

RFID Xpr3ss

Technical Communication Skills Practicum
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The J Team

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Component Selection Rationale

RFID Xpr3ss

Microcontroller

• Freescale MC9S12NE64

- 25 MHz @ 3.3V
- up to 70 I/O pins
- 80 pin TQFP-EP package
- requires separate Ethernet circuitry & jack
- \$8 per chip



1	PD0VDDMC_S0A	1	PL0VACTED
2	PD0VDDMC_S0L	2	PL1UNLED
3	PD0VDDMC_S0S	3	VDDC
4	PD0VDDMC_S0T	4	PL2SPDLED
5	PD0VDDMC_S0U	5	PHY_VDDTX
6	PD0VDDMC_S0V	6	PHY_VDDRX
7	PD0VDDMC_S0W	7	PHY_R0N
8	PD0VDDMC_S0X	8	PHY_R0P
9	PD0VDDMC_S0Y	9	PHY_VDDTX
10	PD0VDDMC_S0Z	10	PHY_VDDTX
11	VDDX1	11	PHY_VDDTX
12	MI_TDRN0W0R0E	12	80-PIN TQFP-EP
13	MI_TDRN0W0R0G	13	PHY_VDDTX
14	MI_TDRN0W0R0B	14	PHY_VDDA
15	MI_TDRN0W0R0Y	15	PHY_VDDA
16	MI_TDRN0W0R0C	16	PHY_VDDA
17	MI_TDRN0W0R0M	17	PHY_VDDA
18	MI_TDRN0W0R0K	18	PHY_VDDA
19	MI_TDRN0W0R0E	19	PHY_VDDA
20	MI_TDRN0W0R0G	20	PHY_VDDA
21	MI_TDRN0W0R0B	21	PHY_VDDA
22	MI_TDRN0W0R0Y	22	PHY_VDDA
23	MI_TDRN0W0R0C	23	PHY_VDDA
24	MI_TDRN0W0R0M	24	PHY_VDDA
25	MI_TDRN0W0R0K	25	PHY_VDDA
26	MI_TDRN0W0R0E	26	PHY_VDDA
27	MI_TDRN0W0R0G	27	PHY_VDDA
28	MI_TDRN0W0R0B	28	PHY_VDDA
29	MI_TDRN0W0R0Y	29	PHY_VDDA
30	MI_TDRN0W0R0C	30	PHY_VDDA
31	MI_TDRN0W0R0M	31	PHY_VDDA
32	MI_TDRN0W0R0K	32	PHY_VDDA
33	MI_TDRN0W0R0E	33	PHY_VDDA
34	MI_TDRN0W0R0G	34	PHY_VDDA
35	MI_TDRN0W0R0B	35	PHY_VDDA
36	MI_TDRN0W0R0Y	36	PHY_VDDA
37	MI_TDRN0W0R0C	37	PHY_VDDA
38	MI_TDRN0W0R0M	38	PHY_VDDA
39	MI_TDRN0W0R0K	39	PHY_VDDA
40	MI_TDRN0W0R0E	40	PHY_VDDA
41	MI_TDRN0W0R0G	41	PHY_VDDA
42	MI_TDRN0W0R0B	42	PHY_VDDA
43	MI_TDRN0W0R0Y	43	PHY_VDDA
44	MI_TDRN0W0R0C	44	PHY_VDDA
45	MI_TDRN0W0R0M	45	PHY_VDDA
46	MI_TDRN0W0R0K	46	PHY_VDDA
47	MI_TDRN0W0R0E	47	PHY_VDDA
48	MI_TDRN0W0R0G	48	PHY_VDDA
49	MI_TDRN0W0R0B	49	PHY_VDDA
50	MI_TDRN0W0R0Y	50	PHY_VDDA
51	MI_TDRN0W0R0C	51	PHY_VDDA
52	MI_TDRN0W0R0M	52	PHY_VDDA
53	MI_TDRN0W0R0K	53	PHY_VDDA
54	MI_TDRN0W0R0E	54	PHY_VDDA
55	MI_TDRN0W0R0G	55	PHY_VDDA
56	MI_TDRN0W0R0B	56	PHY_VDDA
57	MI_TDRN0W0R0Y	57	PHY_VDDA
58	MI_TDRN0W0R0C	58	PHY_VDDA
59	MI_TDRN0W0R0M	59	PHY_VDDA
60	MI_TDRN0W0R0K	60	PHY_VDDA
61	MI_TDRN0W0R0E	61	PHY_VDDA
62	MI_TDRN0W0R0G	62	PHY_VDDA
63	MI_TDRN0W0R0B	63	PHY_VDDA
64	MI_TDRN0W0R0Y	64	PHY_VDDA
65	MI_TDRN0W0R0C	65	PHY_VDDA
66	MI_TDRN0W0R0M	66	PHY_VDDA
67	MI_TDRN0W0R0K	67	PHY_VDDA
68	MI_TDRN0W0R0E	68	PHY_VDDA
69	MI_TDRN0W0R0G	69	PHY_VDDA
70	MI_TDRN0W0R0B	70	PHY_VDDA
71	MI_TDRN0W0R0Y	71	PHY_VDDA
72	MI_TDRN0W0R0C	72	PHY_VDDA
73	MI_TDRN0W0R0M	73	PHY_VDDA
74	MI_TDRN0W0R0K	74	PHY_VDDA
75	MI_TDRN0W0R0E	75	PHY_VDDA
76	MI_TDRN0W0R0G	76	PHY_VDDA
77	MI_TDRN0W0R0B	77	PHY_VDDA
78	MI_TDRN0W0R0Y	78	PHY_VDDA
79	MI_TDRN0W0R0C	79	PHY_VDDA
80	MI_TDRN0W0R0M	80	PHY_VDDA
81	MI_TDRN0W0R0K	81	PHY_VDDA
82	MI_TDRN0W0R0E	82	PHY_VDDA
83	MI_TDRN0W0R0G	83	PHY_VDDA
84	MI_TDRN0W0R0B	84	PHY_VDDA
85	MI_TDRN0W0R0Y	85	PHY_VDDA
86	MI_TDRN0W0R0C	86	PHY_VDDA
87	MI_TDRN0W0R0M	87	PHY_VDDA
88	MI_TDRN0W0R0K	88	PHY_VDDA
89	MI_TDRN0W0R0E	89	PHY_VDDA
90	MI_TDRN0W0R0G	90	PHY_VDDA
91	MI_TDRN0W0R0B	91	PHY_VDDA
92	MI_TDRN0W0R0Y	92	PHY_VDDA
93	MI_TDRN0W0R0C	93	PHY_VDDA
94	MI_TDRN0W0R0M	94	PHY_VDDA
95	MI_TDRN0W0R0K	95	PHY_VDDA
96	MI_TDRN0W0R0E	96	PHY_VDDA
97	MI_TDRN0W0R0G	97	PHY_VDDA
98	MI_TDRN0W0R0B	98	PHY_VDDA
99	MI_TDRN0W0R0Y	99	PHY_VDDA
100	MI_TDRN0W0R0C	100	PHY_VDDA

• Technological Arts neCore12 LAN DIP Module

- 9S12NE64 Based
- only 30 I/O pins
- 40 pin DIP package
- integrated Ethernet circuit
- \$80 per module



• Rabbit RCM3750 RabbitCore Module

- 22.1 MHz @ 5V
- only 33 I/O pins
- 40 pin DIP package
- integrated Ethernet circuit
- \$74 per module



Component Selection Rationale

RFID Xpr3ss

RFID Reader

- TI S4100 Multi-Function Reader Module
 - No antenna (add. cost)
 - Long & short range
 - \$88
- Parallax RFID Reader Module
 - Built-in antenna
 - 2.5" - 3" reading range
 - \$39
- Intersoft USA Medium Range RFID Reader
 - Built-in antenna
 - Slim profile
 - 19" reading range
 - \$130



Intersoft Reader



Component Selection Rationale

RFID Xpr3ss

LCD

- CrystalFontz
 - Model CFAG240128D-FMI-T
 - Built-in LC7981 Controller & 4KByte SRAM
 - 240x128 graphic mode, 40 x 16 text mode
 - \$112 per unit
- CrystalFontz
 - Model CFAH2004K-TMI-JP
 - Large format 20x4 display
 - 8-bit or 4-bit parallel interface
 - \$28 per unit
- Optrex America
 - Model DMF-50773NF-SLY
 - 240x128 graphic
 - \$159 per unit



Keypad

- Storm 6000 series PIN entry pad
 - 16 keys
 - Sealed
 - \$112
- Grayhill Series-84 Keypad
 - 16 keys
 - \$27



Packaging Design

RFID Xpr3ss

Existing Products

- NCR FastLane, Fujitsu U-Scan
 - Standard - scan UPCs on products
 - Upgrade - FastLane unit in Germany, 2004
 - fitted with RFID module
 - deactivated RFID security tags on products
 - “ATM look & feel”
 - Customers include Home Depot, Wal*Mart, BJ’s, METRO Group



FastLane



U-Scan

Our Considerations

- LCD (instead of touch screen)
- Plastic casing
- Weight – not a factor
- Ergonomic placement of reader, LCD, keypad

PCB Footprint Layout

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