14

Sensors

PTC Thermistors (for overheat sensing)
NTC Thermistors (for temperature sensor)
Pyroelectric Infrared Sensors
Thermopiles
Pyroelectric Infrared Sensor Modules
Ultrasonic Sensors
Shock Sensors
Built-in Circuit Acceleration Sensors
Piezoelectric Gyroscopes (GYROSTAR®)
Non-contact Potentiometers
Rotary Sensors
Magnetic Pattern Recognition Sensors
Electric Potential Sensors

● Part Numbering (The structure of the "Global Part Numbers" that will be adopted from June 2001 and the meaning of each code are described herein. If you have any questions about details, inquire at your usual Murata sales office or distributor.)

PTC Thermistors (POSISTOR®) Chip Type

(Global Part Number) PR ❶ | G ❷ | 18 ❸ | BB ❹ | 470 ❺ | M ❻ | B3 ❼ | RB ❽

❶Product ID

Product ID	
PR	PTC Thermistors Chip Type

❷Series

Code	Series
F	for Temperature Sensor
G	for Circuit Protection

❸Dimensions (L×W)

Code	Dimensions (L×W)
18	1.60×0.80

❹Temperature Characteristics

Code	Temperature Characteristics
AR	Curie Point 120°C
AS	Curie Point 130°C
BA	Curie Point 110°C
BB	Curie Point 100°C
BC	Curie Point 90°C
BD	Curie Point 80°C
BE	Curie Point 70°C

❺Resistance

Expressed by three figures. The unit is ohm (Ω). The first and second figures are signficant digits, and the third figure expresses the number of zeros which follow the two figures. If there is a decimal point, it is expressed by the capital letter "**R**". In this case, all figures are significant digits.

Ex.)

Code	Resistance
470	47Ω
471	470Ω

❻Resistance Tolerance

Code	Resistance Tolerance
M	±20%
Q	Special Tolerance

❼Individual Specifications

Code	Individual Specifications
B3	Structure, others

❽Packaging

Code	Packaging
RB	Paper Taping (4mm Pitch)

PTC Thermistors (POSISTOR®) Lead Type

(Global Part Number) PT | GL | 07 | AR | 220 | M | 3P51 | A0
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶Product ID

Product ID	
PT	PTC Thermistors

❷Series

Code	Series
FL	for Temperature Sensor Lead Type
FM	for Temperature Sensor with Lug-terminal
GL	for Circuit Protection Lead Type

❸Dimensions

Code	Dimensions
04	Nominal Body Dimameter 4mm Series
05	Nominal Body Dimameter 5mm Series
07	Nominal Body Dimameter 7mm Series
09	Nominal Body Dimameter 9mm Series
10	Nominal Body Dimameter 10mm Series
12	Nominal Body Dimameter 12mm Series
13	Nominal Body Dimameter 13mm Series
14	Nominal Body Dimameter 14mm Series
16	Nominal Body Dimameter 16mm Series
18	Nominal Body Dimameter 18mm Series
S5	Nominal 5mm Rectangular Series
S6	Nominal 6mm Rectangular Series
S7	Nominal 7mm Rectangular Series

❹Temperature Characteristics

Code	Temperature Characteristics
AR	Curie Point 120°C
BA	Curie Point 110°C
BB	Curie Point 100°C
BC	Curie Point 90°C
BD	Curie Point 80°C
BE	Curie Point 70°C
BF	Curie Point 60°C
BG	Curie Point 50°C
BH	Curie Point 40°C

❺Resistance

Expressed by three figures. The unit is ohm (Ω). The first and second figures are signficant digits, and the third figure expresses the number of zeros which follow the two figures. If there is a decimal point, it is expressed by the capital letter "**R**". In this case, all figures are significant digits.

Ex.)

Code	Resistance
R22	0.22Ω
2R2	2.2Ω
220	22Ω

❻Resistance Tolerance

Code	Resistance Tolerance
H	±25%
N	±30%
M	±20%
Q	Special Tolerance

❼Individual Specifications

Code	Individual Specifications
3P51	Lead Type, others

❽Packaging

Code	Packaging
A0	Ammo Pack
B0	Bulk

NTC Thermistors Lead Type

(Global Part Number) NT | SA0 | XH | 103 | F | E1 | B0
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶Product ID

Product ID	
NT	NTC Thermistors

❷Series

Code	Series
SA0	for Temperature Sensors No Lead-coating Type
SD0	for Temperature Sensors Lead-coating Type

❸Temperature Characteristics

Code	Temperature Characteristics
WB	Nominal B-Constant 4050—4099
WC	Nominal B-Constant 4100—4149
WD	Nominal B-Constant 4150—4199
WF	Nominal B-Constant 4250—4299
XM	Nominal B-Constant 3500—3549
XH	Nominal B-Constant 3350—3399
XR	Nominal B-Constant 3700—3749
XV	Nominal B-Constant 3900—3949

❹Resistance

Expressed by three figures. The unit is ohm (Ω). The first and second figures are signficant digits, and the third figure expresses the number of zeros which follow the two figures. If there is a decimal point, it is expressed by the capital letter "**R**". In this case, all figures are significant digits.

Ex.)

Code	Resistance
202	2kΩ
203	20kΩ

❺Resistance Tolerance

Code	Resistance Tolerance
E	±3%
F	±1%

❻Individual Specifications

Code	Individual Specifications
E1	Lead Style, others

❼Packaging

Code	Packaging
A0	Ammo Pack
B0	Bulk

Pyroelectric Infrared Sensors

(Global Part Number) IR | A- | E710ST | 1
❶ ❷ ❸ ❹

❶Product ID
❷Type
❸Characteristics
❹Individual Specification Code

* Global Part Number shows only an example which might be different from actual part number.
* "❸Characteristics" and "❹Individual Specification Code" might have different digit number from actual Global Part Number.

Thermopiles

(Global Part Number) IR | TE | 5011TC | 01
❶ ❷ ❸ ❹

❶Product ID
❷Type
❸Characteristics
❹Individual Specification Code

* Global Part Number shows only an example which might be different from actual part number.
* "❸Characteristics" and "❹Individual Specification Code" might have different digit number from actual Global Part Number.

Pyroelectric Infrared Sensor Modules

(Global Part Number) IM | D- | B101- | 01
❶ ❷ ❸ ❹

❶Product ID
❷Type
❸Characteristics
❹Individual Specification Code

* Global Part Number shows only an example which might be different from actual part number.
* "❸Characteristics" and "❹Individual Specification Code" might have different digit number from actual Global Part Number.

Ultrasonic Sensors

(Global Part Number) MA | 40MF | 14 | -1N | -M
❶ ❷ ❸ ❹ ❺

❶Product ID
❷Series
❸Characteristics
❹Individual Specification Code
❺Packaging

* Global Part Number shows only an example which might be different from actual part number.
* Any other definitions than "❶Product ID" might have different digit numbers from actual Global Part Number.

Shock Sensors

(Global Part Number) PK | GS-25 | ME | 1 | -R
❶ ❷ ❸ ❹ ❺

❶Product ID
❷Series
❸Characteristics
❹Individual Specification Code
❺Packaging

* Global Part Number shows only an example which might be different from actual part number.
* "❸Characteristics" , "❹Individual Specification Code" and "❺Packaging" might have different digit number from actual Global Part Number.

Built-in Circuit Acceleration Sensors

(Global Part Number) PK | GA-S | 60A | | -M
❶ ❷ ❸ ❹ ❺

❶Product ID
❷Series
❸Characteristics
❹Individual Specification Code
❺Packaging

* Global Part Number shows only an example which might be different from actual part number.
* Any other definitions than "❶Product ID" might have different digit number from actual Global Part Number.

Piezoelectric Gyroscopes (GYROSTAR®)

(Global Part Number) EN | C-03JA | -02 | |
❶ ❷ ❸ ❹

❶Product ID
❷Type
❸Individual Specification Code
❹Packaging

* Global Part Number shows only an example which might be different from actual part number.
* Any other definitions than "❶Product ID" might have different digit number from actual Global Part Number.

Non-contact Potentiometers

(Global Part Number) LP | 05M | 4R1AA | |
❶ ❷ ❸ ❹

❶Product ID
❷Type
❸Characteristics
❹Individual Specification Code

* Global Part Number shows only an example which might be different from actual part number.
* Any other definitions than "❶Product ID" might have different digit number from actual Global Part Number.

Rotary Sensors

(Global Part Number) FR | 05CM | 12AL | |
❶ ❷ ❸ ❹

❶Product ID
❷Type
❸Characteristics
❹Individual Specification Code

* Global Part Number shows only an example which might be different from actual part number.
* Any other definitions than "❶Product ID" might have different digit number from actual Global Part Number.

Magnetic Pattern Recognition Sensors

(Global Part Number) BS | 05W | 1KFAB | |
❶ ❷ ❸ ❹

❶Product ID
❷Type
❸Characteristics
❹Individual Specification Code

* Global Part Number shows only an example which might be different from actual part number.
* Any other definitions than "❶Product ID" might have different digit number from actual Global Part Number.

Electric Potential Sensors

(Global Part Number) PK | E05 | A | |
❶ ❷ ❸ ❹

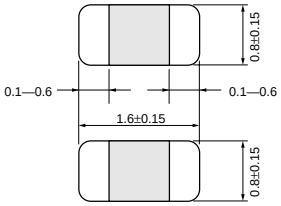
❶Product ID
❷Series
❸Characteristics
❹Individual Specification Code

* Global Part Number shows only an example which might be different from actual part number.
* Any other definitions than "❶Product ID" might have different digit number from actual Global Part Number.

	Detection	Temperature		Infra-red	Ultra-sonic	Magnetic			Mechanical			Electric Poten-tial
									Acceleration		Angle Velocity	
	Murata's Sensors	PTC Thermistors(POSISTOR®)	NTC Thermistors	Pyroelectric Infrared Sensors/Thermopile	Ultrasonic Sensors	Rotary Sensors	Non-contact Potentiometers	Magnetic Pattern Recognition Sensors	Shock Sensors	Built-in Acceleration Sensors	Piezoelectric Vibrating Gyroscopes (GYROSTAR®)	Electric Potential Sensors
Audio Visual Equipment	TV	○	○									
	Audio Equipment	○	○									
	DVD, MD, CD	○	○						○			
	VCR	○	○				○					
	Video Cameras	○	○						○		○	
	Cameras, Digital Cameras		○						○		○	
Home Appliances	Refrigerators		○									
	Microwave Ovens		○	○								
	Air Conditioners	○	○	○								
	Fan Heaters		○									
	Ventilators			○								
	Vacuum Cleaners	○	○									
	Washing Machines											
	Electric Water Fountains		○									
	Kitchen Fans		○	○								
	Water Suppliers		○									
Security	Gas Detection Sensors	○	○	○								
	Flame Detection(heat) Sensors		○	○								
	Flammable Sensors			○								
	Burglar Alarm Systems			○	○							
	Intruders Detection Sensors				○							
	Glass Cracking Detection Sensors			○	○				○			
Health Equipment	Thermometers		○	○								
Factory Automation	Automatic Transportation Systems				○						○	
Equipment	Multi-Joints Robots					○					○	
	Processing Machines					○						
	Shape Inspection Systems				○							
	Molding Machines					○						
Automotive	Engine Control Units		○									
	SRS									○		
	Suspension Control Systems				○							
	Navigation	○	○								○	
	Air Conditioners		○									
	Back Sonars	○			○							
Office Automation	Personal Computers	○	○						○		○	
Equipment	Copying Machines	○	○				○					○
	Printers	○	○		○		○					○
	Facsimiles		○		○		○					
	Electric Boards		○		○							
Financial Systems	Automatic Teller Machines						○	○				

PTC (POSISTOR®) for Overheat Sensing

Chip Type



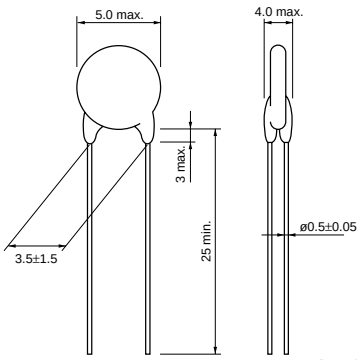
(in mm)

Part Number	Sensing Temperature (at 4.7k ohm) (°C)	Maximum Voltage (V)	Maximum Current (mA)	Curie Point (°C)	Resistance (at 25 degree) (ohm)	Operating Temperature Range (°C)
PRF18BE471QB3RB	85 ±5	16	30	70 (BE)	470 ±50%	-20 to 100
PRF18BD471QB3RB	95 ±5	16	30	80 (BD)	470 ±50%	-20 to 110
PRF18BC471QB3RB	105 ±5	16	30	90 (BC)	470 ±50%	-20 to 120
PRF18BB471QB3RB	115 ±5	16	30	100 (BB)	470 ±50%	-20 to 130
PRF18BA471QB3RB	125 ±5	16	30	110 (BA)	470 ±50%	-20 to 140
PRF18AR471QB3RB	135 ±5	16	30	120 (AR)	470 ±50%	-20 to 150
PRF18AS471QB3RB	145 ±5	16	30	130 (AS)	470 ±50%	-20 to 160

PTC (POSISTOR®) for Overheat Sensing

Lead Type

● PTFL Series



(in mm)

Part Number	Max. Voltage (V)	Curie Point (°C)	Sensing Temp.(TS) (°C)	Resistance Value at 25°C (ohm)	Resistance Value (Sensing Temp. -10°C)	Resistance Value at Sensing Temp.(TS°C)
PTFL04BH471Q2N34B0	16	40 (BH)	60	100 max.	330ohm max.	470ohm min.
PTFL04BG471Q2N34B0	16	50 (BG)	70	100 max.	330ohm max.	470ohm min.
PTFL04BF471Q2N34B0	16	60 (BF)	80	100 max.	330ohm max.	470ohm min.
PTFL04BE471Q2N34B0	16	70 (BE)	90	100 max.	330ohm max.	470ohm min.
PTFL04BD471Q2N34B0	16	80 (BD)	100	100 max.	330ohm max.	470ohm min.
PTFL04BC471Q2N34B0	16	90 (BC)	110	100 max.	330ohm max.	470ohm min.
PTFL04BB471Q2N34B0	16	100 (BB)	120	100 max.	330ohm max.	470ohm min.
PTFL04BH222Q2N34B0	16	40 (BH)	60	330 max.	1.5k ohm max.	2.2k ohm min.
PTFL04BG222Q2N34B0	16	50 (BG)	70	330 max.	1.5k ohm max.	2.2k ohm min.
PTFL04BF222Q2N34B0	16	60 (BF)	80	330 max.	1.5k ohm max.	2.2k ohm min.
PTFL04BE222Q2N34B0	16	70 (BE)	90	330 max.	1.5k ohm max.	2.2k ohm min.
PTFL04BD222Q2N34B0	16	80 (BD)	100	330 max.	1.5k ohm max.	2.2k ohm min.

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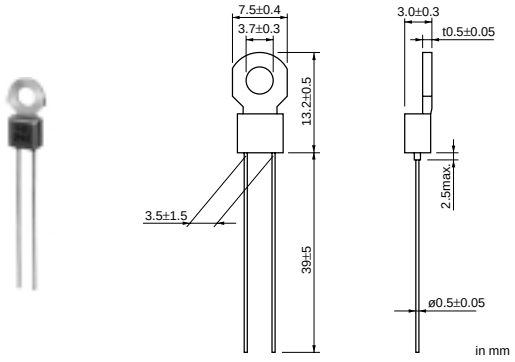
Part Number	Max. Voltage (V)	Curie Point (°C)	Sensing Temp.(TS) (°C)	Resistance Value at 25°C (ohm)	Resistance Value (Sensing Temp. -10°C)	Resistance Value at Sensing Temp.(TS°C)
PTFL04BC222Q2N34B0	16	90 (BC)	110	330 max.	1.5k ohm max.	2.2k ohm min.
PTFL04BB222Q2N34B0	16	100 (BB)	120	330 max.	1.5k ohm max.	2.2k ohm min.

The order quantity should be an integral multiple of the Minimum Quantity shown in the beginning of this catalog.

● **PTFM Series**

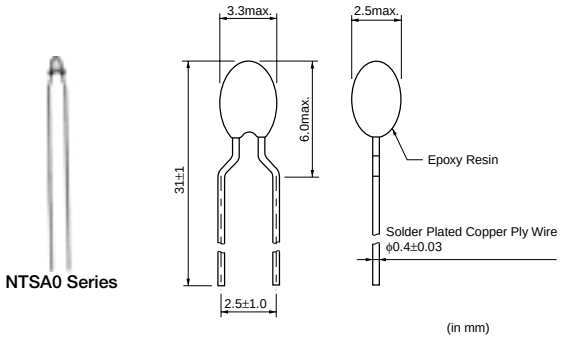


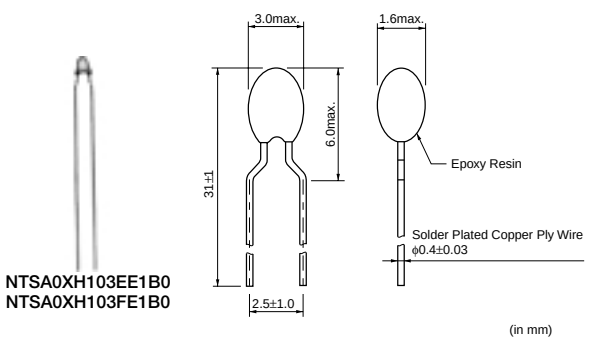
Part Number	Max. Voltage (V)	Curie Point (°C)	Sensing Temp.(TS) (°C)	Resistance Value at 25°C (ohm)	Resistance Value (Sensing Temp. -10°C)	Resistance Value at Sensing Temp.(TS°C)
PTFM04BH471Q2N34B0	16	40 (BH)	60	100 max.	330ohm max.	470ohm min.
PTFM04BG471Q2N34B0	16	50 (BG)	70	100 max.	330ohm max.	470ohm min.
PTFM04BF471Q2N34B0	16	60 (BF)	80	100 max.	330ohm max.	470ohm min.
PTFM04BE471Q2N34B0	16	70 (BE)	90	100 max.	330ohm max.	470ohm min.
PTFM04BD471Q2N34B0	16	80 (BD)	100	100 max.	330ohm max.	470ohm min.
PTFM04BC471Q2N34B0	16	90 (BC)	110	100 max.	330ohm max.	470ohm min.
PTFM04BB471Q2N34B0	16	100 (BB)	120	100 max.	330ohm max.	470ohm min.
PTFM04BH222Q2N34B0	16	40 (BH)	60	330 max.	1.5k ohm max.	2.2k ohm min.
PTFM04BG222Q2N34B0	16	50 (BG)	70	330 max.	1.5k ohm max.	2.2k ohm min.
PTFM04BF222Q2N34B0	16	60 (BF)	80	330 max.	1.5k ohm max.	2.2k ohm min.
PTFM04BE222Q2N34B0	16	70 (BE)	90	330 max.	1.5k ohm max.	2.2k ohm min.
PTFM04BD222Q2N34B0	16	80 (BD)	100	330 max.	1.5k ohm max.	2.2k ohm min.
PTFM04BC222Q2N34B0	16	90 (BC)	110	330 max.	1.5k ohm max.	2.2k ohm min.
PTFM04BB222Q2N34B0	16	100 (BB)	120	330 max.	1.5k ohm max.	2.2k ohm min.

The order quantity should be an integral multiple of the Minimum Quantity shown in the beginning of this catalog.

NTC for Temperature Sensor

Resin Coated Radial Lead Type

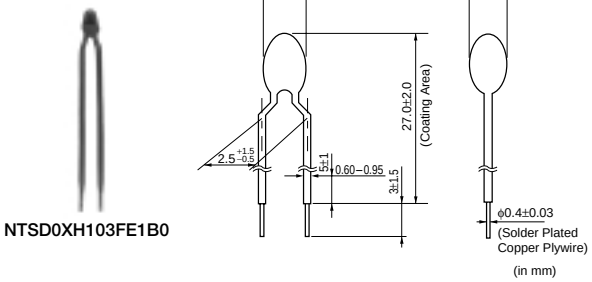




Part Number	Resistance (25°C) (k ohm)	B-Constant (25-50°C) (K)	Max. Operating Current(25°C) (mA)	Rated Electric Power(25°C) (mW)	Typical Dissipation Constant(25°C) (mW/°C)	Thermal Time Constant(s)	Operating Temperature Range (°C)
NTSA0XM202□E1B0	2.0	3500 ±1%	1.05	21	2.1	less than7	-40 to 125
NTSA0XR502□E1B0	5.0	3700 ±1%	0.68	21	2.1	less than7	-40 to 125
NTSA0XH103□E1B0	10	3380 ±1%	0.38	15	1.5	less than7	-40 to 125
NTSA0XV103□E1B0	10	3900 ±1%	0.46	21	2.1	less than7	-40 to 125
NTSA0WB203□E1B0	20	4050 ±1%	0.31	21	2.1	less than7	-40 to 125
NTSA0WC303□E1B0	30	4100 ±1%	0.26	21	2.1	less than7	-40 to 125
NTSA0WD503□E1B0	50	4150 ±1%	0.20	21	2.1	less than7	-40 to 125
NTSA0WF104□E1B0	100	4250 ±1%	0.14	21	2.1	less than7	-40 to 125

A blank column is filled with resistance tolerance codes. (F:±1%, E:±3%)
The order quantity should be an integral multiple of the Minimum Quantity shown in the beginning of this catalog.

● **Lead-Coating Type**



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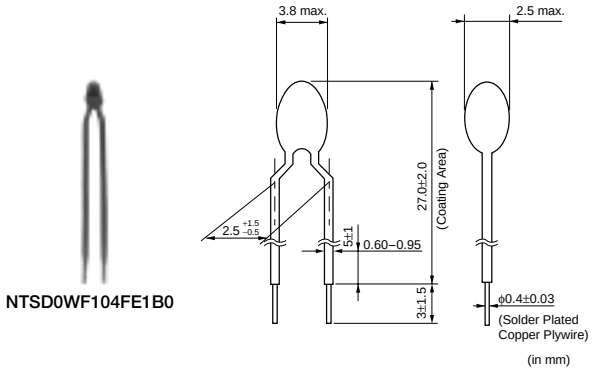


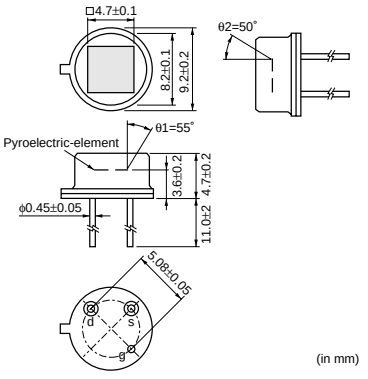
NTSD0WF104FE1B0

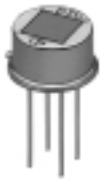
Part Number	Resistance (25°C) (k ohm)	B-Constant (25-50°C) (K)	Max. Operating Current(25°C) (mA)	Rated Electric Power(25°C) (mW)	Typical Dissipation Constant(25°C) (mW/°C)	Thermal Time Constant(s)	Operating Temperature Range (°C)
NTSD0XH103FE1B0	10 ±1%	3380 ±1%	0.38	15	1.5	less than7	-40 to 125
NTSD0WF104FE1B0	100 ±1%	4250 ±1%	0.14	21	2.1	less than7	-40 to 125

The order quantity should be an integral multiple of the Minimum Quantity shown in the beginning of this catalog.

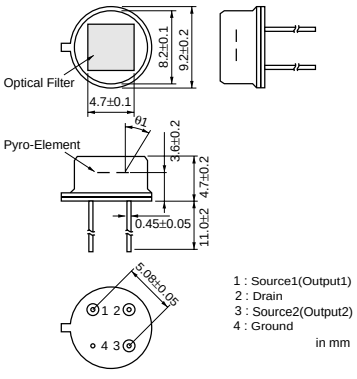
Pyroelectric Infrared Sensors

IRA-E900ST1
IRA-E910ST1





IRA-E940ST1



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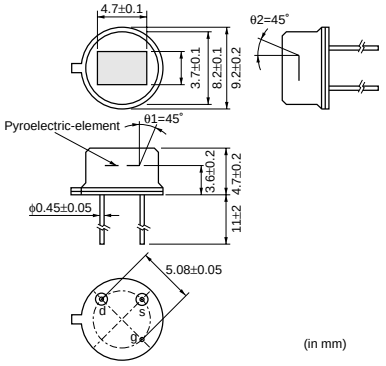
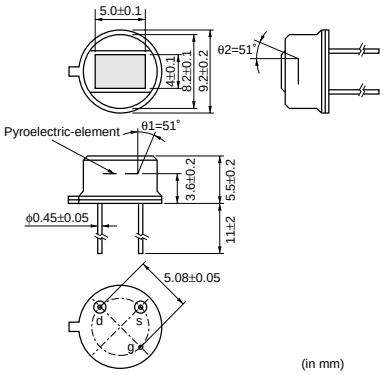
IRA-E700ST1
IRA-E710ST1



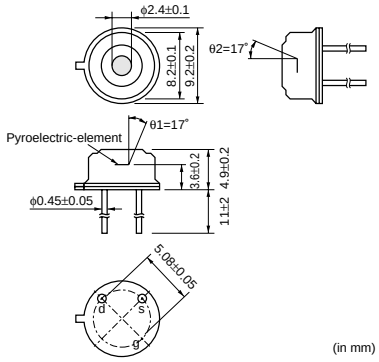
(in mm)

IRA-E500ST0
IRA-E500SZ0



(in mm)

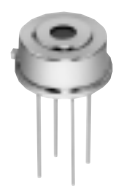
IRA-E410QW1
IRA-E410S1
IRA-E410ST1



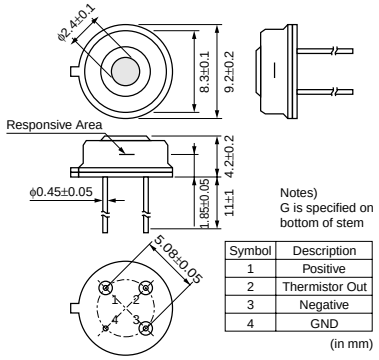
(in mm)

Part Number	Field of View (°)	Optical Filter	Electrode	Operating Temperature Range (°C)
IRA-E900ST1	theta1=theta2=41	5 micro m Long Pass Silicon	(1.1x1.1mm)x4	-25 to 55
IRA-E910ST1	theta1=theta2=41	5 micro m Long Pass Silicon	(1.1x1.1mm)x4	-25 to 55
IRA-E940ST1	theta1=55 ,theta2=50°	5 micro m Long Pass Silicon	(1.35mmx1.0mm)x4	-25 to 55
IRA-E700ST0	theta1=theta2=45	5 micro m Long Pass Silicon	(2.0x1.0mm)x2	-40 to 70
IRA-E710ST0	theta1=theta2=45	5 micro m Long Pass Silicon	(2.0x1.0mm)x2	-40 to 70
IRA-E500ST0	theta1=theta2=51	5μm Long Pass Silicon	(2.4x1.0mm)x2	-25 to 55
IRA-E500SZ0	theta1=theta2=51	7μm Long Pass Silicon	(2.4x1.0mm)x2	-25 to 55
IRA-E410QW1	theta1=theta2=17	4.3μm Band Pass Silicon	fai 1.6mm	-25 to 55
IRA-E410S1	theta1=theta2=17	Silicon	fai 1.6mm	-25 to 55
IRA-E410ST1	theta1=theta2=17	5μm Long Pass Silicon	fai 1.6mm	-25 to 55

Thermopiles



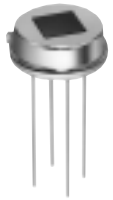
IRTE5011TC01
IRTE6011TC01



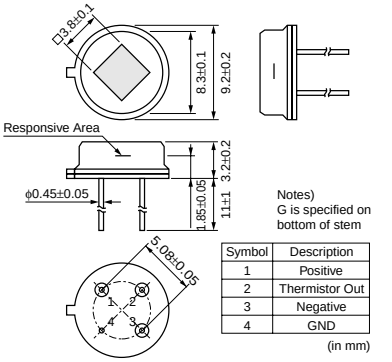
Notes)
G is specified on bottom of stem

Symbol	Description
1	Positive
2	Thermistor Out
3	Negative
4	GND

(in mm)



IRTE5021TC01
IRTE6021TC01



Notes)
G is specified on bottom of stem

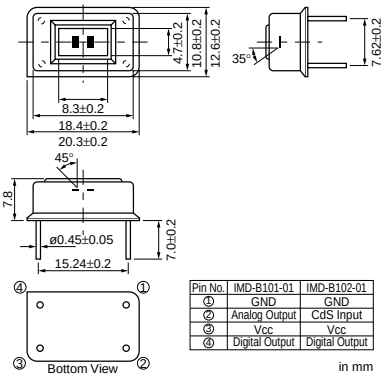
Symbol	Description
1	Positive
2	Thermistor Out
3	Negative
4	GND

(in mm)

Part Number	Output Voltage (mVp-p)	Resistance (k ohm)	Time Constant (ms)	Field of View	Resistance (Thermistors) (k ohm)	BETA (at 25/50 C.) (K)
IRTE5011TC01	100 +-20%	60 +-20k ohm	35 (Typ.)	+-26 degree(S)	50 +-3%	4150 +-1%
IRTE5021TC01	105 +-20%	60 +-20k ohm	35 (Typ.)	+-60 degree(S)	50 +-3%	4150 +-1%
IRTE6011TC01	180 +-20%	100 +-20k ohm	60 (Typ.)	+-14 degree(S)	50 +-3%	4150 +-1%
IRTE6021TC01	210 +-20%	100 +-30k ohm	60 (Typ.)	+-54 degree(S)	50 +-3%	4150 +-1%

Pyroelectric Infrared Sensor Modules

IMD-B101-01



Pin No.	IMD-B101-01	IMD-B102-01
①	GND	GND
②	Analog Output	CdS Input
③	Vcc	Vcc
④	Digital Output	Digital Output

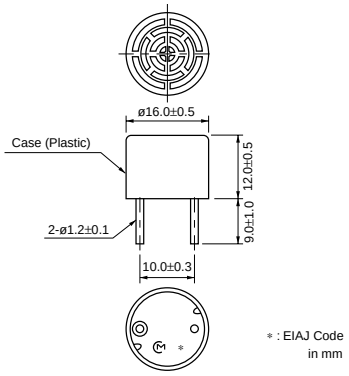
in mm

Part Number	Supply Voltage	Detection Length (without Lens) (m)	Detection Length (with IMD-FL01W/G) (m)	Detection Range (with IMD-FL01W/G)	Output Type
IMD-B101-01	2.6~5.5V	1	5	104°x30°	Digital Output / Analog Output
IMD-B102-01	2.6~5.5V	1	5	104°x30°	Digital Output

Ultrasonic Sensors

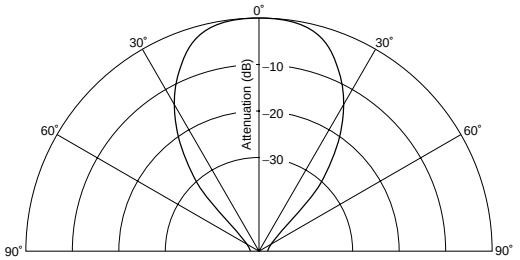
● Open Structure Type

MA40B7



∗ : EIAJ Code
in mm

Directivity in overall sensitivity



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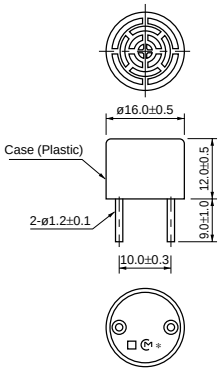
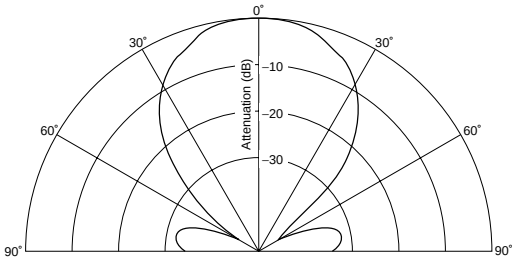
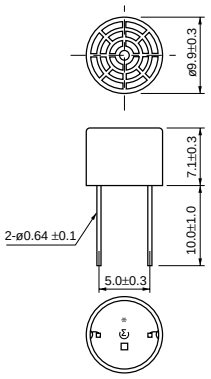
MA40B8R/S



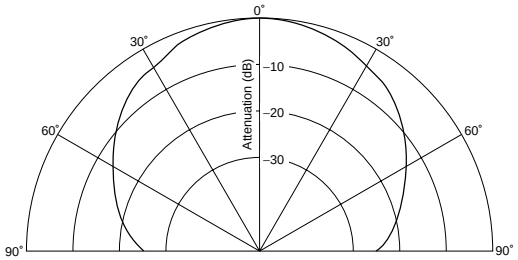
Directivity in sensitivity



MA40S4R/S



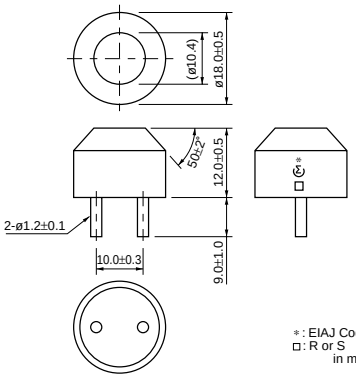
Directivity in sensitivity



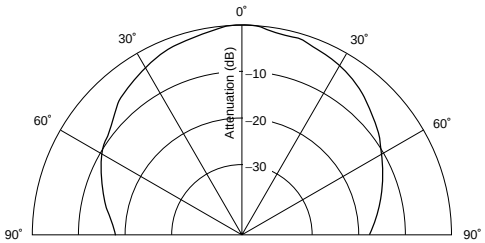
Part Number	Construction	Using Method	Nominal Freq. (kHz)	Overall Sensitivity (dB)	Sensitivity (dB)	S.P.L. (dB)	Directivity (°)	Cap. (pF)	Detectable Range (m)	Resolution (mm)
MA40B7	Open struct.	Dual Use	40	-45 typ. (0dB=10Vpp)	-	-	44	2000	0.2 to 4	9
MA40B8R	Open struct.	Receiver	40	-	-63 typ. (0dB=10V/Pa)	-	50	2000	0.2 to 6	9
MA40B8S	Open struct.	Transmitter	40	-	-	120 typ. (0dB=0.02mPa)	50	2000	0.2 to 6	9
MA40S4R	Open struct.	Receiver	40	-	-63 typ. (0dB=10V/Pa)	-	80	2550	0.2 to 4	9
MA40S4S	Open struct.	Transmitter	40	-	-	120 typ. (0dB=0.02mPa)	80	2550	0.2 to 4	9

● Water Proof Type

MA40E6-7



Directivity in sensitivity



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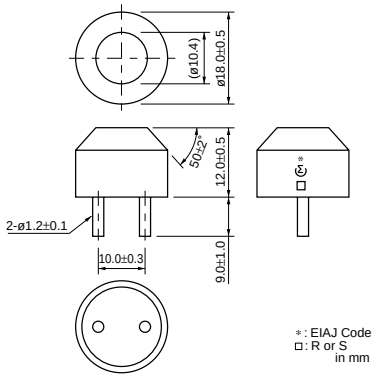
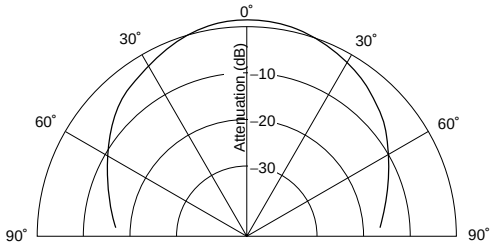
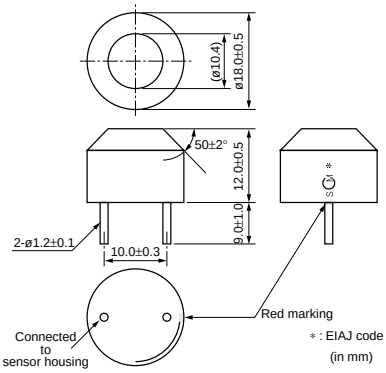
MA40E7R/S



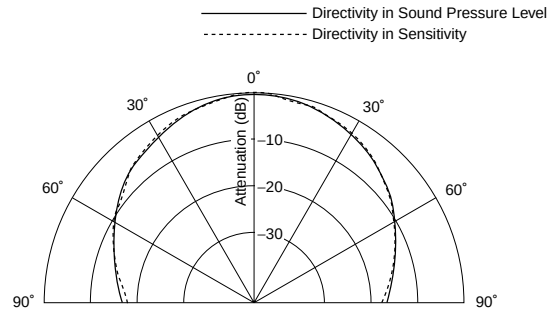
Directivity in S.P.L.



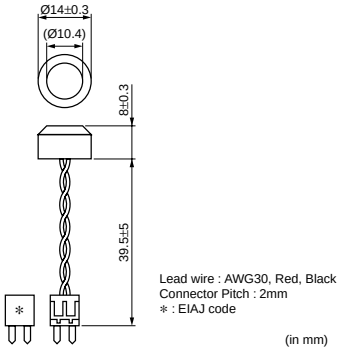
MA40E7S-1



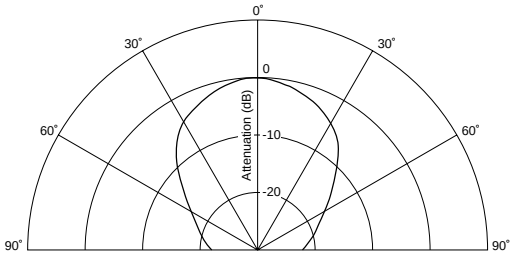
Directivity in overall sensitivity



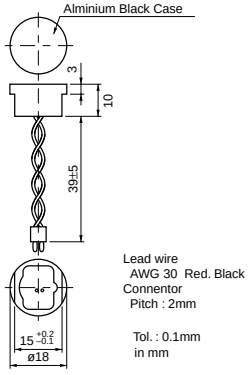
MA40E8-2



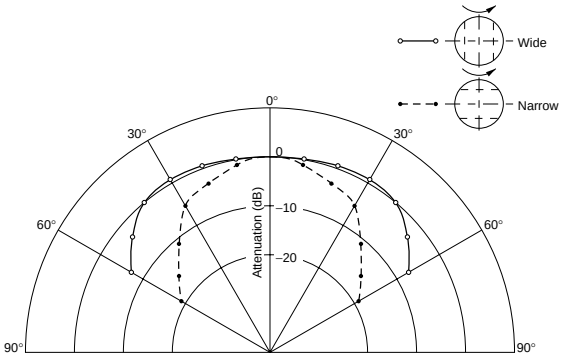
Directivity in overall sensitivity



MA40E9-1



Directivity in overall sensitivity



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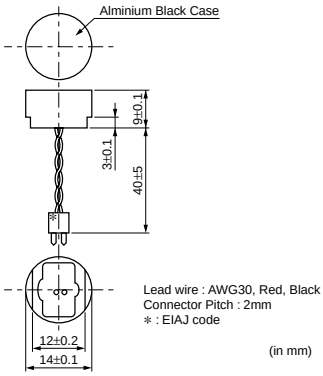
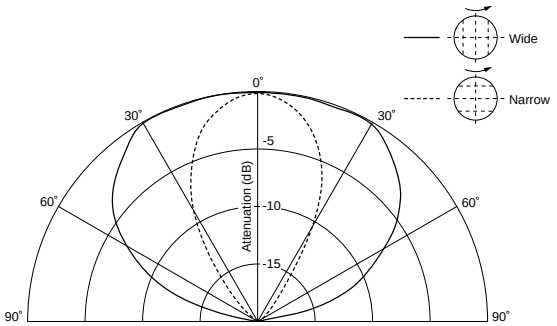
MA40MF14-1B

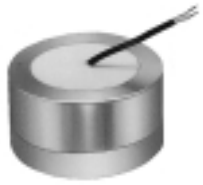


Directivity in overall sensitivity

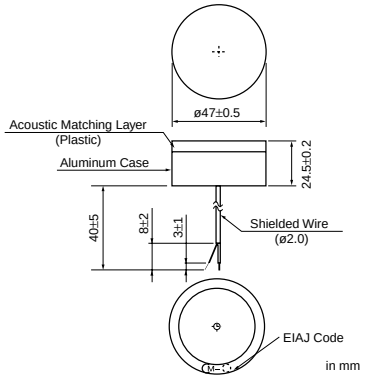


Part Number	Construction	Using Method	Nominal Freq. (kHz)	Overall Sensitivity	Sensitivity (dB)	S.P.L. (dB)	Directivity (°)	Cap. (pF)	Detectable Range (m)	Resolution (mm)
MA40E7R	Water proof	Receiver	40	-	-74 min. (0dB=10V/Pa)	-	100	2200	0.2 to 3	9
MA40E7S	Water proof	Transmitter	40	-	-	106 min. (0dB=0.02mPa)	100	2200	0.2 to 3	9
MA40E7S-1	Water proof	Dual Use	40	-	-72 min. (0dB=10V/Pa) : reference only	106 min. (0dB=0.02mPa)	75	2200	0.2 to 3	9
MA40E8-2	Water proof	Dual Use	40	-	-85 min. (0dB=10V/Pa)	106 min. (0dB=0.02mPa)	75	2800	0.2 to 1.5	9
MA40E9-1	Water proof	Dual Use	40	-	-85 min. (0dB=10V/Pa)	103 min. (0dB=0.02mPa)	100 x50°	4000	0.2 to 1.5	9
MA40MF14-1B	Water proof	Dual Use	40	-	-87 min. (0dB=10V/Pa)	103 min. (0dB=0.02mPa)	110 x50°	4400	0.2 to 1.5	9

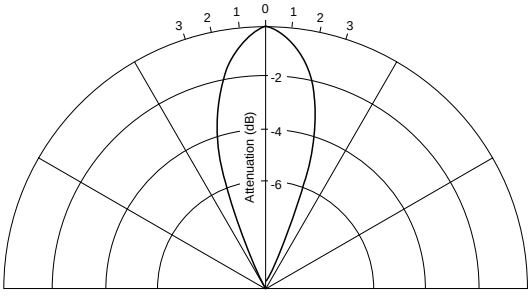
● High-frequency Type



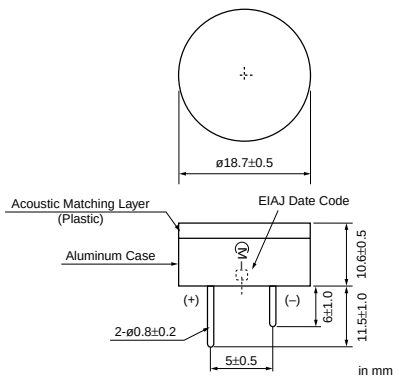
MA80A1



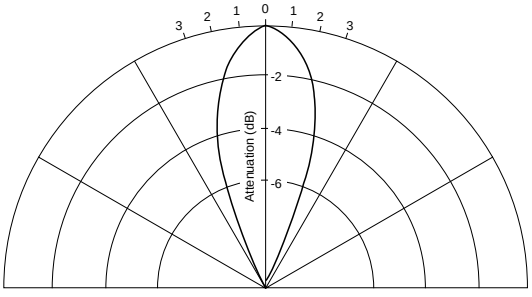
Directivity in overall sensitivity



MA200A1



Directivity in overall sensitivity



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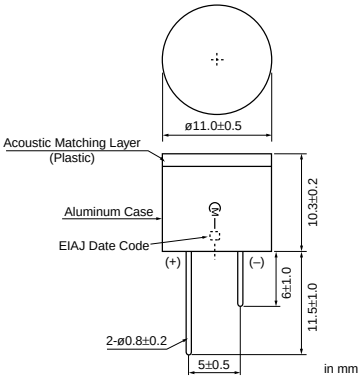
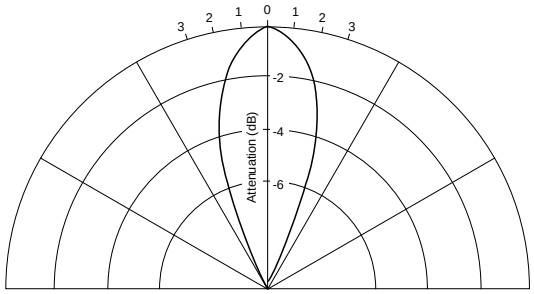
MA400A1



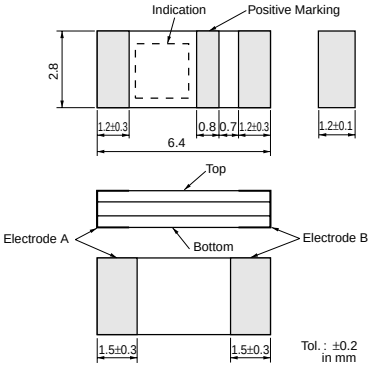
Directivity in overall sensitivity



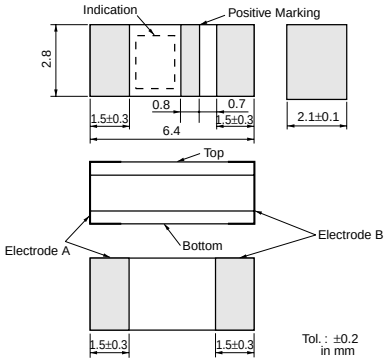
Part Number	Construction	Using Method	Nominal Freq. (kHz)	Overall Sensitivity (dB)	Sensitivity	S.P.L.	Directivity (°)	Cap.	Detectable Range (m)	Resolution (mm)
MA80A1	High frequency type	Dual Use	75 +/-5	-47 min. 0dB=18Vpp (at 50cm)	-	-	7	-	0.5 to 5	4
MA200A1	High frequency type	Dual Use	200 +/-10	-54 min. 0dB=18Vpp (at 20cm)	-	-	7	-	0.2 to 1	2
MA400A1	High frequency type	Dual Use	400 +/-20	-74 min. 0dB=18Vpp (at 10cm)	-	-	7	-	0.06 to 0.3	1

Shock Sensors

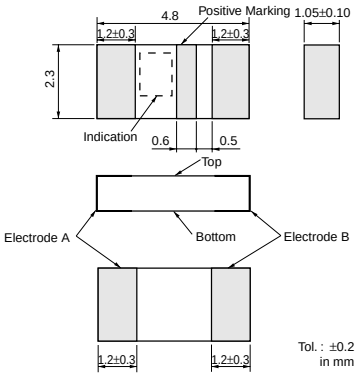
PKGS-00LB-R



PKGS-00LC-R



PKGS-00ME-R

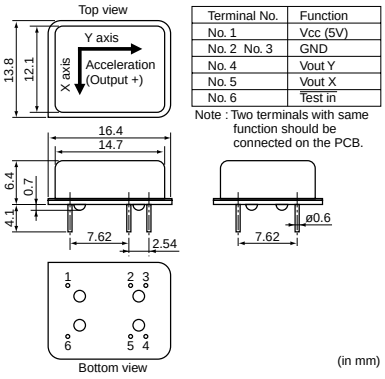


Part Number	Primary Axis Inclined Angle (°)	Voltage Sensitivity* (mV/G)	Capacitance (pF)	Insulation Resistance (M ohm)	Resonant Frequency (kHz)	Non-linearity (%)
PKGS-00LB-R	0	1.85 typ.	210	500 min.	20 typ.	1 typ.
PKGS-00LC-R	0	2.1 typ.	420	500 min.	20 typ.	1 typ.
PKGS-00ME-R	0	1.00 typ.	160	500 min.	27 typ.	1 typ.
PKGS-25LB-R	25	1.85 typ.	240	500 min.	20 typ.	1 typ.
PKGS-25ME-R	25	1.0 typ.	170	500 min.	27 typ.	1 typ.
PKGS-45LB-R	45	1.93 typ.	295	500 min.	20 typ.	1 typ.
PKGS-45ME-R	45	1.00 typ.	210	500 min.	27 typ.	1 typ.
PKGS-90LC-R	90	2.1 typ.	420	500 min.	20 typ.	1 typ.

*1G=9.8m/s²

Built-in Circuit Acceleration Sensors

PKGA-D60A

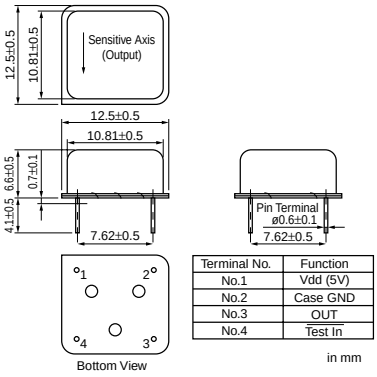


Terminal No.	Function
No. 1	Vcc (5V)
No. 2 No. 3	GND
No. 4	Vout Y
No. 5	Vout X
No. 6	Test in

Note : Two terminals with same function should be connected on the PCB.

(in mm)

PKGA-S60A



Terminal No.	Function
No.1	Vdd (5V)
No.2	Case GND
No.3	OUT
No.4	Test In

in mm

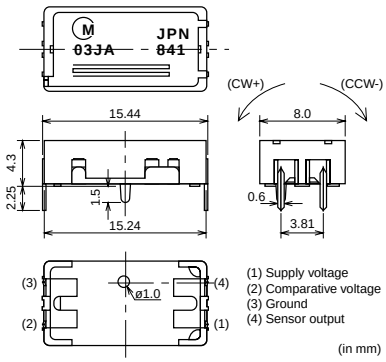
Part Number	Sensitivity* (mV/G)	Non-linearity	Frequency Range	Output Voltage at 0G (V)	Supply Voltage (V)
PKGA-D60A	60 typ.	1 max.	0.68~500Hz typ.	2 typ.	5.00
PKGA-S60A	60 typ.	1 max.	0.66~525Hz typ.	2 typ.	5.00

Other specifications are also available. Please contact us for modifications of sensitivity and offset voltage.

*1G=9.8m/s²

Piezoelectric Gyroscopes (GYROSTAR®)

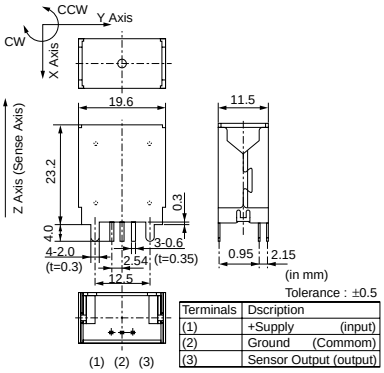
ENC-03J



(1) Supply voltage
(2) Comparative voltage
(3) Ground
(4) Sensor output

(in mm)

ENV-05F-03



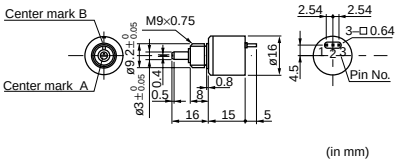
(in mm)

Tolerance : ±0.5

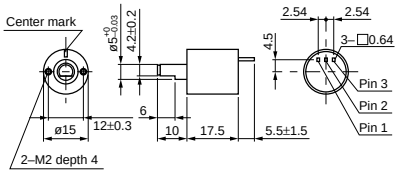
Terminals	Discription
(1)	+Supply (input)
(2)	Ground (Commom)
(3)	Sensor Output (output)

Part Number	Supply Voltage (Vdc)	Maximum Angular Velocity (deg./sec.)	Output (at Angular Velocity=0) (Vdc)	Scale Factor (mV/deg./sec.)	Linearity (%FS)	Offset Drift (deg./sec.)	Response (Hz)	Operating Temperature Range (°C)	Weight (g)
ENC-03J	2.7~5.5	+/-300	1.35 +/-0.7	0.67	+/-5	-	50 max.	-5 to 75	1.0 max.
ENV-05F-03	5 +/-0.5	+/-60	2.5 +/-0.4	25.0	+/-0.5	9 max.	7 max.	-30 to 80	20 max.

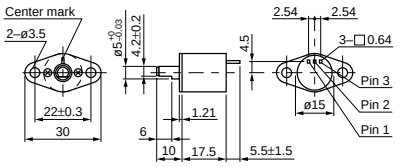
Non-contact Potentiometers



LP05M2F1AA
LP06M2F1HA



LP05M3R1AA
LP06M3R1HA



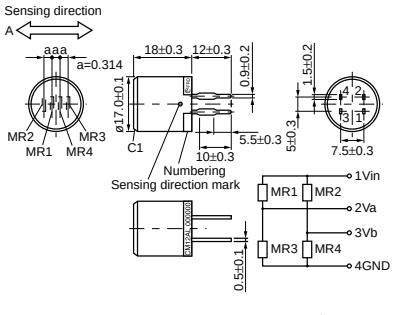
LP05M4R1AA
LP06M4R1HA

Part Number	Rated Voltage (V)	Effective Linearity Range (deg.)	Sensitivity (mV/deg.)	Temp.Coefficient (%)	Max. Rotation Torque (mN•m)	Operating Temperature Range (°C)
LP05M2F1AA	5	+/-50 (Centered at 1/2Vcc)	min.9 (Vcc=5V,at 25°C)	+/-7 (-10°C~60°C)	0.1 (at 25°C)	-10 to 60
LP05M3R1AA	5	+/-50 (Centered at 1/2Vcc)	min.9 (Vcc=5V,at 25°C)	+/-7 (-10°C~60°C)	0.5 (at 25°C)	-10 to 60
LP05M4R1AA	5	+/-50 (Centered at 1/2Vcc)	min.9 (Vcc=5V,at 25°C)	+/-7 (-10°C~60°C)	0.5 (at 25°C)	-10 to 60
LP06M2F1HA	6	+/-50 (Centered at 1/2Vcc)	22 +/-6mV/deg (Vcc=6V,at 25°C)	-0.4~-0.15%/°C(-10°C~60°C)	0.1 (at 25°C)	-10 to 80
LP06M3R1HA	6	+/-50 (Centered at 1/2Vcc)	22 +/-6mV/deg (Vcc=6V,at 25°C)	-0.4~-0.15%/°C(-10°C~60°C)	0.5 (at 25°C)	-10 to 80
LP06M4R1HA	6	+/-50 (Centered at 1/2Vcc)	22 +/-6mV/deg (Vcc=6V,at 25°C)	-0.4~-0.15%/°C(-10°C~60°C)	0.5 (at 25°C)	-10 to 80

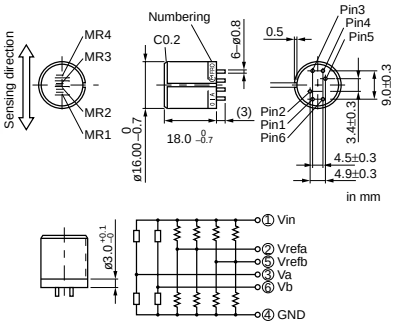
Individual Linearity : ±1.5%(Within effective linearity range)

Rotary Sensors

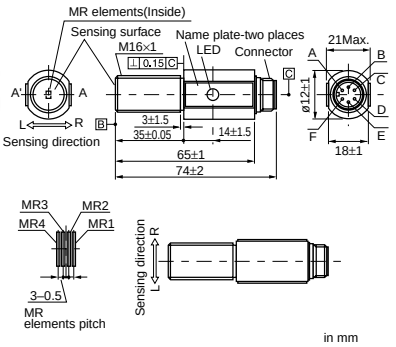
FR05CM12AL



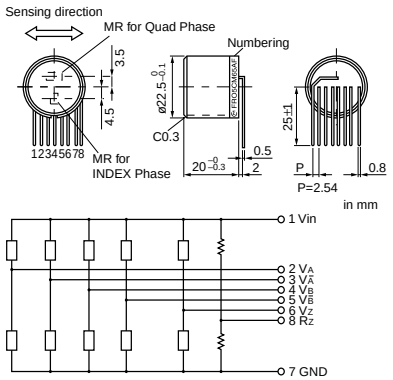
FR05CM62AF



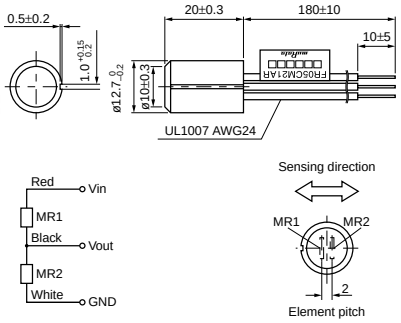
FR12AM32AC



FR05CM65AF



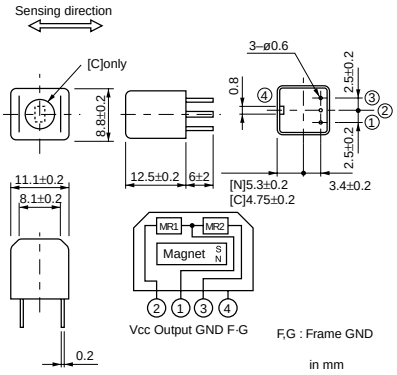
FR05CM21AR

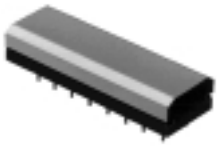


Part Number	Output Type	Target Gear Module
FR05CM12AL	Dual	0.4
FR05CM62AF	Dual with Reference	0.4
FR12AM32AC	Dual,Digital	0.635
FR05CM65AF	Quad with index	0.4(Phase:A-B)
FR05CM21AR	Single	0.3~1.0

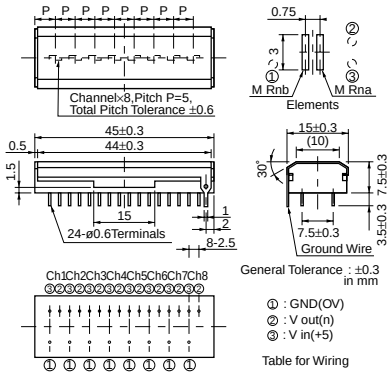
Magnetic Pattern Recognition Sensors

BS05C1HFAA
BS05C1HGCA

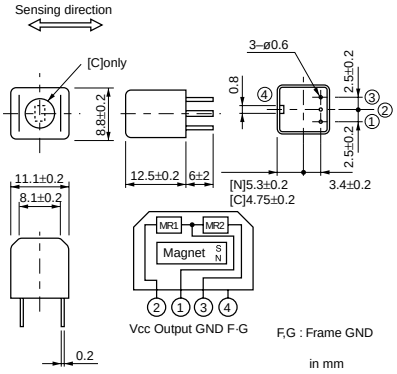




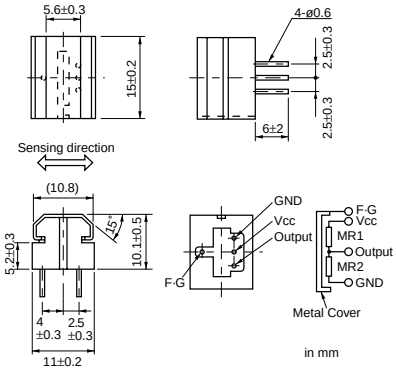
BS05M1HFAL



BS05N1HFAA
BS05N1HGAA
BS05N1HSAA
BS05N1NFAA



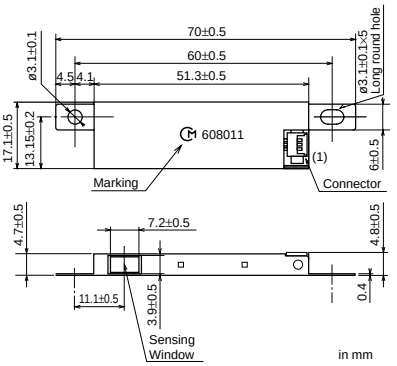
BS05W1KFAA
BS05W1KFAB



Part Number	Supply Voltage (V)	Min. Output Voltage	Max. Output Voltage	Test Method	Detection Width (mm)	Operating Tempeature Range (°C)
BS05C1HFAA	5	400mVrms	-	Test Method A	3	-20 to 60
BS05C1HGCA	5	235mVrms	405mVrms	Test Method A	3	-20 to 60
BS05M1HFAL	5	150mVrms	-	Test Method D	3	0 to 50
BS05N1HFAA	5	400mVrms	-	Test Method A	3	-20 to 60
BS05N1HGAA	5	235mVrms	405mVrms	Test Method A	3	-20 to 60
BS05N1HSAA	5	235mVrms	405mVrms	Test Method A	3	-20 to 60
BS05N1NFAA	5	330mVrms	-	Test Method B	6	-20 to 60
BS05W1KFAA	5	0.3mVp-p	0.8mVp-p	Test Method C	10	-20 to 60
BS05W1KFAB	5	0.3mVp-p	0.8mVp-p	Test Method C	10	-20 to 60

Electric Potential Sensors

PKE05A1
PKE05B1



Part Number	Supply Voltage (Vdc)	Current Consumption (mA)	Min. Detectable Electric Potential (V)	Max. Detectable Electric Potential (V)	Output Voltage	Linearity (%)
PKE05A1	24 +/-10%	50 max.	0	1500	1/240Vdc of the objective potential	+/-1.5 max.(at 50V~1500V)
PKE05B1	24 +/-10%	50 max.	0	-1500	1/240Vdc of the objective potential	+/-1.5 max.(at -50V~-1500V)