



AH284

Hall-Effect Smart Fan Motor Controller

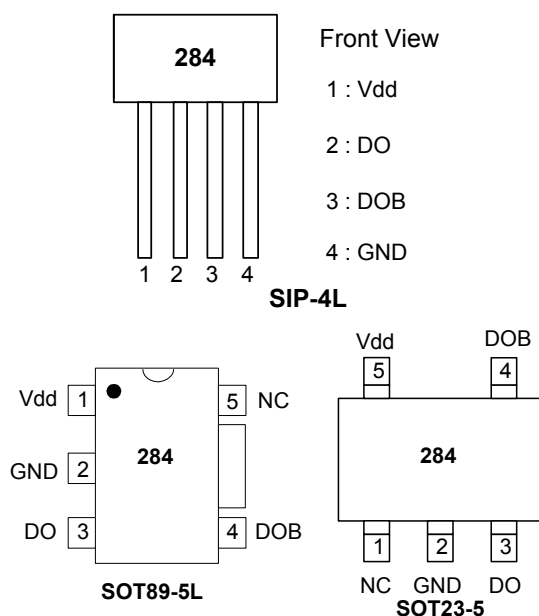
■ Features

- On chip Hall sensor
- Rotor-locked shutdown
- Automatically restart
- Built-in Zener protection for output driver
- Operating voltage: 3.8V~20 V
- Output current: $I_{O(AVE)} = 500\text{mA}$ for SIP-4/SOT89-5
- Output current: $I_{O(AVE)} = 400\text{mA}$ for SOT23-5
- Package: SIP-4L, SOT23-5L, SOT89-5L

■ General Description

AH284 is a monolithic fan motor controller with Hall sensor's capability. It contains two complementary open-drain drivers for motor's coil driving, automatic lock shutdown and restart function relatively. To avoid coil burning, rotor-lock shutdown detection circuit shut down the output driver if the rotor is blocked and then the automatic recovery circuit will try to restart the motor. This function repeats while rotor is blocked. Until the blocking is removed, the motor recovers running normally.

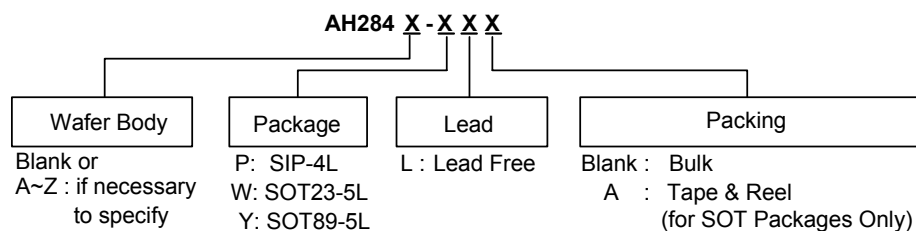
■ Pin Assignment



■ Pin Descriptions

Name	Description
Vdd	Input power
DO	Output pin
DOB	Output pin
GND	Ground
NC	Not connected

■ Ordering Information

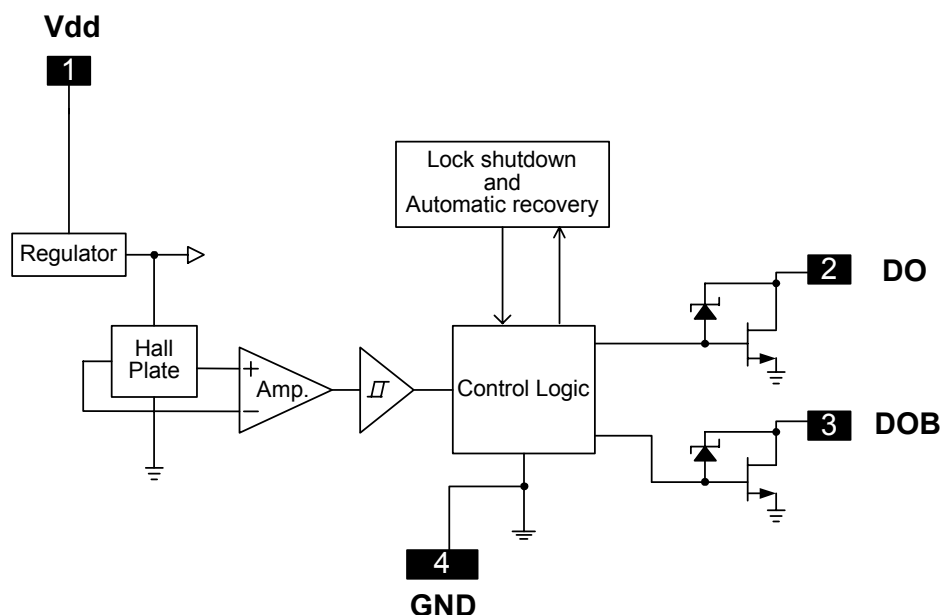




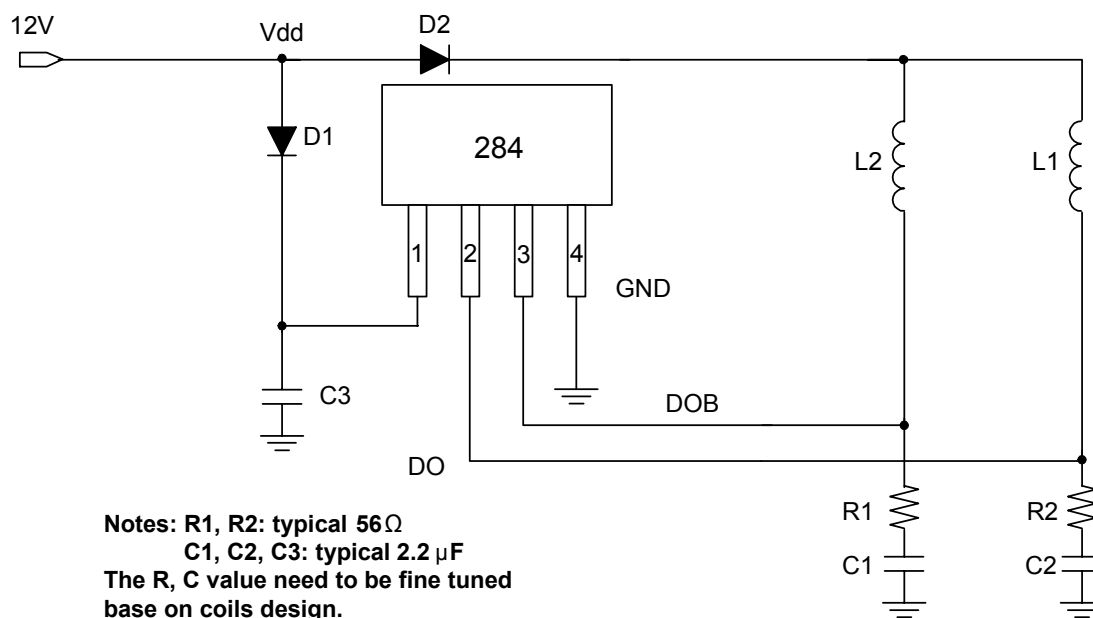
AH284

Hall-Effect Smart Fan Motor Controller

■ Block Diagram (SIP4)



■ Typical Application Circuit (SIP4)



12V brush-less DC fan



AH284

Hall-Effect Smart Fan Motor Controller

■ Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply Voltage	Vdd	24	V
Output Current	I _{O(AVE)}	SIP4/SOT89-5	500
		SOT23-5	400
	I _{O(PEAK)}	700	mA
Power Dissipation	P _D	SIP4	550
		SOT23-5	230
		SOT89-5	800
Operating Temperature	Topr	-40 ~ 100	°C
Storage Temperature	Tstg	-55 ~ 150	°C
Maximum Junction Temp.	Tj	150	°C
Thermal Resistance	θjc	SIP4	227
		SOT23-5	543
		SOT89-5	156

■ Electrical Characteristics (Ta = 25 °C, Vdd =12V, unless otherwise specified)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	Vdd	Operating	3.8	-	20	V
Supply current	Idd	Operating	-	2.0	4.0	mA
Output Leakage Current	Ioff	V _{OUT} =24V	-	< 0.1	10	μA
Locked Protection On	Tlrp-on		0.4	0.5	0.6	Sec
Locked Protection Off	Tlrp-off		2.4	3	3.6	Sec
Output saturation voltage	V _{OUT(sat)}	I _O =300mA	-	375	500	mV
		I _O =500mA	-	625	900	
Output On resistance	Rds(on)	I _O =300mA	-	1.25	1.67	ohm
Output Zener-breakdown Voltage	Vz		35	42	60	V

■ Magnetic Characteristics (Ta = 25 °C, Vdd = 12V, unless otherwise specified)

(1mT=10 Gauss)

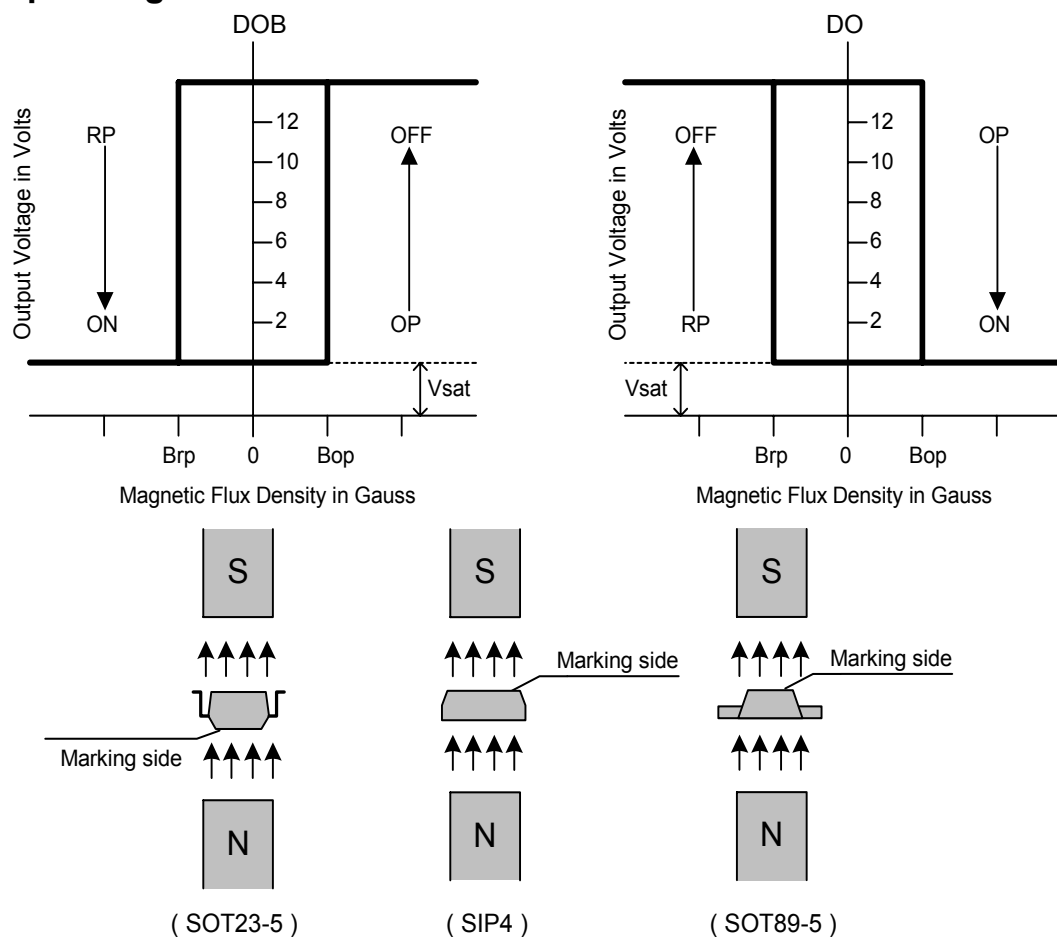
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operate Point	Bop	10	30	60	Gauss
Release Point	Brp	-60	-30	-10	Gauss
Hysteresis	Bhy	--	60	--	Gauss



AH284

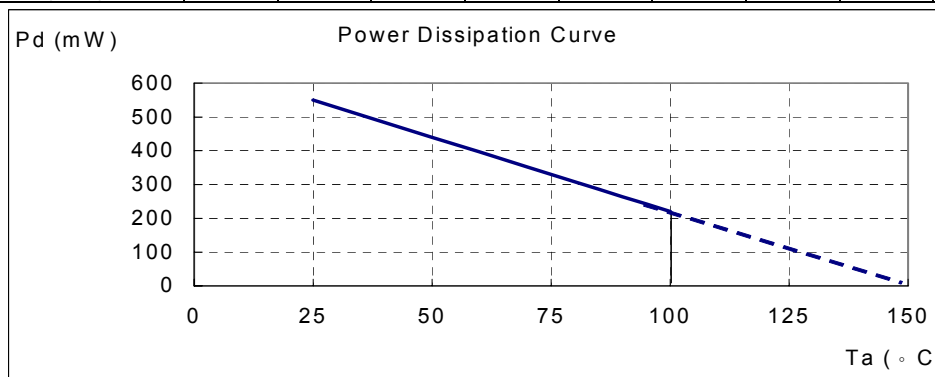
Hall-Effect Smart Fan Motor Controller

■ Operating Characteristics



■ Performance Characteristics (SIP4)

Ta (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	550	440	396	352	308	286	264	242	220
Ta (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	198	176	154	132	110	88	66	44	0



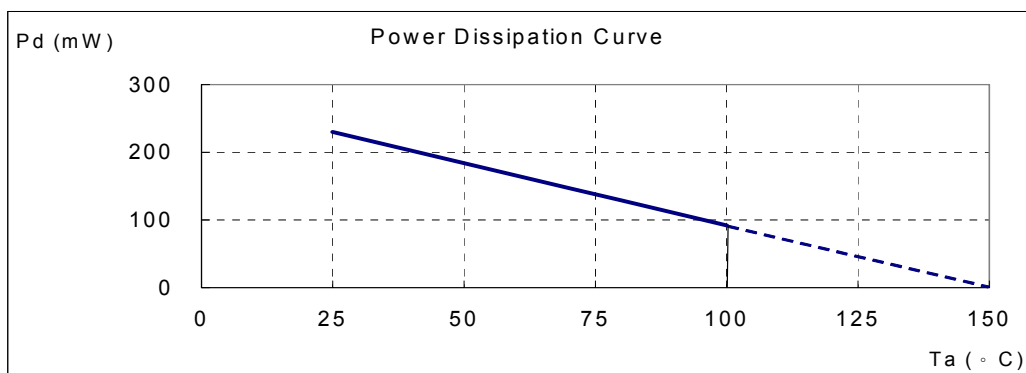


AH284

Hall-Effect Smart Fan Motor Controller

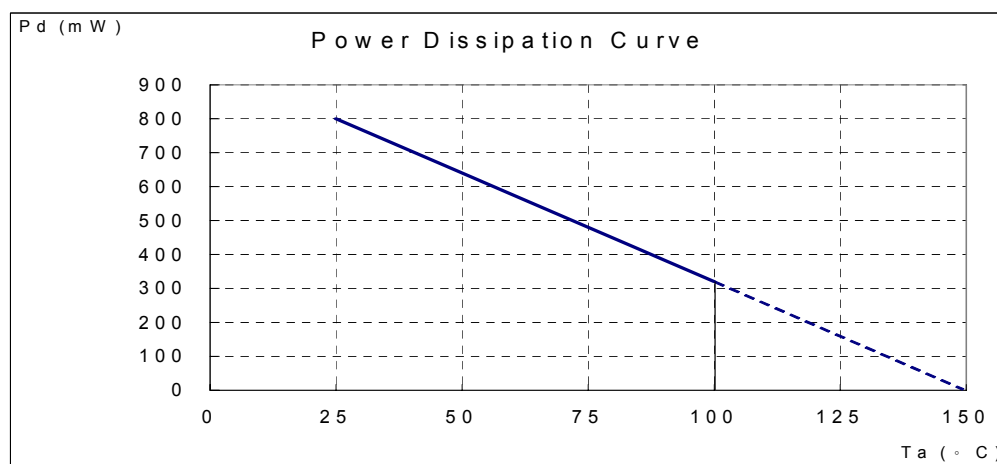
■ Performance Characteristics (SOT23-5)

Ta (°C)	25	50	60	70	80	90	100	110	120	130	140	150
Pd (mW)	230	184	166	147	129	110	92	74	55	37	18	0



■ Performance Characteristics (SOT89-5)

Ta (°C)	25	50	60	70	75	80	85	90	95	100
Pd (mW)	800	640	576	512	480	448	416	384	352	320
Ta (°C)	105	110	115	120	125	130	135	140	145	150
Pd (mW)	288	256	224	192	160	128	96	64	32	0



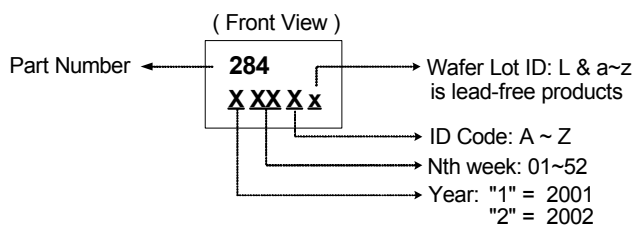


AH284

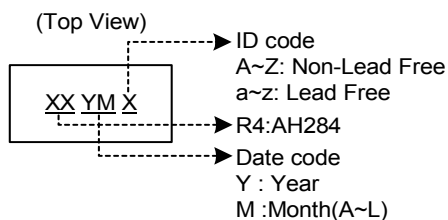
Hall-Effect Smart Fan Motor Controller

■ Marking Information

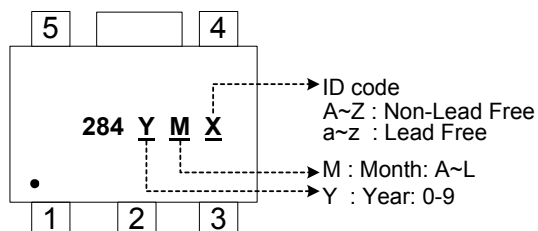
(1)SIP-4L



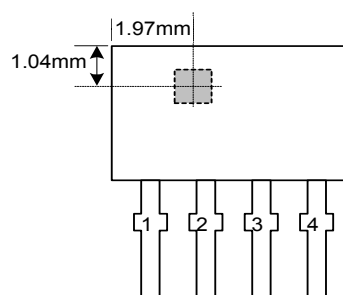
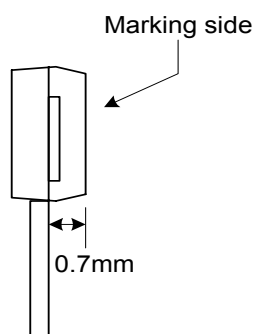
(2)SOT23-5L



(3)SOT89-5L



(1)SIP-4L



Technical drawing of a 284 connector showing three views: top, side, and front. The drawing includes various dimensions and tolerances for the connector's geometry.

Top View Dimensions:

- Width: 14.25mm ± 1.25 mm
- Height: 1.55mm ± 0.1 mm
- Pin Height: 1.03mm ± 0.1 mm
- Pin Spacing: 3.65mm ± 0.1 mm
- Pin Width: 0.30mm ± 0.1 mm
- Pin Angle: 5° - 7° (top), 3° - 5° (bottom)

Side View Dimensions:

- Length: 3.65mm ± 0.1 mm
- Height: 5.22mm ± 0.1 mm
- Pin Height: 0.46mm ± 0.03 mm
- Pin Spacing: 4.20mm ± 0.1 mm

Front View Dimensions:

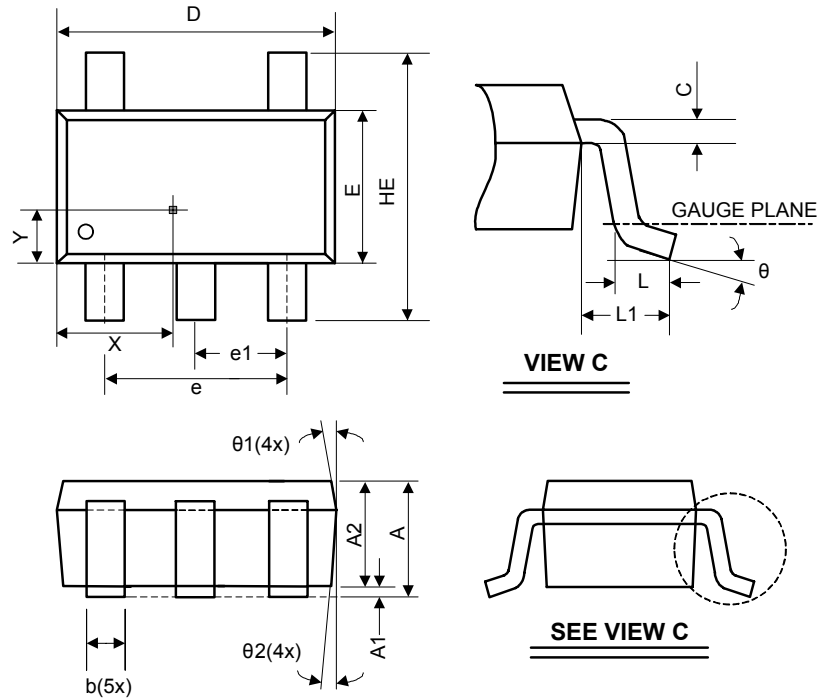
- Width: 1.42mm ± 0.1 mm
- Height: 3.81mm ± 0.03 mm
- Pin Height: 0.41mm ± 0.03 mm
- Pin Spacing: 1.27mm ± 0.03 mm
- Pin Width: 0.2mm Max.



AH284

Hall-Effect Smart Fan Motor Controller

(2) SOT23-5L



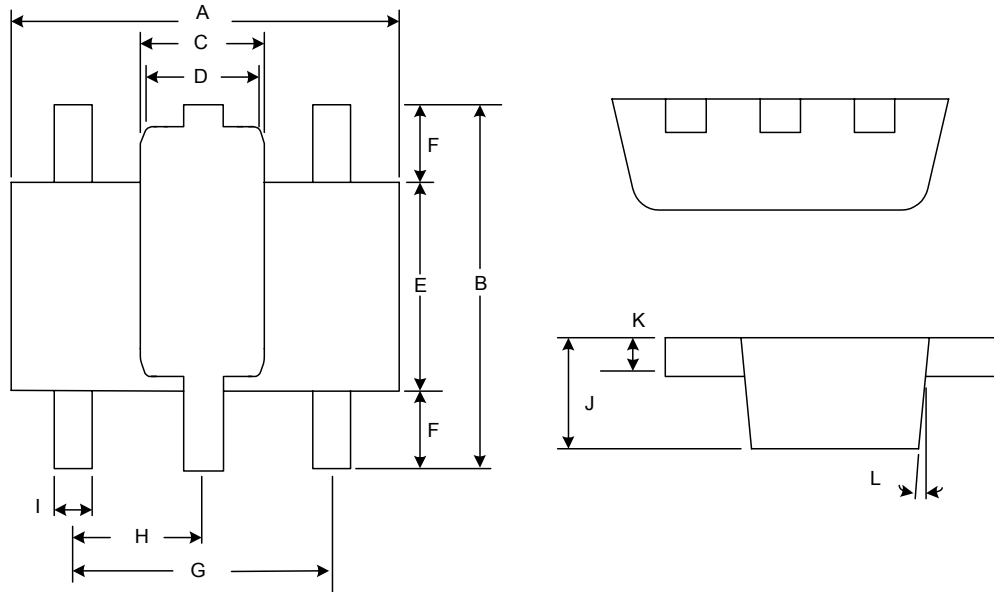
Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.05	-	1.35	0.041	-	0.053
A1	0.05	-	0.15	0.002	-	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	-	0.50	0.010	-	0.020
C	0.08	-	0.20	0.003	-	0.008
D	2.70	2.90	3.00	0.106	0.114	0.118
E	1.50	1.60	1.70	0.059	0.063	0.067
HE	2.60	2.80	3.00	0.102	0.110	0.118
L	0.30	-	0.60	0.012	-	0.024
L1	0.50	0.60	0.70	0.020	0.024	0.028
e	1.80	1.90	2.00	0.071	0.075	0.079
e1	0.85	0.95	1.05	0.033	0.037	0.041
θ	0°	5°	10°	0°	5°	10°
θ1	3°	5°	7°	3°	5°	7°
θ2	6°	8°	10°	6°	8°	10°
X	-	1.067	-	-	0.042	-
Y	-	0.432	-	-	0.017	-



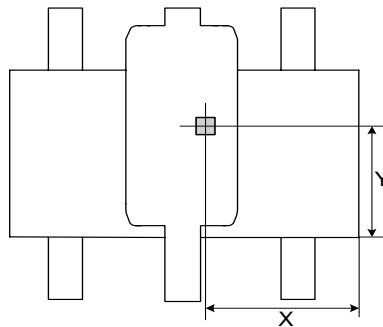
AH284

Hall-Effect Smart Fan Motor Controller

(3) SOT89-5L



Package Sensor Location



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	4.40	4.50	4.60	0.173	0.177	0.181
B	4.05	4.15	4.25	0.159	0.163	0.167
C	1.50	1.60	1.70	0.059	0.063	0.067
D	1.30	1.40	1.50	0.051	0.055	0.059
E	2.40	2.50	2.60	0.094	0.098	0.102
F	0.80	-	-	0.031	-	-
G	3.00 Ref.			0.118 Ref.		
H	1.50 Ref.			0.059 Ref.		
I	0.40	0.46	0.52	0.016	0.018	0.020
J	1.40	1.50	1.60	0.055	0.059	0.063
K	0.35	0.39	0.43	0.014	0.015	0.017
L	5° Typ.			5° Typ.		
X	-	1.90	-	-	0.075	-
Y	-	1.65	-	-	0.065	-