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IRT Eurocard

Type MMM-3240 & MMX-3240

4 ASI to 270 Mb/s Combiner & De-Combiner

Designed and manufactured in Australia

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

IRT Eurocard

Type MMM-3240 & MMX-3240

4 ASI to 270 Mb/s Combiner & De-Combiner

Instruction Book

Table of Contents

This instruction book applies to units later than S/N 0211001.

Operational Safety:

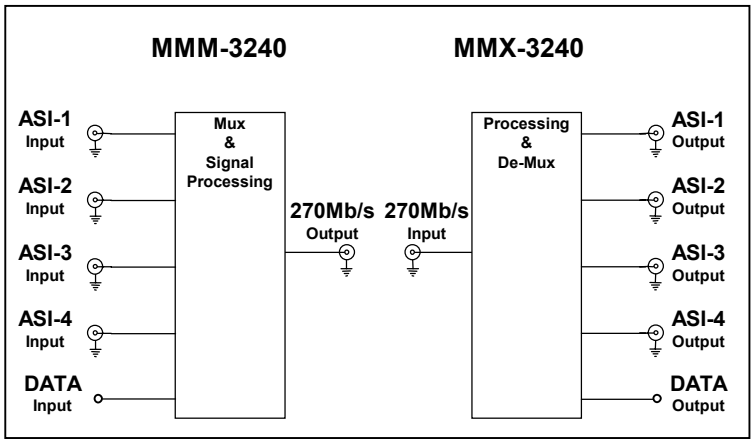
WARNING

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.

IRT Eurocard
Type MMM-3240 & MMX-3240
4 ASI to 270 Mb/s Combiner & De-Combiner

General Description



The MMM-3240 and MMX-3240 are part of a family of data transcoders for converting between the commonly used MPEG2 Transport Stream formats for video distribution in the broadcast industry.

With the MMM-3240 up to four ASI and one data signals can be combined together into a single 270 Mb/s signal for transmission down a single 270 Mb/s type line, such as fibre optic links, ASI/SDI distribution amplifiers, switchers, etc.

The MMM-3240 uses time division multiplexing. The output signal is similar to an ASI signal except for the fact that its packet length is 206 bytes. Channels are spaced 54Mb apart giving an overall payload output of 216Mb/s (within a 270Mb/s carrier) regardless of input channel rates.

The MMX-3240 de-combines the 270 Mb/s signal back into the original four ASI signals (at their original rates) and the RS422 data signal.

The total maximum payload data rate allowed per input is 52 Mb/s for a 204 byte packet length signal. This corresponds to 48Mb/s for a 188 byte packet length signal.

Inputs are automatically equalised for lengths of up to 300m of Belden 8281 or equivalent cable.

RS422 9600 Baud uni-directional data may also be sent on the same link.

Front panel indication and relay alarm on the MMM-3240 transmitter shows if there is an input data rate violation. Corresponding alarm on the MMX-3240 receiver shows a loss of input.

The MMM-3240 and MMX-3240 are standard format IRT Eurocard modules and may be housed in an IRT Eurocard frame alongside distribution amplifiers, switchers and fibre optic modules.

Standard features:

- **Up to 4 ASI and 1 Data stream into one 270 Mb/s stream**
- **52 Mb/s maximum payload data rate per ASI input**
- **Automatic input equalisation up to 300m**
- **Eurocard format**

Technical Specifications

IRT Eurocard module
Type/s MMM-3240 & MMX-3240

MMM-3240:

Inputs:

Type 1	4 x ASI-C 75Ω, 800 mVp-p, BNC connector.
Maximum Data Rate per input	52 Mb/s for a 204 byte packet length. 48Mb/s for a 188 byte packet length.
Type 2	RS422 9600 Baud Uni directional.

Output:

Type	1 x 270Mb/s, 206 byte packet length, 8B/10B encoded, 800 mVp-p, 75Ω BNC connector.
Data Rate	216Mb/s regardless of input rates.

Alarm Output:

Contact closure on error, loss of power.

MMX-3240:

Input:

Type	1 x 270Mb/s, 206 byte packet length, 8B/10B encoded, 800 mVp-p, 75Ω BNC connector (as per MMM-3240 output).

Outputs:

Type 1	4 x ASI-C 75Ω, 800 mVp-p, BNC connector.
Data Rate	same as MMM-3240 input rates.
Type 2	RS-422 9600 Baud Uni directional.

Alarm Output:

Contact closure on loss of input, loss of power.

Power Requirements

28 Vac CT (14-0-14) or ±16 Vdc.

Power consumption 6.5 VA.

Other

Temperature range		0 - 50° C ambient.
Mechanical		Suitable for mounting in IRT 19" rack chassis with input, output and power connections on the rear panel.
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.

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

Technical Description

MMM-3240:

The MMM-3240 MUX encoder accepts 4 ASI input streams with payload rates up to 52 Mb/s each (for a 204 byte signal, 48 Mb/s for a 188 byte signal), via BNC connectors, and an RS422 9600 Baud uni directional data stream via an 8 pin HE14 connector on the rear connector assembly. Each input is individually equalised and converted to parallel form for processing.

The 4 individual ASI payload streams and RS422 data stream are byte interleaved and re-inserted within a 270 Mb/s envelope and transmitted via a rear assembly BNC connector. When an input's data rate is less than the maximum allowed, null bytes are added as fillers to pad out the muxed signal. This combined output signal is able to pass down any 270 Mb/s circuit such as ASI fibre links, routers or distribution amplifiers. The original 4 ASI and RS422 data streams are separated by the associated MMX-3240 decoder.

A relay alarm output is also provided if any of the input signals exceed its maximum allowed payload rate or on loss of power via a 2 pin header on the rear assembly. Alarm condition is indicated by a short to ground relay contact and a red LED on the front panel.

MMX-3240:

The MMX-3240 de-combiner performs the reverse function of the MMM-3240 combiner. It accepts a 270 Mb/s signal that has been multiplexed by an MMM-3240 combiner and equalises and converts it to parallel form for processing.

The signal is then converted back into 4 separate ASI streams and an RS422 data stream as originally inputted to the corresponding MMM-3240 combiner. ASI outputs are via BNC connectors and the RS422 output is by an 8 pin HE14 connector on the rear back plane connector assembly.

A relay alarm output is also provided on loss of input signal or power via a 2 pin header on the rear assembly. Alarm condition is indicated by a short to ground relay contact and a red LED on the front panel.

Link Settings

MMM-3240:

LK1	Factory Setup
LK2	Factory Setup
LK3	Factory Setup
LK4	Factory Setup
LK5	Factory Setup
LK6A	U13 program chip position
LK6B	U14 program chip position
LK7	Terminate RS422

MMX-3240:

LK1	Factory Setup
LK2	Factory Setup
LK3	Factory Setup
LK4	Factory Setup
LK5	Factory Setup
LK6A	U14 program chip position
LK6B	U13 program chip position
LK10	Terminate RS422

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:

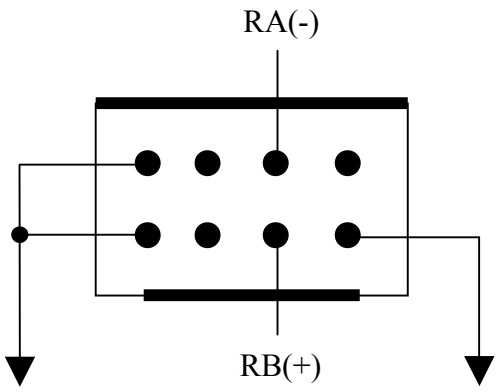
See details in separate manual for selected frame type.

Connections:

MMM-3240:

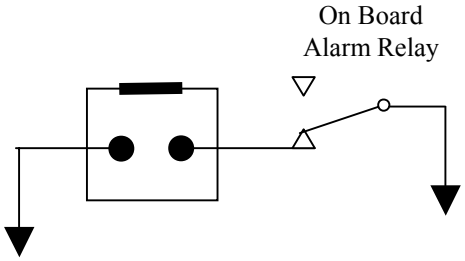
ASI Inputs:
The 4 ASI BNC inputs are terminated in 75 Ohms. Input cable equalisation for each input is automatic for up to 300 metres of high quality 75 Ohm coaxial cable (Belden 8281 or equivalent). No adjustments are required. Input payload rate for each input must be less than the maximum allowable of 50 Mb/s.

RS422 Data Input:
RS422 9600 Baud uni direction data input is via an HE-14 8 pin double row connector. Link LK7 allows termination of the RS422 line with a 220 Ohm resistor should it be required.



Output:
This combined 270 Mb/s BNC output has a 75 Ohms characteristic output impedance. Only high quality 75 Ohm coaxial cable (Belden 8281 or 1694A equivalent) should be used. No adjustments are required, but cable must be terminated in 75 Ohms at the connected load.

Alarm Output:
Alarm output is via a two-pin 0.1" header. Alarm condition is when there is a short between these two pins. This corresponds to either if there is an input data rate violation that exceeds the maximum allowed rate of 52 Mb/s (for a 204 byte signal, 48 Mb/s for a 188 byte signal) or a loss of power. A front panel LED also gives a visual indication



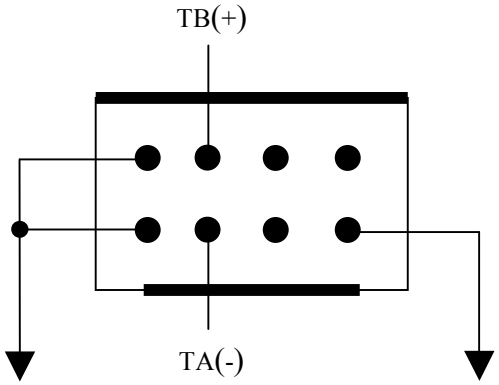
of the alarm condition.

MMX-3240:

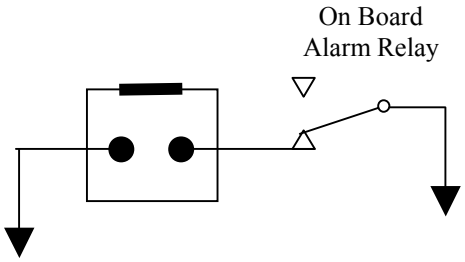
ASI Input:
The combined 270 Mb/s BNC input is terminated in 75 Ohms. Input cable equalisation is automatic for up to 300 metres of high quality 75 Ohm coaxial cable (Belden 8281 or equivalent). No adjustments are required.

ASI Outputs:
The 4 ASI BNC outputs each have a 75 Ohms characteristic output impedance. Only high quality 75 Ohm coaxial cable (Belden 8281 or 1694A equivalent) should be used. No adjustments are required, but cable must be terminated in 75 Ohms at the connected load. Each of the outputs corresponds to the equivalent input of the MMM-3240.

RS422 Data Output:
RS422 9600 Baud uni direction data output is via an HE-14 8 pin double row connector. Link LK10 allows termination of the RS422 line with a 220 Ohm resistor should it be required.



Alarm Output:
The alarm output is via a two-pin 0.1" header. Alarm condition is when there is a short between these two pins. This corresponds to either a loss of input signal or a loss of power. A front panel LED also gives a visual indication of the alarm condition.



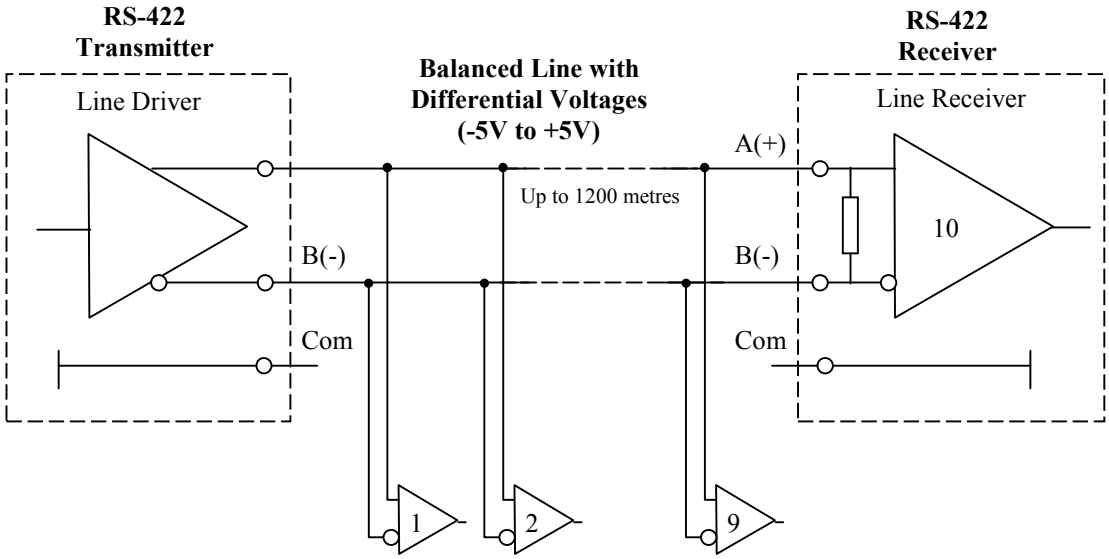
The RS-422 Standard

The RS-422 standard introduced in the early 1970s defines a balanced (or differential) data communications interface using two separate wires for each signal. Due to the high noise immunity of the RS-422 standard, high data speeds and long distances can be achieved.

The RS-422 specification allows reliable serial data communications for:

- Distances up to 1200 metres
- Data rates of up to 10 Mb/s

Only one line driver is allowed on a line, and up to ten line receivers can be driven by it. Figure 1.1 illustrates RS-422.



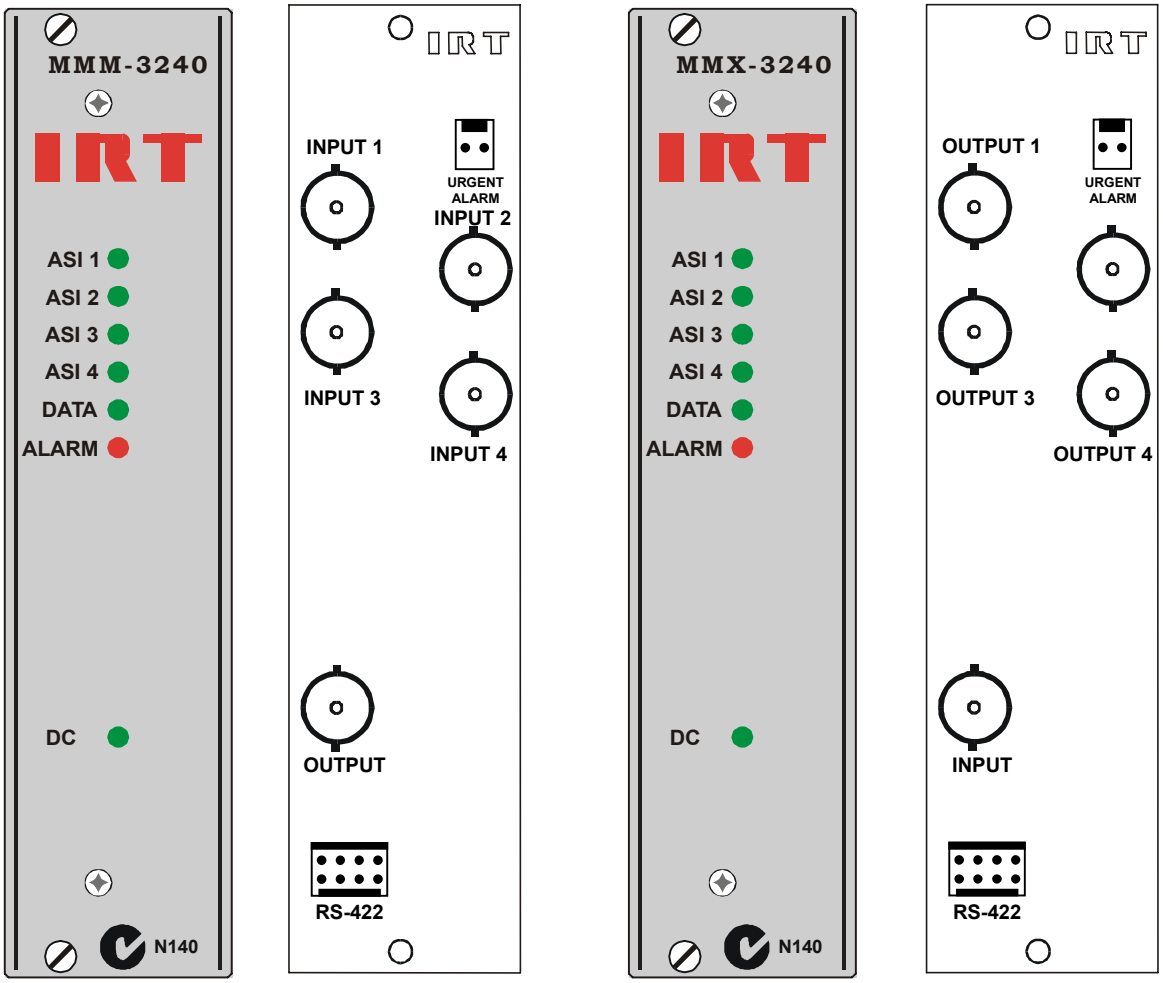
RS-422 Receivers (up to 10 devices)

Figure 1.1: RS-422 Connection

(Ref: IDC Engineers Pocket Guide)

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 1 hour's labour, at IRT's current labour charge rate, 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 1 hour's labour will apply, whether the equipment is within the warranty period or not. Contact IRT for current hourly rate.

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.

Equipment Service
IRT Electronics Pty Ltd
26 Hotham Parade
ARTARMON
N.S.W. 2064
AUSTRALIA

Phone: 61 2 9439 3744 Fax: 61 2 9439 7439
Email: service@irtelectronics.com

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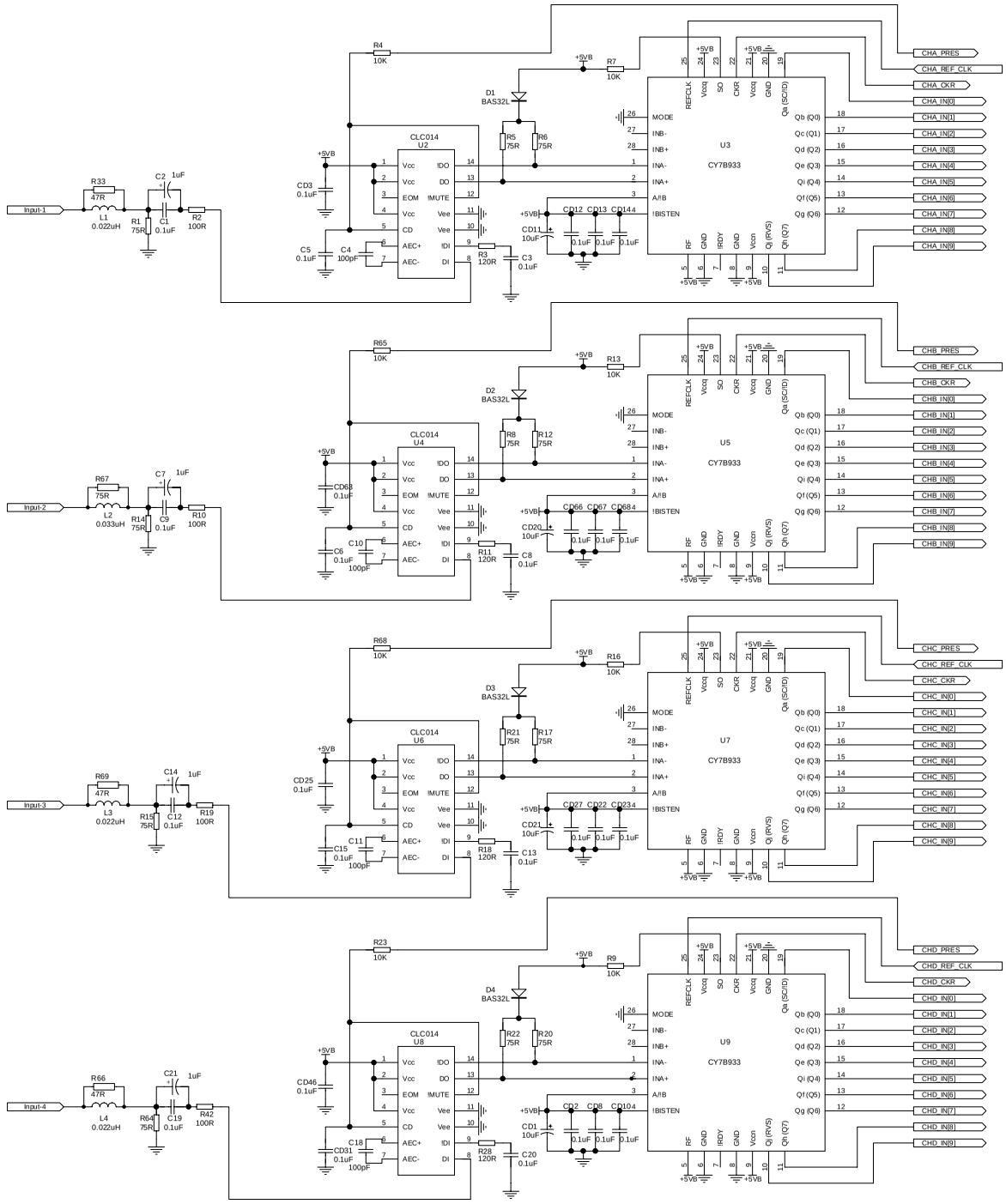

804660S2
804660S2.SCH

804660S3
804660S3.SCH

PC 804661

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DRAWN RBB
ENG.APR.
CHECKED
Revision: 1
Date: 6-Nov-2003

IRT

SIZE A4

Title MMM-3240
4xASI MUX TO ASI

SCALE N.T.S.

Drawing No. 804660

Sheet 1 of 3

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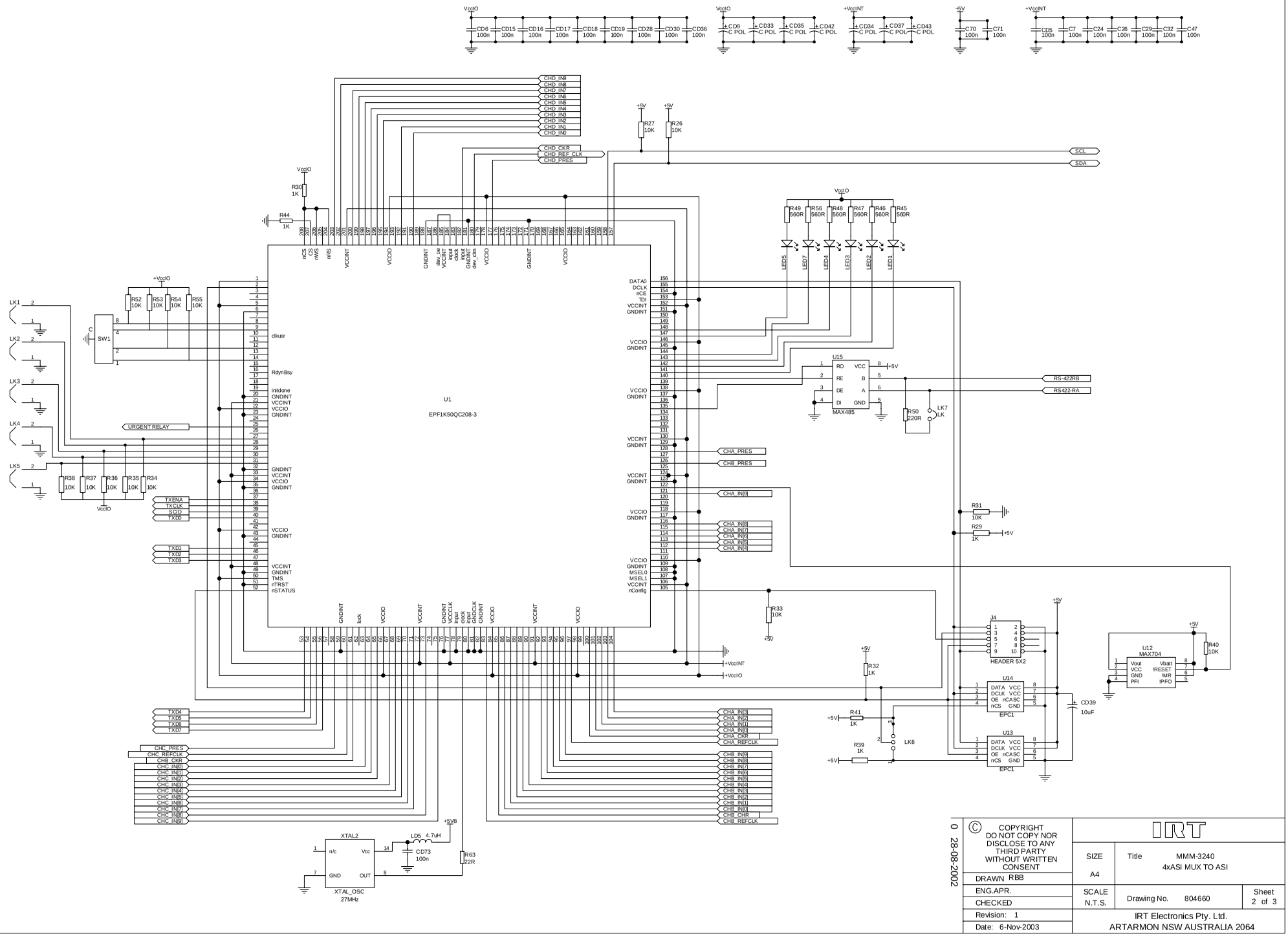

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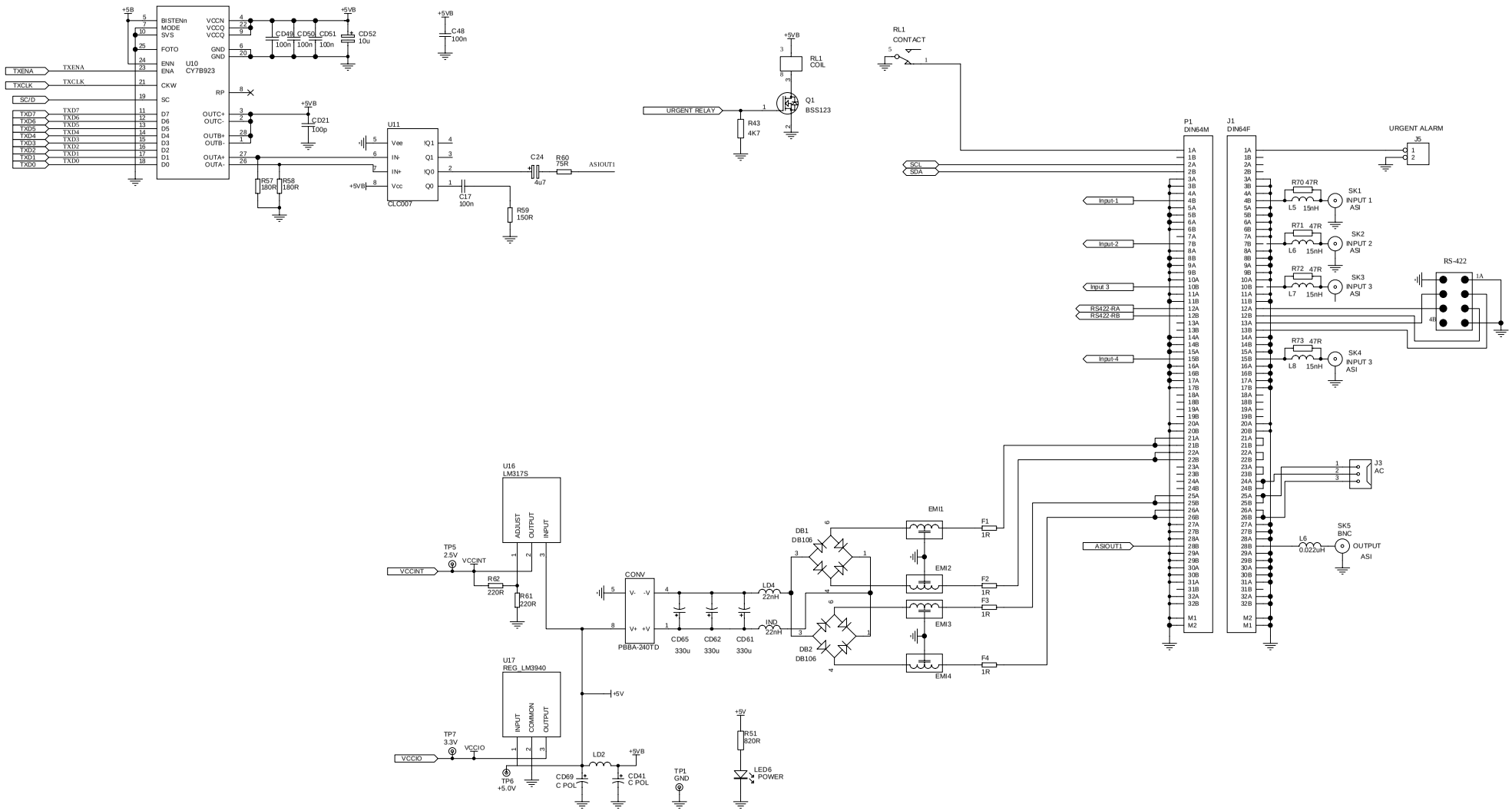
	Date: 6-Nov-2003	ARTARMON NSW AUSTRALIA 2064	



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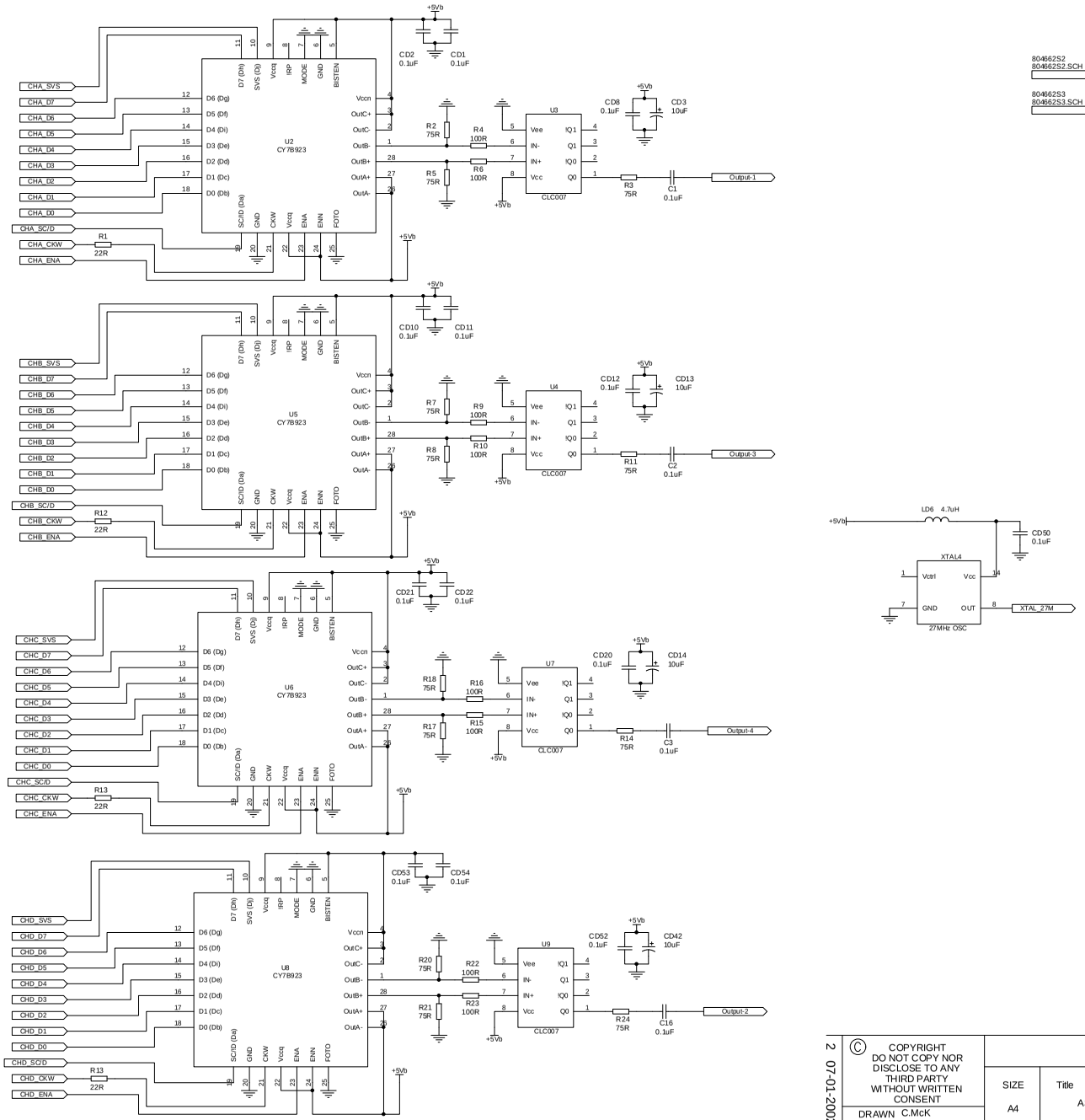

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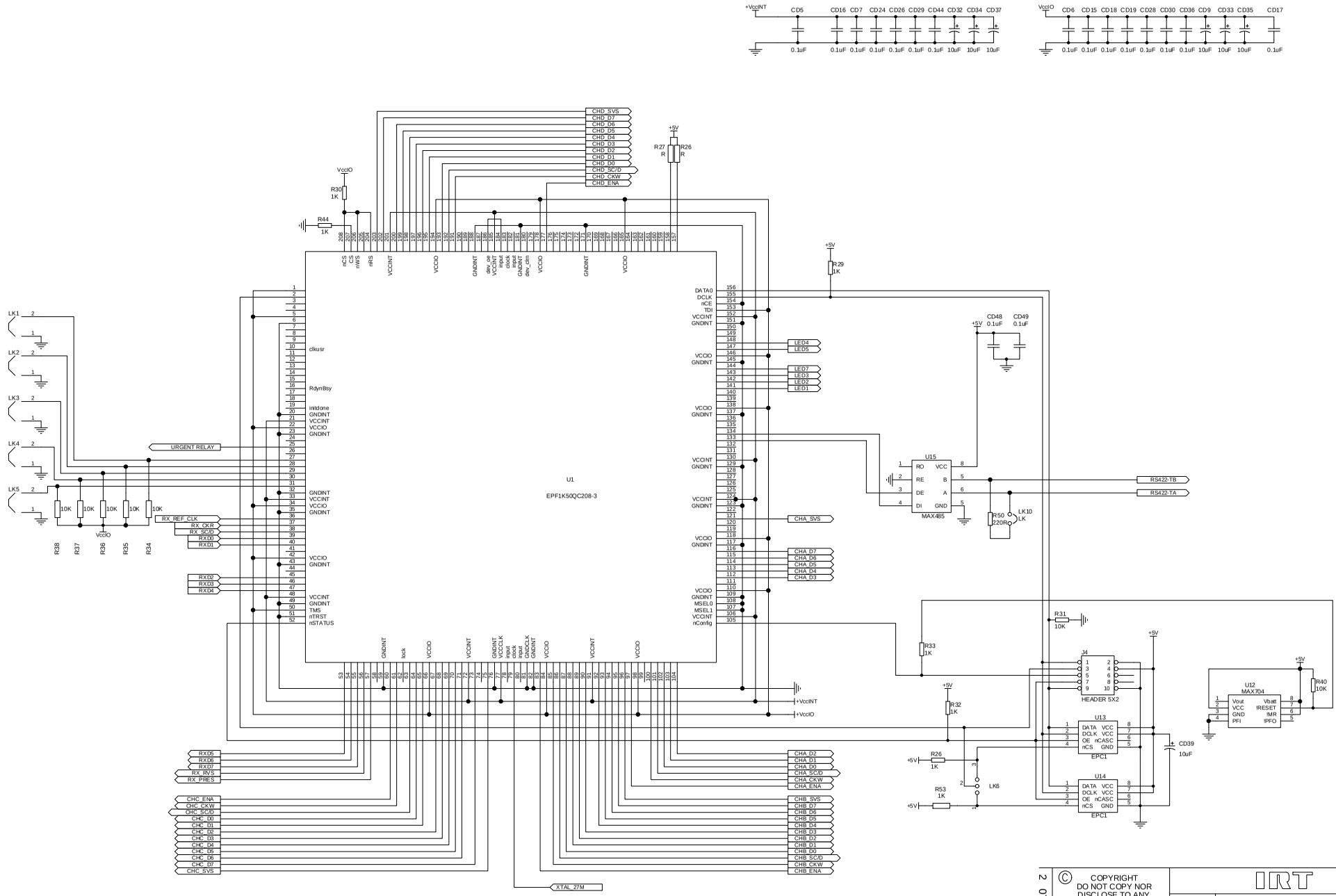

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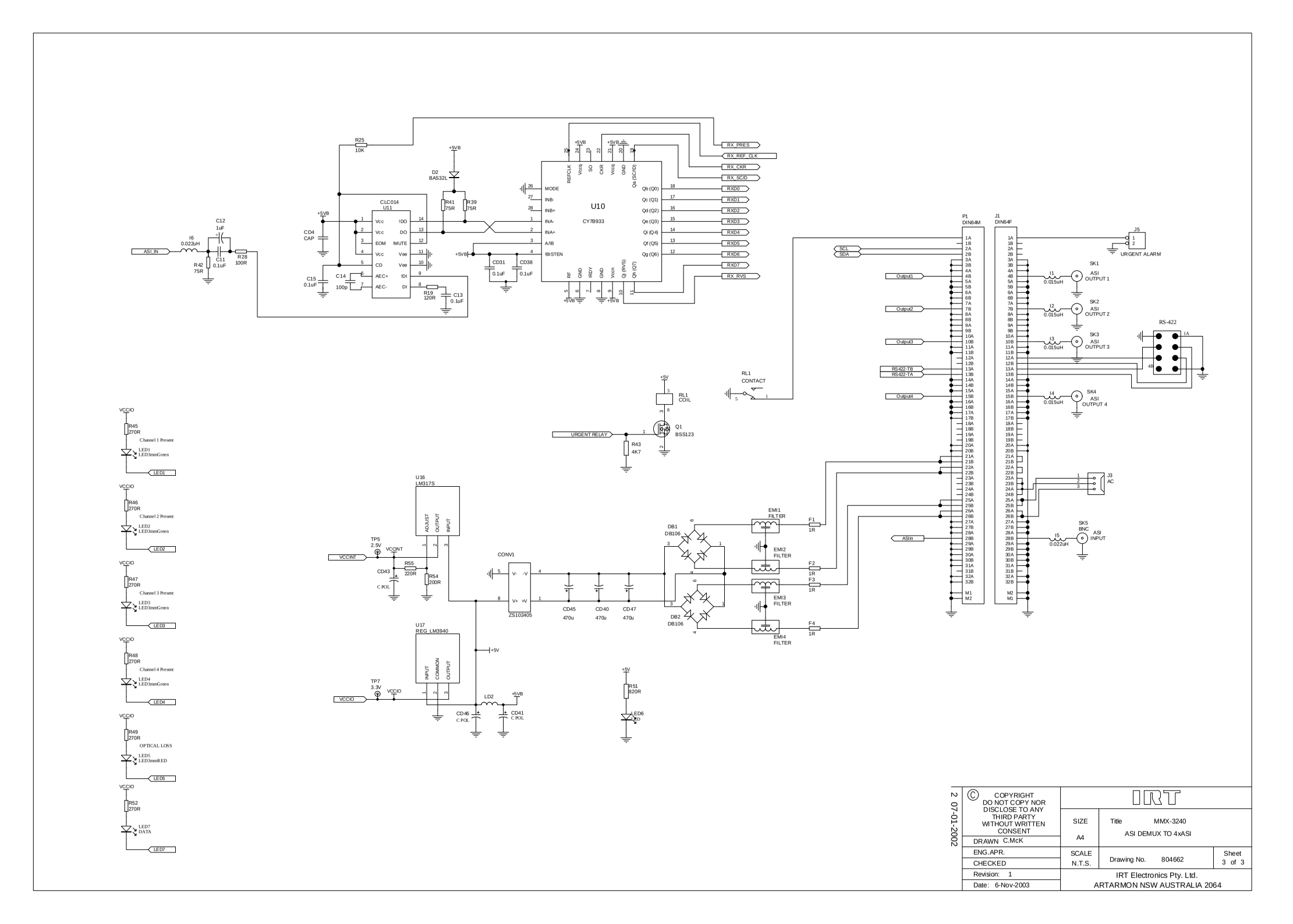

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