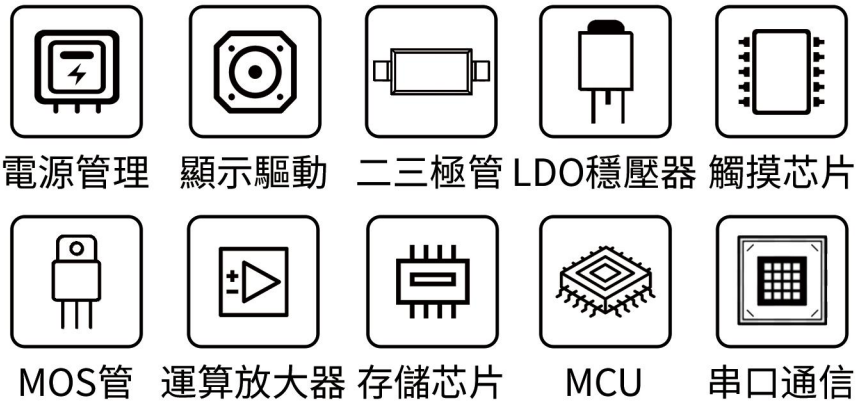
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TL494-TD

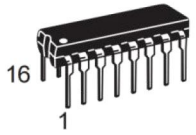
產品規格說明書

TL494

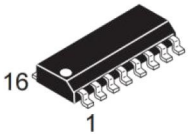
SWITCHMODE PULSE WIDTH MODULATION CONTROL CIRCUIT

Features

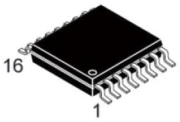
- Complete Pulse Width Modulation Control Circuitry
- On– Chip Oscillator with Master or Slave Operation
- On– Chip Error Amplifiers
- On– Chip 5.0 V Reference
- Adjustable Deadtime Control
- Uncommitted Output Transistors Rated to 500 mA Source or Sink
- Output Control for Push– Pull or Single– Ended Operation
- Undervoltage Lockout



DIP-16



SOP-16



TSSOP-16

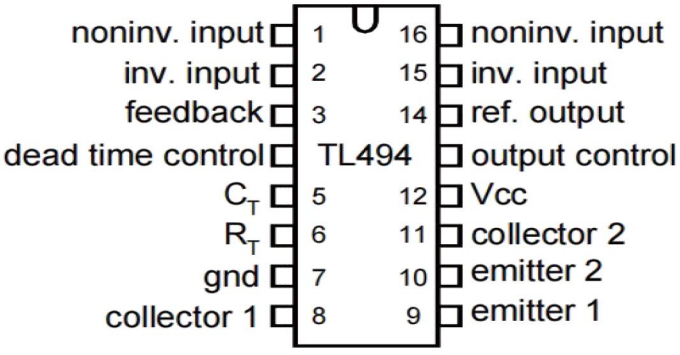
Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
TL494	DIP-16	TL494C	TUBE	1000pcs/box
TL494	SOP-16	TL494C	REEL	2500pcs/reel
TL494	TSSOP-16	TL494C	REEL	2500pcs/reel
TL494	DIP-16	TL494I	TUBE	1000pcs/box
TL494	SOP-16	TL494I	REEL	2500pcs/reel
TL494	TSSOP-16	TL494I	REEL	2500pcs/reel

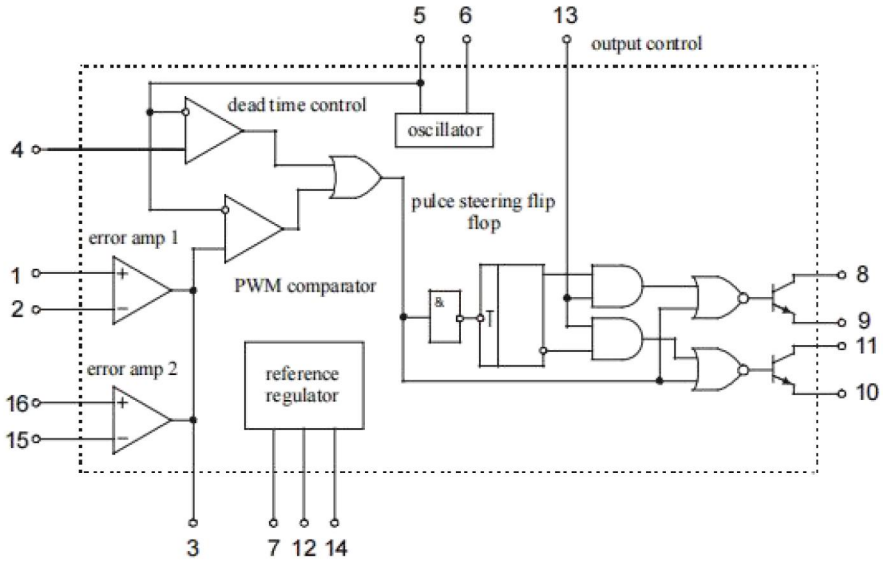
DESCRIPTION

The TL494 is a fixed frequency, pulse width modulation control circuit designed primarily for SWITCHMODE power supply control.

PIN ASSIGNMENT



LOGIC DIAGRAM



Pin 7 = GND
Pin 12 = V_{cc}

Maximum And Recommended Operating Conditions

Symbol	Parameter		Recommended operating conditions		Maximum ratings		Unit
			Min	Max	Min	Max	
V_{CC}	Supply Voltage		7	40		41	V
V_I	Amplifier Input Voltage		-0.3	V_{CC}-2		V_{CC}+0.3	V
V_O	Collector Output Voltage			40		41	V
I_{OC}	Collector Output Current(Each Transistor)			200		250	mA
T_{STG}	Storage Temperature Range				-65	150	℃
T_A	Operating Free-Air TemperatureRange	TL494C	0	70			℃
		TL494I	-40	85			℃
T_L	Lead Temperature (Soldering, 10 seconds)				-	245	℃

Note:Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but specific performance is not ensured.

ELECTRICAL CHARACTERISTICS (TA= -40~+85℃, f =10kHz)

Symbol	Parameter	Test Conditions	Value		Tempe-rature, ℃	Unit
			Min	Max		
V_{ref}	Output voltage	I_0=1.0mA,V_{CC}=15V	4.75	5.25	-40~+85	V
U_{regin}	Input regulation	V_{CC}=7~ 40V，I_0=1.0mA	-	25	25	mV
U_{regout}	Output regulation	I_0=1~10 mA，V_{CC} =15V	-	15	25	mV
V_{ref}	Output voltagechange with temperature	I_0=1mA，V_{CC} =15V	-	1.0	-40~+85	%
I_{SC}	Short circuit output current	V_{ref}=0，tsc< 1s V_{CC}=15 V	-	50		mA
f_{osc}	Frequency	C=0.01uF, R=12k V_{CC}=15V，$V_{(03)}$=0.7V	6.0	14		kHz
f_{osc}	Standard Deviationof Frequency *	V_{CC}=15V，$V_{(03)}$=0.7V	-	15		%
$f_{osc}(\triangle V)$	Frequency Change with Voltage	V_{CC}=7~40V,$V_{(03)}$=0.7V	-	10	25	%
$f_{osc}(\triangle T)$	Frequency Change with Temperature	C=0.01uF, R_T=12k V_{CC}=15V，$V_{(03)}$=0.7V	-	2.0	-40~+85	%
$I_{IB(2T)}$	Input bias current(pin 4)	V_I=0…5.25V,V_{CC}=15V $V_{(03)}$=0.7V	-	-10		A
DCmax	Maximum duty cycle (each output)	$V_{I(04)}$=0V,V_{CC}=15V $V_{(03)}$=0.7V	45	-		%
V_{THD1}	Input thresholdvoltage (pin 4) (Zero Duty Cycle)	DCmax=0，V_{CC}=15V $V_{(03)}$=0.7V	-	3,3		V
V_{THD2}	Input thresholdvoltage (pin 4) (Maximum DutyCycle)	Dcmax V_{CC}=15V，$V_{(03)}$=0.7V	0	-		V
t_{rc}	Output voltage risetime (Common- Emitter)	V_{CC}=15V，$V_{(03)}$=2.0V	-	200	-40~+85	ns
t_{fc}	Output voltage falltime (Common- Emitter)	V_{CC}=15V，$V_{(03)}$=2.0V	-	100		ns
t_{rf}	Output voltage risetime (Emitter- Follower)	V_{CC}=V_C=15V， $V_{(03)}$=2.0V	-	200		ns
t_{ff}	Output voltage falltime (Emitter- Follower)	V_{CC}=V_C=15V， $V_{(03)}$=2.0V	-	100	-40~+85	ns
V_{THP}	Input thresholdvoltage (pin 3)	DCmax=0，V_{CC}=15V	-	4.5		V
I_I	Input sink current(pin 3)	V_{CC}=15V，$V_{(03)}$=0.7V	0.3	-		mA
V_{IO}	Input offset voltage	V_{CC}=15V，$V_{O(03)}$=2.5V	-	10		mV
I_{IO}	Input offset current	V_{CC}=15V，$V_{O(03)}$=2.5V	-	250		nA
I_{IB}	Input bias current	V_{CC}=15V，$V_{O(03)}$=2.5V	-	1		A

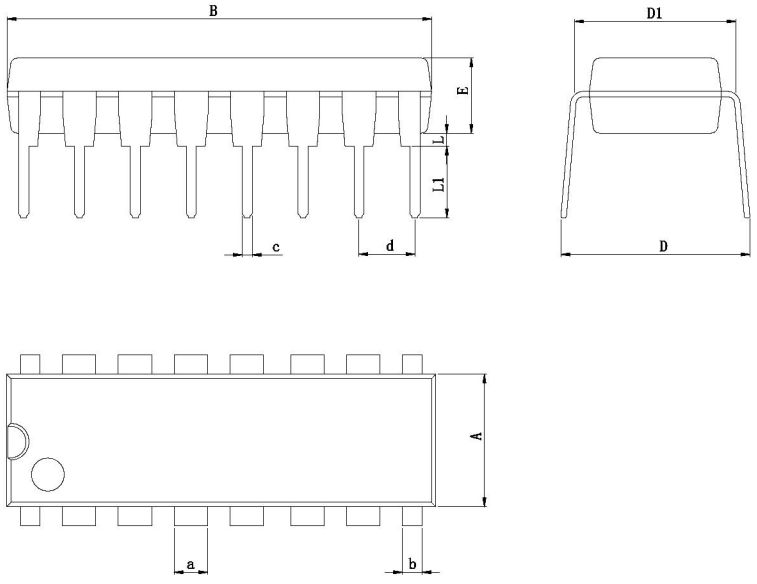
V_{ICRL}	Low Input common mode voltage range	V_{CC}=7~40V	-0.3	-		V
V_{ICRH}	High Input common mode voltage range	V_{CC}=7~40V	V_{CC} -2	-		V
A_{VOL}	Open loop voltage amplification	V_0=3V，V_{CC}=15V V_O=0.5~3.5V	70	-		dB
f_b	Unity-gainbandwidth	V_{CC}=15V	100	-		kHz
CMRR	Common mode rejection ratio	Vcc=40V	65	-	25	dB
I_{OL}	Output sink current(pin 3)	V_{CC}=15V，$V_{0(03)}$=0.7V	0.3	-		mA
I_{OH}	Output sourcecurrent (pin 3)	V_{CC}=15V，$V_{0(03)}$=3.5V	-2.0		-40~+85	mA
$I_{C(off)}$	Collector off-state current	V_{CE}=V_{CC}=40V	-	100		A
$I_{E(off)}$	Emitter off-state current	V_{CC}=V_C=40V,V_E=0V	-	-100		A
$V_{SAT(C)}$	Collector - Emitter saturation voltage (Common-Emitter)	V_{CC}=15V,V_E=0V $V_{0(03)}$=3.0V,I_C=200mA	-	1.3		V
$V_{SAT(E)}$	Collector - Emitter saturation voltage (Emitter-follower)	V_{CC}=V_C=15V I_E= -200mA,$V_{0(03)}$=3.0V			-20~+85	V
IOCH	Output control input current	VCC=15V V0(03)=0.7V	-	3.5	25	mA
ICC15	Standby Supply Current at VCC 15V	V_{CC}=15V	-	10		mA
ICC40	Standby Supply Current at VCC 40V	VCC=40V	-	15	25	mA
ICCA	Average Supply Current	VCC=15V V0(03)=0.7V V0(04)=2.0V	-	15	-40~+85	mA

Standard deviation is a measure of the statistical distribution about the mean as derived from the formula

$$\sigma = \sqrt{\frac{\sum_{n=1}^{N} (Xn - \overline{X})^2}{N - 1}}$$

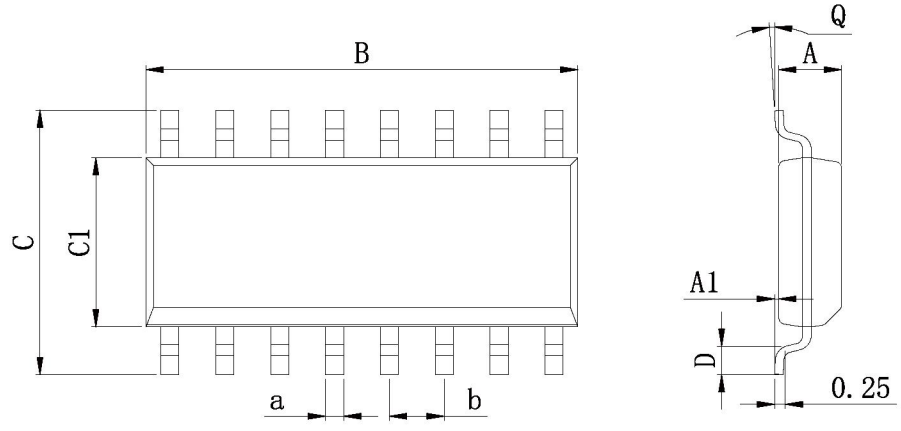
Physical Dimensions

DIP-16



Dimensions In Millimeters(DIP-16)											
Symbol:	A	B	D	D1	E	L	L1	a	b	c	d
Min:	6.10	18.94	8.10	7.42	3.10	0.50	3.00	1.50	0.85	0.40	2.54 BSC
Max:	6.68	19.56	10.9	7.82	3.55	0.70	3.60	1.55	0.90	0.50	

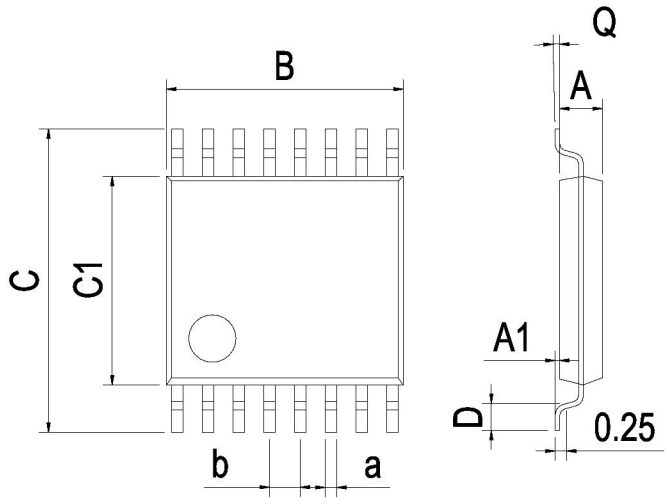
SOP-16



Dimensions In Millimeters(SOP-16)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	9.80	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	10.0	6.20	4.00	0.80	8°	0.45	

Physical Dimensions

TSSOP-16



Dimensions In Millimeters(TSSOP-16)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.85	0.05	4.90	6.20	4.30	0.40	0°	0.20	0.65 BSC
Max:	0.95	0.20	5.10	6.60	4.50	0.80	8°	0.25	