

M5297P

AC-DC TOTAL SYSTEM RESET IC

DESCRIPTION

M5297P is a system reset IC designed for Power Supply System at office Automation, Factory Automation equipment, which watches both AC Power Supply and DC Power Supply at the same time.

This IC watches the AC Power Supply, in shutting off the AC Power Supply, that is to say before dropping of the System Power Supply (DC Power Supply), which detects the abnormal state of the System.

After the AC Power Supply shut off, in normal state of the System Power Supply (DC Power Supply), this IC sends the System Reset Output to the CPU and MPU. Continuously when the trouble of the System Power Supply (DC Power Supply) happen, users have already been able to complete the all emergency measurement.

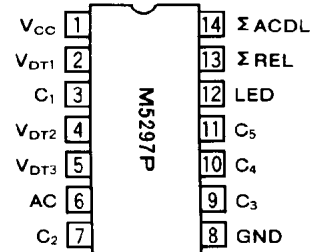
FEATURES

- WATCH AC Power Supply
- WATCH 3 DC Power Supplies
- 3 Reset Output (open collector)
 - Low Reset 2
 - High Reset 1
- Variable delay time for using capacitor and Resistor

APPLICATION

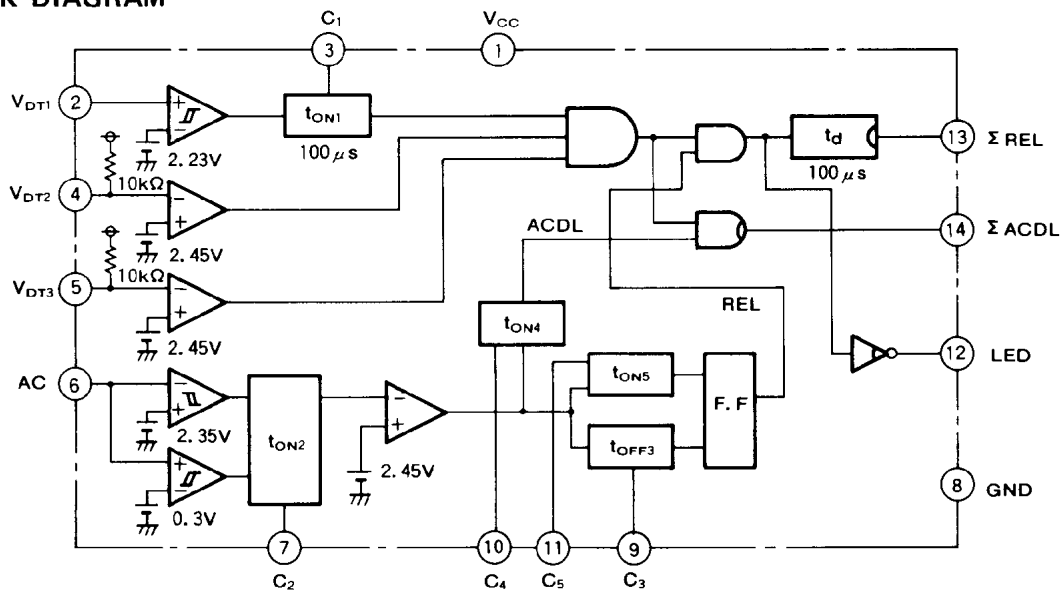
Power Supply System

PIN CONFIGURATION (TOP VIEW)



Outline 14P4

BLOCK DIAGRAM



AC-DC TOTAL SYSTEM RESET IC

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V _{CC}	Supply voltage		7	V
V _o	Applied voltage		20	V
I _o	Output current		10	mA
P _D	Power dissipation		700	mW
K _θ	Thermal derating		7	mW/°C
T _{opr}	Operating temperature		-20 ~ +85	°C
T _{stg}	Storage temperature		-55 ~ +125	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{CC} = 5V, unless otherwise noted)

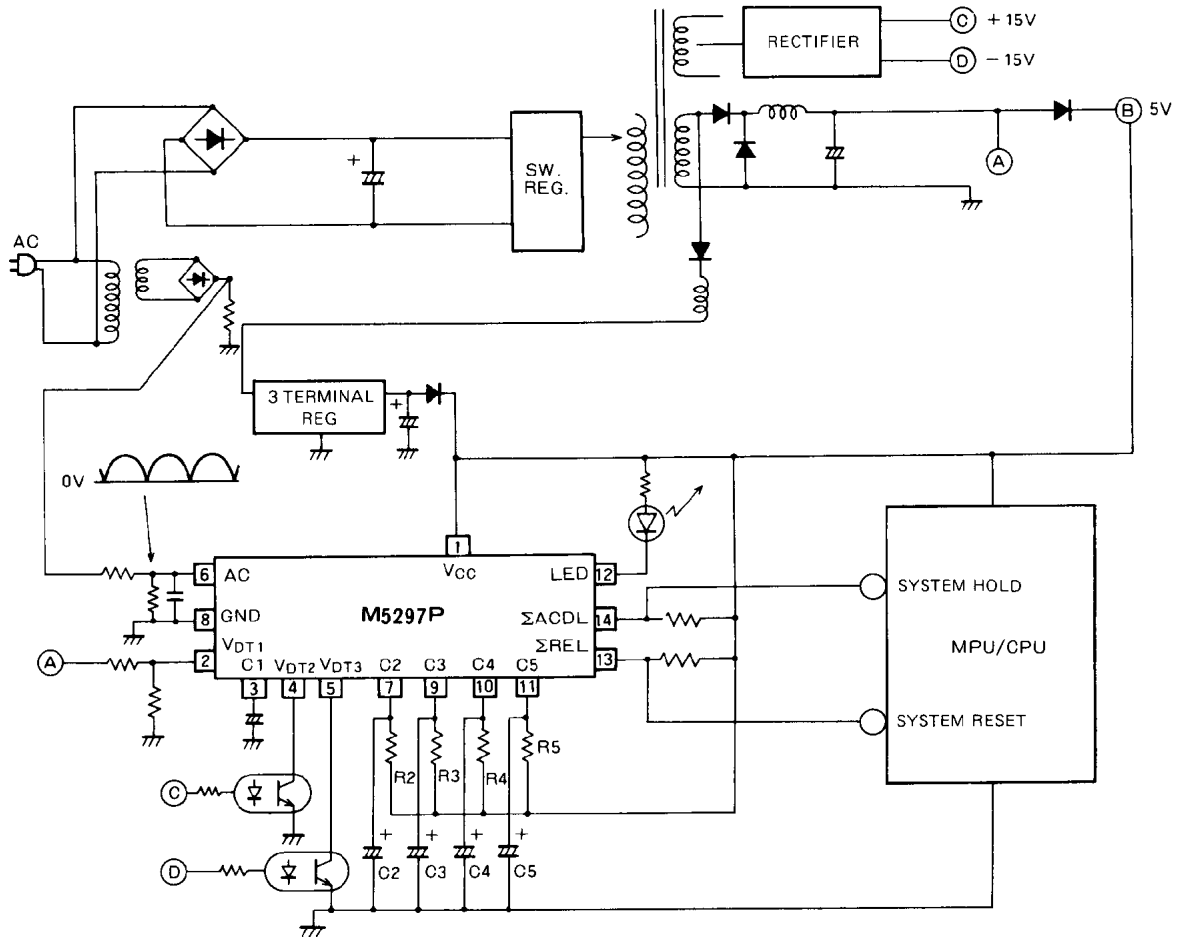
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I _{CC}	Circuit current			10	15	mA
V _{DT1}	Detect voltage 1		2.12	2.23	2.34	V
ΔV _{DT1}	Hysteresis VDT1		0.05	0.1	0.2	V
V _{DT2}	Detect voltage 2		2.0	2.45	2.9	V
V _{DT3}	Detect voltage 3		2.0	2.45	2.9	V
V _{TAC1}	REAC(H) Detect voltage		2.22	2.35	2.46	V
ΔV _{AC1}	Hysteresis VTAC1			0.2		V
V _{TAC2}	REAC(L) Detect voltage		0.15	0.3	0.6	V
ΔV _{AC2}	Hysteresis VTAC2			0.1		V
V _{REF·TH}	AC Reset threshold		2.31	2.45	2.57	V
T ₁	VDT1 delay time	C1 = 0	0.02	0.1	0.4	ms
T _{ON1}	VDT1 delay time	C1 = 0.22μF	20	50	100	ms
T _{OFF2}	ΣACDL [OFF] time	C2 = 0.47μF, R2 = 18kΩ	2.8	5.6	11.2	ms
T _D	ΣACDL → ΣREL delay time		0.05	0.1	0.4	ms
T _{OFF3}	ΣREL [OFF] time	C3 = 4.7μF, R3 = 20kΩ	13.5	27	54	ms
T ₄	ΣACDL [ON] time	C4 = 0μF, R4 = 20kΩ		1		μs
T _{ON4}	ΣACDL [ON] time	C4 = 3.3μF, R4 = 20kΩ	9.5	19	38	ms
T ₅	ΣREL [ON] time	C5 = 0μF, R5 = 20kΩ		5		μs
T _{ON5}	ΣREL [ON] time	C5 = 4.7μF, R5 = 20kΩ	13.5	27	54	ms
V _{ACDL}	ΣACDL saturation voltage	I _o = 5mA		0.2	0.5	V
V _{REL}	ΣREL saturation voltage	I _o = 5mA		0.2	0.5	V
V _{LED}	LED saturation voltage	I _o = 5mA		0.2	0.5	V
I _{DT1}	VDT1 source current	V _{DT1} = 0V		-0.1		μA
I _{DT2}	VDT2 source current	V _{DT2} = 0V		-0.5	-1.5	mA
I _{DT3}	VDT3 source current	V _{DT3} = 0V		-0.5	-1.5	mA
I _{AC}	AC source current	V _{AC} = 0V		-0.2		μA
I _{ACDL}	ΣACDL leak current	V _{ACDL} = 20V			10	μA
I _{REL}	ΣREL leak current	V _{REL} = 20V			10	μA
I _{LED}	LED leak current	V _{LED} = 20V			10	μA

Symbol Explanation

- ACDL : AC power supply Down Low
- REL : Reset Low
- T_{OFF2} : Maximum time for detecting the AC power supply shut off.
- T_D : The period from ΣACDL Low Reset output to ΣREL Low Reset output.
- T_{OFF3} : The period which subtract previous T_D from the following time, period from ΣACDL Low Reset output to ΣREL Low Reset output.
- T_{ON4} : The period from detecting the AC power supply recover to ΣACDL High output.
- T_{ON5} : The period from detecting the AC power supply recover to ΣREL High output.

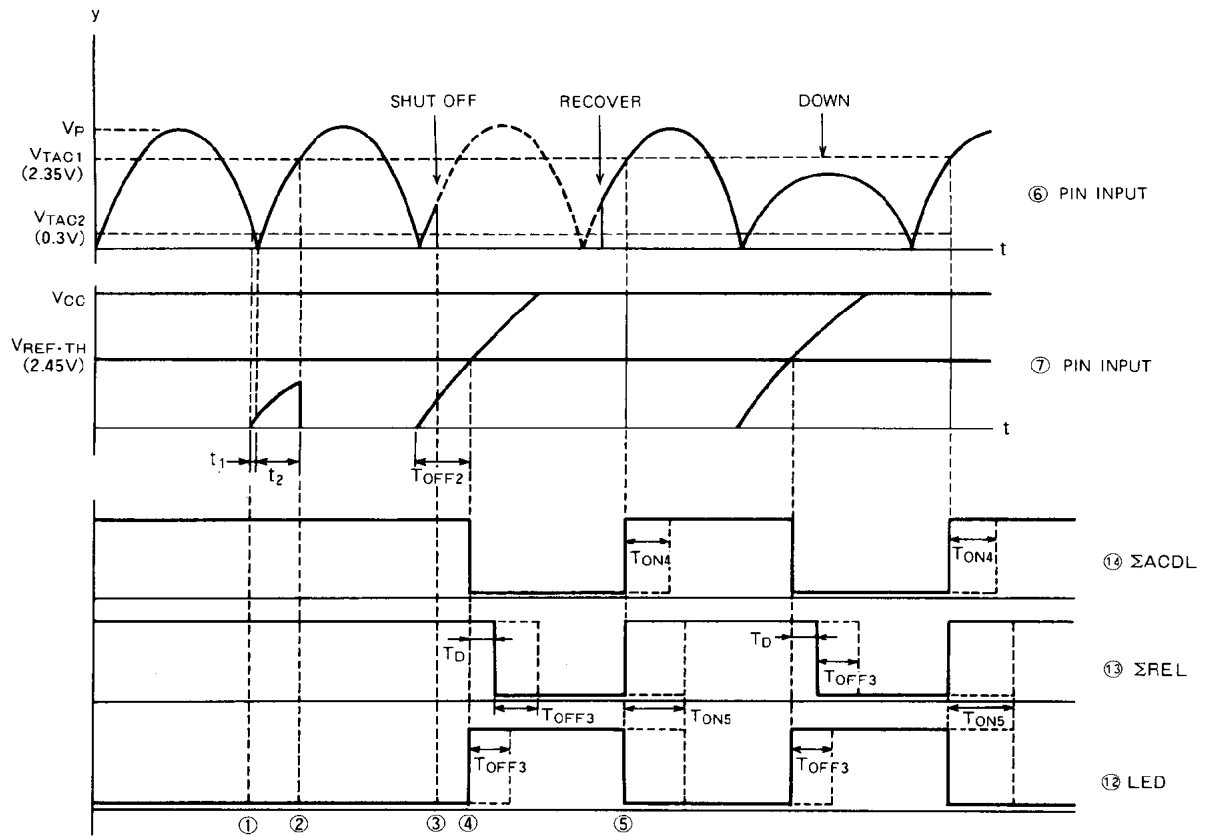
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Application for Power Supply System



AC-DC TOTAL SYSTEM RESET IC

Timing Chart for detecting AC Power Supply (V_{DT1} , V_{DT2} , V_{DT3} , normal)



Time calculation method

$$t_1 = \frac{1}{360 \cdot f} \sin^{-1} \frac{0.3}{V_p} \quad , \quad t_2 = \frac{1}{360 \cdot f} \sin^{-1} \frac{2.35}{V_p} \quad (f: \text{AC Power Supply frequency})$$

$$T_{OFF2} = C_2 \cdot R_2 \ln \frac{V_{CC}}{V_{CC} - 2.45} \quad , \quad T_{OFF3} = C_3 \cdot R_3 \ln \frac{V_{CC}}{V_{CC} - 1.25}$$

$$T_{ON4} = C_4 \cdot R_4 \ln \frac{V_{CC}}{V_{CC} - 1.25} \quad , \quad T_{ON5} = C_5 \cdot R_5 \ln \frac{V_{CC}}{V_{CC} - 1.25}$$