



51494

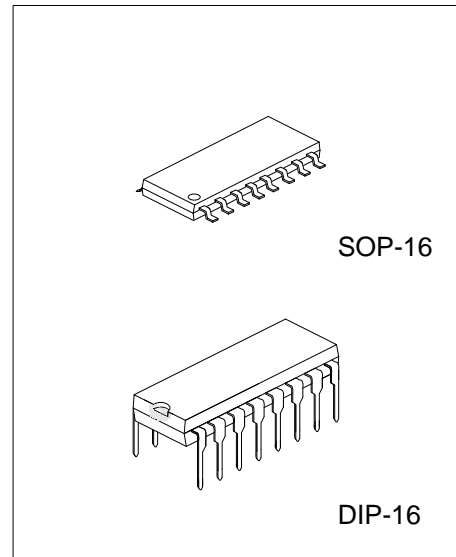
LINEAR INTEGRATED CIRCUIT

DESCRIPTION

The UTC **51494** is a monolithic bipolar integrate circuit that provides same 494 function and built in power good signal circuit for easy using **51494** can be easily implemented by just adding a capacitor.

FEATURES

- * Fully integrated with compact 16-pin dip
- * All necessary functions included for most popular half bridge circuit.
- * Built-in power good delay and power fail lead function.
- * Power good delay time is linearly.
- * Proportional to external capacitor value.
- * Reduced external components for cost down and components for cost down and compact size.

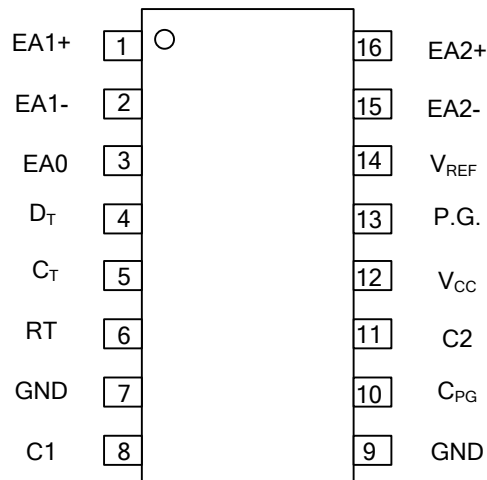


ORDERING INFORMATION

| Ordering Number | | Package | Packing |
|-----------------|--------------|---------|-----------|
| Lead Free | Halogen Free | | |
| 51494L-S16-R | 51494G-S16-R | SOP-16 | Tape Reel |
| 51494L-S16-T | 51494G-S16-T | SOP-16 | Tube |
| 51494L-D16-T | 51494G-D16-T | DIP-16 | Tube |

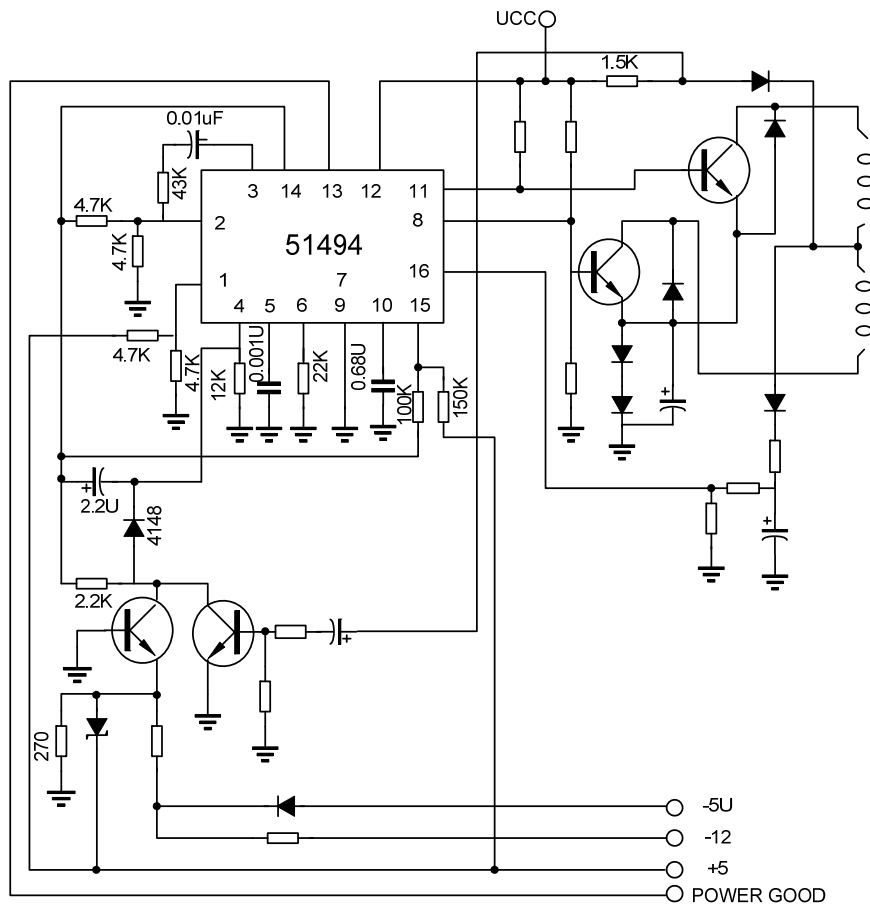
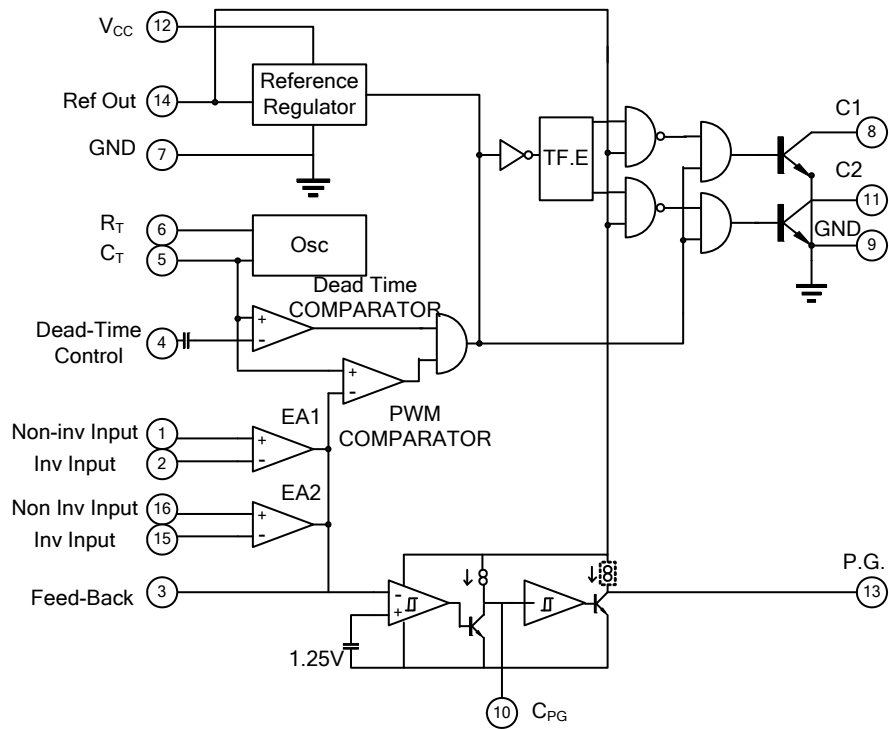
| | |
|---|---|
| <p>51494L-D16-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p> | <p>(1) R: Tape Reel, T: Tube</p> <p>(2) D16: DIP-16, S16: SOP-16</p> <p>(3) G: Halogen Free, L: Lead Free</p> |
|---|---|

■ PIN ASSIGNMENT



| PIN | NAME | FUNCTION |
|-----|------------------|---|
| 1 | EA1+ | Error amplifier noninverting input, same as pin 1 of 494 |
| 2 | EA1- | Error amplifier inverting input, same as pin 2 of 494 |
| 3 | EA0 | Error amplifier output and feedback, same as pin 3 of 494 |
| 4 | D _T | Dead time control input, same as pin 4 of 494 |
| 5 | C _T | Connect capacitor to oscillator circuit for operating frequency, same as pin 5 of 494 |
| 6 | R _T | Connect resistor to oscillator circuit for operating frequency, same as pin 6 of 494 |
| 7 | GND | Ground terminal of IC, same as pin 7 of 494 |
| 8 | C1 | Collector of output transistor one, same as pin 8 of 494 |
| 9 | GND | Ground terminal of IC |
| 10 | C _{PG} | Terminal for capacitor to determine power good delay time |
| 11 | C2 | Collector of output transistor two, same as pin 11 of 494 |
| 12 | V _{CC} | Supply voltage, same as pin 12 of 494 |
| 13 | P.G. | Output for power good signal |
| 14 | V _{REF} | Reference voltage output, same as pin 14 of 494 |
| 15 | EA2- | Error amplifier inverting input, same as pin 15 of 494 |
| 16 | EA+ | Error amplifier noninverting input, same as pin 16 of 494 |

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(Unless otherwise specified, all is over operating free-air temperature Range)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|--|------------------|----------------|------|
| Supply Voltage | V_{CC} | 42 | V |
| Voltage from any pin to ground (except pin8 & pin11) | V_{IN} | $V_{CC} + 0.3$ | V |
| Collector Output Voltage | V_{C1}, V_{C2} | 42 | V |
| Peak Collector Output | I_{C1}, I_{C2} | 250 | mA |
| Power Dissipation | P_D | 1500 | mW |
| Operating Temperature | T_{OPR} | 0 ~ +70 | °C |
| Storage Temperature | T_{STG} | -40 ~ +150 | °C |
| Junction Temperature | T_J | 125 | °C |

Note: 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.

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified, $T_A=0\sim 70^\circ\text{C}$, $V_{CC}=15\text{V}$, $f=10\text{kHz}$)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|------------------|--|------|------|----------|---------------|
| REFERENCE SECTION | | | | | | |
| Reference Voltage | V_{REF} | $I_{REF} = 1.0\text{mA}$ | 4.75 | 5 | 5.25 | V |
| Line Regulation | V_{LINE} | $7\text{V} < V_{CC} < 40\text{V}$ | | 2 | 25 | mV |
| Load Regulation | V_{LOAD} | $1\text{mA} < I_{REF} < 5\text{mA}$ | | 1 | 15 | mV |
| Temperature Coefficient | | $0^\circ\text{C} < F_A < 70^\circ\text{C}$ | | 0.01 | 0.03 | %/°C |
| OSCILLATOR SECTION | | | | | | |
| Oscillator Frequency | F_{OSC} | $C_T = 0.01\mu\text{F}$, $R_T = 12\text{k}\Omega$ | | 10 | | kHz |
| Oscillator Frequency Change Over Operating Temperature Range | Δf_{OSC} | $C_T = 0.01\mu\text{F}$, $R_T = 12\text{k}\Omega$ | | | 2 | % |
| DEAD TIME CONTROL SECTION | | | | | | |
| Input Bias Current (Pin 4) | $I_{B(DT)}$ | $V_{CC} = 15\text{V}$, $0\text{V} < V_4 < 5.25\text{V}$ | | -2 | -10 | μA |
| Maximum Duty Cycle, Each Output | $D_{C(MAX)}$ | $V_{CC} = 15\text{V}$, Pin 4 = 0V Output Control Pin = V_{REF} | 43 | | 45 | % |
| Input Threshold Voltage | Zero Duty | V_{TH} | | 3 | 3.3 | V |
| | Max Duty | | 0 | | | |
| ERROR AMPLIFIER SECTION | | | | | | |
| Input Offset Voltage | V_{ICS} | $V_3 = 2.5\text{V}$ | | 2 | 10 | mV |
| Input Offset Current | I_{ICS} | $V_3 = 2.5\text{V}$ | | 25 | 250 | nA |
| Input Bias Current | I_{IB} | $V_3 = 2.5\text{V}$ | | 0.2 | 1 | μA |
| Input Common-mode Voltage Range | V_{ICR} | $7\text{V} < V_{CC} < 40\text{V}$ | -0.3 | | V_{CC} | V |
| Large Signal Open-Loop Voltage Range | G_{VO} | $0.5\text{V} < V_3 < 3.5\text{V}$ | 60 | 74 | | dB |
| Unity-Gain Band width | f_c | | | 650 | | kHz |

■ ELECTRICAL CHARACTERISTICS(Cont.)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|---------------|---------------------------------|------|------|------|---------|
| OUTPUT SECTION | | | | | | |
| Collector Off-State Current | $I_{C(OFF)}$ | $V_{CC}=V_C=40V, V_E=0$ | | 2 | 100 | μA |
| Emitter Off-State Current | $I_{E(OFF)}$ | $V_{CC}=V_C=40V, V_E=0$ | | | -100 | μA |
| Output Saturation Voltage Common-Emitter | $V_{CE(SAT)}$ | $V_E=15V, I_C=200mA$ | | 1.1 | 1.3 | V |
| OUTPUT CONTROL (pin13) | | | | | | |
| Standby Power Supply Current | I_{CC} | | | 6 | 10 | mA |
| Output AC Characteristic | | | | | | |
| Raise Time Common-Emitter | T_R | | | 100 | 200 | ns |
| Fall Time Common-Emitter | T_R | | | 25 | 100 | ns |
| PWM COMPARATOR SECTION | | | | | | |
| Inhibit Threshold Voltage | V_{THI} | Zero Duty cycle | | 4 | 4.5 | V |
| Output Source Current | I_{O+} | $0.5V < V_3 < 3.5V$ | 2 | | | mA |
| Output Sink Current | I_{O-} | $0.5V < V_3 < 3.5V$ | -0.2 | -0.6 | | mA |
| POWER GOOD SECTION | | | | | | |
| Power Good Delay Time | t_{PD} | $C_D = 1\mu F$ | 230 | 280 | 330 | ms |
| | | $C_D = 0.47\mu F$ | 108 | 130 | 160 | |
| Power Fail Lead Time | T_{P1} | | | 4 | | ms |
| Output High Voltage | V_{OH} | $V_{PINN} = 5V, I_L = 1mA$ | 4.75 | | | V |
| Output Saturation Voltage | V_{SAT} | $V_{PINN} = 5V, I_{SINK} = 4mA$ | | | 0.4 | V |
| Output Leakage Current | I_{OH} | | | | 100 | μA |

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. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.