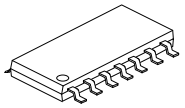
LOW-SATURATION, TWO-CHANNEL BIDIRECTIONAL MOTOR DRIVER IC FOR USE IN LOW-VOLTAGE APPLICATIONS



SOP-14

■ 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

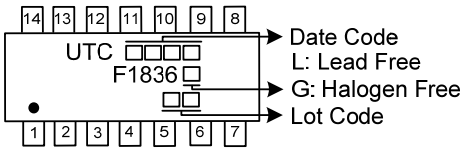
* Operating under low voltage range (Minimum: 2.5V)
* Low saturation voltage (only 0.48V for 0.4A)
* Parallel connection (only 0.5V for 0.8A)
* Built-in Spark killer diodes
* Built-in Thermal shutdown Protection Function
* Separate motor power supply and logic power supply
* Brake function
* Compact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

■ ORDERING INFORMATION

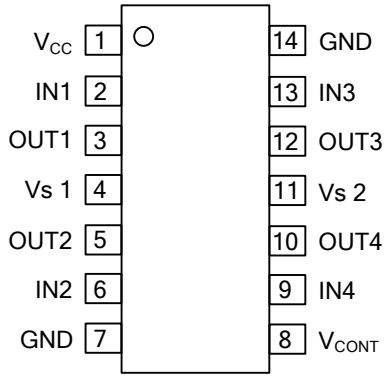
Ordering Number		Package	Packing
Lead Free	Halogen Free		
F1836L-S14-R	F1836G-S14-R	SOP-14	Tape Reel

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

■ MARKING



■ PIN CONFIGURATION



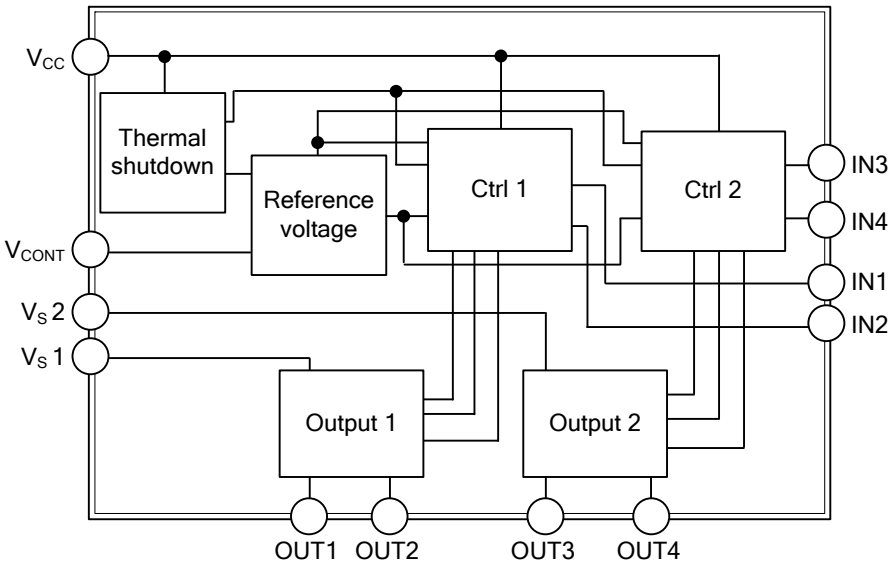
■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V_{CC}	Power Supply
2	IN1	The input of the channel 1
3	OUT1	The output of the channel 1
4	V_S 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_{CONT}	The output of a reference voltage
9	IN4	The input of the channel 2
10	OUT4	The output of the channel 2
11	V_S 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_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.3 ~ +10.5	V
		V_S	-0.3 ~ +10.5	V
Output Voltage		V_{OUT}	V_S + V_{SF}	V
Input Voltage		V_{IN}	-0.3 ~ +10	V
Ground Pin Flow-Out current	Per channel	IGND	1.0	A
Power Dissipation	With board (Note 2)	P_D	800	mW
Operating Temperature		T_{OPR}	-40 ~ +85	°C
Storage Temperature		T_{STG}	-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^3 glass epoxy PCB

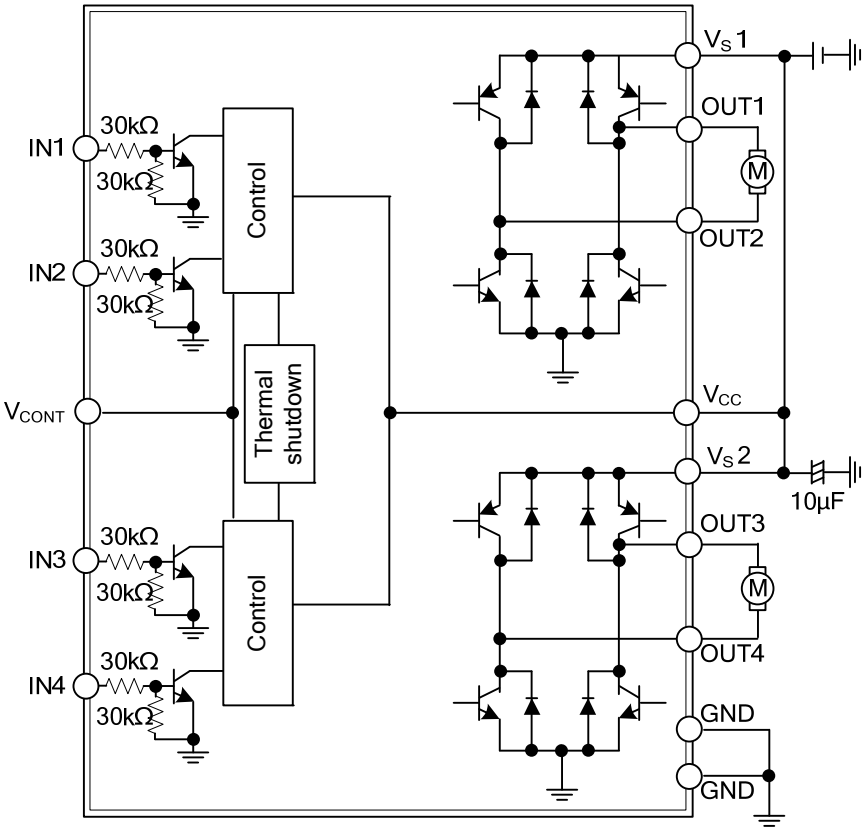
■ ALLOWABLE OPERATING RANGES (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	2.5 ~ 9.0	V
	V_S	1.8 ~ 9.0	V
Input High-Level Voltage	V_{IH}	1.8 ~ 9.0	V
Input Low-Level Voltage	V_{IL}	-0.3 ~ +0.7	V

■ ELECTRICAL CHARACTERISTICS (V_{CC}=V_S=3V, T_A=25°C, unless otherwise specified)

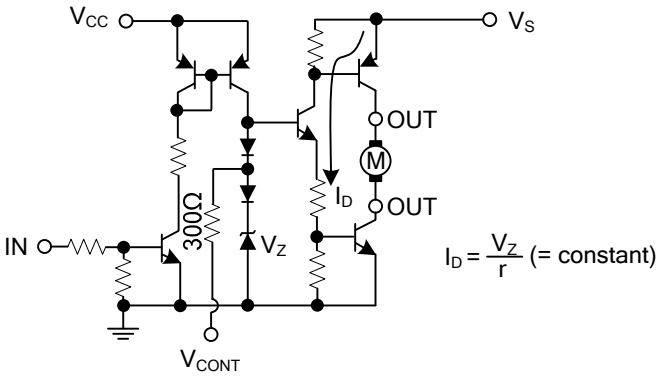
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current	$I_{CC}0$	V_{IN}1, 2, 3, 4=0V, I_{CC}+I_S		0.1	10	μA
	$I_{CC}1$	V_{IN}1=3V, V_{IN}2, 3, 4=0V, I_{CC}+I_S		14	20	mA
	$I_{CC}2$	V_{IN}1, 2=3V, V_{IN}3, 4=0V, I_{CC}+I_S		34	38	mA
Output Saturation Voltage	$V_{OUT}1$	I_{OUT}=200mA		0.24	0.35	V
	$V_{OUT}2$	I_{OUT}=400mA		0.48	0.70	V
	$V_{OUT}3$	I_{OUT}=400mA, parallel connection		0.25	0.40	V
	$V_{OUT}4$	I_{OUT}=800mA, parallel connection		0.50	0.80	V
Output Sustaining Voltage	$V_{O(SUS)}$	I_{OUT}=400mA	9			V
Input Current	I_{IN}	V_{IN} =2V, V_{CC}=6V			80	μA
Spark Killer Diode Reverse Current	$I_{S(LEAK)}$	V_{CC}1, 2=9V			30	μA
Spark Killer Diode Forward Voltage	V_{SF}	I_{OUT}=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_{CC}, V_S1, V_S2, and IN1 through IN4 are within the limits set by the absolute maximum ratings. (Ex: V_{CC}=3V, V_S1, 2=2V, IN1 to IN4=5V)

V_{CONT} Pin



As shown in the above diagram, the V_{CONT} pin outputs the voltage of the band gap Zener V_Z+V_F (= 1.93 V).
In normal use, this pin is left open.

■ TYPICAL CHARACTERISTICS