

SPECIFICATION

1. SUMMARY

This specification is applied to Isolation Amplifier for
MODEL LX384

2. MODEL NAME

LX384

3. OUTLINE

Model LX384 is an amplifier of small size and high voltage withstand. Isolation withstand voltage between Input and Output is guaranteed continuous 5kV p-p at AC or DC.
Non-linearity is $\pm 0.05\%$ (typical) 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 114dB(typical), CMRR between Input and Guard is 78dB(typical).
This Model has an isolated power supply for driving another device.
Dimension is 38(W) x 38(L) x 16(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	$\pm 0.05\%$ (typical)
Gain	1~10 (V/V)
Common Mode Rejection Ratio (CMRR) between Input and Output	114dB(typical)
Common Mode Rejection Ratio (CMRR) between Input and Guard	78dB(typical)
Isolated Power Supply	$\pm 8.5V$ 5mA
Dimension (molded case)	38(W) x 38(L) x 16(H) mm

5. Absolute Maximum Rating

Power Supply Voltage	15.5V
Common Mode Input Voltage	5KVrms
Operating Temperature	0°C ~ 70°C
Storage Temperature	-20°C ~ 85°C
Max Soldering Temperature	260°C 10 Sec

6. Electronic Characteristics (Ta = 25°C, Power Supply Voltage = 15V)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	Viso	(1)		±(5+20/G)		mV
Temperature Drift	ΔViso/ΔT	Ta=0~70°C		±(1+150/G)		μV/°C
Input Bias Current	IB	Initial			7	nA
Temperature Drift	ΔIB/ΔT			±0.1		nA/°C
Input Impedance	ZIN	Differential		1G // 70		Ω // PF
		Over Load		300		KΩ
		Common Mode		50G // 20		Ω // PF

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS	
Linear Differential Input Voltage		$G = 1$	± 5			V	
Max Differential Input Voltage	VDF	Continuous (AC, DC)	240			V _{rms}	
		Pulse Width 10mS f=0.1Hz	6500			V _{pk}	
Max Common Mode Input Voltage Input or Guard to Output	VCM	50HZ, 60HZ, 3 minutes	5000			V _{rms}	
		Continuous (AC, DC)	5000			V _{pk}	
Common Mode Rejection Ratio	CMRR	V _{cm} =110V f=50Hz 60Hz	Input-Output (2)		114		dB
			Input-Output (3)	100			dB
			Input-Guard (4)		78		dB
Leak Current	IL	Input- grand (Power Supply) (5)			2	μ Arms	
Gain Range	GR		1 ~ 10			V/V	
Gain Calculation			$G=1+100K\Omega / (10.7K\Omega +RG)$			V/V	
Gain Error	GE			± 3		%	
Non-Linearity	NL			± 0.05		%	

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Gain-Temperature Drift	$\Delta G / \Delta T$	$T_a = 0 \sim 70^\circ\text{C}$		± 0.0075		$\% / ^\circ\text{C}$
Gain-Long Term Change Drift	$\Delta G / \Delta T$			± 0.001		$\% / 1000\text{h}$
Max Output Voltage	V_o	$R_L = 50\text{K}\Omega$	± 5			V
Output Impedance	Z_o			1		$\text{K}\Omega$
Output Ripple Voltage	VRI	1MHz Band Width		5		mVpp
Small Signal Frequency Response	f s	$G = 1 \sim 10, -3\text{dB}$		1		KHz
Max Output Frequency	f c	$G = 1 \sim 10$		500		Hz
Slue Rate	S R			25		$\text{mV} / \mu\text{s}$
Recovery Time	t REC	$\pm 6500\text{V}$ Pulse Differential Input		200		ms
Input Noise Voltage	V N	$G = 10, f = 0.05\text{Hz} \sim 100\text{Hz}$			8	μVpp
		$G = 10, f = 10\text{Hz} \sim 1\text{KHz}$			10	μVrms
Input Noise Current	IN	$f = 0.05\text{Hz} \sim 100\text{Hz}$		5		pApp

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Isolated Power Supply Voltage Accuracy Load Balance Ripple Voltage	V ISO \pm	$\pm 5\text{m A Load}$		± 8.5		V
				± 5		%
		Iiso = 0~100%		15		%
		100KHz Band Width		100		mVpp
Isolated Power Supply Current	Iiso		5			mA
No Load Current	IQ			14		mA
Power Supply Voltage Range	V+		12	15	15.5	V

(1) 0 adjustable See page-8.

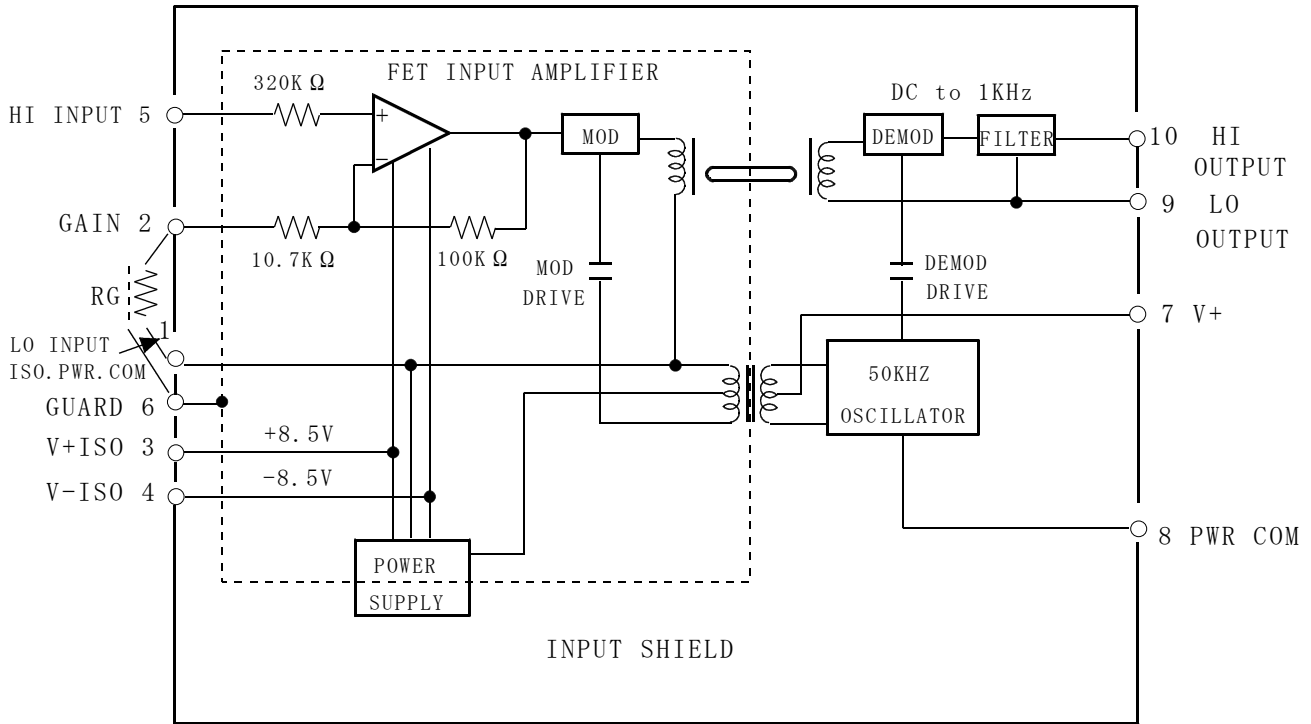
(2) Source impedance shall be balanced

(3) Source impedance shall be 5K Ω unbalanced

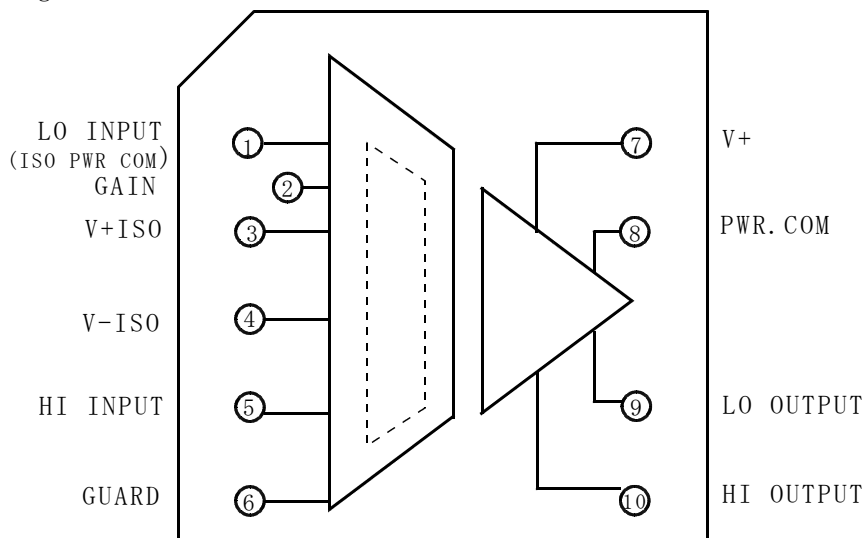
(4) Source impedance shall be 1K Ω unbalanced

(5) 110V f=50Hz, 60Hz

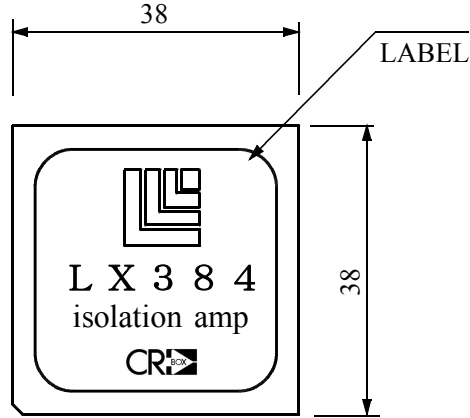
7. Block Diagram



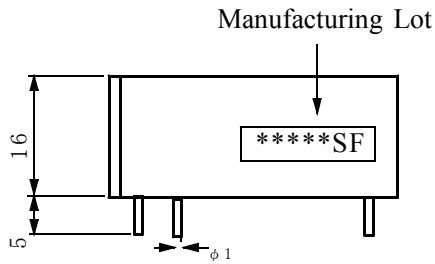
8. Pin Assignment



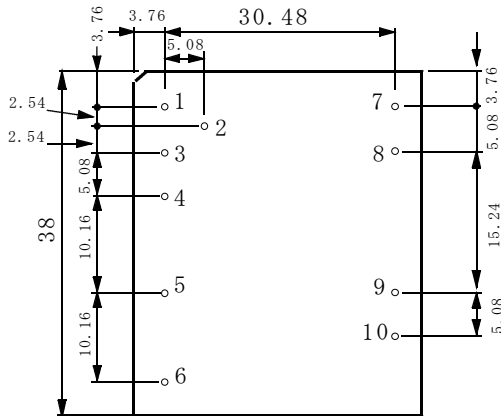
9. Dimension



UNIT : mm
 ALLOWANCE : ±0.5
 MATERIAL
 CASE : EPOXY RESINS
 LABEL : PET
 PIN : 1 φ BRASS covered
 with solder plate
 INSIDE : MOLDED
 RESIN



*****SF
 Lead Free
 manufacturer
 serial No.
 month
 year



PIN No.	SIGNAL
1	LO INPUT
2	GAIN
3	V+ISO
4	V-ISO
5	HI INPUT
6	GUARD
7	V+
8	PWR.COM
9	LO OUTPUT
10	HI OUTPUT

10. HOW TO USE

10.1 GAIN CALCULATION

This Model LX384 can easily adjust the gain between 1 to 10 by adding a resistor.

If you connect the resistor R_G between PIN-1 and PIN-2, Gain G will be as follows:

$$G = 1 + \frac{100K \Omega}{10.7K \Omega + R_G} \quad (1)$$

When $G = 1 V/V$, PIN-2 shall be open.

When $G = 10 V/V$, PIN-1 and PIN-2 shall be connected.

Because this R_G will be sensitive for induction, it's effective to guard in order to keep high CMRR.

The gain accuracy of this model is $\pm 3%$ (typical) and temperature drift is $\pm 0.0075\%/^{\circ}C$ (typical), but those are affected by characteristics of R_G . We recommend to use R_G same quality as metal oxide resistor like 1% and 50ppm.

10.2 ADJUSTMENT of OFFSET

OFFSET of Output can be adjustable to zero in the range of 1 to 10V/V gain as FIG-1, but additional voltage of $\pm 15V$ is required.

If you need floating Output of PWR-COM, connect $0.1 \mu F$ condenser with DC50V withstanding between LO OUTPUT and PWR COM.

10.3 INDUCTION

This model has protection resistor of $320K \Omega$ at HI-INPUT.

This resistor works to limit differential current up to saturation of operational amplifier in case of Input high voltage.

operational amplifier in input stage is FET which is non-reverse input circuit.

Input Stage is floating type by PIN-6 (Guard PIN).

As mentioned above, R_G is easily affected, therefore we recommend to guard by PIN-6 in order to keep high CMRR, also to decrease input cable capacitance (See Fig.-1).

10.4 ISOLATE POWER SUPPLY

You can use floating power supply of $\pm 8.5V$ between PIN-3(V+iso) and PIN-4(V-iso).

Maximum Current is $\pm 5mA$.

Operation Voltage of this model is covered from +12V to +15.5V.

Therefore, when 15V is applied, $\pm 8.5V$ of Viso can be obtained,

This power can be used as an amplifier, a transducer, a bridge for input floating signal.

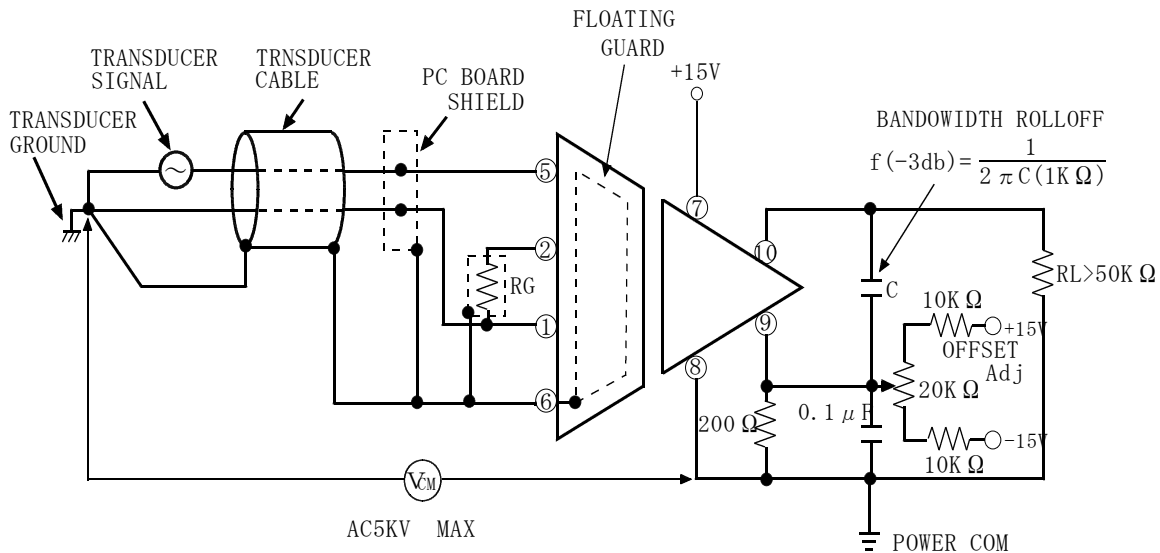


FIG-1 CIRCUIT DIAGRAM

11. CAUTION

- 11.1 When you connect reverse polarity at power supply, this device will be broken.

12. WARRANTY (DOMESTIC ONLY)

- 12.1 Warranty is expired at 2 years after delivery. During this period We will replace new device or repair it without charge in case of manufacture's fault clearly.