

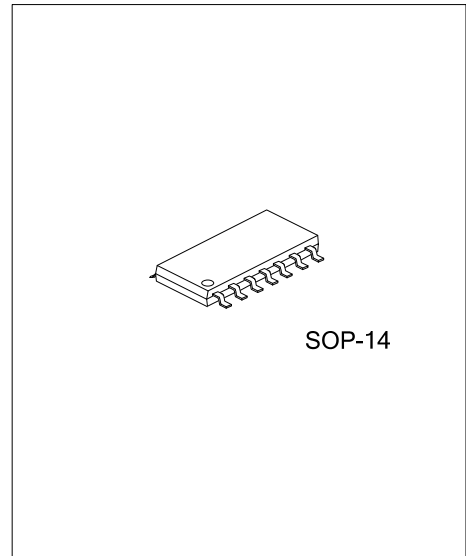


F1836

Preliminary

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

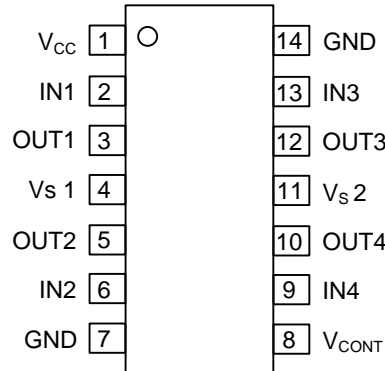
- * Operating under low voltage range (Minimum: 2.5V)
- * Low saturation voltage (only 0.4V for 0.4A)
- * Parallel connection (only 0.5V for 0.8A)
- * Built-in Spark killer diodes
- * Built-in Thermal shutdown Protection Function
- * Separate motor power supply and logic power supply
- * Brake function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

ORDERING INFORMATION

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

| | |
|--|---|
| <p>F1836L-S14-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p> | <p>(1) R: Tape Reel, T: Tube</p> <p>(2) S14: SOP-14</p> <p>(3) Halogen Free, L: Lead Free</p> |
|--|---|

■ PIN CONFIGURATION



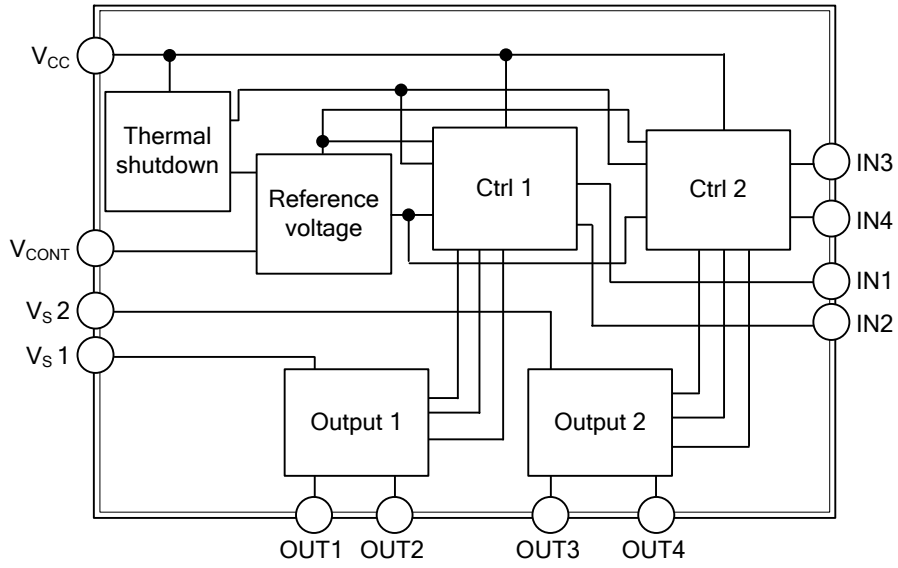
■ PIN DESCRIPTION

| 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 ($T_A=25^\circ\text{C}$)

| 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 | I_{GND} | 1.0 | A |
| Power Dissipation | With board (Note 2) | P_D | 800 | mW |
| Operating Temperature | | T_{OPR} | -20~+75 | $^\circ\text{C}$ |
| Storage Temperature | | T_{STG} | -40~+125 | $^\circ\text{C}$ |

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 30x30x1.5 mm³ glass epoxy PCB

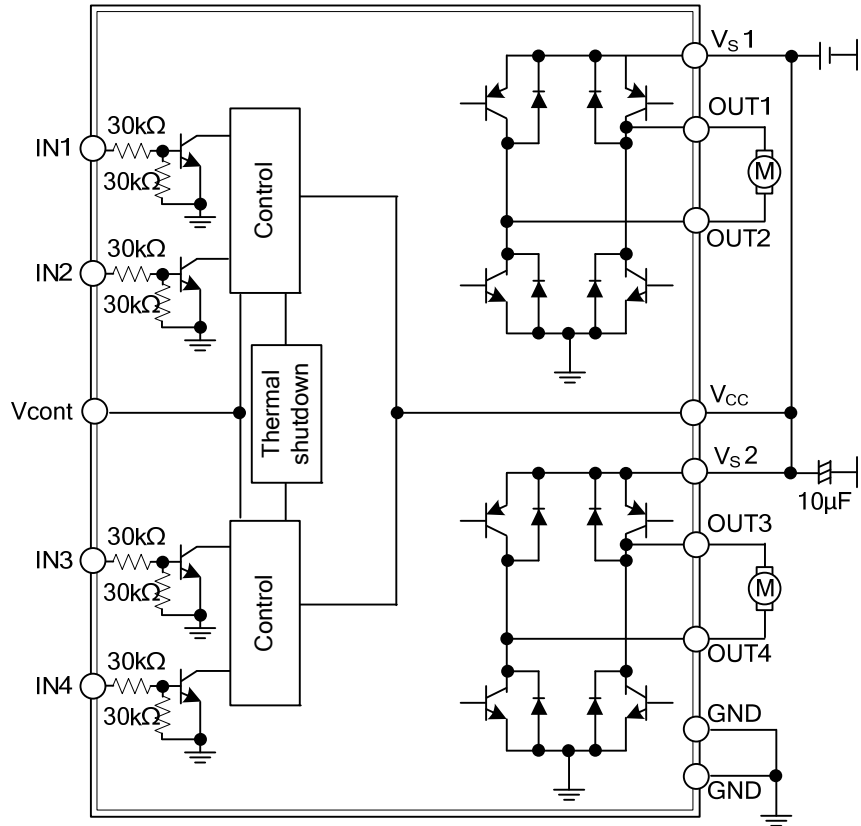
■ ALLOWABLE OPERATING RANGES ($T_A=25^\circ\text{C}$)

| 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 ($T_A=25^\circ\text{C}$, $V_{CC}=V_S=3\text{V}$)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------------------------|---------------|--|-----|------|------|---------------|
| Supply Current | I_{CC0} | $V_{IN1, 2, 3, 4}=0\text{V}$, $I_{CC}+I_S$ | | 0.1 | 10 | μA |
| | I_{CC1} | $V_{IN1}=3\text{V}$, $V_{IN2, 3, 4}=0\text{V}$, $I_{CC}+I_S$ | | 14 | 20 | mA |
| | I_{CC2} | $V_{IN1, 2}=3\text{V}$, $V_{IN3, 4}=0\text{V}$, $I_{CC}+I_S$ | | 22 | 35 | mA |
| Output Saturation Voltage | V_{OUT1} | $I_{OUT}=200\text{mA}$ | | 0.2 | 0.28 | V |
| | V_{OUT2} | $I_{OUT}=400\text{mA}$ | | 0.4 | 0.6 | V |
| | V_{OUT3} | $I_{OUT}=400\text{mA}$, parallel connection | | 0.25 | 0.35 | V |
| | V_{OUT4} | $I_{OUT}=800\text{mA}$, parallel connection | | 0.5 | 0.7 | V |
| Output Sustaining Voltage | $V_{O(SUS)}$ | $I_{OUT}=400\text{mA}$ | 9 | | | V |
| Input Current | I_{IN} | $V_{IN}=2\text{V}$, $V_{CC}=6\text{V}$ | | | 80 | μA |
| Spark Killer Diode Reverse Current | $I_{S(LEAK)}$ | $V_{CC1, 2}=9\text{V}$ | | | 30 | μA |
| Spark Killer Diode Forward Voltage | V_{SF} | $I_{OUT}=400\text{mA}$ | | | 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} , $V_{S2}=2V$, IN1 to IN4=5V)

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