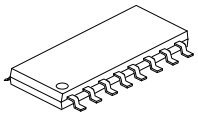
51494

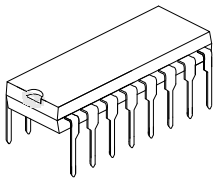
LINEAR INTEGRATED CIRCUIT

■ 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.



SOP-16



DIP-16

■ FEATURES

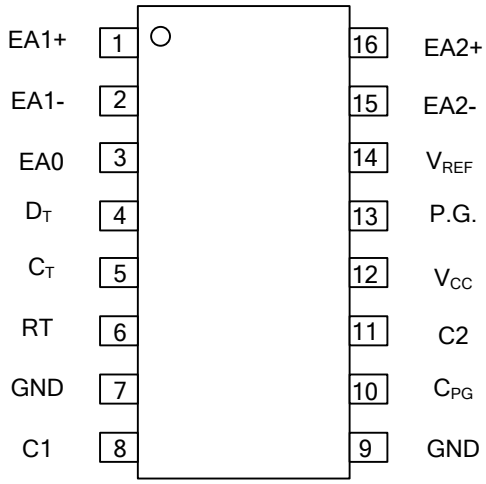
* Fully integrated with compact 16-pin dip
* All necessary functions included for most popular half bridge circuit.
* Built-in power good delay and power fail lead function.
* Power good delay time is linearly.
* Proportional to external capacitor value.
* Reduced external components for cost down and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

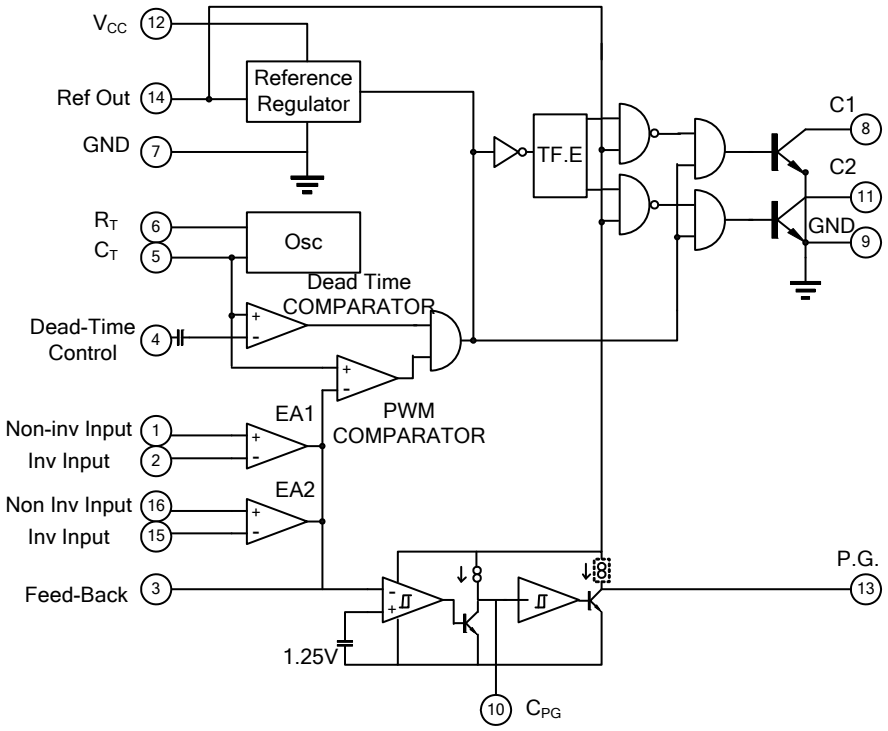
51494L-D16-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel, T: Tube (2) D16: DIP-16, S16: SOP-16 (3) G: Halogen Free, L: Lead Free

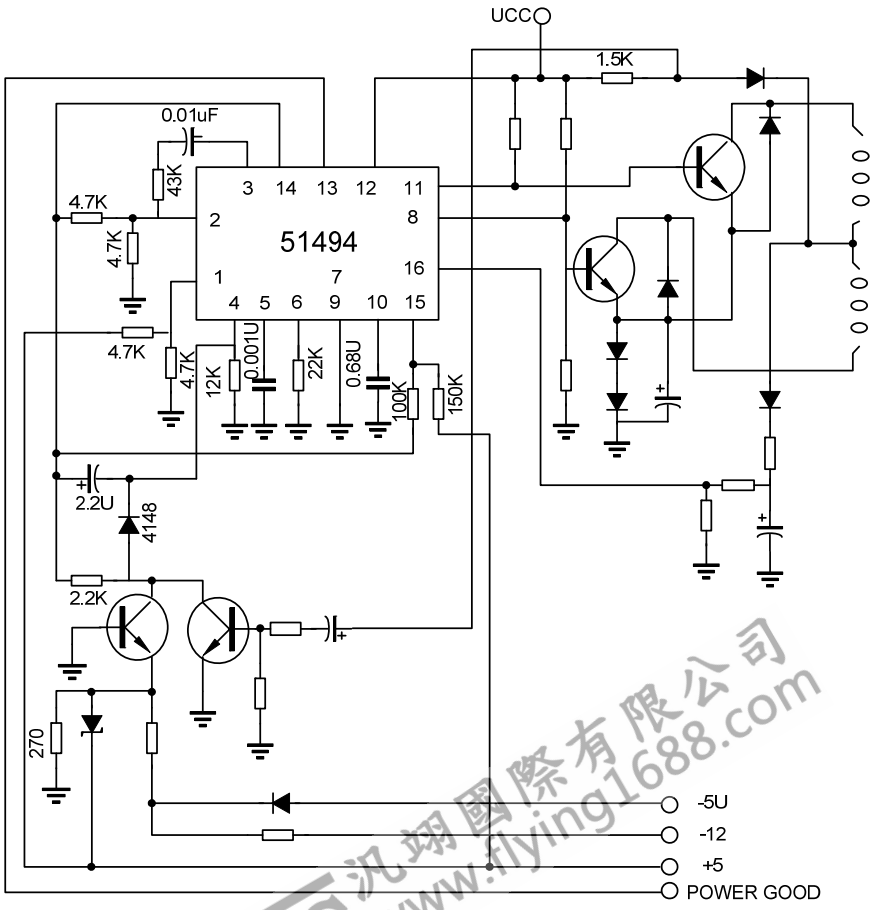
■ PIN ASSIGNMENT



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	℃
Storage Temperature	T_{STG}	-40 ~ +150	℃
Junction Temperature	T_J	125	℃

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=0~70℃, V_{CC}=15V, f=10kHz)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
REFERENCE SECTION							
Reference Voltage		V_{REF}	I_{REF} =1.0mA	4.75	5	5.25	V
Line Regulation		V_{LINE}	7V<V_{CC}<40V		2	25	mV
Load Regulation		V_{ILOAD}	1mA<I_{REF}<5mA		1	15	mV
Temperature Coefficient			0℃ <F_A<70℃		0.01	0.03	%/℃
OSCILLATOR SECTION							
Oscillator Frequency		F_{OSC}	C_T=0.01μF, R_T=12kΩ		10		kHz
Oscillator Frequency Change Over Operating Temperature Range		Δf_{OSC}	C_T=0.01μF, R_T=12kΩ			2	%
DEAD TIME CONTROL SECTION							
Input Bias Current (Pin 4)		$I_{IB(DT)}$	V_{CC} =15V, 0V<V4<5.25V		-2	-10	μA
Maximum Duty Cycle, Each Output		$D_{C(MAX)}$	V_{CC} = 15V, 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}	V3=2.5V		2	10	mV
Input Offset Current		I_{ICS}	V3=2.5V		25	250	nA
Input Bias Current		I_{IB}	V3=2.5V		0.2	1	μA
Input Common-mode Voltage Range		V_{ICR}	7V <V_{CC}< 40V	-0.3		V_{CC}	V
Large Signal Open-Loop Voltage Range		G_{VO}	0.5V < V3 < 3.5V	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, L_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 < V3 < 3.5V	2			mA
Output Sink Current	I_O-	0.5V < V3 < 3.5V	-0.2	-0.6		mA
POWER GOOD SECTION						
Power Good Delay Time	t_{PD}	C_D = 1μF	230	280	330	ms
		C_D = 0.47μF	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