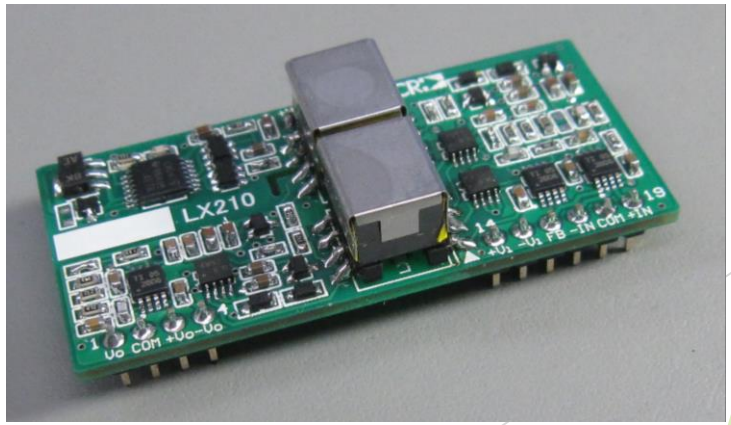
Feature for Model LX210 (Compatible Model to AD210)

CRBOX CO LTD



Ver0.08

What is a Isolation Amplifier ?

- An Amplifier which is be able to Communicate a signal based on Isolation between Input and Output
- Main methods to Communicate a signal are Light , Magnate , and Capacitor

Merit of Isolation Amplifier

- Prevent Common mode Noise even if high voltage noise at Input or Output
- To keep Safely use because of few leakage current between Input and Output

Application for Isolation Amplifier

- Train (Watching Overhead current or voltage)
- Medical (use for interface of medical equipment or sensor)
- Electric Power generation (interface between Generator and control parts)

Feature for Model LX210

- Full compatible model to AD210
- Method of Communicate a signal is 3 ports Magnetic
- Available for Custom specification

Comparison Data to Another Maker （NO.1）

MODEL	Another Maker A	Another Maker B	Another Maker C	LX210	Unit
GAIN					
Range	1～100	1～100	1～100	1～100	[V/V]
Error	±2	±1	±2	±1	[%]max
To Temperature Range (0℃～＋70℃)	25	25	25	25	[ppm/℃]max
To Temperature Range(−25℃～80℃)	±50	±50	±50	±30	[ppm/℃]max
To Power supply	±0.002	±0.002	±0.002	±0.001	[%/V]
Non Linearity（Best straight line method ） ※Non Linearity＝ΔV／Rated Full Scale Output Range ΔV＝Output − Ideal Linearity Ideal linearity is Regulated Optimum Linearity Rated Full Scale Output Range ＝ 20V	±0.025	±0.012	±0.025	±0.010	[%]max
Rated Input Voltage					
Linea input Range	±10	±10	±10	±10	[V]
Maximum Safety Differential Input	±15	±15	±15	±15	[V]
CMVmax(between Input and Output)					
AC60Hz continuous	2500	2500	1500	2500	[Vrms]
DC Continuous	±3500	±3500	±2000	±3500	[Vpeak]
CMRR （60Hz, G=100V/V), Rs≦500Ω	120	120	120	125	[dB]
Leak Current between input and Output @240Vrms, 60Hz	2	2	2	2	[uArms]max

Comparison Data to Another Maker （NO.2）

MODEL	Another Maker A	Another Maker B	Another Maker C	LX210	Unit
Input Impedance					
Normal Mode	1000	1000	1000	1000	[GΩ]
Common Mode	5GΩ//5pF	5GΩ//5pF	5GΩ//5pF	—	
Input Bias Current					
Initial Value@25℃	30typ(400max)	30typ(400max)	30typ(400max)	30typ(400max)	[pA]
(0～70℃)	10	10	10	—	[nA]max
(−25～85℃)	30	30	30	30	[nA]max
Input Differential current					
Initial Value@25℃	5typ(200max)	5typ(200max)	5typ(200max)	5typ(200max)	[pA]
(0～70℃)	2	2	2	2	[nA]max
(−25～85℃)	10	10	10	10	[nA]max
Input Noise					
Voltage (1kHz)	18	18	18	—	[nV/Hz^0.5]
Voltage (10Hz～10kHz)	4	4	4	—	[uVrms]
Current (1kHz)	0.01	0.01	0.01	—	[pA/Hz^0.5]

Comparison Data to Another Maker （NO.3）

MODEL	Another Maker A	Another Maker B	Another Maker C	LX210	Unit
Frequency Characteristics					
Band Width (−3dB)					
G=1V/V	20	20	20	25	[kHz]
G=100V/V	15	15	15	20	[kHz]
Settling Time (±10mV, 20V Step)					
G=1V/V	150	150	150	80	[us]
G=100V/V	500	500	500	250	[us]
Slew Rate (G=1V/V)	1	1	1	1	[V/us]
Input Conversion Offset Voltage ※G=Gain					
Initial Value@25℃	±15 ±45/G	±5 ±15/G	±15 ±45/G	±0.5±4.5/G	[mV]max
To Temperature Flacutuation (0～70℃)	±10 ±30/G	±10 ±30/G	±10 ±30/G	—	[uV/℃]
To Temperature Flacutuation (−25～85℃)	±10 ±50/G	±10 ±50/G	±10 ±50/G	±2±18/G	[uV/℃]
※For Reference Output Offset Voltage(G=1)	±60	±20	±60	±5	[mV]max
※For Reference Output Offset Voltage(G=100)	±1545	±515	±1545	±55	[mV]max
Rated Output Voltage					
Output Voltage @RL=2kΩ	±10	±10	±10	±10	[V]min
Output Impedance	1	1	1	1	[Ω]max
Output Ripple Voltage (BW=100kHz)	10	10	10	10	[mVpp]max

Comparison Data to Another Maker （NO.4）

MODEL	Another Maker A	Another Maker B	Another Maker C	LX210	Unit
Isolated Output					
Output Voltage (No Load)	±15	±15	±15	±15	[V]
Accuracy	±10	±10	±10	±10	[%]
Current	±5	±5	±5	±5	[mA]
Regulation Vin = 15V Load Fluctuation: No Load to Full Load ※Full Load (Voss, − Voss, Viss, −Viss Each 5mA)	—			-5	[%]
Regulation Input Fluctuation: Vin = 13.5V～16.5V	—			±2	[%]
Ripple				±100	[mV]
Powe Supply					
Rated Voltage (Guaranteed Specification Value)	15V±5%	15V±5%	15V±5%	15V±10%	
Rated Voltage (Guaranteed Working Value)	15V±5%	15V±10%	15V±10%	15V±10%	
Powe Supply Current (at No Working)	50	50	50	40	[mA]
Powe Supply Current (at Full Load and Full Signal Working)	80	80	80	80	[mA]
Temperature Range					
(Guaranteed Specification Value)	-25～85	-25～85	-25～85	-25～85	[℃]
(Guaranteed Working Value)	-40～85	-40～85	-40～85	-40～85	[℃]
(Storage)	-40～85	-40～85	-40～85	-40～85	[℃]
RoHS	No Support			Support	
Size	25.4×53.3×8.9			25×53×12.5	[mm]

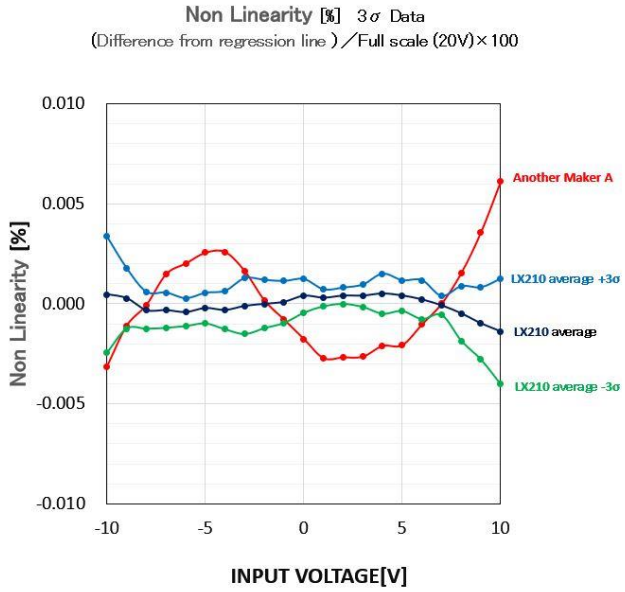
Comparison Measured Data to Another Maker （NO.1）

sample number of another Maker is 1ps　　LX210 is 5ps.

Non Linearity

The ideal Isolation Amplifier shall obtain surely proportionated Output Voltage(y) to Input Voltage(x). But actually there are errors based on offset or Characteristics.

Non-linearity here means finding the optimum straight line with the least error from the data of each input voltage and output voltage, calculating how much error there is from that straight line, and dividing by the full scale (Best straight line method).



The right side graph is comparison data between another maker , 5 pcs average and average± 3 σ of LX210 at 25℃.

※σ is standard deviation. Average ±3σ means include 99.73% of all sampling data

➔ Namely only 2.7 pcs are excluded in 1000 pcs.

Comparison Measured Data to Another Maker （NO.2）

sample number of another Maker is 1ps　　LX210 is 5ps.

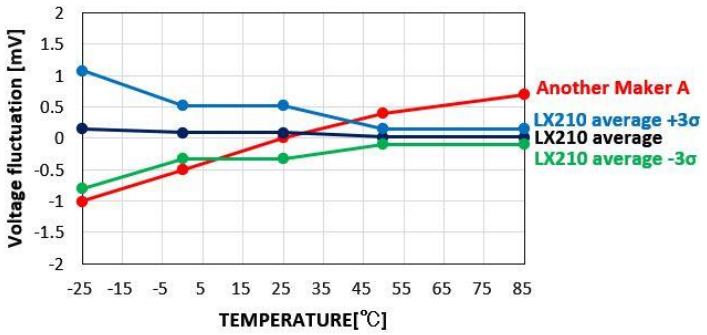
Temperature Drift （Output voltage）

Fluctuation of Output Voltage by temperature

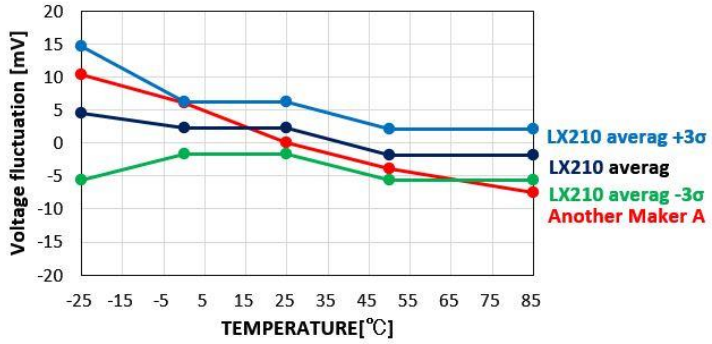
（Gain = 1）

Temperature Range is from −25℃ to 85℃

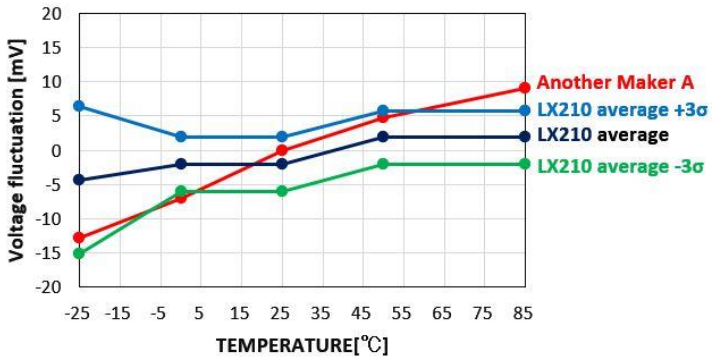
INPUT 0V



INPUT +10V



INPUT −10V



Comparison Measured Data to Another Maker （NO.3）

sample number of another Maker is 1ps　　LX210 is 5ps.

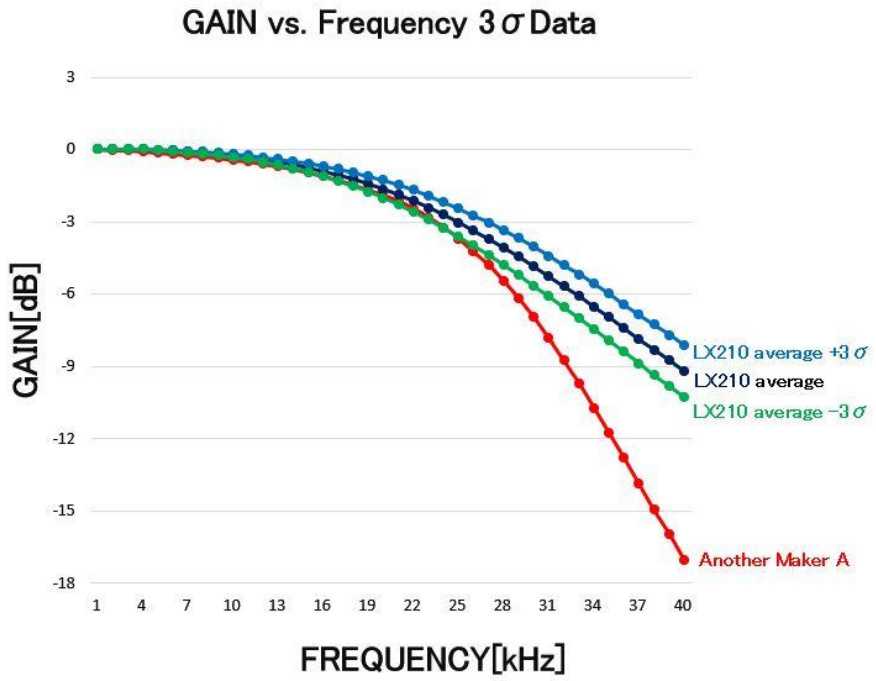
Frequency Characteristics

Output Voltage Response to Input Frequency

Condition

Gain = 1, Vin = ±5V, Sine wave, −3dB

Sample	Band width[kHz]
Another Maker A	25.94
LX210_No1	26.92
LX210_No2	26.37
LX210_No3	27.12
LX210_No4	27.11
LX210_No5	27.98
LX210 average	27.10
σ	0.518
3σ	1.553



Comparison Measured Data to Another Maker （NO.4）

sample number of another Maker is 1ps　　LX210 is 5ps.

Current Consumption

■Input Voltage 0V

Condition

Gain = 1

±Viss=±Voss=0mA

Power Supply Voltage = 15V

Temperature ＝ 25℃

Sample	Current Consumption [mA]
Another Maker A	26.67
LX210_No1	29.43
LX210_No2	28.90
LX210_No3	29.70
LX210_No4	29.95
LX210_No5	29.79
LX210 average	29.55
σ	0.37
+3σ	30.65
−3σ	28.45

■Input Voltage 0V Viss Full load

Condition

Gain = 1

±Viss=±Voss=±5mA

Power Supply Voltage = 15V

Temperature ＝ 25℃

Sample	Current Consumption [mA]
Another Maker A	52.88
LX210_No1	60.11
LX210_No2	59.60
LX210_No3	60.33
LX210_No4	60.59
LX210_No5	60.74
LX210 average	60.27
σ	0.40
+3σ	61.47
−3σ	59.08

■Input Voltage 10V

Condition

Gain = 1

±Viss=±Voss=0mA

Power Supply Voltage = 15V

Temperature ＝ 25℃

Sample	Current Consumption [mA]
Another Maker A	26.86
LX210_No1	32.23
LX210_No2	31.48
LX210_No3	32.46
LX210_No4	32.70
LX210_No5	32.41
LX210 average	32.26
σ	0.42
+3σ	33.50
−3σ	31.01

■ Input Voltage ±10V, Sine wave

Condition

Gain = 1

±Viss=±Voss=0mA

Power Supply Voltage = 15V

Temperature ＝ 25℃

Sample	Current Consumption [mA]
Another Maker A	48.57
LX210_No1	43.84
LX210_No2	42.90
LX210_No3	43.87
LX210_No4	44.08
LX210_No5	43.48
LX210 average	43.63
σ	0.41
+3σ	44.88
−3σ	42.39

Comparison Measured Data to Another Maker （NO.5）

sample number of another Maker is 1ps　　LX210 is 5ps.

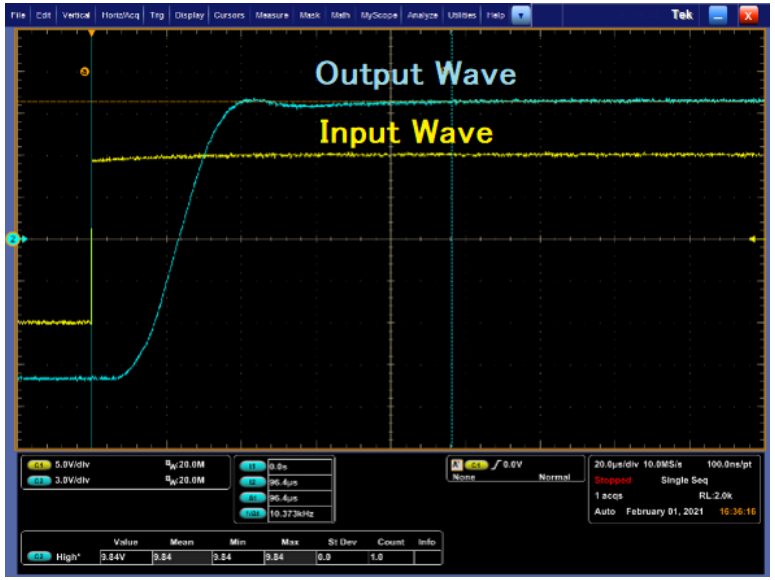
Output Rising waveform（Output rise up wave When Input Wave apply Square wave）

Input Voltage = ±10V, 100Hz Square Wave, Room Temperature, Gain = 1,

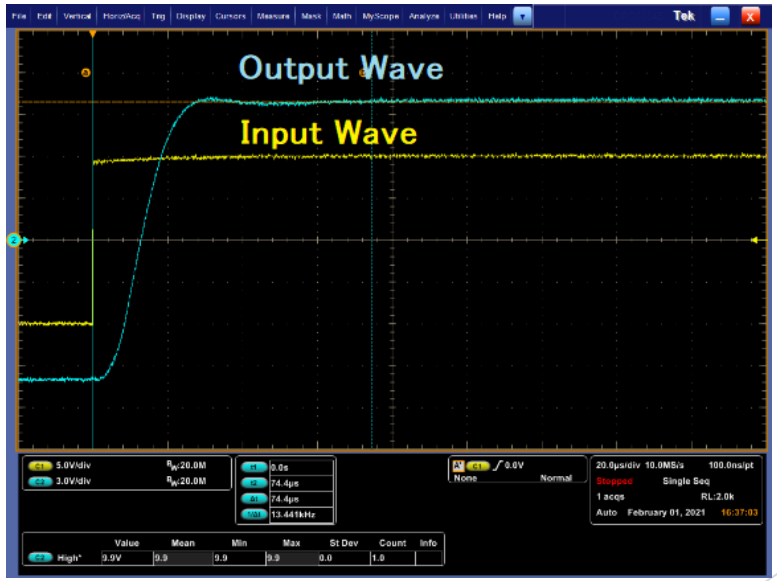
Yellow：Input Wave (5V/div)　Blue：Output Wave (3V/div)

Horizontal axis：20usec/div

Another Maker A



LX210



Inquiry

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