

# **RS-232 MIO-E Design Reference**

**Revision 1.0**



**Reference Documents**

Document	Location
SCH3106 Datasheet	
HIN213 Datasheet	

## Introduction

- This document is the design reference for designing a MIOe module with RS-232 feature to work with Advantech MIO single board.
  
- Contents:
  - Function Selection Table
  - PCB Layout Considerations
  - Reference Schematic
  - Component List

This document is only for MIOe design reference purpose only. Although the information is intended to be accurate, Advantech makes no claims, promises, or guarantees about the quality or reliability of a MIOe board that designed by any user who is outside of Advantech Corp.

## FUNCTION SELECTION TABLE

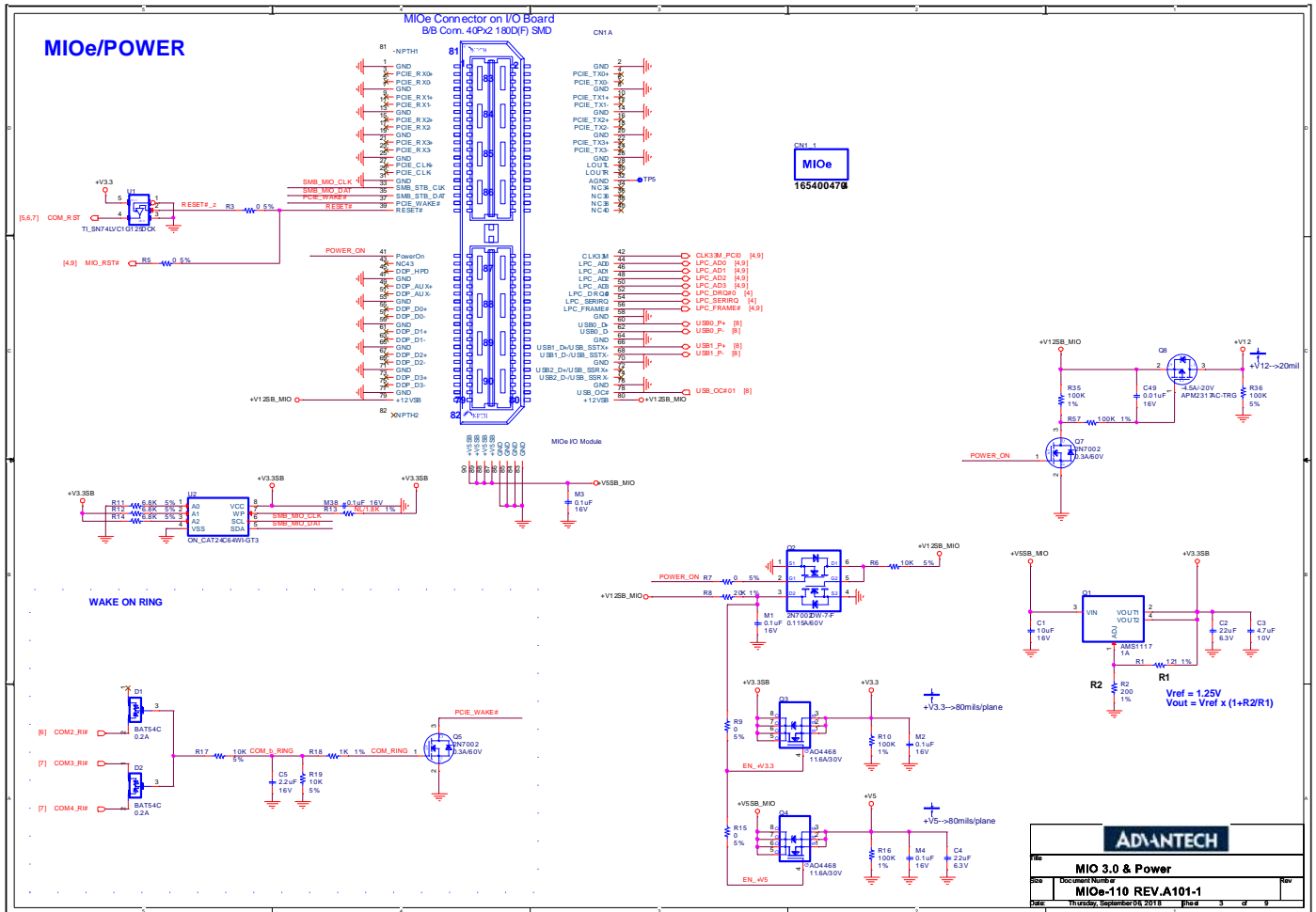
### **SYSOPT0, SYSOPT1 (Pin U3.68, U3.70):**

Configuration	Base I/O address
1. Pull-up SYSOPT0 with a 10 K $\Omega$ resistor to 3.3V power rail.	0x04E
2. Pull-up SYSOPT1 with a 10 K $\Omega$ resistor to 3.3V power rail.	

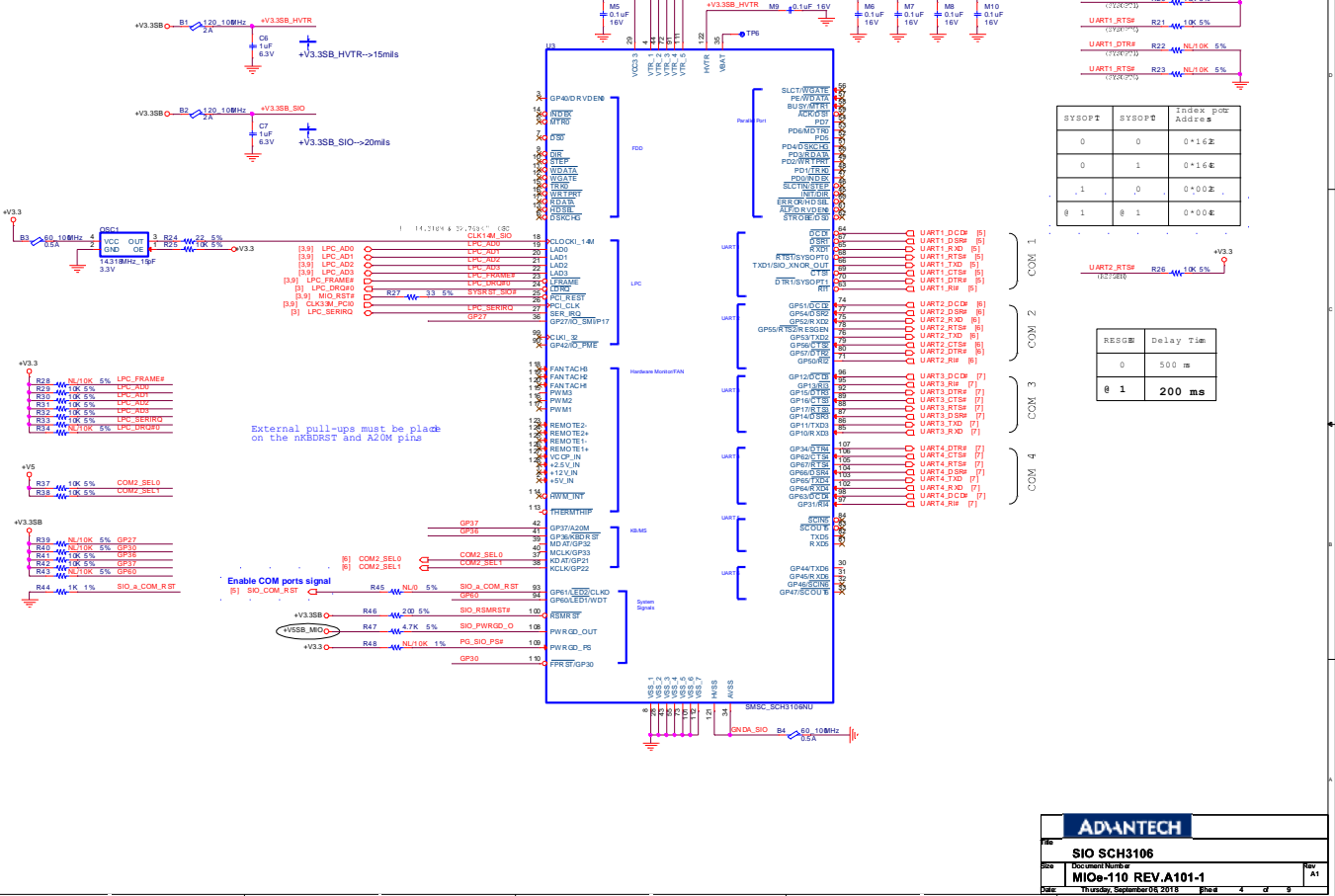
## PCB Layout Considerations

Please notice that PCB Layout will be vary depends on design. For layout considerations, please refer to SCH3106 and HIN213 datasheet.

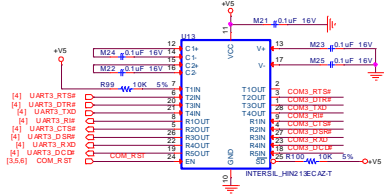
### Reference Schematic



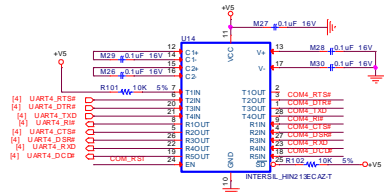
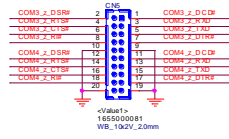
### SIO SCH3106



### COM3/COM4



COM3_D.CDP	B24	500 100MHz 0.3A	COM3_Z.D.CDP	C31	180pF 50V
COM3_Z.R#W	B25	500 100MHz 0.3A	COM3_Z.DTR#	C32	180pF 50V
COM3_R#D	B26	500 100MHz 0.3A	COM3_Z.R#D	C33	180pF 50V
COM3_RTS#	B27	500 100MHz 0.3A	COM3_Z.RTS#	C34	180pF 50V
COM3_TXD	B28	500 100MHz 0.3A	COM3_Z.TXD	C35	180pF 50V
COM3_CTS#	B29	500 100MHz 0.3A	COM3_Z.CTS#	C36	180pF 50V
COM3_DTR#	B30	500 100MHz 0.3A	COM3_Z.DTR#	C37	180pF 50V
COM3_R#W	B31	500 100MHz 0.3A	COM3_Z.R#W	C38	180pF 50V



COM4_D.CDP	B32	500 100MHz 0.3A	COM4_Z.D.CDP	C39	180pF 50V
COM4_Z.DSR#	B33	500 100MHz 0.3A	COM4_Z.DTR#	C40	180pF 50V
COM4_R#D	B34	500 100MHz 0.3A	COM4_Z.R#D	C41	180pF 50V
COM4_RTS#	B35	500 100MHz 0.3A	COM4_Z.RTS#	C42	180pF 50V
COM4_TXD	B36	500 100MHz 0.3A	COM4_Z.TXD	C43	180pF 50V
COM4_CTS#	B37	500 100MHz 0.3A	COM4_Z.CTS#	C44	180pF 50V
COM4_DTR#	B38	500 100MHz 0.3A	COM4_Z.DTR#	C45	180pF 50V
COM4_R#W	B39	500 100MHz 0.3A	COM4_Z.R#W	C46	180pF 50V



### Component List

QTY	Description	Reference	Manufacture Part Number	Manufacture
2	Bead 120ohm 25% 2A SMD 0603 BLM18PG121SN1 WO/Pb	B1	BLM18PG121SN1	台灣村田股份有限公司 (Taiwan Murata Electronics Co., Ltd.)
		B2		
2	Bead 60ohm 500mA SMD 0603 BLM18PG600SN1D WO/Pb	B3	BLM18PG600SN1D	台灣村田股份有限公司 (Taiwan Murata Electronics Co., Ltd.)
		B4		
16	Bead 600ohm 25% 300mA SMD 0402 BLM15AG601SN1D	B24	BLM15AG601SN1D	台灣村田股份有限公司 (Taiwan Murata Electronics Co., Ltd.)
		B25		
		B26		
		B27		
		B28		
		B29		
		B30		
		B31		
		B32		
		B33		
		B34		
		B35		
		B36		
B37				
B38				
B39				
1	MLCC X7R 10uF 10% 16V SMD 1206	C1	C1206X106K016T	台灣東電化股份有限公司 (TDK Taiwan Corporation)
1	MLCC X5R 22uF 20% 6.3V SMD 0805	C2	0805X226M6R3CT	台灣村田股份有限公司 (Taiwan Murata Electronics Co., Ltd.)
1	MLCC Y5V 4.7uF +80%-20% 10V SMD 0805	C3	C0805Y475Z010T	台灣太陽誘電(股)公司 (Taiwan Taiyo Yuden Co., Ltd.)
1	MLCC X5R 22uF 20% 6.3V SMD 0805	C4	0805X226M6R3CT	台灣村田股份有限公司 (Taiwan Murata Electronics Co., Ltd.)
1	MLCC X7R 2.2uF 10% 16V SMD 0805	C5	0805B225K160CT	台灣東電化股份有限公司 (TDK Taiwan Corporation)
2	MLCC X5R 1uF 10% 6.3V SMD 0402	C6	0402X105K6R3CT	台灣東電化股份有限公司 (TDK Taiwan Corporation)
		C7		

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16	MLCC X7R 180pF 10% 50V SMD 0402	C31	CC0402KRX7R9BB181	國巨股份有限公司 (Yageo Co.,Ltd.)
		C32		
		C33		
		C34		
		C35		
		C36		
		C37		
		C38		
		C39		
		C40		
		C41		
		C42		
		C43		
		C44		
		C45		
		C46		
21	MLCC X7R 0.1uF 10% 16V SMD 0402	M1	0402B104K160CT	國巨股份有限公司 (Yageo Co.,Ltd.)
		M2		
		M3		
		M4		
		M5		
		M6		
		M7		
		M8		
		M9		
		M10		
		M21		
		M22		
		M23		
		M24		
		M25		
		M26		
M27				
M28				
M29				
M30				
M38				

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1	MLCC X7R 0.01uF 10% 16V SMD 0402	C49	0402B103K160CT	國巨股份有限公司 (Yageo Co.,Ltd.)
1	WAFER BOX 2*10P 2mm 180D(M) DIP 24W2140-20S10-01	CN5	\$1655000081	何迪企業股份有限公司 (Ho-Base Technology Co.,Ltd.)
2	Schottky BAT54C 0.2A 30V SMD SOT-23	D1	BAT54C	恩智浦半導體 (NXP Semiconductors)
		D2		
1	OSC 14.318MHZ 50ppm 3.3V 15pF SMD 4P 7x5mm	OSC1	7W14300014	台灣晶技股份有限公司 (Txc Corporation)
1	REG LDO AMS1117 SMD SOT-223 3P 1A ADJ AMS	Q1	AMS1117	Advanced Monolithic System Inc.
1	MOSFET N-CH 2N7002DW-7-F 0.115A 60V SMT SOT-363	Q2	2N7002DW-7-F	Diodes Inc.
2	MOSFET N-CH AO4468 11.6A 30V SMD SOIC8 8P	Q3	AO4468	香港商萬國半導體股份有限公司 (Alpha & Omega Semiconductor, Ltd.)
		Q4		
2	MOSFET N-CH 2N7002 0.3A 60V SMD SOT-23 3P	Q5	2N7002	恩智浦半導體 (NXP Semiconductors)
		Q7		
1	MOSFET P-CH APM2317AC-TRG -20V -4.5A SMD SOT-23	Q8	APM2317AC-TRG	大中積體電路股份有限公司 (Sinopower Semiconductor Inc.)
1	CR 121 1% 1/10W SMD 0603	R1	0603WAF1210T5E	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
1	CR 200 1% 1/10W SMD 0603	R2	0603WAF2000T5E	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
1	CR 20K 1% 1/16W SMD 0402	R8	0402WGF2002TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
1	CR 1.8K 1% 1/16W SMD 0402	R13	0402WGF1801TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
1	CR 10K 1% 1/16W SMD 0402	R48	0402WGF1002TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
2	CR 1K 1% 1/16W SMD 0402	R18	0402WGF1001TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
		R44		
4	CR 100K 1% 1/16W SMD 0402	R10	0402WGF1003TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
		R16		
		R35		
		R57		

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6	CR 0 5% 1/16W SMD 0402	R3	0402WGJ0000TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
		R5		
		R7		
		R9		
		R15		
		R45		
27	CR 10K 5% 1/16W SMD 0402	R6	0402WGJ0103TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
		R17		
		R19		
		R20		
		R21		
		R22		
		R23		
		R25		
		R26		
		R28		
		R29		
		R30		
		R31		
		R32		
		R33		
		R34		
		R37		
		R38		
		R39		
		R40		
R41				
R42				
R43				
R99				
R100				
R101				
R102				
1	CR 100K 5% 1/16W SMD 0402	R36	0402WGJ0104TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)

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1	CR 200 5% 1/16W SMD 0402	R46	0402WGJ0201TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
1	CR 22 5% 1/16W SMD 0402	R24	0402WGJ0220TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
1	CR 33 5% 1/16W SMD 0402	R27	0402WGJ0330TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
1	CR 4.7K 5% 1/16W SMD 0402	R47	0402WGJ0472TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
3	CR 6.8K 5% 1/16W SMD 0402	R11	0402WGJ0682TCE	厚聲電子工業有限公司 (Uniroyal Electronics Industry Co.,Ltd.)
		R12		
		R14		
1	IC SN74LVC1G125DCKR SMD SC-70 5P	U1	SN74LVC1G125DCKJ	德州儀器工業股份有限公司 (Texas Instruments Incorporated)
1	IC CAT24C64WI-GT3 EEPROM SMD SOIC 8P	U2	CAT24C64WI-GT3	安森美半導體 (On Semiconductor)
1	IC SCH3106-NU SMD VTQFP 128P	U3	SCH3106-NU	美商史恩希股份有限公司 (Standard Microsystems Corporation)
2	IC HIN213ECAZ-T RS232 RECEIVER SMD SSOP 28P	U13	HIN213ECAZ-T	英特矽爾半導體股份有限公司 (Intersil Limited)
		U14		
1	MIOE Connector	CN1	QTE-040-05-L-D-A	Samtec U.S.A.

## Other Remarks

This document provides a reference on hardware design only. For other support or resource such as Firmware or other utilities, please contact your local agent.