

User's Manual

K0RE81

Evaluation Platform for μ PD78F9882 Microcontroller

Contents

1. Introduction	5
2. Connecting to the K232 Serial Adapter.....	7
3. K232 Jumper Settings for the K0RE81	8
4. Pre-Flashed Firmware	8

1. INTRODUCTION

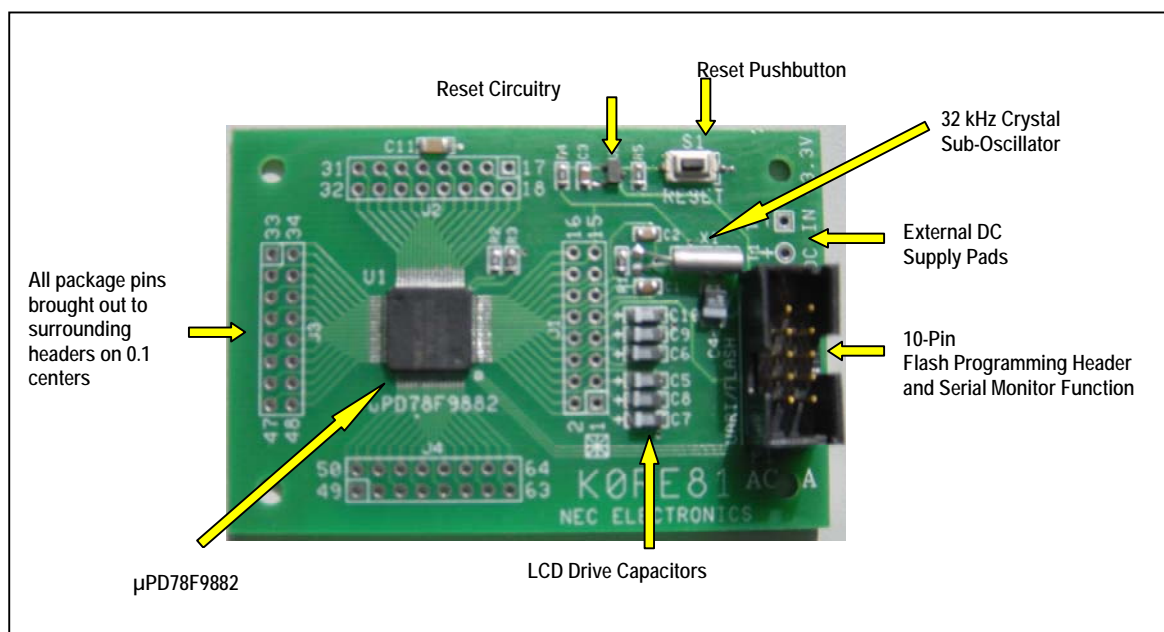
To facilitate design with an NEC Electronics flash microcontroller, a specific device, along with appropriate crystals and reset circuitry is provided on a printed circuit board. All of the package pins are brought out to standard 0.1-inch headers that surround the microcontroller package on all four sides.

The K0RE81 board employs the μ PD78F9882 flash microcontroller, which is identical to the μ PD789881 mask ROM version, except that it does not exhibit the same ultra-low-power performance. A design therefore would be implemented in the K0RE81 board via the μ PD78F9882, and the code and operation thoroughly debugged before committing to mask ROM release.

Table 1. μ PD789881/ μ PD78F9882 Comparison

μ PD789881	μ PD78F9882
Ultra-low power operation, $I_{DD4} < 0.9 \mu\text{A typ.}$	Ultra-low-power operation not available
16 KB mask ROM	32 KB flash memory
26 x 4 LCD controller	26 x 4 LCD controller
Four timer channels	Four timer channels
One serial UART channel	One serial UART channel
28 I/O ports (four N-channel open drain)	28 I/O ports (four N-channel open drain)
Pull-up resistors on open-drain port (mask option)	No pull-up resistors on open-drain port
On-chip multiplier: $8 \times 8 = 16$ bits	On-chip multiplier: $8 \times 8 = 16$ bits
On-chip voltage divider and regulator	On-chip voltage divider and regulator

Figure 1. Board Layout

Table 2. K0RE81 (μ PD78F9882) Pin Configuration

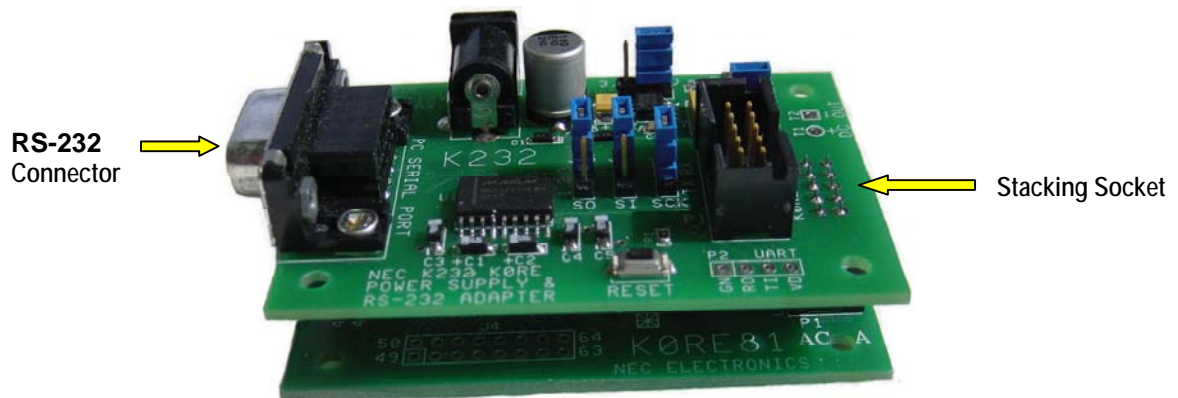
1	VLC2	17	P01	33	P11	49	S11
2	VLC1	18	P02	34	P10	50	S10
3	CAPH2	19	P03	35	P95/S25	51	S9
4	CAPL2	20	P50	36	P94/S24	52	S8
5	CAPL1	21	P51	37	P93/S23	53	S7
6	CAPH1	22	P52	38	P92/S22	54	S6
7	HV _{DD}	23	P53	39	P91/S21	55	S5
8	VR _{OUT}	24	V _{SS0}	40	P90/S20	56	S4
9	V _{DD1}	25	V _{DD0}	41	P84/S19	57	S3
10	V _{SS1}	26	P30/INTP0/TO0/TI00	42	P83/S18	58	S2
11	XT1	27	P31/INTP1/TI51	43	P82/S17	59	S1
12	XT2	28	P32/INTP2/TO50/TI50	44	P81/S16	60	S0
13	ICO (V _{PP})	29	P33/INTP3/TI51	45	P80/S15	61	COM3
14	ICO (FPCLK)	30	P20/TO51	46	S14	62	COM2
15	/Reset	31	P21/TxD0	47	S13	63	COM1
16	P00	32	P22/RxD0	48	S12	64	COM0

Note: Package pin numbers match the header pinout numbers.

2. CONNECTING TO THE K232 SERIAL ADAPTER

There are two ways to connect to the K232. The first is via the J2 10-pin stackable header. Figure 2 shows the board's orientation for stacking.

Figure 2. Stacked Connection



The second is with an extension ribbon cable supplied with the K232 that plugs onto the P1 10-pin header on the circuit side of the K232. The other side plugs into the flash programmer header on the K0RE81. These connections use keyed headers and can only be plugged in one way. See Figure 3.

Figure 3. Ribbon Cable Connection



3. K232 JUMPER SETTINGS FOR THE K0RE81

1. Connect jumper JP1 if you want the K0RE81 to derive power from the K232 adapter.
2. Set jumper JP2 for 3.3-volt operation.
3. Set JP3 jumper on TX (pins 1–2)
4. Set JP4 jumper on RX (pins 2–3).
5. JP5 requires no jumper.

4. PRE-FLASHED FIRMWARE

The K0RE81 was flashed in manufacturing with the K0SM9882 mini-monitor program for testing and diagnostics. The K232 will work with the K0RE81 right out of the box. Check the *K232 User's Manual* for communication port settings.

Table 3. Bill of Materials

Item	Part Name	Description	Value	Digi-Key Part No.	Quantity
1	R2	RES, SMT, 0805, 1.0k OHM, 5%	1.0k	P1.0KACT-ND	5
2	R3	RES, SMT, 0805, 3.3k OHM, 5 %	3.3k	P3.3KACT-ND	1
3	R4	RES, SMT, 0805, 10k OHM, 5%	10k	P10KACT-ND	3
4	R5	RES, SMT, 0805, 100k OHM, 5%	100k	P100KACT-ND	1
5	R1	RES, SMT, 0805, 220k OHM, 5%	220k	P220KACT-ND	1
6	C5, C6, C7, C8, C9, C10	0.47 μ F, 25V, TAN CAP, TANT, SMT, 3216	0.47 μ F, 25V, 10%	PCS5474CT-ND	6
7	C4	10 μ F, 16V, TAN CAP, TANT, SMT, 3528	10 μ F, 16V, 10%	PCS3106CT-ND	1
8	C1, C2	CAP, MLC, C0G, SMT, 0805, 33 pF, 50V, 5%	33 pF	PCC330CGCT-ND	2
9	C3	CAP, MLC, C0G, SMT, 0805, 470 pF, 50V, 5%	470 pF	PCC471CGCT-ND	1
10	C11	CAP, MLC, X7R, SMT, 1206, 100 nF, 50V, 10%	100 nF	PCC104BCT-ND	1
11	X1	XTAL, 32 kHz, 8.2 mm, ECS-3X8	32 kHz	X801-ND	1
12	U2	IC, LIN, VOLTAGE DETECTOR, 2.7V (SOT-23)	TC54VN2702	TC54V2702ECB71CT	1
13	U1	IC, MCU, SMT, FLASH, NEC μ PD78F9882	μ PD78F9882	Available from NEC	1
14	P1	HDR, TWO-ROW, VERT, SHRD, 0.100", 10-Pin	HDR, 10-Pin	A26267-ND	1
15	S1	SWITCH, PUSHBUTTON, SPST, 6 mm x 3.5 mm, SMT	SW, EVQPP	P8086SCT-ND	1
16	P2	HDR, TWO-ROW, VERT, SHRD, 0.100", 10-Pin	HDR, 10-PIN	A26267-ND	1
17	J1, J2, J3, J4	SKT, 16-Pin		N/A	(4)
18	T1, T2	Terminal	TERM	N/A	2
23	PCB	Printed Circuit Board	PCB	N/A	1

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