

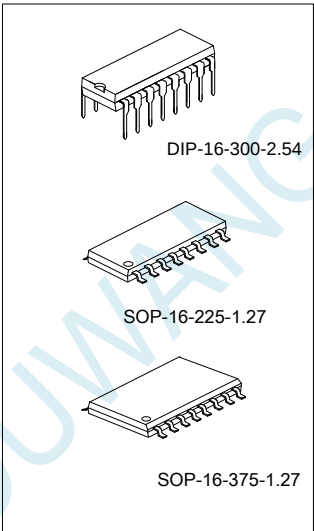
VOLTAGE-MODE PWM CONTROLLER

DESCRIPTION

The UTC3525 is a monolithic integrated circuit that included all of the control circuit necessary for a pulse width modulating regulator. There are a voltage reference, an error amplifier, a pulse width modulator, an oscillator, under-voltage lockout, soft start circuit, and output drivers in the chip.

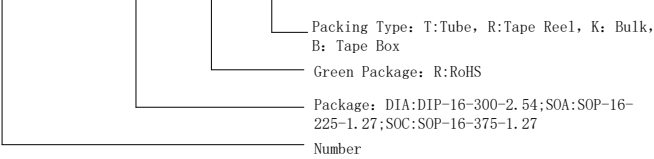
FEATURES

- * 5.1V± 1% Reference
- * Oscillator Sync Terminal
- * Internal Soft Start
- * Dead time Control
- * Under-Voltage Lockout

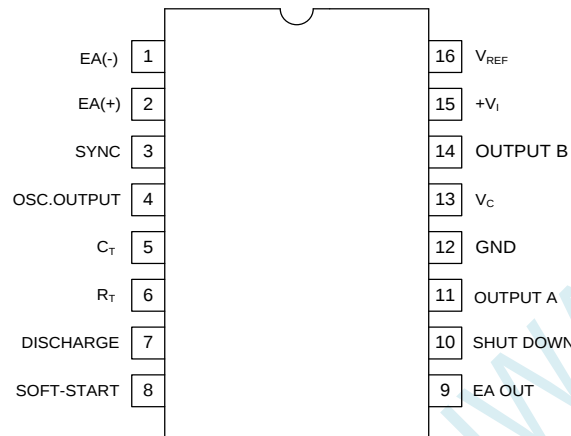


ORDERING INFORMATION				
Ordering Number	Package	Print Number	Free	Packing
UTC3525-DIA-R-T	DIP-16-300-2.54	UTC3525D	RoHS	Tube
UTC3525-SOA-R-T	SOP-16-225-1.27	UTC3525E	RoHS	Tube
UTC3525-SOA-R-R	SOP-16-225-1.27	UTC3525E	RoHS	Tape Reel
UTC3525-SOC-R-T	SOP-16-375-1.27	UTC3525M	RoHS	Tube
UTC3525-SOC-R-R	SOP-16-375-1.27	UTC3525M	RoHS	Tape Reel

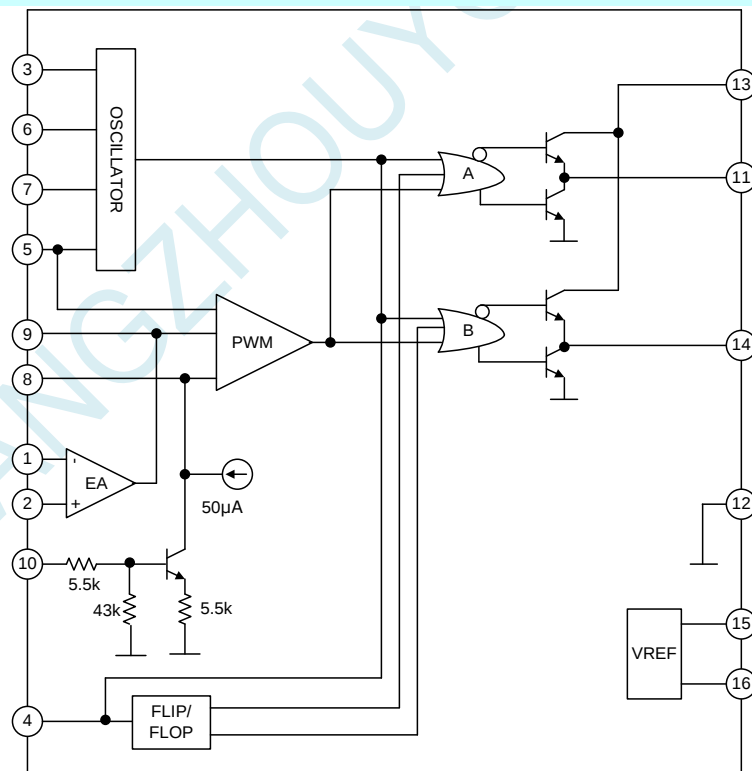
UTC3525 - DIA - R - T



PIN CONFIGURATIONS



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	40	V
Collector Supply Voltage	V_C	40	V
Output Current, Sink or Source	I_O	500	mA
Reference Output Current	I_{REF}	50	mA
Oscillator Charging Current	$I_{CHG(OSC)}$	5	mA
Power Dissipation ($T_A = 25^\circ\text{C}$)	P_D	1000	mW
Junction Temperature	T_J	-40 ~ +125	$^\circ\text{C}$
Operating Ambient Temperature	T_{OPR}	0 ~ +70	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$
Lead Temperature (Soldering, 10 sec)	T_{LEAD}	+260	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{CC} = 20\text{V}$, unless otherwise specified)

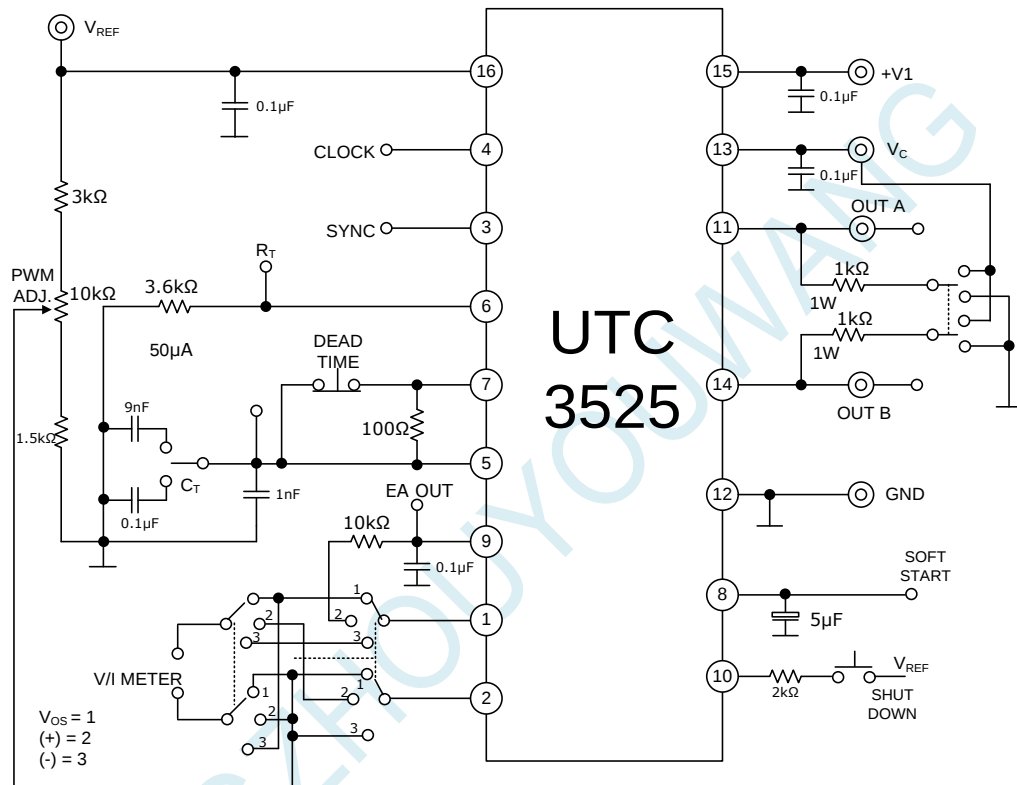
Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Unit
REFERENCE SECTION						
Reference Output Voltage	V_{REF}	$T_J = 25^\circ\text{C}$	5.0	5.1	5.2	V
Line Regulation	ΔV_{REF}	$V_{CC} = 8 \text{ to } 35\text{V}$		9	20	mV
Load Regulation	ΔV_{REF}	$I_{REF} = 0 \text{ to } 20\text{mA}$		20	50	mV
Short Circuit Output Current	I_{SC}	$V_{REF} = 0, T_J = 25^\circ\text{C}$		80	100	mA
Total Output Variation (Note 1)	ΔV_{REF}	Line, Load and Temperature	4.95		5.25	V
Temperature Stability (Note 1)	ST_T			20	50	mV
Long Term Stability (Note 1)	ST	$T_J = 25^\circ\text{C}, 1 \text{ KHrs}$		20	50	mV
OSCILLATOR SECTION						
Initial Accuracy (Note 1, 2)	$ACCUR$	$T_J = 25^\circ\text{C}$		± 3	± 6	%
Frequency Change With Voltage	$\Delta f / V_{CC}$	$V_{CC} = 8 \text{ to } 35\text{V}$ (Note 1, 2)		± 0.8	± 2	%
Maximum Frequency	$f_{(MAX)}$	$R_T = 2\text{K}\Omega, C_T = 470\text{pF}$	400	430		KHz
Minimum Frequency	$f_{(MIN)}$	$R_T = 200\text{K}\Omega, C_T = 0.1\mu\text{F}$		60	120	Hz
Clock Amplitude (Note 1, 2)	$V_{(CLK)}$		3	4		V
Clock Width (Note 1, 2)	$t_{W(CLK)}$	$T_J = 25^\circ\text{C}$	0.3	0.6	1	μs
Sync Threshold	$V_{TH(SYNC)}$		1.2	2	2.8	V
Sync Input Current	$I_{I(SYNC)}$	Sync = 3.5V		1.3	2.5	mA
ERROR AMPLIFIER SECTION ($V_{CM} = 5.1\text{V}$)						
Input Offset Voltage	V_{IO}			1.5	10	mV
Input Bias Current	I_{BAIS}			1	10	μA
Input Offset Current	I_{IO}			0.1	1	μA
Open Loop Voltage Gain	G_{VO}	$R_L \geq 10\text{M}\Omega$	60	80		dB
Common Mode Rejection Ratio	$CMRR$	$V_{CM} = 1.5 \text{ to } 5.2\text{V}$	60	90		dB
Power Supply Rejection Ratio	$PSRR$	$V_{CC} = 8 \text{ to } 35\text{V}$	50	60		dB

Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Unit
PWM COMPARATOR SECTION						
Minimum Duty Cycle	$D_{(MIN)}$				0	%
Maximum Duty Cycle	$D_{(MAX)}$		45	49		%
Input Threshold Voltage (Note 2)	V_{TH1}	Zero Duty Cycle	0.7	0.9		V
Input Threshold Voltage (Note 2)	V_{TH2}	Max Duty Cycle		3.2	3.6	V
SOFT-START SECTION						
Soft Start Current	I_{SOFT}	$V_{SD} = 0V, V_{SS} = 0V$	25	51	80	μA
Soft Start Low Level Voltage	V_{SL}	$V_{SD} = 2.5V$		0.3	0.9	V
Shutdown Threshold Voltage	$V_{TH(SD)}$		0.7	1.3	2.0	V
Shutdown Input Current	$I_{N(SD)}$	$V_{SD} = 2.5V$		0.3	1	mA
OUTPUT SECTION						
Low Output Voltage I	$V_{OL I}$	$I_{SINK} = 20mA$		0.1	0.4	V
Low Output Voltage II	$V_{OL II}$	$I_{SINK} = 100mA$		0.5	2	V
High Output Voltage I	$V_{CH I}$	$I_{SOURCE} = 20mA$	18	19		V
High Output Voltage II	$V_{CH II}$	$I_{SOURCE} = 100mA$	17	18		V
Under Voltage Lockout	V_{UV}	V_8 and $V_9 = High$	6	7	8	V
Collector Leakage Current	I_{LKG}	$V_{CC} = 35V$		80	200	μA
Rise Time (Note 1)	t_R	$C_L = 1nF, T_J = 25^\circ C$		80	600	nS
Fall Time (Note 1)	t_F	$C_L = 1nF, T_J = 25^\circ C$		70	300	nS
STANDBY CURRENT						
Supply Current	I_{CC}	$V_{CC} = 35V$		12	20	mA

Note:1. These parameters, although guaranteed over the recommended operating conditions, are not 100% tested in production

2. Tested at $f_{osc}=40\text{ KHz}$ ($R_T=3.6K, C_T=0.01\mu F, R_O=0\Omega$.)

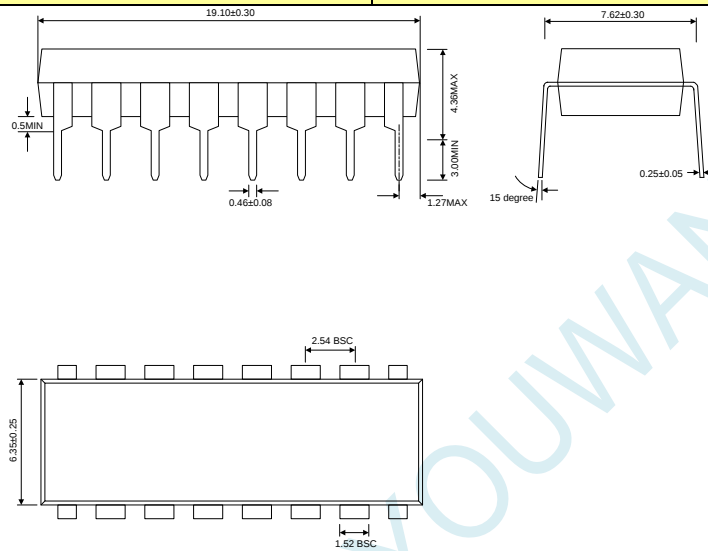
TEST CIRCUIT



PACKAGE OUTLINE

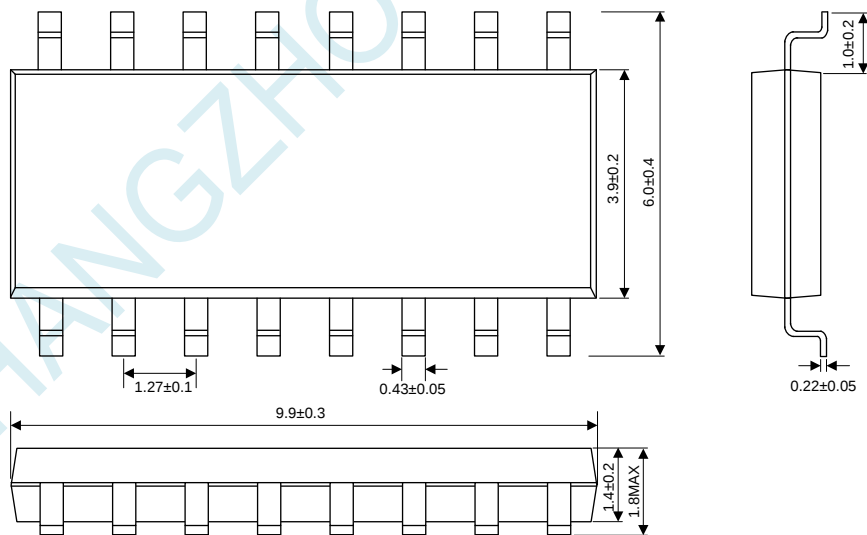
DIP-16-300-2.54

UNIT: mm



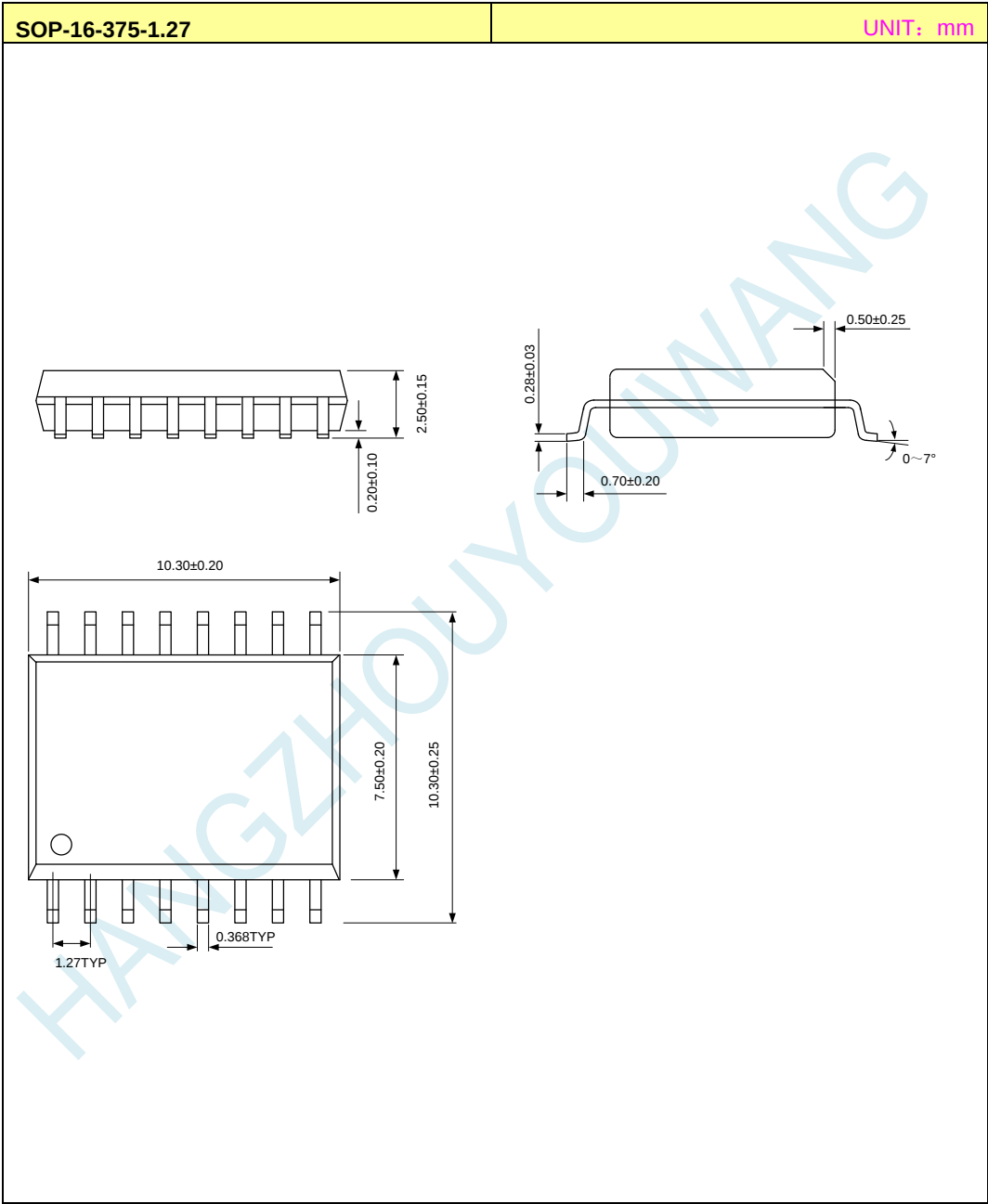
SOP-16-225-1.27

UNIT: mm



UTC3525

LINEAR INTEGRATED CIRCUIT



ELECTROSTATIC DISCHARGE CAUTION

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage handling to prevent electrostatic damage to the device.

NOTICE

HANGZHOU YOUWANG ELECTRONICS CO.LTD assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HANGZHOU YOUWANG ELECTRONICS CO.LTD's products described or contained herein. HANGZHOU YOUWANG ELECTRONICS CO.LTD's products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.

Attach

Revision History

Data	REV	Description	Page
2014.11.17	1.0	Original	
2017.11.06	1.1	Add "Electrostatic Discharge Caution" and "NOTICE"	
2019.06.11	1.2	添加SOP16-225封装及更改版面	
2020.06.12	1.3	添加SOP16-375封装和订购信息	
2021.03.02	1.4	添加结温温度，焊接温度300改为260，上升下降时间条件统一，外形尺寸图更改	