High Sensitivity Open Drain Hall Effect Latch

1. Description

iA1188N Hall-effect sensor is a temperature stable, stress-resistant sensor. Superior high-temperature performance is made possible through a dynamic offset cancellation that utilizes chopper-stabilization. This method reduces the offset voltage normally caused by device over molding, temperature dependencies, and thermal stress.

iA1188N includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger. Advanced DMOS wafer fabrication processing is used to take advantage of low-voltage requirements, component matching, very low input-offset errors, and small component geometries.

This device requires the presence of both south and north polarity magnetic fields for operation. In the presence of a south polarity field of sufficient strength, the device output sensor on, and only switches off when a north polarity field of sufficient strength is present.

The package is in a Halogen Free version has been verified by third party Lab.

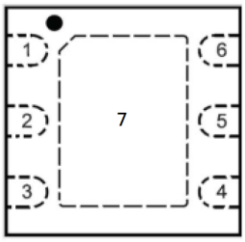
2. Features

- DMOS Hall IC Technology.
- Reverse bias protection on power supply pin.
- Chopper stabilized amplifier stage.
- Optimized for BLDC motor applications.
- Reliable and low shifting on high Temp condition.
- Good ESD Protection.
- Customer sensitivity/Temperature selection are available

3. Applications

- High temperature Fan motor
- 3 phase BLDC motor application
- Speed sensing
- Position sensing
- Current sensing
- Revolution counting
- Solid-State Switch
- Linear Position Detection
- Angular Position Detection
- Proximity Detection

4. Pin Assignments and Definitions



DFN 1.6 x 1.6
(Top View)

Pin No.	Pin Name	Function
1	V_{DD}	Power Supply
2	N.C	N.C
3	V_{OUT}	Output
4	N.C	N.C
5	V_{SS}	Ground
6	N.C	N.C
7	N.C	N.C

*Suggest Pin 7 (EP) short to ground.

5. Marking Information

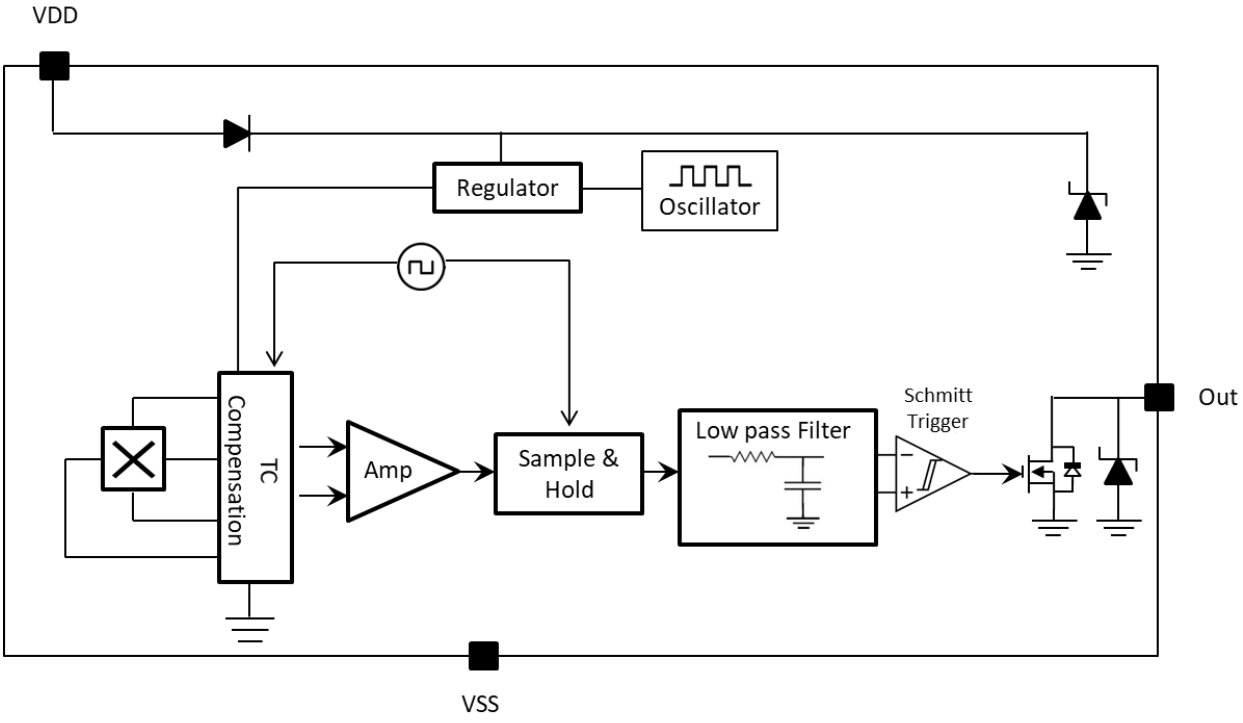
Product Name	Package	Marking
iA1188N	DFN 1.6 x 1.6	88X X: Date Code

6. Ordering Code

iA1188N □	Assembly Material G: Halogen and Lead Free Device

Note: inergy defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

7. Block Diagram



8. Absolute Maximum Ratings *(T_A = 25 ºC)*

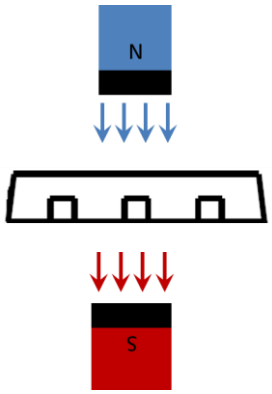
Characteristics		Values	Unit
Supply Voltage (***V_{DD}***)		28	V
Output Voltage,(***Vout***)		28	V
Reverse Voltage, (***V_{DD} / Vout***)		-28/-0.3	V
Output current, (***I_{SINK}***)		50	mA
Operating Temperature Range, (***T_A***)		-40 ~ +125	℃
Storage temperature Range, (***T_S***)		-65 ~ +150	℃
Maximum Junction Temp,(***T_J***)		150	℃
Thermal Resistance	(θ_{JA})	250	℃/W
	(θ_{JC})	50	℃/W
Package Power Dissipation, (P_D)		500	mW

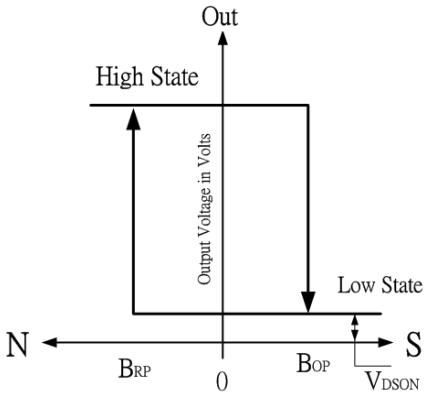
9. Electrical Characteristics

(DC Operating Parameters ：T_A =+25℃, V_{DD}=12V)

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, (V_{DD})	Operating	2.5		26.0	V
Supply Current, (I_{DD})	B<B_{OP}		2.5	5.0	mA
Output Saturation Voltage, (V_{DSON})	I_{OUT}=20mA, B>B_{OP}			400.0	mV
Output Leakage Current, (I_{OFF})	I_{OFF} B<B_{RP}, V_{OUT} = 12V			10.0	uA
Power-On Time, (T_{PO})	Power-On		150		uS
Output Switch Frequency, (F_{SW})	Operating	3			kHz
Output Rise Time, (T_R)	R_L=1K Ohm, C_L =20pF		0.05	0.45	uS
Output Fall Time, (T_F)	R_L=1K Ohm, C_L =20pF		0.2	0.45	uS
Electro-Static Discharge	HBM	4			KV
Operate Point, B_{OP}	B>B_{OP} V_{OUT} On	5		25	Gauss
Release Point, B_{RP}	B<B_{RP}, V_{OUT} Off	-25		-5	Gauss
Hysteresis, (B_{HYS})	|B_{OP}- B_{RP}|		30		Gauss

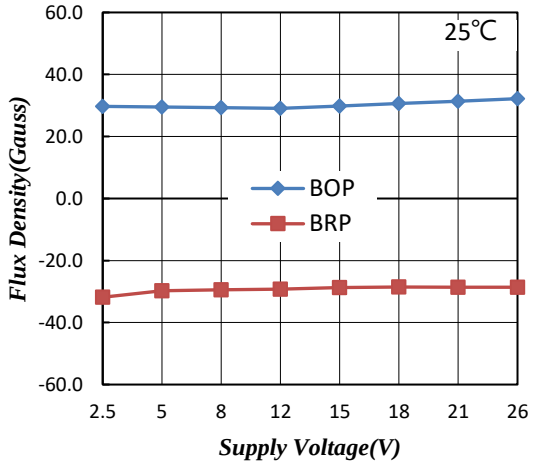
10. Output Behavior versus Magnetic Polar



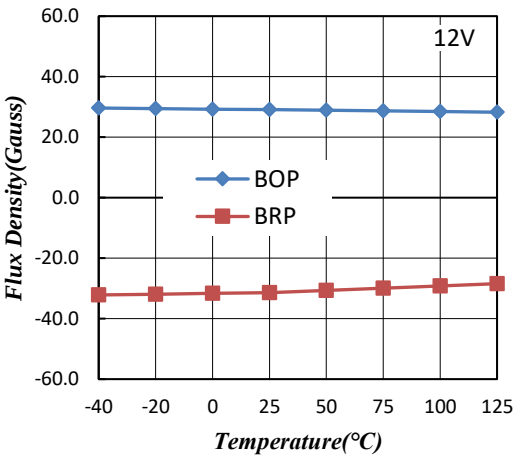


11. Typical Characteristics

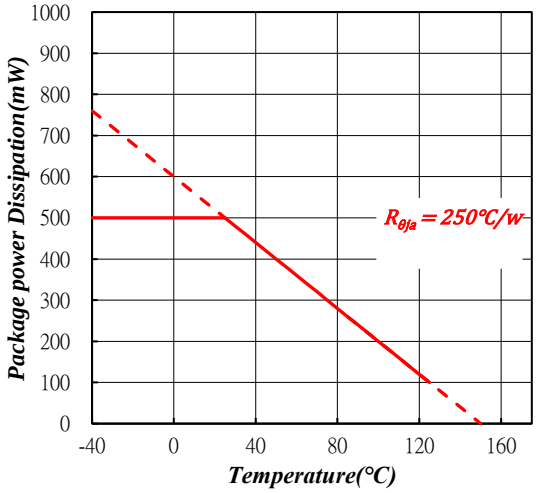
Typical Supply Voltage (V_{DD}) Versus Flux Density



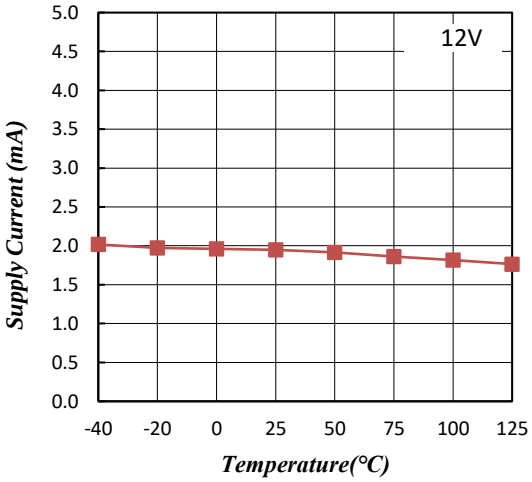
Typical Temperature (T_A) Versus Flux Density



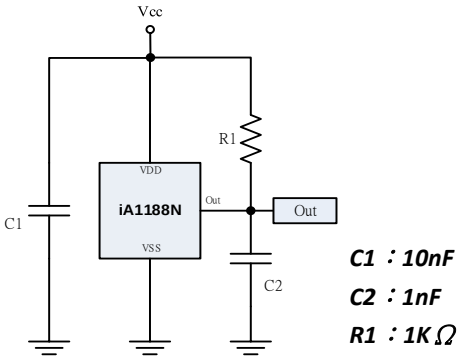
Power Dissipation versus Temperature (T_A)



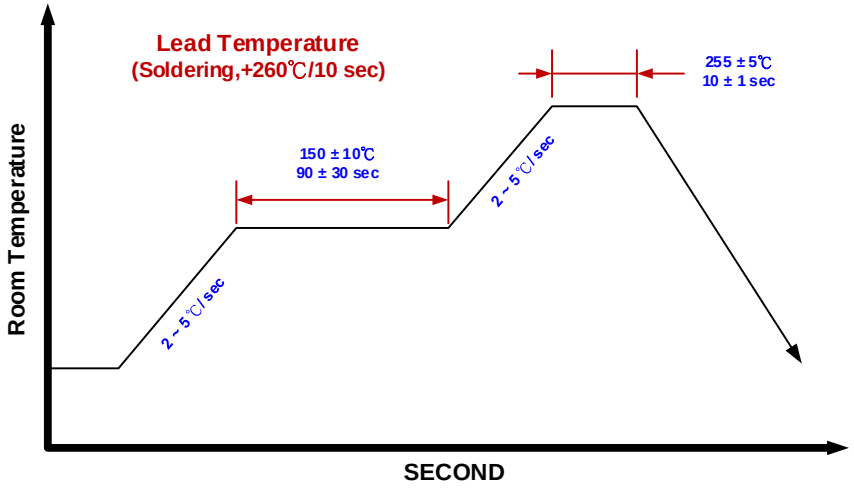
Typical Temperature (T_A) Versus Supply Current (I_{DD})



12. Typical Application circuit



13. IR reflow curve

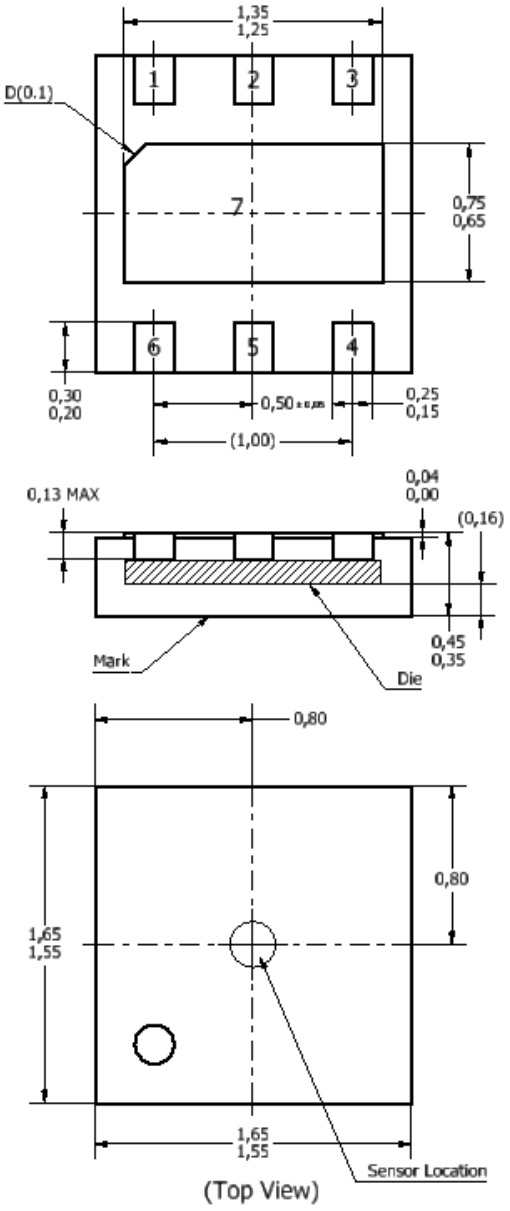


Soldering Condition

14. Package Dimensions

DFN 1.6x1.6 Package

(Bottom View)



(Top View)

NOTES:

1. Dimension in mm
2. Land Pattern (For reference only)