I R T Electronics Pty Ltd A.B.N. 35 000 832 575
26 Hotham Parade, ARTARMON N.S.W. 2064 AUSTRALIA
National: Phone: (02) 9439 3744 Fax: (02) 9439 7439
International: +61 2 9439 3744 +61 2 9439 7439
Email: sales@irtelectronics.com
Web: www.irtelectronics.com

IRT Eurocard

Type DVJ-3000

270 Mb/s SDI/ASI De-Jitteriser

Designed and manufactured in Australia

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

IRT Eurocard

Type DVJ-3000

270 Mb/s SDI/ASI De-Jitteriser

Instruction Book

Table of Contents

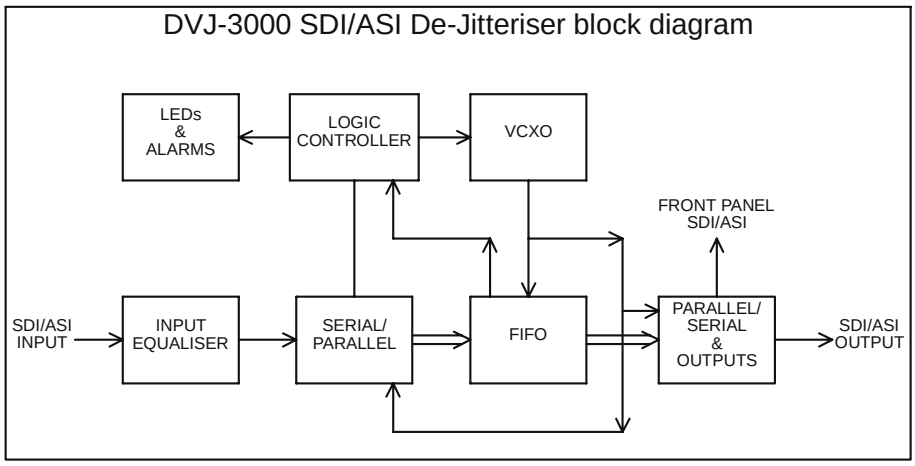
Operational Safety:

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.

General Description



The DVJ-3000 is designed to reduce the jitter in 270 Mb/s SDI or ASI signals.

Due to the fact that true loop through inputs are not normally available in most digital equipment, the signal is frequently subject to automatic equalisation and reclocking. Together with noise pickup this leads to the inevitable increase in jitter in the signal. The only successful way to overcome this is to regenerate the signal with a new clock signal referenced to the long-term data rate.

The DVJ-3000 provides this solution with a Voltage Controlled Crystal Oscillator (VCXO) operating in conjunction with a First In First Out (FIFO) memory to provide a constant output data rate, which removes any short-term data rate errors.

Up to twelve DVJ-3000's or other Eurocard modules may be housed in one 3 RU frame.

The DVJ-3000 supports redundant power supply inputs.

For input jitter within this mask,
Output jitter < 0.125 UI.

Features:

- **Reduces jitter build up in distribution chains**
- **Suitable for 270 Mb/s SDI or ASI signals**
- **Automatic input equalisation to > 300 metres of Belden 8281 or equiv. cable**
- **Alarm output on loss of signal input**
- **Front panel output monitoring**

Technical Specifications
DVJ-3000

Input:

Type	SDI/ASI.
Number	1.
Impedance	75 Ω.
Return loss	>15 dB 5 MHz to 270 MHz.
Equalisation	Automatic, better than 300 metres at 270 Mb/s for Belden 8281 or equivalent cable.

Outputs:

Number	1 SDI or ASI plus one SDI / ASI front panel monitoring output.
Type	Reclocked/De-jittered.
Level	800 mV ±10% into 75 Ω.
Impedance	75 Ω.
Return loss	>15 dB 5 MHz to 270 MHz.

Performance:

Cable compensation	Automatic, better than 300 metres at 270 Mb/s for Belden 8281 or equivalent cable.
Reclocking	270 Mb/s crystal locked.
Insertion Delay	<20 μs

Connectors:

BNC 75 Ohms.

Indicators:

Power	LED (green) for +5 V.
Signal present	LED (green).

Alarm:

Signal loss	Contact closure. N/O, N/C & Common pins available.

Power requirement:

Voltage	28 Vac CT (14-0-14) or ±16 Vdc
Consumption	4 VA (<120 mA).

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 enamel, 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.
Standard accessories (supplied with module)		Rear connector assembly.

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

Circuit Description

Input 270 Mb/s SDI or ASI signal is fed from the input 75Ω BNC connector on the rear connector assembly to an equaliser chip, IC12. Output from this chip feeds a de-serialiser chip, IC8, where the input serial stream is converted to parallel form for inputting to IC7, which is a field Programmable Gate Array (FPGA).

The FPGA performs the majority of the processing of the signal and is too complicated to describe in detail. Its programming is held in IC9.

Re-clocking is provided by a 27 MHz VCXO, X01, which is controlled by IC7 through interface IC5.

The re-clocked de-jitterised signal is fed out of the FPGA in parallel form to IC11, which acts as a parallel to serial converter. This serialised signal then feeds an output driver chip, IC14, which outputs the de-jitterised signal to 75Ω BNC connectors located on the rear connector assembly and the front panel.

Power to the unit is via either ±16 Vdc or 14-0-14 Vac. This is rectified by diode bridges DB1 and DB2 and rectified by voltage regulators IC2, IC3 and IC4.

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.

Input / Output connections:

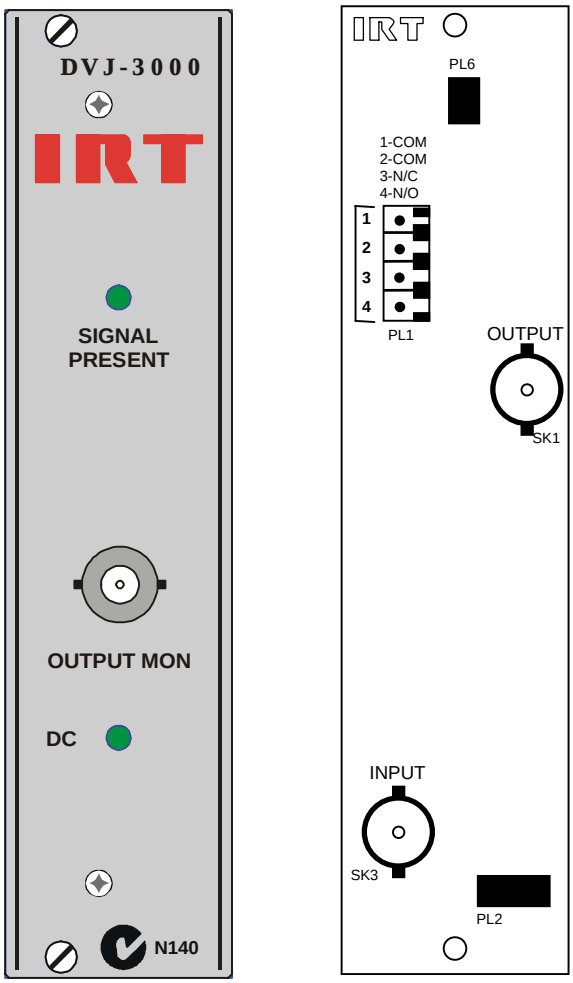
Input and output ASI or SDI connections are via 75Ω BNC connectors located on the rear connector assembly.

Alarm Output connection:

A relay alarm output is provided for loss of signal or loss of power via a four pin phoenix connector on the rear connector assembly. Normally open (N/O), Normally Closed (N/C) and two Common (COM) connections are provided.

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.

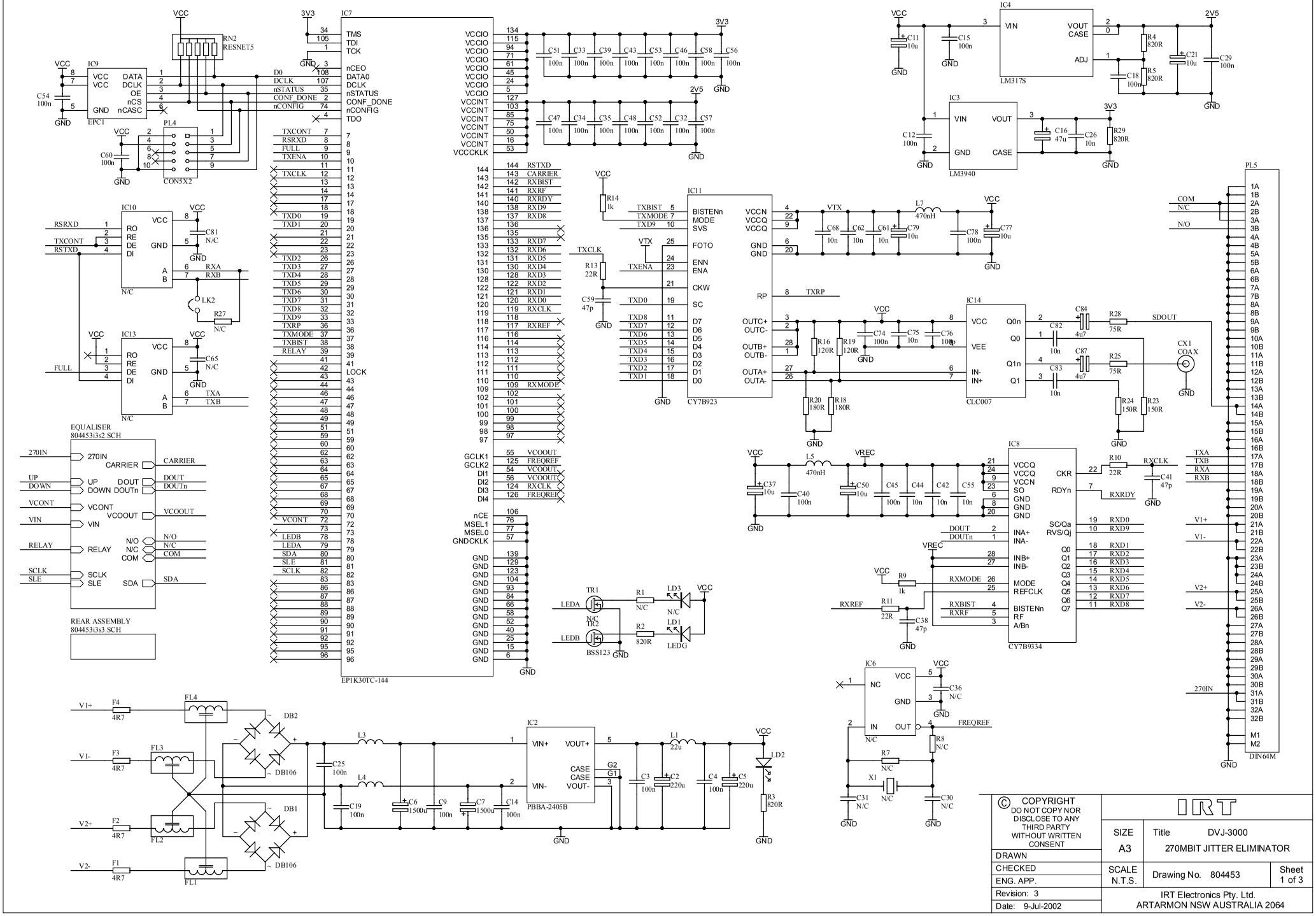
The equipment should be returned **to the agent who originally supplied the equipment** or, where this is not possible, to IRT direct as follows.

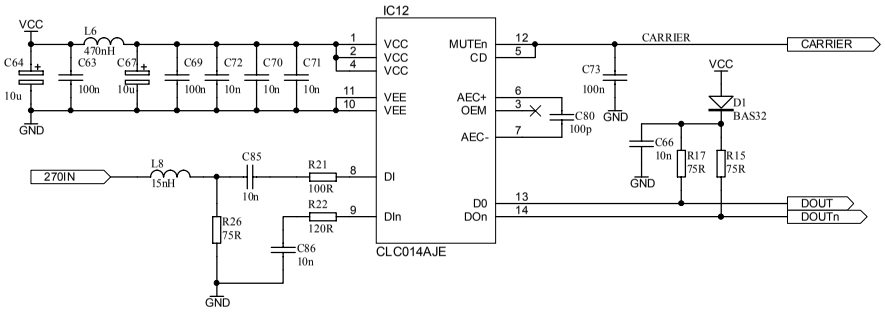
Equipment Service
IRT Electronics Pty Ltd
26 Hotham Parade
ARTARMON
N.S.W. 2064
AUSTRALIA

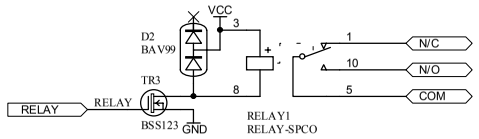
Phone: 61 2 9439 3744 Fax: 61 2 9439 7439
Email: service@irtelectronics.com

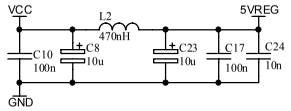
Drawing List Index

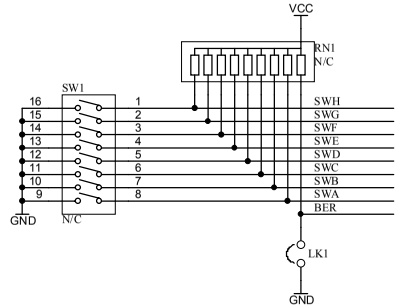
Drawing #	Sheet #	Description
804453	1	DVJ-3000 270 Mbit Jitter Eliminator circuit diagram – sheet 1.
804453	2	DVJ-3000 270 Mbit Jitter Eliminator circuit diagram – sheet 2.
804453	3	DVJ-3000 270 Mbit Jitter Eliminator circuit diagram – sheet 3.

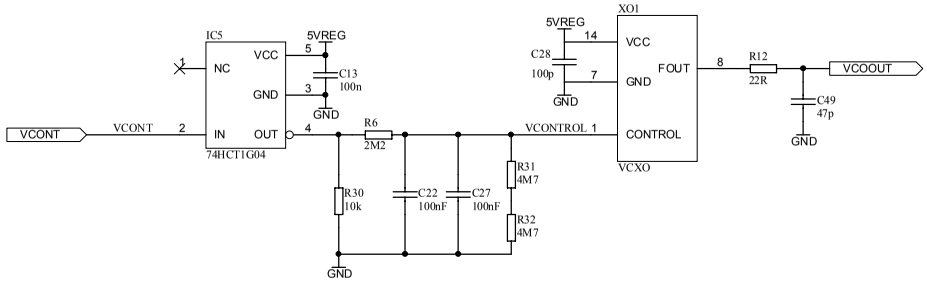

IC7
EP1K30TC-144
IC9
EPC1
IC10
IC13
IC11
CY7B923
IC14
CLC007
IC8
CY7B9334
IC4
LM317S
IC3
LM3940
IC6
IC2
PBBA-2405B
PL5
DIN64M
EQUALISER
804453i3s2.SCH
REAR ASSEMBLY
804453i3s3.SCH
DB2
DB106
DB1
DB106
TR1
TR2
BSS123
LD1
LD2
LD3
LEDG
CON5X2
RN2
RESNET5
LK2
VCC
3V3
2V5
GND
TMS
TDI
TCK
nCEO
DATA0
DCLK
nSTATUS
CONF_DONE
nCONFIG
TDO
LOCK
RSTXD
CARRIER
RXBIST
RXRF
RXRDY
RXD9
RXD8
RXD7
RXD6
RXD5
RXD4
RXD3
RXD2
RXD1
RXD0
RXCLK
RXREF
RXMODE
VCOOUT
FREQREF
RXCLK
RXCOUT
nCE
MSEL1
MSEL0
GNDCKLK
TXBIST
TXMODE
TXD9
TXCLK
TXENA
TXD0
TXD8
TXD7
TXD6
TXD5
TXD4
TXD3
TXD2
TXD1
TXRP
VTX
FOTO
ENN
ENA
CKW
SC
D7
D6
D5
D4
D3
D2
D1
D0
BISTENn
MODE
SVS
VCCN
VCCQ
GND
OUTC+
OUTC-
OUTB+
OUTB-
OUTA+
OUTA-
IN-
IN+
Q0n
Q0
Q1n
Q1
VEE
CKR
RDYn
SC/Qa
RVS/Qj
INA+
INA-
INB+
INB-
MODE
REFCLK
BISTENn
RF
A/Bn
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
RXRDY
RXD0
RXD1
RXD2
RXD3
RXD4
RXD5
RXD6
RXD7
RXD8
DOUT
DOUTn
SDOUT
CX1
COAX
COM
N/O
N/C
TXA
TXB
RXA
RXB
V1+
V1-
V2+
V2-
270IN
M1
M2
LEDA
LEDB
FREQREF
SCLK
SDA
SLE
RELAY
UP
DOWN
DOUTn
VCONT
VIN
RSRXD
TXCONT
RSTXD
FULL
TXA
TXB
LOCK
VREC
RXREF
RXCLK
RXMODE
RXBIST
RXRF
RXRDY
LCOCK
© COPYRIGHT
DO NOT COPY NOR DISCLOSE TO ANY THIRD PARTY WITHOUT WRITTEN CONSENT
DRAWN
CHECKED
ENG. APP.
Revision: 3
Date: 9-Jul-2002
IRT
SIZE
A3
Title DVJ-3000
270MBIT JITTER ELIMINATOR
SCALE
N.T.S.
Drawing No. 804453
Sheet 1 of 3
IRT Electronics Pty. Ltd.
ARTARMON NSW AUSTRALIA 2064

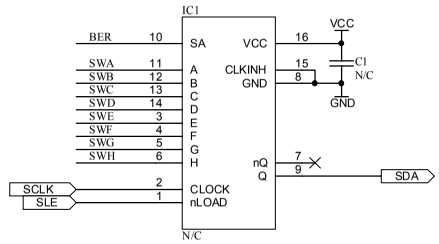




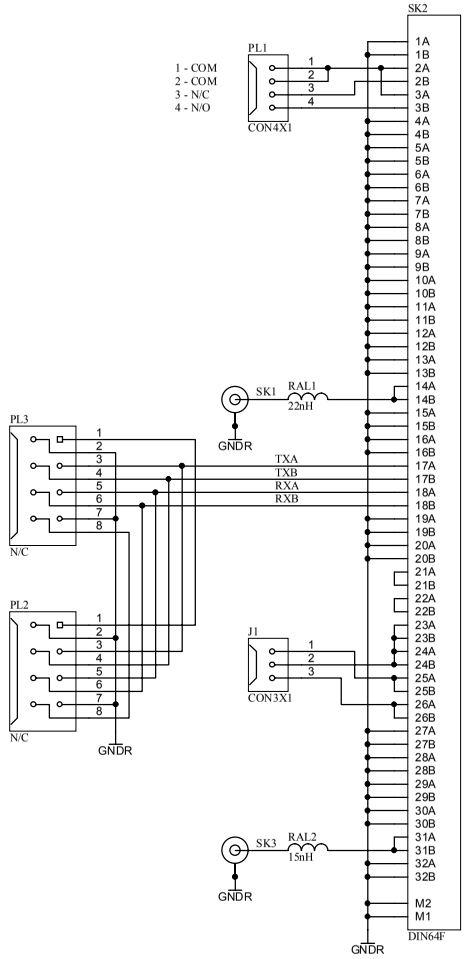








1 29-09-1998		IRT	
DRAWN K.N.	SIZE A3	Title DVJ-3000 270MBIT JITTER ELIMINATOR	
CHECKED	SCALE N.T.S.	Drawing No. 804453	Sheet 2 of 3
ENG. APP.			
Revision: 3		IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064	
Date: 9-Jul-2002			



IRT

DRAWN	SIZE A3	Title DVJ-3000 270MBIT JITTER ELIMINATOR
CHECKED	SCALE N.T.S.	Drawing No. 804453 — Sheet 3 of 3
ENG. APP.		
Revision: 3	IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064	
Date: 9-Jul-2002		