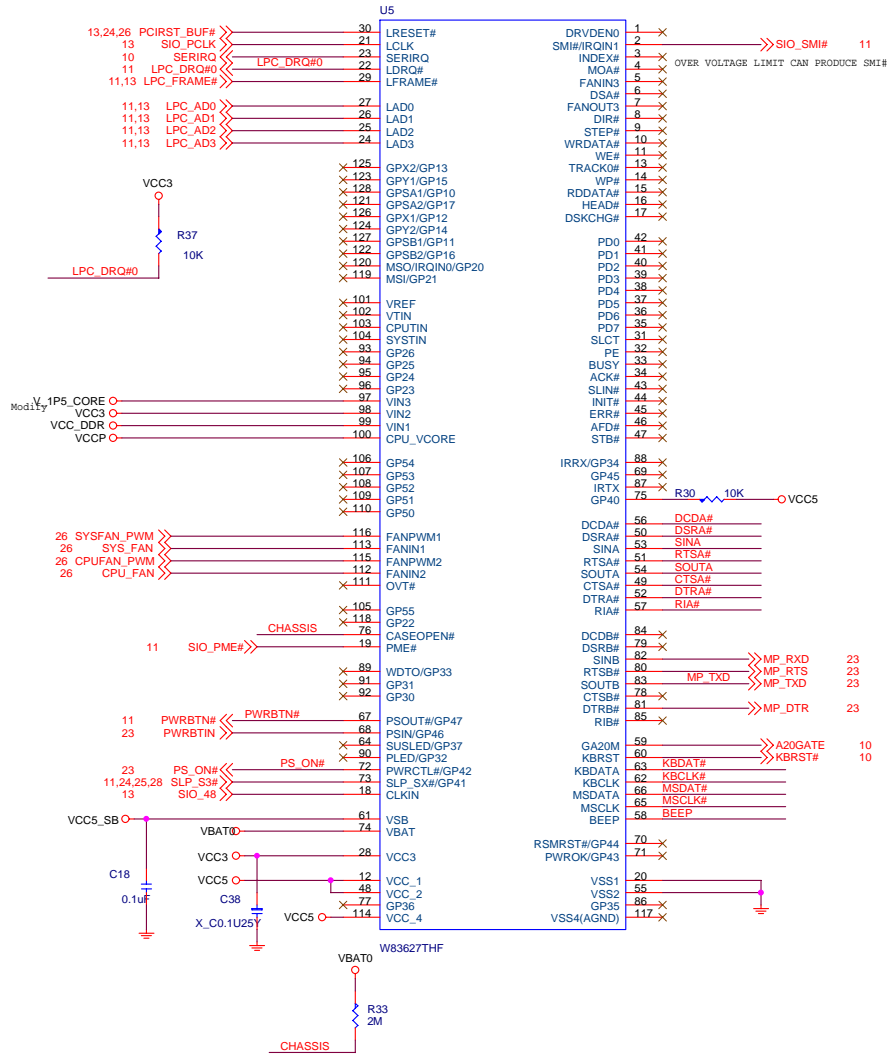
[illegible]

default is high

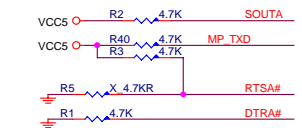
	RN6	8P4R-1K
BIOS WP#	1	2
PRES1	3	4
PRES2	5	6
PRES3	7	8

VCC3

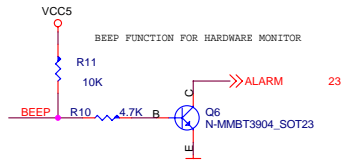
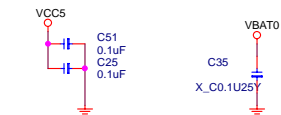
PRES4 R13 1K



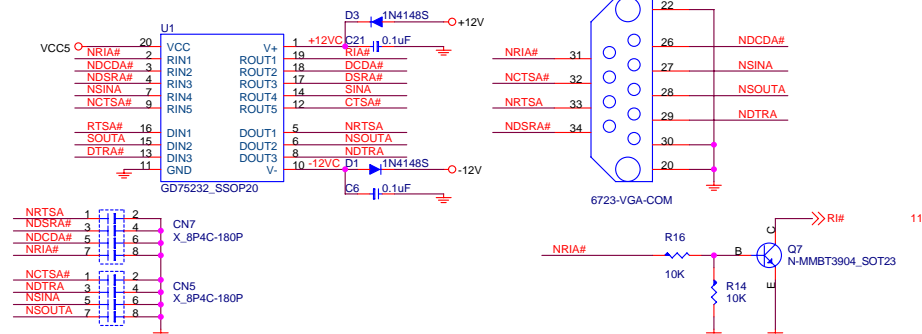
### LPC I/O STRAPPING RESISTOR



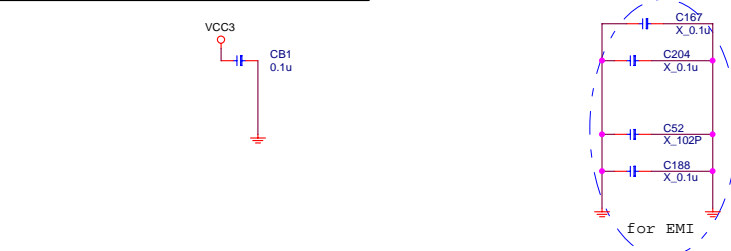
SOUTA	L: Disable KBC	H: Enable KBC
SOUTB	L: 24MHZ	H: 48MHZ
RTSA#	L: CFAD=2E	H: CFAD=4E
DTRA#	L: PNP Default	H: PNP no Default



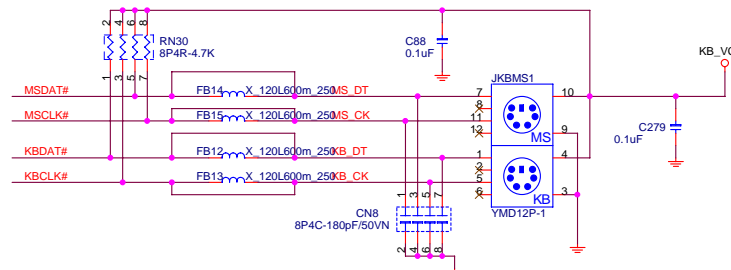
### SERIAL PORT 1



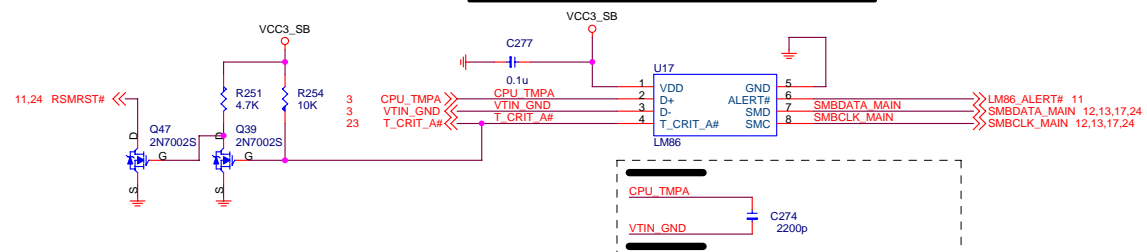
### LPC I/O DECOUPLING CAPACITORS



### PS2 KEYBOARD & MOUSE CONNECTOR

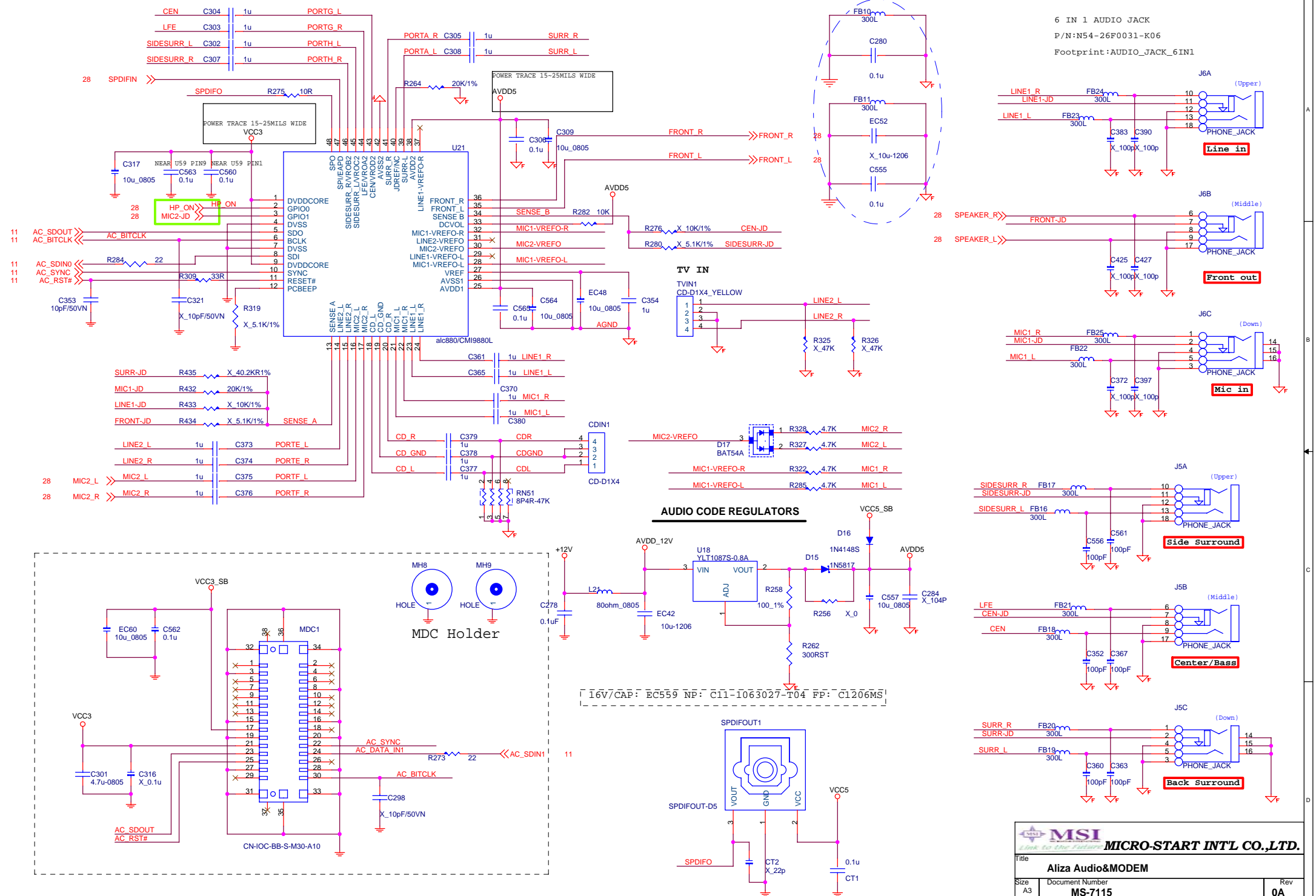


### LM86 DIGITAL TEMPERATURE SENSOR



MSI  
Micro-Start Intl Co., Ltd.

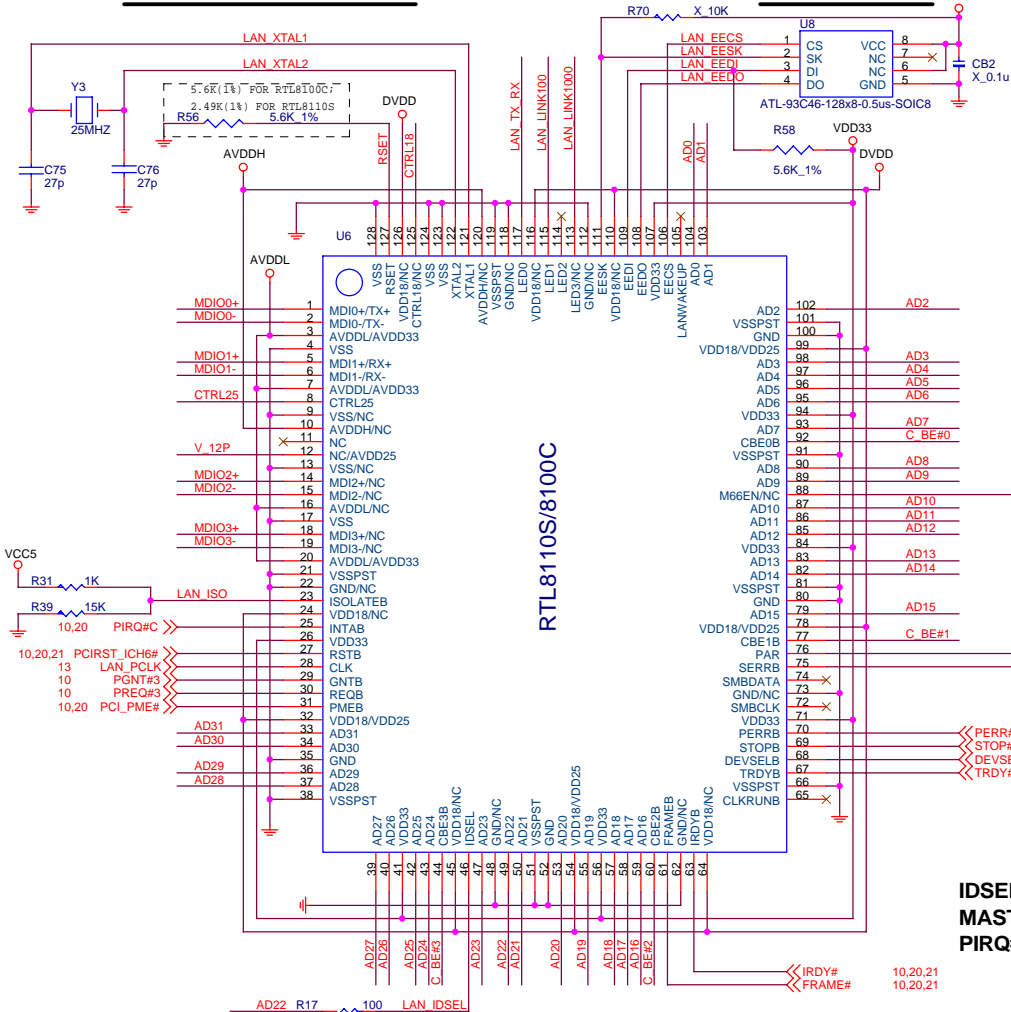
Title LPC I/O - W83627THF&LM86		
Size Custom	Document Number MS-7115	Rev 0A
Date Wednesday, December 15, 2004	Sheet 14	of 31





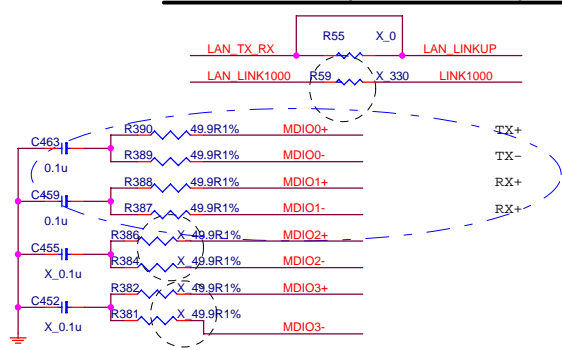
## PCI LAN RTL8110S/8100C

## LAN EEPROM

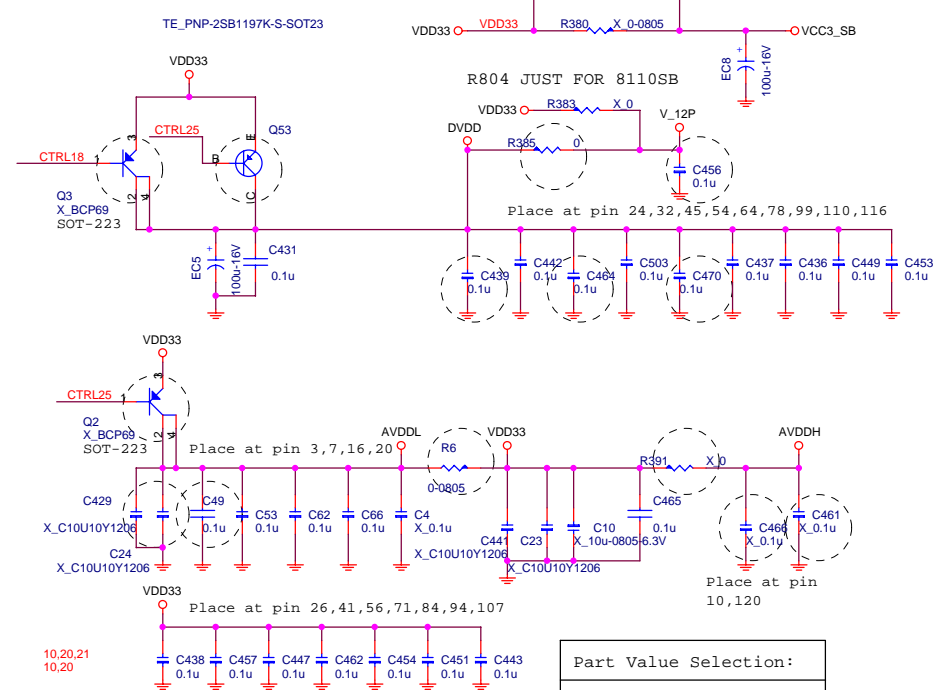
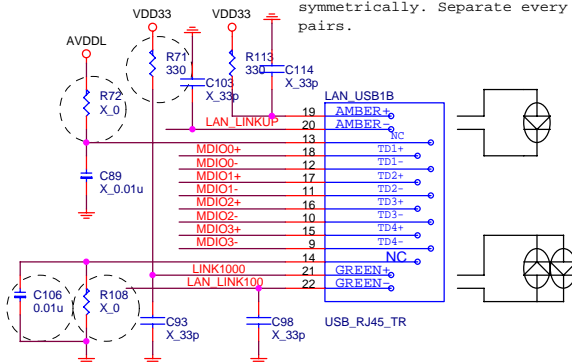


**IDSEL = AD29**  
**MASTER = PREQ#3**  
**PIRQ#G**

## RJ45 Connector (with transformer)



1- MDIO+ & MDIO- pairs should be  
 100-ohm differential impedance.  
 Route equal length and  
 symmetrically. Separate every  
 pairs.



### Part Value Selection:

GbE: 8110S LAN(1000M)  
 TE: 8100C LAN(10/100M)  
 L: With LAN option  
 X: No Stuff

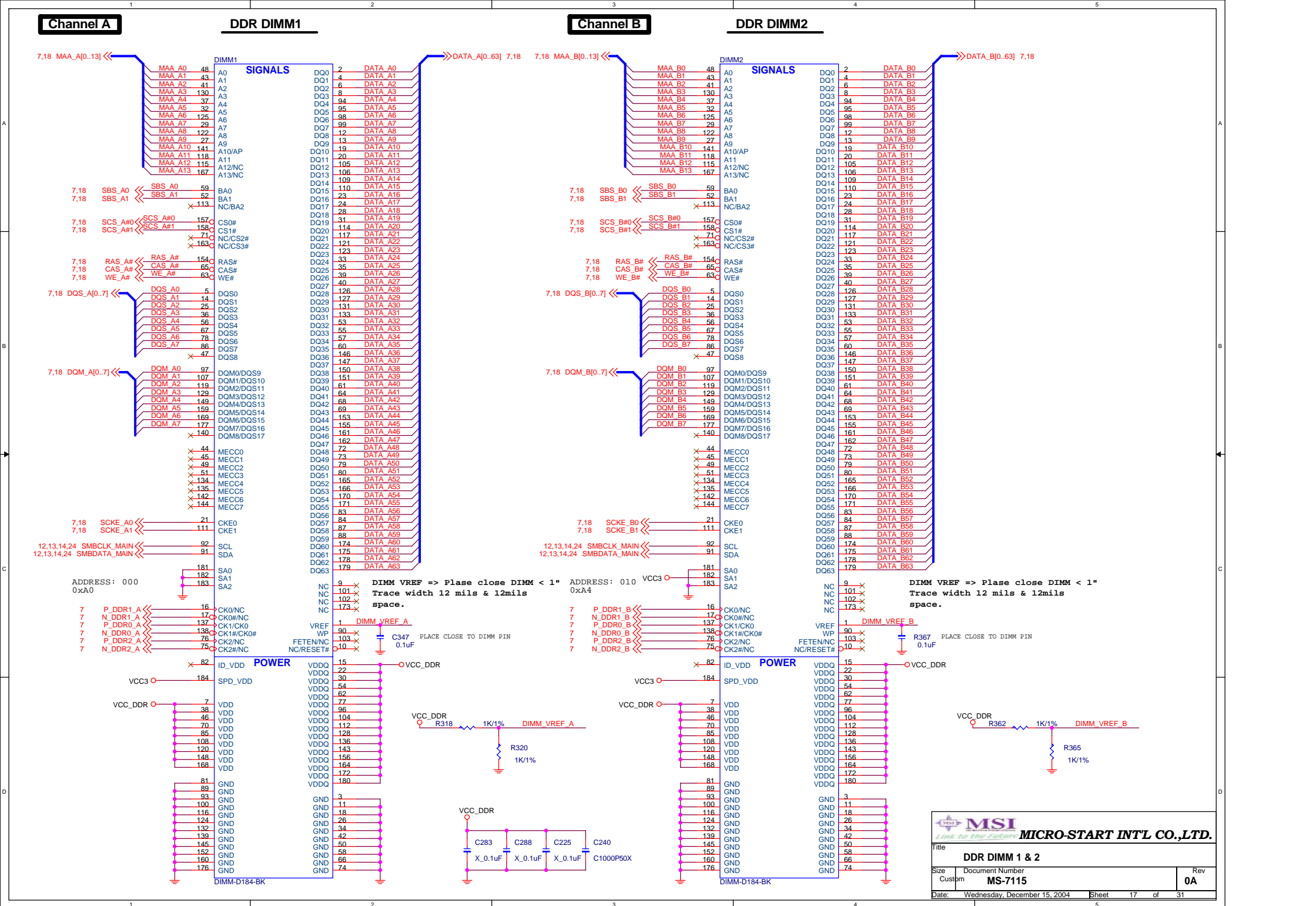
	DVDD	DVDDA	AVDDL	AVDDH	V-12P
8100C	2.5V	2.5V	3.3V	X	2.5V
8110S	1.8V	1.8V	2.5V	3.3V	X

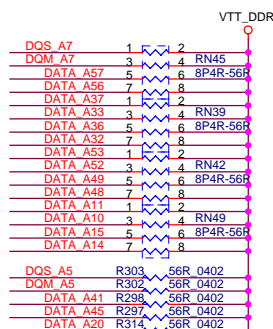
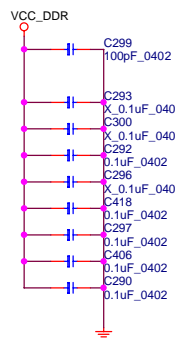
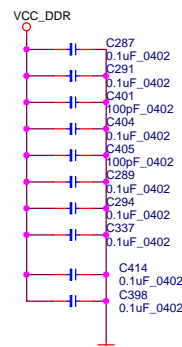
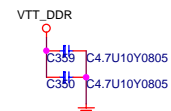
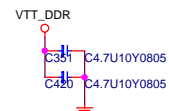
DEFAULT 10/100,  for GIGALAN OPTION



Title		
REALTEK LAN 8110S/8100C		
Size	Document Number	Rev
A3	MS-7115	0A
Date:	Wednesday, December 15, 2004	Sheet 16 of 31









7.17	SCS_A#1	R301	56R 0402
7.17	SCS_A#2	R299	56R 0402
7.17	SCKE_A0	R313	56R 0402
7.17	SCKE_A1	R312	56R 0402
<hr/>			
	MAA_A1	R292	47R 0402
	MAA_A2	R306	47R 0402
	MAA_A5	R289	47R 0402
	MAA_A8	R288	47R 0402
	MAA_A7	R287	47R 0402
	MAA_A3	R290	47R 0402
	MAA_A4	R290	47R 0402
	MAA_A10	R308	47R 0402
	MAA_A0	R307	47R 0402
	MAA_A6	R305	47R 0402
	MAA_A9	R311	47R 0402
	MAA_A11	R310	47R 0402
	MAA_A12	R310	47R 0402
	MAA_A13	R304	47R 0402
<hr/>			
7.17	SBS_A0	R294	47R 0402
		R293	47R 0402

7,17 WE\_A# R296 47R 0402  
7,17 RAS\_A# R295 47R 0402  
7,17 CAS\_A# R300 47R 0402

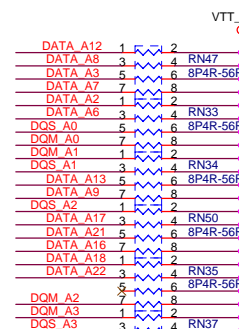
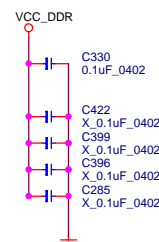
7,17 DQS\_A[0..7] << 

7,17 DATA\_A[0..63] << 

7,17 DQM\_A[0..7] << 


7,17 MAA\_A[0..13] << 

Command Group: SMA,SBS,SRAS#SCAS# & SWE# (47 ohm)



DATA A25	7	8
DATA A31	1	2
DATA A32	3	4
DATA A36	5	8P4R-56F
DATA A30	1	2
DATA A38	1	2
DOM A4	3	4
DATA A34	5	6
DATA A34	5	6
DATA A34	5	6
DATA A40	1	2
DATA A44	1	2
DATA A44	1	2
DATA A35	1	2
DATA A39	7	8
DATA A37	1	2
DATA A24	3	4
DATA A19	5	6
DATA A23	7	8
DATA A41	1	2
DATA A0	1	2
DATA A5	4	6
DATA A4	7	8
DATA A47	1	2
DATA A46	3	4
DATA A43	5	6
DATA A42	7	8
DATA A61	3	4
DATA A60	3	4
DATA A51	5	6
DATA A50	7	8
DATA A59	1	2
DATA A58	3	4
DATA A63	5	6
DATA A62	7	8
DATA A56	3	4
DATA A54	3	4
DATA A6	5	6
DATA A6	7	8

7,17 WE\_B# << R354 47R 0402  
7,17 RAS\_B# << R353 47R 0402  
7,17 CAS\_B# << R357 47R 0402

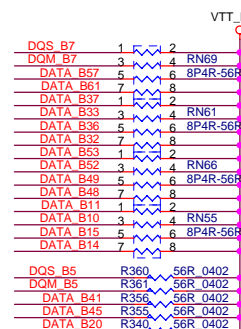
7,17 DQS\_B[0..7] <<< 

7,17 DATA\_B[0..63] <<< 

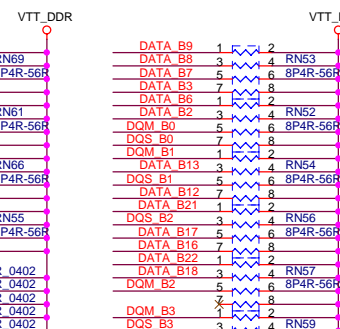
7,17 DQM\_B[0..7] <<< 

7,17 MAA\_B[0..13] <<< 

Command Group: SMA,SBS,SRAS#SCAS# & SWE# (47 ohm)

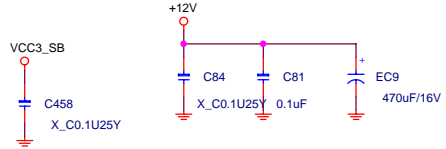
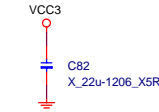
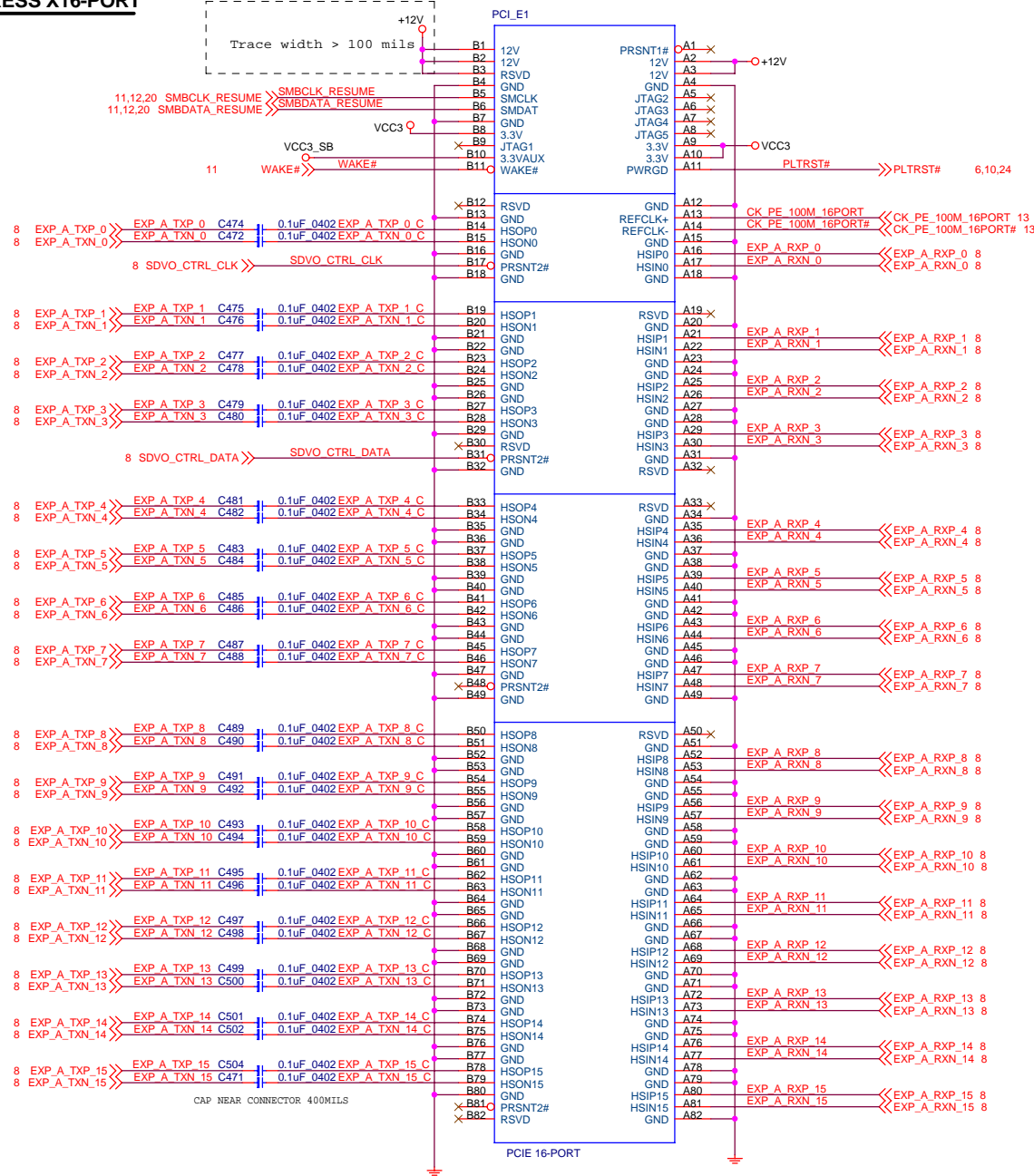


7,17	SCS_B#0	R358	56R 0402
7,17	SCS_B#1	R359	56R 0402
7,17	SCS_B#2	R339	56R 0402
7,17	SCKE_B0	R338	56R 0402
MAA B1	R351	47R 0402	
MAA B2	R350	47R 0402	
MAA B5	R346	47R 0402	
MAA B8	R345	47R 0402	
MAA B7	R344	47R 0402	
MAA B3	R347	47R 0402	
MAA B4	R348	47R 0402	
MAA B10	R364	47R 0402	
MAA B0	R363	47R 0402	
MAA B6	R347	47R 0402	
MAA B9	R343	47R 0402	
MAA B11	R342	47R 0402	
MAA B12	R341	47R 0402	
MAA B13	R366	47R 0402	
7,17	SBS_B0	R352	47R 0402
7,17	SBS_B1	R337	47R 0402

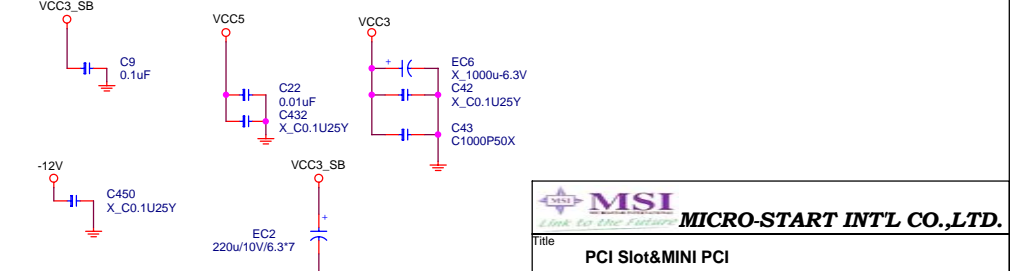
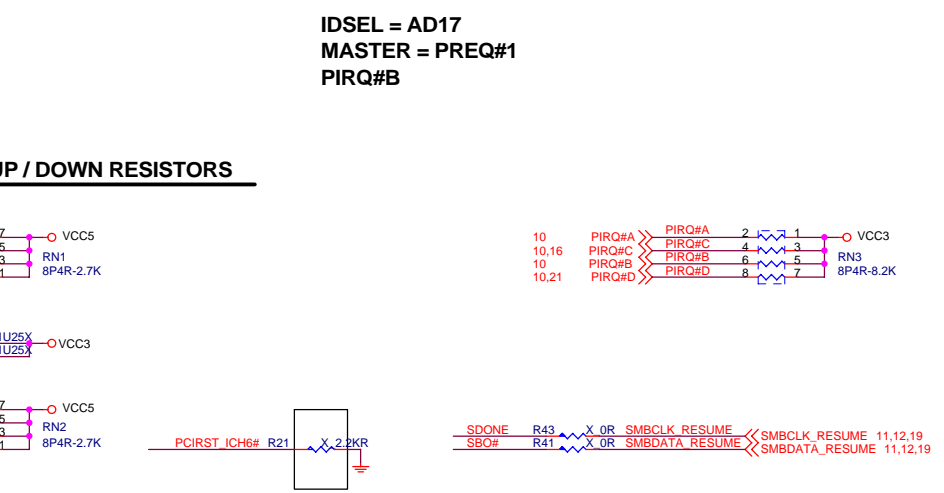


DATA B25	7	2	
DATA B31	1	8	
DATA B27	3	4	RN60
DATA B30	2	6	8P4R-56P
DATA B26	7	8	
DATA B38	1	2	
DATA B34	3	4	RN62
DOM B4	5	6	8P4R-56P
DOS B4	7	8	
DATA B44	1	2	
DATA B40	3	4	RN63
DATA B35	5	6	8P4R-56P
DATA B39	7	8	
DATA B28	1	2	
DATA B24	3	4	RN58
DATA B23	5	6	8P4R-56P
DATA B19	7	8	
DATA B35	1	2	8
DATA B1	3	4	RN68
DATA B0	5	6	8P4R-56P
DATA B4	7	8	
DATA B47	1	2	
DATA B46	3	4	RN64
DATA B43	5	6	8P4R-56P
DATA B42	7	8	
DATA B56	1	2	4
DATA B60	3	4	RN67
DATA B51	5	6	8P4R-56P
DATA B50	7	8	
DATA B59	1	2	
DATA B63	3	4	RN70
DATA B58	5	6	8P4R-56P
DATA B62	7	8	
DATA B55	1	2	4
DATA B54	3	4	RN65
DOS B6	5	6	8P4R-56P
DOM B6	7	8	

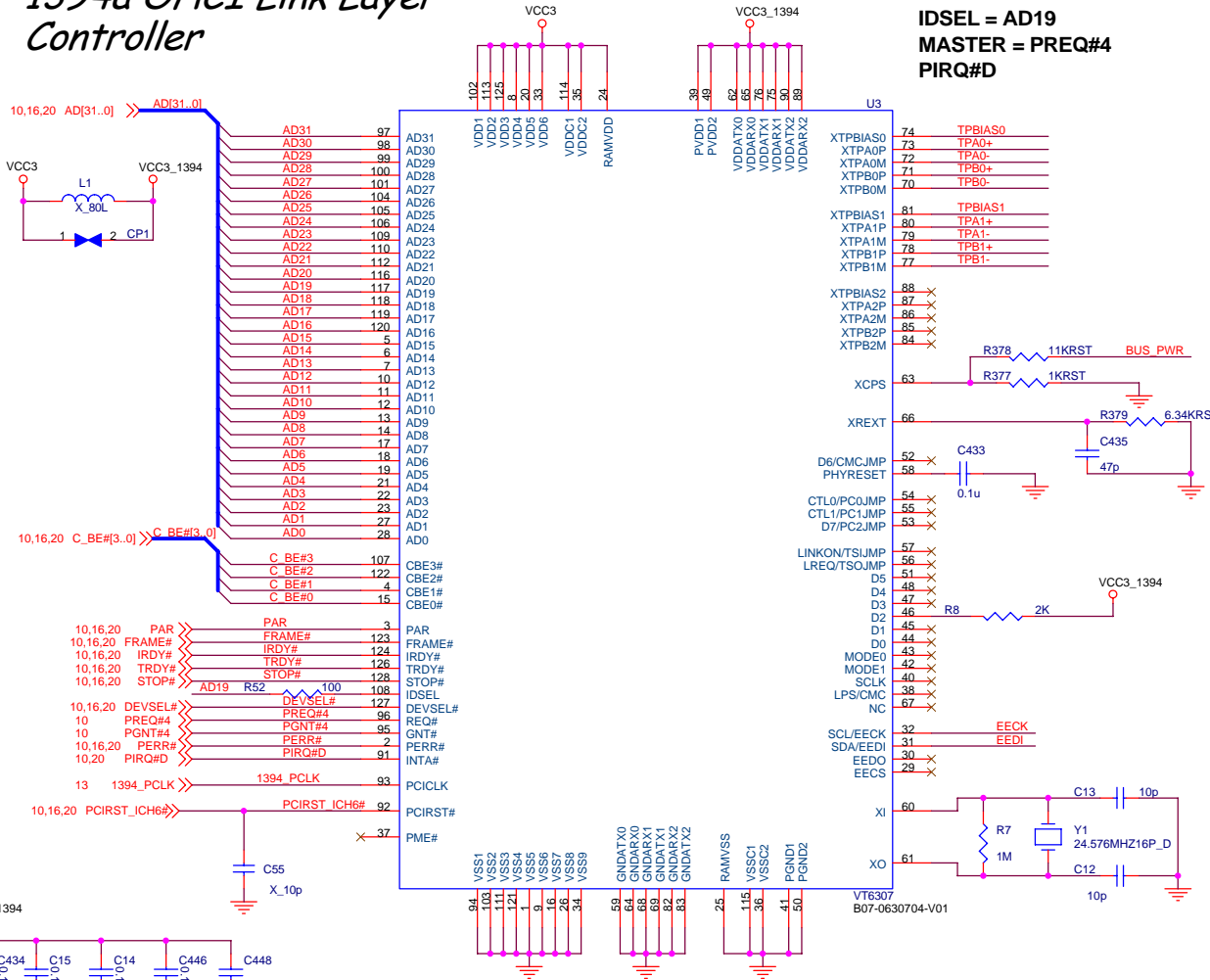
# PCI EXPRESS X16-PORT



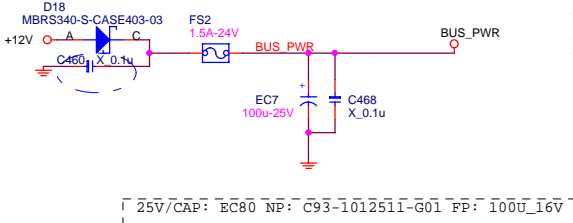
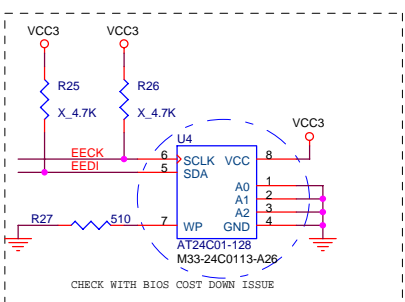
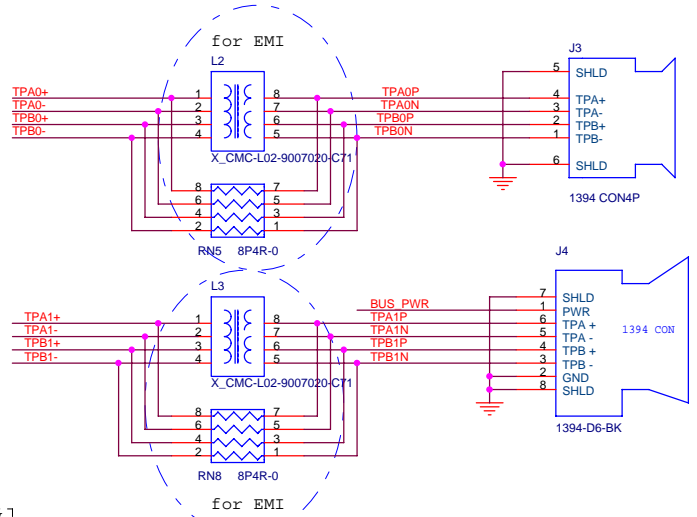
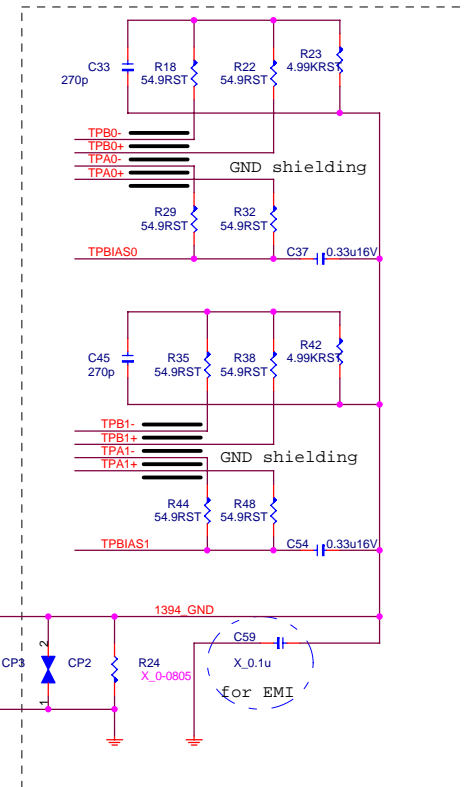
<b>MICRO-START INT'L CO.,LTD.</b>		
Title		
PCI -Express X16 Port		
Size	Document Number	Rev
A3	MS-7115	0A
Date:	Wednesday, December 15, 2004	Sheet 19 of 31



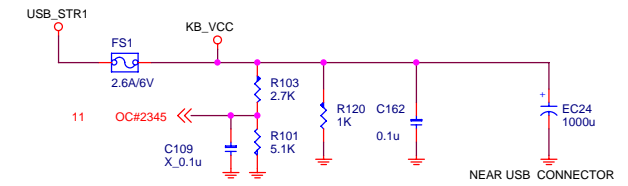
# 1394a OHCI Link Layer Controller



IDSEL = AD19  
MASTER = PREQ#4  
PIRQ#D

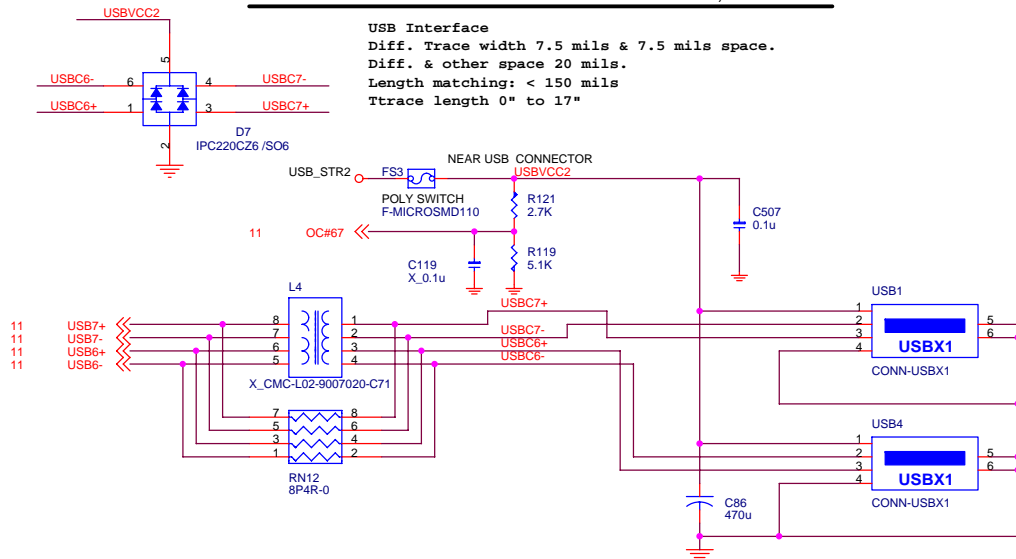


## POWER CIRCUIT FOR USB PORT 1~4



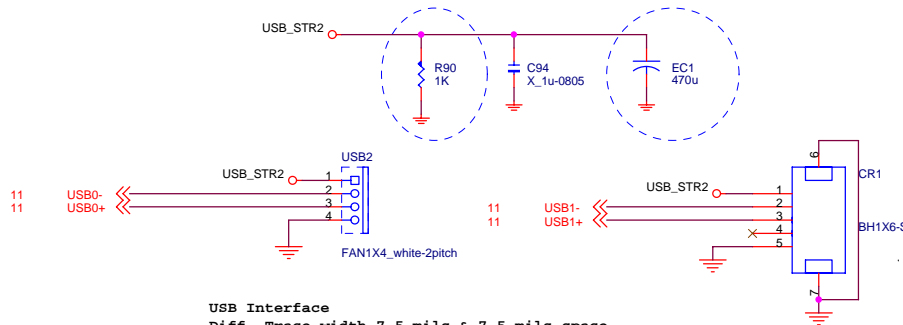
## FRONT USB CONNECTOR FOR USB PORT 6,7

**USB Interface**  
Diff. Trace width 7.5 mils & 7.5 mils space.  
Diff. & other space 20 mils.  
Length matching: < 150 mils  
Ttrace length 0" to 17"



## MCE IR CONNECTOR

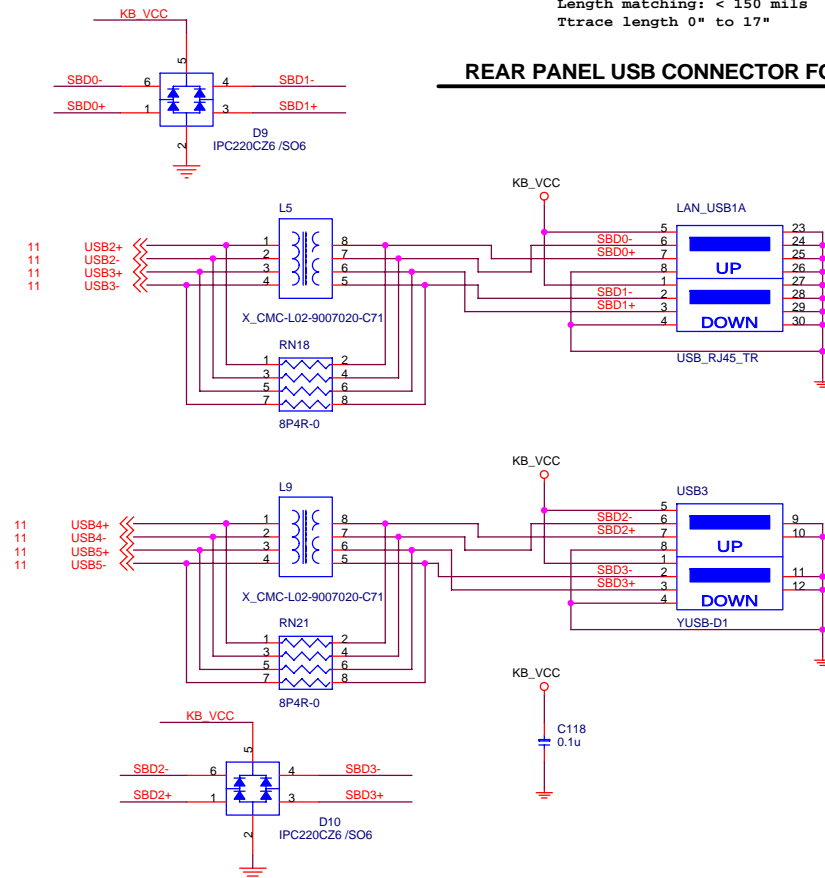
## FRONT CARD READER USB CONNECTOR



**USB Interface**  
Diff. Trace width 7.5 mils & 7.5 mils space.  
Diff. & other space 20 mils.  
Length matching: < 150 mils  
Ttrace length 0" to 17"

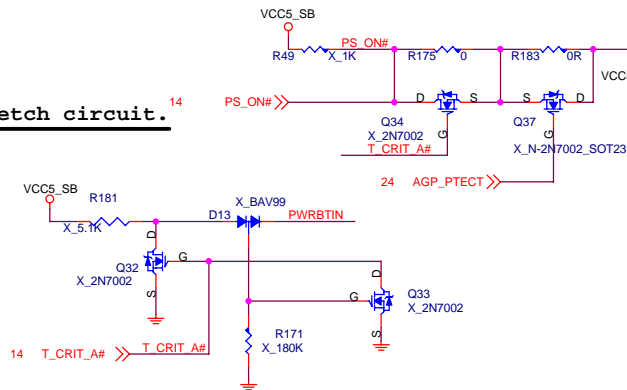
## REAR PANEL USB CONNECTOR FOR USB PORT 1~4

**USB Interface**  
Diff. Trace width 7.5 mils & 7.5 mils space.  
Diff. & other space 20 mils.  
Length matching: < 150 mils  
Ttrace length 0" to 17"



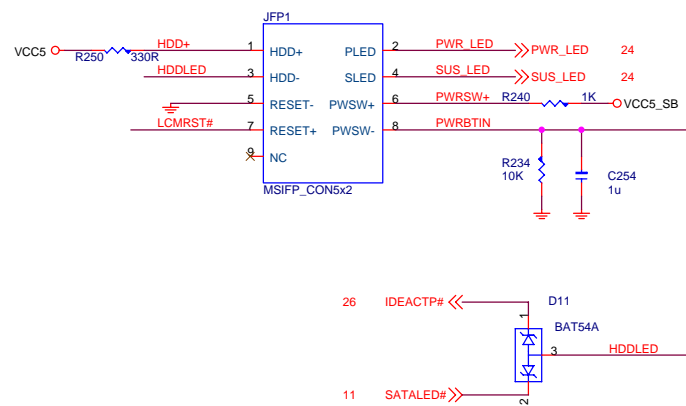


# **Latch circuit.**

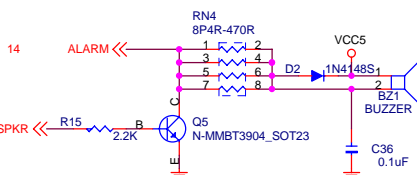
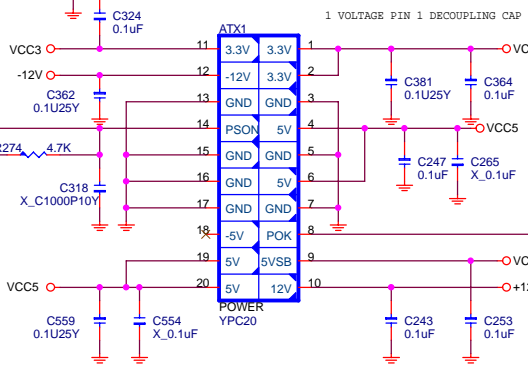


(Put at Solder Side)

## **Intel Front Panel**

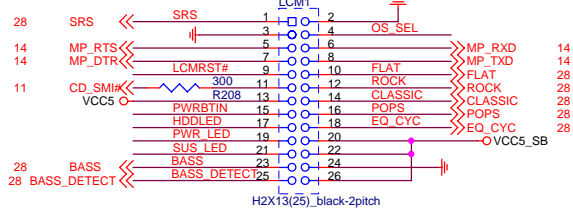


## **ATX Connector**

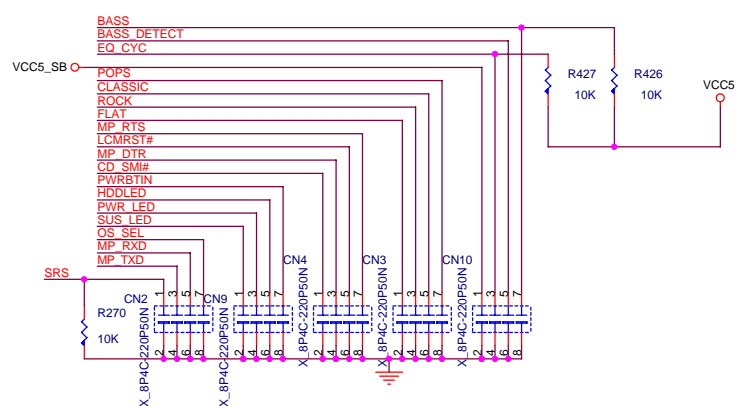
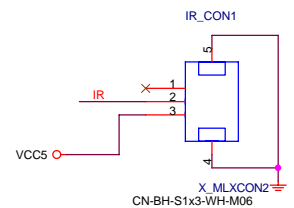


## **Table for POWER LED's behavior on LCM.**

MODE	LCM 1	PLED1 PIN19	PLED2 PIN21	LED State
S0/ INSTANT-ON		H	L	Green
S1		Flash	L	Flash Green / 1Hz
S3		L	H	Yellow
S4/5		L	L	Dark



## **IR Connector**



# ACPI Controller

**3VSB MODE SELECT**

3VSB MODE 3VSLDRC#

SINGLE MOSFET PULL HIGH

DUAL MOSFET PULL LOW

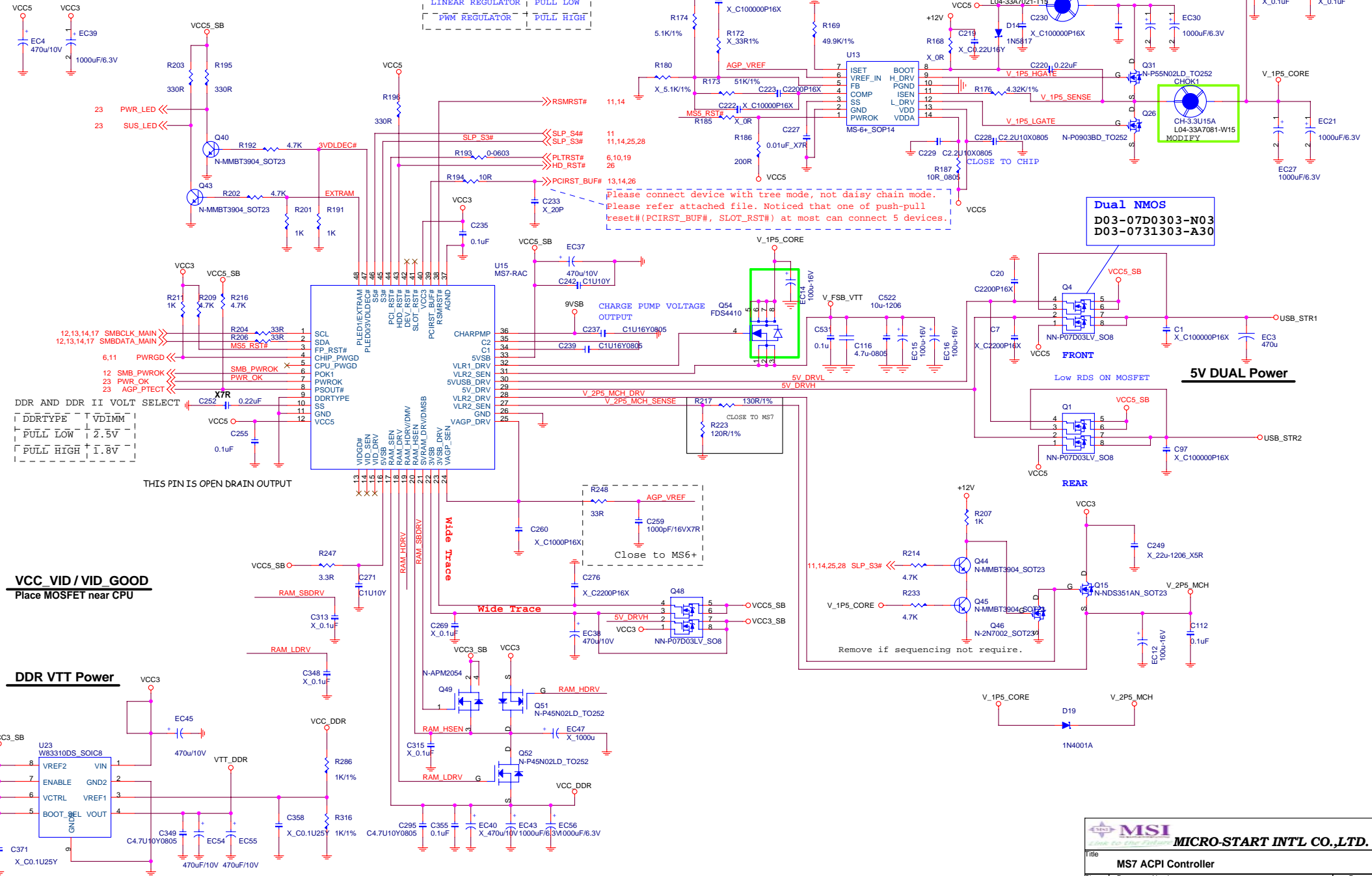
**VDIMM LINEAR OR PWM SELECT**

VDIMM MODE EXTRAM

LINEAR REGULATOR PULL LOW

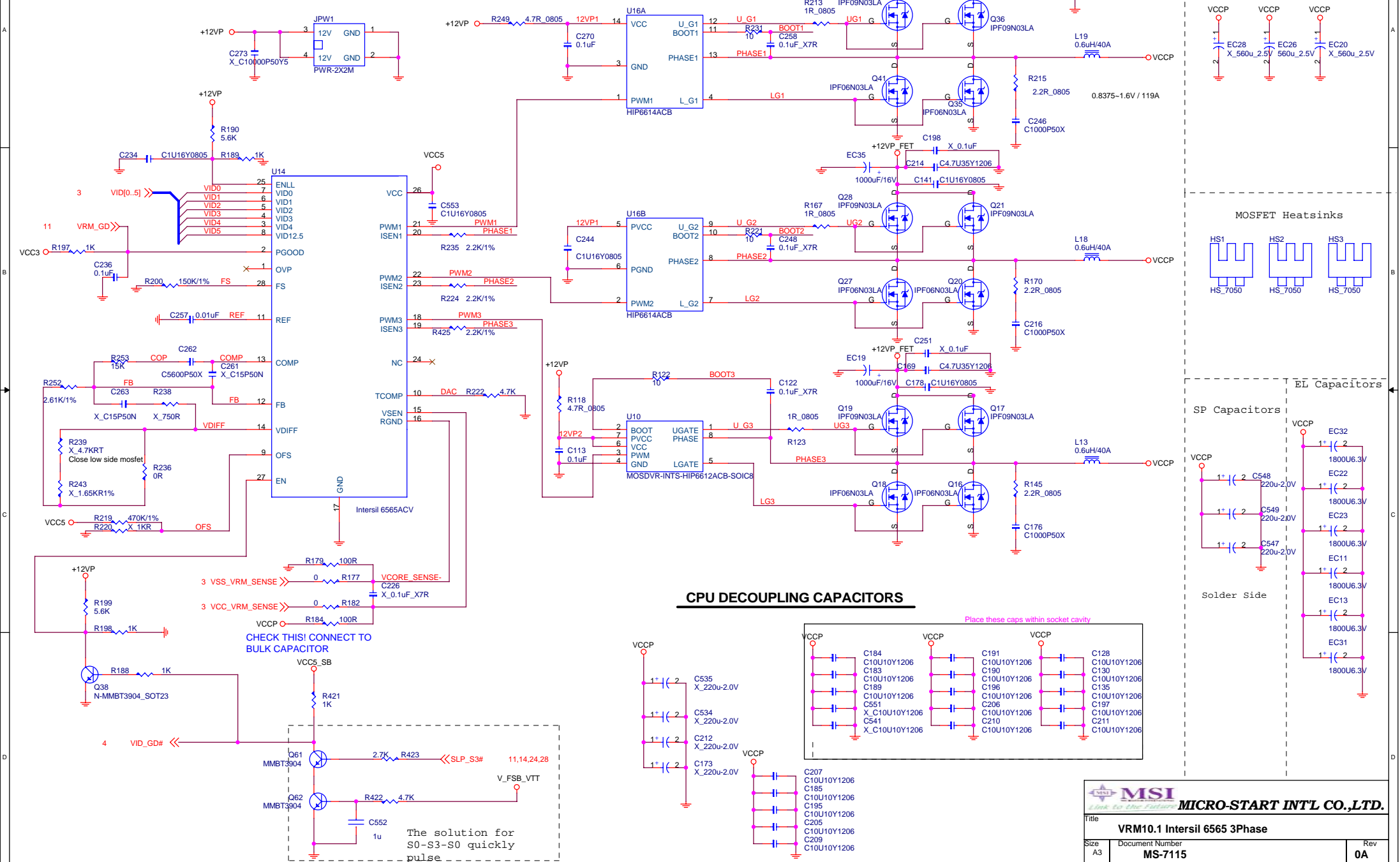
PWM REGULATOR PULL HIGH

## AGP POWER





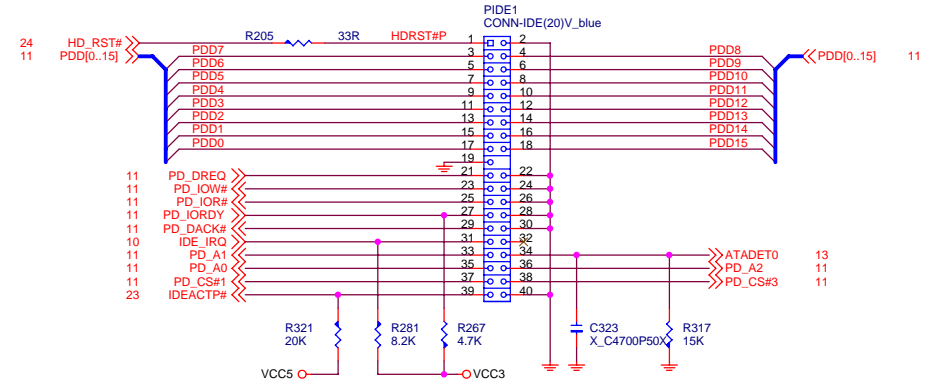
## Voltage Regular Module



## SERIAL ATA CONNECTOR BLOCK

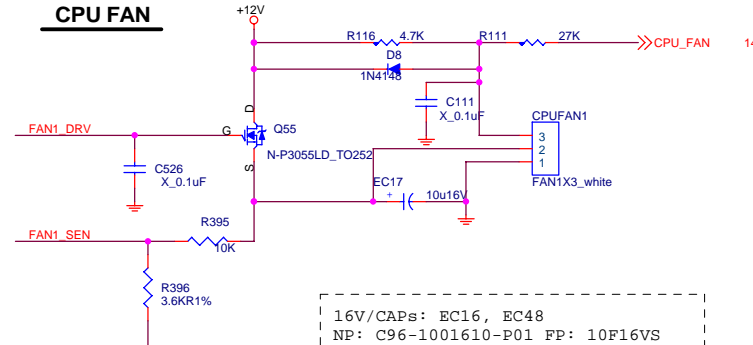
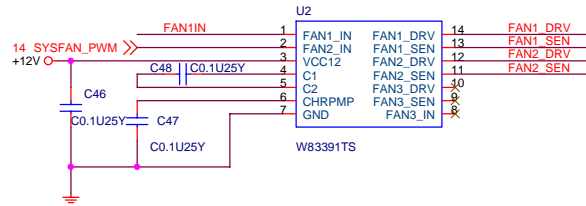


## ATA 33/66/100 IDE Connectors

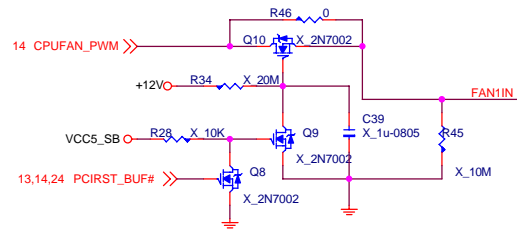


## FAN CONTROL

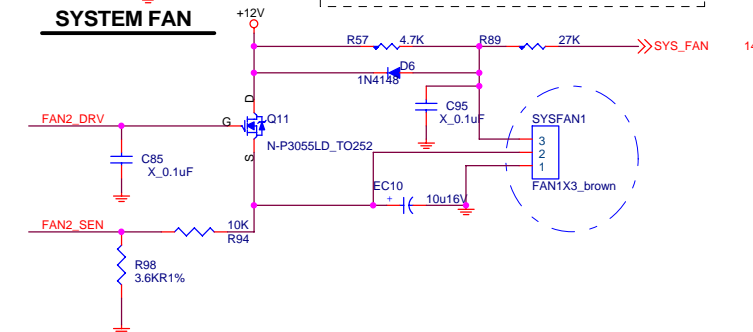
### CPU FAN



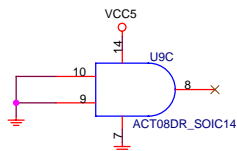
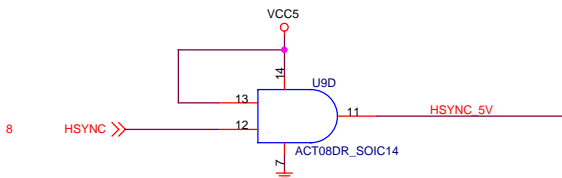
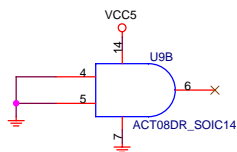
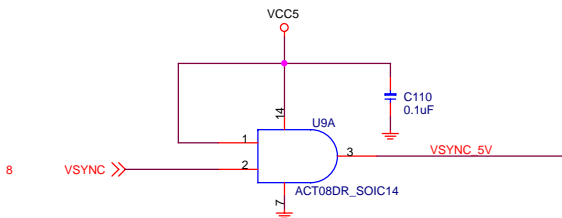
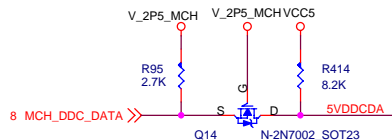
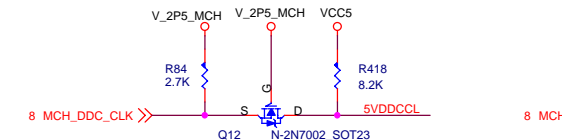
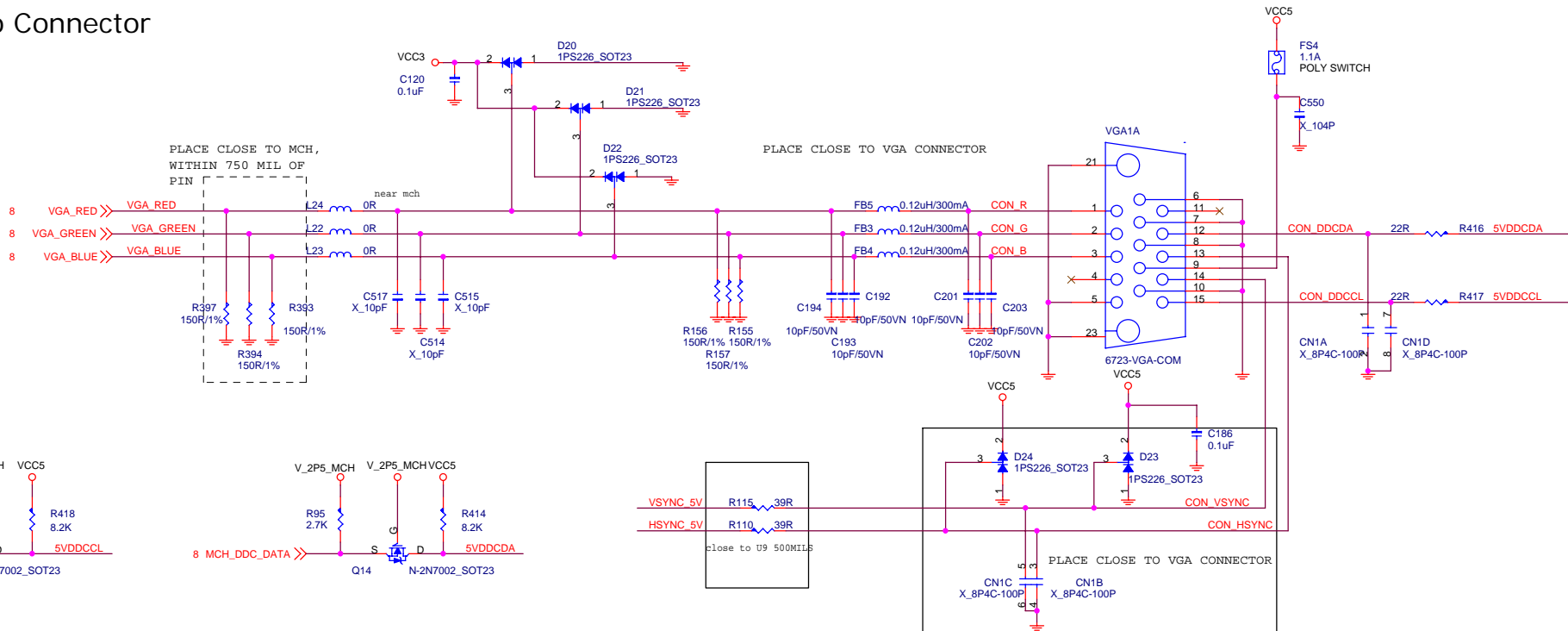
### FAN control dealy circuit



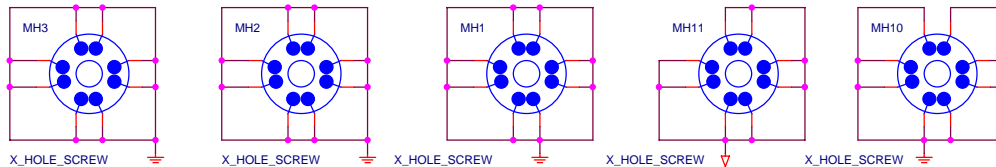
### SYSTEM FAN



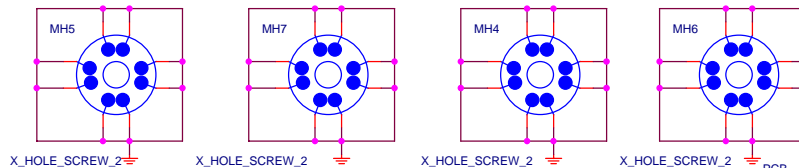
# Video Connector



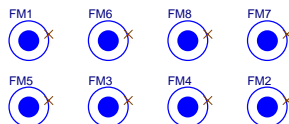
## Mounting Holes



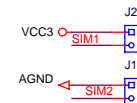
## CPU Hole



## Optics Orientation Holes

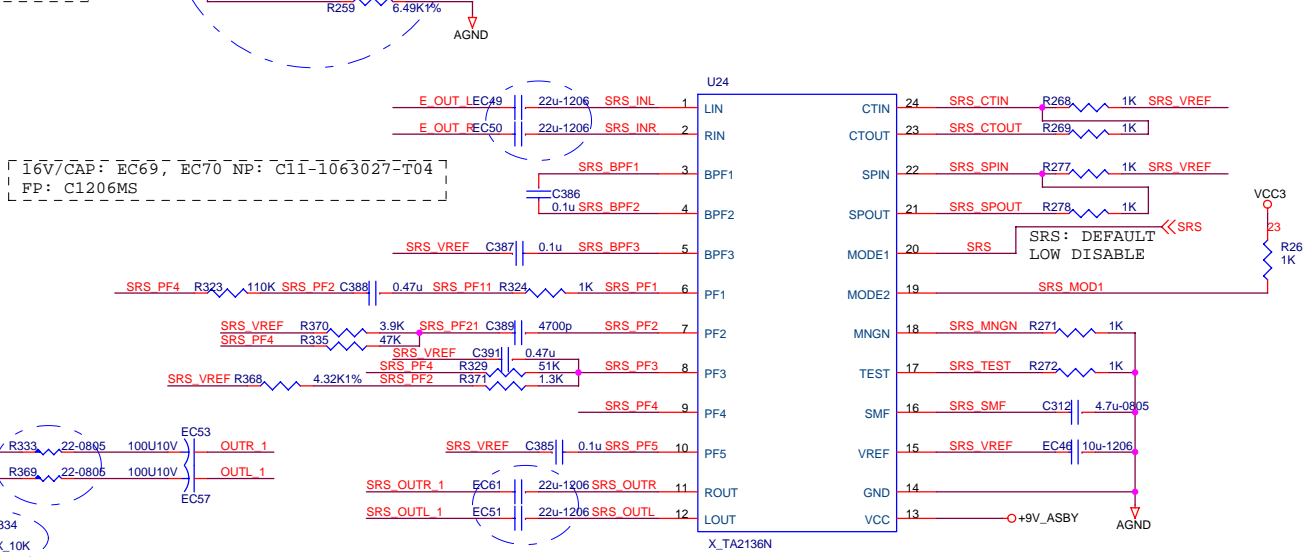
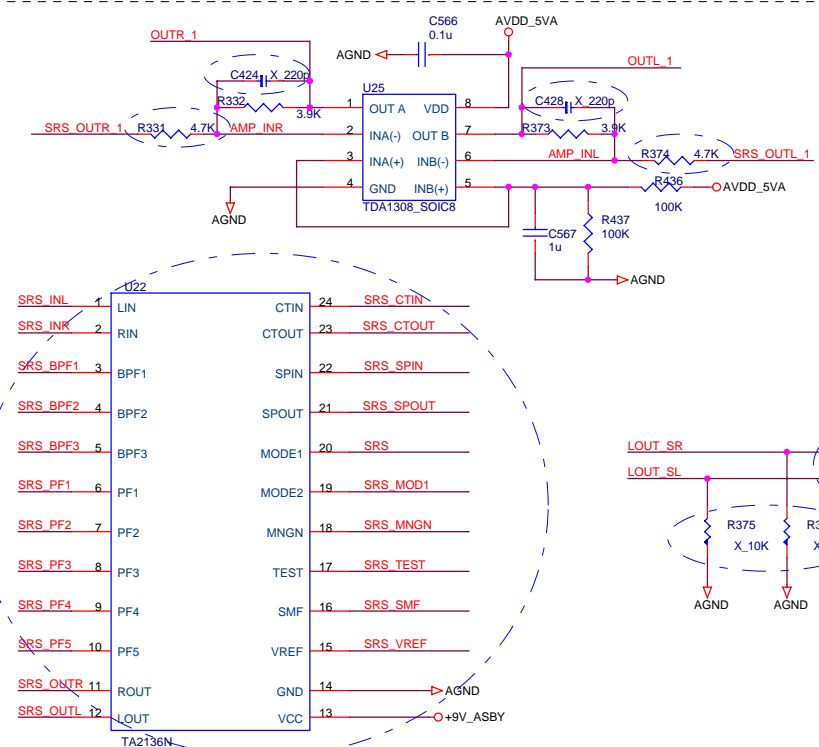
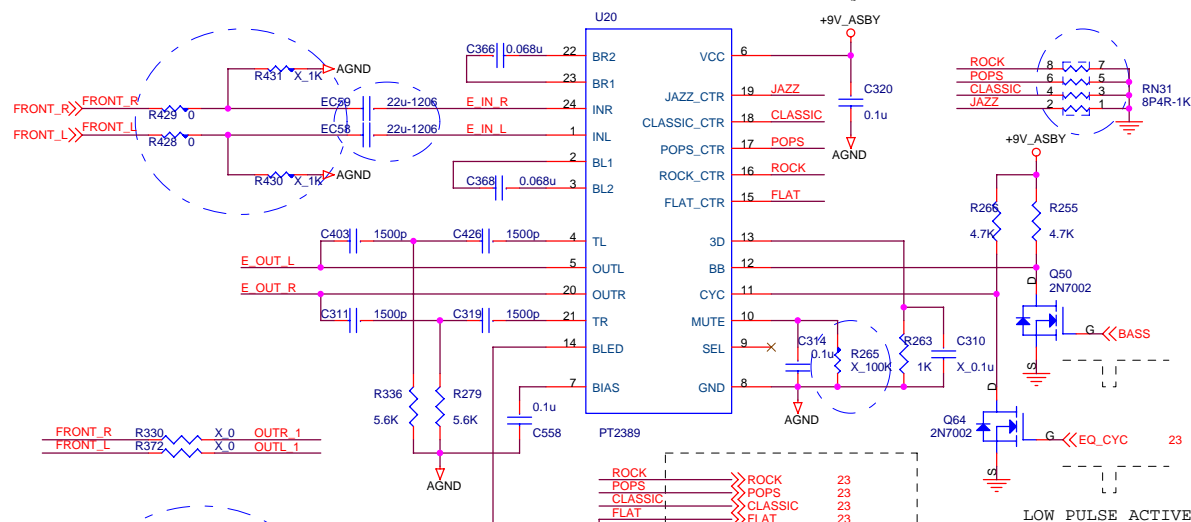
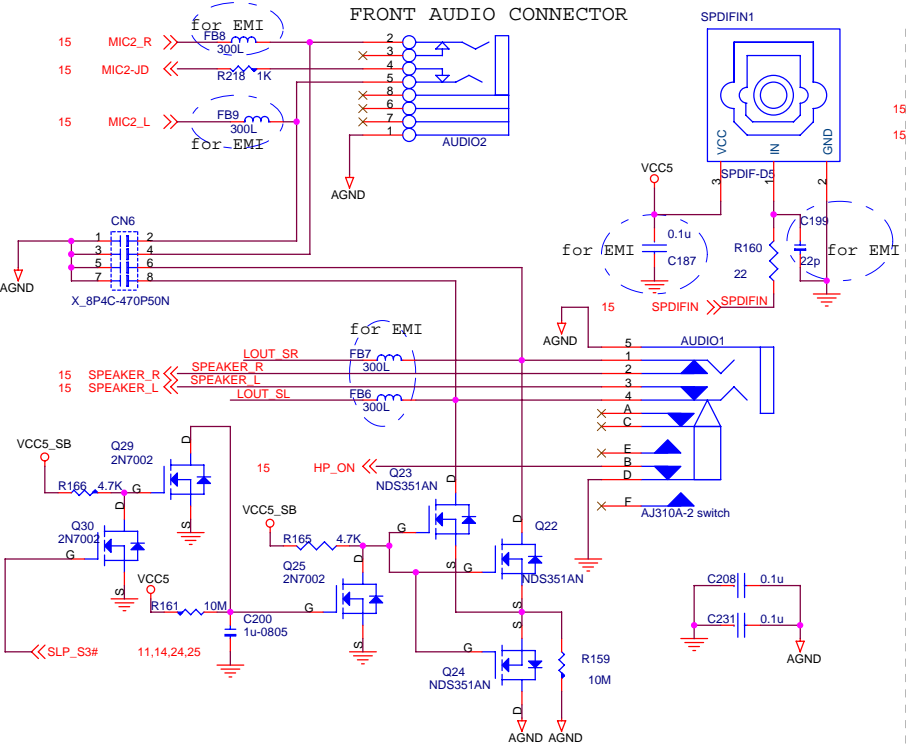


## Simulation



<b>MICRO-START INT'L CO.,LTD.</b>		
Title: <b>VGA CON&amp;Misc</b>		
Size: A3	Document Number: <b>MS-7115</b>	Rev: <b>0A</b>
Date: Wednesday, December 15, 2004	Sheet: 27 of 31	

# FRONT AUDIO CONNECTOR



Title			FRONT AUDIO&EQ, SRS
Size	Document Number	Rev	
A3	MS-7115	0A	
Date:	Wednesday, December 15, 2004	Sheet	28 of 31

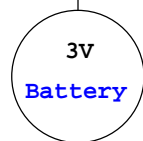
<b>Tejas</b>		
0.8375V - 1.6000V Core	- 95A	
1.2V FSB Vtt	- 2.9~3.5 A	

<b>Gransdale GMCH</b>		
1.2V FSB Vtt	- 1.0A	
2.6V DDR I/O (S0,S1)	-3.0A	
2.6V DDR I/O (S3)	-250mA	
*2.5V DAC	- 0.07A	
2.5V HV	- 5mA	
1.5V Core (Integrated)	- 9.7A	
1.5V Core (Discrete)	- 7.7A	
*1.5V PCI Express	- 1.4A	

<b>ICH6</b>		
1.2V VCC_CPU	- 14mA	
1.5V Core	- 1.88A	
*1.5V PCI Express	- 560mA	
1.5V SATA	- 430mA	
+3.3V VccSus	- 330mA	
RTC (G3)	- 5uA	
5VRef	- 1mA	
5VrefSus	- 10mA	
+3.3V	- 220mA	

<b>FWH</b>		
+3.3V (S0,S1)	- 107mA	

CLOCK GEN:+3.3V 560mA  
 SUPERIO:+3.3V:50mA;3.3SBY:50mA  
 AUDIO:3.3V:30mA;5V:100mA  
 LAN:3.3SBY:400mA  
 1394:3.3V:160mA(BUS PWR+12V:1.4A)  
 MS7:5VSB:350mA;3.3V:100mA



<b>ISL6561</b>		
VCCP	VRM 10.1	
0.8375V-1.6000V	95A	
4-Phase Switch		

<b>W83310DS</b>		
VTT_DDR		
1.3V Linear	1.0A	

<b>MS7 Regulator</b>		
V_FSB_VTT		
1.2V Linear	4.6A	
VCC_DDR		
2.6V (S0,S1)	7.0A	
Linear(S3)	570mA	
V_2P5_MCH		
2.5V Linear	100mA	
VCC3_SB		
3.3V Linear	1.5A	
5VDUAL1,2		
5V Linear	22mA	

<b>MS6+ Regulator</b>		
V_1P5_CORE		
1.5V Switch	14A	

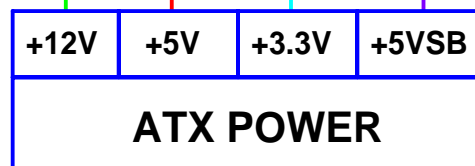
<b>DDR DIMM &amp; TERMINATOR</b>		
1.3V VTT_DDR	- 1.0A	
2.6V VCC_DDR (S0,S1)	-4.0A	
2.6V VCC_DDR (S3)	-160mA	

<b>PCI Express x16 slot</b>		
+12V	- 4.4 A	
+3.3Vaux (wake)	- 375mA	
+3.3Vaux (no wake)	- 20mA	
+3.3V	- 3.0A	

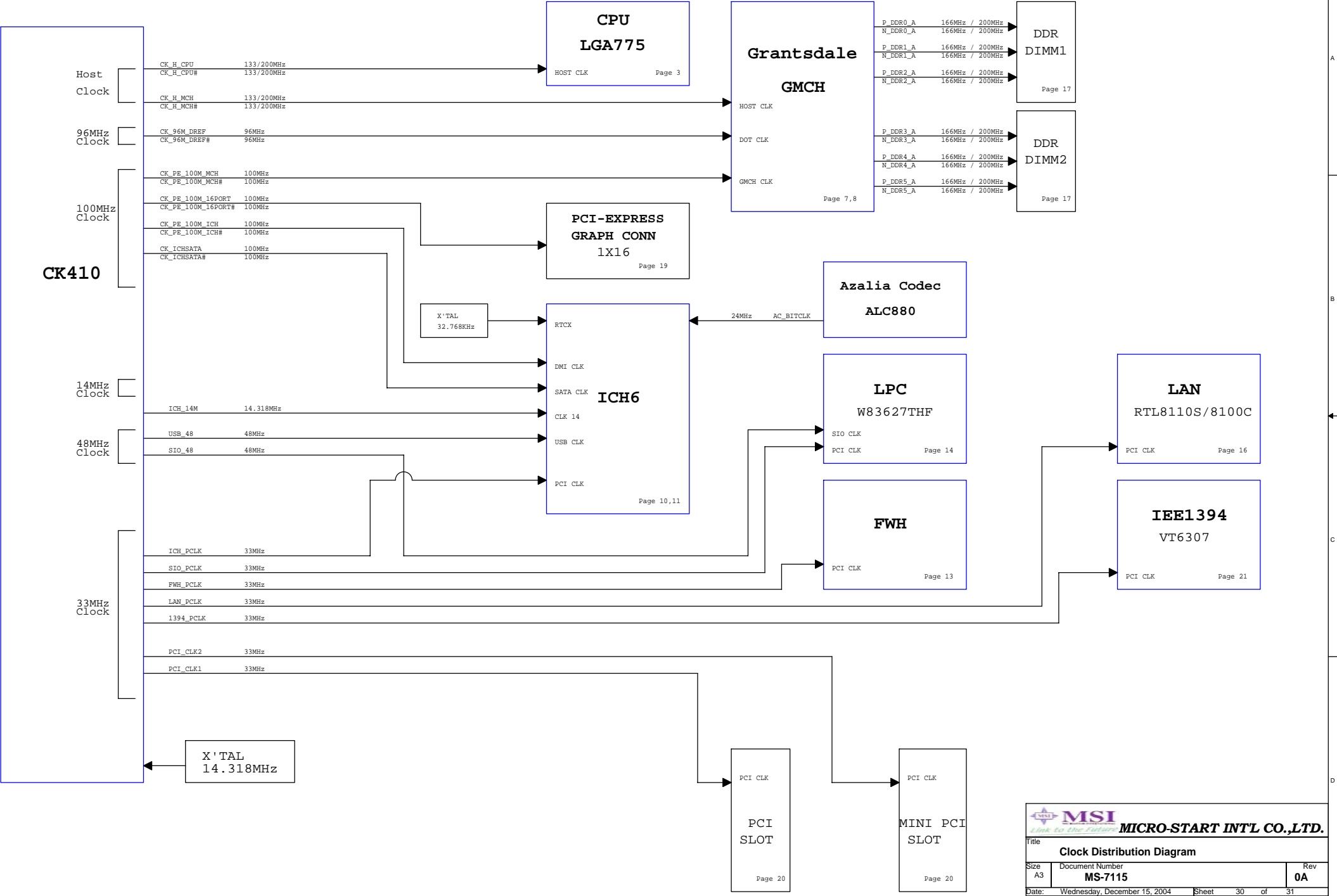
<b>PCI slot x1&amp;mini pci</b>		
+3.3Vaux (wake)	- 375mA	
+3.3Vaux (no wake)	- 20mA	
+3.3V	- 7.6A	
+5V	- 5.0A	
+12V	- 0.5A	

<b>USB</b>		
+5V (S0,S1)	- 4A	
+5V (S3)	- 20mA	

<b>PS2</b>		
+5V (S0,S1)	- 345mA	
+5V (S3)	- 2.0mA	



# Clock Distribution Diagram




# MS-7115

## SCHEMATIC HISTORY

Rev	Date	Page	Description
0A			

Rev	Date	Page	Description

 <b>MICRO-START INT'L CO.,LTD.</b>		
Title		
HISTORY		
Size A3	Document Number <b>MS-7115</b>	Rev <b>0A</b>
Date: Wednesday, December 15, 2004	Sheet 31 of 31	