



3521

CMOS IC

PWM CONTROLLER WITH SUPERVISORY CIRCUIT FOR SWITCHING POWER SUPPLY

DESCRIPTION

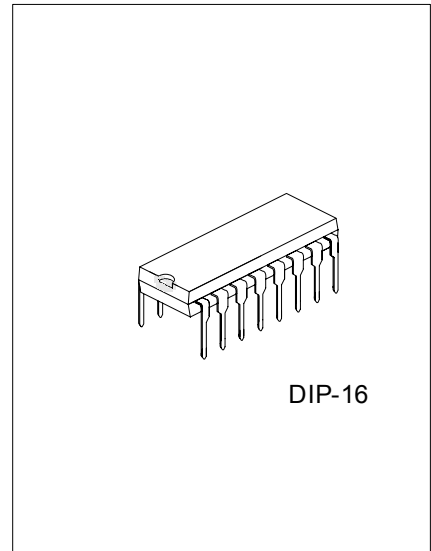
UTC 3521 PWM controller is designed for switching mode power supply for PCs etc. It provides all the functions similar to combinations of industrial 494 plus UTC 3510 circuits.

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

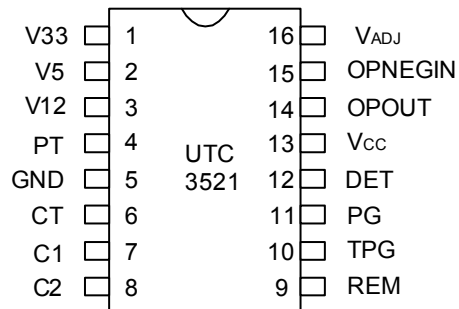
Order Number		Package	Packing
Normal	Lead Free Plating		
3521-D16-T	3521L-D16-T	DIP-16	Tube



*Pb-free plating product number: 3521L

<p>3521L-D16-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Lead Plating 	<ul style="list-style-type: none"> (1) T: Tube (2) D16: DIP-16 (3) L: Lead Free Plating, Blank: Pb/Sn
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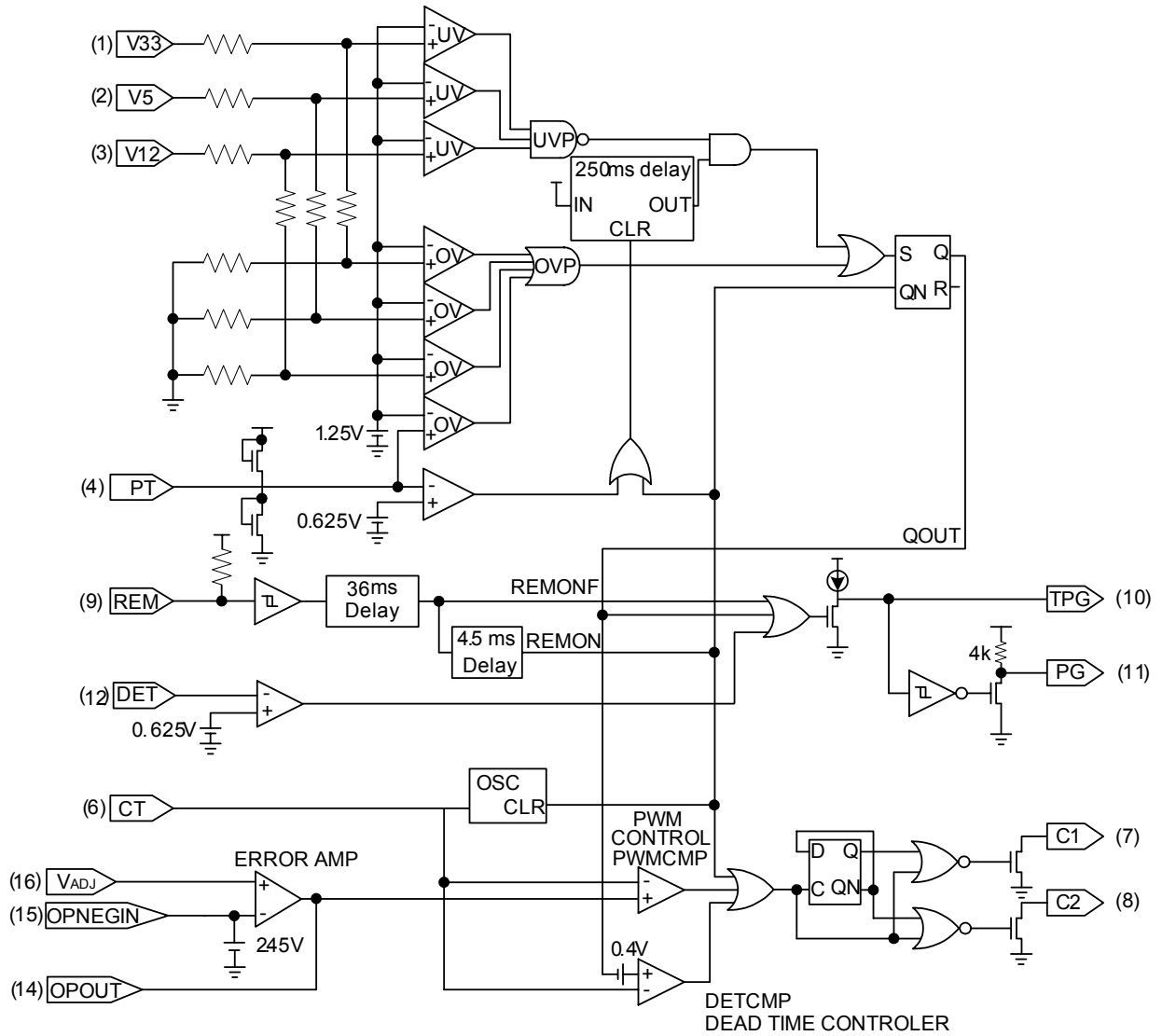
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	TYPE	FUNCTIONS
1	V33	I	OVP/UVIP INPUT FOR 3.3V
2	V5	I	OVP/UVIP INPUT FOR 5V
3	V12	I	OVP/UVIP 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}	$C=2.2\mu F$	100	250	500	ms
TOTAL DEVICE						
Standby Supply Current	I_{CC}			10	20	mA
OSCILLATION SECTION						
Oscillation Frequency	F_{OSC}	$C_T=2200P$	50		60	KHz
Frequency Change With TEMP.	$F_{OSC/T}$	$C_T=2200P$		2		%

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