



**TECHNICAL
&
OPERATIONS MANUAL**

**BC360T
BC360R**

3G/SD/HD ↔ Fibre

Issue 6

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Safety Warning – Important Precautions

To reduce the risk of fire or electric shock, do not expose this equipment to rain, moisture, or wet conditions.

General Safety Guidelines

- Always **disconnect the entire system from the AC mains** before cleaning or servicing.
- The following product frames – **BC100, BC100i, BC101, BC102, BC120, BC160i** – must be connected using a **three-conductor AC mains power cord with an earth ground**. All three conductors must be used at all times to prevent electric shock.
- Do **not** bypass or disable any fuse.
- Only replace fuses with those of the **specified type and rating**.
- Do **not** use flammable or combustible chemicals for cleaning.
- Do **not** pour or spill liquids directly onto the unit.
- Do **not** allow any liquid to enter the unit or wet the internal components.
- Do **not** operate the unit with any cover or panel removed.
- Do **not** obstruct the ventilation slots—**adequate airflow must be maintained**.
- Do **not** operate the unit in environments with **extreme temperatures**.
- Do **not** use or store the unit in **explosive atmospheres**.
- Do **not** attempt to repair the unit yourself. If servicing is required, please contact your local **Bluebell Opticom** distributor.

Product Warranty

Bluebell Opticom Ltd provides warranty coverage as detailed in our general terms and conditions.

Please note that warranty support is only valid **if product serial numbers remain intact and legible**. Tampering with or removing serial numbers may void your warranty.



EN60950
EN55103-1: 1996
EN55103-2: 1996

Safety
Emission
Immunity

Bluebell Opticom Ltd



Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

This device complies with part 15 of the FCC Rules
Operation is subject to the following two condition:
(1) This device may cause harmful interference, and
(2) This device must accept any interference received,
including, Interference that may cause undesired
operation

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Description	BC360
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The **BC360** board encompass both fibre to 3G/SD/HD conversion (**BC360R**) and 3G/SD/HD to fibre conversion (**BC360T**).

BC360R Single channel fibre optic to 3G/SD/HD conversion

BC360T Single channel 3G/SD/HD to fibre optic conversion

Fibre Optic Receiver BC360R

Comprised of two board types:

BC360BR BC360R Baseboard

The **BC360BR** is a baseboard that can be fitted with 1 or 2 **BC360R2** 3G/SD/HD digital video fibre optic receiver daughter boards to provide 1 or 2 channels of fibre to 3G/SD/HD conversion.

It is fitted with 1 dual port LC fibre optic receiver connector and connectors to mount 1 or 2 BC360R2 receiver daughter boards.

BC360R2 Fibre Optic receiver daughter boards

The BC360R2 provides a 3G/SD/HD output compliant with ANSI/SMPTE 259/292 at data rates from 143 to 2970 Mb/s. 1 or 2 BC360R2 receiver boards can be fitted onto the B360BR baseboard. Each BC360R2 board is fitted with 2 x 3G/SD/HD output BNCs and an indicator LED.

Fibre Optic Transmitter BC360T

Comprised of two board types;

BC360BT BC360T Baseboard

The **BC360BT** is a baseboard that can be fitted with 1 or 2 BC360T2 3G/SD/HD digital video fibre optic transmitter daughter boards to provide 1 or 2 channels of 3G/SD/HD to fibre conversion.

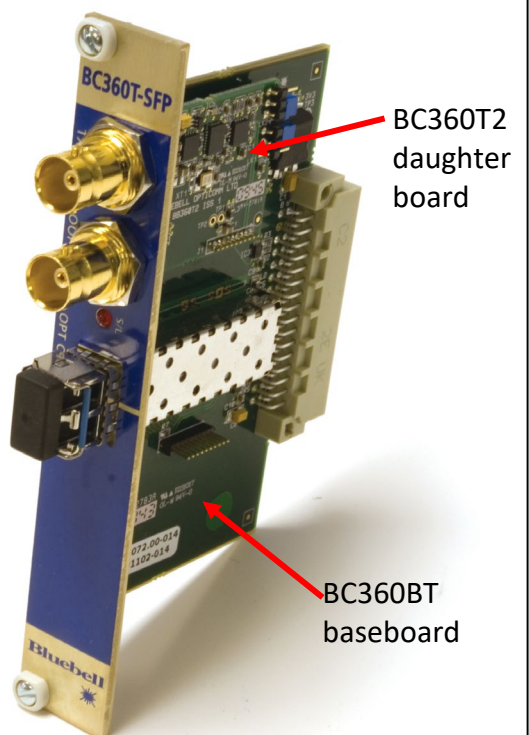
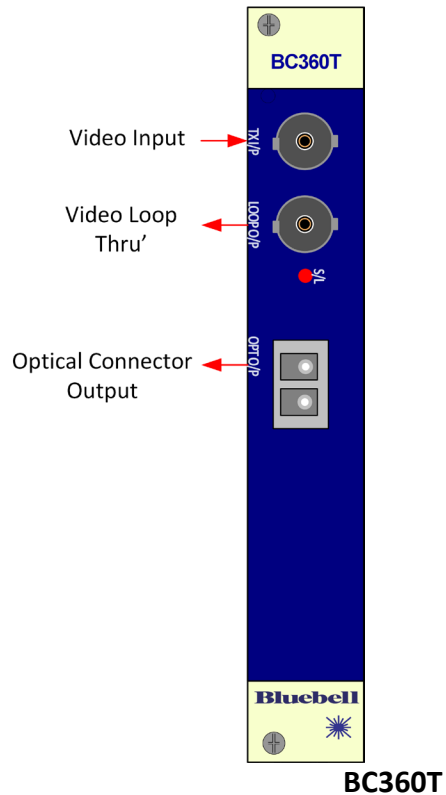
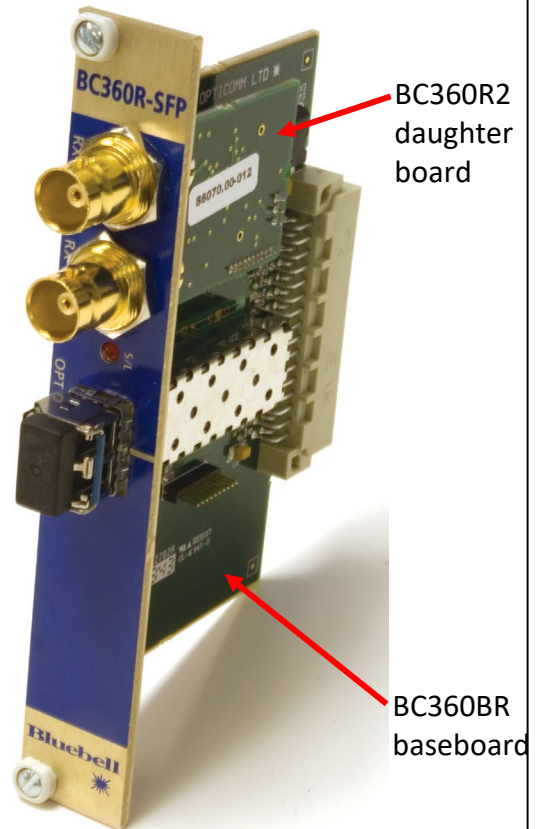
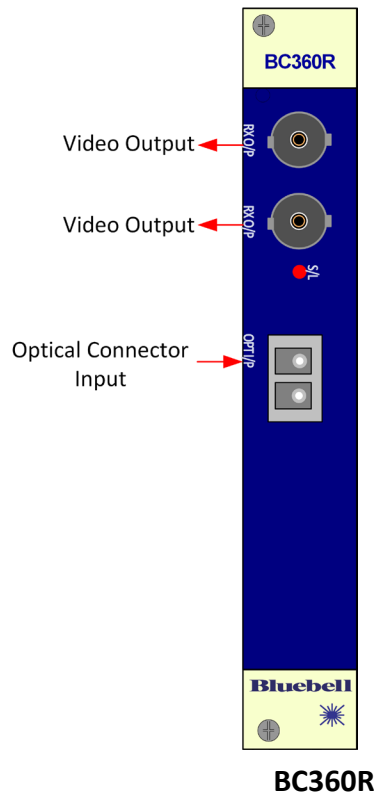
It is fitted with 1 dual port LC fibre optic transmitter connector and connectors to mount 1 or 2 BC360T2 transmitter boards.

BC360T2 Fibre optic transmitter daughter boards

The BC360T2 takes in digital video signal compliant with ANSI/SMPTE 259/292 at data rates from 143 to 2970 Mb/s. 1 or 2 BC360T2 transmitter daughter board can be fitted onto the B360BT baseboard. Each BC360T2 module is fitted with 1 3G/SD/HD input BNC, 1 loop through BNC and an indicator LED.

Product photos

BC360



RECEIVER: OPTICAL to 3G/SD/HD**BC360R****Specifications****BC360R****General**

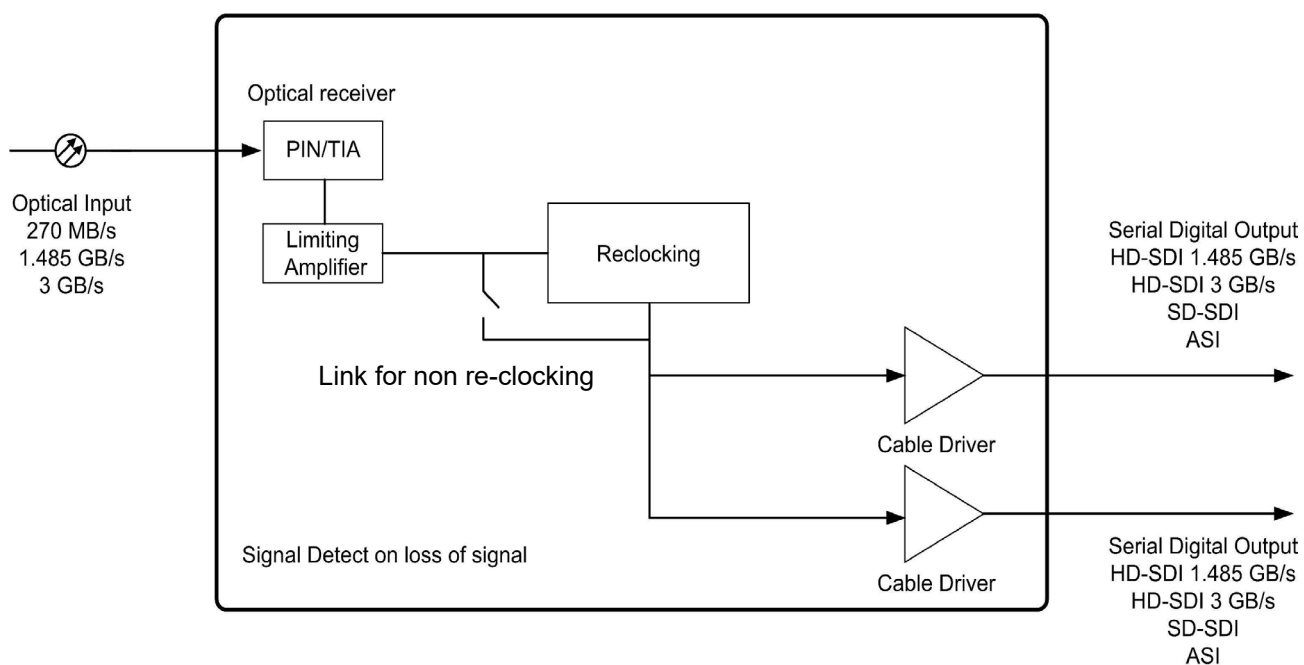
Depth	60mm
Width	30mm (6TE)
Height	100mm (3U)
Weight	150g
Operating Temp	-30°C to +70°C
MTTF	69x10E5 hours
Power Supply	6v @ 500mA (BC362R),

Optical i/p

Singlemode	LC 1310nm	LC connector
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Video o/p

Connector	BNC
Impedance	75R
Format	SMPTE 259/292 at data rates from 143 to 2970 Mb/s

Block Diagram**BC360R**

Circuit description

BC360R

The BC360R-SFP is a 3G/SD/HD digital video fibre optic receiver. It is intended for operation with ANSI/SMPTE 259/292 digital video at data rates from 143 to 2970 Mb/s.

The digital video receiver input is via LC connector from fibre.
The digital video receiver outputs are via 2 BNC connectors.

Power input: 4.6V to 6.0V DC via a DIN 41612 1/2 AB RA format 32 way connector. In normal operation this is supplied by the Bluebell BC100 or BC160 card rack.

Circuit Description:-

Base board BC360BR;

The +6 Volts DC input is filtered by C1 and fed to regulator IC1 (+3.3V) Pin 3. The regulated +3.3V output is on IC1 pin 2: C3 decouples this to ground. Filtered +3.3V outputs are fed to the fibre daughter boards (BC360R2) via J1 and J2. Power supply test points are TP2 (Gnd) and TP3 (+3.3V). IC3 and IC4 buffer the status outputs from the BC360R2 to drive the system status lines and LED's.

Digital video receiver daughter board BC360R2;

The digital video input from base board fibre optic output is fed to IC1 which reclocks the serial data stream and provides an indication of correct data rate lock. LK1 can be used to configure IC1 to reclock (low, link pins 2 to 3 = default) or to bypass reclocking (high, link pins 1 to 2). Cable driver IC4 provides 75 Ohm outputs on BNC1 and BNC2 (labelled RX o/p on back panel).

Current required at 3 GB/s

1 x BC360R2:	180mA
Base board with 1 daughter board:	70mA

Adjustments;

There are no adjustments on these boards

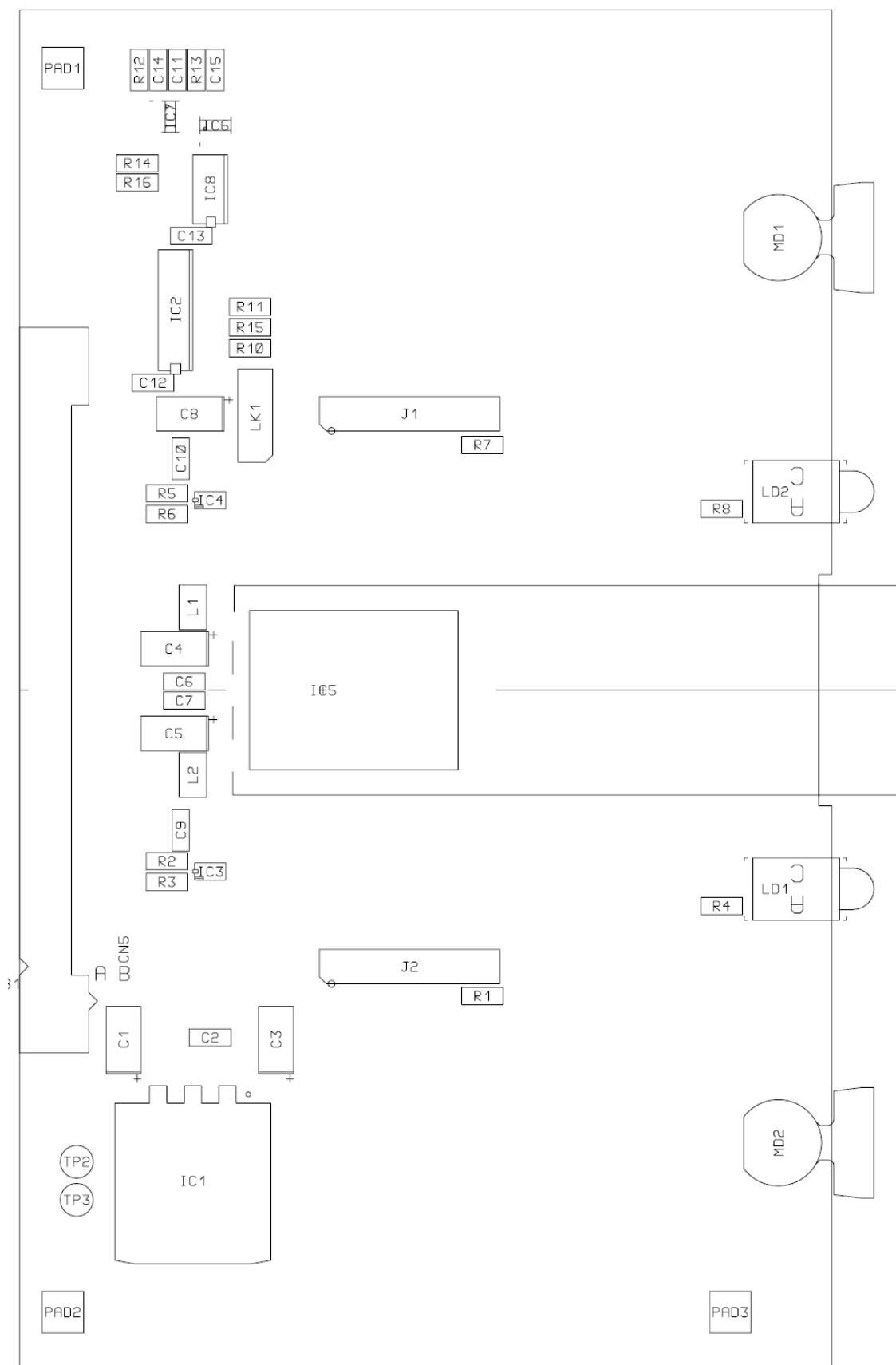
Link Settings:

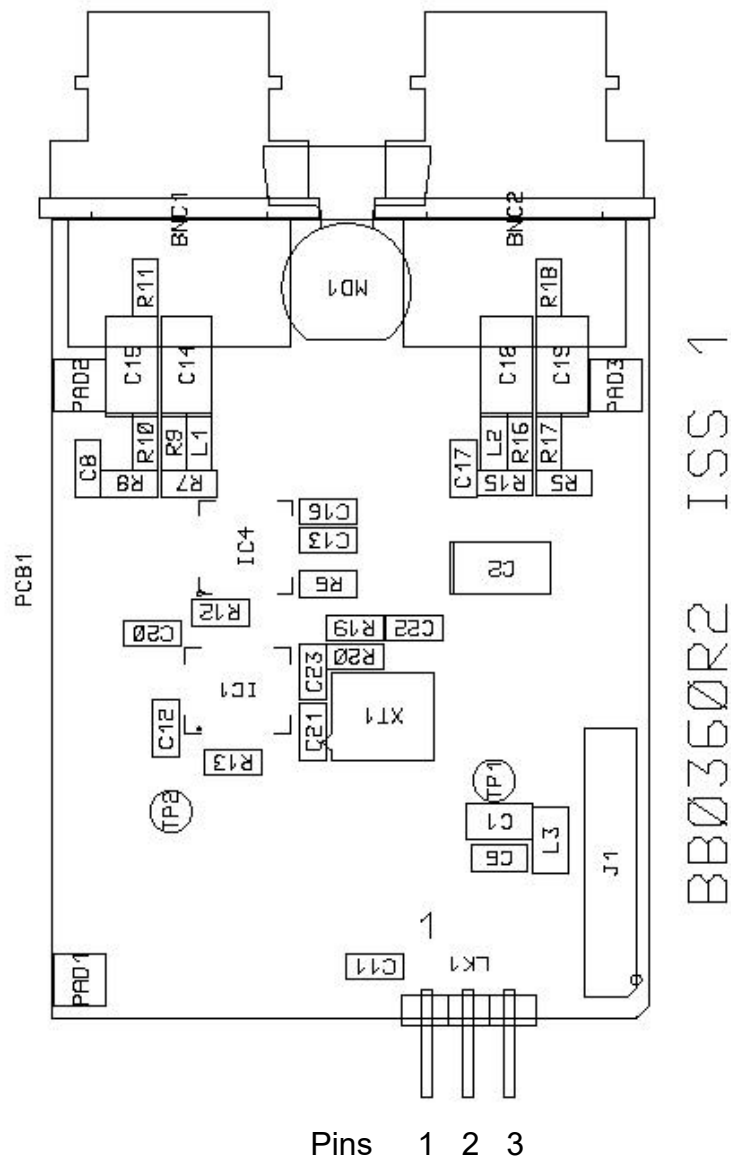
On the digital video receiver boards BC360R2:

LK1: Link pins 1 to 2 to disable receiver re-clocking.
Link pins 2 to 3 to enable receiver re-clocking (Default).

Indicators:

The red LED located on the front panel lights to indicate loss of lock.





LK1. Link pins 1 to 2 to disable receiver re-clocking.
 LK1. Link pins 2 to 3 to enable receiver re-clocking (Default).

Parts list**BC360BR**

24C02J	CAT24C02WI-GT3	1	IC8
74HC125	74HC125	1	IC2
74LVC1G97	SN74LVC1G97DCK	1	IC6
74LVC2G07	SN74LVC2G07DCK	1	IC7
74LVC2G240	SN74LVC2G240DCUR	2	IC3 IC4
CAGE-SFP	20PIN-CAGE-SFP	1	SK2
CAP-0603-COG-10%	10pF	1	C11
CAP-0603-X7R-10%	100nF	5	C2 C12 C13 C14 C15
CAP-0603-X7R-10%	10nF	4	C6 C7 C9 C10
CAP-TANT-TAJ-A	22uF16V	5	C1 C3 C4 C5 C8
CHOKE-BLM21	BLM21PG331SN1D	2	L1 L2
CONN-DIN41612-32		1	CN5
HEADER-0.05"-10W	HDR-0.05"V10	2	J1 J2
HEADER-3x1-2mm	TSM-103-01-S-SV	1	LK1
LED-3MM-RA RED	RED	2	LD1 LD2
NCP1086	NCP1086D2T-33	1	IC1
PCB	BC360BR-ISSUE-2	1	PCB1
RES-0603-1%-0.1W	10K	8	R1 R7 R10 R11 R12 R13 R15 R16
RES-0603-1%-0.1W	180R	6	R2 R3 R4 R5 R6 R8
RES-0603-1%-0.1W	2K2	1	R14
SFP-2RX	GO2927	1	IC5
SOCKET-SFP20	20PIN-SFP	1	SK1

Parts list**BC360R2**

BNC-TROMP-UCBBJE	UCBBJE20-1	2	BNC1 BNC2
CAP-0603-COG-10%	39pF	2	C21 C22
CAP-0603-X7R-10%	10nF	8	C6 C8 C11 C13 C16 C17 C20 C23
CAP-0603-X7R-10%	56nF	1	C12
CAP-0805-X7R-10%	1uF	1	C1
CAP-TANT-TAJ-A	10uF4V	5	C2 C14 C15 C18 C19
CHOKE-0603	4n7H	2	L1 L2
CHOKE-BLM21	BLM21PG331SN1D	1	L3
HEADER-3x1-2mm	M22-2030305	1	LK1
LMH0307	LMH0307SQ	1	IC4
LMH0346	LMH0346SQ	1	IC1
PCB	BB360R2 ISSUE-1	1	PCB1
RES-0603-1%-0.1W	100R	2	R12 R13
RES-0603-1%-0.1W	750R	1	R6
RES-0603-1%-0.1W	75R	10	R5 R7 R8 R9 R10 R11 R15 R16 R17 R18
RES-0603-1%-0.1W	SOT	2	R19 R20
XTAL-27MHz-ACT32	27 MHz	1	XT1

TRANSMITTER: 3G/SD/HD to OPTICAL BC360T

Specifications

BC360T

General

Depth	60mm
Width	30mm (6TE)
Height	100mm (3U)
Weight	150g
Operating Temp	-30°C to +70°C
MTTF	69x10E5 hours
Power Supply	6v @ 660mA (BC362T)

Optical o/p

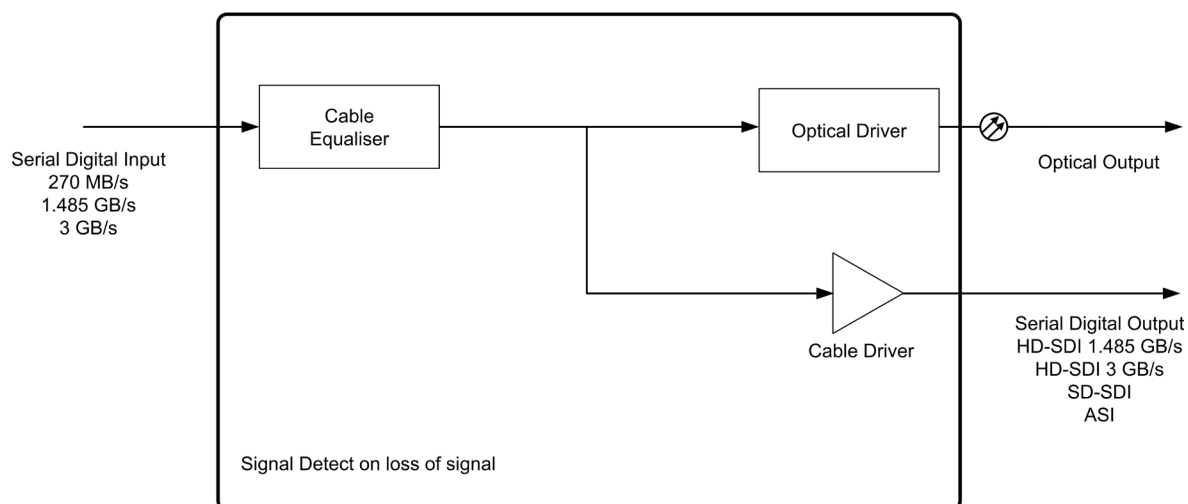
Singlemode	1310nm - LC connector
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Video i/p

Connector	BNC with loop through BNC o/p
Impedance	75R
Equalisation	Automatic up to 300m (SD) – 100m (3G)
Format	SMPTE 259/292 at data rates from 143 to 2970 Mb/s

Block Diagram

BC360T



The BC360T-SFP is a 3G/SD/HD digital video fibre optic transmitter. It is intended for operation with ANSI/SMPTE 259/292 digital video at data rates from 143 to 2970 Mb/s.

The digital video transmitter input is via BNC connector.

The digital video transmitter output is via LC connector to fibre.

The digital video transmitter repeat output is via BNC connector.

Power input: 4.6V to 6.0V DC via a DIN 41612 1/2 AB RA format 32 way connector.

Circuit Description:-

Base board BC360BT

The +6 Volts DC input is filtered by C1 and fed to regulator IC1 (+3.3V) Pin 3. The regulated +3.3V output is on IC1 pin 2: C3 decouples this to ground. Filtered +3.3V outputs are fed to the fibre daughter boards (BC360T2) via J1 and J2. Power supply test points are, TP2 (Gnd) and TP3 (+3.3V). IC3 and IC4 buffer the status outputs from the BC360T2 board to drive the system status lines and LED's.

Digital video transmitter daughter boards BC360T2

The digital video input from BNC connector BNC1 is fed to equaliser IC2 which provides compensation for frequency dependent cable losses. The data output from IC3 is next fed to IC4 which reclocks the serial data stream and provides indication of correct data rate lock via LK2. LK2 can be configured to allow either lock or signal strength indication to the system status and local LED indicator LD1 (for lock detect link pins 1 to 2, default). LK1 can be used to configure IC1 to reclock (low, link pins 2 to 3, default) or to bypass reclocking (high, link pins 1 to 2). The re-clocked signal is next fed a differential driver to IC1. This provides the 75 Ohm repeat output plus a differential output to the baseboard laser driver module.

Current required at 3Gb/s

1 x BC360T2:	260mA
Base board with 1 daughter board:	70mA

Adjustments;

There are no adjustments on these boards

Link Settings:

On the digital video transmitter boards BC360T2

LK1: Link pins 1 to 2 to disable receiver re-clocking.
Link pins 2 to 3 to enable receiver re-clocking (Default).

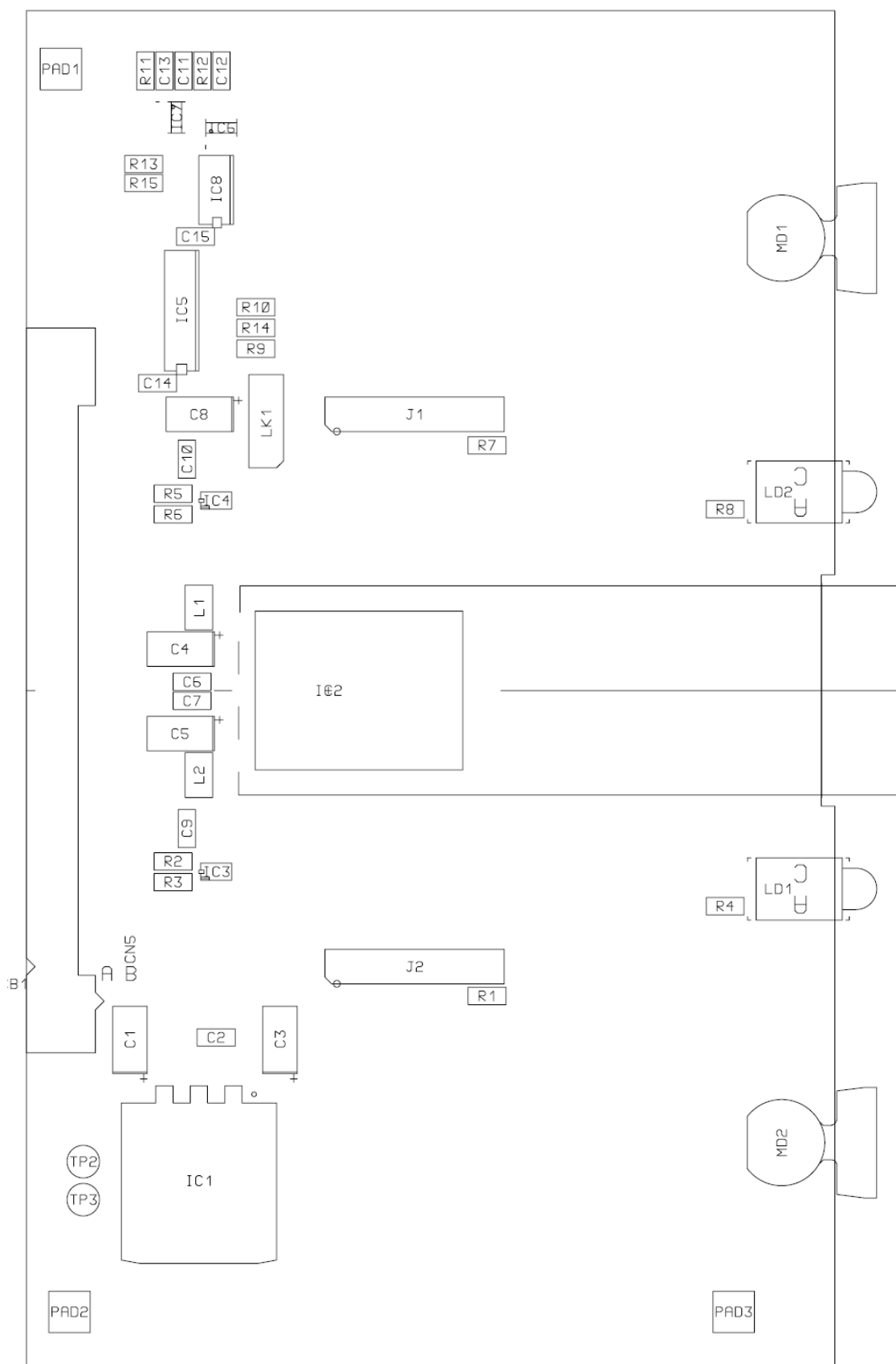
LK2: Link pins 1 to 2 for data lock error indication (Default).
Link pins 2 to 3 for received signal strength error indication

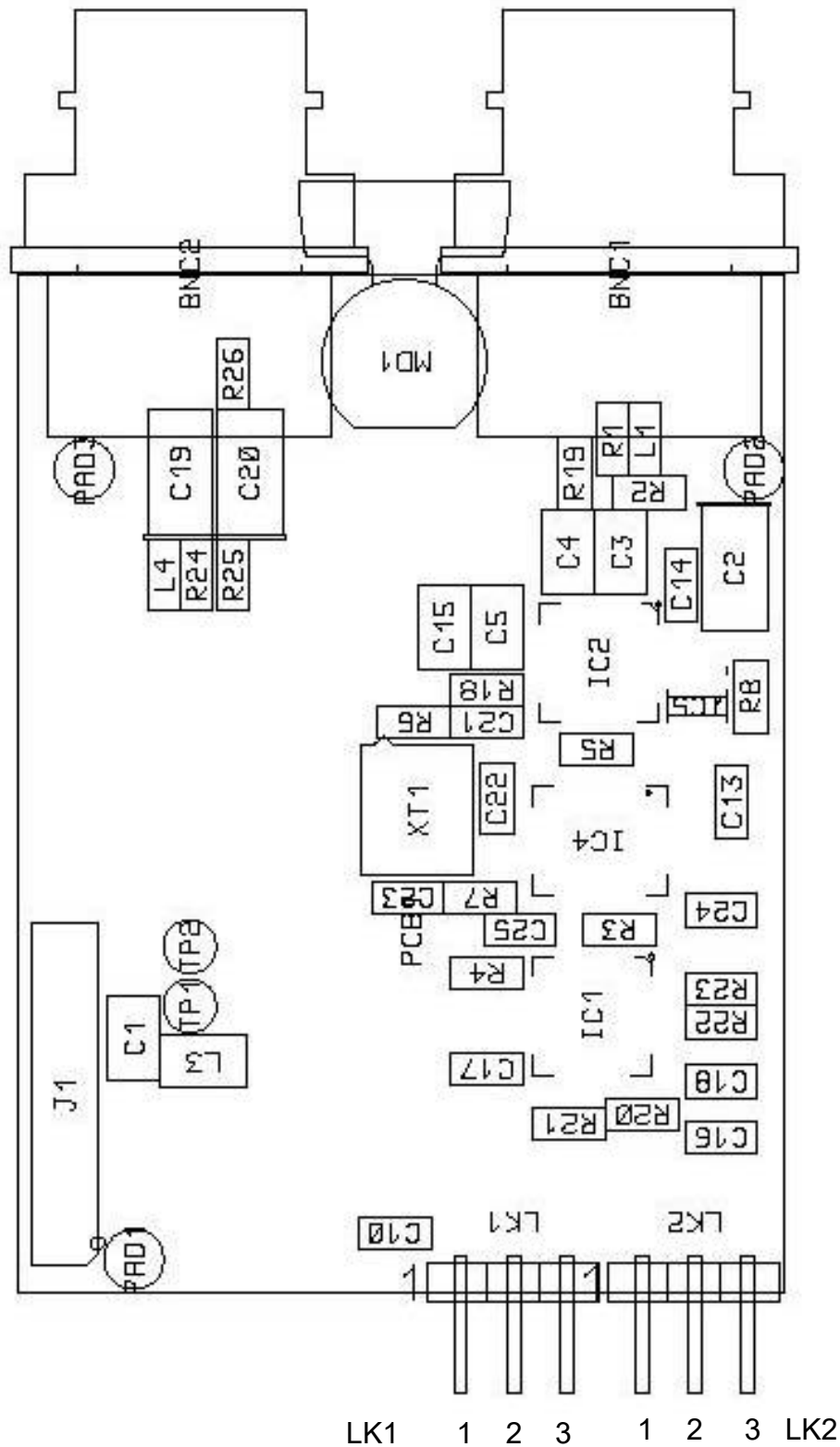
Indicators:

The LED located on the front panel indicates either: data lock error (LED on)
Or low signal strength (LED on), dependant on position of links LK2.

Component Layout	BC360BT
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Component Layout	BC360BT
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LK1

Link 1 to 2 to disable receiver re-clocking.
Link 2 to 3 to enable receiver re-clocking (Default).

LK2

Link 1 to 2 for data lock error indication (Default).
Link 2 to 3 for signal strength error indication.

Parts list**BC360BT**

74LVC2G240	SN74LVC2G240DCUR	2	IC3, IC4
CAGE-SFP	20PIN-CAGE-SFP	1	SK2
CAP-0603-X7R-10%	100nF	1	C2
CAP-0603-X7R-10%	10nF	4	C6, C7, C9, C10
CAP-TANT-TAJ-A	22uF6V3	5	C1, C3, C4, C5, C8
CHOKE-BLM21	BLM21PG331SN1D	2	L1, L2
CONN-DIN41612-32		1	CN5
HEADER-0.05"-10W	TMS-110-01-G-S	2	J1, J2
LED-3MM-RA RED	RED	2	LD1, LD2
		2	LD1, LD2
NCP1086	NCP1086D2T-33	1	IC1
PCB	BC360BT ISSUE-1	1	PCB1
RES-0603-1%-0.1W	10K	3	R1, R7, R9
RES-0603-1%-0.1W	180R	6	R2, R3, R4, R5, R6, R8
SFP-2TX	EOLS-30-DR-DN	1	IC2
SOCKET-SFP20	20PIN-SFP	1	SK1

Parts list**BC360T2**

74LVC2G04	SN74LVC2G04DCK	1	IC5
BNC-TROMP-UCBBJE	UCBBJE20-1	2	BNC1 BNC2
CAP-0603-COG-10%	39pF	2	C22 C23
CAP-0603-X7R-10%	100nF	1	C14
CAP-0603-X7R-10%	10nF	7	C10 C16 C17 C18 C21 C24 C25
CAP-0603-X7R-10%	56nF	1	C13
CAP-0805-X7R-10%	1uF	4	C1 C3 C4 C5
CAP-0805-X7R-10%	SOT	1	C15
CAP-TANT-TAJ-A	10uF4V	3	C2 C19 C20
CHOKE-0603	4n7H	2	L1 L4
CHOKE-BLM21	BLM21PG331SN1D	1	L3
HEADER-3x1-2mm	M22-2030305	2	LK1 LK2
LMH0307	LMH0307SQ	1	IC1
LMH0344	LMH0344SQ	1	IC2
LMH0346	LMH0346SQ	1	IC4
PCB	BB360T2 ISSUE-1	1	PCB1
RES-0603-1%-0.1W	100R	3	R3 R5 R8
RES-0603-1%-0.1W	36R	1	R19
RES-0603-1%-0.1W	47R	2	R20 R21
RES-0603-1%-0.1W	750R	1	R4
RES-0603-1%-0.1W	75R	7	R1 R2 R22 R23 R24 R25 R26
RES-0603-1%-0.1W	SOT	3	R6 R7 R18
XTAL-27MHz-ACT32	27 MHz	1	XT1