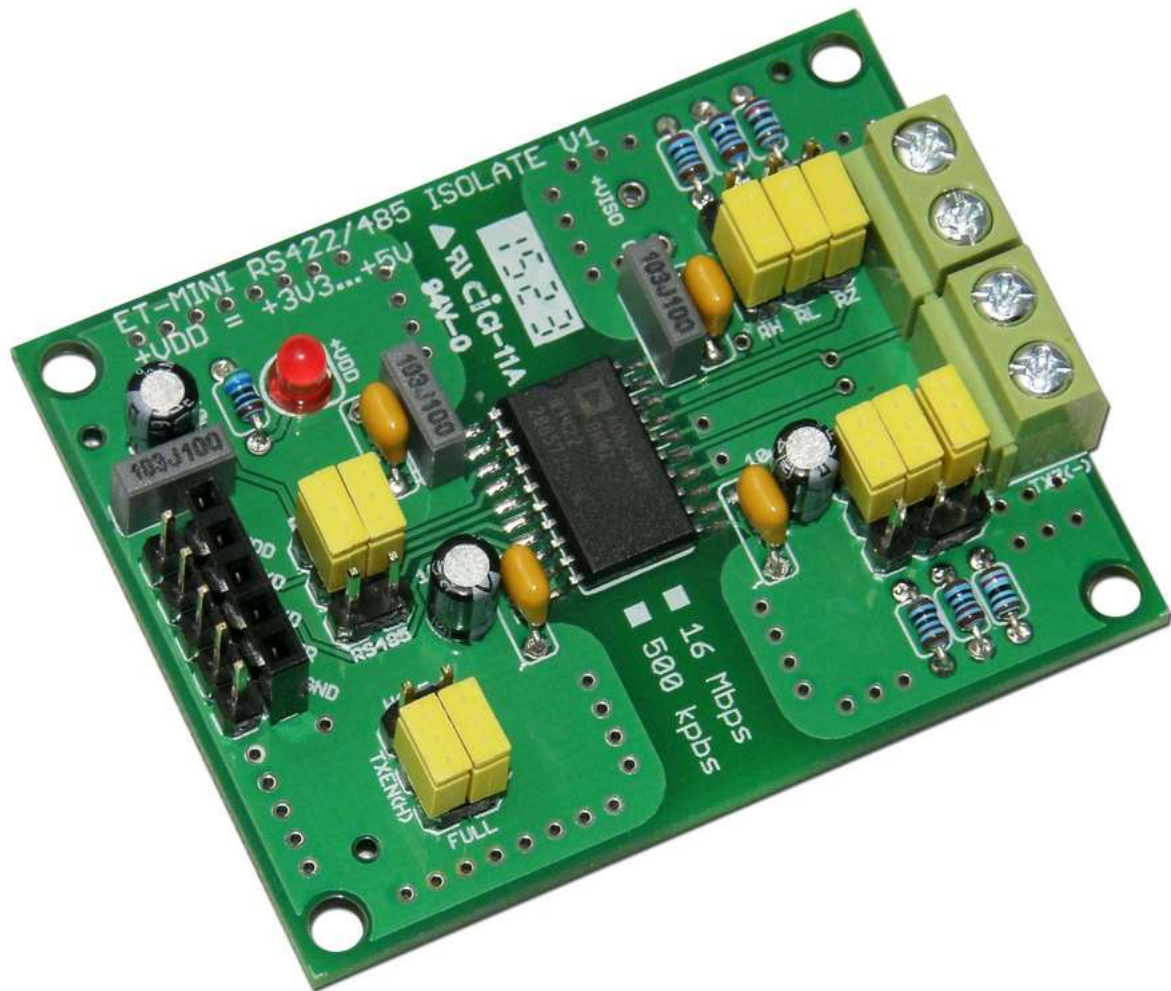# ET-MINI RS422/485 ISOLATION

      ET-MINI RS422/485 ISOLATION is the set of Line Driver to convert Signal Connection of PORT UART/USART as TTL Type from Microcontroller to Signal RS422 or RS485 as ISOLATE Type. It can be used with 3.3V and 5V and it supports Mode RS422 FULL DUPLEX 4-WIRE, Mode RS485 FULL DUPLEX 4-WIRE, and Mode RS485 HALF DUPLEX 2-WIRE.

      It is more convenient because it uses only one set of POWER SUPPLY that provides power to the circuit on the side of Signal TTL. It can be used with Power Supply 3.3V and 5V; it is unnecessary to find any power source to provide Circuit Driver of RS422/485. It is safe to use because it protects the device in the network from damaged, especially defective electric system or thunderbolt because Signal on the side of TTL and Driver is isolated completely.

SPECIFICATIONS
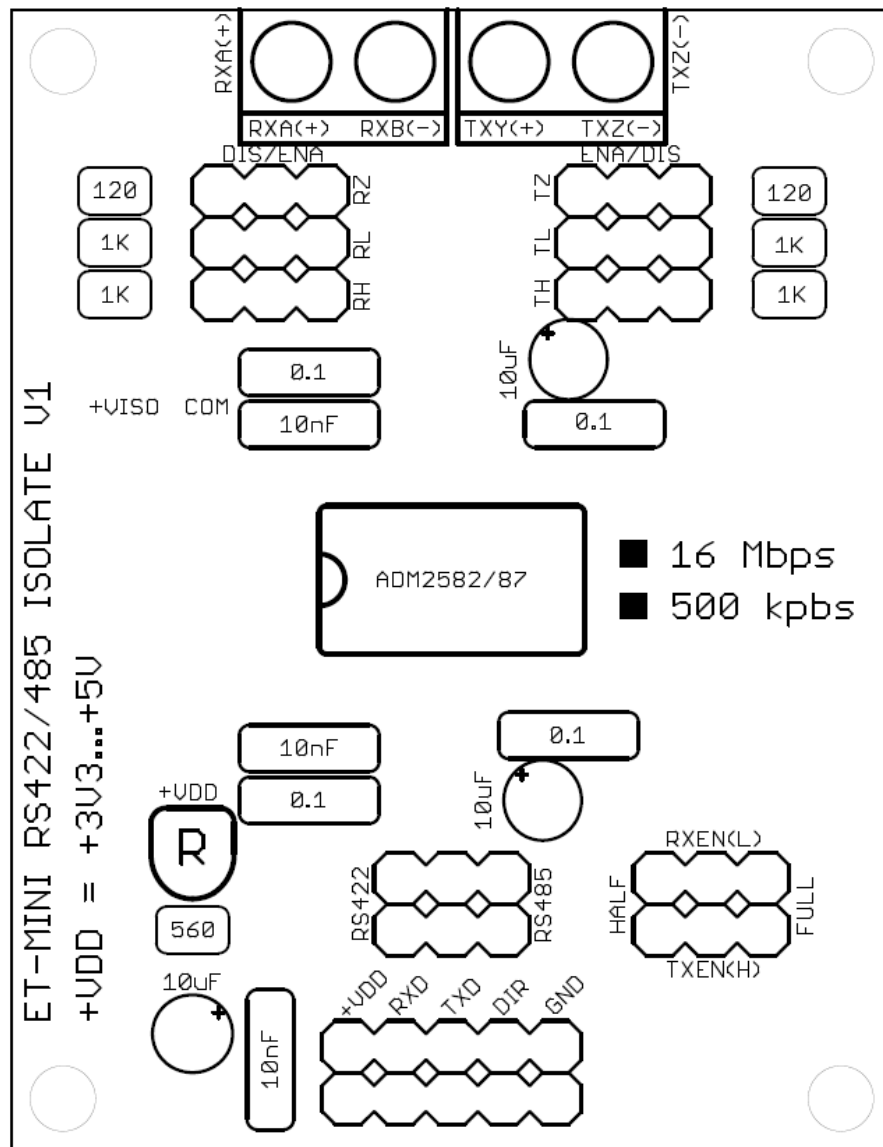
- Use CHIP ADM2587E as Line Driver to convert the signal connection to be ISOLATE Type
- Connect Signal UART(RXD/TXD/DIR) as TTL Type(3.3V/5V) by Connector Pin Header 1x5 2.54mm. Pitch
- Be used with 3.3V and 5V with LED to show states
- Support the maximum Baud Rate at 500kbps(600-256000BPS)
- Support the connection as RS422 Full Duplex 4-WIRE, RS485 Half Duplex 2-WIRE and RS485 Full Duplex 4-WIRE
- PCB Size: 4.5 x 5.6 cm.

SIGNAL CONNECTION

Signals on UART side
- +**VDD** is Power Source that can be used with 3.3V and 5V.
- **RXD** is signal for receiving data on the side of TTL that has been converted from receiving data on the side of RS422/485.
- **TXD** is signal for sending data on the side of TTL to convert and send data to the side of RS422/485.
- **DIR** is Signal TTL OUTPUT from Microcontroller; it sets direction of Line Driver for receiving-sending data, especially RS485. However, it is unnecessary to use this signal if it is RS422.
  - If used as RS485 HALF DUPLEX 2-WIRE, Signal DIR is used to setup direction of Line Driver for receiving or sending data. If it is HIGH, it sends data; but, if it is LOW, it receives data.
  - If used as RS485 FULL DUPLEX 4-WIRE, LINE DRIVER on the side of receiver is enabled to receive data all the time but LINE DRIVER on the side of sender is controlled by Signal DIR. It uses Signal DIR to control Enable/Disable LINE DRIVER for sending data. If it is HIGH, it connects LINE DRIVER with CABLE to send data; but, if it is LOW, it disables function sending data; it seems that it removed the Signal LINE DRIVER from CABLE.
- GND is Reference point for Power SUPPLY and Signals.

Signals on RS422/485 side
- **RXA(+)** is the signal of receiving data from RS422/485.
- **RXB(-)** is the signal of receiving data from RS422/485.
- **TXY(+)** is the signal of sending data for RS422/485.
- **TXZ(-)** is the signal of sending data for RS422/485.

How to use RS485 FULL DUPLEX 4-WIRE

When using this operation mode, it must setup 1 device to be RS422 that is Master and the rest of devices are setup to be Slave in the format of RS485 FULL DUPLEX. It can connect 256 points together at the maximum. It connects signal of sending data TXY(+) and TXZ(-) from Master to signal of receiving data (RXA(+) and RXB(-) of all Slaves that are parallel interface. For Signal TXY(+) and TXZ(-) of all Slaves must be parallel interface and then connect to RXA(+) and RXB(-) of Master.

When choose and setup operation mode of this Board ET-MINI RS422/485 ISOLATIOBN, it has to choose RS422 Mode for any position that is setup to be Master; and it has to choose RS485 Mode and choose the format of RS485 as FULL DUPLEX for any position that is setup to be Slave.

When using this operation mode, the Master device can receive and send data all the time and all Slave devices can simultaneously receive data from Master all the time. However, the Slave device needs Signal DIR to control and disable the sender of its own LINE DRIVER. LINE DRIVER of all Slave devices only operates when the Master device requires communicating to. When it ends the communication to Master, the Slave always disables the signal of sending data of LINE DRIVER because it gives a chance for other Salve devices to send data to Master via the Cable without crashing data.
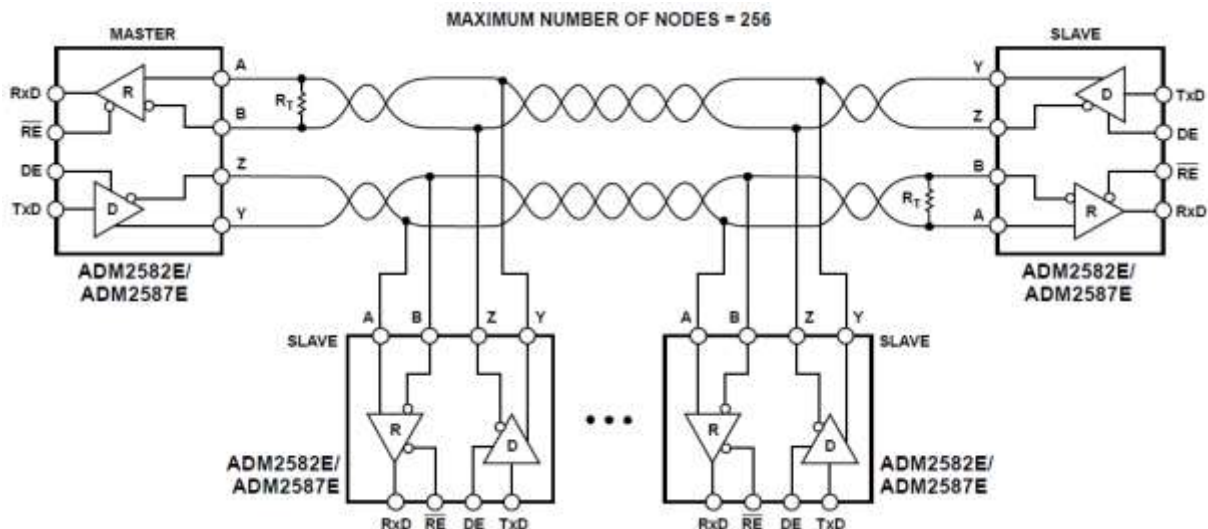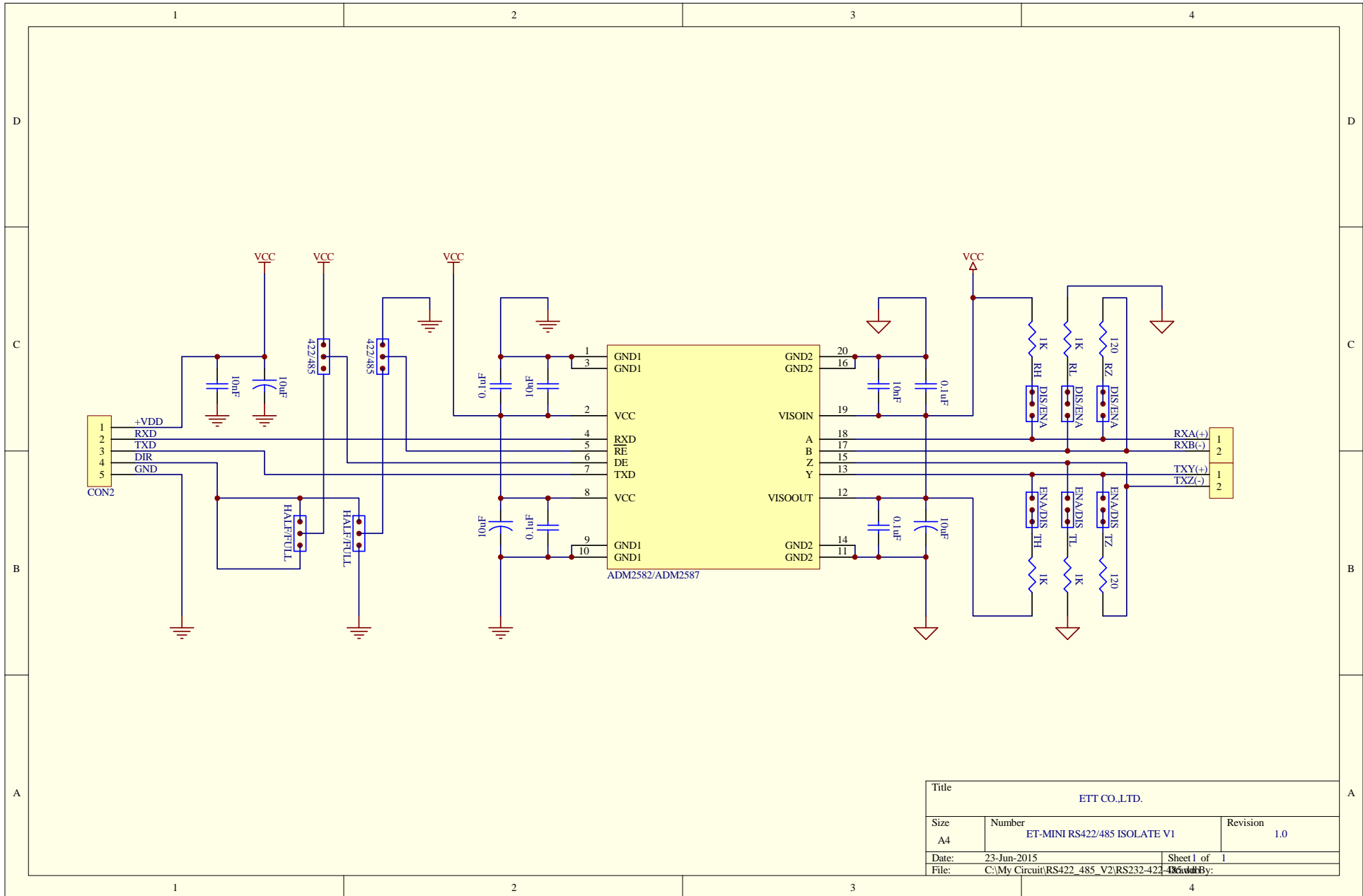
How to use RS485 Half Duplex 2-WIRE

It requires connecting Signal RXA(+) and TXY(+) together to be Signal RS485(+); and it requires connecting Signal RXB(-) and TXZ(+) together to be Signal RS485(-). For Signal RS485(-) and RS485(+) of each point, it can be parallel interfaced; in this case, it can connect 256 points together in the same line.

It must choose the operation mode for this Board ET-MINI RS422/485 ISOLATION to be RS485 Half Duplex and it uses Signal DIR to control the direction of receiving/sending data. If sending data, it sets the Signal DIR to be HIGH and now it becomes a sender. After sent the data completely, it must set Signal DIR to be LOW and now it returns to be receiver that waits for receiving data.
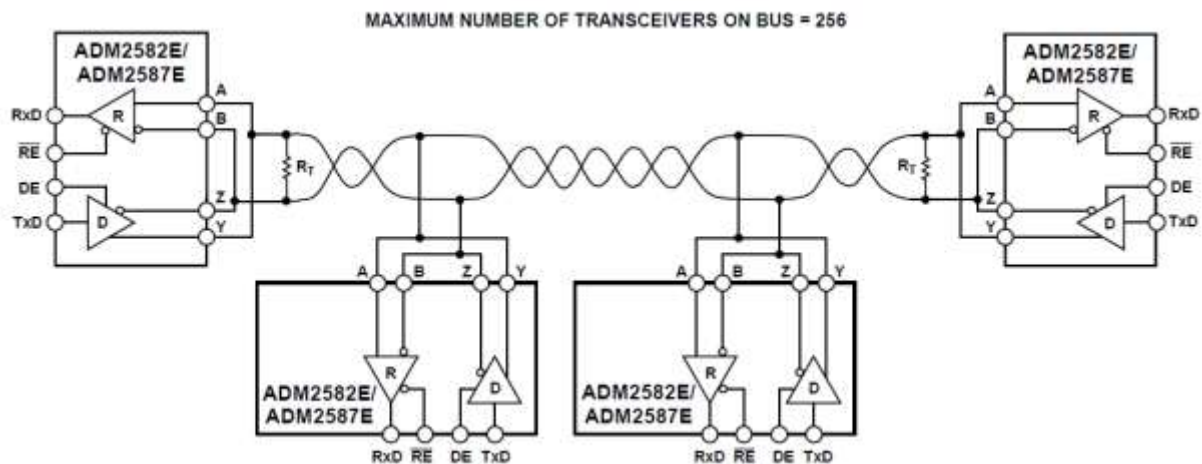
Fail Safe BIAS

Board ET-MINI RS422/485 ISOLATION has the Circuit Fail Safe BIAS of Signal RS422/485 on both sides of sender and receiver; there is Jumper to enable or disable as required. Normally, it only enables the Circuit Fail Safe BIAS of the particular board that is used at the beginning and at the end position of Cable. If using Mode RS485 Half Duplex 2-WIRE, it only enables the receiver (RH,RZ,RL; or, if using Mode RS422 or RS485 Full Duplex 4-WIRE, it has to enables both sides of receiver (RH,RZ,RL) and sender (TH,TZ,TL).

VCC VCC VCC VCC

CON2
1 +VDD
2 RXD
3 TXD
4 DIR
5 GND

422/485
422/485

10nF
10uF

0.1uF
10nF

HALF/FULL
HALF/FULL

10uF
0.1uF

ADM2582/ADM2587

1 GND1
3 GND1
2 VCC
4 RXD
5 RE
6 DE
7 TXD
8 VCC
9 GND1
10 GND1

GND2 20
GND2 16
VISOIN 19
A 18
B 17
Z 15
Y 13
VISOOUT 12
GND2 14
GND2 11

10nF
0.1uF

0.1uF
10nF

RH 1K DIS/ENA
RL 1K DIS/ENA
RZ 120 DIS/ENA

TH ENA/DIS 1K
TL ENA/DIS 1K
TZ ENA/DIS 120

RXA(+) 1
RXB(-) 2

TXY(+) 1
TXZ(-) 2

Title
ETT CO.,LTD.

Size A4
Number ET-MINI RS422/485 ISOLATE V1
Revision 1.0

Date: 23-Jun-2015
Sheet 1 of 1
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