

## Angular Position Sensing ( EM-3241 ) (Preliminary Specification)

All values specified in this data sheet are target specifications and are not guaranteed. The specifications are subject to change without notice.

### Features

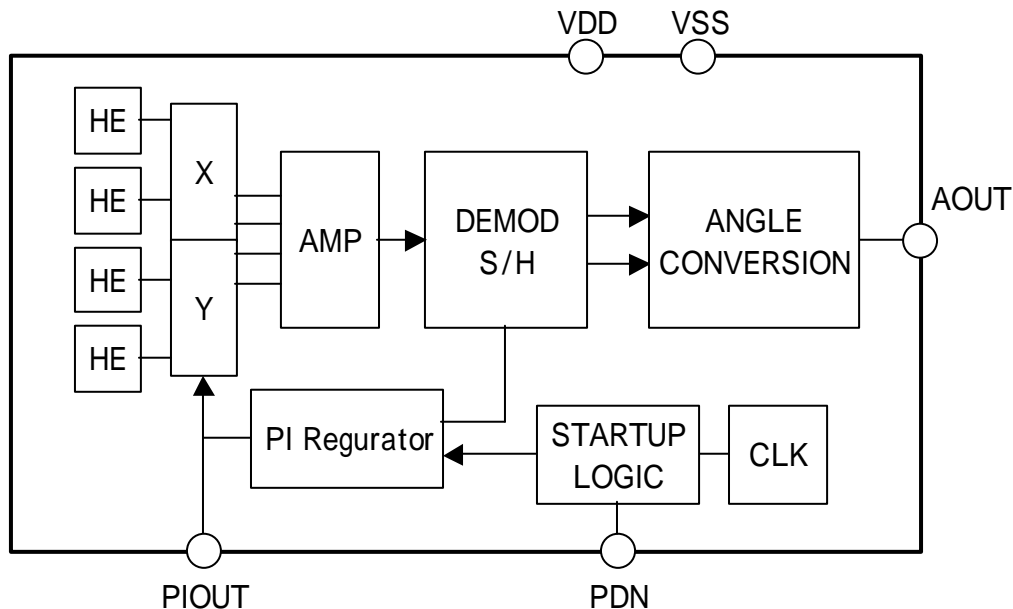
- Angular position sensing with Hall effect device
- Non contact rotation angle sensing by coin shape magnet and magnetic sensing IC
- Very small package with good stability against temperature change
- Single operative voltage 3V



### Outline

EM-3241 outputs analog signal proportional to angular position of magnet using signal from Hall sensors and the signal's processing. The combination EM-3241 with coin shape magnet realizes non contact angular position sensing features. Very wide variety of magnets can be used for the measurement, and very stable output without any significant error can be available even if the magnet has some temperature dependency.

### Block diagram



**Absolute maximum rating**

Symbol	Parameters	Min.	Typ.	Max.	Unit	Remarks
V <sub>SUP</sub>	Supply voltage	0		6	V	
T <sub>S</sub>	Storage temperature	-40		125	°C	

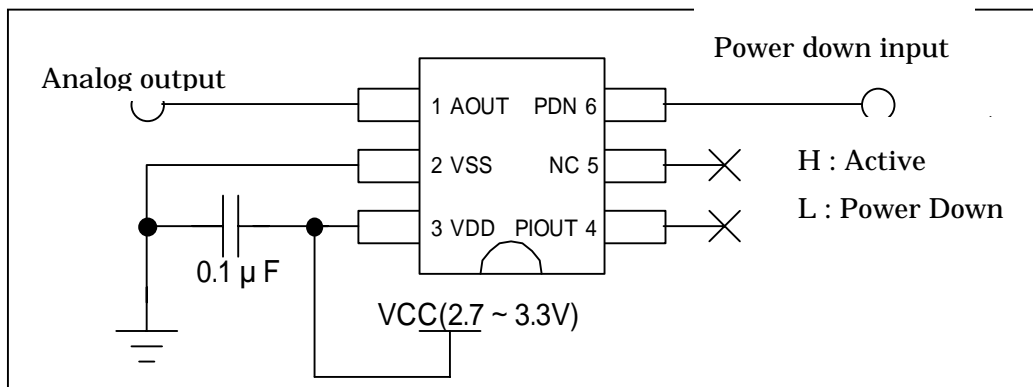
**Recommended operating condition**

Symbol	Parameters	Min.	Typ.	Max.	Unit	Remarks
V <sub>CC</sub>	Supply Voltage	2.7	3	3.3	V	
T <sub>A</sub>	Operating Temperature	-30		85	°C	

**Electric & Magnetic characteristics**

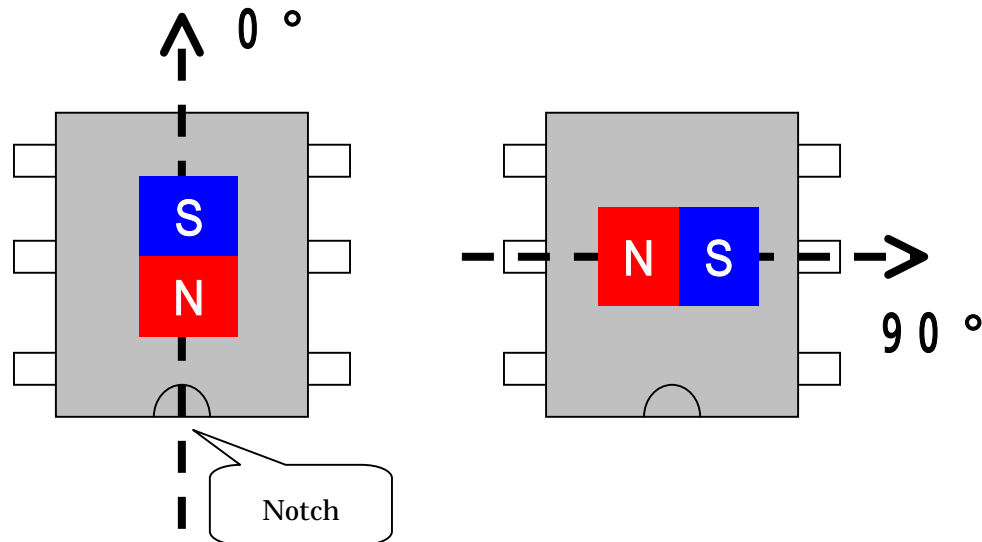
Symbol	Parameters	Min.	Typ.	Max.	Unit	Remarks
B <sub>RANGE</sub>	Detective Magnetic Range	11	15	19	mT	
A <sub>RANGE</sub>	Detective angle range			360	Deg.	
A <sub>PREC</sub>	Angle preciseness	-5	0	5	Deg.	@25°C
A <sub>TD</sub>	Angle Temperature Drift	-1	0	1	Deg.	@-30 ~ 85°C
BBW	Max. Rotation Speed			200	Hz	
	Output Cycle		50		KHz	
T <sub>d</sub>	Output signal delay		30		μs	
V <sub>OUT</sub>	Output Voltage range	0.1VDD		0.9VDD	V	Ratio metric
I <sub>SUP</sub>	Supply Current		9.0		mA	w/ sensor drive
I <sub>PD</sub>			1.0		μA	Power-down
T <sub>PD</sub>	Wake-up time	400	500	800	μs	PDN:L H
I <sub>OUT</sub>	Output current			0.3	mA	
CL	Load capacitance			500	pF	

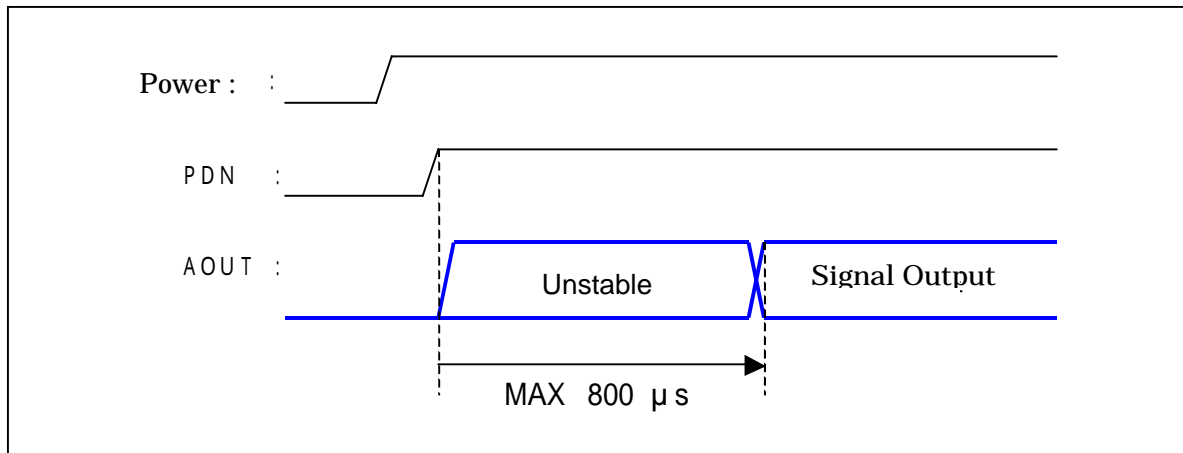
**Recommended Connection Diagram**



**Absolute angle position & Magnet Position**

Analog output increases with clockwise magnet rotation.

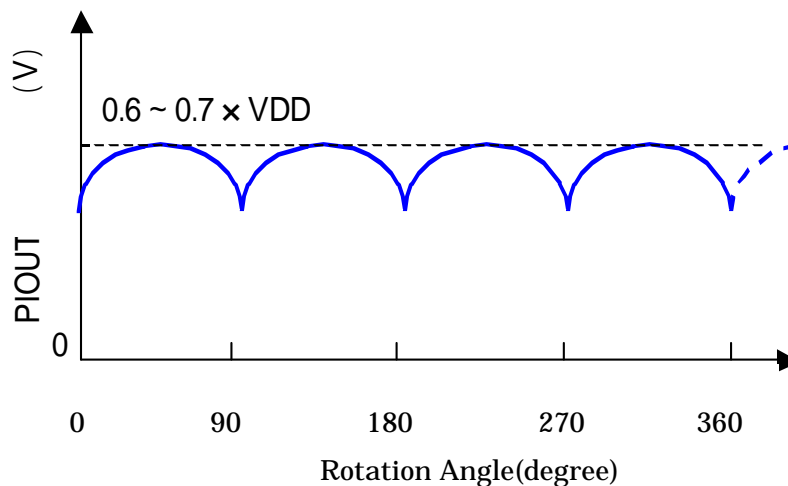


**Timing chart for output**

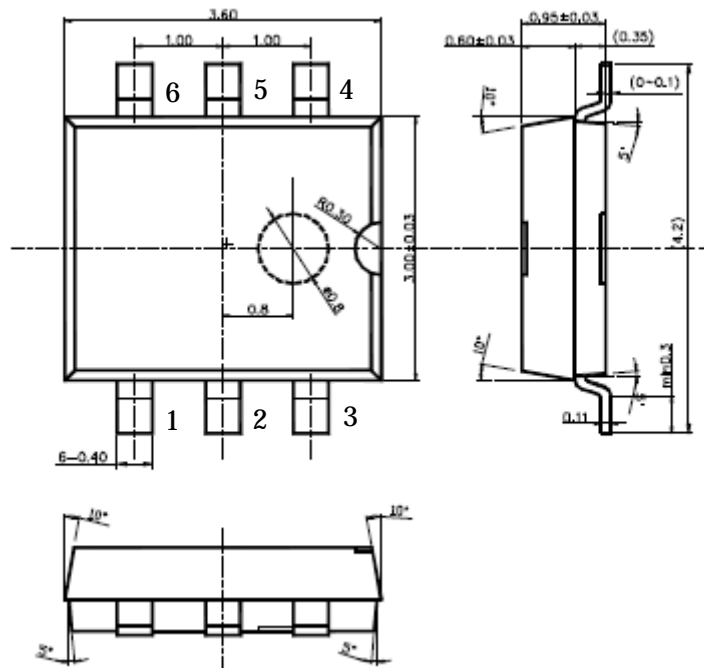
Please note there is "output unstable state" before actual signal outputs when the state is change from "Power Down" to "Active."

**Magnetic Field Optimization**

Output voltage from "PIOUT" pin can be used to monitor magnetic field condition against which the IC functions. Peak value of "PIOUT" will be 60-70% of supply voltage(VDD) when the target magnetic field is optimized.



<i>Package</i>
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Pin No.	Name	Comments
1	AOUT	Sensor output
2	VSS	Ground pin. A ceramic capacitor (0.1μF) should be connected between VDD and VSS.
3	VDD	Power supply. Please see above "VSS" for capacitor attach.
4	PIOUT	PI output. Output voltage monitoring when magnetic strength is confirmed. <b>Normally no connection(open).</b>
5	NC	<b>No connection(open)</b>
6	PDN	Power down. PDN=Logic High(3V)→ IC active. Internally being pulled down and power-down state kept when reset(power on).

<i>Important Notice</i>
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