

AN5900

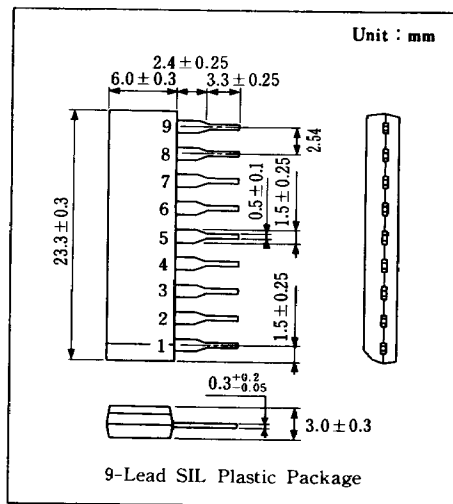
Switching Regulator Control Circuit

■ 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

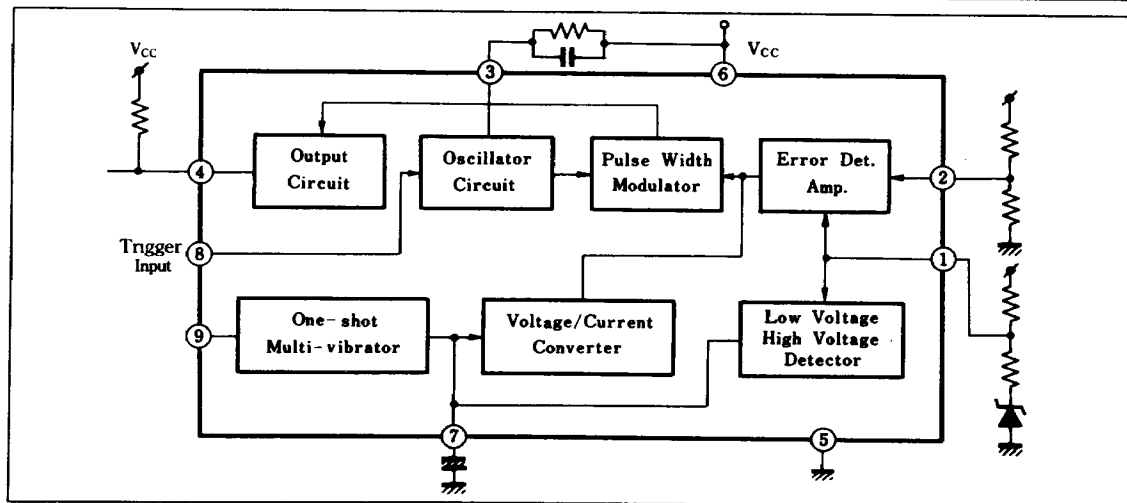
- Soft start circuit
- 0 ~ 0.7 duty
- Protection circuit for over voltage and current
- External trigger available
- High supply voltage protection
- Low supply voltage protection
- Reference voltage provided by external zener diode
- Compact 9-lead plastic SIL package for higher flexibility in PCB design



■ 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 ($T_a = 25^\circ\text{C}$)

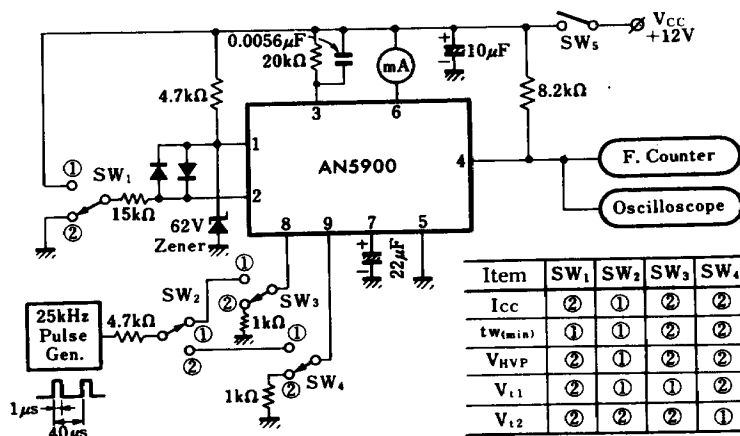
Item		Symbol	Rating		Unit
Voltage	Supply Voltage	V_{CC}	14.0		V
	Circuit Voltage	V_{6-5}	0	+14.4	V
		V_1, V_2, V_{4-5}	0	V_{6-5}	V
		V_{3-5}	3	10	V
		V_{7-5}	0	8	V
		V_8, V_{9-5}	-3	+4	V
Current	Supply Current	I_6	18.0		mA
	Circuit Current	I_4	-1	+50	mA _{peak}
Power Dissipation		P_D	260		mW
Local Power Dissipation (Q_1)		$P_D(Q_1)$	60		mW
Temperature	Operating Ambient Temperature	T_{opr}	$-20 \sim +75$		$^\circ\text{C}$
	Storage Temperature	T_{stg}	$-55 \sim +150$		$^\circ\text{C}$

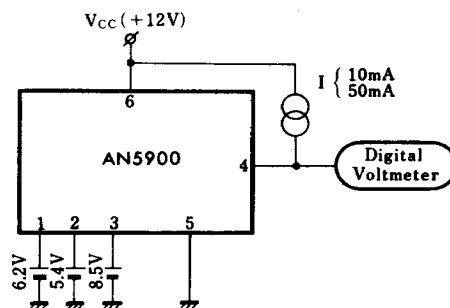
Note : $\oplus$ is flow-in current to the circuit, while $\ominus$ is flow-out current

■ Electrical Characteristics ($V_{CC} = 12\text{V}$, $T_a = 25^\circ\text{C}$)

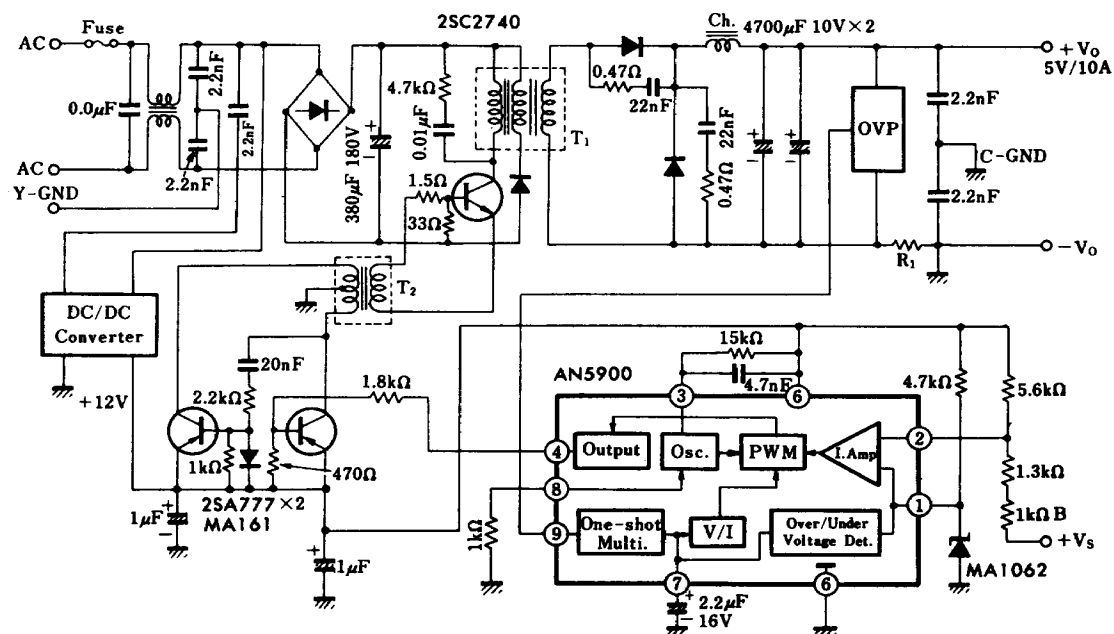
Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Total Circuit Current	I_{tot}	1		8.4	10.5	12.6	mA
Oscillation Frequency	f_{osc}	1		14.0	14.8	15.6	kHz
Output Pulse Duty (max)	$tw(duty)$	1		67	72	77	%
Output Pulse Duty (min)	$tw(duty)$	1			0	0	%
Output Saturation Voltage (1)	$V_{O(sat)(1)}$	2	$I_4 = 10\text{mA}$		0.10	0.30	V
Output Saturation Voltage (2)	$V_{O(sat)(2)}$	2	$I_4 = 50\text{mA}$		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_{i1}	1	0.66	0.71	0.76	V
	One-Shot Multi Start	V_{i2}	1	0.68	0.73	0.78	V

Test Circuit 1 (I_{tot} , f_{osc} , $tw(duty)$, V_{HVP} , V_{LVP} , V_{i1} , V_{i2})



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

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