



2001年3月15日

No. VTF-7542

株式会社東北フジクラ 殿

## 仕様書

品名: Piezoresistive Pressure Sensor

型名: XFAM-250KPASR

顧客名: Pewarton AG

他社への販売可。

件名:



株式会社フジクラ

機器電材事業部 センサ技術部

承認	照査	担当



V-7542

### 1. General ;

This document details the performance specifications of FUJIKURA's XFAM-250KPASR, high level output, absolute, 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 whetstone 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 (Measurable) pressure range
XFAM-250KPASR	20 ~ 250 kPa · Absolute

Table shown below is revision records of this specification

V				
IV				
III				
II				
Rev.I				
Est.	2001.3.15	T.Takizawa		
	Date	Name	Remarks	Mark



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#### 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
XFAM-250KPASR	No.9-757-029	No.9-757-032 A	No.9-757-067

Weight	approximately 0.3g
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#### 5. Absolute maximum rating ;

Item	Symbol	Rating	Unit
Maximum load pressure	Pmax+	375	kpa·abs.
Maximum input voltage	Vccmax	8	VDC
Compensated temperature range	Topt1	10 ~ 40	°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	—	Non-corrosive gases	
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	10 Ω max.	
Source current	Isource	0.02 mA max.	
Sink current	Isink	2 mA max.	
Offset voltage	Voff	0.2±0.040 V	※1



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Output voltage at full scale	Vfs	4.7 ± 0.040 V	※1
Output span voltage	SV	4.5 V	
Accuracy	Error	± 0.3psi	※1, 2
Response time	Tr	1 ms. typ.	※1, 3

**Notes;**※1) The error excludes the ratio metric effect of changes in input voltage.  
 The output of XFAM sensors is ratio metric within this specified excitation range of 4.90 to 5.10 volts.  
 See transfer function as follows.

- ※2) Accuracy consists of the following: Non-linearity, temperature errors over the temperature range 10 to 40°C, pressure hysteresis and calibration (sensitivity and offset).
- ※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.

**8. Transfer Function ;**

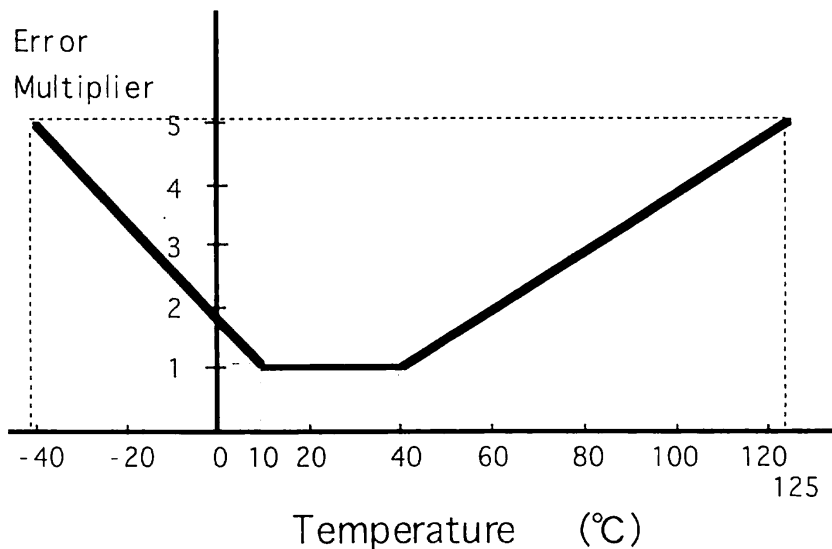
$$V_{out} = V_s \times ((P \times \alpha) + \beta) \pm (\text{Pressure Error} \times \text{Temperature Error Multiplier} \times \alpha \times V_s)$$

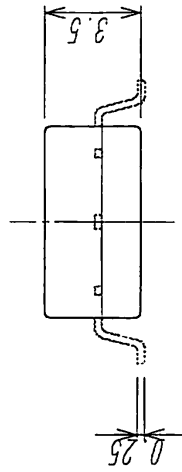
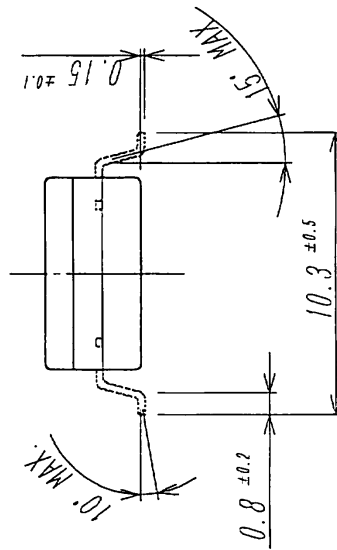
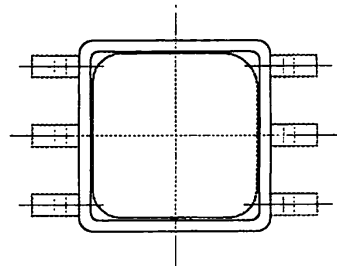
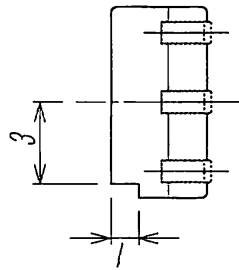
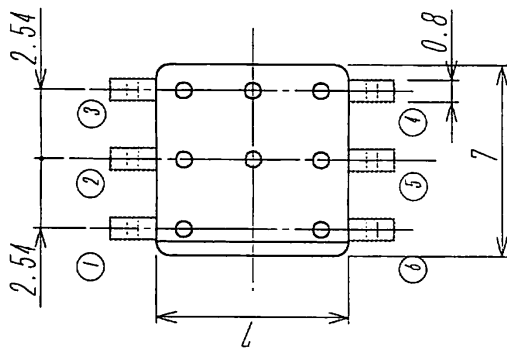
$V_s = 5.0 \pm 2\% (V)$ : The output voltage ( $V_{out}$ ) changes linearly with the power supply voltage  $V_s$  given  $4.90V \leq V_s \leq 5.10V$ .

$P$  = Input Pressure (kPa·Absolute)

Model	Pressure Range	$\alpha$	$\beta$	Pressure Error (kPa)
XFAM-250KPASR	20 ~ 250kPa·abs.	0.003913	-0.03826	2.069 between 5psi abs. And 27psi abs. only

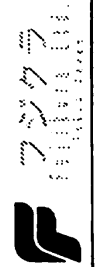
Temperature Error Multiplier





PART NO.	部品名	材質	個数	摘要
NAME OF PART	XFAM			REMARKS
PROJECT NAME: FAM and XFAM series				
第3角法	名称TITLE			
単位UNIT	外形寸法図			
mm	Outline Diagram			
尺数SCALE	図面番号DRAWING NO.			
4:1	9-757-029			
DATE OF ISSUE	DATE OF ISSUE			
7-7-1998	3-31-1998			

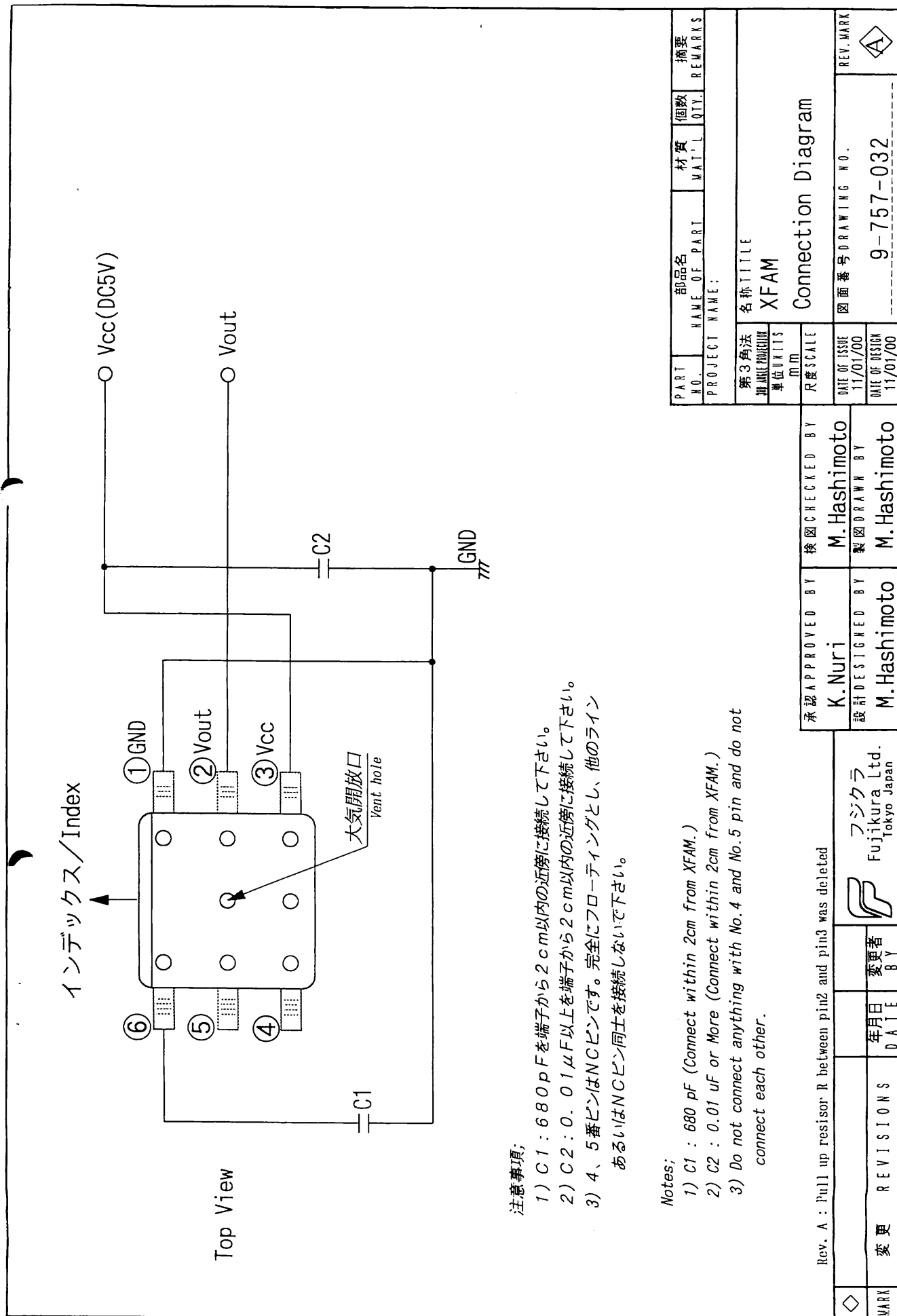
承認 APPROVED BY	検図 CHECKED BY
K. NURI	R. Nagano
設計 DESIGNED BY	製図 DRAWN BY
S. Suzuki	S. Suzuki



変更者 BY  
年月日 DATE

変更 REVISIONS	
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インデックス/Index

8126  
XFAM  
250A

ロット Lot No.

8126

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

XFAM : XFAM-250KPASR  
250A

PART NO.	部品名 NAME OF PART	材質 MATERIAL	個数 QTY.	摘要 REMARKS
PROJECT NAME:				
第3角法 第三角法 単位 UNITS	名称 TITLE			
mm	XFAM-250KPASR			
尺度 SCALE	Marking Diagram			
DATE OF ISSUE 3/15/01	図面番号 DRAWING NO.			REV. MARK
DATE OF DESIGN 3/15/01	9-757-067			◇
承認 APPROVED BY K. Nuri	検図 CHECKED BY K. Nuri			
設計 DESIGNED BY T. Takizawa	製図 DRAWN BY T. Takizawa			
変更 REVISIONS	年 DATE	フジクラ Fujikura Ltd. Tokyo Japan		
◇	BY			

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