



3521

CMOS IC

PWM CONTROLLER WITH SUPERVISORY CIRCUIT FOR SWITCHING POWER SUPPLY

■ DESCRIPTION

UTC **3521** PWM controller is designed for switching mode power supply for PCs etc. It provides all the functions similar to combinations of industrial 494 plus UTC 3510 circuits.

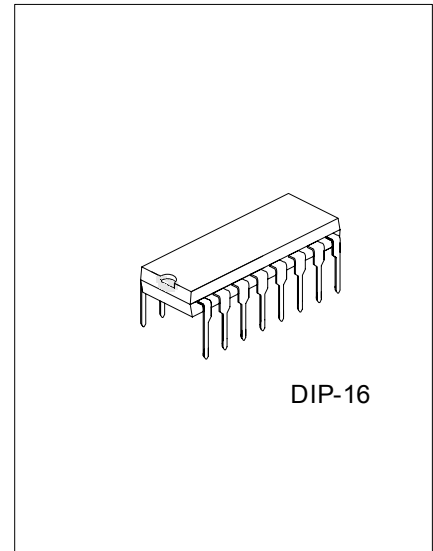
■ FEATURES

- * Over-voltage protection for 3.3V, 5V and 12V with delay
- * Under-voltage detection for 3.3V, 5V and 12V with delay
- * Remote ON/OFF function
- * Power good circuitry for PCs.

■ ORDERING INFORMATION

Order Number		Package	Packing
Normal	Lead Free Plating		
3521-D16-T	3521L-D16-T	DIP-16	Tube

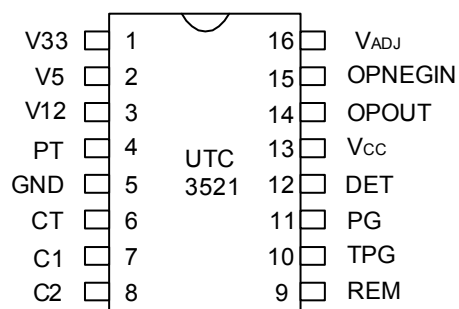
3521L-D16-T (1)Packing Type (2)Package Type (3)Lead Plating	(1) T: Tube (2) D16: DIP-16 (3) L: Lead Free Plating, Blank: Pb/Sn
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DIP-16

*Pb-free plating product number: 3521L

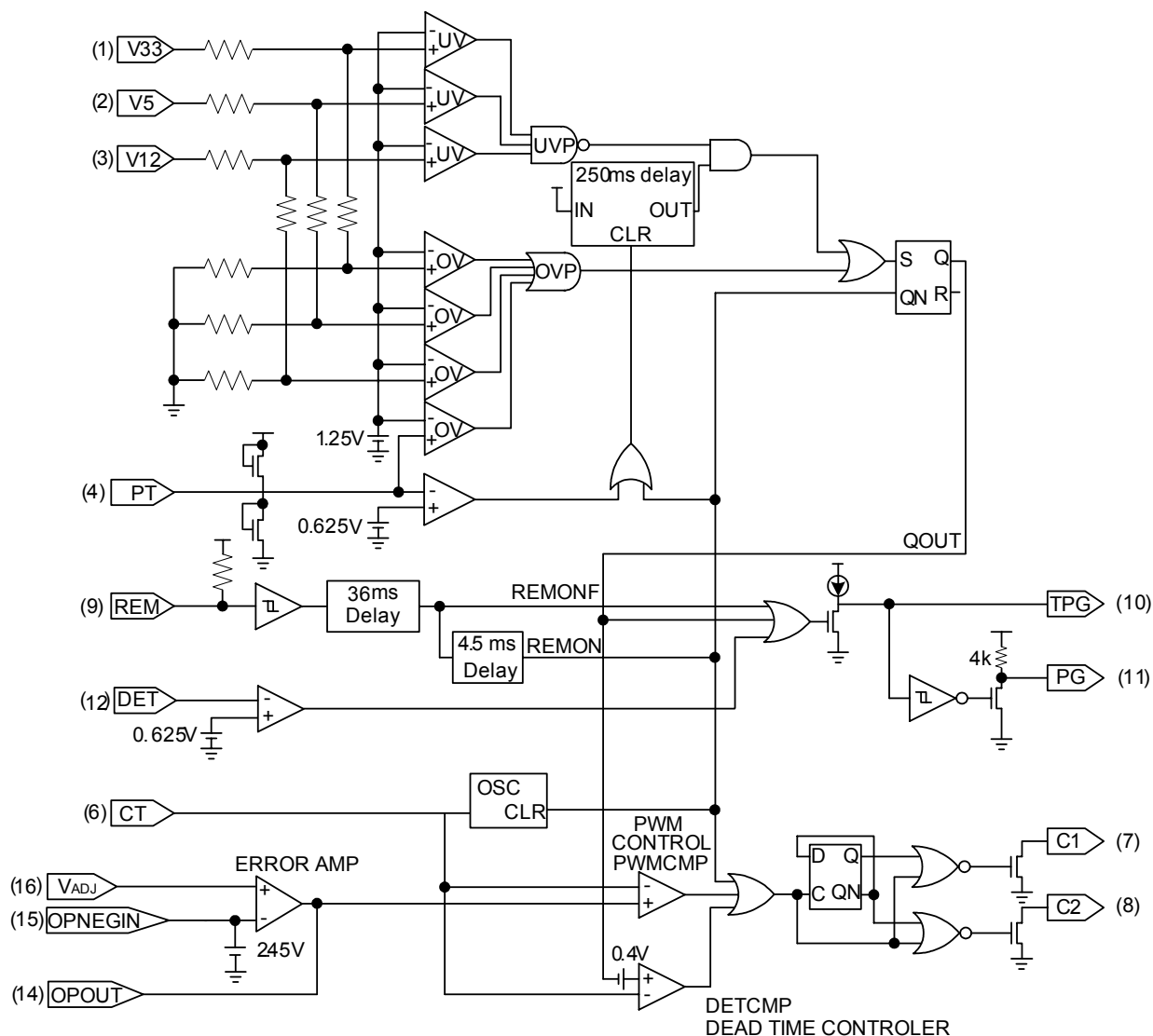
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	TYPE	FUNCTIONS
1	V33	I	OVP/UVI INPUT FOR 3.3V
2	V5	I	OVP/UVI INPUT FOR 5V
3	V12	I	OVP/UVI INPUT FOR 12V
4	PT	I	ADDITIONAL OVP PROTECTION
5	GND	P	GROUND
6	CT		CAP FOR OSCILLATION FREQUENCY
7	C1	O	OUTPUT 1
8	C2	O	OUTPUT 2
9	REM	I	REMOTE ON/OFF PIN.
10	TPG		POWER GOOD DELAY TIME SETTING
11	PG	O	POWER GOOD SIGNAL OUT.
12	DET	I	POWER GOOD SIGNAL DETECTION INPUT
13	V _{CC}	P	SUPPLY VOLTAGE FOR IC
14	OPOUT	O	OP AMP OUTPUT
15	OPNEGIN	I	OP AMP NEGATIVE INPUT
16	V _{ADJ}	I	VOLTAGE ADJUST PIN

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS ($V_{CC}=5.5V$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	5.5	V
Drain Output Voltage	V_{CC1}, V_{CC2}	5.5	V
Drain Output Current	I_{CC1}, I_{CC2}	200	mA
Power Dissipation	P_D	200	mW
Operating Temperature	T_{OPR}	-10 ~ +70	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}C$, $V_{CC}=5V$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
DEAD TIME CONTROL SECTION						
Input Threshold Voltage	$V_{I(THR)}$	ZERO DUTY CYCLE		3.0	3.3	V
		MAX. DUTY CYCLE		0.1		
ERROR AMP SECTION						
Opneg Bias Voltage		OPNEG OPEN	2.38	2.45	2.52	V
Close Loop Voltage Gain	G_{VC}	0.5V ~ 3.5V		65		dB
Cross Over Point		0dB		320		KHz
OUTPUT SECTION						
Output Saturation Voltage	V_{DSSAT}	$I_D=200mA$		1.1	1.3	V
Drain Off-State Current	$I_{D(OFF)}$	$V_{CC}=V_D=V_S=0V$		2	10	μA
Rising Time	t_R			100	200	ns
Falling Time	t_F			50	200	ns
PROTECTION SECTION						
Over Voltage Protection (OVP)	V33		3.8	4.1	4.3	V
	V5		5.8	6.2	6.6	
	V12		4.41	4.64	4.90	
	P_T		1.2	1.25	1.3	
Under Voltage Protection (UVP)	V33		1.78	1.98	2.18	V
	V5		2.70	3.00	3.30	
	V12		2.11	2.37	2.63	
UVP Disable Voltage	P_T		0.55	0.62	0.68	V
UVP Delay Time	t_{DLY}		100	250	500	ms
REMOTE ON/OFF SECTION						
REM High Input Voltage	V_{IH}		2.0			V
REM Low Input Voltage	V_{IL}				0.8	V
REM Pull High Voltage	$V_{H(PULL)}$		2.0		5.25	V
REM Delay Time	t_{DLY}		30	36	42	ms
REM Off Delay Time	$t_{DLY (OFF)}$		3.5	4.5	5.5	ms
POWER GOOD SECTION						
Detecting Input Voltage	$V_{I(DET)}$		0.55	0.62	0.68	V
Output Saturation Voltage	$V_{O(SAT)}$	$I_{PG}=10mA$		0.2	0.4	V
Charging Current For TPG	I_{CHAR}			30		μA
PG Output Pull-up Resistor	$R_{O(PULL-UP)}$			4		K Ω
PG Output Load Resistor	$R_{O(LOAD)}$		0.5	1	2	K Ω
PG Delay Time	t_{DLY}	C=2.2 μF	100	250	500	ms
TOTAL DEVICE						
Standby Supply Current	I_{CC}			10	20	mA
OSCILLATION SECTION						
Oscillation Frequency	Fosc	C _T =2200P	50		60	KHz
Frequency Change With TEMP.	Fosc/T	C _T =2200P		2		%

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