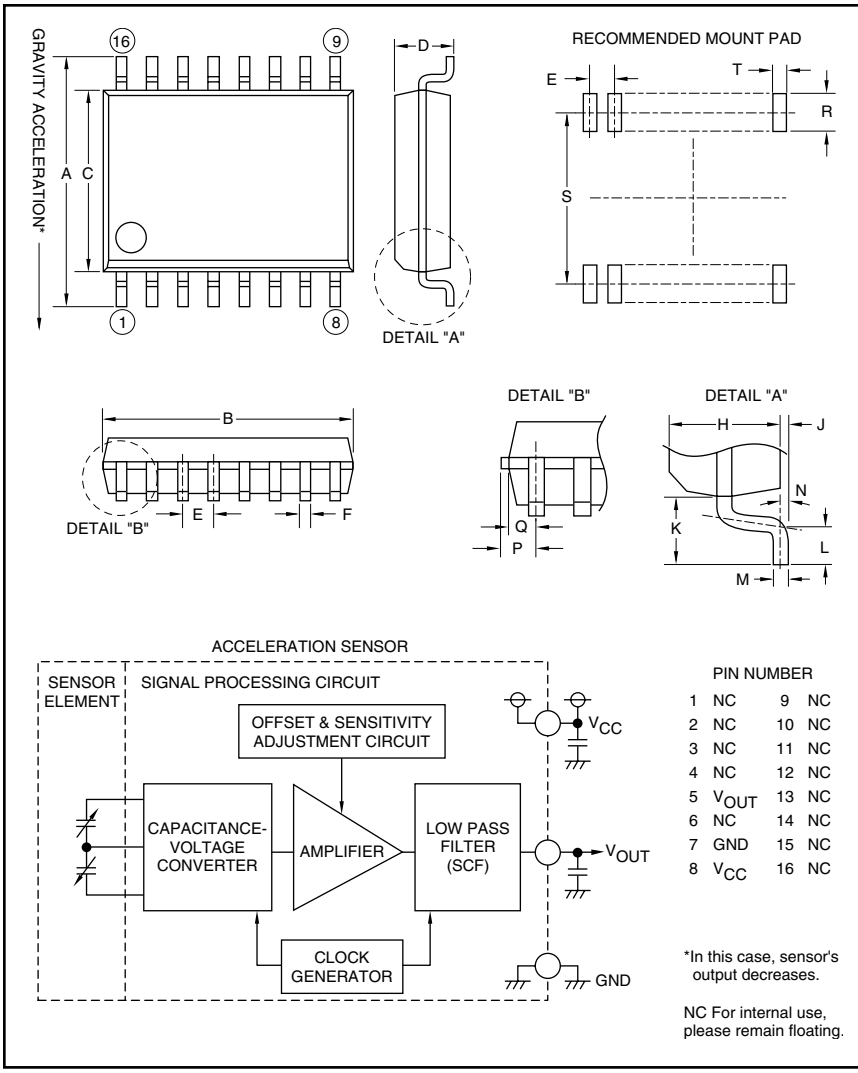
Powerex, Inc., 200 E. Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

MAS1390P

Intellimod™ Module

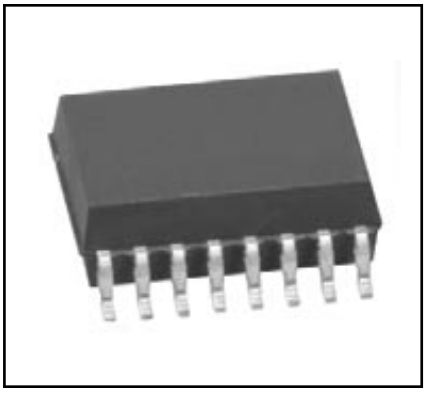
±2g Acceleration Sensor
4.75 – 5.25 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	0.41±0.01	10.3±0.3
B	0.41±0.004	10.3±0.1
C	0.3±0.004	7.5±0.1
D	0.104 Max.	2.65 Max.
E	0.05	1.27
F	0.0165±0.0028	0.42±0.07
H	0.09	2.3
J	0.008±0.004	0.2±0.1
K	0.06	1.4

Dimensions	Inches	Millimeters
L	0.0315±0.008	0.8±0.2
M	0.1±0.002	0.25±0.05
N	8° Max.	8° Max.
P	0.034 Max.	0.855 Max.
Q	0.028	0.705
R	0.05 Min.	1.27 Min.
S	0.375	9.53
T	0.03	0.76



Description:
The MAS1390P is a ±2g acceleration sensor designed so the sensor element and the signal processing circuit are integrated in one package that is small and can be mounted directly on a printed board. This design helps reduce the overall size of the systems.

Features:
- ☐ Capacitive Type Acceleration Sensor
- ☐ Output Proportional to Supply
- ☐ 16-pin Plastic SOP
- ☐ Wide Operation Temperature Range, Small Size and Lightweight

Applications:
- ☐ Inclination Meter
- ☐ Video Projector
- ☐ Car Navigation
- ☐ Virtual Reality Input Devices
- ☐ Vibration Measurement

Ordering Information:
MAS1390P is a ±2g Acceleration Sensor
4.75 – 5.25 Volts

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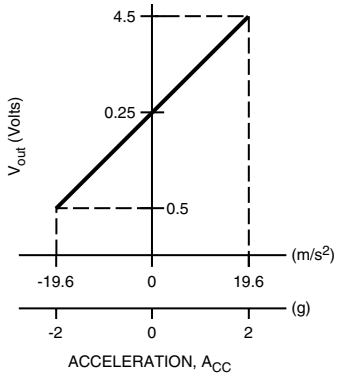
Absolute Maximum Ratings, T_a = 25°C unless otherwise specified

Characteristics	Symbol	MAS1390P	Units
Maximum Operating Voltage	$V_{CC(max.)}$	-0.3 ~ 7	Volts
Storage Temperature	T_{stg}	-40 ~ 105	°C
Maximum Operating Acceleration	$A_{CC(max.)}$	±9800 (±1000)	m/s^2 (g)
Operating Voltage (T_a = -30 ~ 85)	V_{CC}	4.75 ~ 5.25	Volts
Operating Temperature	T_{opr}	-30 ~ 85	°C
Rated Acceleration (T_a = -30 ~ 85)	$A_{CC(opr)}$	Typ. = -19.6 ~ 19.6 (-2 ~ 2)	m/s^2 (g)
		Min. = -14.7 ~ 14.7 (-1.5 ~ 1.5)	

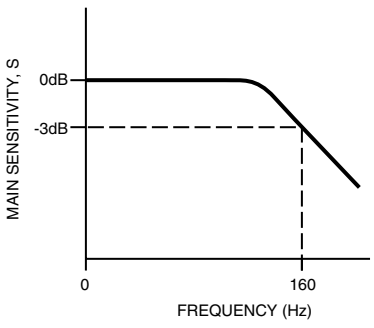
Electrical and Mechanical Characteristics, V_{CC} = 5V unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Main Axis Sensitivity	S	f = DC, T_a = 25°C	96.9	102.0	107.1	mV/(m/s^2)
			(970)	(1000)	(1030)	(mV/g)
		f = DC, T_a = -30 ~ 85°C	91.8	102.0	112.2	mV/(m/s^2)
			(950)	(1000)	(1050)	(mV/g)
Offset Voltage	V_O	A_{CC} = 0 m/s^2 (0g), T_a = 25°C	2.300	2.500	2.700	Volts
		Δ from 25°C, A_{CC} = 0 m/s^2 (0g), T_a = -30 ~ 85°C	-1.5	0	1.5	mV/°C
Upper Cut-off Frequency	fcH	T_a = -30 ~ 85°C	160	—	—	Hz
Output Linearity	L_O	A_{CC} = -19.6 ~ 19.6 m/s^2 (-2 ~ 2g) T_a = 25°C	-2	0	2	%F.S.
Sensitivity Ratio between Main and Other Axis	S_O/S	T_a = 25°C	—	—	5	%
Output Drive Capability	I_{odc}	A_{CC} = 0 m/s^2 (0g), T_a = 25°C	-0.2	—	0.2	mA
Supply Current	I_{CC}	A_{CC} = 0 m/s^2 (0g), T_a = 25°C	—	3.5	5.0	mA
Output Noise	N_O	A_{CC} = 0 m/s^2 (0g) with External Capacitors, T_a = -30 ~ 85°C	—	8	15	mVp-p

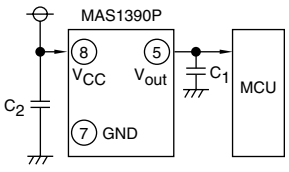
TYPICAL CHARACTERISTICS



OPERATING FREQUENCY RANGE



MEASUREMENT CIRCUIT



C_1 : 1000PF ceramic capacitor to reduce switching noise
C_2 : 0.047µF ceramic capacitor to reduce switching noise