

Evaluation Board for Socket Modems

AL1100S Evaluation Board Version 4
Designer's Guide

Version 102

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1. INTRODUCTION

1.1. SUMMARY

The xmodus AL1100S Socket Modem Evaluation Board provides the OEM with a complete test environment for the AL2000S, AL3000S, AL4000S, AL5000S and AL7000S socket modem families. The new DIL40 socket modem family from xmodus is also supported.

This Evaluation Board helps you in testing and design-in of all the Analog, ISDN and GSM socket modems. It provides you all the necessary Interfaces to connect the modem directly to a computers com-port and to the telephone and/or ISDN line. It provides you a quick start solution even if your final target system is not ready yet.

2. INTERFACES

2.1 Supported Interfaces

The major hardware signal interfaces of the AL1100S Socket Modem Evaluation Board are illustrated in Figure 1-1.

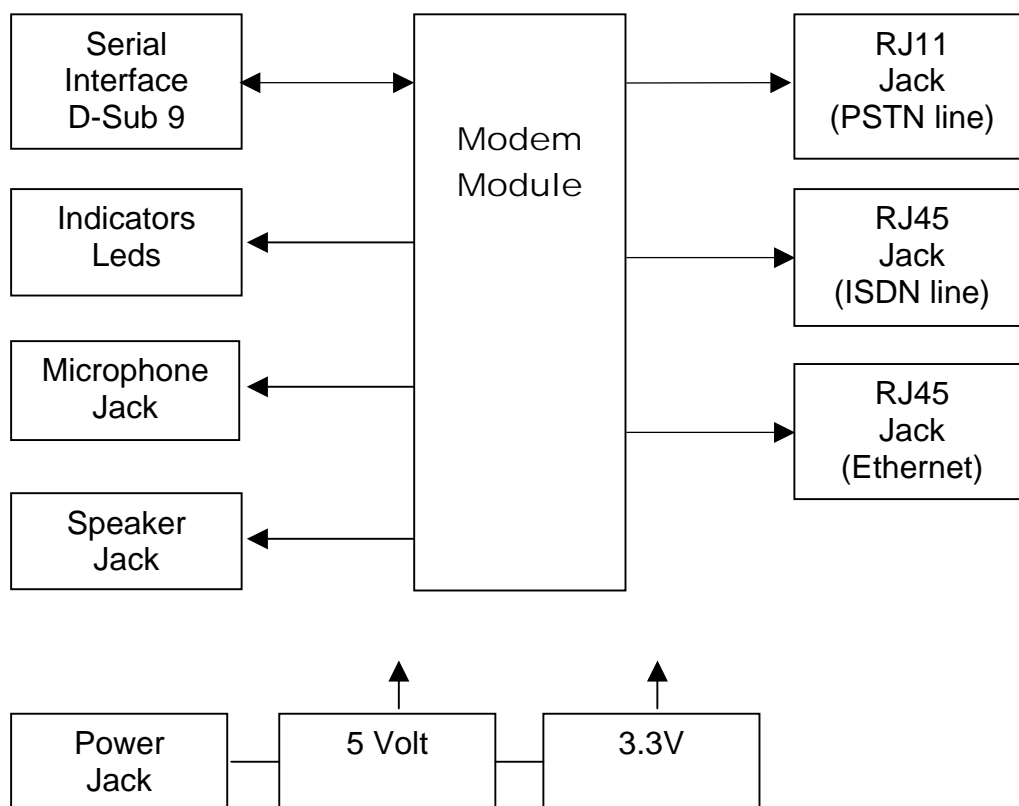


Figure 1-1. Typical Block Diagrams

2.1.1 Serial / Indicator Led Interface:

The following LED indicator outputs are supported.

LED	Color	EIA	Function
D4	Yellow	DCD	Data Carrier Detect Indicator
D5	Yellow	RXD	Receive Data Indicator
D6	Yellow	DTR	Data Terminal Ready Indicator
D7	Yellow	TXD	Transmit Data Indicator

2.1.2 Socket Modem Led Interface (Optional):

LED	Color	EIA	Function
D3	Green	GSM	GSM Network active
D2	Green	DTR	Data Terminal Ready (from module)

2.1.3 Power Led:

LED	Color	EIA	Function
D1	Red		5 Volt Power Led

2.1.4 Serial Interface P4 (D-Sub 9 female):

Pin	EIA	Function	Level
1	DCD	Data Carrier Detect	V.28
2	RXD	Receive Data	V.28
3	TXD	Transmit Data	V.28
4	DTR	Data Terminal Ready	V.28
5	GND	Ground	V.28
6	DSR	Data Set Ready	V.28
7	RTS	Request to Send	V.28
8	CTS	Clear to Send	V.28
9	RI	Ring Indicator	V.28

2.1.5 Speaker Interface P8 (Stereo Jack 3.5 mm):

Jack	Pin	Function
P8	GND	Ground
P8	2	Speaker Output
P8	3	Speaker Output

2.1.6 Microphone Interface P7 (Stereo Jack 3.5 mm):

Jack	Pin	Function
P7	GND	Ground
P7	2	Microphone Input
P7	3	Microphone Input

2.1.7 ISDN Interface P2 (RJ45 Jack):

Jack	Pin	Function
P2	1	NC
P2	2	NC
P2	3	TX+ (ISDN S/T Interface)
P2	4	RX+ (ISDN S/T Interface)
P2	5	RX- (ISDN S/T Interface)
P2	6	TX- (ISDN S/T Interface)
P2	7	NC
P2	8	NC

2.1.8 PSTN Interface P6 (RJ11 Jack):

Jack	Pin	Function
P6	1	NC
P6	2	NC
P6	3	TIP (Phone Line)
P6	4	RING (Phone Line)
P6	5	NC
P6	6	NC

2.1.9 ETHERNET Interface P3 (RJ45 Jack):

Jack	Pin	Function
P2	1	TX + (ETHERNET Interface)
P2	2	TX - (ETHERNET Interface)
P2	3	RX + (ETHERNET Interface)
P2	4	NC
P2	5	NC
P2	6	RX - (ETHERNET Interface)
P2	7	NC
P2	8	NC

2.1.10 Power Input P9,J7 (2 pole Header):

Jack	Pin	Function
P9,J7	1	DC 7.5 – 12 Volt @ 500mA AC 6 – 9 Volt @ 500mA
P9,J7	2	DC 7.5 – 12 Volt @ 500mA AC 6 – 9 Volt @ 500mA

2.2 Order of Connectors, Jumpers and Leds

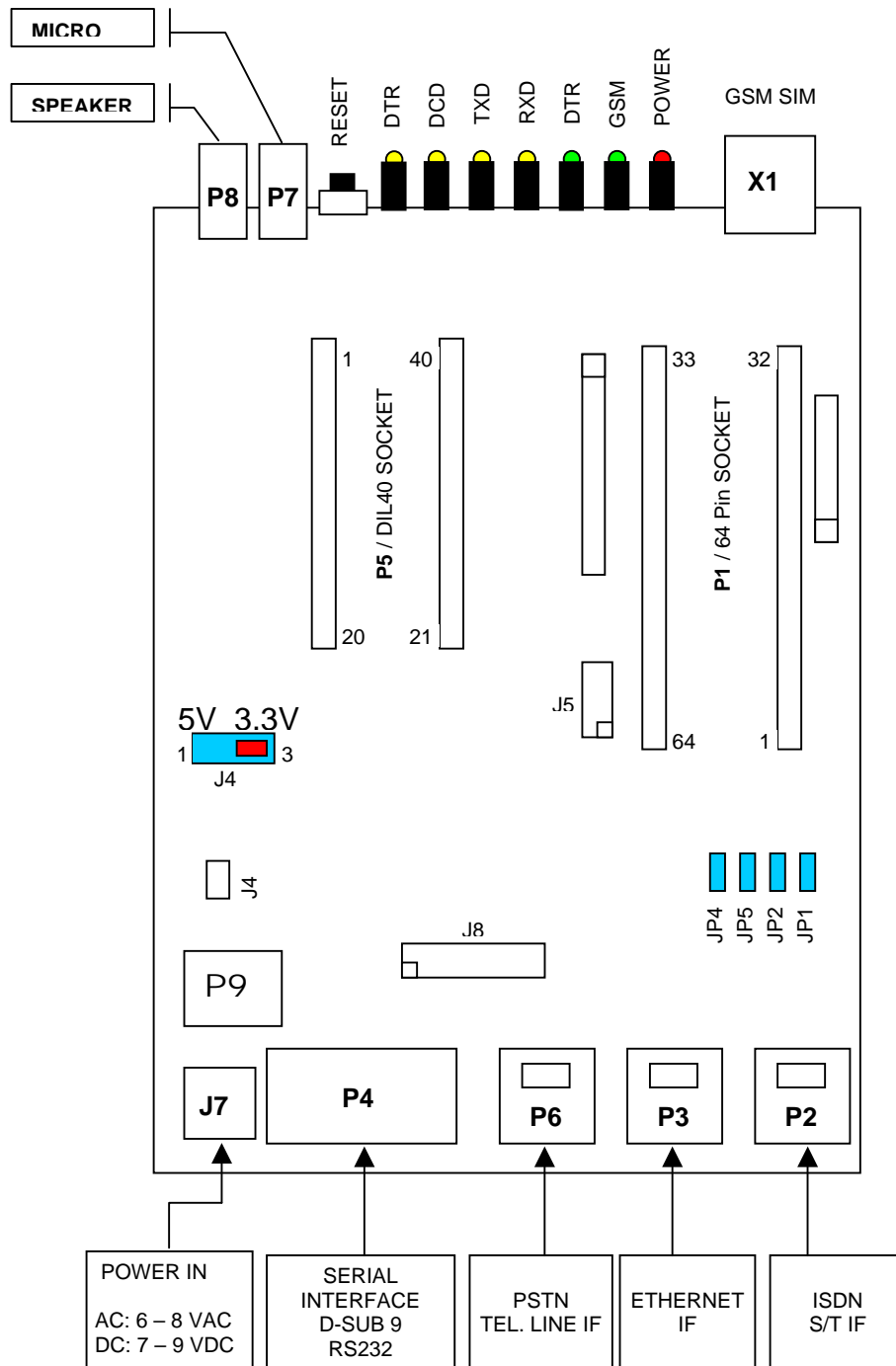


Figure 2-1. Order of Connectors, Jumpers and Leds

3. JUMPER SETTINGS

3.1 JP1 / JP2 Jumper Settings

ANALOG / ISDN INTERFACE 64-PIN SOCKET	
JP1 / JP2	Function
Closed	Analog Interface used (AL4000S, AL3000S Models)
Closed	ISDN Interface used (AL5000S Modems)
Closed	ETHERNET Interface used (LAN Modem)
Open	DIL-40 Module used (AL2000S Modems)

3.2 JP4 / JP5 Jumper Settings

ANALOG / ISDN INTERFACE DIL-40 SOCKET	
JP4 / JP5	Function
Closed	Analog Interface used (AL2000S Modems)
Open	ISDN Interface used (AL5000S Modems)
Open	64-Pin Module used (AL4000S, AL3000S Models)
Open	ETHERNET Interface used (LAN Modem)

3.3 J4 Jumper Settings

POWER SOURCE OF		
J4.1	J4.3	Function
Closed	Open	5 Volt Power to Module
Open	Closed	3.3 Volt Power to Module

4. Test Connectors

TEST IF	
JP5	Function
1	TIN1
2	TOUT1
3	LCS1
4	PIN56
5	VO1
6	VC1
7	GND
8	VCC

Analog IN / OUT of Voice Codecs	
JP5	Function
1	TI+ A
3	TI- A
5	A_PO- A
7	A_PO+ A
9	VCC
11	GND
2	TI+ B
4	TI- B
6	A_PO- B
8	A_PO+ B
10	VCC
12	GND

5. SETUP AND COMMISSIONING

1. Power Source settings

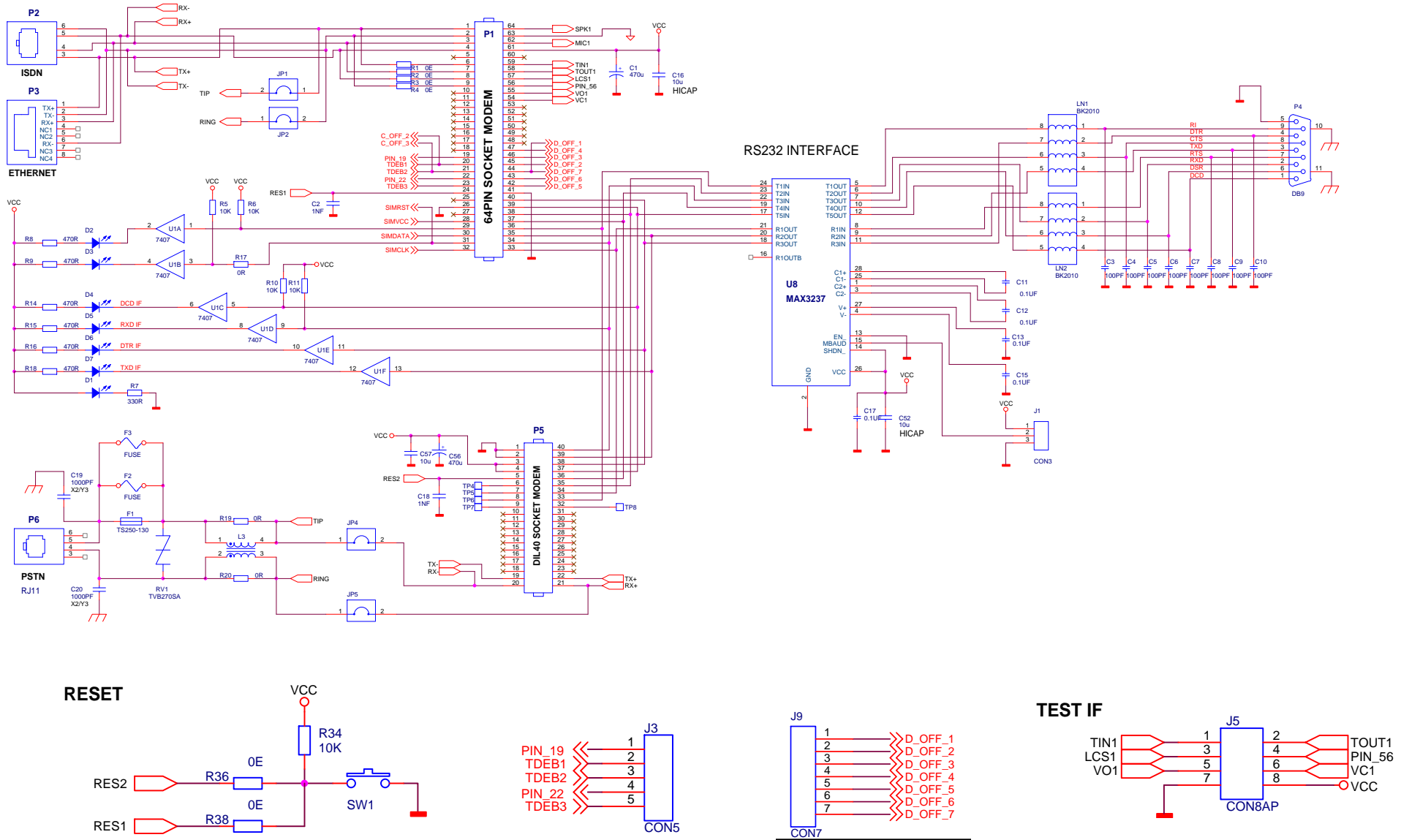
IMPORTANT !

Set correct Power Source (5 Volt or 3.3 Volt) for Socket Modem under Test according to [3.2] or [3.3].

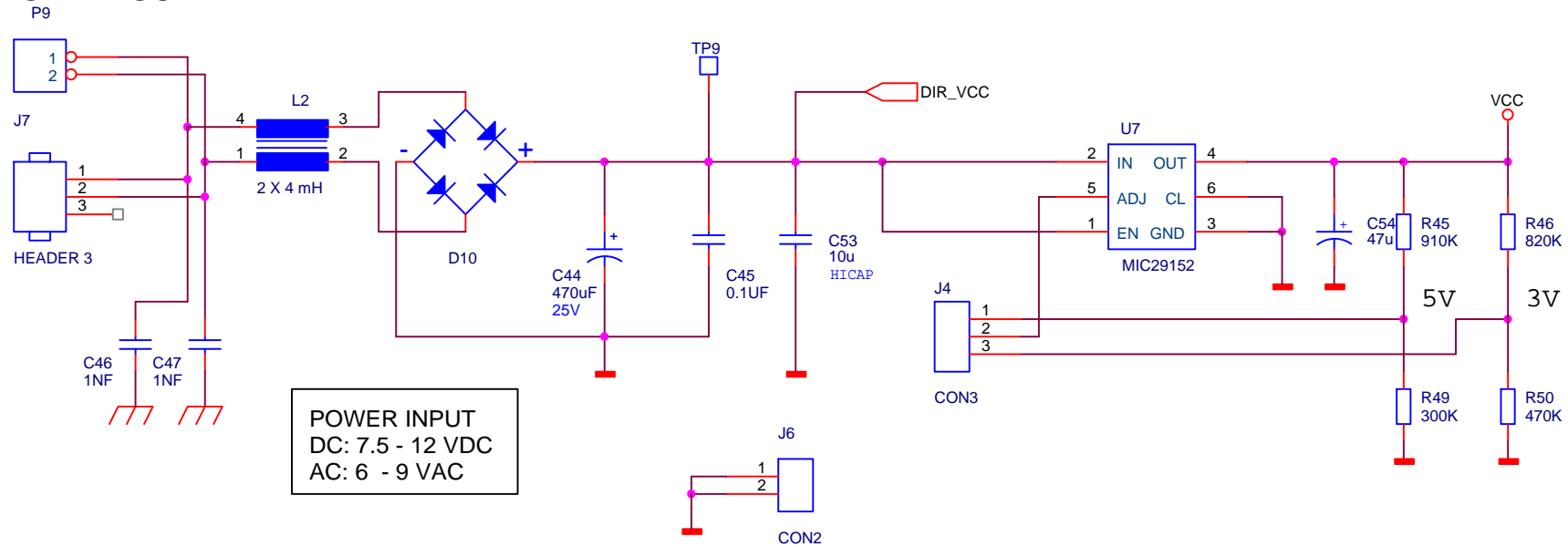
(setting of wrong power source can cause permanent damage to socket modem modules)

2. Set Analog or ISDN or ETHERNET Interface according to [3. 1]
3. Plug in Socket Modem
4. Connect P4 (serial interface) to COM PORT of your PC.
5. Connect PSTN or ISDN phone line to P2 or P6 according [2.1.7] and / or [2.1.8].
6. Plug in Power Source to P9,J7 according to [2.1.9]
7. Push Reset (reset of socket modem).
8. Start Terminal Programm on PC. Configure Com-Port and 115200 N81.
9. Test Connection by typing AT<CR>. The Modem should respond with "OK".

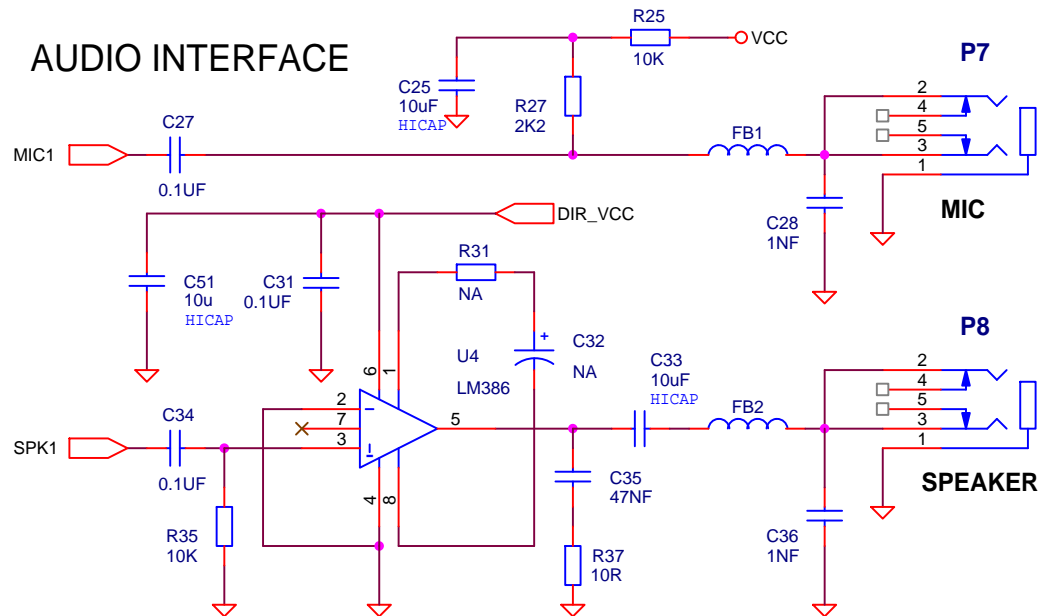
6. SCHEMATICS



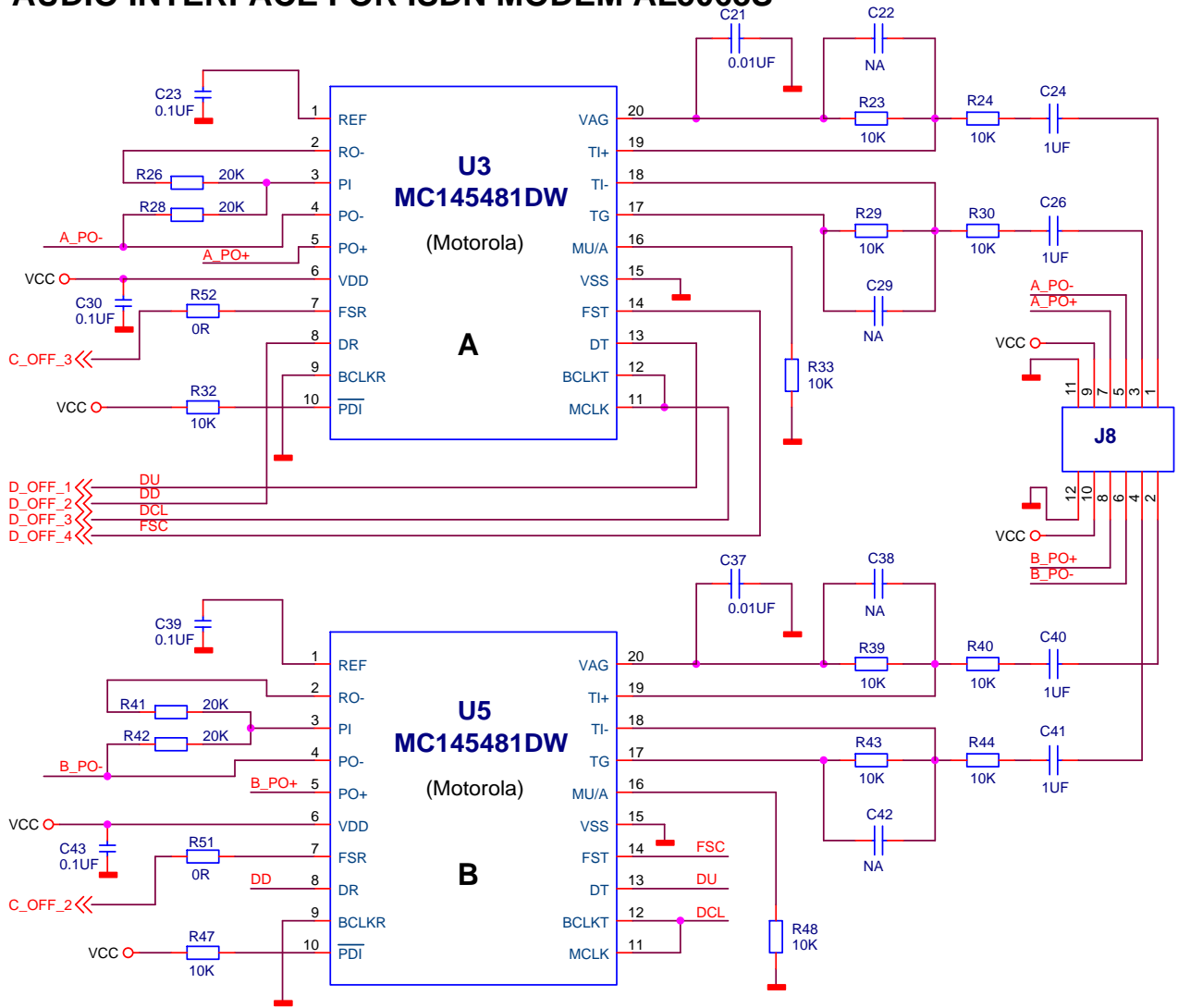
POWER SUPPLY



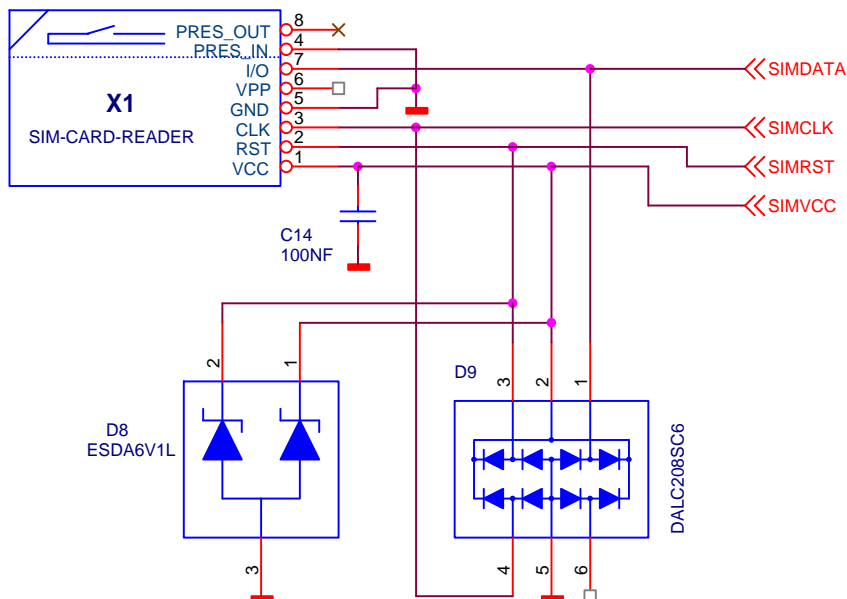
AUDIO INTERFACE



AUDIO INTERFACE FOR ISDN MODEM AL5068S



SIM INTERFACE



7. BILL OF MATERIALS

QTY	REFERENCE	VALUE	DESCRIPTION	PACKAGE
8	C3,C4,C5,C6,C7,C8,C9,C10	100PF COG 50V 5%	MLCC MCH185A101JK	EIA 0603
2	C2,C18	1NF X7R 25V 20%	MLCC MCH182CN102KK / MCH185CN102KK	EIA 0603
4	C28,C36,C46,C47	1000PF X7R 25V 10%	MLCC MCH182CN102KK / MCH185CN102KK	EIA 0603
2	C19,C20	1000PF X2/Y3 10%	MLCC LS1808N102K302NXT SAFETY EN60950	EIA 1808
0	C21,C37	10NF X7R 25V 10%	MLCC MCH185CN103KK / MCH185CN103KK	EIA 0603
1	C35	47NF X7R 25V 10%	MLCC MCH185CN473KK / MCH185CN473KK	EIA 0603
0	C22,C29,C38,C42	100NF X7R 25V 10%	MLCC MCH182CN104KK / MCH185CN104KK	EIA 0603
6	C11,C12,C13,C14,C15,C17,	100NF X7R 25V 10%	MLCC MCH182CN104KK / MCH185CN104KK	EIA 0603
0	C23,C30,C39,C43	100NF X7R 25V 10%	MLCC MCH182CN104KK / MCH185CN104KK	EIA 0603
3	C27,C31,C34	100NF X7R 25V 10%	MLCC MCH182CN104KK / MCH185CN104KK	EIA 0603
0	C32	100NF X7R 25V 10%	MLCC MCH182CN104KK / MCH185CN104KK	EIA 0603
1	C45	100NF X7R 25V 10%	MLCC MCH182CN104KK / MCH185CN104KK	EIA 0603
0	C24,C26,C40,C41	1UF X7R 10V 10%	MCH184CN105K	EIA 0603
8	C16,C48,C49,C50,C51,C52, C53,C57	10UF X5R 6.3V 20%	MLCC HICAP / JMK316BJ106ML-T / JMK316BJ106KL-T	EIA 1206
2	C33,C25	10UF X5R 6.3V 20%	MLCC HICAP / JMK316BJ106ML-T / JMK316BJ106KL-T	EIA 1206
1	C54	47UF 10V 20%	TANTALUM CAP OXICAP NOJC476M006R	CASE C
1	C44	470UF 25V 20%	AL ELECTROLYTIC CAP ECA1EM471 - 10 X 12.5	LS 4,5
		470UF 25V 20%	AL ELECTROLYTIC CAP 25-YK-220-M-0-TA-10x12.5	LS 4,5
2	C56,C1	470UF LOW ESR 10V	TANTAL ESR 0.1 OHM / B45197-A2477-K509	CTCE
		470UF LOW ESR 10V	TANTAL ESR 0.1 OHM / TPSE477K010R0100	CTCE
6	R1,R2,R3,R4,R36,R38	0R00 0.100W 5% 50V	FIXED CHIP RESISTORS JUMPER	EIA 0603
1	R17	0R00 0.100W 5% 50V	FIXED CHIP RESISTORS JUMPER	EIA 0603
0	R51,R52	0R00 0.100W 5% 50V	FIXED CHIP RESISTORS JUMPER	EIA 0603
2	R21,R22	0R00 0.100W 5% 50V	FIXED CHIP RESISTORS JUMPER	EIA 1206
2	R19,R20	0R00 0.100W 5% 50V	FIXED CHIP RESISTORS JUMPER	EIA 0603
1	R37	10R0 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
1	R7	330R 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
6	R8,R9,R14,R15,R16,R18	470R 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
1	R27	2K20 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
0	R31	10K0 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
4	R5,R6,R10,R11	10K0 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
6	R25,R33,R34,R35,R39,R48	10K0 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
0	R24,R30,R40,R44,R23,R29 R43,R32,R47	10K0 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
0	R26,R28,R41,R42	20K0 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
1	R45	910K 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
1	R46	820K 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
1	R49	300K 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603
1	R50	470K 0.100W 5% 50V	FIXED CHIP RESISTORS	EIA 0603

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QTY	REFERENCE	VALUE	DESCRIPTION	PACKAGE
4	D4,D5,D6,D7	551-0307	LED 3MM YELLOW	RM 2.54
2	D2,D3	551-0207	LED 3MM GREEN	RM 2.54
1	D1	551-0407	LED 3MM RED	RM 2.54
1	D8	ESDA6V1L	DUAL TRANSIL ARRAY FOR ESD PROTECTION	SOT23
1	D9	DALC208SC6	LOW CAPACITANCE DIODE ARRAY	SOT23-6L
1	D10	DF04S	BRIDGE RECTIFIER 1A 400V SMD	DALC208_0
2	FB1,FB2	BK1608 HW 431	FERRITE BEAD 430 OHM @ 100MHZ / 100MA	EIA 0603
1	F1	TS250-130-2	POLYSWITCH RESETTABLE FUSE	SMD
0	F2	MST 250	Kleinstsicherung mit rad Anschl. 1A	FUSE
0	F3	OMT 250	SMD Sicherung	FUSE
4	JP1,JP2,JP4,JP5	HEADER 4X2	VERTICAL HEADER 4X2 POLE / RM2.54	RM2.54
2	JP1,JP2	JUMPER	JUMPER RM2.54	RM2.54
2	J4,J1	HEADER 1X3	VERTICAL HEADER 1X3 POLE / RM2.54	RM2.54
2	J4,J1	JUMPER	JUMPER RM2.54	RM2.54
0	J3	CON5	CON5 RM2.54	RM2.54
0	J5	HEADER 4X2	VERTICAL HEADER 2X4 POLE / RM2.54	RM2.54
1	J6	HEADER 1X2	VERTICAL HEADER 1X2 POLE / RM2.54	RM2.54
1	J7	POWER JACK	POWER JACK 90° (170 601-2)	THD
0	J8	CON12AP	VERTICAL HEADER 2X6 POLE / RM2.54	RM2.54
0	J9	CON7	CON7 RM2.54	RM2.54
2	LN1,LN2	BK2010 4W241	FERRITE CHIP BEAD ARRAY (4X)	EIA 0804
1	L2	DFKH2-14-1.0-4/A	DUAL COMMON MODE CHOKE - 1A 2X4MH	01-2
1	L3	744220	COMMON MODE CHOKE 4700uH / 0.5A (744220)	SMD
2	P1	MMS-132-01-LSV	SOCKELLEISTEN VERTIKAL 2MM (2X32POL)	RM 2.00
1	P2	327388-1	FCC MODULAR JACK TCO 8POLE / RJ45	90 DEG
1	P3	327388-1	FCC MODULAR JACK TCO 8POLE / RJ45	90 DEG
1	P4	329152-5	D-SUB CONNECTOR DB9 FEMALE	90 DEG
1	P5	110-93-640-41-001	DUAL-IN-LINE SOCKET 40POLE PRECISION	RM 2.54
1	P6	327346-1	FCC MODULAR JACK TCO 6POLE / RJ11	90 DEG
2	P7,P8	ST-3151-5C	AUDIO STEREO JACK / 3.5mm JACK / ST-315 SERIES	90 DEG
1	P9	MSTBVA 2.5/ 2-G-5.08	COMBICON VERTICAL HEADER NR. 17 55 51 6	RM 5.08
1	RV1	P3100SC	SIDACTOR DEVICE	DO-214AA
1	PCB	PCB V4.1	PCB VERSION 4.1	
1	LAB	LABEL	LABEL DOC AL1100S_LAB.DOC	
1	SW1	B3F-3120	MECHANICAL KEY SWITCH B3F	RADIAL
1	U1	MC74LCX07DG	HEX BUFFERS (OPEN COLLECTOR)(3.3V-5V)	SO-14
0	U5,U3	MC145481DW	AUDIO CODEX MC145481DW SOIC20W	SOG-20
1	U4	LM386M-1	AUDIO AMPLIFIER 250MW	SO-8
1	U7	MIC29152BU	HIGH CURRENT LOW DROPOUT REGULATOR	TO-263
1	U8	MAX3237ECA1	RS232 TRANSCEIVER 3.3-5V	SSOP28
1	X1	CCM03-3754-R102	SIM CARD CONNECTOR / CCM03 SERIES	SIM CARD

