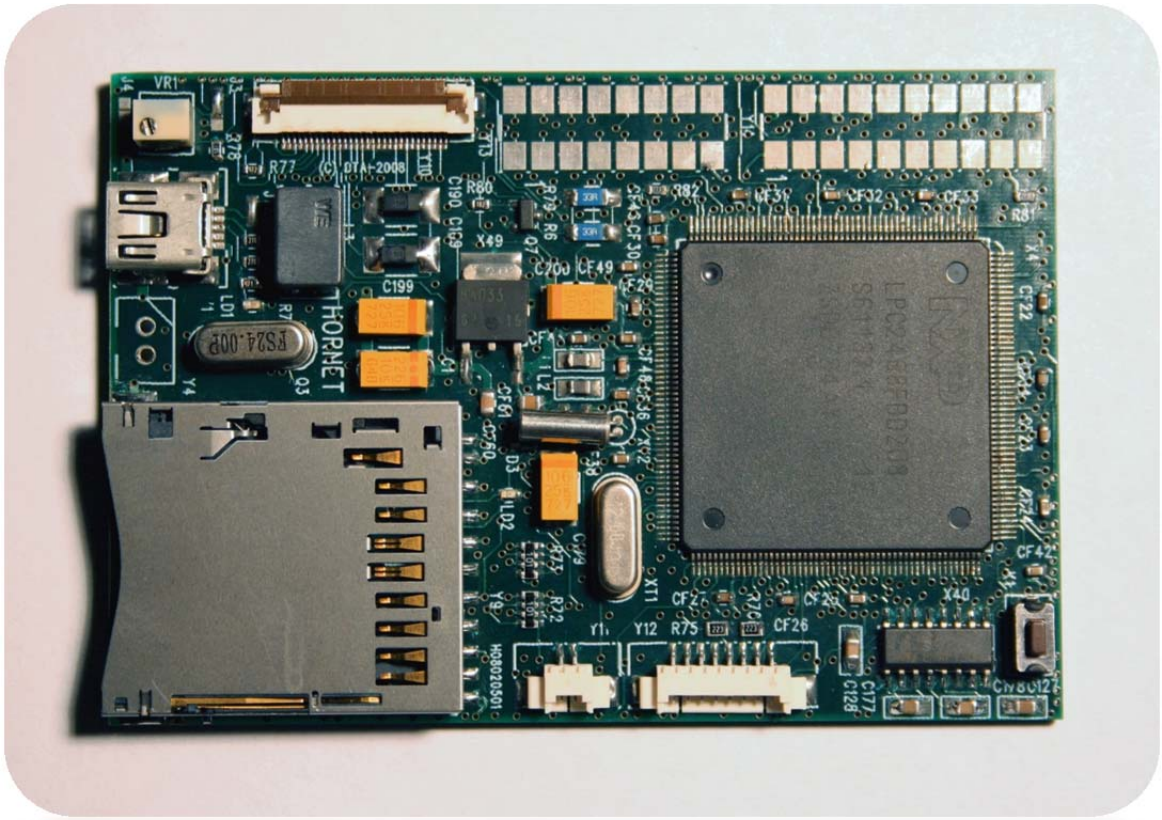
HORNET



Manuale Utente
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Febbraio 2019

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INTRODUZIONE

HORNET è una scheda con microcontrollore ARM **Open Source** utilizzata in diversi prodotti OT.

È basata su un processore ARM7 NXP LPC2468 a 72MHz, con diverse espansioni di memoria e la gran parte delle connessioni disponibili sui due connettori a passo 100mils e con interasse multiplo di 100 mils, in modo che puó essere utilizzata sulle schede di prototipazione.

Si interfaccia tramite una porta USB2 (CY68013) e due canali RS232, è presente inoltre un connettore per un LCD di testo ed uno per il tipo grafico. Completa la scheda anche una interfaccia per Secure Digital.

La scheda è completa di un programma di gestione detto Monitor, permette di effettuare diagnosi dell'hardware ed ha diverse applicazioni per funzioni di sviluppo.

Per lo sviluppo di applicativi trovate disponibile in mdi un IDE che utilizza un ARM GNU Toolchain, completo di librerie.

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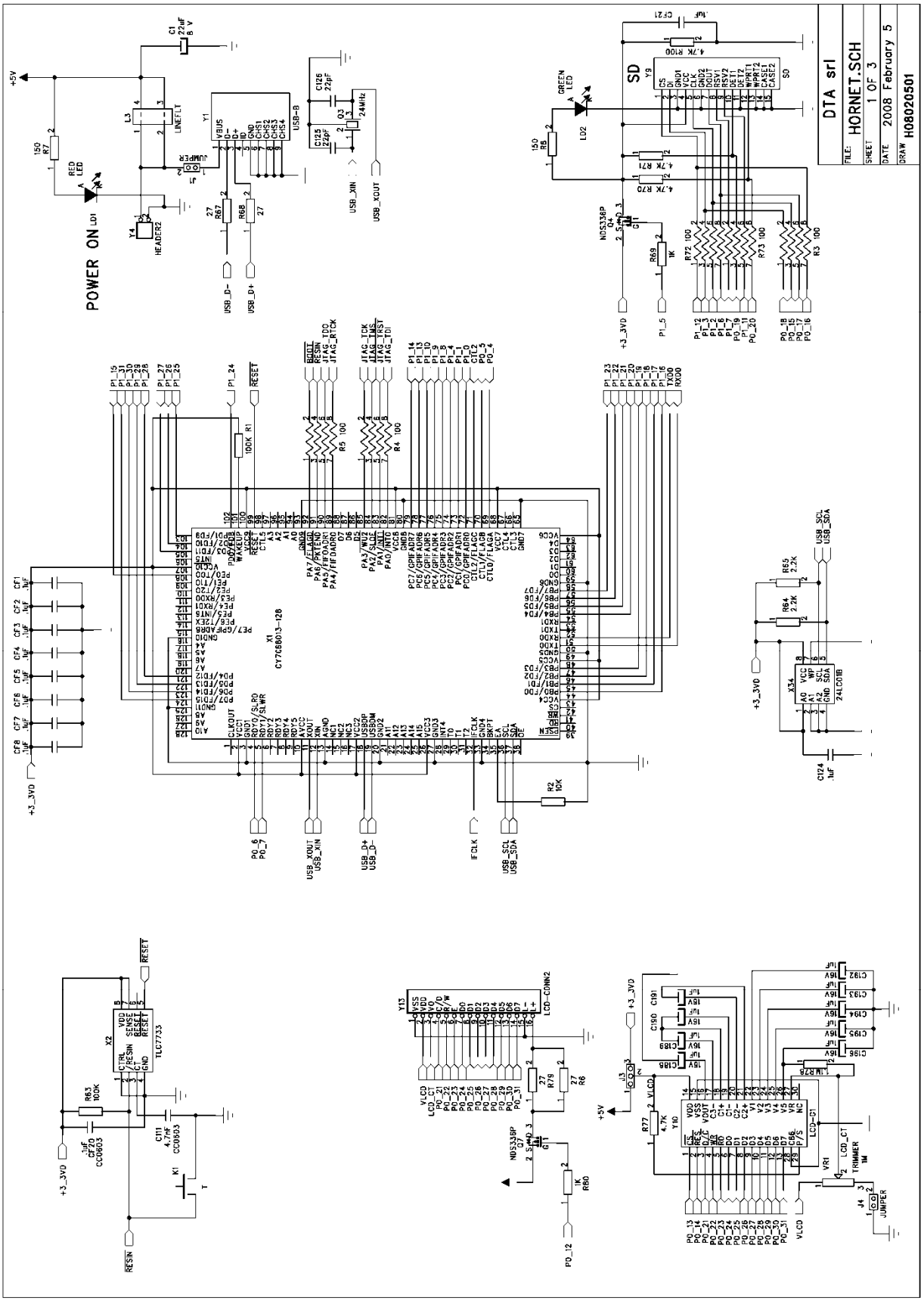
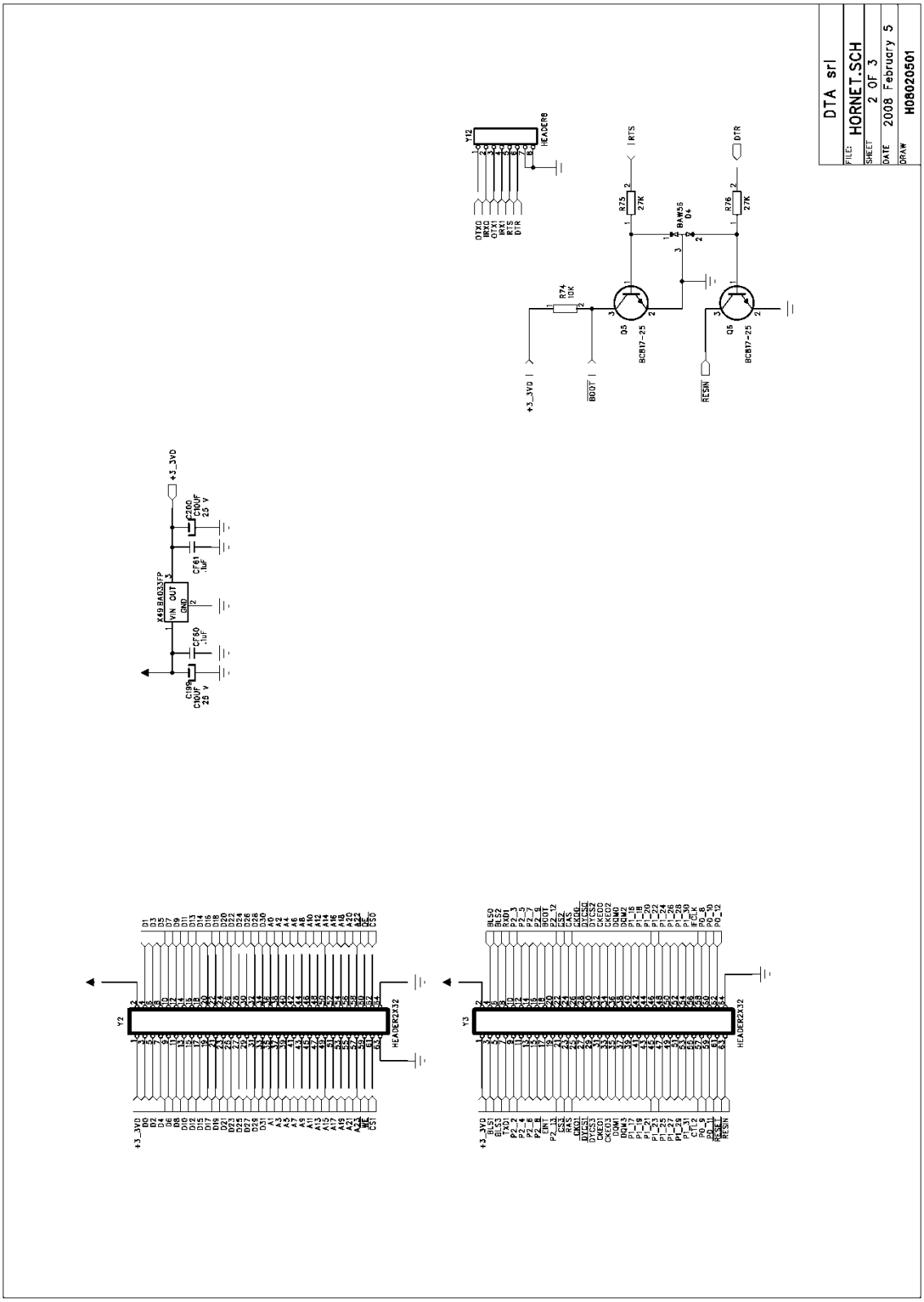
SCHEMA ELETTRICO

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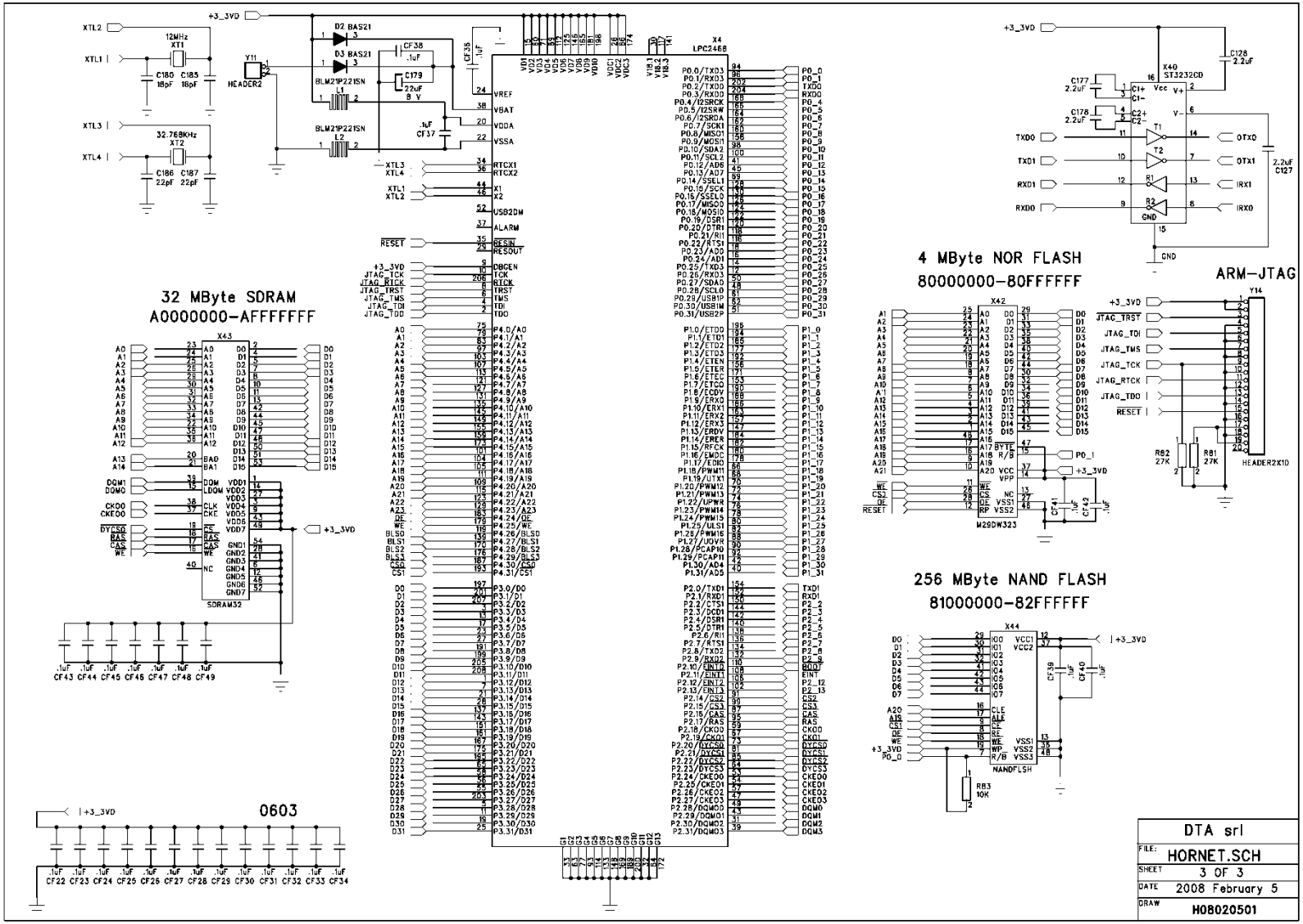
SHEET 2 OF 3
DATE 2008 February 5
DRAW H08020501
HEADER8
HEADER2X32
HEADER2X32
BC817-25
BC817-25
BAW56
R74 10K
R75 27K
R76 27K
C199 C100UF 25 V
C200 C100UF 25 V
C201 .1UF
C160 .1UF
X49.BA033FP
+3_3VD
RTS
DTR
BOOT
RESIN


32 MByte SDRAM
A0000000–AFFFFFFF
4 MByte NOR FLASH
80000000–80FFFFFF
ARM–JTAG
256 MByte NAND FLASH
81000000–82FFFFFF
0603
DTA srl
FILE: HORNET.SCH
SHEET 3 OF 3
DATE 2008 February 5
DRAW H08020501

BUS ESPANSIONE

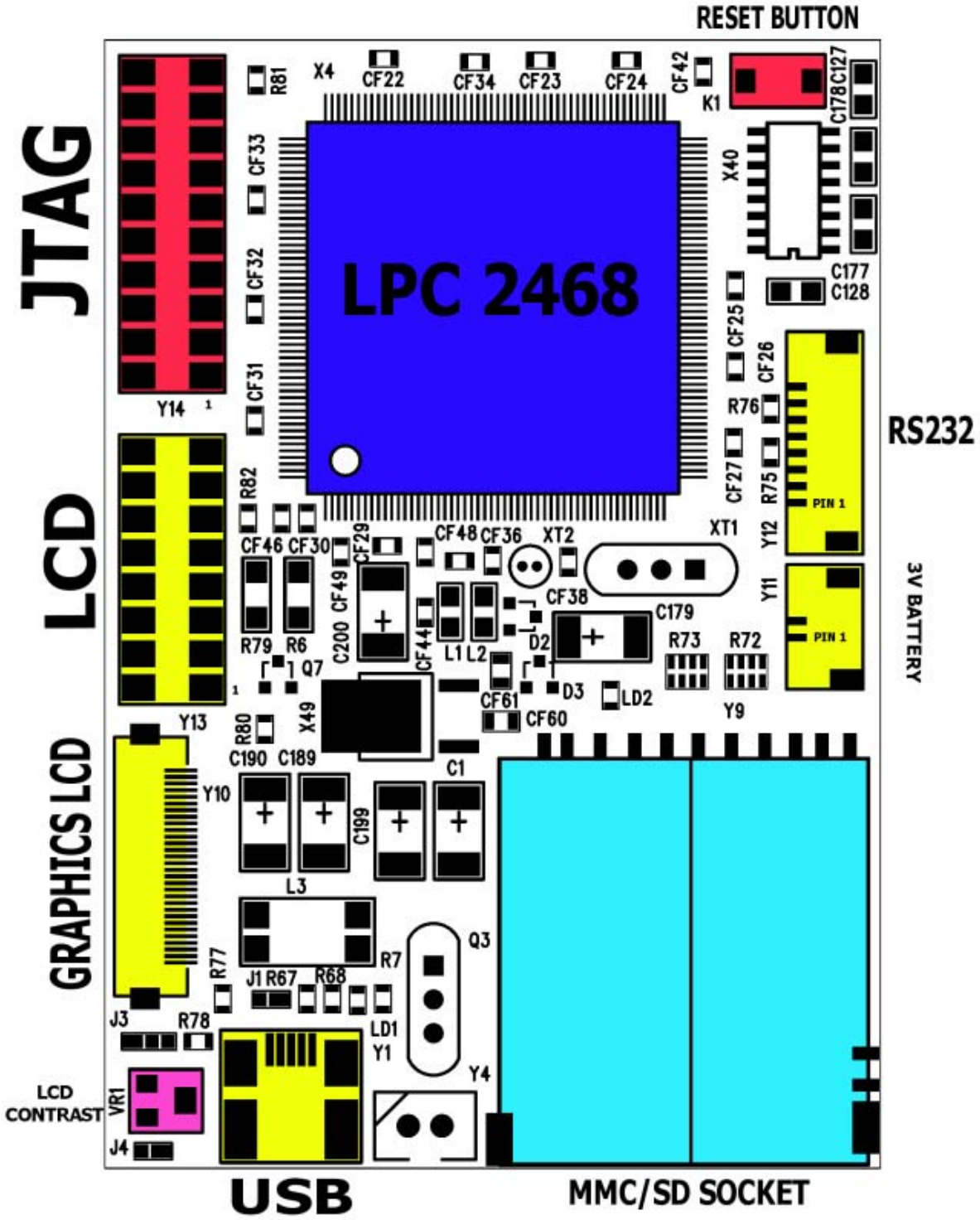
Y2

HORNET USAGE	SIGNAL	SIGNAL	SIGNAL	SIGNAL	PIN 1	PIN 2	SIGNAL	SIGNAL	SIGNAL	SIGNAL	HORNET USAGE
Memory expansion data bus.			D0	P3.0	**3**	**4**	P3.1	D1			Memory expansion data bus.
Memory expansion data bus.			D2	P3.2	**5**	**6**	P3.3	D3			Memory expansion data bus.
Memory expansion data bus.			D4	P3.4	**7**	**8**	P3.5	D5			Memory expansion data bus.
Memory expansion data bus.			D6	P3.6	**9**	**10**	P3.7	D7			Memory expansion data bus.
Memory expansion data bus.			D8	P3.8	**11**	**12**	P3.9	D9			Memory expansion data bus.
Memory expansion data bus.			D10	P3.10	**13**	**14**	P3.11	D11			Memory expansion data bus.
Memory expansion data bus.			D12	P3.12	**15**	**16**	P3.13	D13			Memory expansion data bus.
Memory expansion data bus.			D15	P3.15	**17**	**18**	P3.14	D14			Memory expansion data bus.
	RXD1	PWM0[2]	D17	P3.17	**19**	**20**	P3.16	D16	PWM0[1]	TXD1	
	DCD1	PWM0[4]	D19	P3.19	**21**	**22**	P3.18	D18	PWM0[3]	CTS1	
	DTR1	PWM0[6]	D21	P3.21	**23**	**24**	P3.20	D20	PWM0[5]	DSR1	
	PCAP1[0]	CAP0[0]	D23	P3.23	**25**	**26**	P3.22	D22	PCAP0[0]	RI1	
	PWM1[2]	MAT0[0]	D25	P3.25	**27**	**28**	P3.24	D24	CAP0[1[	PWM1[1]	
	PWM1[4]	CAP1[0]	D27	P3.27	**29**	**30**	P3.26	D26	MAT0[1]	PWM1[3]	
	PWM1[6]	MAT1[0]	D29	P3.29	**31**	**32**	P3.28	D28	CAP1[1]	PWM1[5]	
		MAT1[2]	D31	P3.31	**33**	**34**	P3.30	D30	MAT1[1]	RTS1	
Memory expansion address bus.			A1	P4.1	**35**	**36**	P4.0	A0			Memory expansion address bus.
Memory expansion address bus.			A3	P4.3	**37**	**38**	P4.2	A2			Memory expansion address bus.
Memory expansion address bus.			A5	P4.5	**39**	**40**	P4.4	A4			Memory expansion address bus.
Memory expansion address bus.			A7	P4.7	**41**	**42**	P4.6	A6			Memory expansion address bus.
Memory expansion address bus.			A9	P4.9	**43**	**44**	P4.8	A8			Memory expansion address bus.
Memory expansion address bus.			A11	P4.11	**45**	**46**	P4.10	A10			Memory expansion address bus.
Memory expansion address bus.			A13	P4.13	**47**	**48**	P4.12	A12			Memory expansion address bus.
Memory expansion address bus.			A15	P4.15	**49**	**50**	P4.14	A14			Memory expansion address bus.
Memory expansion address bus.			A17	P4.17	**51**	**52**	P4.16	A16			Memory expansion address bus.
Memory expansion address bus.			A19	P4.19	**53**	**54**	P4.18	A18			Memory expansion address bus.
Memory expansion address bus.	SSEL1	SCL2	A21	P4.21	**55**	**56**	P4.20	A20	SDA2	SCK1	Memory expansion address bus.
Memory expansion address bus.	MOSI1	RXD2	A23	P4.23	**57**	**58**	P4.22	A22	TXD2	MISO1	Memory expansion address bus.
Memory expansion signal strobe			WE	P4.25	**59**	**60**	P4.24	OE			Memory expansion signal strobe
CS NAND FLASH			CS1	P4.31	**61**	**62**	P4.30	CS0			CS NOR FLASH
				GND	**63**	**64**	GND				

Y3

HORNET USAGE	SIGNAL	SIGNAL	SIGNAL	SIGNAL	PIN	PIN	SIGNAL	SIGNAL	SIGNAL	SIGNAL	HORNET USAGE
					1	2					
			BLS1	P4.27	3	4	P4.26	BLS0			
	RXD3	MAT2[1]	BLS3	P4.29	5	6	P4.28	BLS2	MAT2[0]	TXD3	
Serial transmit channel 1	TRACECLK	TXD1	PWM1[1]	P2.0	7	8	P2.1	PWM1[2]	RXD1	PIPESTAT0	Serial receive channel 1
	PIPESTAT1	CTS1	PWM1[3]	P2.2	9	10	P2.3	PWM1[4]	DCD1	PIPESTAT2	
	TRACESYNC	DSR1	PWM1[5]	P2.4	11	12	P2.5	PWM1[6]	DTR1	TRACEPKT0	
	TRACEPKT1	RI1	PCAP1[0]	P2.6	13	14	P2.7	RD2	RTS1	TRACEPKT2	
	TRACEPKT3	TXD2	TD2	P2.8	15	16	P2.9	USB C1	RXD2	EXTIN0	
	I2STXCLK	MCIDAT1	EINT1	P2.11	17	18	P2.10	EINT0			BOOT signal, ISP uploader
	I2STXSDA	MCIDAT3	EINT3	P2.13	19	20	P2.12	EINT2	MCIDAT2	I2STXWS	
	SCL1	CAP2[1]	CS3	P2.15	21	22	P2.14	CS2	CAP2[0]	SDA1	
SDRAM strobe			RAS	P2.17	23	24	P2.16	CAS			SDRAM strobe
			CLKOUT1	P2.19	25	26	P2.18	CLKOUT0			SDRAM strobe
			DYCS1	P2.21	27	28	P2.20	DYCS0			SDRAM strobe
	SSEL0	CAP3[1]	DYCS3	P2.23	29	30	P2.22	DYCS2	CAP3[0]	SCK0	
			CKEOUT1	P2.25	31	32	P2.24	CKEOUT0			SDRAM strobe
	MOSI0	MAT3[1]	CKEOUT3	P2.27	33	34	P2.26	CKEOUT2	MAT3[0]	MISO0	
SDRAM strobe			DQMOUT1	P2.29	35	36	P2.28	DQMOUT0			SDRAM strobe
	SCL2	MAT3[3]	DQMOUT3	P2.31	37	38	P2.30	DQMOUT2	MAT3[2]	SDA2	
D1 on USB interface			ENET_MDIO	P1.17	39	40	P1.16	ENET_MDC			D0 on USB interface
D3 on USB interface	CAP1[1]	USBPPWR1	USBTXE1	P1.19	41	42	P1.18	USBUPLED1	PWM1[1]	CAP1[0]	D2 on USB interface
D5 on USB interface	SSEL0	PWM1[3]	USBTXDM1	P1.21	43	44	P1.20	USBTXDP1	PWM1[2]	SCK0	D4 on USB interface
D7 on USB interface	MISO0	PWM1[4]	USBRXDP1	P1.23	45	46	P1.22	USBRCV1	USBPWRD1	MAT1[0]	D6 on USB interface
D9 on USB interface	MAT1[1]	USBHSTEN1	USBLS1	P1.25	47	48	P1.24	USBRXDM1	PWM1[5]	MOSI0	D8 on USB interface
D11 on USB interface	CAP0[1]	USBOVRCR1	USBINT1	P1.27	49	50	P1.26	USBSSPND1	PWM1[6]	CAP0[0]	D10 on USB interface
D13 on USB interface	MAT0[1]	PCAP1[1]	USB_SDA1	P1.29	51	52	P1.28	USBSCL1	PCAP1[0]	MAT0[0]	D12 on USB interface
D15 on USB interface	AD0[5]	SCK1	USBOVRCR2	P1.31	53	54	P1.30	USBPWRD2	VBUS	AD0[4]	D14 on USB interface
				CTL2	55	56	IFCLK				
	MAT2[3]	MOSI1	I2STXSDA	P0.9	57	58	P0.8	I2STXWS	MISO1	MAT2[2]	
	MAT3[1]	SCL2	RXD2	P0.11	59	60	P0.10	TXD2	SDA2	MAT3[0]	
				RESET	61	62	P0.12	USBPPWR2	MISO1	AD0[6]	
				RESIN	63	64	GND				

SERIGRAFIA LATO SUPERIORE



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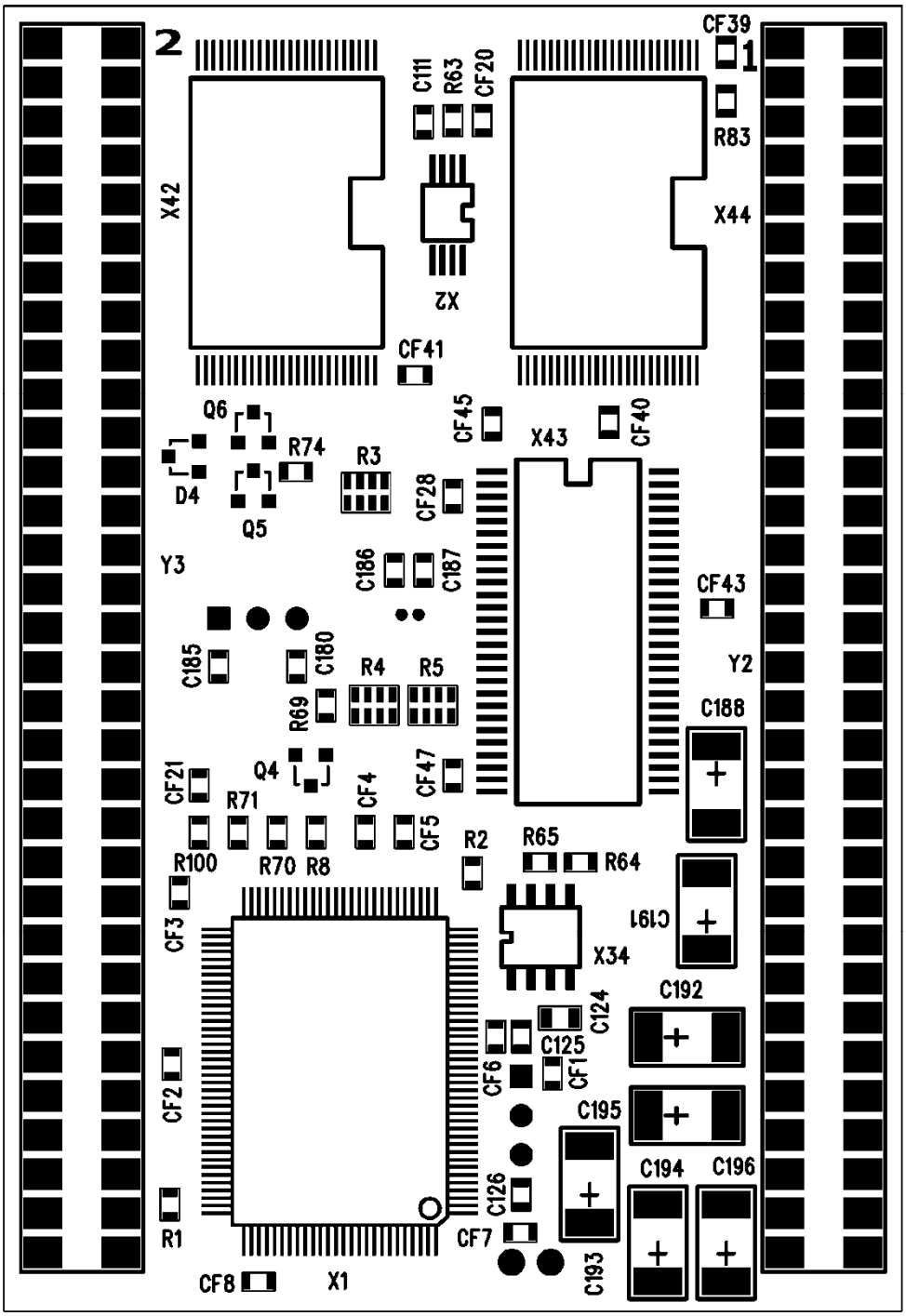

CF Capacitors

CF1	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	CF29	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
CF2	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	CF30	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
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CF23	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	CF46	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
CF24	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	CF48	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
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CF26	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	CF60	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
CF27	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	CF61	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)

Capacitors

C111	**4.7nF SMD 0603** (cod. RS: 464-6521)	C179	**22 µF 10V Tantalum** (cod. RS: 648-0367)
C124	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	C180	**18pF SMD 0603** (cod. RS: 545-4036)
C125	**22pF SMD 0603** (cod. RS: 624-2351)	C185	**18pF SMD 0603** (cod. RS: 545-4036)
C126	**22pF SMD 0603** (cod. RS: 624-2351)	C186	**22pF SMD 0603** (cod. RS: 624-2351)
C127	**2.2 µF 10V SMD 0805** (cod. RS: 106-757)	C187	**22pF SMD 0603** (cod. RS: 624-2351)
C128	**2.2 µF 10V SMD 0805** (cod. RS: 106-757)	C199	**10 µF 25V Tantalum**(cod. AVX: T491C106M025AT)
C177	**2.2 µF 10V SMD 0805** (cod. RS: 106-757)	C200	**10 µF 25V Tantalum** (cod. AVX: T491C106M025AT)
C178	**2.2 µF 10V SMD 0805** (cod. RS: 106-757)		

Resistors

R1	**100 KΩ SMD 0603** (cod. RS: 213-2531)	R67	**27 Ω SMD 0603** (cod. RS: 213-2058)
R2	**10 KΩ SMD 0603** (cod. RS: 213-2531)	R68	**27 Ω SMD 0603** (cod. RS: 213-2058)
R7	**470 Ω SMD 0603** (cod. RS: 213-2222)	R69	**1 KΩ SMD 0603** (cod. RS: 213-2266)
R8	**100 Ω SMD 0603** (cod. RS: 213-2143)	R74	**10 KΩ SMD 0603** (cod. RS: 213-2531)
R63	**100 KΩ SMD 0603** (cod. RS: 213-2531)	R75	**27 KΩ SMD 0603** (cod. RS: 213-2468)
R64	**2,2 KΩ SMD 0603** (cod. RS: 213-2317)	R76	**27 KΩ SMD 0603** (cod. RS: 213-2468)
R65	**2,2 KΩ SMD 0603** (cod. RS: 213-2317)	R100	**4,7 KΩ SMD 0603** (cod. RS: 213-2367)

Resistor networks

R4	**100 Ω SMD** (cod. 522-5563)	R5	**100 Ω SMD** (cod. 522-5563)

Inductances

L1	**BLM21P221SN** (cod. DK: 490-1054-2-ND)	L3	**Bobina modo comune SMD** (cod. RS: 367-5017)
L2	**BLM21P221SN** (cod. DK: 490-1054-2-ND)		

Diodes

D2	**BAS21** (cod. RS: 445-1840)	D4	**BAW56E6327** (cod. DK: BAW56INCT-ND)
D3	**BAS21** (cod. RS: 445-1840)		

Transistors

Q4	**NDS336** (cod. DK : NDS336PCT-ND)	Q6	**BC817-25** (cod. RS: 436-7903)
Q5	**BC817-25** (cod. RS: 436-7903)		

Integrated Circuits

X1	**CY7C68013A-128AXC** (cod.DK: 428-1688-ND)	X34	**24LC64** (cod. RS: 415-1247)
X2	**TLC7733 IPWR** (cod. DK: 296-3285-1-ND)	X40	**ST3232CD** (cod. RS: 415-2105)
X4	**LPC2468FBD208-S** (cod. DK: 568-4261-ND)	X49	**BA033FP** (cod. RS: 263-9874)

Various

Y1	**USB Connector** (cod. RS: 515-2027)	Q3	**Quartz 24 Mhz low profile** (cod. RS: 472-0360)
Y11	**Molex 2 vie 90° SMD** (cod. RS: 342-1488)		
Y12	**Molex 8 pins 90° SMD** (cod. RS: 542-7157)	K1	**SMD tactile switch** (cod. RS: 378-6353)
XT1	**Quartz 12 Mhz low profile** (cod. DS: 64 47 96)	LD1	**Led SMD 0603 red** (cod. RS: 654-5177)
XT2	**ECS-3X8** (cod. DK: X801-ND)	LD2	**Led SMD 0603 green** (cod. RS: 654-4304)

Jumpers

J3	**OPEN**	J4	**OPEN**

MODIFICHE:

- Cortocircuitare i pin 20 e 24 di X4
- Alzare il pin 50 di X1

CF Capacitors

CF1	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	**CF32**	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
CF2	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	**CF33**	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
CF3	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	**CF34**	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
CF4	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	**CF36**	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)
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CF31	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)		

Capacitors

C1	**22 µF 10V Tantalum** (cod. RS: 648-0367)	**C187**	**22pF SMD 0603** (cod. RS: 624-2351)
C111	**4.7nF SMD 0603** (cod. RS: 464-6521)	**C188**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C124	**0.1 µF SMD 0603**(cod. HT: C0603ZRY5V9BB104)	**C189**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C125	**22pF SMD 0603** (cod. RS: 624-2351)	**C190**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C126	**22pF SMD 0603** (cod. RS: 624-2351)	**C191**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C127	**2.2 µF 10V SMD 0805** (cod. RS: 106-757)	**C192**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C128	**2.2 µF 10V SMD 0805** (cod. RS: 106-757)	**C193**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C177	**2.2 µF 10V SMD 0805** (cod. RS: 106-757)	**C194**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C178	**2.2 µF 10V SMD 0805** (cod. RS: 106-757)	**C195**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C179	**22 µF 10V Tantalum** (cod. RS: 648-0367)	**C196**	**10 µF 16V** (cod. DK:511-1473-1-ND)
C180	**18pF SMD 0603** (cod. RS: 545-4036)	**C199**	**10 µF 25V Tantalum**(cod. AVX: T491C106M025AT)
C185	**18pF SMD 0603** (cod. RS: 545-4036)	**C200**	**10 µF 25V Tantalum** (cod. AVX: T491C106M025AT)
C186	**22pF SMD 0603** (cod. RS: 624-2351)		

Resistors

R1	**100 KΩ SMD 0603** (cod. RS: 213-2531)	R71	**4,7 KΩ SMD 0603** (cod. RS: 213-2367)
R2	**10 KΩ SMD 0603** (cod. RS: 213-2531)	R74	**10 KΩ SMD 0603** (cod. RS: 213-2531)
R6	**33 Ω SMD 1206** (cod. RS: 223-2063)	R75	**27 KΩ SMD 0603** (cod. RS: 213-2468)
R7	**100 Ω SMD 0603** (cod. RS: 213-2143)	R76	**27 KΩ SMD 0603** (cod. RS: 213-2468)
R8	**100 Ω SMD 0603** (cod. RS: 213-2143)	R77	**4,7 KΩ SMD 0603** (cod.213-2367)
R63	**100 KΩ SMD 0603** (cod. RS: 213-2531)	R78	**1.1 MΩ SMD 0603** (cod. DS: 71 56 61)
R64	**2,2 KΩ SMD 0603** (cod. RS: 213-2317)	R79	**33 Ω SMD 1206** (cod. RS: 223-2063)
R65	**2,2 KΩ SMD 0603** (cod. RS: 213-2317)	R80	**1 KΩ SMD 0603** (cod. RS: 213-2266)
R67	**27 Ω SMD 0603** (cod. RS: 213-2058)	R81	**27 KΩ SMD 0603** (cod. RS: 213-2468)
R68	**27 Ω SMD 0603** (cod. RS: 213-2058)	R82	**27 KΩ SMD 0603** (cod. RS: 213-2468)
R69	**1 KΩ SMD 0603** (cod. RS: 213-2266)	R83	**10 KΩ SMD 0603** (cod. RS: 213-2531)
R70	**4,7 KΩ SMD 0603** (cod. RS: 213-2367)	R100	**4,7 KΩ SMD 0603** (cod. RS: 213-2367)

Resistor networks

R3	**100 Ω SMD** (cod. 522-5563)	R72	**100 Ω SMD** (cod. 522-5563)
R4	**100 Ω SMD** (cod. 522-5563)	R73	**100 Ω SMD** (cod. 522-5563)
R5	**100 Ω SMD** (cod. 522-5563)		

Trimmers

VR1	**1 MΩ SMD** (cod. RS:240-1641)		

Inductances

L1	**BLM21P221SN** (cod. DK: 490-1054-2-ND)	L3	**Bobina modo comune SMD** (cod. 367-5017)
L2	**BLM21P221SN** (cod. DK: 490-1054-2-ND)		

Diodes

D2	**BAS21** (cod. RS: 445-1840)	D4	**BAW56E6327** (cod. DK: BAW56INCT-ND)
D3	**BAS21** (cod. RS: 445-1840)		

Transistors

Q4	**NDS336** (cod. DK : NDS336PCT-ND)	Q6	**BC817-25** (cod. RS: 436-7903)
Q5	**BC817-25** (cod. RS: 436-7903)	Q7	**NDS336** (cod. DK: NDS336PCT-ND)

Integrated Circuits

X1	**CY7C68013A-128AXC** (cod.DK: 428-1688-ND)	X42	**M29DW323DB70N6** (cod. DK: 497-1699-ND)
X2	**TLC7733 IPWR** (cod. DK: 296-3285-1-ND)	X43	**MT48LC16M16A2TG** (cod. DK: 557-1065-1-ND)
X4	**LPC2468FBD208-S** (cod. DK: 568-4261-ND)	X44	**MT29F2G08AACWP** (cod. DK: 557-1201-1-ND)
X34	**24LC64** (cod. RS: 415-1247)	X49	**BA033FP** (cod. RS: 263-9874)
X40	**ST3232CD** (cod. RS: 415-2105)		

Various

Y1	**USB Connector** (cod. RS: 515-2027)	Q3	**Quartz 24 Mhz low profile** (cod. RS: 472-0360)
Y2	**SMT Strip 2X32 male** (cod. RS: 155-923)		
Y3	**SMT Strip 2X32 male** (cod. RS: 155-923)	XT1	**Quartz 12 Mhz low profile** (cod. DS: 64 47 96)
Y4	**AMP 2 pins** (cod. RS: 232-9814)	XT2	**ECS-3X8** (cod. DK: X801-ND)
Y9	**SD Socket adapter** (cod. RS: 509-9229)		
Y10	**30 pins FPC connector 90°** (cod. RS: 542-6980)	K1	**SMD tactile switch** (cod. RS: 378-6353)
Y11	**Molex 2 vie 90° SMD** (cod. RS: 342-1488)		
Y12	**Molex 8 pins 90° SMD** (cod. RS: 542-7157)	LD1	**Led SMD 0603 red** (cod. RS: 654-5177)
Y13	**SMT Strip 2X8 male** (cod. RS: 155-923)	LD2	**Led SMD 0603 green** (cod. RS: 654-4304)
Y14	**SMT Strip 2X10 male** (cod. RS: 155-923)		

Jumpers

J3	**1-2**	J4	**OPEN**

Modifiche:

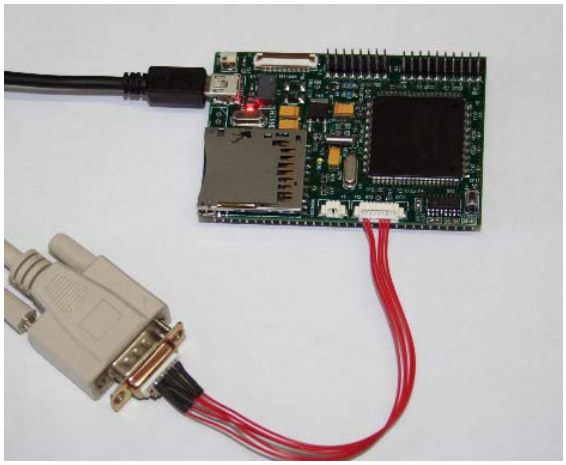
- Se viene montato un LCD nero o blu (cod. RS: 532-6818/532-6824 sostituire R6 e R79 con due resistenze da 150 Ω 1206(cod. RS: 223-2142)
- Cortocircuitare i pin 20 e 24 di X4
- Alzare il pin 50 di X1

LEGEND

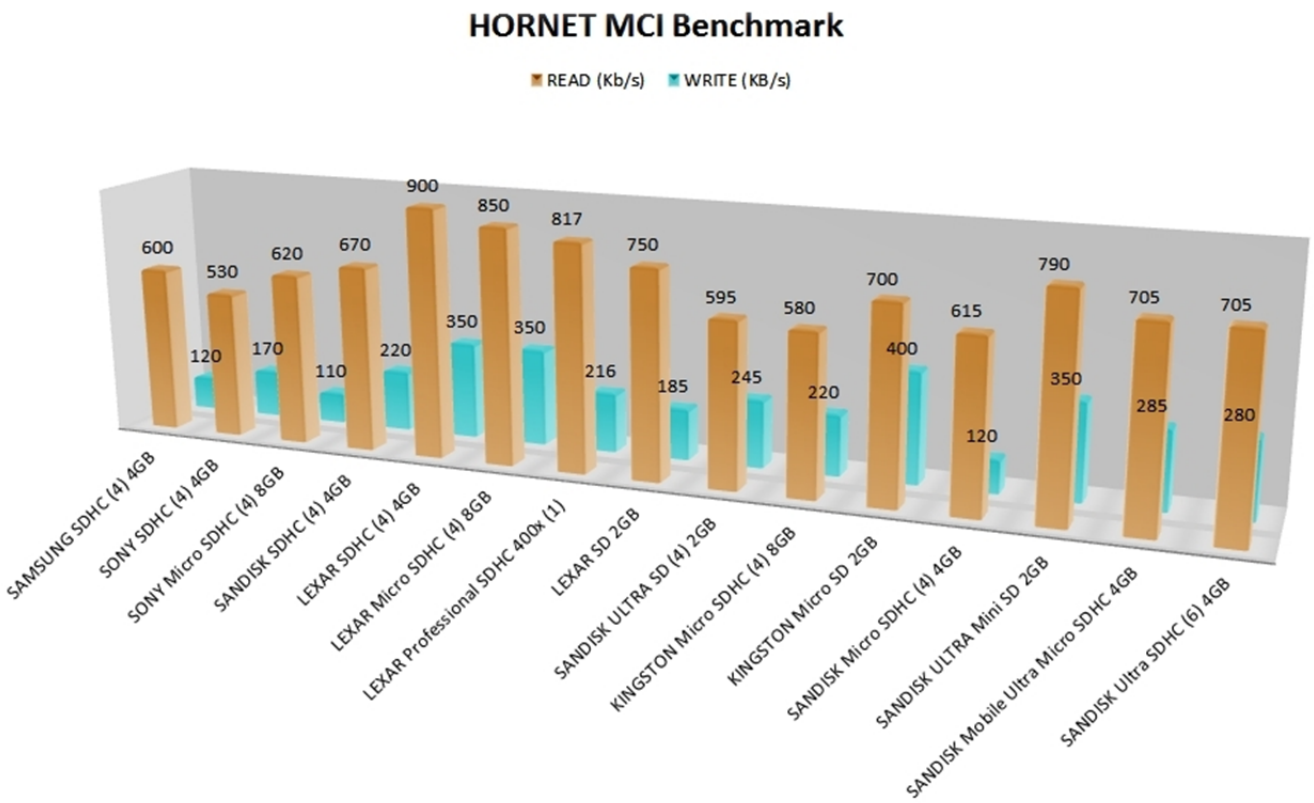
AVX: www.avx.com
DK: www.digikey.com
DS: www.distrelec.com
FA: www.farnell.com
FC: www.fairchildsemi.com
KC: www.kontek-comatel.com
RS: www.rswww.com

COLLEGAMENTO HORNET/RS232

9 POLI FEMMINA	MOLEX 8 poli
2	1
3	2
7	5
4	6
5	7



SD BENCHMARK



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