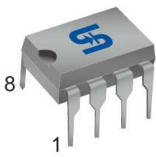
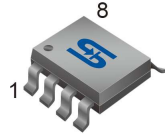


DIP-8



SOP-8



Pin Definition:

1. VCC	8. VB
2. RT	7. HO
3. CT	6. VS
4. COMP	5. LO

Description

TS19706 is a high voltage, high speed, self-oscillating power MOSFET and IGBT driver with both high and low side referenced output channels. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. The front end features a programmable oscillator which is similar to the 555 timer. The output drivers feature a high pulse current buffer stage and an internal dead time designed for minimum driver cross-conduction. Propagation delays for the two channels are matched to simplify use in 50% duty cycle applications. The floating channel can be used to drive an N-MOSFET or IGBT in the high side configuration that operates off a high voltage rail up to 600 volts.

Features

- Floating channel designed for operation ~+600V
- Noise immunity of transient voltage
- Under-voltage lockout
- Programmable oscillator frequency
- Matched propagation delay for both channels
- Ultra low startup current @75uA
- Shutdown function turns off both channel
- Low side output in phase with R_T

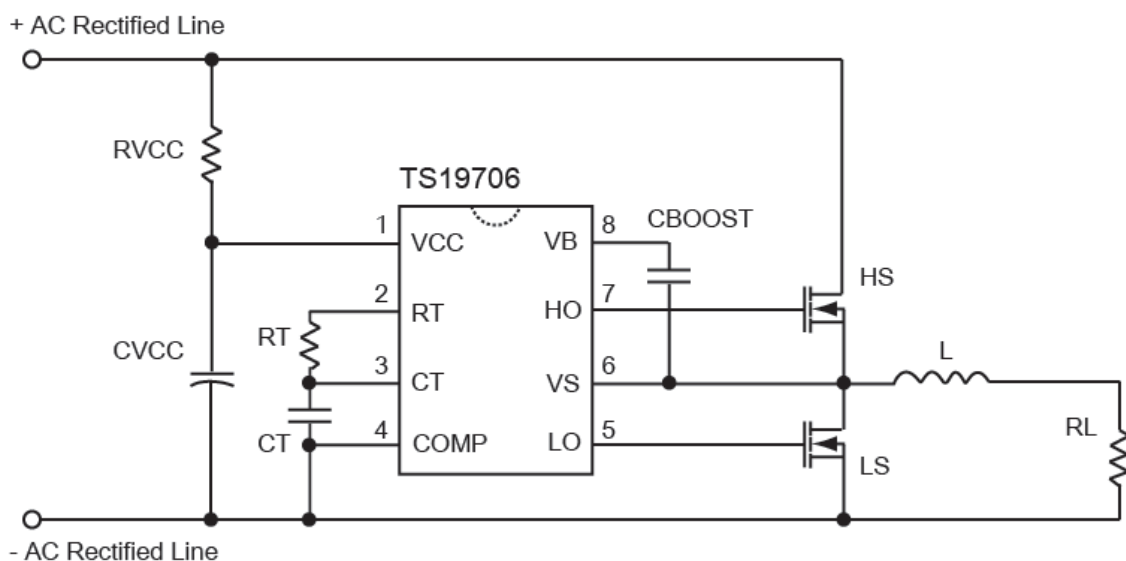
Application

- Ballast Lamp
- Motor driver
- SMPS

Ordering Information

Part No.	Package	Packing
TS19706CD C3	DIP-8	50pcs / Tube
TS19706CS RL	SOP-8	2.5Kpcs / 13" Reel

Typical Application Circuit



Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Supply Voltage	V _{CC}	19	V
Recommend VCC Operating Condition	V _{CC}	10 ~ 18	V
Recommend VBS Operating Condition	V _{BS}	V _{CC} -0.7 ~ 18	V
High Side Floating Supply Voltage	V _B	-0.3 ~ 625	V
High Side Floating Supply Offset Voltage	V _S	V _B -25 ~ V _B +0.3	V
High Side Gate Drive Output	HO	V _S -0.3 ~ V _B +0.3	V
Low Side Gate Drive Output	LO	-0.3 ~ V _{CC} +0.3	V
RT Pin Voltage	V _{RT}	-0.3 ~ V _{CC} +0.3	V
CT Pin Voltage	V _{CT}	-0.3 ~ V _{CC} +0.3	V
Power Dissipation @ T _A =85°C	SOP-8	400	mW
	DIP-8	650	
Operating Ambient Temperature	T _{OPR}	-20 ~ +85	°C
Junction Temperature	T _J	+150	°C
Storage Temperature Range	T _{STG}	-65o +150	°C
Thermal Resistance - Junction to Ambient	SOP-8	160	°C/W
	DIP-8	100	
ESD Voltage Protection	HMB	3	KV
	MM	200	V

Electrical Specifications

VBIAS (VCC, VBS) = 12V, CL = 1000 pF, CT = 1 nF and TA = 25°C unless otherwise specified. The VIN, VTH and IIN parameters are referenced to COM. The VO and IO parameters are referenced to COM and are applicable to the respective output leads: HO or LO.

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Low Voltage Supply						
Rising VCC under-voltage lockout threshold	V _{CCUV+}		8.1	9.0	9.9	V
Falling VCC under-voltage lockout threshold	V _{CCUV-}		7.2	8.0	8.8	V
VCC under-voltage lockout Hysteresis	V _{CCUVH}	V _{CC} ≤ V _{CCUV}	0.5	1.0	1.5	V
Micropower startup VCC supply current	I _{QCCUV}		--	50	100	μA
Quiescent VCC supply current	I _{QCC}		--	160	300	μA
VCC operating voltage	V _{op}		10	12	18	V
Floating Supply						
Micropower startup VBS supply current	I _{QBSUV}	V _{CC} ≤ V _{CCUV}	--	0	10	μA
Quiescent VBS supply current	I _{QBS}		--	30	50	μA
Offset supply leakage current	I _{LK}	V _B =V _S =600V	--	--	50	μA

Electrical Specifications

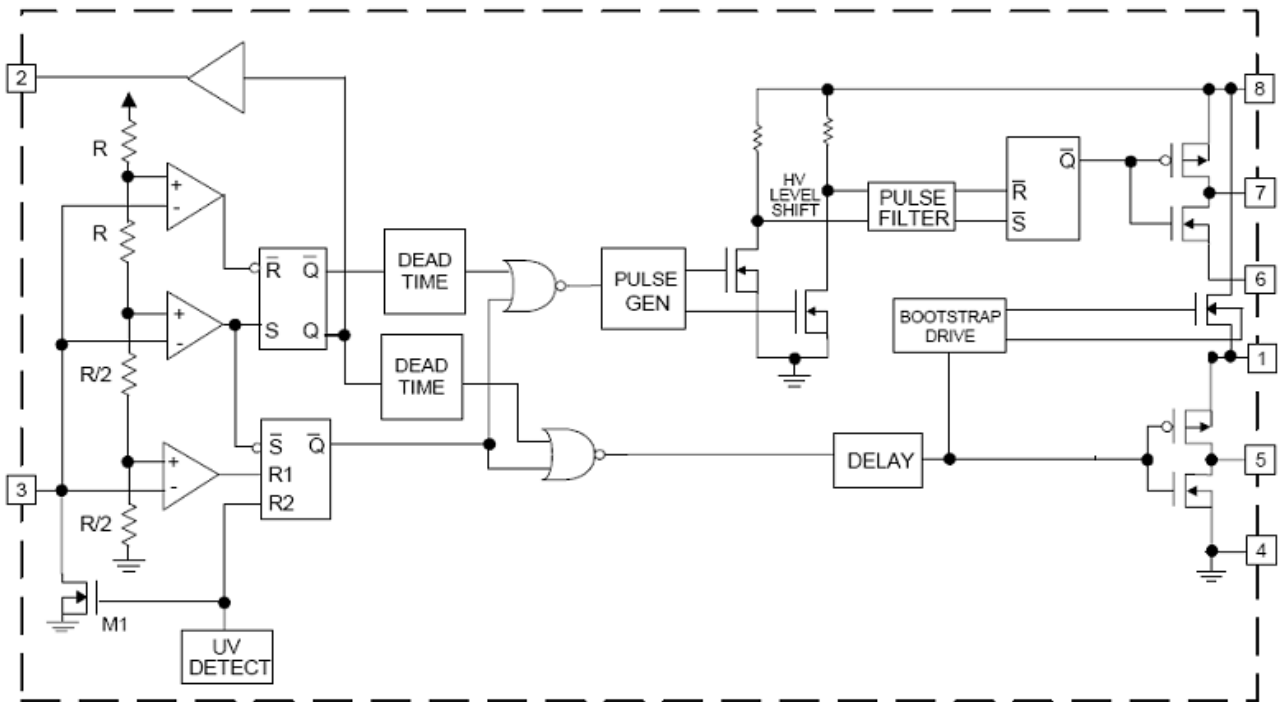
VBIAS (VCC, VBS) = 12V, CL = 1000 pF, CT = 1 nF and TA = 25°C unless otherwise specified. The VIN, VTH and IIN parameters are referenced to COM. The VO and IO parameters are referenced to COM and are applicable to the respective output leads: HO or LO.

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Oscillator Frequency						
Oscillator frequency (CT=1008pF)	f _{OSC}	RT = 14.71k	47.2	48.2	49.2	kHz
RT pin duty cycle	d	f _{OSC} < 100kHz	48	50	52	%
CT pin current	I _{CT}		--	0.001	1.0	uA
UV-mode CT pin pull-down current	I _{CTUV}	V _{CC} = 7V	0.25	0.30	0.5	mA
Upper CT ramp voltage threshold	V _{CT+}		--	8.0	--	V
Lower CT ramp voltage threshold	V _{CT-}		--	4.0	--	V
CT voltage shutdown threshold	V _{CTSD}		3.8	4.1	4.2	V
High-level RT output voltage, VCC – VRT	V _{RT+}	I _{RT} = 100uA	--	10	50	mV
		I _{RT} = 1mA	--	100	300	mV
Low-level RT output voltage	V _{RT-}	I _{RT} = 100uA	--	10	50	mV
		I _{RT} = 1mA	--	100	300	mV
UV-mode RT output voltage	V _{RTUV}	V _{CC} ≤ V _{CCUV}	--	0	100	mV
SD-Mode RT output voltage, VCC – VRT	V _{RTSD}	I _{RT} = 100uA	--	10	50	mV
Fate Driver Output						
Output rise time (CL=1nF)	t _r	V _{CC} ≤ V _{CCUV}	--	80	150	nS
Output fall time (CL=1nF)	t _f		--	30	100	nS
Shutdown propogation delay	t _{SD}		--	660	--	nS
Output deadtime (HO or LO)	t _D		--	1.1	--	μs

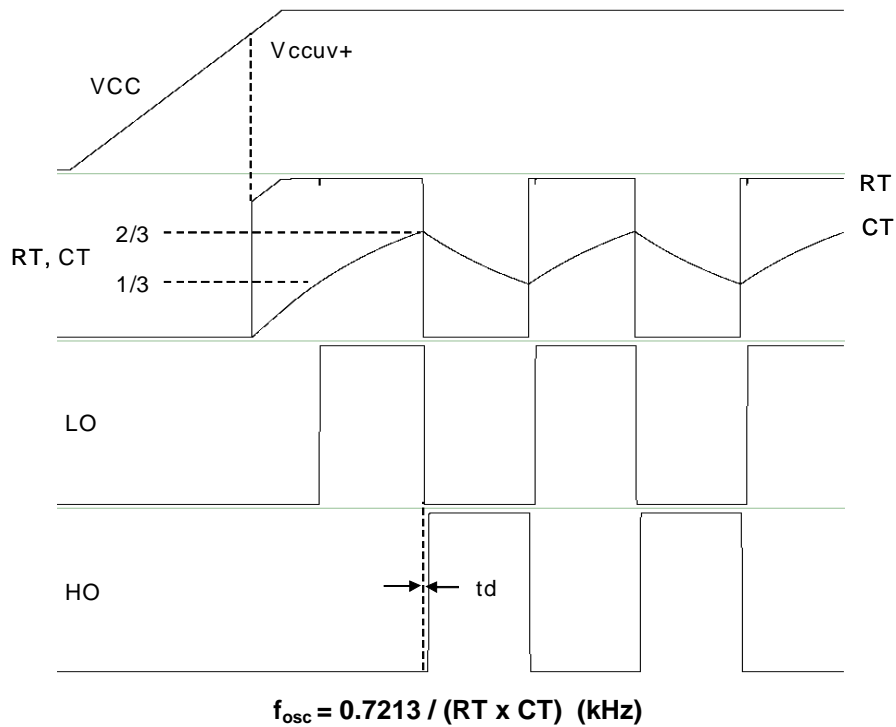
Pin Description

Pin	Function	Description
1	VCC	Low side and logic fixed supply
2	RT	Oscillator timing resistor input, in phase with HO for normal IC operation
3	CT	Oscillator timing capacitor input, the oscillator frequency according to the following equation: f = 0.7213 / (RT x CT)
4	COMP	Low side return
5	LO	Low side gate drive output
6	VS	High side floating supply offset
7	HO	High side gate drive output
8	VB	High side floating supply

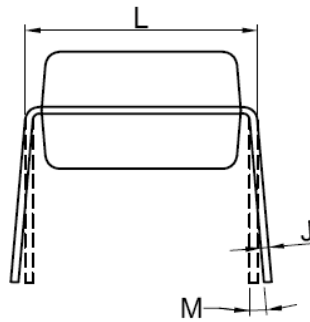
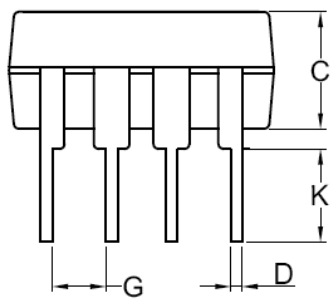
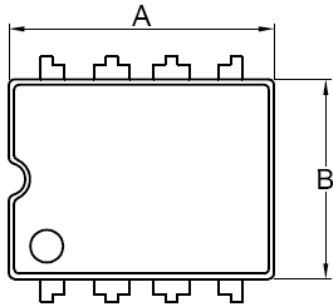
Block Diagram



Input & Output Timing Diagram

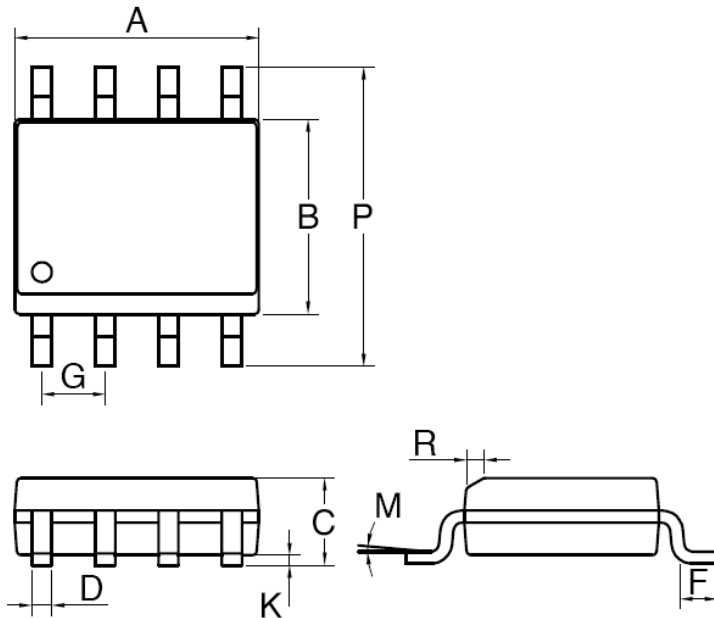


DIP-8 Mechanical Drawing



DIM	DIP-8 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.07	9.32	0.357	0.367
B	6.22	6.48	0.245	0.255
C	3.18	4.45	0.125	0.135
D	0.35	0.55	0.019	0.020
G	2.54 (typ)		0.10 (typ)	
J	0.29	0.31	0.011	0.012
K	3.25	3.35	0.128	0.132
L	7.75	8.00	0.305	0.315
M	-	10°	-	10°

SOP-8 Mechanical Drawing



SOP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX.
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27BSC		0.05BSC	
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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