

DATE : March 11, 2016

MODEL : LX0402H

## SPECIFICATION

### 1. SUMMARY

This specification is applied to Isolation Amplifier for  
MODEL LX0402H

### 2. MODEL NAME

LX0402H



### 3. OUTLINE

Model LX0402H is an amplifier of 3-PORTS, small size and high voltage withstand. Output portion has a buffer amplifier for current amplifier.

Isolation withstand voltage between Input and Output is guaranteed continuous 5kv p-p at AC or DC.

Non-linearity is  $\pm 0.05\%$  (max) at full scale.

Gain is 1 when No.2 -pin is open, 10 times when No.1-pin and No.2-pin are connected, and adjustable within 1 to 10 times when a resistor is inserted between No.1-pin and No.2-pin.

Common Mode Rejection Ratio (CMRR) between Input and Output is 110dB (typical).

This Model has an isolated power supply for driving another device. Output offset voltage is zero adjustable with an external 50K potential meter.

Dimension is 38(W) x 38(L) x 10(H) mm

This Model is suitable especially for Medical and Industrial instrument application.

### 4. Feature

Isolation Withstanding Voltage	5kvp-p at continuous AC or DC 5kvrms at 1 minute
Non-Linearity	$\pm 0.05\%$ (MAX)
Gain	1 ~ 10 (V/V)
Common Mode Rejection Ratio (CMRR) between Input and Output	110dB (typical)
Dimension (molded case)	38(W) x 38(L) x 16(H) mm

## 5. Absolute Maximum Rating

Power Supply Voltage	1 6 . 5 V
Common Mode Input Voltage	5 K V
Operating Humidity	Less than 90%Rh
Operating Temperature	- 1 0 ~ 7 0
Storage Temperature	- 2 5 ~ 8 5
Max Soldering Temperature	2 6 0 1 0 Sec

6. Electronic Characteristics (  $T_a = 25$  , Power Supply Voltage = 1.5 V )

ITEM	SYMBOL	CONDITION	MIN	TYPICAL	MAX	UNIT
Input Offset	$V_{io}$			Remarks 1		mV
Temperature Drift	$V_{io}/T$				$\pm 100$	$\mu V/$
Power Supply Drift	$V_{ios}/V^+$				$\pm 0.1$	mV/%
Input Bias Current	$I_B$	Initial			7	nA
Temperature Drift	$I_B/T$	$T_a = -10 \sim 70$		$\pm 0.1$		nA/
Input		Differential		$10^7$		
		Common Mode		$5 \times 10^{10}$		

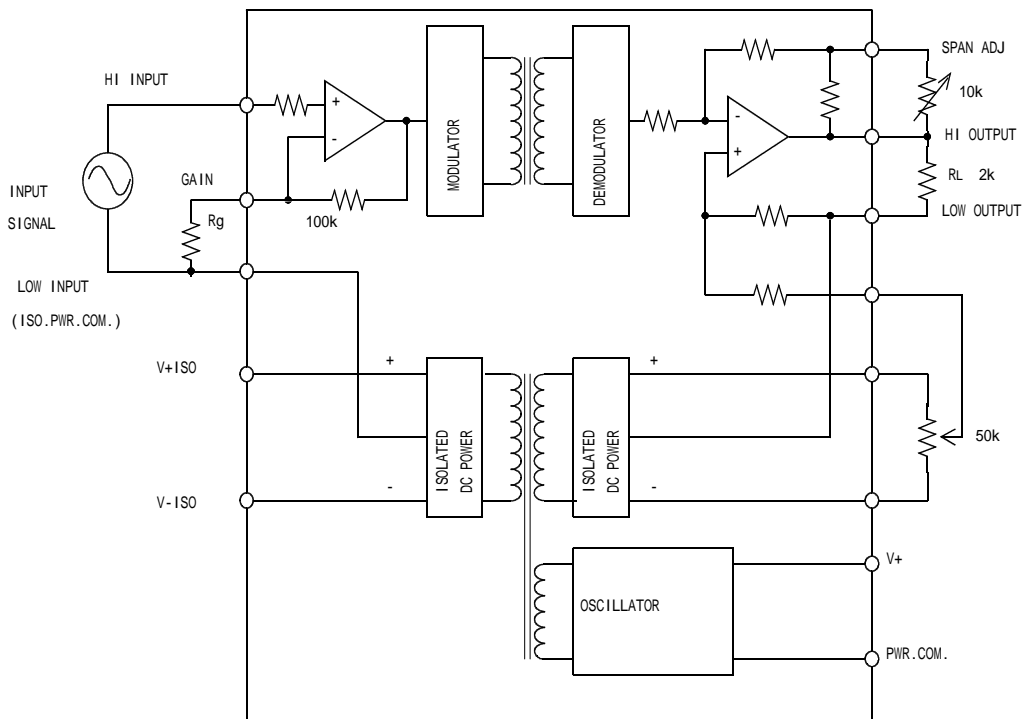
ITEM	SYMBOL	CONDITION	MIN	TYPICAL	MAX	UNIT
Linear Differential Input Voltage	$V_{CM}$	$G = 1$	$\pm 10$			V
Max Differential Input Voltage	$V_{DF}$	Continuous	30			V <sub>rms</sub>
		Pulse Width 10mS f=0.1Hz	6500			V <sub>pk</sub>
Max Common Mode Input Voltage	$V_{CM}$	50HZ,60HZ, 1 minutes	5000			V <sub>rms</sub>
		Continuous (PULSE)	5000			V <sub>pk</sub>
		Continuous (DC)	5000			V
Common Mode Rejection Ratio	CMRR	$V_{inAC}=110V$ f=50Hz 60Hz		110		dB
Gain Range	GR		1 ~ 10			V/V
Gain Calculation			$G=1+100K /RG$			V/V
Gain Error	GE			Remarks2		%
Non-Linearity	NL	$V_0 = \pm 10V$	$\pm 0.02$	$\pm 0.05$		%
		$V_0 = \pm 5V$	$\pm 0.02$	$\pm 0.05$		%

ITEM	SYMBOL	CONDITION	MIN	TYPICAL	MAX	UNIT
Gain-Temperature Drift	G/ T	T a = 0 ~ 70		± 0.02	± 0.05	%/
Max Output Voltage	V o		± 10			V
Output Impedance	Z o				10	
Output Ripple Voltage	V RI	1MHz Band Width			50	mVpp
Max Output Current	I o				5	mA
Small Signal Frequency Response	f s	G=1 ~ 10, -3dB	3.5	4		KHz
Max Output Frequency	f c	G = 1	3.5	4		KHz
Srue Rate	S R			0.2		mV/ μ s
Isolated Power Supply Voltage	V ISO ±	V=15V No Load			± 15	V
Accuracy				± 1	± 2	%
Load Balance		I iso = 0 ~ 100%		2	8	%
Ripple Voltage		1MHz Band Width		20	30	mVP-P

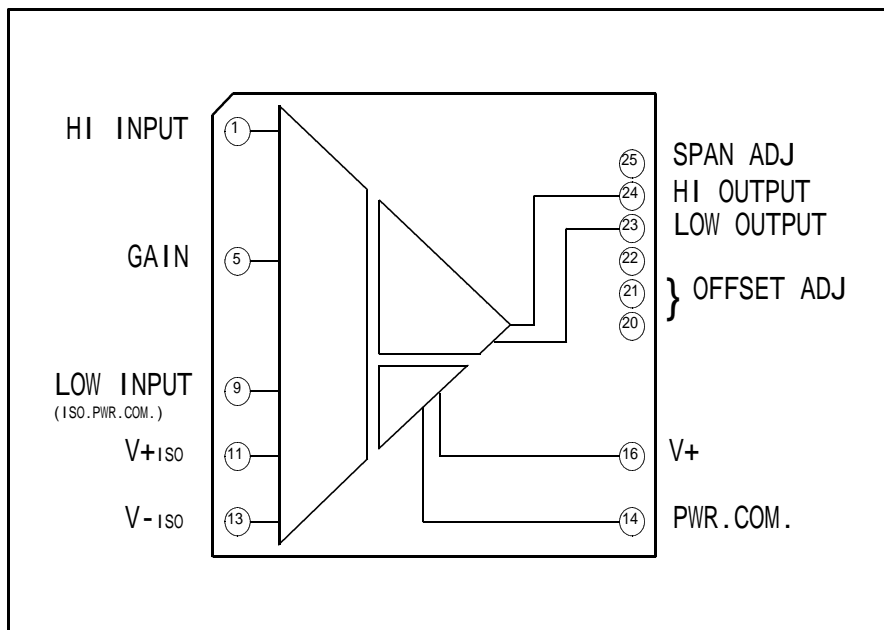
ITEM	SYMBOL	CONDITION	MIN	TYPICAL	MAX	UNIT
Isolated Power Supply Current	$I_{iso}^{\pm}$		5			%
Power Supply Voltage Range	V +		13.5	15	16.5	V
No Load Current Consumption	$I_Q$	$V^+ = 15V$		25	35	mA
Stray Capacity	Input-Output			20		pF
	Input-Power Supply			10		pF
	Output-Power Supply			10		pF
Weight				28		g

Remark 1 2 0 adjustable See page-8.

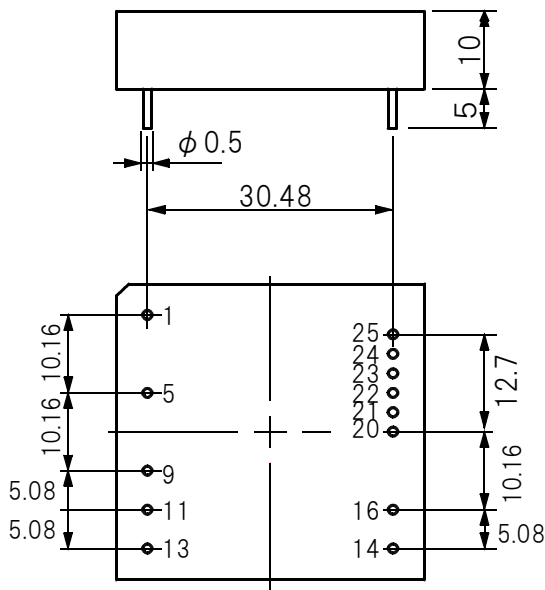
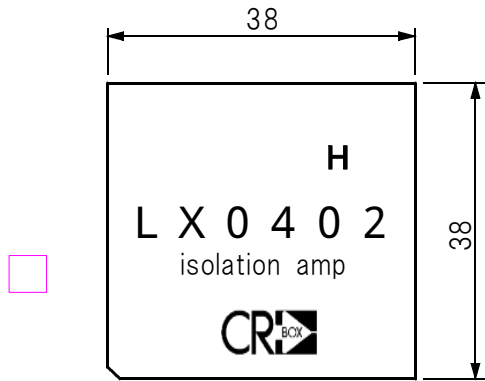
7. Block Diagram



8. Pin Assignment ( BOTTOM VIEW )



1 0 . Dimension



PIN connection

- 1 : HI INPUT
- 5 : GAIN
- 9 : LOW INPUT
- 11 : V<sup>+</sup> ISO
- 13 : V<sup>-</sup> ISO
- 14 : PWR COM.
- 16 : V<sup>+</sup>
- 20 : OFFSET ADJ
- 21 : OFFSET ADJ
- 22 : OFFSET ADJ
- 23 : LOW OUTPUT
- 24 : HI OUTPUT
- 25 : SPAN ADJ

No number indicion

## 11. HOW TO USE

### 11.1 3 Ports Isolation Amplifier

3 Ports Isolation Amplifier is absolute isolated device between input and output, Power Supply and Amplifier.

Model LX0402H is separated between Input Circuit and Power Supply and Output Circuit by special designed Transformer.

Those portion keep  $V_{cm}$  5000 Vpk in case of Continuous, AC or DC.

Therefore Output Signal is isolated from Power Supply and if you adjust Output Offset to zero and Span of Output Voltage, this device keeps the specifications.

As Output Signal is amplified up to  $\pm 5mA$  by Operational Amplifier, the device can drive directly load resistor of more than 2 K

### 11.2 Offset adjustment and Span adjustment

SPAN adjustment shall connect between 24 and 25 PIN with a potential meter at full scale.

As the output of the amplifier get  $\pm 10V$ , full scale shall be  $\pm 10V$ .

OFFSET of Output can be adjustable to zero with 20 21 22 PINs.

As isolated Output Voltage gets between 20 and 21 PIN, Offset adjustment shall be done at +IN side of the amplifier balancing with 50K of a potential meter.

### 11.3 INDUCTION

Input Stage composes a bipola operational amplifier.

As the impedance of between 1 and 5 PIN is very high, those stage affects with outer induction.

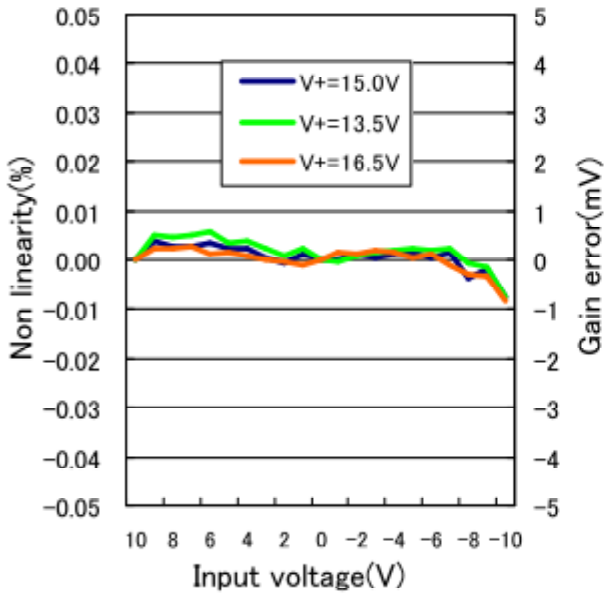
If you use this amplifier, take care outer induction and use shield plate around it.

Especially the resistor  $R_G$  for gain control shall put near the device.

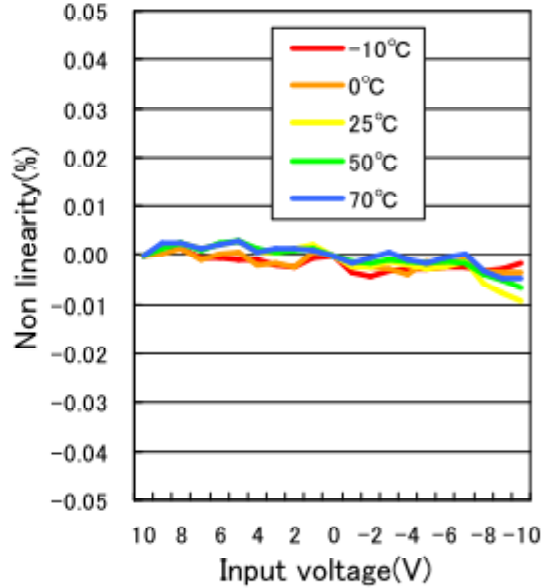


13 Characteristics

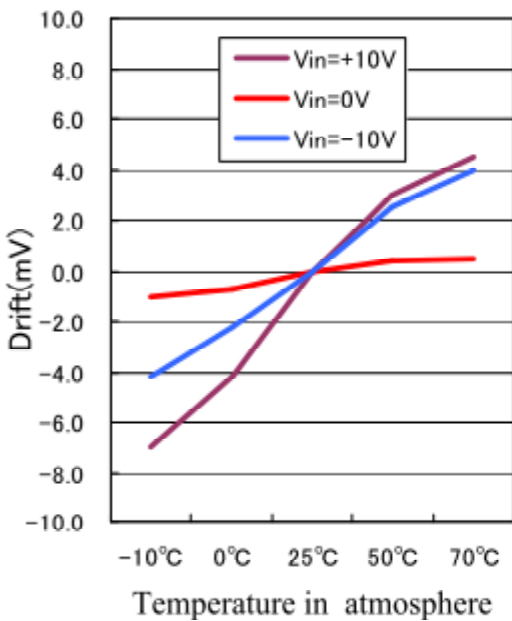
Non linearity - Power supply voltage



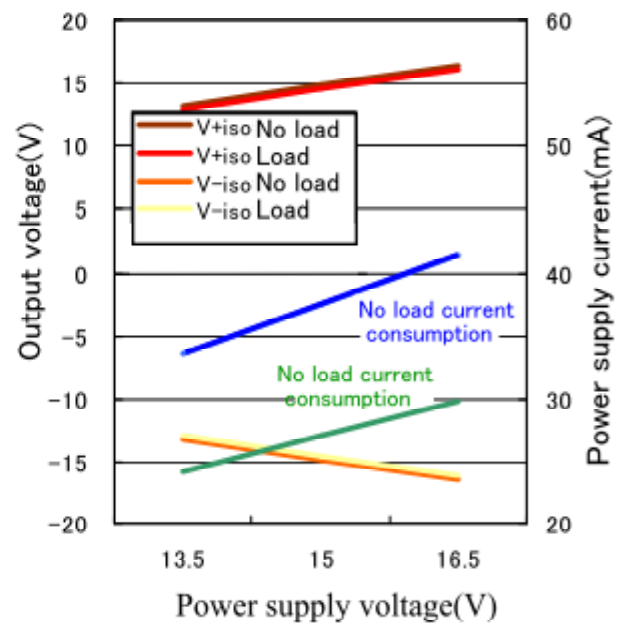
Non linearity - Temperature in atmosphere



Offset span - Temperature in atmosphere



Isolated Power supply • Current consumption  
— Power supply voltage



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