

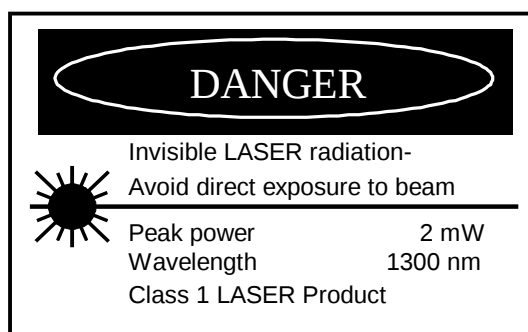


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IRT Eurocard

Types DDT-3220 & DDR-3220

ASI / SDI 4 Channel Multiplexer / De-Multiplexer Fibre Optic Link



Designed and manufactured in Australia

IRT can be found on the Internet at:
<http://www.irtelectronics.com>

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Types DDT-3220 & DDR-3220
ASI / SDI 4 Channel Multiplexer / De-Multiplexer
Fibre Optic Link
Instruction Book

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This instruction book applies to units later than S/N 0201001.

Operational Safety:

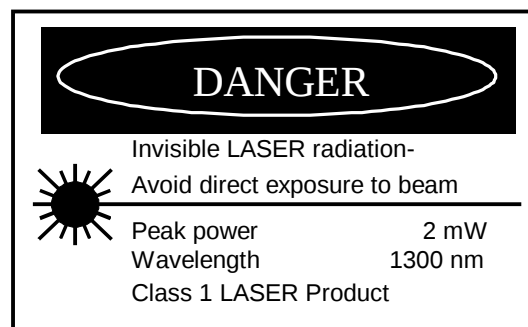
WARNING

Operation of electronic equipment involves the use of voltages and currents that may be dangerous to human life. Note that under certain conditions dangerous potentials may exist in some circuits when power controls are in the **OFF** position. Maintenance personnel should observe all safety regulations.

Do not make any adjustments inside equipment with power **ON** unless proper precautions are observed. All internal adjustments should only be made by suitably qualified personnel. All operational adjustments are available externally without the need for removing covers or use of extender cards.

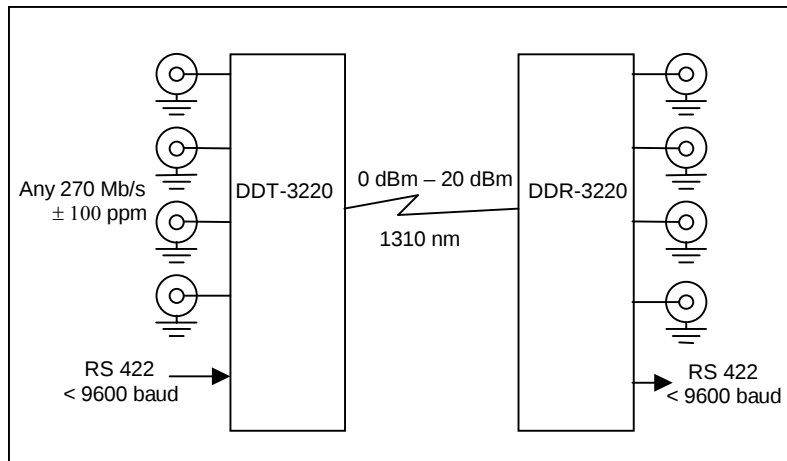
Optical Safety

The light emitted from the LASER diode used in this system is invisible and may be harmful to the human eye. Avoid looking directly into the fibre optic cable or connectors or into the collimated beam along their axis when the device is in operation. Operating the LASER diode outside of its maximum ratings may cause device failure or a safety hazard.



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General Description



The DDT-3220 accepts up to four 270 Mb/s input signals which may be ASI, SDI, SDDI, or any 270Mb/s signals - or a mixture of each type. The signals may be asynchronous to each other.

The signals are time division multiplexed into a single 1.302 Gb/s stream for transmission via single mode fibre to the receiver, which performs the reverse operation and restores correct 270 Mb/s timing.

In addition to the four 270 Mb/s channels, a single RS422 channel is included for transmission of auxiliary data at rates of up to 9600 baud.

The modules are in IRT standard Eurocard format and may be used in any standard IRT frame alongside other IRT analogue and digital modules.

Standard features:

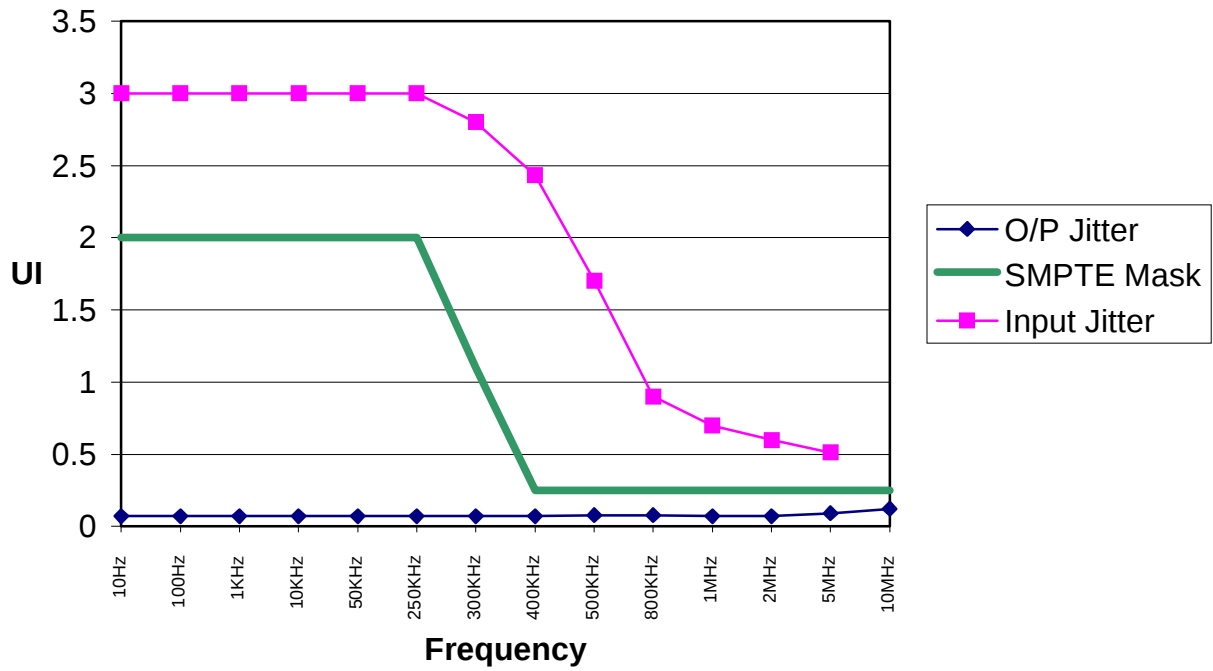
- **ASI and SDI capability.**
- **Automatic cable equalisation for up to 200 m on each input.**
- **Maximum optical path loss of 20 dB.**
- **External urgent and non-urgent alarms for system monitoring.**

Applications:

- **Multichannel digital with data on a single fibre.**
- **Upgrade capacity of existing fibre.**
- **Maintain timing between related signals by ensuring same path transmission delay.**

Typical Jitter Characteristics

The following table shows typical jitter characteristics of output jitter compared to input jitter. Note how output jitter is appreciably reduced. Mask corresponds to SMPTE recommended practice RP 184-1996.



Technical Specifications

DDT-3220

Inputs:

ASI/SDI:	Number	4
	Type	ASI or SDI 270 Mb/s ± 100 ppm
	EQ	automatic for up to 200 m of Belden 8281 or equivalent cable
	Format	synchronous or asynchronous
RS422:	Connectors	BNC 75 Ω
	Number	1
	Type	9600 baud
	Format	asynchronous
	Connectors	HE 14/8 / matches DN 9

Outputs:

Number	1
Type	1310 nm, 1.302 Gb/s
Power level	0 dBm $\pm$ 1 dB
Connector	SC/PC

Alarm Outputs:

Urgent	Contact closes for loss of power, TX lock error or LASER fail.
Non-urgent	Contact closes on absence of all inputs or on power failure.

DDR-3220

Inputs:

Number	1
Type	1310 nm, 1.302 Gb/s
Power Level	> - 20 dBm
Connector	SC/PC

Outputs:

ASI/SDI:	Number	4
	Type	ASI or SDI 270 Mb/s ± 100 ppm
	Format	synchronous or asynchronous
	Connectors	BNC 75 Ω
RS422:	Number	1
	Type	9600 baud
	Format	asynchronous
	Connectors	HE 14/8 / matches DN 9

Alarm Outputs:

Urgent	Contact closes on loss of power, RX lock error or optical input fail.
Non-urgent	Contact closes if all channels are absent or power failure

System Performance:

Maximum optical path loss	20 dB
---------------------------	-------

Power requirement:

Voltage	28 Vac CT (14-0-14) or $\pm 16^\circ$ Vdc
Consumption	<6 VA per module

Other:

Temperature range	0 - 50° C ambient	
Mechanical	Suitable for mounting in IRT 19" rack chassis with all connections at the rear.	
Finish:	Front panel	Grey, silk-screened black lettering & red IRT logo.
	Rear assembly	Detachable silk-screened PCB with direct mount connectors to Eurocard and external signals.
Dimensions	6 HP x 3 U x 220 mm IRT Eurocard.	
Supplied accessories	Rear connector assembly including matching connector for switcher control.	

Due to our policy of continuing development, these specifications are subject to change without notice.

Configuration

There are no user configurable settings. Any potentiometer and link settings are factory set. The following is supplied for information only.

Link settings:

DDT-3220:

LK10 RS422 termination (220R) (IN = normal)

DDR-3220:

LK10 RS422 termination (220R) (IN = normal)

Operation

Up to four ASI, SDI or a combination both are connected to the input 75 Ω BNC connectors on the rear assembly of the DDT-3220 four channel mux transmitter. Each of the inputs must be 270 Mb/s. These input signals do not need to be synchronous with each other. Unused inputs should be terminated with 75 Ω terminations so as to suppress any spurious noise that may be generated on an unterminated input.

Multiplexed signal is then optically transmitted at 1.302 Gb/s .

The DDR-3220 Demultiplexer detects the optical signal and then de-multiplexes it. Outputs, in the same order to the inputs, appear on the 75 Ω BNC connectors on the rear connector panel.

As well as ASI or SDI inputs, a dedicated RS-422 port is provided on each of the units for transmission with the other input signals.

Alarms & Indicators:

DDT-3220:

- Urgent Alarm relay contact closure for loss of power, Tx lock error or laser fail;
- Non-urgent Alarm contact closure if no channels are present;
- Channel 1 presence indicator (green LED);
- Channel 2 presence indicator (green LED);
- Channel 3 presence indicator (green LED);
- Channel 4 presence indicator (green LED);
- Tx lock error or laser fail (red LED);
- DC power (green LED);

DDR-3220:

- Urgent Alarm relay contact closure for loss of power, Rx lock error or loss of optical input;
- Non-urgent Alarm relay contact closure if no channels are present;
- Channel 1 presence indicator (green LED);
- Channel 2 presence indicator (green LED);
- Channel 3 presence indicator (green LED);
- Channel 4 presence indicator (green LED);
- Rx lock error or loss of optical input (red LED);
- DC power (green LED);

Installation

Pre-installation:

Handling:

This equipment may contain or be connected to static sensitive devices and proper static free handling precautions should be observed.

Where individual circuit cards are stored, they should be placed in antistatic bags. Proper antistatic procedures should be followed when inserting or removing cards from these bags.

Power:

AC mains supply: Ensure that operating voltage of unit and local supply voltage match and that correct rating fuse is installed for local supply.

DC supply: Ensure that the correct polarity is observed and that DC supply voltage is maintained within the operating range specified.

Earthing:

The earth path is dependent on the type of frame selected. In every case particular care should be taken to ensure that the frame is connected to earth for safety reasons. See frame manual for details.

Signal earth: For safety reasons a connection is made between signal earth and chassis earth. No attempt should be made to break this connection.

Installation in frame or chassis:

See details in separate manual for selected frame type.

ASI/SDI Inputs and Outputs:

Up to four ASI, SDI or a combination of both are fed into 75 Ω BNC connectors on the rear connector panel of the DDT-3220. Unused inputs are best terminated with a 75 Ω termination to avoid spurious noise being sent to the receiver where the front panel LEDs could illuminate and give the false impression that there is a signal on that line.

The corresponding outputs are by 75 Ω BNC connectors on the DDR-3220 rear connector panel. Output numbers on the DDR-3220 correspond to the input numbers on the DDT-3220. There is no need to terminate the unused channel outputs on the DDR-3220.

Fibre Optic Connection:

Warning

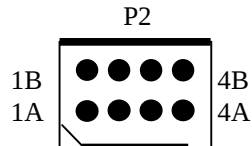
Optical Connections

The optical connectors on the DDT-3220 & DDR-3220 are attached to the main module PCB, NOT the rear connector assembly.

When installing the optical fibre sufficient slack should be allowed for the module to be withdrawn with the optical fibre attached until the connector is clear of the frame and can be disconnected.

If this is not done, the module will not be able to be removed without first disconnecting the optical fibre at the rear. Attempting to remove the module without first disconnecting the fibre may result in damage to the fibre and / or the module.

RS-422 Connection:

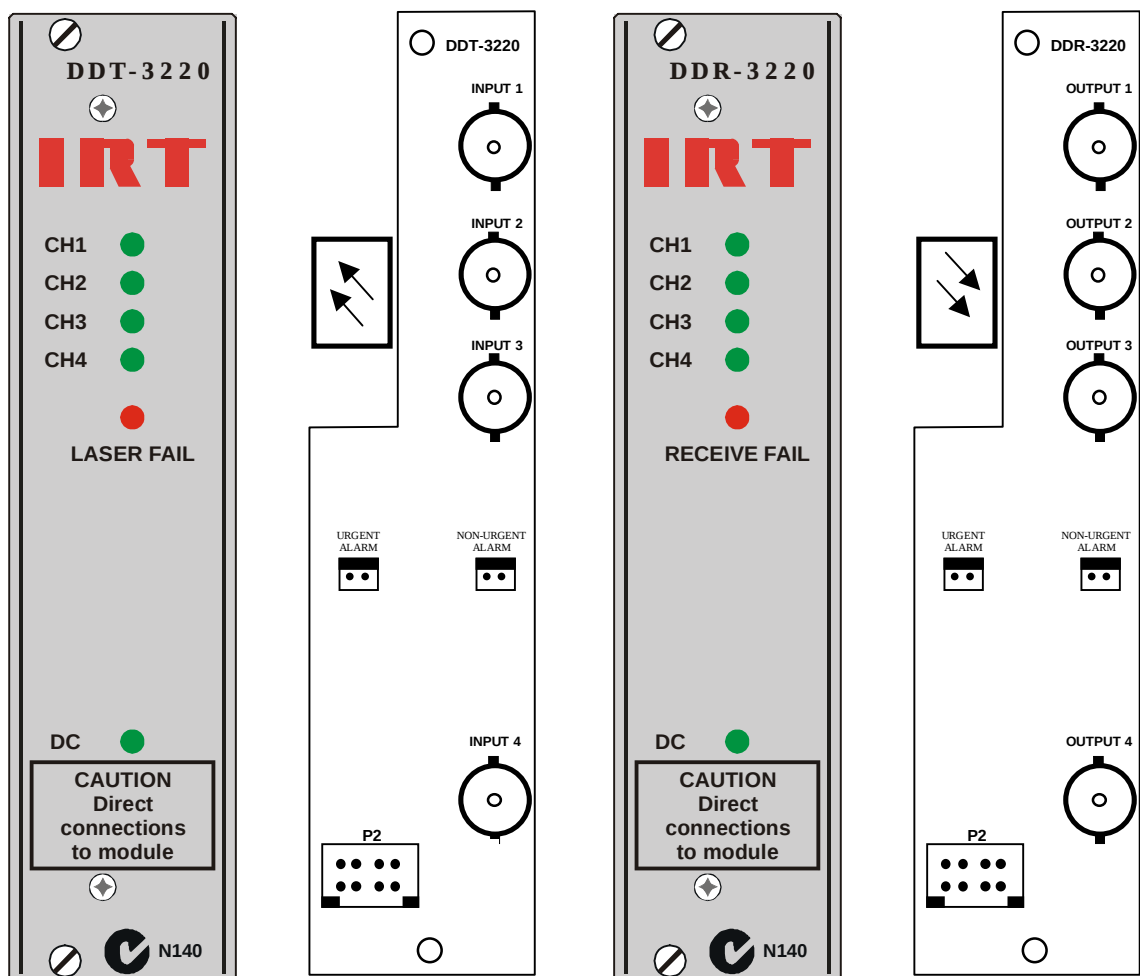


For connections to the RS-422 line, wire pins from P2 to a DB9 Female connector as follows:

PL4	DB9F
2A	2
2B	7
3A	3
3B	8
4A	4 Ground
4B	6 Ground

Front & rear panel connector diagrams

The following front panel and rear assembly drawings are not to scale and are intended to show connection order and approximate layout only.



Maintenance & storage

Maintenance:

No regular maintenance is required.

Care however should be taken to ensure that all connectors are kept clean and free from contamination of any kind. This is especially important in fibre optic equipment where cleanliness of optical connections is critical to performance.

Storage:

If the equipment is not to be used for an extended period, it is recommended the whole unit be placed in a sealed plastic bag to prevent dust contamination. In areas of high humidity a suitably sized bag of silica gel should be included to deter corrosion.

Where individual circuit cards are stored, they should be placed in antistatic bags. Proper antistatic procedures should be followed when inserting or removing cards from these bags.

Warranty & service

Equipment is covered by a limited warranty period of three years from date of first delivery unless contrary conditions apply under a particular contract of supply. For situations when “**No Fault Found**” for repairs, a minimum charge of \$A120.00 will apply, whether the equipment is within the warranty period or not.

Equipment warranty is limited to faults attributable to defects in original design or manufacture. Warranty on components shall be extended by IRT only to the extent obtainable from the component supplier.

Equipment return:

Before arranging service, ensure that the fault is in the unit to be serviced and not in associated equipment. If possible, confirm this by substitution.

Before returning equipment contact should be made with IRT or your local agent to determine whether the equipment can be serviced in the field or should be returned for repair.

The equipment should be properly packed for return observing antistatic procedures.

The following information should accompany the unit to be returned:

1. A fault report should be included indicating the nature of the fault
2. The operating conditions under which the fault initially occurred.
3. Any additional information, which may be of assistance in fault location and remedy.
4. A contact name and telephone and fax numbers.
5. Details of payment method for items not covered by warranty.
6. Full return address.
7. For situations when “**No Fault Found**” for repairs, a minimum charge of \$A120.00 will apply, whether the equipment is within the warranty period or not.

Please note that all freight charges are the responsibility of the customer.

The equipment should be returned **to the agent who originally supplied the equipment or, where this is not possible**, to IRT direct as follows.

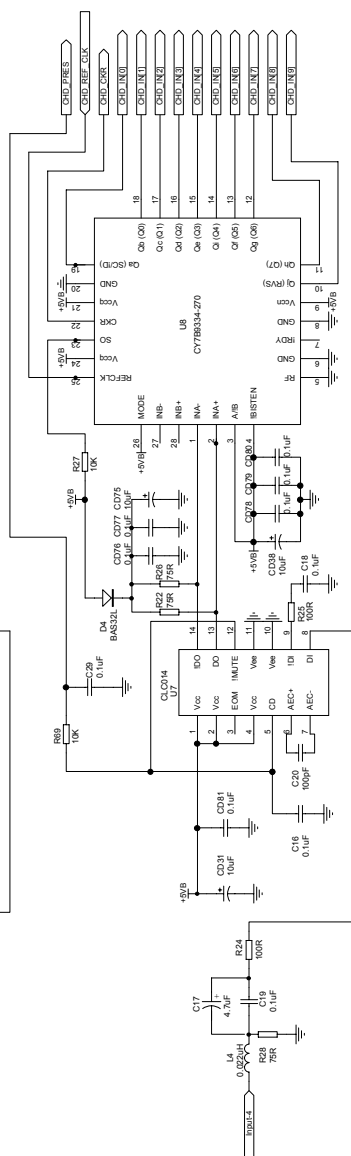
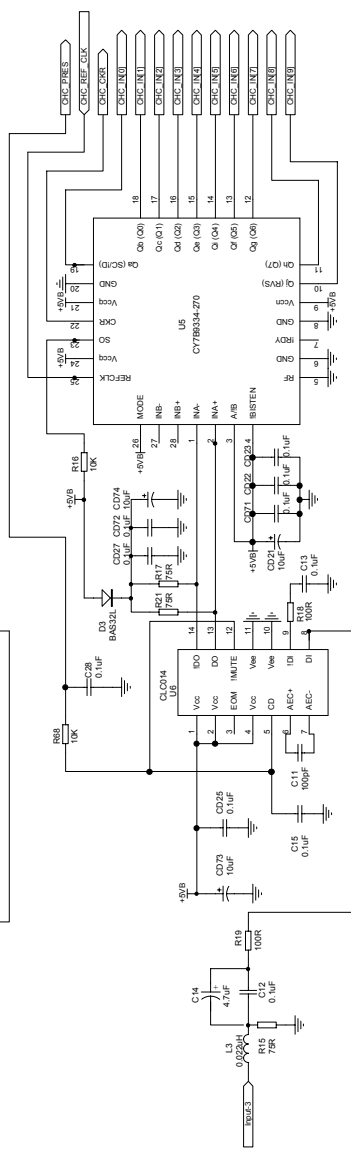
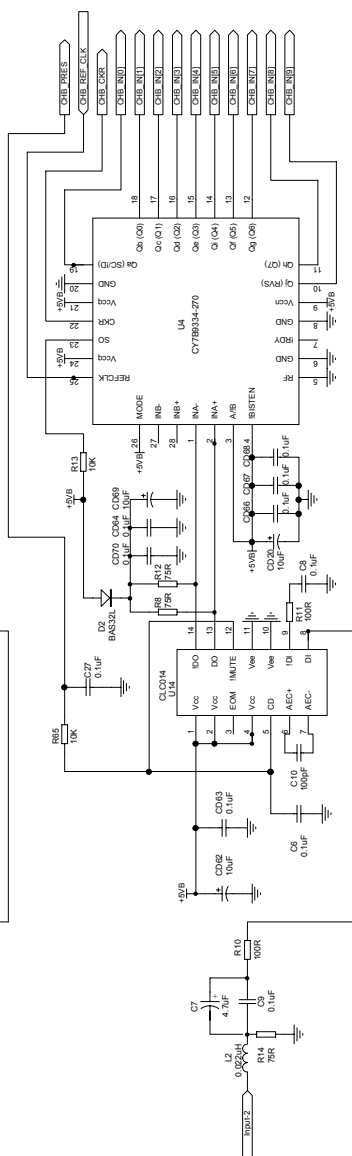
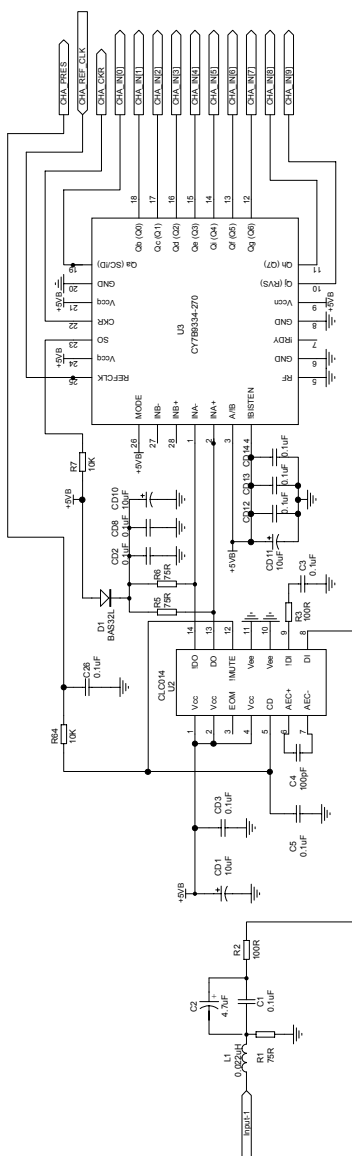
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Phone: 61 2 9439 3744
Email: service@irtelectronics.com

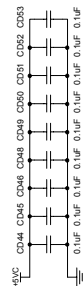
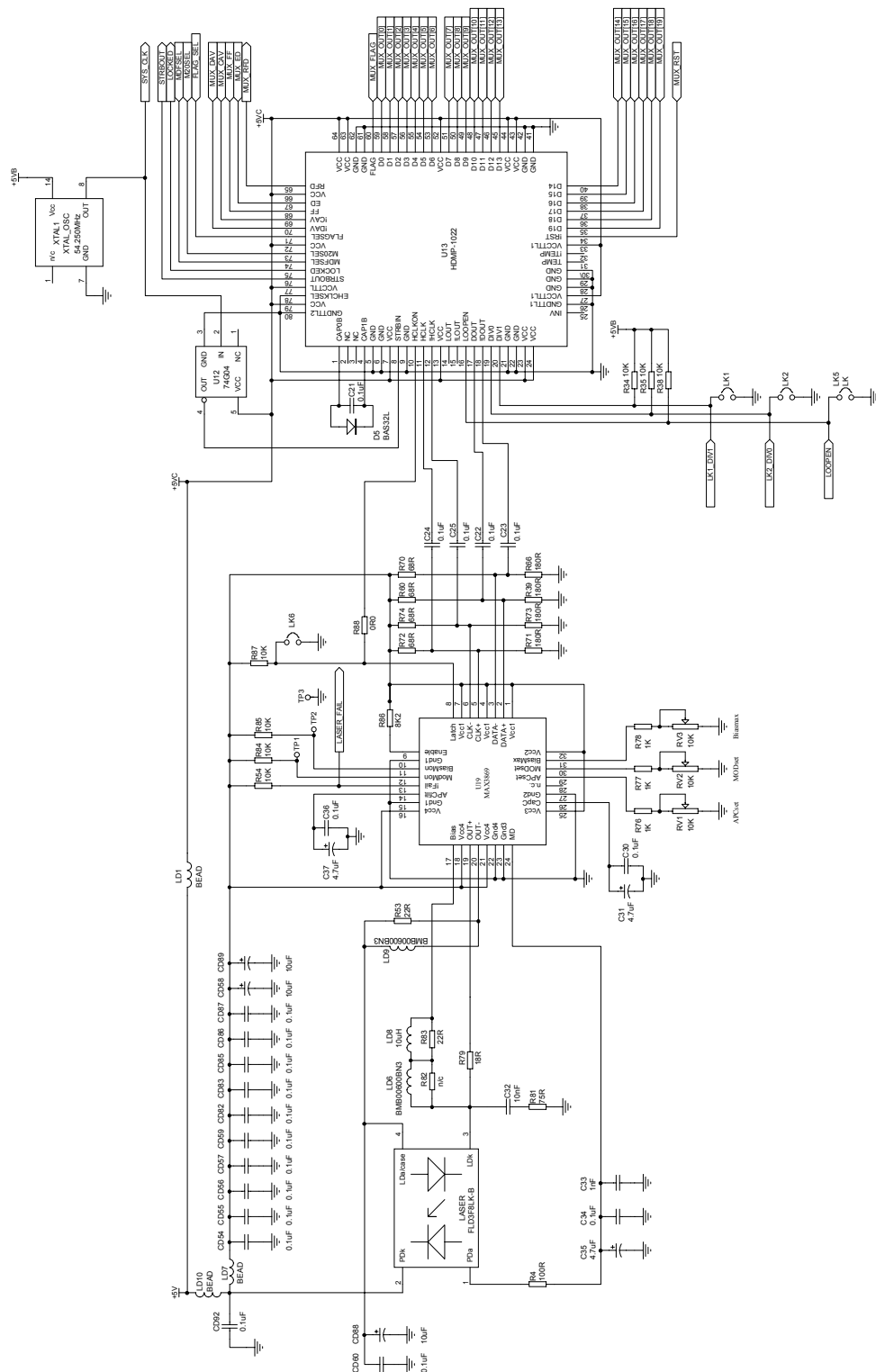
Fax: 61 2 9439 7439

Drawing List Index

Drawing #	Sheet #	Description
804568	1	DDT-3220 Multi-channel ASI/SDI Transmitter Serial Input Schematic
804568	2	DDT-3220 Multi-channel ASI/SDI Transmitter FPGA Mux Schematic
804568	3	DDT-3220 Multi-channel ASI/SDI Transmitter Optical Output Schematic
804568	4	DDT-3220 Multi-channel ASI/SDI Transmitter Rear Assembly Schematic
804572	1	DDR-3220 Multi-channel ASI/SDI Receiver Serial Output Schematic
804572	2	DDR-3220 Multi-channel ASI/SDI Receiver FPGA De-Mux Schematic
804572	3	DDR-3220 Multi-channel ASI/SDI Receiver Optical Receiver Schematic
804572	4	DDR-3220 Multi-channel ASI/SDI Receiver Rear Assembly Schematic



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		SIZE A4	Title Multi-Channel AS/ISDI Transmitter	Drawing No. 894568 Sheet 1 of 4	
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		ENGR.	N.T.S.		
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		Revision: 1			
		Date: 23/May/2002			
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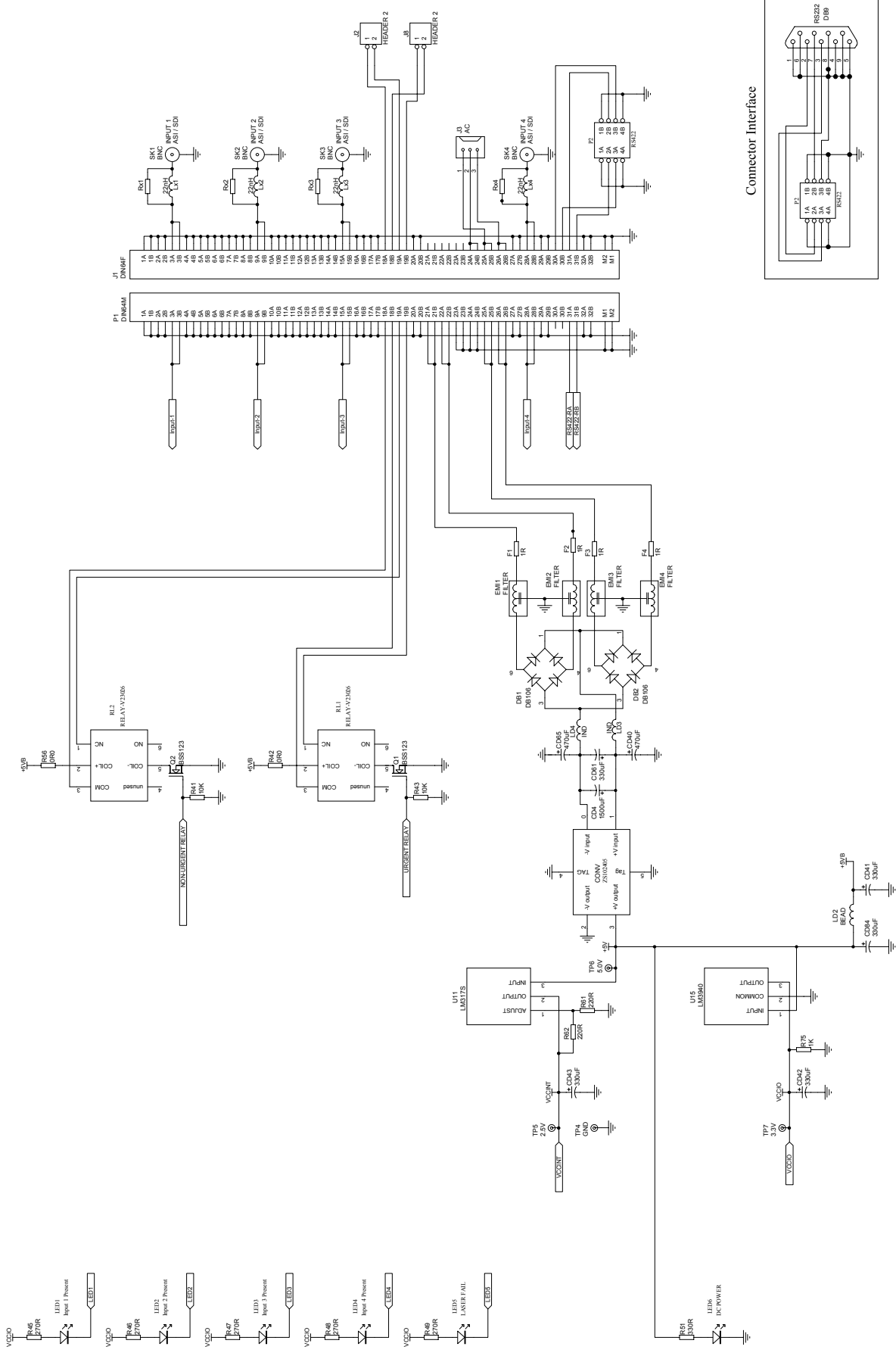


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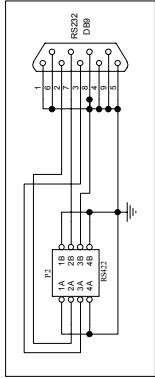
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Revision: 1			
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Connector Interface



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DRAWN CMK	SCALE N.T.S.	Sheet 4 of 4
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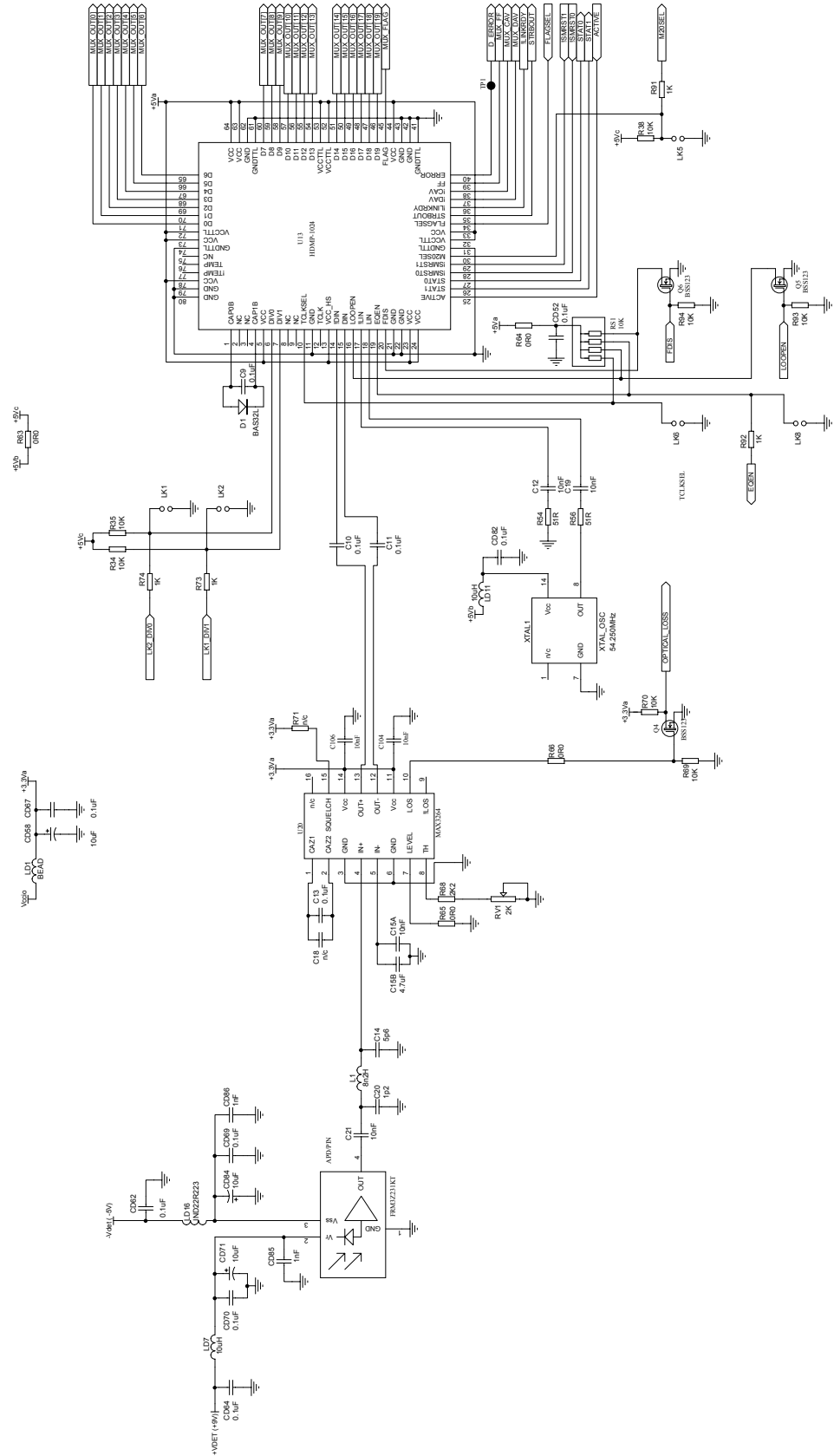


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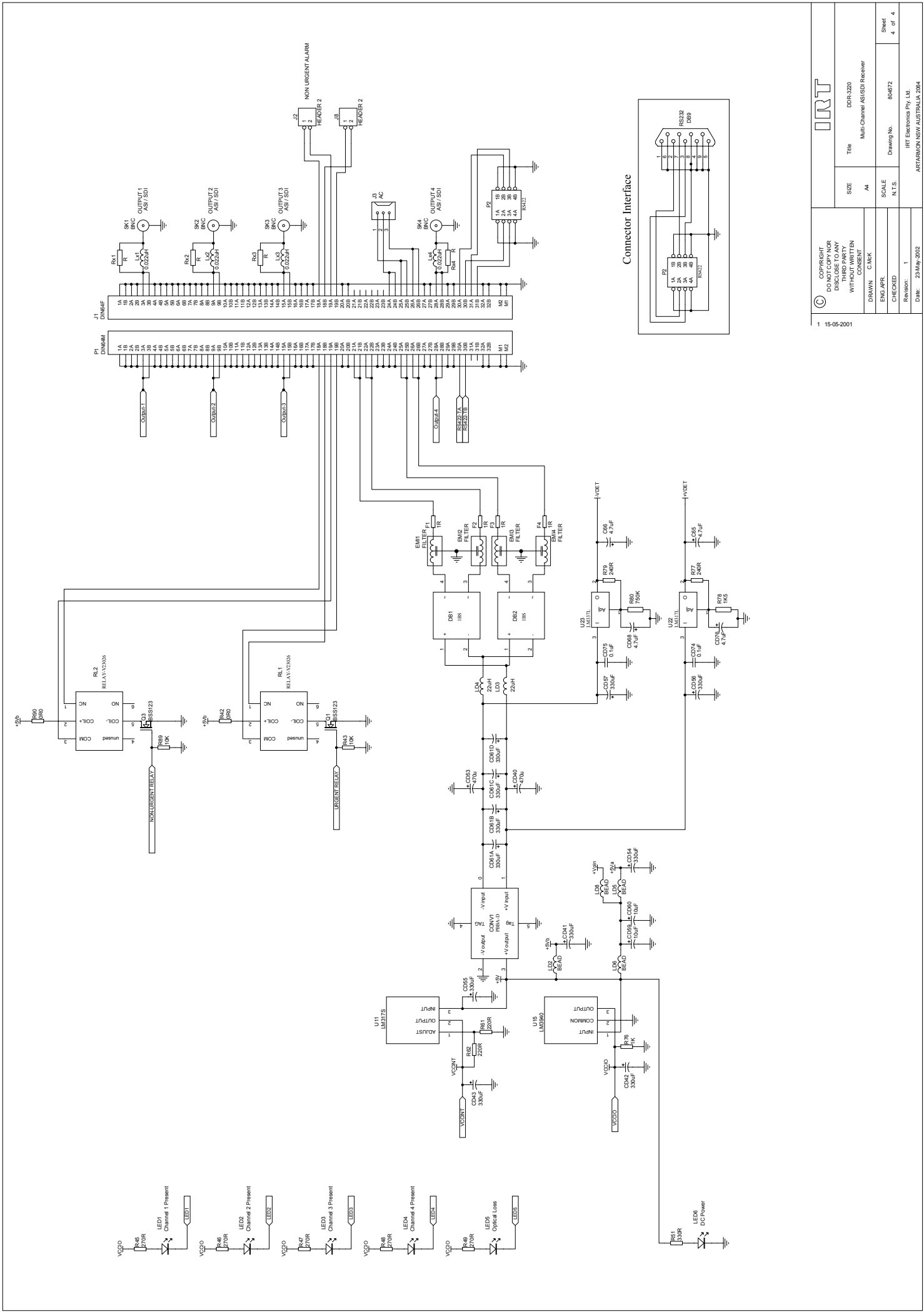
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 3 of 4
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Revision: 1		Sheet 4 of 4	
Date: 23 May 2002		APTARCON NSW AUSTRALIA 2004	

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