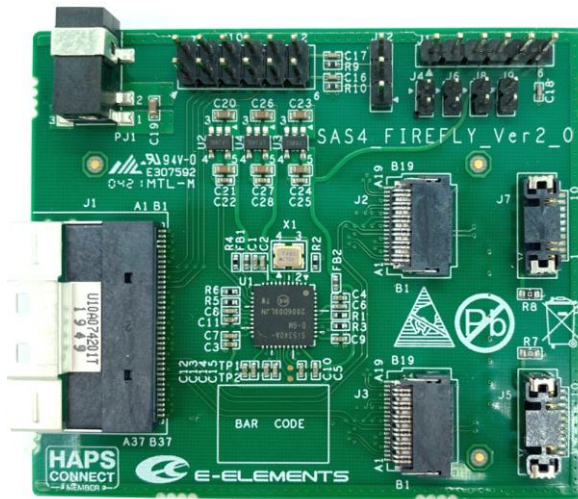


SAS4_FIREFLY

EH1809002032

Reference Manual

February 2021 ver0.2



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Revision History

Date	Rev	Comment
Jul 2020	v0.1	Initial version
Feb 2021	v0.2	Add a clock generator for SAS4 and FIREFLY REFCLK

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SAS4_FIREFLY

IMPORTANT!

ESD



The SAS4_FIREFLY Transceiver Card, as with all other electronic equipment, is sensitive to electrostatic discharge (ESD). When handling the transceiver card:

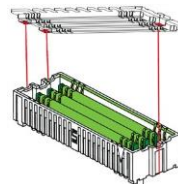
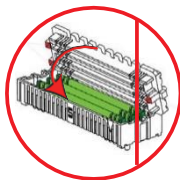
- Transport the card in an ESD bag
- Wear an anti-static wrist strap
- Make sure the work area is equipped with an ESD mat

Warning

Never hot-plug interface cards, daughter boards or cables. Always power down the HAPS® system when adding or removing a board, card, or cable to avoid damage to both the system and peripheral.

HapsTrak® 3 Connector Considerations

The HT3 connectors must be attached carefully! If connected improperly socket pins can be deformed or holding rail ends can become damaged.



Overview

This document is the SAS4_FIREFLY Reference Manual and describes the functions of the SAS4_FIREFLY daughter board.

The SAS4_FIREFLY daughter board includes two stacked FireFly transceiver connectors that support up to eight high-speed serial links over two FIREFLY cables and connected to SAS4 SFF8654 connector.

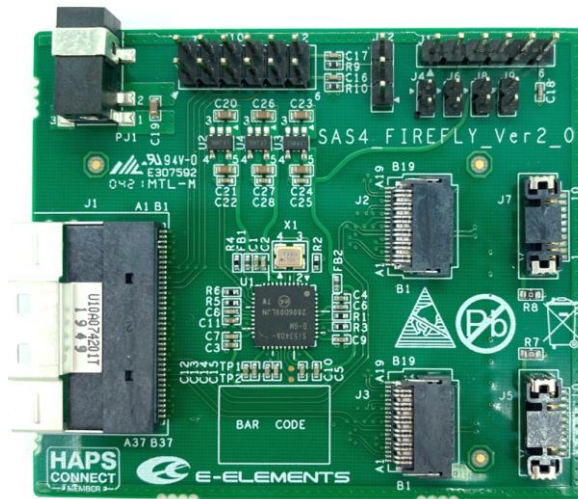


Figure 1: Top View of SAS4_FIREFLY

Layout

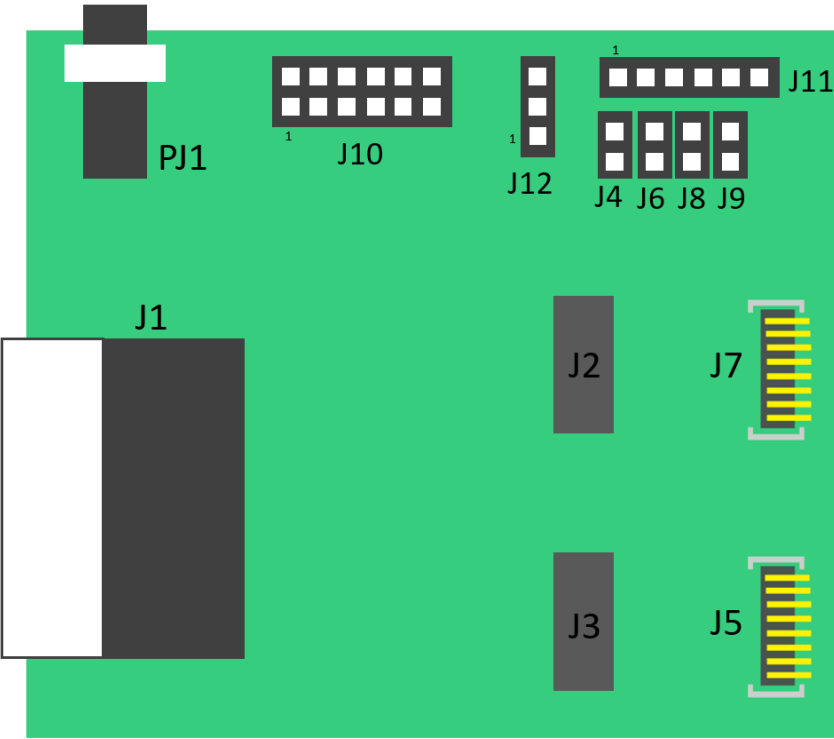
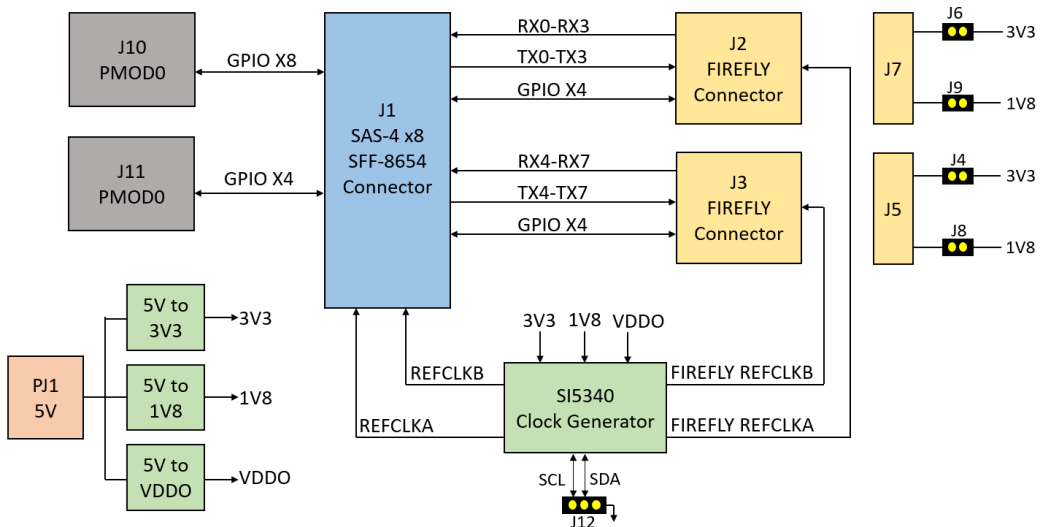


Figure 2: Top SAS4_FIREFLY Card Layout

Figure 3 shows the connectivity of the SAS4_FIREFLY daughter board's headers.



Programmable Frequency Clocks

SAS4_FIREFLY uses a Silicon Labs SI5340A-D-GM chip to generate arbitrary clock frequencies which are controlled by IIC, slave address is 0x74.

Trace Name	SI5340A-D-GM(U1)		Connected to
	Pin Name	Pin Number	
Default clock frequency : 187.5MHz			
SI5340A_SDA	SDA	13	J12 Pin2
SI5340A_SCL	SCL	14	J12 Pin3
SAS4_REFCLKA_P	OUT0	20	J1 A11
SAS4_REFCLKA_N	OUT0b	19	J1 A12
SAS4_REFCLKB_P	OUT1	25	J1 A29
SAS4_REFCLKB_N	OUT1b	24	J1 A30
FIREFLY_REFCLKA_P	OUT2	31	J2 B12
FIREFLY_REFCLKA_N	OUT2b	30	J2 B11
FIREFLY_REFCLKB_P	OUT3	36	J3 B13
FIREFLY_REFCLKB_N	OUT3b	35	J3 B11

Pin Tables

SlimSAS

J1			
GND	A1	B1	GND
FIREFLYA_TXD_P0	A2	B2	FIREFLYA_RXD_P0
FIREFLYA_TXD_N0	A3	B3	FIREFLYA_RXD_N0
GND	A4	B4	GND
FIREFLYA_TXD_P1	A5	B5	FIREFLYA_RXD_P1
FIREFLYA_TXD_N1	A6	B6	FIREFLYA_RXD_N1
GND	A7	B7	GND
GPIO_A1	A8	B8	GPIO_B1
GPIO_A2	A9	B9	GPIO_B2
GND	A10	B10	GND
SAS4_REFCLKA_P	A11	B11	GPIO_B3
SAS4_REFCLKA_N	A12	B12	GPIO_B4
GND	A13	B13	GND
FIREFLYA_TXD_P2	A14	B14	FIREFLYA_RXD_P2
FIREFLYA_TXD_N2	A15	B15	FIREFLYA_RXD_N2
GND	A16	B16	GND
FIREFLYA_TXD_P3	A17	B17	FIREFLYA_RXD_P3
FIREFLYA_TXD_N3	A18	B18	FIREFLYA_RXD_N3
GND	A19	B19	GND
FIREFLYB_TXD_P0	A20	B20	FIREFLYB_RXD_P0
FIREFLYB_TXD_N0	A21	B21	FIREFLYB_RXD_N0
GND	A22	B22	GND
FIREFLYB_TXD_P1	A23	B23	FIREFLYB_RXD_P1
FIREFLYB_TXD_N1	A24	B24	FIREFLYB_RXD_N1
GND	A25	B25	GND
GPIO_A3	A26	B26	GPIO_B5
GPIO_A4	A27	B27	GPIO_B6
GND	A28	B28	GND
SAS4_REFCLKB_P	A29	B29	GPIO_B7
SAS4_REFCLKB_N	A30	B30	GPIO_B8
GND	A31	B31	GND
FIREFLYB_TXD_P2	A32	B32	FIREFLYB_RXD_P2
FIREFLYB_TXD_N2	A33	B33	FIREFLYB_RXD_N2
GND	A34	B34	GND
FIREFLYB_TXD_P3	A35	B35	FIREFLYB_RXD_P3
FIREFLYB_TXD_N3	A36	B36	FIREFLYB_RXD_N3
GND	A37	B37	GND

FIREFLY Connector

Connector		Connector	
J2		J2	
Trace Name	Pin	Pin	Trace Name
GND	A1	B1	GND
FIREFLYA_TXD_N0	A2	B2	FIREFLYA_TXD_N1
FIREFLYA_TXD_P0	A3	B3	FIREFLYA_TXD_P1
GND	A4	B4	GND
FIREFLYA_TXD_N2	A5	B5	FIREFLYA_TXD_N3
FIREFLYA_TXD_P2	A6	B6	FIREFLYA_TXD_P3
GND	A7	B7	GND
GPIO_B6	A8	B8	GPIO_B2
GPIO_B5	A9	B9	GPIO_B1
GND	A10	B10	GND
GPIO_A1	A11	B11	FIREFLY_REFCLKA_N
GPIO_A2	A12	B12	FIREFLY_REFCLKA_P
GND	A13	B13	GND
FIREFLYA_RXD_P3	A14	B14	FIREFLYA_RXD_P2
FIREFLYA_RXD_N3	A15	B15	FIREFLYA_RXD_N2
GND	A16	B16	GND
FIREFLYA_RXD_P1	A17	B17	FIREFLYA_RXD_P0
FIREFLYA_RXD_N1	A18	B18	FIREFLYA_RXD_N0
GND	A19	B19	GND
Connector		Connector	
J3		J3	
Trace Name	Pin	Pin	Trace Name
GND	A1	B1	GND
FIREFLYB_TXD_N0	A2	B2	FIREFLYB_TXD_N1
FIREFLYB_TXD_P0	A3	B3	FIREFLYB_TXD_P1
GND	A4	B4	GND
FIREFLYB_TXD_N2	A5	B5	FIREFLYB_TXD_N3
FIREFLYB_TXD_P2	A6	B6	FIREFLYB_TXD_P3
GND	A7	B7	GND
GPIO_B8	A8	B8	GPIO_B4
GPIO_B7	A9	B9	GPIO_B3
GND	A10	B10	GND
GPIO_A3	A11	B11	FIREFLY_REFCLKB_N
GPIO_A4	A12	B12	FIREFLY_REFCLKB_P
GND	A13	B13	GND
FIREFLYB_RXD_P3	A14	B14	FIREFLYB_RXD_P2
FIREFLYB_RXD_N3	A15	B15	FIREFLYB_RXD_N2
GND	A16	B16	GND
FIREFLYB_RXD_P1	A17	B17	FIREFLYB_RXD_P0
FIREFLYB_RXD_N1	A18	B18	FIREFLYB_RXD_N0
GND	A19	B19	GND

PMOD Connectors

J10

Trace Name	Pin	Pin	Trace Name
PMOD_A1	1	2	PMOD_B1
PMOD_A2	3	4	PMOD_B2
PMOD_A3	5	6	PMOD_B3
PMOD_A4	7	8	PMOD_B4
GND	9	10	GND
+3V3	11	12	+3V3

J11

Trace Name	Pin
GPIO_B5	1
GPIO_B5	2
GPIO_B7	3
GPIO_B8	4
GND	5
GND	6