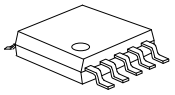
SINGLE-PHASE FULL-WAVE FAN MOTOR DRIVER



SSOP-10

■ DESCRIPTION

The UTC **F1862** is a Single-phase full-wave motor driver designed specially for small DC fans. For example, CPU cooling fans.

■ FEATURES

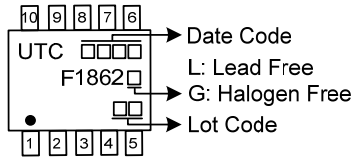
* Wide Operating Voltage 5V or 12V Are Both Acceptable
* Built-In Hall Amplifier And Hall Bias Circuit
* Built-In Lockup And Thermal Protection With Automatic Recovery Circuits
* Latch-Type Lockup Detection Output (RD) is Low During Rotation And High During Stop.
* Start/Stop Pin For Standby Mode Control

■ ORDERING INFORMATION

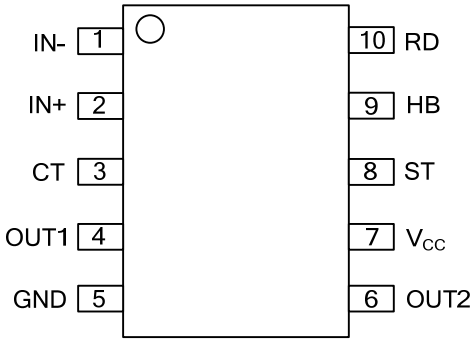
Ordering Number		Package	Packing
Lead Free	Halogen Free		
F1862L-R10-R	F1862G-R10-R	SSOP-10	Tape Reel

F1862G-R10-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) R10: SSOP-10 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



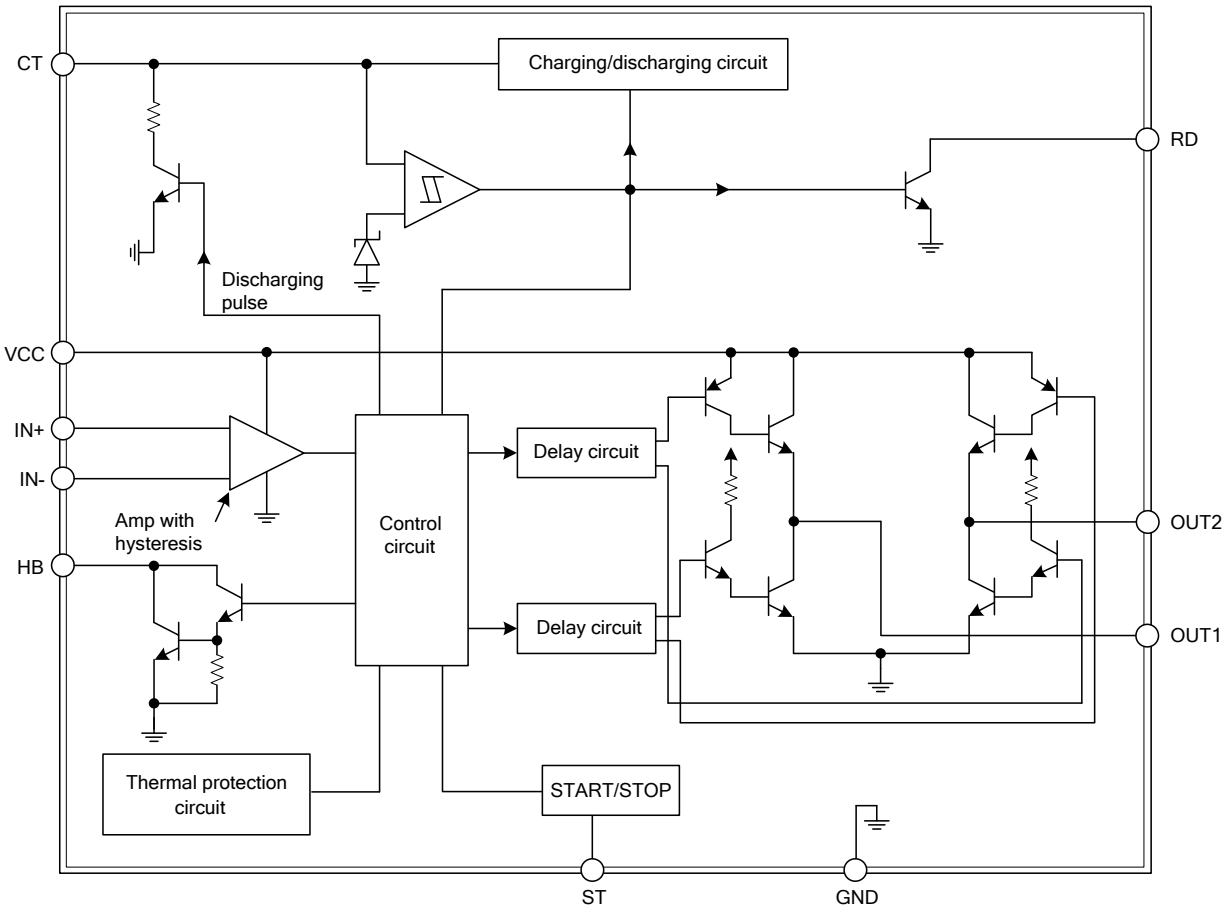
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	IN-	Hall signal input pin
2	IN+	Hall signal input pin
3	CT	This pin serves timing capacitor connecting pin between CT and GND.
4	OUT1	Single-phase coil output pin
5	GND	Ground
6	OUT2	Single-phase coil output pin
7	V_{CC}	Power supply pin for whole I_C.
8	ST	When input to this pin is High, motor drive is stopped (OUT is high impedance).
9	HB	Hall bias switching pin.
10	RD	Latch-type lockup detection output (RD) is low during rotation and high during stop.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Maximum Supply Voltage	$V_{CC\ MAX}$	17	V
Maximum Output Current	$I_{OUT\ MAX}$	0.8	A
Maximum Output Withstand Voltage	$V_{OUT\ MAX}$	17	V
RD Maximum Output Withstand Voltage	$V_{R\ MAX}$	17	V
RD Maximum Output Current	$I_{R\ MAX}$	5	mA
HB Maximum Output Current	$I_{B\ MAX}$	10	mA
ST Maximum Input Voltage	$V_{ST\ MAX}$	15	V
Allowable Power Dissipation (With Specified Substrate (Note 2))	P_{D_MAX}	800	mW
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-55~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Specified substrate: 114.3×76.2×1.5mm glass epoxy.

■ ALLOWABLE OPERATING RANGE (T_A=25°C , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	3.8 ~ 16.8	V
ST Input High-Level Voltage	STH	3 ~ 14	V
ST Input Low-Level Voltage	STL	-0.3 ~ 0.4	V
Hall Input Common-Mode Input Voltage Range	V_{ICM}	0.2 ~ V_{CC}-1.5	V

■ ELECTRICAL CHARACTERISTICS (V_{CC}=5V, T_A=25°C , unless otherwise specified)

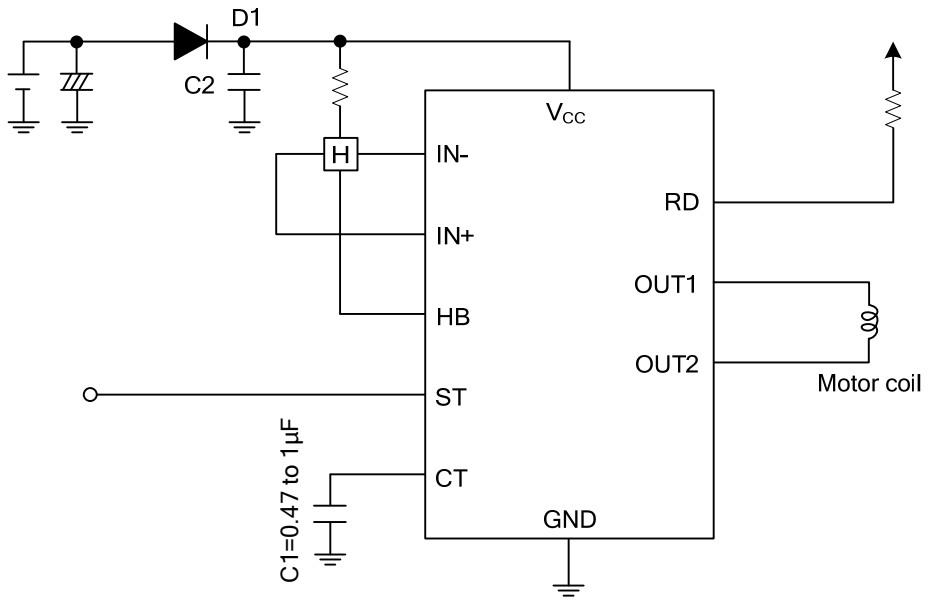
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Circuit Current	I_{CC}	In Drive Mode (CT=[L], ST=[L])		6.5	9.1	mA
		In Lockup Protecting Mode (CT=[H], ST=[L])		2.2	3.1	mA
		In Standby Mode (ST=[H])		110	150	μA
Lock Detection Capacitor Charging Current	I_{CT1}		1.9	2.8	3.7	μA
Capacitor Discharging Current	I_{CT2}		0.32	0.46	0.6	μA
Capacitor Charging/Discharging Current Ratio	R_{CT}	RCD=ICT1/ICT2	5.0	6.0	7.0	
CT Charging Voltage	V_{CT1}		2.55	2.75	2.95	V
CT Discharging Voltage	V_{CT2}		1.6	1.8	2.0	V
Output Low-Level Voltage	V_{OL}	I_O=200mA		0.2	0.3	V
Output High-Level Voltage	V_{OH}	I_O=200mA	3.9	4.1		V
Hall Input Sensitivity	V_{HN}	Zero Peak Value. (Including Offset, Hysteresis)		7	15	mV
RD Output Pin Low-Level Voltage	V_{RD}	I_{RD}=5mA		0.1	0.3	V
RD Output Pin Leakage Current	I_{RDL}	V_{RD}=15V			30	μA
HB Output Low-Level Voltage	V_{HBL}	I_{HB}=5mA		1.0	1.3	V
ST Pin Input Current	I_{ST}	V_{ST}=5V		75	100	μA

■ TRUTH TABLE

ST	IN-	IN+	CT	OUT1	OUT2	RD	HB	MODE
H				OFF	OFF	OFF	OFF	Standby
L	H	L	L	H	L	L	L	Operating
	L	H		L	H			
			H	OFF	OFF	OFF	L	Lock protection

Note1: The RD output is latched at “L”-level in operating mode and “H”-level in stop mode.

■ TYPICAL APPLICATION CIRCUIT



Notes: 1. D1 is used to prevent IC destruction caused by reverse-connection. It can be omitted if no problems are expected.
2. C2 is used to apply a kickback regenerative current when using the IC with the coil current over 500mA.
3. When CT is not used, it should be connected to ground.
4. When RD, ST, and HB are not used, they should be left open.

■ TYPICAL CHARACTERISTICS