

Messrs.

SPECIFICATION

Integrated Pressure Sensor

Model No.: **XFPMC-250KPAR**

Distributor :

Project: _____

Reference: _____

O. Kitamura

Fujikura Ltd.

1. General;

This document details the performance specifications of FUJIKURA's XFPMC-250KPAR, high level output, on-chip signal conditioned, temperature compensated and calibrated pressure transducers.

2. Principle;

FUJIKURA's integrated semiconductor pressure sensor has four pressure sensitive piezoresistors which are formed on the diaphragm surface of a silicon chip. This chip includes a constant current drive circuit, signal amplification circuitry and resistors for calibration of offset and sensitivity and temperature compensation. These are achieved using silicon planer technique.

When the applied pressure deforms the diaphragm, the piezoresistors change their resistance due to the piezoresistance effect. The resistance change of the four resistors, which constitute a wheatstone bridge circuit, results in a pressure proportional voltage because there is an internally supplied constant current excitation. The surrounding circuit then amplifies the low-level voltage to provide a linear, repeatable high-level output voltage.

3. Pressure range & rating;

Model	Rated (Measureable) pressure range
XFPMC-250KPAR	20 ~ 250 kPa·Absolute

4. Package outline dimensions, Electrical pin connections, Marking and Weight;

Refer the attached drawings.

The following table shows the drawing No.

Model	Package outline dimensions	Electrical pin connections	Marking
XFPMC-250KPAR	No.9-751-090	No.9-751-051	No.9-751-089

Weight	approximately 1.2g
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Table shown below is revision records of this specification

Rev.3	12/6/11	O. Kitamura	Pressure media	(C)
Rev.2	02/5/07	H. Nishida	Maximum load pressure 500kPa => 600kPa	(B)
Rev.1	02/4/01	H. Nishida	Revise accuracy	(A)
Est.	01/10/1	M.Sato		
	Date	Name	Comments	Remark

5. Absolute maximum rating;

Item	Symbol	Rating	Unit
Maximum load pressure	Pmax+	600 (B)	kPa·abs.
Maximum input voltage	Vccmax	8	VDC
Compensated temperature range	Topt1	0 ~ 85	°C
Operating temperature range	Topt2	-40 ~ 125	°C
Storage temperature range	Tstg	-40 ~ 125	°C
Insulation durability	—	AC500V, 1minute.	
Insulation impedance	—	100MΩ min. (DC500V)	

6. Recommended operating conditions;

Item	Symbol	Condition	Unit
Rated pressure	Popt	20 ~ 250	kPa·abs.
Type of pressure	—	Absolute	
Pressure media	—	Media compatible with LPG&CNG (C)	
Supply Voltage (const.)	Vcc	5.0±0.25	VDC

7. Electrical characteristics;

(Vcc=5VDC constant, ambient temperature Ta =25°C)

Item	Symbol	Rating	Note
Power consumption	Icc	10 mA max.	
Output impedance	Imp	10Ω max.	
Source current	Isource	0.2 mA max.	
Sink current	Isink	2mA max.	
Offset voltage	Voff	0.2±0.1125V	※1
Output voltage at full scale	Vfs	4.7±0.1125V	※1
Output span voltage	SV	4.5 V	
Accuracy	Error	±5kPa (20~140kPa) ±3.5% reading (140~250kPa)	※ 1,2 (A)
Response time	Tr	1 ms. typ.	※3

- Notes;** 1) The error excludes the ratio metric effect of changes in input voltage. The output of XFPM sensors is ratio metric within this specified excitation range of 4.75 to 5.25 volts. See transfer function as follows.
- 2) Accuracy consists of the following: Non-linearity, temperature errors over the temperature range 0°C to 85°C, pressure hysteresis and calibration error (sensitivity and offset) in the pressure range between 20kPa-abs and 250kPa-abs.
- 3) Response time is defined as the time for the change in output voltage from 10% to 90% of its final value when the input pressure make a step change.

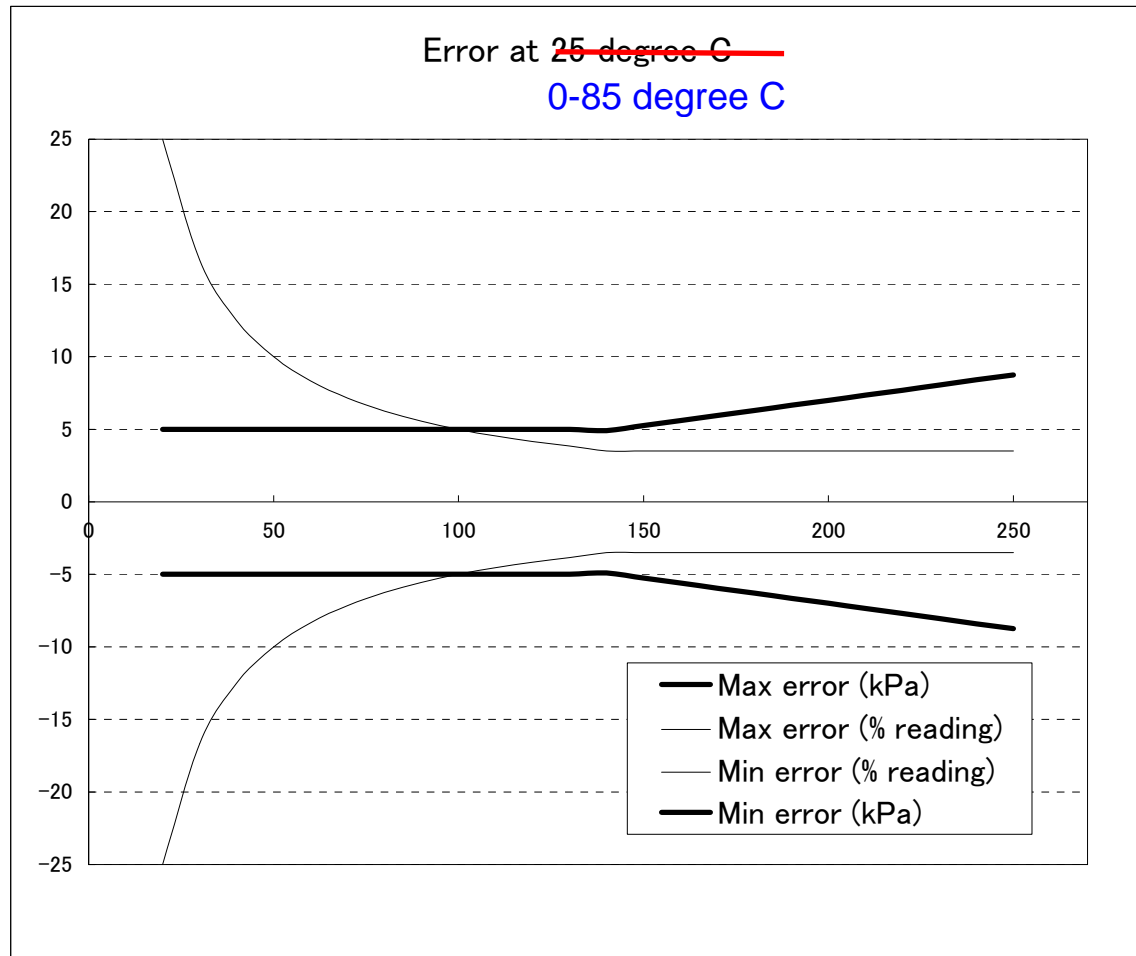


Figure. 1

8. Transfer Function;

$$V_{out} = V_s \times (P \times \alpha + \beta) \pm (\text{Pressure Error} \times \text{Temperature Error Multiplier} \times \alpha \times V_s)$$

$V_s = 5.0 \pm 5\%$ (V) : As above equation, the output voltage (V_{out}) depends on the power supply voltage V_s (retiometric) within +/-5% of V_s change.

P = Input Pressure (kPa· Absolute)

Model	Pressure Range	α	β	Pressure Error (kPa)
XFPMC-250KPAR	20-250kPa abs.	0.003913	-0.03826	5.750 between 20kPa-abs and 250kPa-abs only

Temperature Error Multiplier

5 between 20-140 kPa-abs
 Pressure (kPa) x 0.035 between 140-250kPa-abs
 Pressure Error should follow Figure 1 in Chapter7

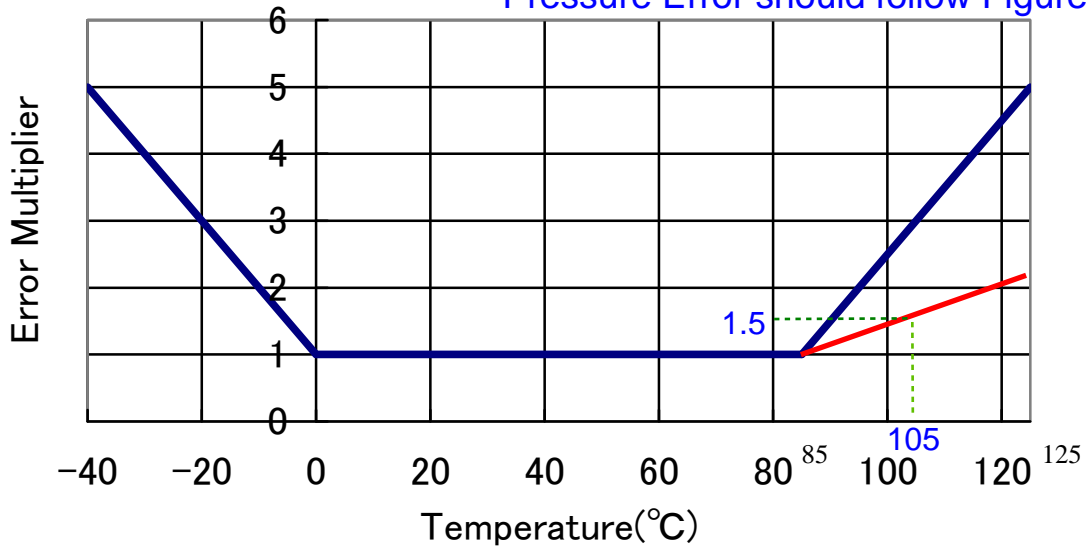
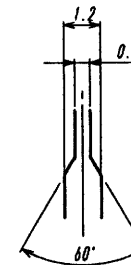
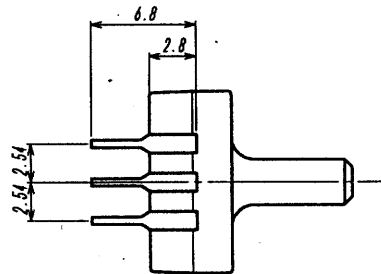
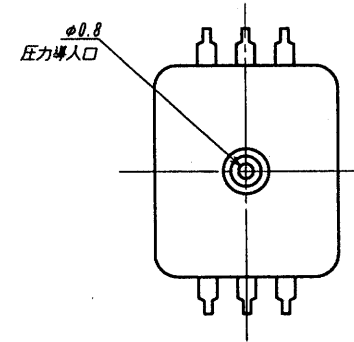
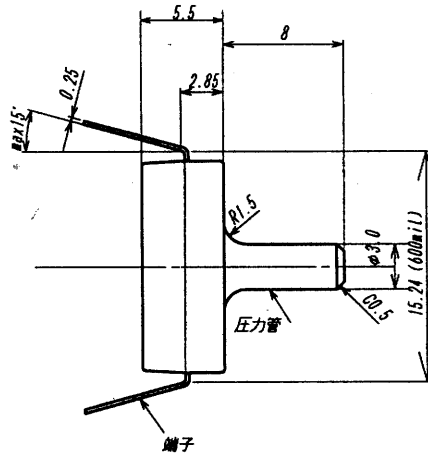
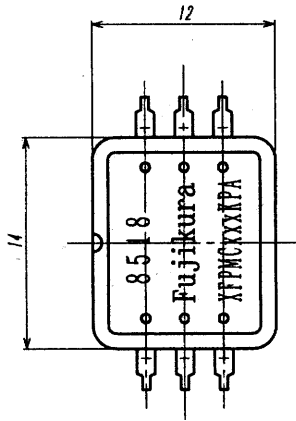


Figure 2



PART NO.	部品名 NAME OF PART	材質 MAT'L	個数 QTY.	摘要 REMARKS
PROJECT NAME:				
第3角法 3RD ANGLE PROJECTION	名称 TITLE			
単位 UNITS mm	XFPMC-XXXXPAR 外形图 Package outline diagram			
尺度 SCALE FREE				
DATE OF ISSUE 10/05/01	図面番号 DRAWING NO.			REV. MARK
DATE OF DESIGN 10/05/01	9-751-090			◇

承認 APPROVED BY
K. NURI

検図 CHECKED BY
R. Nagano

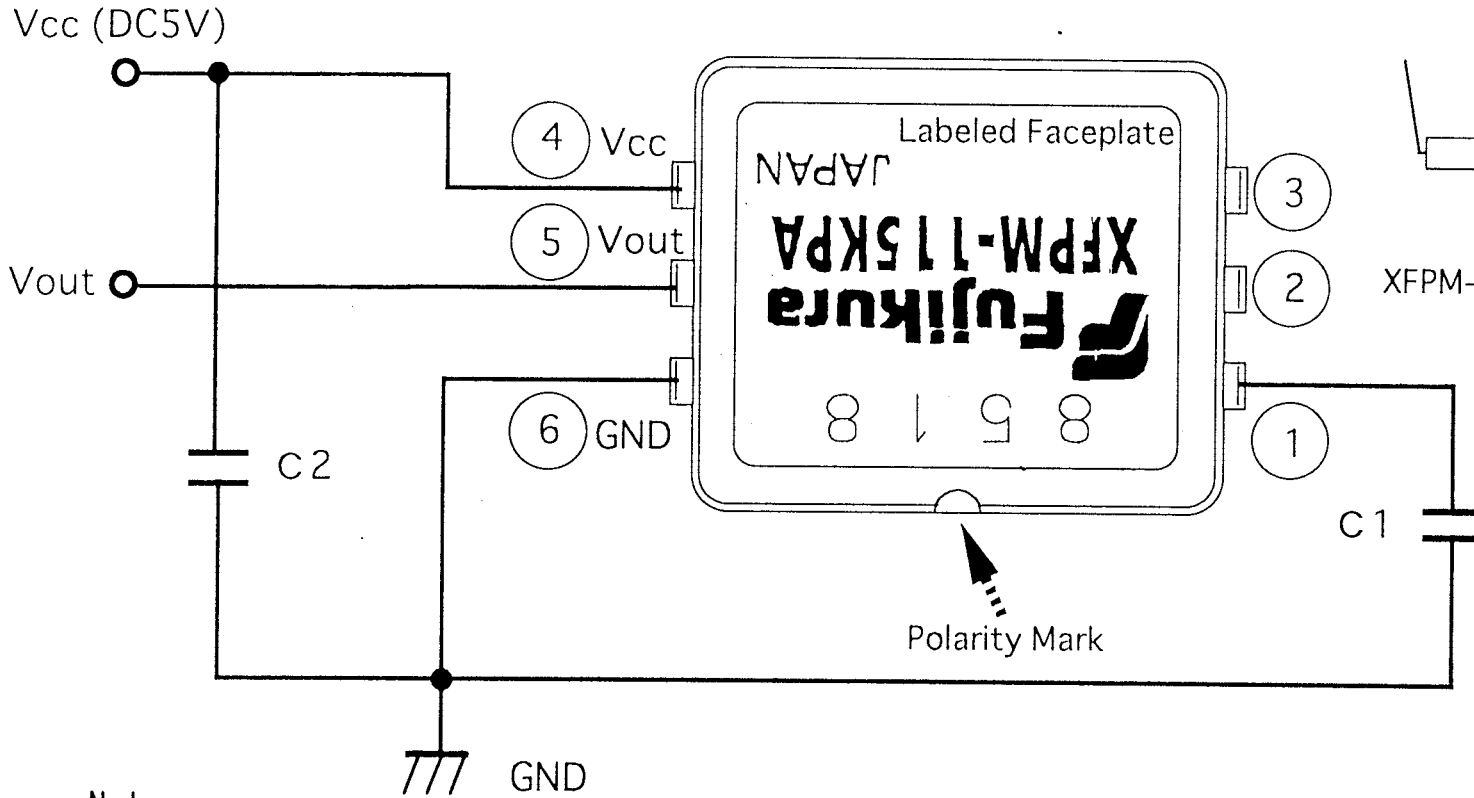
設計 DESIGNED BY
M. Sato

製図 DRAWN BY
M. Sato

 **フジクラ**
Fujikura Ltd.
Tokyo Japan

◇	変更 REVISIONS	年月日 DATE	変更者 BY
MARK			

rev.1 DC3V FOR X3PM-xxxKPA(R)



Notes;

- 1) C1 : Connect 680pF within 2cm from the sensor.
- 2) C2 : Connect 0.01 μ F within 2cm from the sensor.
- 3) Do not connect anything with No.2 and No.3.
And do not connect each other.

Rev (B) : Delete the pull up resistor connected between pin No.4 and No.5.

PART NO.	部品名 NAME OF PART	材質 MAT'L	個数 QTY.	摘要 REMARKS
PROJECT NAME :				
第3角法 3RD ANGLE PROJECTION	名称TITLE XFPM-115KPA(R) series			
単位UNITS mm	Pin connection diagram			
尺度SCALE	図面番号DRAWING NO.			
DATE OF ISSUE 06/29/00	9-751-051			REV. MARK B
DATE OF DESIGN 06/29/00				

ADD DISCRPTION FOR X3PM-xxxKPA(R)	9/27/06	H. N	フジクラ Fujikura Ltd. Tokyo Japan
MARK 変更 REVISIONS	年月日 DATE	変更者 BY	

承認APPROVED BY K. Nuri	検図CHECKED BY M. Hashimoto
設計DESIGNED BY K. Ito	製図DRAWN BY M. Hashimoto

8518
 Fujikura
 XFPMCXXXKPA

ロット番号 : Lot No.

8518

年 Year
 8 : 1998y, 9 : 1999y, 0 : 2000y

月 Month
 1~9 : Jan.~Sep., X : Oct., Y : Nov., Z : Dec.
 (10月) (11月) (12月)

日 Day
 01~31 : 1st~31th

型式 : Model

XFPMC-250KPA(R)
 XFPMC-300KPA(R)
 XFPMC-400KPA(R)

PART NO.	部品名 NAME OF PART	材質 MAT'L	個数 QTY.	摘要 REMARKS
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PROJECT NAME :

第3角法 3RD ANGLE PROJECTION	名称 TITLE
単位 UNITS	XFPMC-XXXKPA(R)
mm	Marking Diagram
尺度 SCALE	

承認 APPROVED BY K. Nuri	検図 CHECKED BY R. Nagano
設計 DESIGNED BY M. Sato	製図 DRAWN BY M. Sato

DATE OF ISSUE 09/12/2001	図面番号 DRAWING NO. 9-751-089	REV. MARK
DATE OF DESIGN 09/12/2001		

◇				 フジクラ Fujikura Ltd. Tokyo Japan
MARK	変更 REVISIONS	年月日 DATE	変更者 BY	