KS8721BL/SL Demo Board User Guide

Single 3.3V supply 10/100BaseTX/FX MII Physical Layer Transceiver

Preliminary - Rev 1.0 June' 2004

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Revision History

Revision	Date	Change
User Guide 0.9	09/26/02	Preliminary Release
User Guide 1.0	06/10/04	Initial Release

Introduction

The KS8721BL/SL evaluation board is a single port 10/100 Base Transceiver with MII interface.

The default settings of this demo board are documented in this manual, please see "jumper setting section" of this manual.

This board is not intended for reference design nor manufacturing. Please contact Micrel FAE for consultation of layout and other design issues.

Features

- Micrel KS8721BL/SL Single 3.3V supply 10/100BaseTX/FX Physical Layer Transceiver
- RJ45 jacks for Ethernet LAN port
- 1 MII (media independent Interface) connector for I/F with MAC controller
- 4 LEDs to indicate the status and activities
- Micrel MIC5216-3.3BM5 or MIC5207-3.3BM5 Regulator to step down to 3.3V
- Jumpers for various configurations

Kit Contents

The KS8721BL/SL Evaluation kit includes the following:

- KS8721BL/SL Evaluation Board
- KS8721BL/SL Board User Guide

Reference Documents

KS8721BL/SL Data Sheet (contact Micrel/Kendin for latest datasheet)
KS8721BL/SL Schematics
KS8721BL/SL Schematics in OrCAD format
KS8721BL/SL Gerber file
MIC5216-3.3BM5 or MIC5207-3.3BM5 Datasheet
(The latest datasheet from www.micrel.com)
AN117 Application Note – Drop-in Replacement with KS8721B/BT

Hardware Description

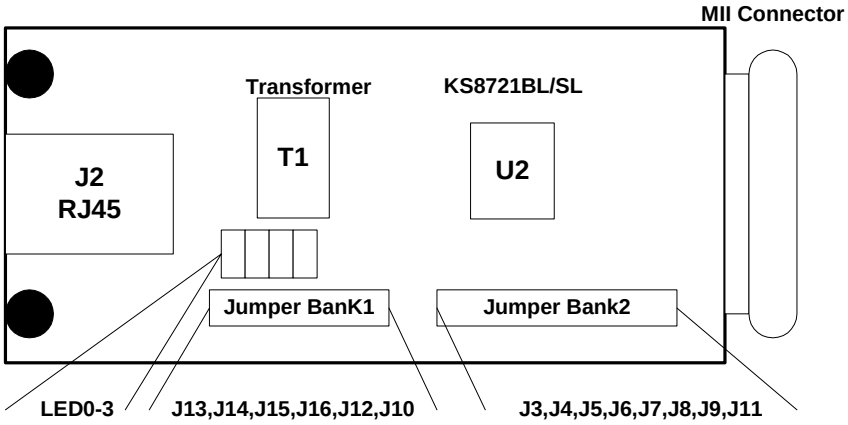

Fig-1 KS8721BL/SL Demo Board Layout

LED indicators

There are 4 LED to indicate the traffic activities.

- LED0 – “ON” is Link, “Toggle” is Activity
- LED1 – “ON” is 100 Base, “OFF” is 10 Base
- LED2 – “ON” is Full Duplex, “OFF” is Half Duplex
- LED3 – “ON” is Collision, “OFF” is no Collision

Jumper setting

KS8721BL/SL will read the following settings during power up or RESET stage.

- J3, J4, J5, J6 and J10 -- setup the PHY address at power up, the default is 00001 when J3 to J6 and J10 are open.
- J7, “SHORT” Enable PCS Loop back, default is “OPEN”.
- J11, “SHORT” Enable ISOLATE MII mode, all MII pins are high impedance, default is “OPEN”.
- J12 – Open for normal operation, short for POWER DOWN mode, default is “OPEN”.
- J13 (LED0) – Factory test pin.
- J14 (LED1) – Open for 100 Base, short for 10 Base, default is “OPEN”.
- J15 (LED2) – Open Full Duplex, short Half Duplex, default is “OPEN”.
- J16* (LED3) – Open Auto negotiation, short for force mode, default is “OPEN”.

* Even at Auto-negotiation mode (J16), the max advertised capability is set by J14. J15.

40-Pin MII Ports

Table lists the pinouts for the 40-pin MII Fast Ethernet ports.

Pin	Signal	Pin	Signal
1	+5V	21	+5V
2	MDIO	22	Common
3	MDC	23	Common
4	RxD<3>	24	Common
5	RxD<2>	25	Common
6	RxD<1>	26	Common
7	RxD<0>	27	Common
8	Rx_DV	28	Common
9	Rx_Clk	29	Common
10	Rx_Er	30	Common
11	Tx_Er	31	Common
12	Tx_Clk	32	Common
13	Tx_En	33	Common
14	TxD<0>	34	Common
15	TxD<1>	35	Common
16	TxD<2>	36	Common
17	TxD<3>	37	Common
18	Col	38	Common
19	CRS	39	Common
20	+5V	40	+5V

Bill of Material

Description	Quantity	Reference designator	Manufacturer	Part Number
10/100 BaseTX/FX PHY	1	U2	**Micrel**	**KS8721BL or KS8721SL**
Low Noise µCap LDO	2	U1	**Micrel**	**MIC5216-3.3BM5 or MIC5207-3.3BM5**
Crystal 25MHZ	1	Y1	Dig-Key or Equiv.	SE3441
Cap 47UF	3	C2,C7,C23	Dig-Key or equiv.	
Cap 0.1UF	12	C4, C8, C10, C13, C14, C15, C16, C17, C18, C19, C21, C22	Dig-Key or equiv.	.
Cap 100 UF	1	C6	Dig-Key or equiv.	
Cap 10uF	2	C9, C26	Dig-Key or equiv.	
Cap 22PF	2	C11, C12	Dig-Key or equiv.	
Cap 1000Pf/2KV	1	C20	Dig-Key or equiv.	
Cap 0.01UF	1	C24	Dig-Key or equiv.	
Diode 1N4148	1	D1	Dig-Key or equiv.	
FBEAD	2	FB1, FB2	Steward	HI1206N101R-00
HEADER 1x1	1	TP1	Dig-Key or equiv.	
JUMPER	12	J3, J4, J5, J6, J7, J10, J11, J12, J13, J14, J15, J16	Dig-Key or equiv.	
RJ45 Jack	1	J2	Dig-Key or equiv..	A9095-ND
Male MII connector	1	J1	AMP Inc.	
LEDx3	3	LED1, LED2, LED3	Dig-Key or equiv.	
Resistor 10K	2	R1, R20	Dig-Key or equiv.	
Resistor 33	9	R3, R4, R8, R9, R10, R11, R12, R14, R15	Dig-Key or equiv.	
Resistor 49.9 1%	4	R6, R7, R32, R33	Dig-Key or equiv.	
Resistor 6.49K 1%	1	R13	Dig-Key or equiv.	
Resistor 3K	1	R16	Dig-Key or equiv.	

Resistor 75	4	R17, R18, R26, R39	Dig-Key or equiv.	
Resistor 1K	3	R21, R22, R23	Dig-Key or equiv.	
Resistor 220	4	R27, R28, R29, R31	Dig-Key or equiv.	
Resistor 4.7K	7	R40, R41, R42, R43, R44, R47, R50	Dig-Key or equiv.	
Transformer	1	T1	Pulse	H1102

Appendix

KS8721BL/SL Evaluation Board Schematics Rev 1.1

Micrel Ethernet KS8721BL/SL Demo Board Schematics

REVISION HISTORY

DATE:	DESCRIPTION	REVISION
July/08/03	INITIAL RELEASE	1.0
Sept/23/03	Change the part number to KS8721BL/SL Change description on MIC5216 and MIC5207	1.1

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Title: KS8721BL/SL Demo Board

Size: B | Document Number | Rev: 1.1

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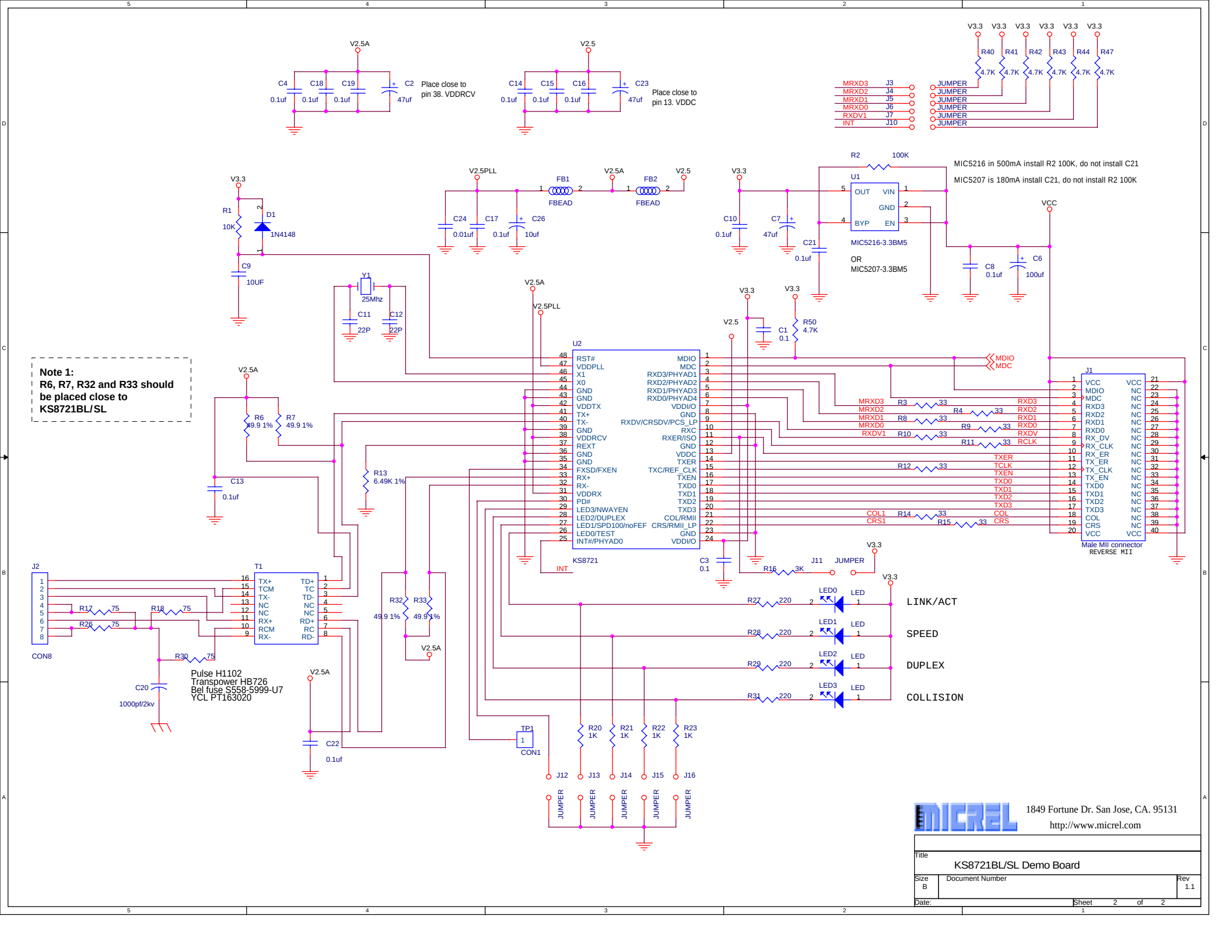
V2.5A
C4 0.1uf
C18 0.1uf
C19 0.1uf
C2 47uf
Place close to pin 38. VDDRCV
V2.5
C14 0.1uf
C15 0.1uf
C16 0.1uf
C23 47uf
Place close to pin 13. VDDC
V3.3
R40 4.7K
R41 4.7K
R42 4.7K
R43 4.7K
R44 4.7K
R47 4.7K
MRXD3 J3
MRXD2 J4
MRXD1 J5
MRXD0 J6
RXDV1 J7
INT J10
JUMPER
R2 100K
MIC5216 in 500mA install R2 100K, do not install C21
MIC5207 is 180mA install C21, do not install R2 100K
U1
OUT VIN GND BYP EN
MIC5216-3.3BM5
OR
MIC5207-3.3BM5
C10 0.1uf
C7 47uf
C21 0.1uf
C8 0.1uf
C6 100uf
VCC
V2.5PLL
FB1 FBEAD
FB2 FBEAD
C24 0.01uf
C17 0.1uf
C26 10uf
R1 10K
D1 1N4148
C9 10UF
Y1 25Mhz
C11 22P
C12 22P
Note 1:
R6, R7, R32 and R33 should be placed close to KS8721BL/SL
R6 49.9 1%
R7 49.9 1%
C13 0.1uf
R13 6.49K 1%
U2
RST# VDDPLL X1 X0 GND GND VDDTX TX+ TX- GND VDDRCV REXT GND GND FXSD/FXEN RX+ RX- VDDRX PD# LED3/NWAYEN LED2/DUPLEX LED1/SPD100/noFEF LED0/TEST INT#/PHYAD0
MDIO MDC RXD3/PHYAD1 RXD2/PHYAD2 RXD1/PHYAD3 RXD0/PHYAD4 VDDI/O GND RXDV/CRSDV/PCS_LP RXC RXER/ISO GND VDDC TXER TXC/REF_CLK TXEN TXD0 TXD1 TXD2 TXD3 COL/RMII CRS/RMII_LP GND VDDI/O
KS8721
INT
C1 0.1
R50 4.7K
C3 0.1
R16 3K
J11 JUMPER
MDIO MDC
J1
Male MII connector
REVERSE MII
MRXD3 R3 33 RXD3
MRXD2 R4 33 RXD2
MRXD1 R8 33 RXD1
MRXD0 R9 33 RXD0
RXDV1 R10 33 RXDV
R11 33 RCLK
R12 33 TXER TCLK TXEN TXD0 TXD1 TXD2 TXD3
COL1 R14 33 COL
CRS1 R15 33 CRS
J2
CON8
T1
TX+ TCM TX- NC NC RX+ RCM RX-
TD+ TC TD- NC NC RD+ RC RD-
R17 75
R18 75
R26 75
R30 75
C20 1000pf/2kv
Pulse H1102
Transpower HB726
Bel fuse S558-5999-U7
YCL PT163020
R32 49.9 1%
R33 49.9 1%
C22 0.1uf
TP1
CON1
R20 1K
R21 1K
R22 1K
R23 1K
J12 J13 J14 J15 J16
JUMPER
LED0 R27 220 LED
LED1 R28 220 LED
LED2 R29 220 LED
LED3 R31 220 LED
LINK/ACT
SPEED
DUPLEX
COLLISION
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Title
KS8721BL/SL Demo Board
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