

Not Recommended for New Design



AP1346/1347

Two Coil Fan Motor Predriver

■ Features

- Compatible to a Hall element
- Operating voltage (V_{CC}) : 4V to 28V
- Lock shutdown and automatic restart
- Rotation detection (RD) output name as AP1347
- Speed indication output (FG) named as AP1346
- Output current $I_O=70\text{mA}_{(\text{max})}$
- Operating temperature (T_{opr}) : -30°C to +85°C
- SOP8 package
- Include Thermal Shutdown circuit

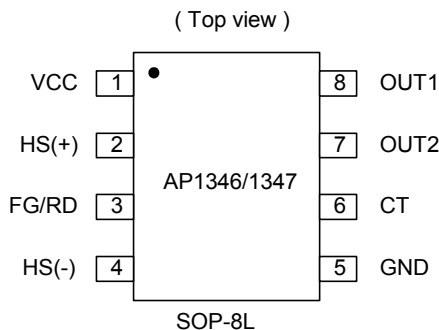
■ Application

- High voltage, high current brushless DC fan

■ General Description

The AP1346/7 fan motor predriver is suited for two-coil brush-less DC fan. All functions, including lock shutdown, automatic restart, speed indication (FG), have been integrated into one chip. When the motor is under lock condition, lock shutdown function turns off the output. When the lock condition is removed, the IC automatically restarts and allows DC fan to run. In addition, the FG function is to indicate the rotation speed and the RD function is to detect the motor status.

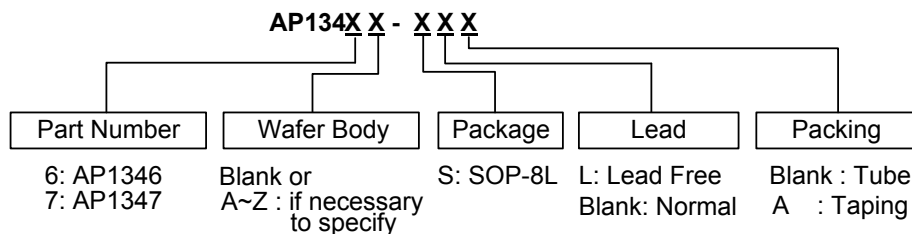
■ Pin Assignment



■ Pin Descriptions

Name	Description
VCC	Power input
HS(+)	Hall input
FG /RD	Speed indication / Rotation detection
HS(-)	Hall input
GND	Ground
CT	Timing capacitor
OUT2	Driver output
OUT1	Driver output

■ Ordering Information



Two Coil Fan Motor Predriver

The diagram illustrates a Hall-effect-based current sensor circuit. A voltage input is connected to a capacitor C1 and a diode D1. The output of D1 is connected to the VCC pin of the AP1346/AP1347 IC. A diode D2 is connected in parallel with the input line. The Hall element is connected to the HS(+) and HS(-) pins of the IC. The HS(-) pin is also connected to a capacitor C2. The IC has pins for VCC, GND, OUT1, OUT2, CT, and FG/RD. The output of the sensor is taken from the FG/RD pin, which is connected to a resistor R6 and an output terminal. The circuit also includes two transistors, Q1 and Q2, and several resistors (R1, R2, R4, R5) and diodes (Z11, Z1N, Z21, Z2N) for signal conditioning and protection.

Not Recommended for New Design



AP1346/1347

Two Coil Fan Motor Predriver

■ Absolute Maximum Ratings (T_A=25°C)

Parameter	Symbol	Rating	Unit
Input voltage	V _{CC}	30	V
Output current	I _{OUT}	70	mA
Allowable power dissipation	P _D	550*(note1)	mW
Operating temperature	T _{OPR}	-30 to +85	°C
Storage temperature	T _{STG}	-55 to +125	°C

*note1 : Reduced by 5.5mW for each increase in Ta of 1°C over 25 °C

■ Electrical Characteristics (T_A=25°C, V_{CC}=12V, unless otherwise noted)

Parameter	Symbol	Conditions	Rating			Unit
			Min.	Typ.	Max.	
Input voltage	V _{IN}		4	--	28	V
Hall input voltage (DC+AC)	V _{BH}	Includes the amplitude of signal	1	--	V _{CC} -0.5	V
Supply current	I _{CC}	The output is off	--	4	5.5	mA
Hall amp input hysteresis (+)	V _{HYS+}	Delta V when V _{BH} =6V	3	--	15	mV
Hall amp input hysteresis (-)	V _{HYS-}	Delta V when V _{BH} =6V	-15	--	-3	mV
Charge current	I _{CHG}	V _{CT} = 1.5V	7.7	9.6	11.5	uA
Discharge current	I _{DHG}	V _{CT} = 1.5V	0.19	0.24	0.29	uA
Charge/discharge ratio	R _{CD}	I _{CHG} /I _{DCHG}	32	40	48	--
Clamp voltage	V _{CL}		1.6	2.0	2.4	V
Comparator voltage	V _{CP}		0.8	1.0	1.2	V
Output high level	V _{OH}	I _O = 10mA	10	10.5	--	V
FG / RD pin output low	V _{FGL} / V _{RDL}	I _{FG} = 5mA / I _{RD} = 5mA	--	--	0.5	V
FG / RD pin sink current capacity	I _{FG} / I _{RD}	V _{FGL} = 2V / V _{RDL} = 2V	8	--	--	mA

Not Recommended for New Design

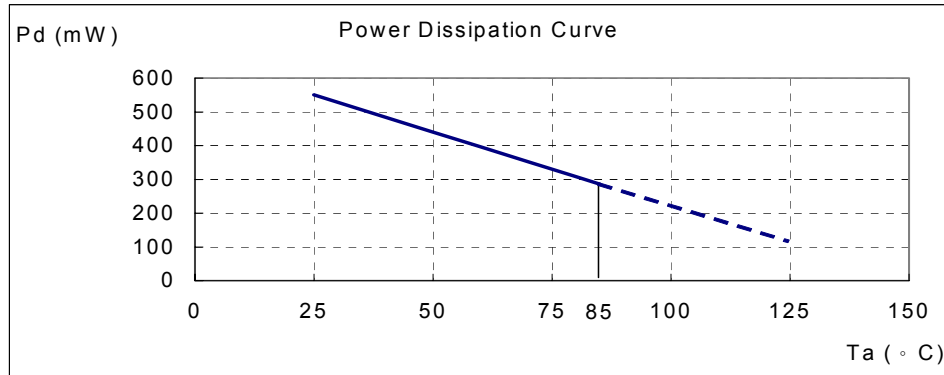


Two Coil Fan Motor Predriver

AP1346/1347

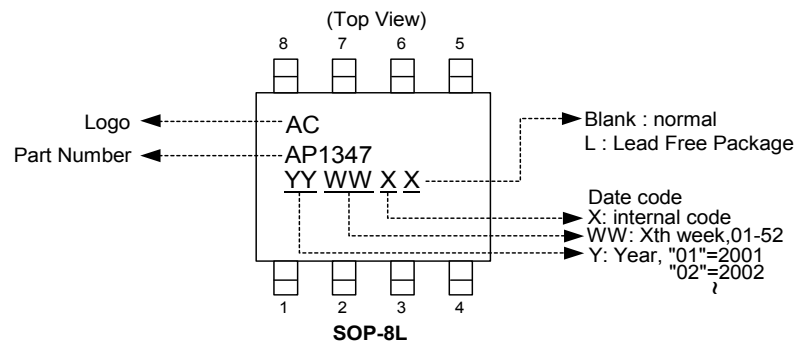
■ Performance Characteristics

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



Note : SOP-8L package.

■ Marking Information



Note: For AP1346, part number is marked as AP1346.

Not Recommended for New Design

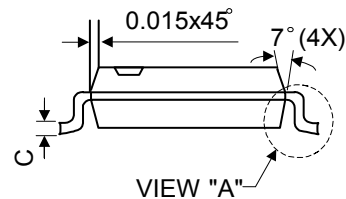
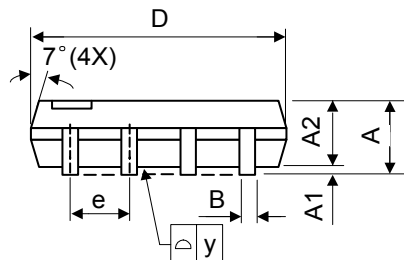
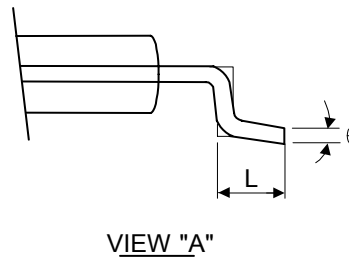
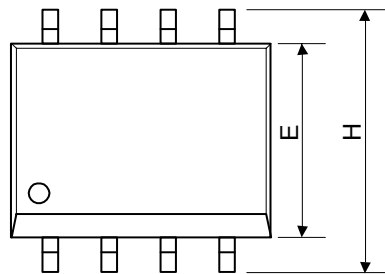


Two Coil Fan Motor Predriver

AP1346/1347

■ Package Information

Package Type: SOP-8L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.40	1.60	1.75	0.055	0.063	0.069
A1	0.10	-	0.25	0.040	-	0.100
A2	1.30	1.45	1.50	0.051	0.057	0.059
B	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.010
D	4.80	5.05	5.30	0.189	0.199	0.209
E	3.70	3.90	4.10	0.146	0.154	0.161
e	-	1.27	-	-	0.050	-
H	5.79	5.99	6.20	0.228	0.236	0.244
L	0.38	0.71	1.27	0.015	0.028	0.050
y	-	-	0.10	-	-	0.004
θ	0°	-	8°	0°	-	8°