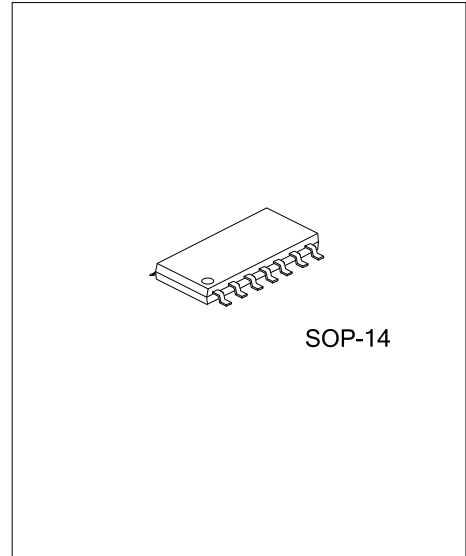




## F1836

## LINEAR INTEGRATED CIRCUIT

LOW-SATURATION,  
TWO-CHANNEL  
BIDIRECTIONAL MOTOR  
DRIVER IC FOR USE IN  
LOW-VOLTAGE APPLICATIONS



### DESCRIPTION

The UTC **F1836** is a bipolar stepper-motor driver IC for use in low-voltage applications. And, It is a low-saturation two-channel bidirectional motor driver IC which is ideal for use in cameras, printers, and other portable devices.

### FEATURES

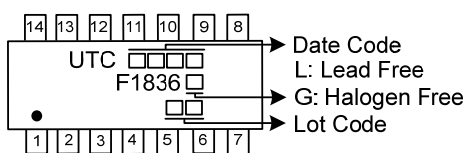
- \* Operating under low voltage range (Minimum: 2.5V)
- \* Low saturation voltage (only 0.48V for 0.4A)
- \* Parallel connection (only 0.5V for 0.8A)
- \* Built-in Spark killer diodes
- \* Built-in Thermal shutdown Protection Function
- \* Separate motor power supply and logic power supply
- \* Brake function
- \* Compact package

### ORDERING INFORMATION

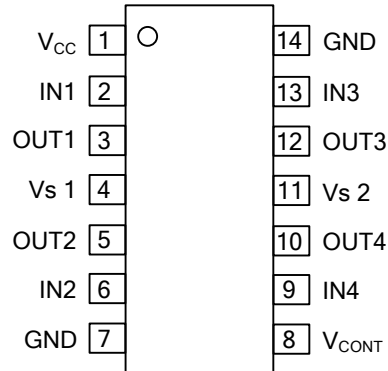
Ordering Number		Package	Packing
Lead Free	Halogen Free		
F1836L-S14-R	F1836G-S14-R	SOP-14	Tape Reel

<p>F1836G-S14-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) S14: SOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
---	---

### MARKING



### ■ PIN CONFIGURATION



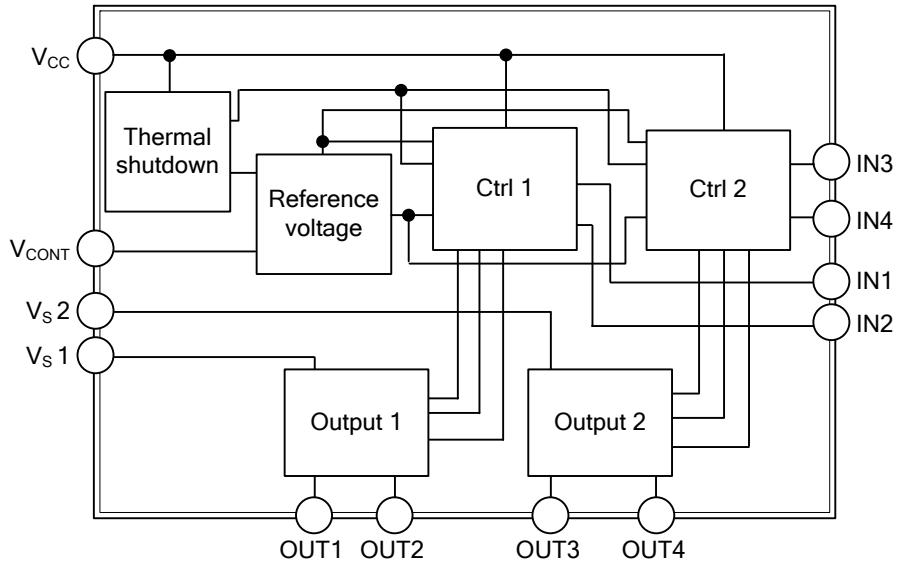
### ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V <sub>CC</sub>	Power Supply
2	IN1	The input of the channel 1
3	OUT1	The output of the channel 1
4	V <sub>S</sub> 1	The power supply of channel 1
5	OUT2	The output of the channel 1
6	IN2	The input of the channel 1
7, 14	GND	Ground The ground potential of the IC
8	V <sub>CONT</sub>	The output of a reference voltage
9	IN4	The input of the channel 2
10	OUT4	The output of the channel 2
11	V <sub>S</sub> 2	The power supply of channel 2
12	OUT3	The output of the channel 2
13	IN3	The input of the channel 2

### ■ TRUTH TABLE

IN 1, 3	IN 2, 4	OUT 1, 3	OUT 2, 4	Mode
H	L	H	L	Forward
L	H	L	H	Reverse
H	H	L	L	Brake
L	L	OFF	OFF	Standby

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V <sub>CC</sub>	-0.3 ~ +10.5	V
		V <sub>S</sub>	-0.3 ~ +10.5	V
Output Voltage		V <sub>OUT</sub>	V <sub>S</sub> + V <sub>SF</sub>	V
Input Voltage		V <sub>IN</sub>	-0.3 ~ +10	V
Ground Pin Flow-Out current	Per channel	IGND	1.0	A
Power Dissipation	With board (Note 2)	P <sub>D</sub>	800	mW
Operating Temperature		T <sub>OPR</sub>	-40 ~ +85	°C
Storage Temperature		T <sub>STG</sub>	-40 ~ +125	°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. Mounted on 30×30×1.5 mm<sup>3</sup> glass epoxy PCB

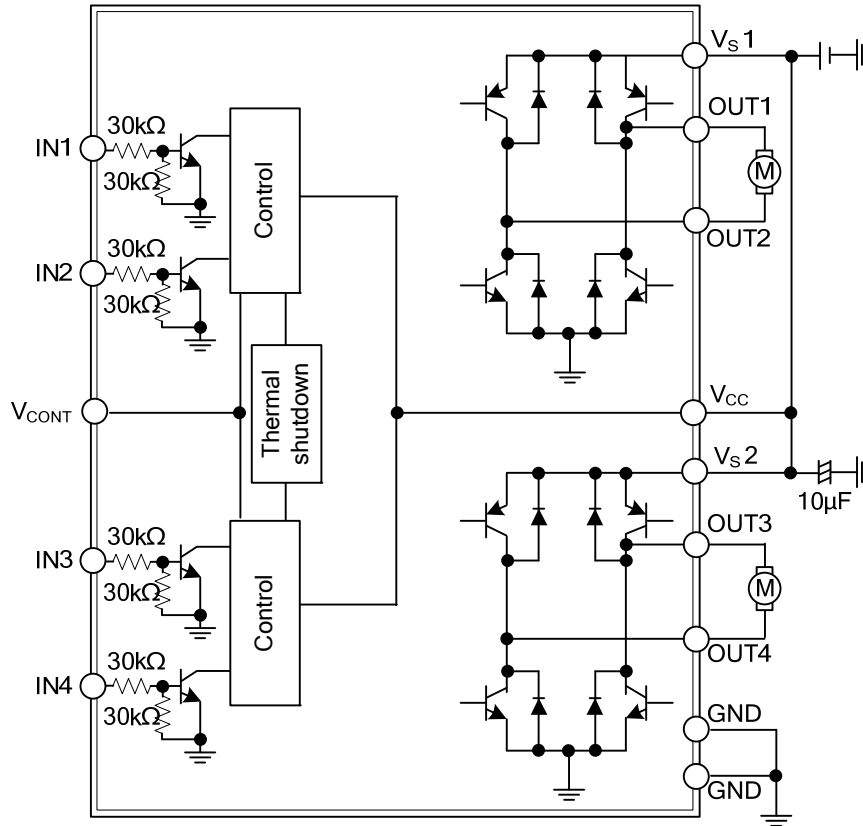
■ ALLOWABLE OPERATING RANGES (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V <sub>CC</sub>	2.5 ~ 9.0	V
		V <sub>S</sub>	1.8 ~ 9.0	V
Input High-Level Voltage		V <sub>IH</sub>	1.8 ~ 9.0	V
Input Low-Level Voltage		V <sub>IL</sub>	-0.3 ~ +0.7	V

■ ELECTRICAL CHARACTERISTICS (V<sub>CC</sub>=V<sub>S</sub>=3V, T<sub>A</sub>=25°C, unless otherwise specified)

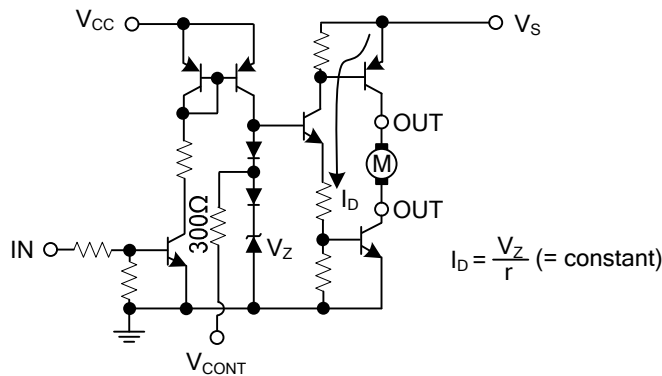
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current	I <sub>CC0</sub>	V <sub>IN1, 2, 3, 4</sub> =0V, I <sub>CC</sub> +I <sub>S</sub>		0.1	10	μA
	I <sub>CC1</sub>	V <sub>IN1</sub> =3V, V <sub>IN2, 3, 4</sub> =0V, I <sub>CC</sub> +I <sub>S</sub>		14	20	mA
	I <sub>CC2</sub>	V <sub>IN1, 2</sub> =3V, V <sub>IN3, 4</sub> =0V, I <sub>CC</sub> +I <sub>S</sub>		34	38	mA
Output Saturation Voltage	V <sub>OUT1</sub>	I <sub>OUT</sub> =200mA		0.24	0.35	V
	V <sub>OUT2</sub>	I <sub>OUT</sub> =400mA		0.48	0.70	V
	V <sub>OUT3</sub>	I <sub>OUT</sub> =400mA, parallel connection		0.25	0.40	V
	V <sub>OUT4</sub>	I <sub>OUT</sub> =800mA, parallel connection		0.50	0.80	V
Output Sustaining Voltage	V <sub>O(SUS)</sub>	I <sub>OUT</sub> =400mA	9			V
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =2V, V <sub>CC</sub> =6V			80	μA
Spark Killer Diode Reverse Current	I <sub>S(LEAK)</sub>	V <sub>CC1, 2</sub> =9V			30	μA
Spark Killer Diode Forward Voltage	V <sub>SF</sub>	I <sub>OUT</sub> =400mA			1.7	V

■ TYPICAL APPLICATION CIRCUIT



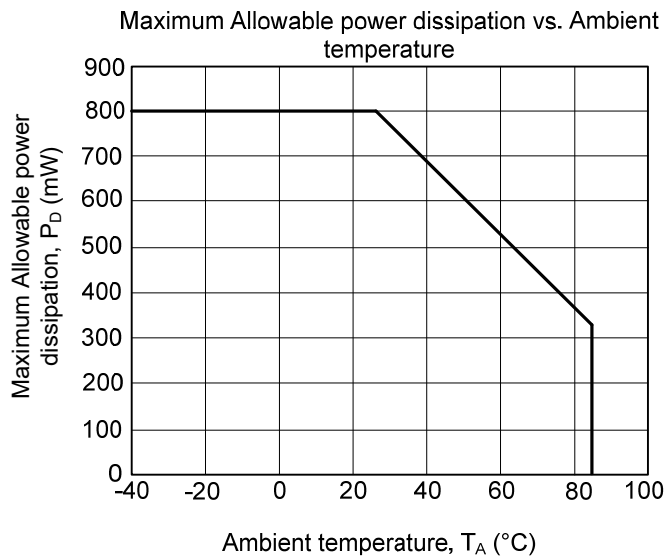
Note: There are no restrictions on the relationship of each voltage level in comparison with the others (regarding which is higher or lower), as long as the voltages applied to V<sub>CC</sub>, V<sub>S1</sub>, V<sub>S2</sub>, and IN1 through IN4 are within the limits set by the absolute maximum ratings. (Ex: V<sub>CC</sub>=3V, V<sub>S1</sub>, 2=2V, IN1 to IN4=5V)

V<sub>CONT</sub> Pin



As shown in the above diagram, the V<sub>CONT</sub> pin outputs the voltage of the band gap Zener V<sub>Z</sub>+V<sub>F</sub> (= 1.93 V). In normal use, this pin is left open.

■ TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.