

AN5900

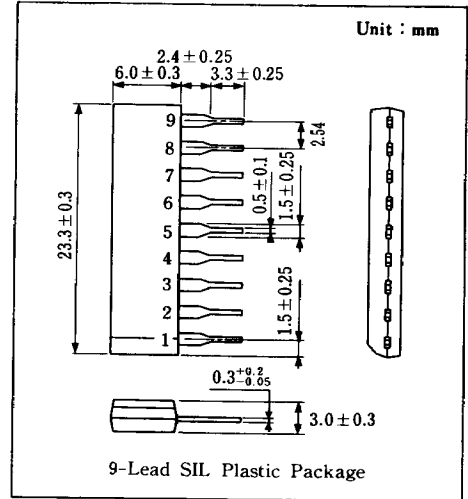
Switching Regulator Control Circuit

■ Outline

The AN5900 is an integrated circuit in which a PWM switching regulator control circuit and protect circuit are integrated on a single chip.

■ Features

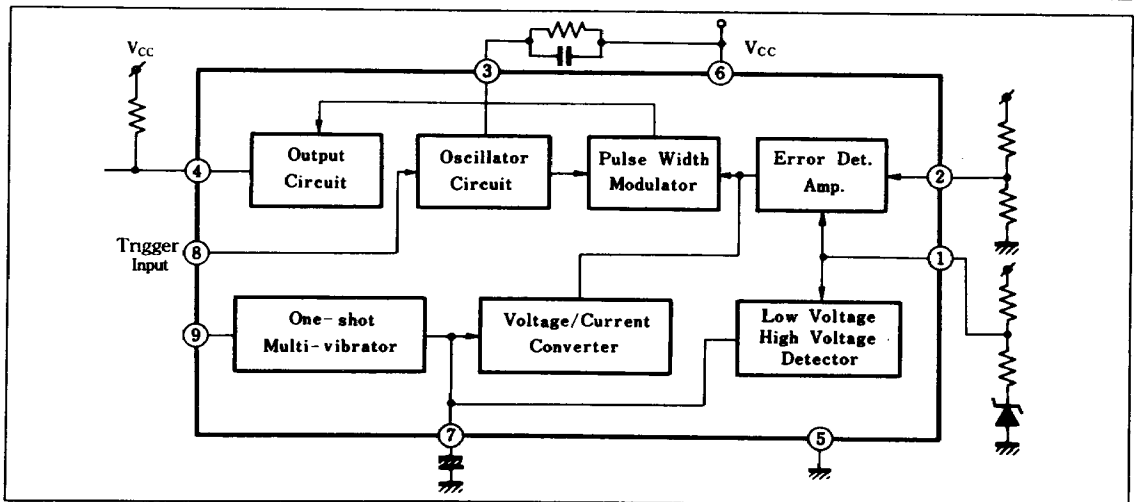
- Soft start circuit
- 0 ~ 0.7 duty
- Protection circuit for over voltage and current
- External trigger available
- High supply voltage protection
- Low supply voltage protection
- Reference voltage provided by external zener diode
- Compact 9-lead plastic SIL package for higher flexibility in PCB design



■ Pin

Pin No.	Pin Name
1	Ref. Voltage
2	Feedback
3	Oscillator
4	Output
5	GND
6	V _{cc}
7	Soft Start
8	Trigger
9	Protector

■ Block Diagram



■ Absolute Maximum Ratings (Ta = 25°C)

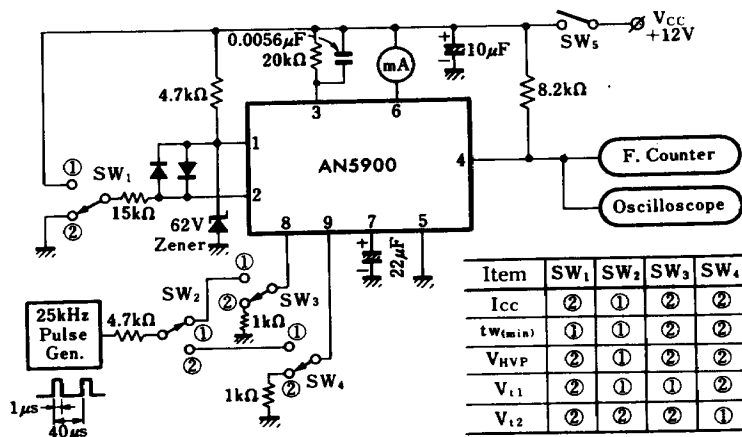
Item		Symbol	Rating		Unit
Voltage	Supply Voltage	V _{CC}	14.0		V
	Circuit Voltage	V ₆₋₅	0	+14.4	V
		V _{1, V2, V4-5}	0	V ₆₋₅	V
		V ₃₋₅	3	10	V
		V ₇₋₅	0	8	V
		V _{8, V9-5}	-3	+4	V
Current	Supply Current	I ₆	18.0		mA
	Circuit Current	I ₄	-1	+50	mA _{peak}
Power Dissipation		P _D	260		mW
Local Power Dissipation (Q1)		P _D (Q1)	60		mW
Temperature	Operating Ambient Temperature	T _{opr}	-20 ~ +75		°C
	Storage Temperature	T _{stg}	-55 ~ +150		°C

Note : ⊕ is flow-in current to the circuit, while ⊖ is flow-out current

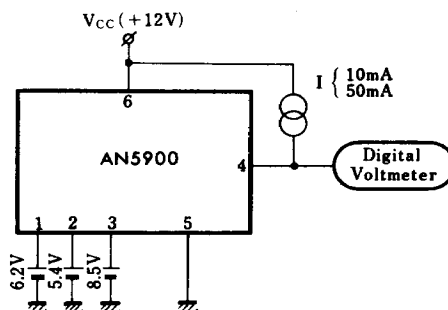
■ Electrical Characteristics (V_{CC} = 12V, Ta = 25°C)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Total Circuit Current	I _{tot}	1		8.4	10.5	12.6	mA
Oscillation Frequency	f _{osc}	1		14.0	14.8	15.6	kHz
Output Pulse Duty (max)	tw(duty)	1		67	72	77	%
Output Pulse Duty (min)	tw(duty)	1			0	0	%
Output Saturation Voltage (1)	V _{O(sat)(1)}	2	I ₄ = 10mA		0.10	0.30	V
Output Saturation Voltage (2)	V _{O(sat)(2)}	2	I ₄ = 50mA		0.62	1.00	V
High Supply Voltage Protection	V _{HVP}	1		13.2	13.9	14.6	V
Low Supply Voltage Protection	V _{LVP}	1		4.8	5.2	5.6	V
Input Voltage	Ext. Trigger Start	V _{t1}	1	0.66	0.71	0.76	V
	One-Shot Multi Start	V _{t2}	1	0.68	0.73	0.78	V

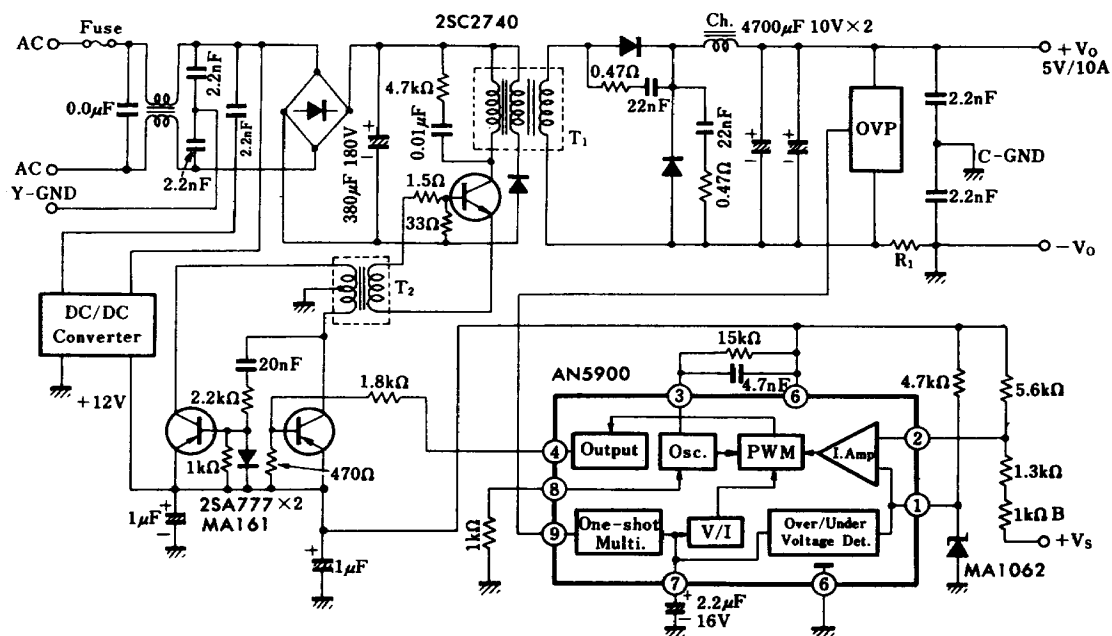
Test Circuit 1 (I_{tot}, f_{osc}, tw(duty), V_{HVP}, V_{LVP}, V_{t1}, V_{t2})



Item	SW ₁	SW ₂	SW ₃	SW ₄
I _{cc}	②	①	②	②
tw _(min)	①	①	②	②
V _{HVP}	②	①	②	②
V _{t1}	②	①	①	②
V _{t2}	②	②	②	①

Test Circuit 2 ($V_{0(sat)}$)

Application Circuit



Typical Circuit Characteristics

Item	Characteristics Value	Unit
Output Voltage	5.0	V
Output Current	10.0	A
Output Voltage Variable Range	4.5~5.8	V
Max. Output Voltage	68	W
Effective Efficiency	68	%
Output Voltage Stability	0.05% + <10mV	mV
Output Rise Time (full load)	80	ms
Output Rise Time (no load)	70	ms
Output Fall Time (full load)	30	ms