YAMAHA LSI

Y-DS2

Built-in DSU Module for Terminal Equipment

1 General

Y-DS2 is designed to be installed in terminal equipment, conforming to TTC Standard JT-I430 and JT-G961. Y-DS2 provides the ISDN subscriber interface (two-wire time compression multiplexing operation) and the NT side of the ISDN Basic Rate user-network interface function (digital four-wire time-division full-duplex operation).
S/T reference point, Y-DS2 has two types of interface : JT-I430 interface and TTL interface.
TTL Interface is especially effective when Y-DS2 is combined with YAMAHA's ISDN LSI for S/T reference point interface, YTD418 or YTD423. It allows considerable cost reduction on parts around the pulse transformer to construct a device with a built-in DSU.
Y-DS2 is operated by power supply of 5 volts from terminal equipment. For phantom power feeding for S/T bus, Y-DS2 makes use of electric power of 40 volts from terminal equipment.
In addition, the driver/receiver block for S/T reference point allows the detachable DSU function by pin setting, using Yamaha S/T interface LSIs, YTD418 or YTD423, which supports TTL interface for JT-I430. Customer, therefore, can select the driver/receiver block or DSU function.

2 Features

Line	INS-Net 64
No. of Line	1
Line Interface	TTC Standard JT-G961
Terminal Interface	TTC Standard JT-I430 and TTL
Loop Function	LOOP2A
Power Supply Capability to Terminal Equipment	Local Power
Lightning Protection	15 μs$\times$100 μs, 15kV, 200 A(max)
Operating Temperature Range	-10°C to 60°C (Up to 90%RH noncondensing)
Storage Temperature Range	-20°C to 70°C (Up to 90%RH noncondensing)
Supply Voltage	5V$\pm$5% Supplied by Main Equipment

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Y-DS2 CATALOG
CATALOG No.:4YDS2A3
1999.1

3 Block Diagram

Y-DS2 Block Diagram is shown in Figure 1.

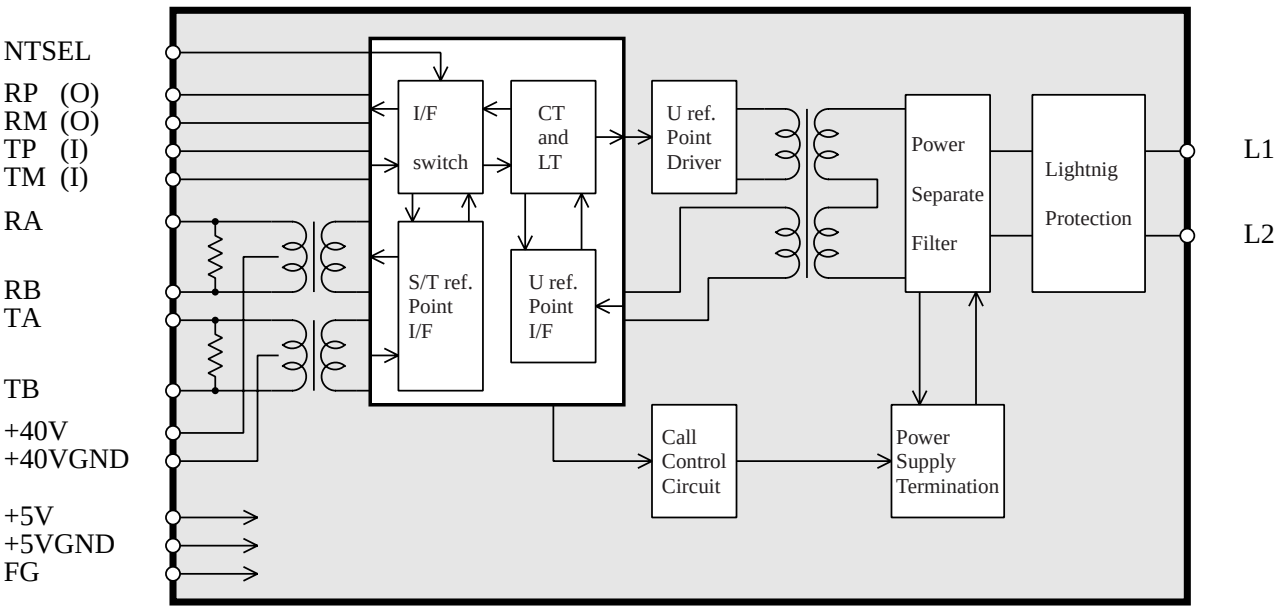

Figure 1: Y-DS2 Block Diagram

4 Pin Functions

Pin No.	Pin Name	Description
1	L1	Connect to L1
2	L2	Connect to L2
3	FG	Connect to Equipment FG
4	FG	Connect to Equipment FG
5	RB	NTSEL “H” : JT-I430 RB Signal Output NTSEL “L” : JT-I430 TB Signal Output
6	RA	NTSEL “H” : JT-I430 RA Signal Output NTSEL “L” : JT-I430 TA Signal Output
7	TB	NTSEL “H” : JT-I430 TB Signal Input NTSEL “L” : JT-I430 RB Signal Input
8	TA	NTSEL “H” : JT-I430 TA Signal Input NTSEL “L” : JT-I430 RA Signal Input
9	+40VGND	+40V supply input(−)
10	+40V	+40V supply input(+)
11	RM	TTL signal Output(−)
12	RP	TTL Signal Output(+)
13	TM	TTL signal Input(−)
14	TP	TTL Signal Input(+)
15	NTSEL	Set up detachable DSU function “H” : Use Y-DS2 as DSU “L” : Use of Y-DS2 as driver/receiver for S/T reference point
16	+5V	+5V supply needed
17	+5V	+5V supply needed
18	+5VGND	Connect to Equipment GND
19	+5VGND	Connect to Equipment GND
20	+5VGND	Connect to Equipment GND

Note 1 FG must be connected to the internal FG of the TE.
If it’s not connected, Lightning Protection may not work properly.

Note 2 Don’t connect +5VGND and +40VGND.

Note 3 Set up TP and TM in “L” when you don’t use TTL interface.

5 JT-I430, TTL interface

JT-I430 Interface and TTL Interface is shown below.

- DSU – TE Interface (RA,RB,RP,RM)

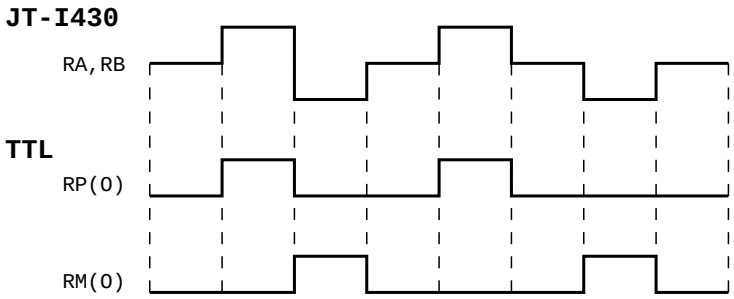

Figure 2: DSU – TE Interface

- TE – DSU Interface (TA,TB,TP,TM)

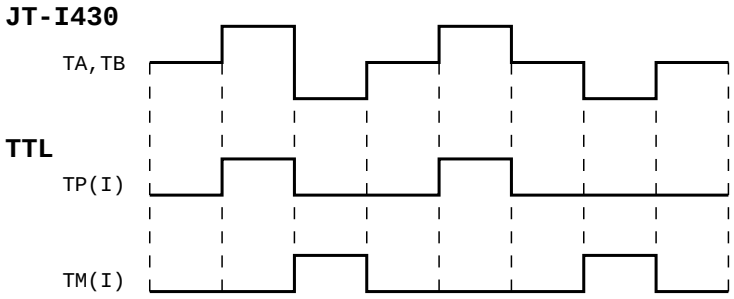

Figure 3: TE – DSU Interface

6 Detachable DSU function

Y-DS2 can be used as the driver/receiver for S/T reference point by the detachable DSU function.
Using this feature, the terminal equipment that includes Y-DS2 can be connect to other DSU or built-in DSU terminals by pin setting, as a terminal equipment.

Note. When the detachable DSU function is required, it is necessary to remove the terminal resistors on RA/RB pin and TA/TB pin from the existing main board. When the Y-DS2 without the terminal resistors is required, please contact Yamaha sales staff.

6.1 DSU function

To use Y-DS2 as DSU, set up NTSEL in "H".
DSU requires the terminal resistors. Therefore, the terminal resistors are required on the main board using Y-DS2 as DSU, when the terminal resistors have been removed from Y-DS2.

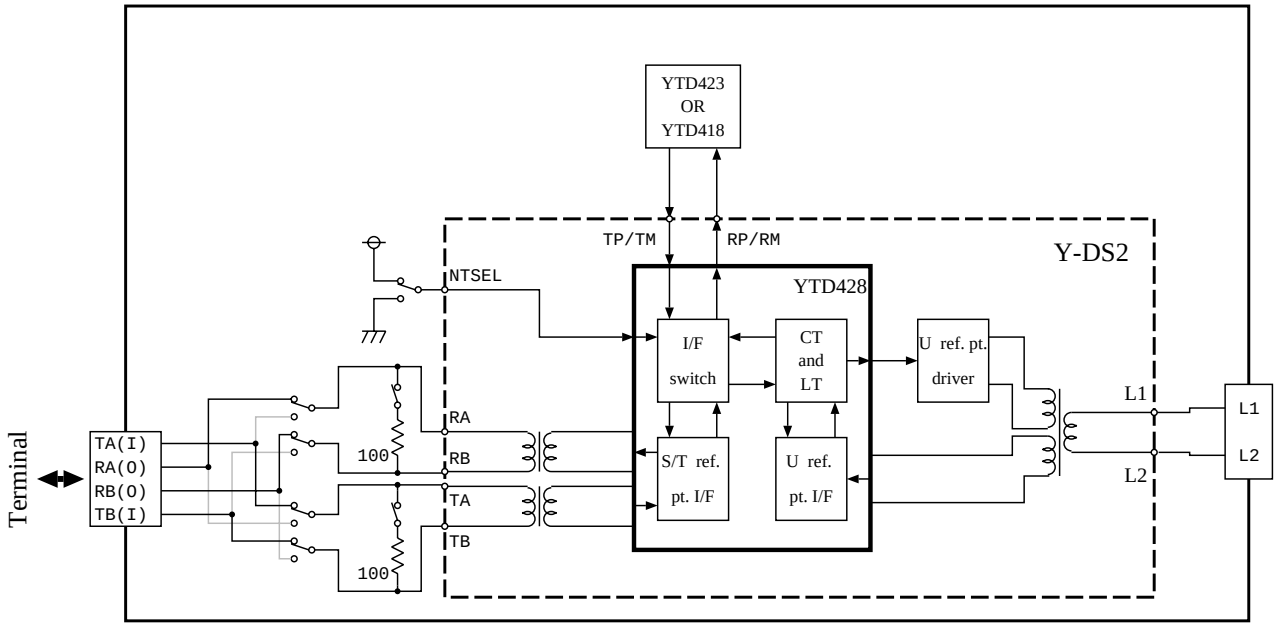

Figure 4: A use example as DSU

6.2 Driver/Receiver for S/T reference point function

To use Y-DS2 as Driver/Receiver for S/T reference point, set up NTSEL in "L".
The terminal resistors are only mounted on the nearest terminal from DSU and other terminals that are connected with the same bus don't require the terminal resistors. Therefore, use the Y-DS2 that is removed the terminal resistors, to use Y-DS2 as Driver/Receiver for S/T reference point. Also, mount the terminal resistors on the main board and enable the terminal resistors to turn ON/OFF by switch or other devices on the main board.
Besides, the signals of TA/TB and RA/RB of Y-DS2 should be exchanged by switches or other devices on the main board. Because S/T bus signals that are connected to TA, TB, RA and RB pin are different between using as DSU and S/T terminal.

Y-DS2			8-pole connections(RJ-45)			
Pin No.	Pin Name	I/O	NTSEL= "H"		NTSEL= "L"	
			Signal	Pole No.	Signal	Pole No.
8	TA	IN	TA	3	RA	4
6	RA	OUT	RA	4	TA	3
5	RB	OUT	RB	5	TB	6
7	TB	IN	TB	6	RB	5

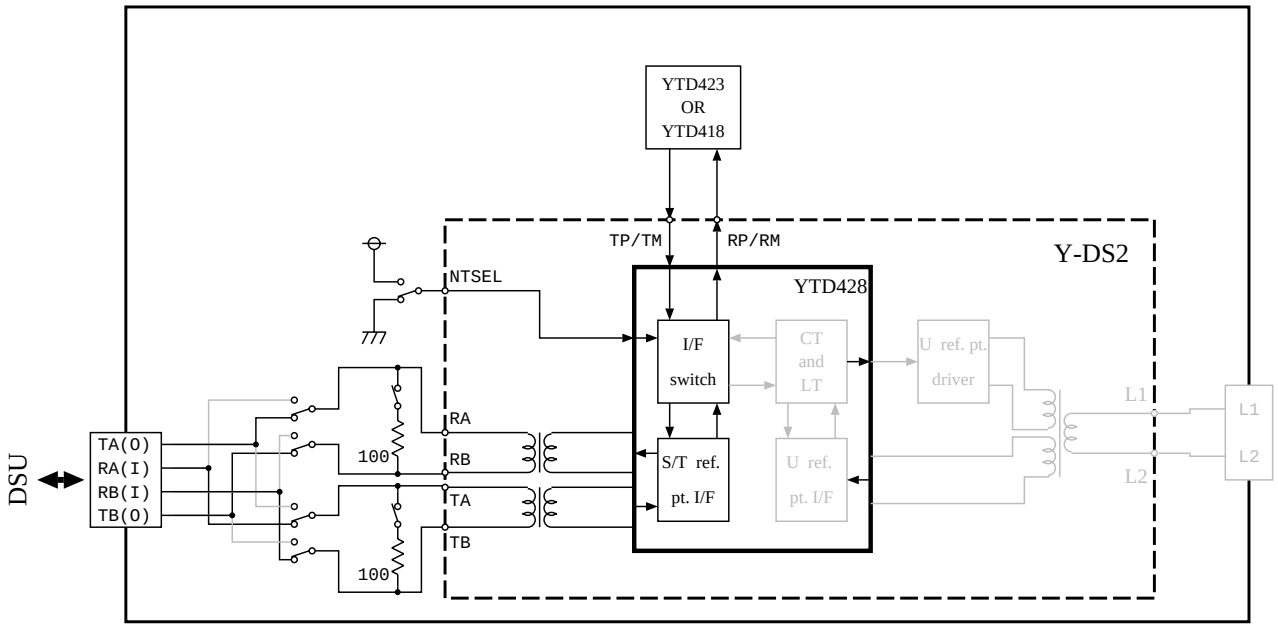

Figure 5: A use example as driver/receiver for S/T reference point

7 Note

Note 1 The use of the silicon surge absorber on the power supply circuit of the main board side is recommended in order to protect the terminal from the thunderbolt surge current.

Figure 6 is the example circuit.

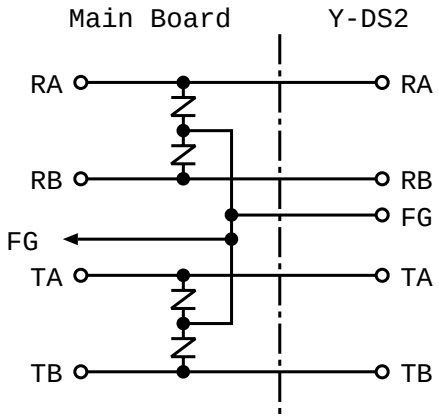

Figure 6: Example circuit 1

The recommended parts are as follows;

- Silicon surge absorber
  - Breakover Voltage = 150V

Note 2 The use of the diode and the silicon surge absorber on Phantom Feeding circuit of the main board side is recommended in order to protect the power supply circuit of Y-DS2 from the thunderbolt surge current.

Figure 7 is the example circuit.

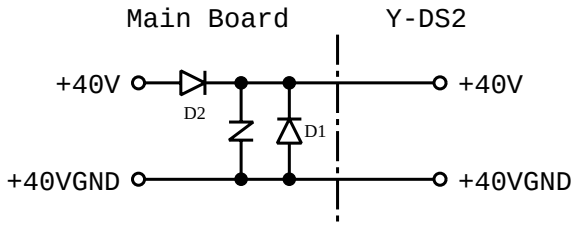

Figure 7: Example circuit

The recommended parts are as follows;

- Silicon surge absorber
  - Breakover Voltage = 120V
- Diode D1
  - Maximum Reverse Voltage = 600V
  - Average Rectified Forward Current = 1A
- Diode D2
  - Schottky type
  - Maximum Reverse Voltage = More than 90V
  - Average Rectified Forward Current = More than 1A

8 Board Size

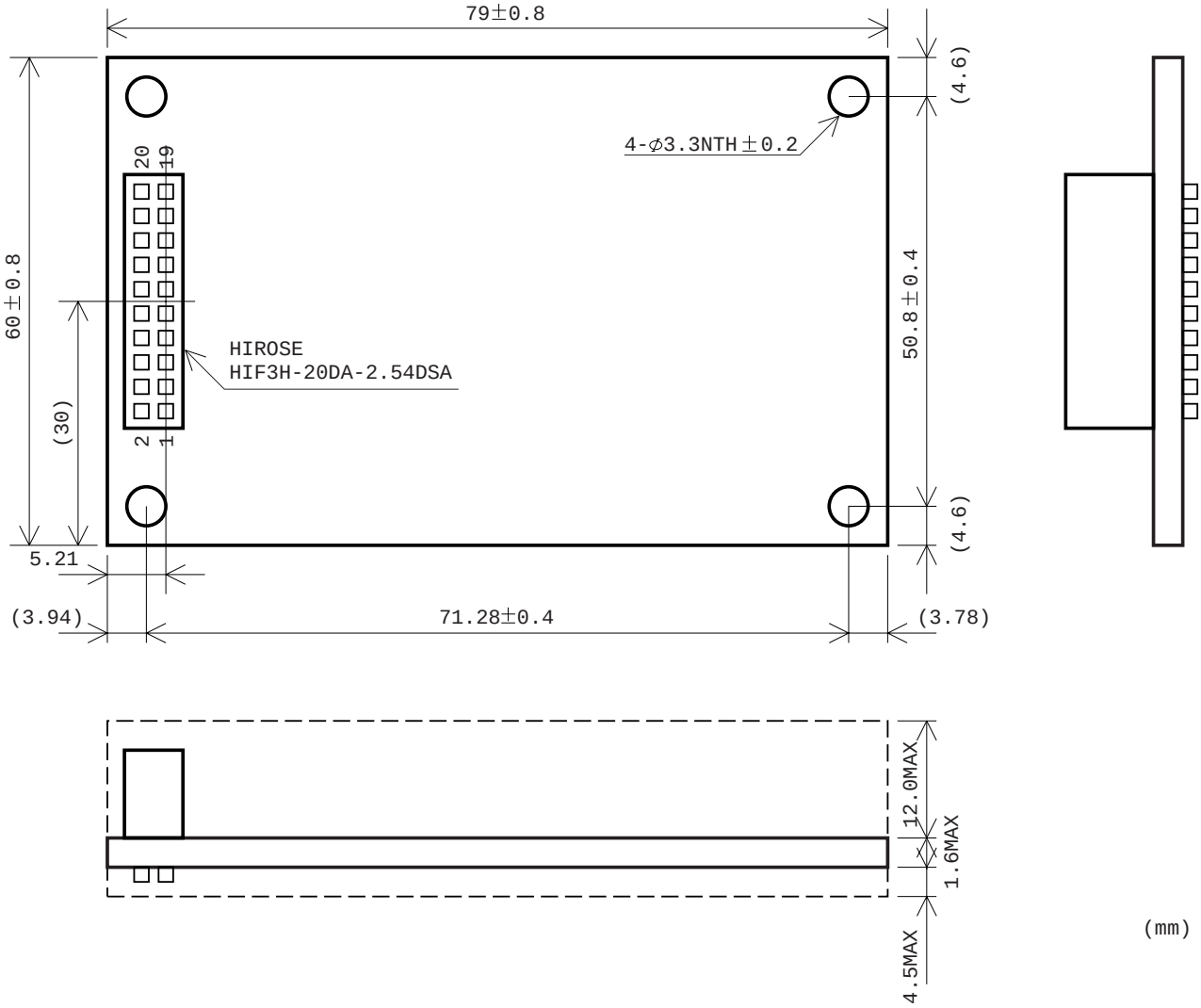

Figure 8: Y-DS2 Size

Note. Use recommended connectors on the main board as below:

Recommended connector : HIROSE A1-20PA-2.54DSA
: HIROSE HIF3H-20PB-2.54DSA

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