

PRELIMINARY

Notice: This is not a final specification.

Some parametric limits are subject to change.

MITSUBISHI SEMICONDUCTORS

MAS1390P

± 2g ACCELERATION SENSOR

DESCRIPTION

MAS1390P is a ± 2g acceleration sensor .

The sensor element and the signal processing circuit are integrated in one package, it is small and it can be mounted directly on a printed board, so it helps reduce the overall size of the systems.

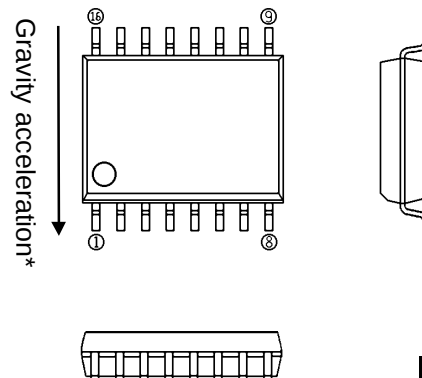
FEATURES

- Capacitive type acceleration sensor
- Output ratiometric to supply
- 16-pin plastic SOP
- Wide operation temperature range, small size and lightweight.

APPLICATION

- Car Navigation
- Projectors
- Virtual Reality Input Devices
- Inclination Meter
- Vibration Measurement
- Velocity and Position Measurement

OUTLINE DRAWING

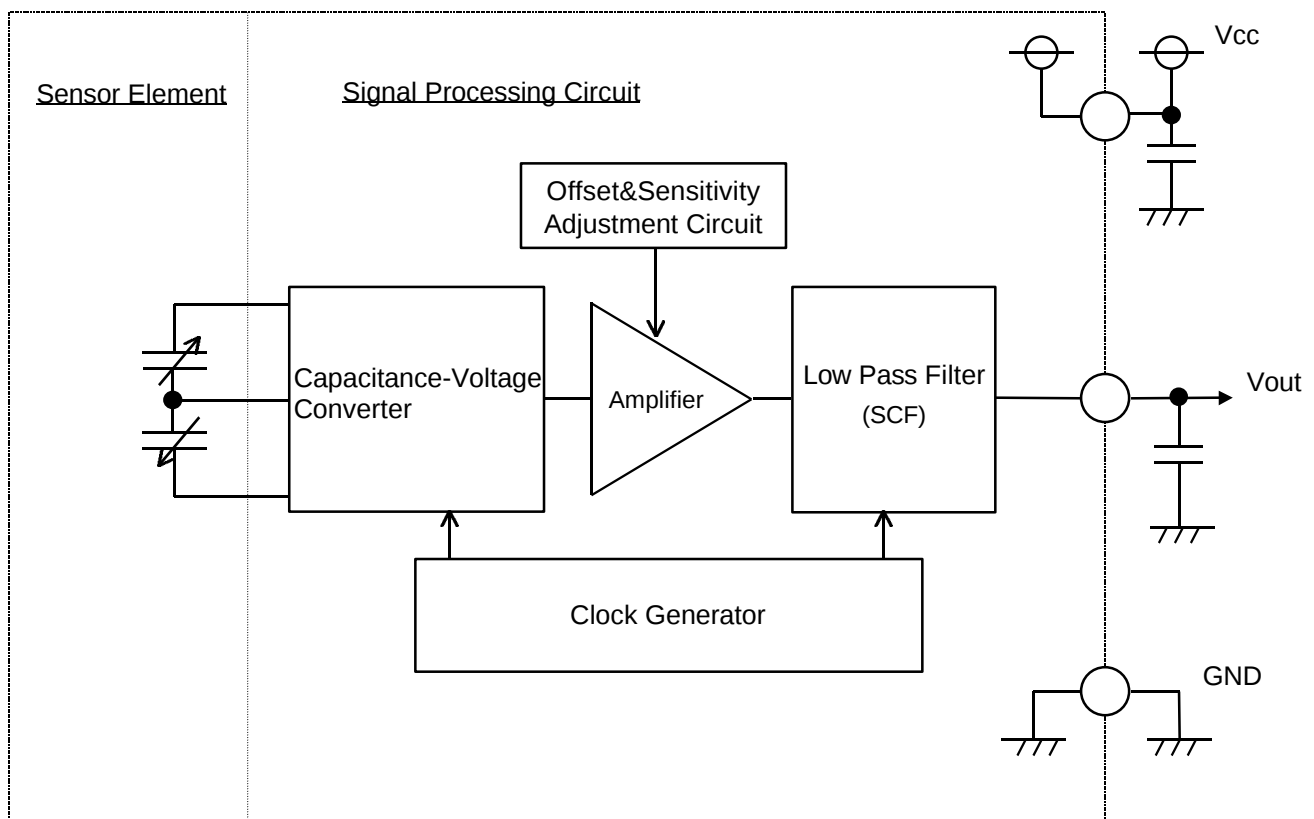


Pin Number			
	NC		NC
	NC		NC
	NC		NC
	NC		NC
	Vout		NC
	NC		NC
	GND		NC
	Vcc		NC

*) In this case sensor's output decreases.
NC: Internal use. Please remain floating.

CIRCUIT DIAGRAMS

Acceleration Sensor



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ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ta()	Ratings	Units
Maximum operating voltage	Vcc(MAX)	25	-0.3 ~ 7	V
Storage temperature	Tstg	-	-40 ~ 105	° C
Maximum operating acceleration	Acc(MAX)	25	± 9800(± 1000)	m/s ² (g)

MAXIMUM RATINGS

Parameter	Symbol	Ta()	Ratings	Units
Operating voltage	Vcc	-30 ~ 85	4.75 ~ 5.25	V
Operating temperature	Topr	-	-30 ~ 85	° C
Rated acceleration	Acc(opr)	-30 ~ 85	typ -19.6 ~ 19.6 (-2 ~ 2)	m/s ² (g)
			min -14.7 ~ 14.7 (-1.5 ~ 1.5)	

ELECTRICAL CHARACTERISTICS(Vcc=5V unless otherwise noted)

Parameter	Symbol	Ta()	Conditions	Min.	Typ.	Max.	Units
Main axis sensitivity	S	25	f=DC	96.9 (970)	102.0 (1000)	107.1 (1030)	mV/(m/s ²) (mV/g)
		-30 ~ 85	f=DC	91.8 (950)	102.0 (1000)	112.2 (1050)	mV/(m/s ²) (mV/g)
Offset voltage	Vo	25	Acc=0m/s ² (0g)	2.300	2.500	2.700	V
		-30 ~ 85	Δ from 25 Acc=0m/s ² (0g)	-1.5	0	1.5	mV/
Upper cut-off frequency	fcH	-30 ~ 85	-	160	-	-	Hz
Output linearity	Lo	25	Acc=-19.6 ~ 19.6m/s ² (-2 ~ 2g)	-2	0	2	%F.S.
Sensitivity ratio between main and other axis	So/S	25	-	-	-	5	%
Output drive capability	Iodc	25	Acc=0m/s ² (0g)	-0.2		0.2	mA
Supply current	Icc	25	Acc=0m/s ² (0g)	-	3.5	5.0	mA
Output noise	No	-30 ~ 85	Acc=0m/s ² (0g) with external capacitors	-	8	15	mVp-p

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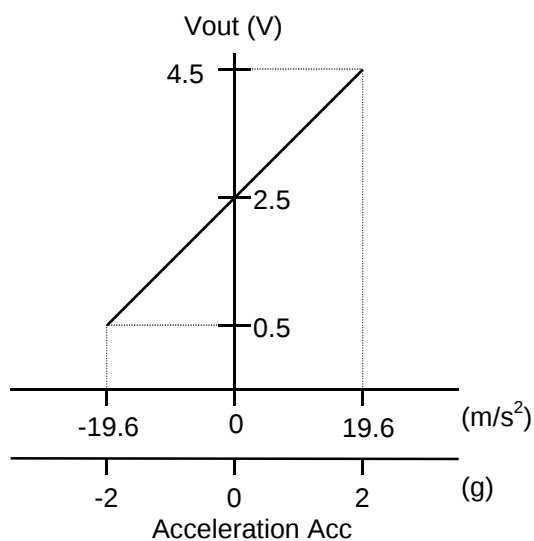
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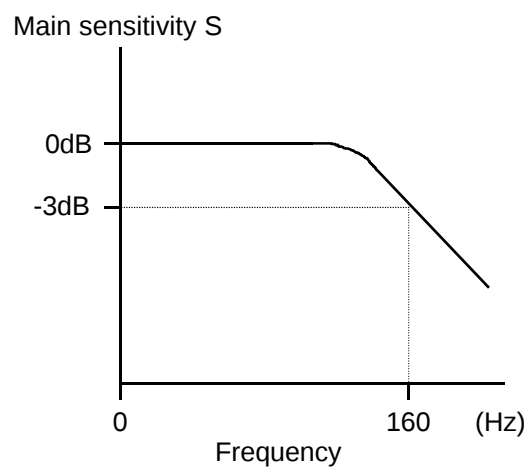
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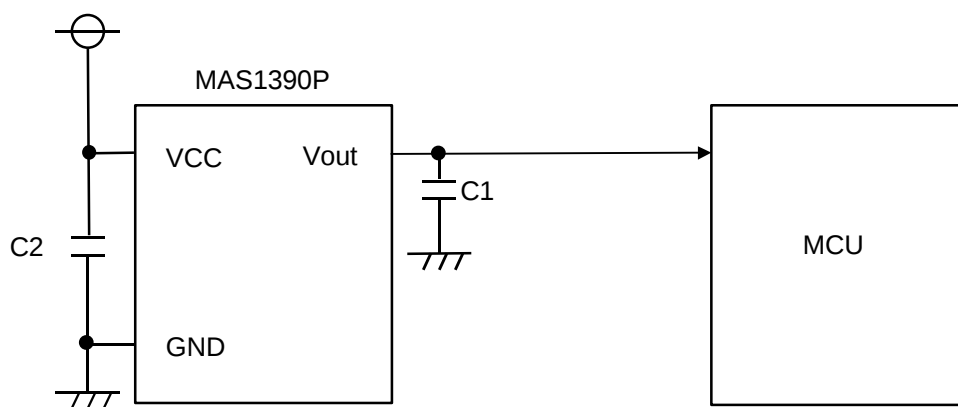
Typical characteristics



Operating frequency range



MEASUREMENT CIRCUIT



C1: 1000pF ceramic capacitor to reduce switching noise

C2: 0.047 μ F ceramic capacitor to reduce switching noise

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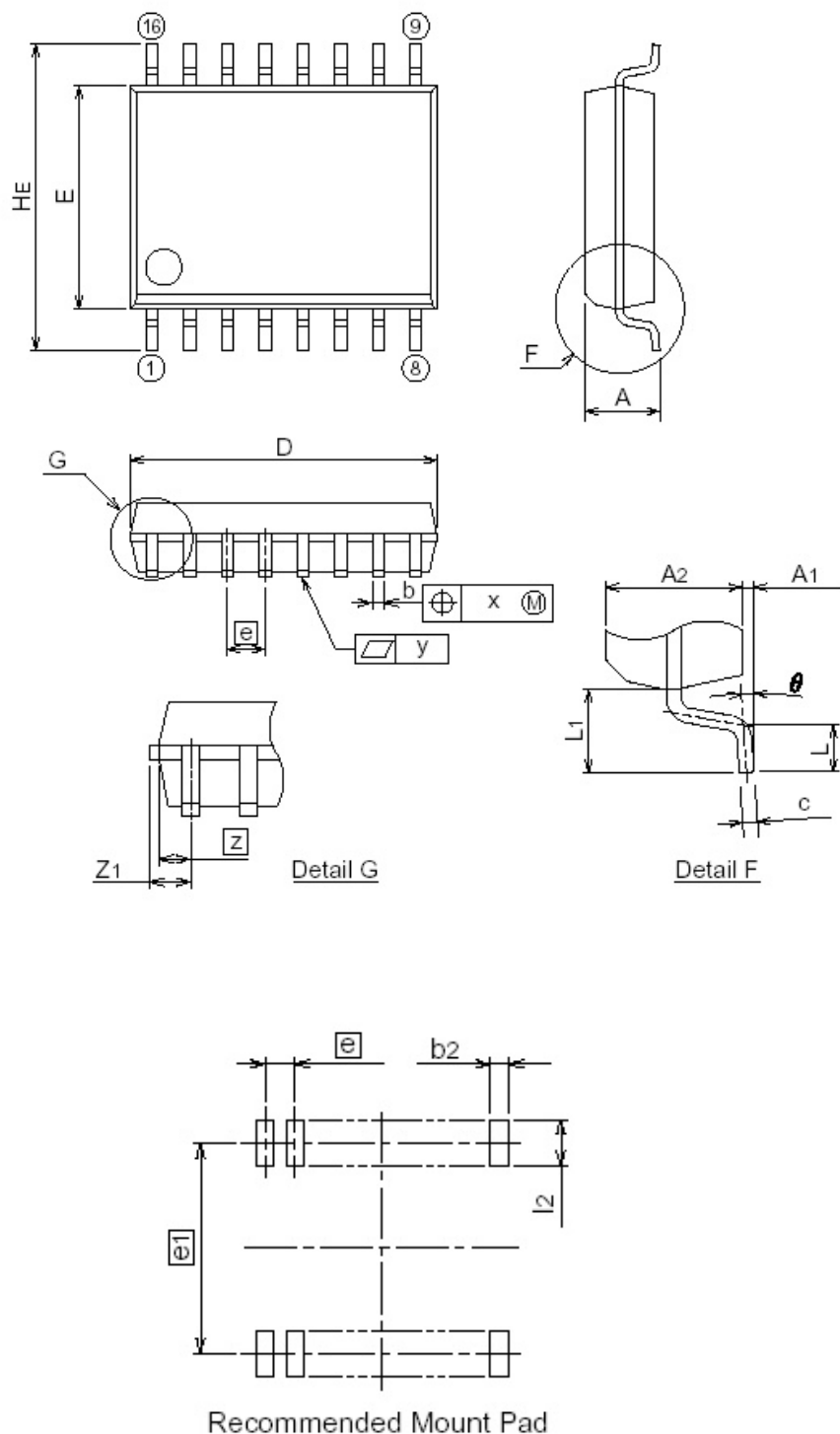
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PACKAGE OUTLINE



Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	—	—	2.65
A1	0.1	0.2	0.3
A2	—	2.3	—
b	0.35	0.4	0.49
c	0.23	0.25	0.3
D	10.2	10.3	10.4
E	7.4	7.5	7.6
e	—	1.27	—
HE	10.0	10.3	10.6
L	0.6	0.8	1.0
L1	—	1.4	—
Z	—	0.705	—
Z1	—	—	0.855
x	—	—	0.25
y	—	—	0.1
θ	0°	—	8°
b2	—	0.76	—
e1	—	9.53	—
l2	1.27	—	—

HANDLING PRECAUTIONS

- (1) If this product is subjected to mechanical shock, it might be damaged. Please handle the device carefully.
- (2) Don't use ultra-sonic wave cleaning, when this product needs to be cleaned.