Fujikura

V7400(D)

1. General;

This document details the performance specifications of FUJIKURA's **XFGM-6XXXYPZSR-(TP)** 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 resisters, which constitute a Whaetstone 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
XFGM-6025KPGSR-(TP)	0 ~ +25kPa Gauge
XFGM-6050KPGSR-(TP)	0 ~+50kPa Gauge
XFGM-6100KPGSR-(TP)	0 ~ +100kPa Gauge
XFGM-6100KPGVSR-(TP)	-100 ~ 0kPa Gauge/Negative Pressure
XFGM-6200KPGSR-(TP)	0 ~ +200kPa Gauge
XFGM-6100KPGWSR-(TP) (c)(d)	-100~+100kPa Gauge/Bipolar Pressure
XFGM-6001MPGSR-(TP)	0 ~ +1.0MPa Gauge

Table shown below is revision records of this specification

V				
IV				
III	02.12.20	H. Nishida	Additional description for tape & reel	(d)
II	01.11.30	M.Sato	Addition; XFGM-6100KPGWSR	(C)
Rev.I	00.09.13	M.Hashimoto	Modify; Vccmax, Isource, Isink, pin connection diagram	(B)
Est.	99.07.01	R.Nagano		
	Date	Name	Comments	Remark

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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	Delivery Style
XFGM-6XXXYPZSR	9-757-005	9-757-003-B	9-757-015	Bulk
XFGM-6XXXYPZSR-TP	9-757-005	9-757-003-B	9-757-015	Tape & Reel (d)

Weight	approximately 0.35g

5. Absolute maximum rating;

Item	Symbol	Rating	Unit
Maximum load pressure	Pmax+	Rated Pressure ×2 001MPG:1.5times of Rating	kPa
Maximum input voltage	Vccmax	8 (B)	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	See clause #3	kPa
Type of Pressure	–	Gauge	
Pressure media	–	Non-corrosive gases	
Supply Voltage(const.)	Vcc	5.0±0.25	VDC

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7. Electrical characteristics;

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

Item	Symbol	Rating	Note
Power consumption	Icc	10mA max. (Typ., 7mA)	
Output impedance	Imp	10Ω max.	
Source current	Isource	0.2 mA max. (B)	
Sink current	Isink	2 mA max. (B)	
Offset voltage	Voff	0.2±0.1125V	*1
Output voltage at full scale	Vfs	4.7±0.1125V	*1
Output span voltage	SV	4.5V	
Accuracy	Error	±2.5%FS	*1, *2
Response time	Tr	1ms. typ.	*3

Notes; *1) The error excludes the ratio metric effect of changes in input voltage.

*2) Accuracy consists of the following: Non-linearity, temperature errors over the temperature range 0 to 85°C, pressure hysteresis and calibration error of sensitivity and offset at 25°C.

*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 ;

Vout = Vs× (P×α+β)±(Pressure Error×Temperature Error Multiplier×α×Vs)

※Vs = 5.0 volts

Notes; The output voltage (Vout) is not perfectly ratiometric with the power supply voltage.

※P = Input Pressure (kPa)

Model	Pressure Range	α	β	Pressure Error (kPa)
XFGM-6025KPGSR-(TP)	0 ~ +25kPa	0.036	0.04	0.625
XFGM-6050KPGSR-(TP)	0 ~ +50kPa	0.018	0.04	1.25
XFGM-6100KPGSR-(TP)	0 ~ +100kPa	0.009	0.04	2.5
XFGM-6100KPGVSR-(TP)	0 ~ -100kPa	-0.009	0.04	2.5
XFGM-6200KPGSR-(TP)	0 ~ +200kPa	0.0045	0.04	5
XFGM-6100KPGWSR-(TP)	-100 ~ +100kPa	0.0045	0.49	5
XFGM-6001MPGSR-(TP)	0 ~ +1000kPa	0.0009	0.04	25

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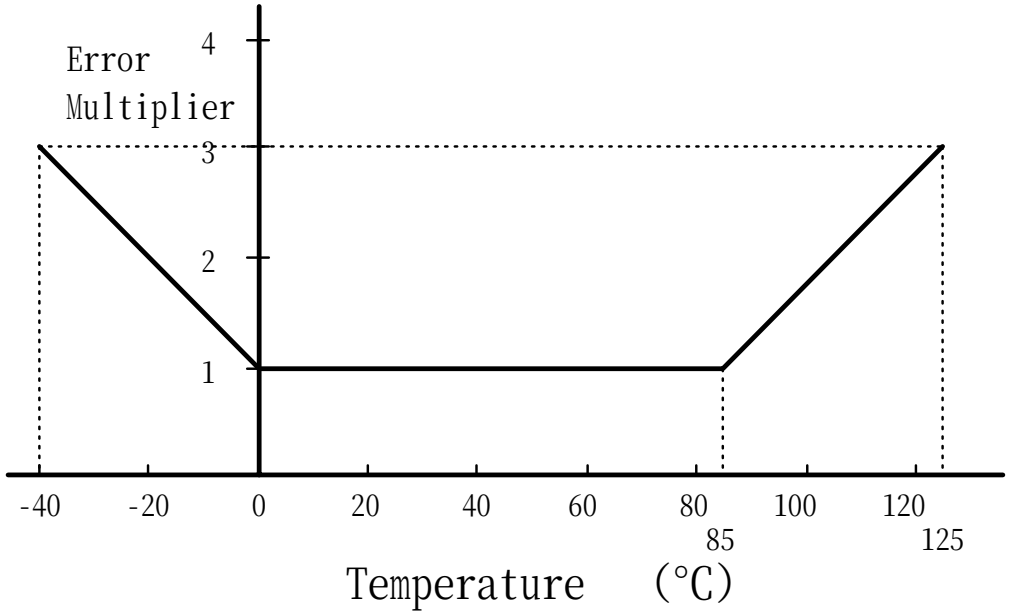
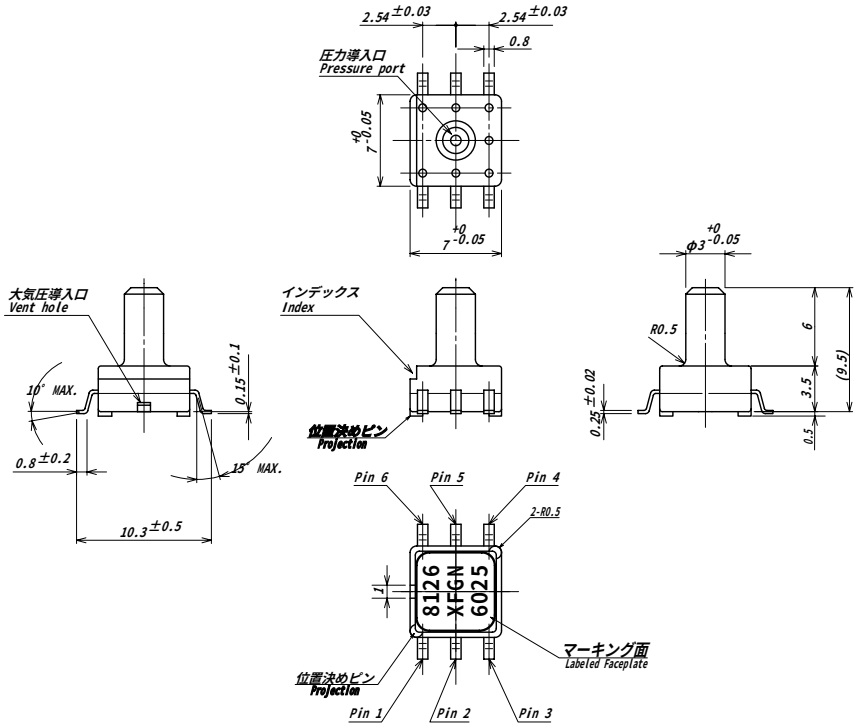
Temperature Error Multiplier





◇ Definition of the model name

package : FGM, FGN ... un-amplified sensor
XFGM, XFGN ... pre-amplified, compensated sensor
FGMC, XFGMC ... applicable for liquid medium

suffix : -AU ... gold plated lead pins, otherwise silver (Ag) plated

MARK	変更 REVISIONS	年月日 DATE	変更者 BY
◇			
◇	Definition of the model name	12-01-01	H. Nishida

フジクラ Fujikura Ltd. Tokyo Japan

承認 APPROVED BY	K.Nuri	検図 CHECKED BY	R.Nagano
設計 DESIGNED BY	S.Suzuki	製図 DRAWN BY	T.Adachi

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 (X)FGM/N-6 Outline Diagram
単位 UNITS mm	
尺度 SCALE Free	
DATE OF ISSUE 01/29/98	図面番号 DRAWING NO. 9-757-005
DATE OF DESIGN 01/29/98	REV.MARK ◇

インデックス／Index

1126
XFGM
3XXXZ

ロット　Lot No.

1126

年　Year
0：2000y,1：2001y,2：2002y

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

XFGM 3XXX	:XFGM-3XXXYPGSR	XFGM 3XXXV	:XFGM-3XXXYPGVSR
XFGM 6XXX	:XFGM-6XXXYPGSR	XFGM 6XXXV	:XFGM-6XXXYPGVSR
XFGN 6XXX	:XFGN-6XXXKPGSR	XFGM 3XXXW	:XFGM-3XXXKPGWSR
		XFGM 6XXXW	:XFGM-6XXXKPGWSR

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
単位UNITS mm
尺度SCALE

名称TITLE
XFGM-3/6, XFGN-6 series
Marking Diagram

MARK	変更 REVISIONS	年月日 DATE	変更者 BY
◇			

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Fujikura Ltd.
Tokyo Japan

承認APPROVED BY	検図CHECKED BY
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設計DESIGNED BY	製図DRAWN BY
H.Konishi	R.Nagano

DATE OF ISSUE 02/09/98
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図面番号DRAWING NO. 9-757-015

REV.MARK ◇C

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