



UM601/A

Preliminary

LINEAR INTEGRATED CIRCUIT

VOLTAGE AND CURRENT CONTROLLER

■ DESCRIPTION

The UTC **UM601/A** integrated circuit incorporates a high stability series band gap voltage reference, two ORed operational amplifiers and a current source.

This IC compares the DC voltage and the current level at the output of a switching power supply to an internal reference. It provides a feedback through an optocoupler to the PWM controller IC in the primary side.

The controlled current generator can be used to modify the level of current limitation by offsetting the information coming from the current sensing resistor.

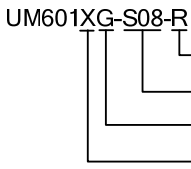
It can be used in voltage supervisors, every types of application requiring a precision voltage regulation and current limitation, over voltage protection, battery charger with a constant voltage and a limited output current.

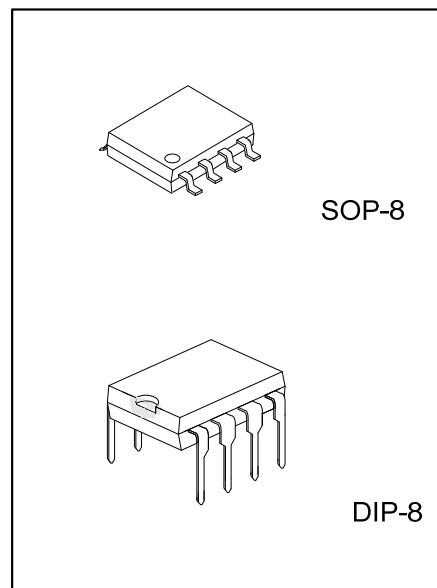
■ FEATURES

- * 1.24V Series Voltage Reference with 10mA Output Current and 1% Precision (UM601A)
- * Two Operational Amplifiers with ORed Output and 1MHz Gain Bandwidth Product
- * Built-In Current Generator with Enable / Disable Function
- * 4.5 ~ 32V Supply Voltage Range

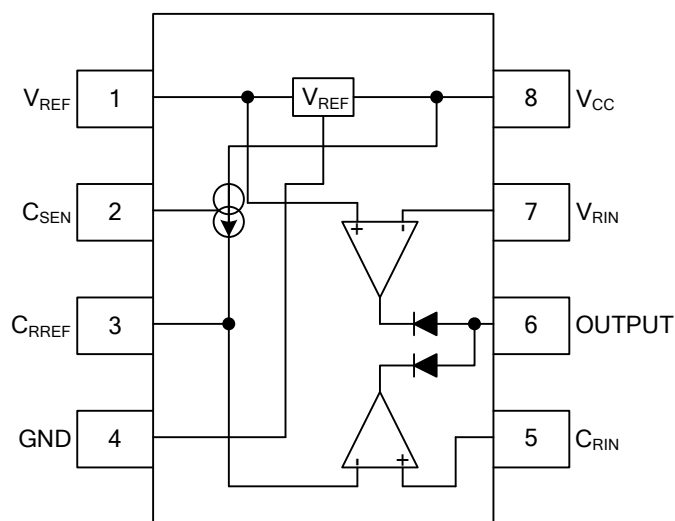
■ ORDERING INFORMATION

Ordering Number			Package	Packing
Normal	Lead Free	Halogen Free		
UM601-S08-R	UM601L-S08-R	UM601G-S08-R	SOP-8	Tape Reel
UM601-D08-T	UM601L-D08-T	UM601G-D08-T	DIP-8	Tube
UM601A-S08-R	UM601AL-S08-R	UM601AG-S08-R	SOP-8	Tape Reel
UM601A-D08-T	UM601AL-D08-T	UM601AG-D08-T	DIP-8	Tube

 UM601XG-S08-R (1) Packing Type (2) Package Type (3) Halogen Free (4) Reference Voltage	(1) R: Tape Reel, T: Tube (2) S08: SOP-8, D08: DIP-8 (3) Blank: Pb/Sn, L: Lead Free, G: Halogen Free (4) Refer to Electrical Characteristics
--	---



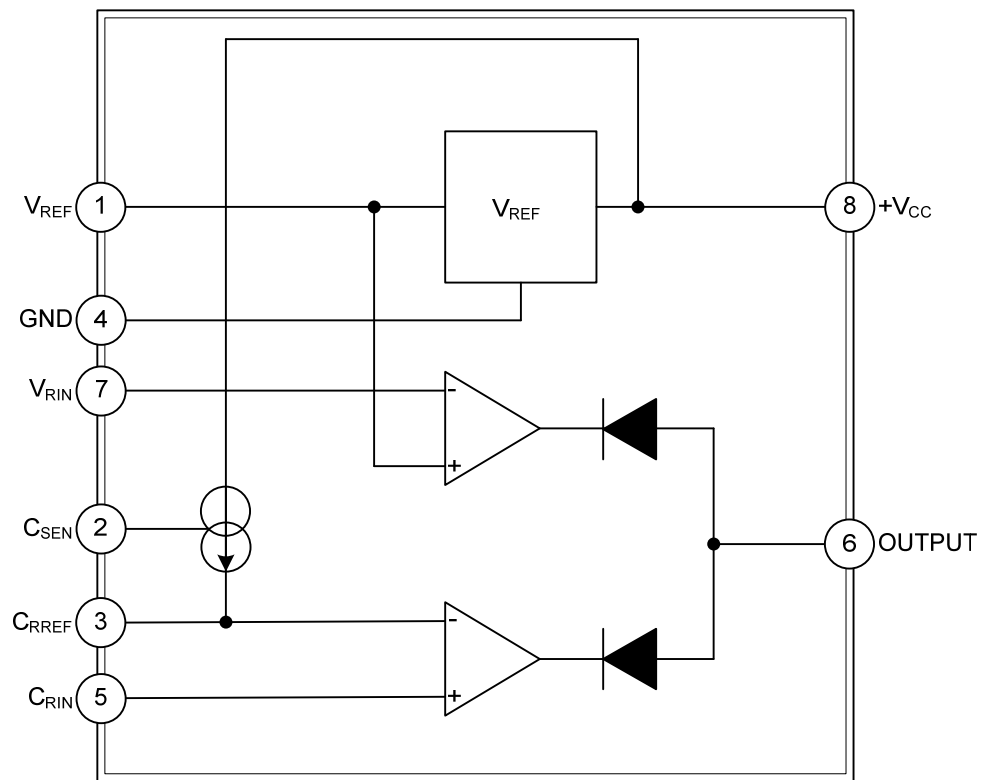
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN	NAME	TYPE	FUNCTION
1.	V _{REF}	OUTPUT	Voltage Reference Output 1.24V, 10mA max. Do not short circuit
2.	C _{SEN}	INPUT	Current source enable input. This current source can be used to offset the voltage measurement on the sense resistor and therefore to modify the charge current. The current source is enabled when the input volage on pin 2 is lower than 0.8V
3.	C _{RREF}	INPUT	Current Limitation Reference Input
4.	GND	INPUT	Ground
5.	C _{RIN}	INPUT	Current Limitation Loop Input, connected to the sense resistor
6.	OUTPUT	OUTPUT	Output pin common to the voltage regulation and current limitation loops. This output can drive the primary side (LED) of an optocoupler
7.	V _{RIN}	INPUT	Voltage Regulation Loop Input
8.	V _{CC}	INPUT	Power Supply Input (4.5 ~ 32VDC)

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
DC Supply Voltage	V_{CC}	36	V
Output Current	I_{OUT}	20	mA
Power Dissipation	P_D	200	mW
Input Voltage	V_{IN}	-0.3 ~ $V_{CC}-1.5$	V
Input Current	I_{IN}	± 1	mA
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-40 ~ +125	°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.

■ OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	4.5 ~ 32	V
Ambient Operating Temperature	T_{OPR}	$T_{MIN} \sim T_{MAX}$	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	130 ~ 200	°C/W

■ ELECTRICAL CHARACTERISTICS ($V_{CC}=15V$, $T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Total Supply Current	I _{CC}	V _{CC} =15V				2	mA
Input Voltage	V _I			0		V _{CC} -1.5	V
Input Offset Voltage	V _{IO}	T _A =25°C		-5	1	5	mV
		T _{MIN} <T _{AMB} <T _{MAX}		-7		7	mV
Input Bias Current	I _{IB}	V _{IN} =1.2V on pin 7 and V _{IN} =0V on pin5	25°C	-700	-300	0	nA
			T _{MIN} <T _{AMB} <T _{MAX}	-1000		0	nA
Output Sink Current	I _{SINK}	V _{OL} =2.5 V	25°C		15		mA
			T _{MIN} <T _{AMB} <T _{MAX}	8			mA
Large Signal Voltage Gain	A _{VO}	R _L =2kΩ, T _{MIN} <T _{AMB} <T _{MAX}		15			V/mV
Supply Voltage Rejection Ratio	SVR	T _{MIN} <T _{AMB} <T _{MAX}		65	90		dB
Common Mode Rejection Ratio	CMR	T _{MIN} <T _{AMB} <T _{MAX}			80		dB
Gain Bandwidth Product	GBP	V _{CC} =15V, F=100kHz, V _{IN} =10mV, R _L =2kΩ, C _L =100pF			1		MHz
Output Leakage Current	I _{OH}	T _A =25°C				2	μA
		T _{MIN} <T _{AMB} <T _{MAX}				7	μA

VOLTAGE REFERENCE

Reference Voltage	V_{REF}	$I_{OUT}=1mA$, $T_{AMB}=25^\circ C$	UM601	1.21	1.24	1.27	V
			UM601A	1.227	1.240	1.252	
Temperature Stability	K_{VT}	$T_{MIN} < T_{AMB} < T_{MAX}$		30	100		ppm/°C
Load Regulation	Reglo	$1mA < I_{OUT} < 10mA$		5	15		mV
Line Regulation	Regli	$5V < V_{IN} < 32V$		3.5	10		mV

CURRENT GENERATOR

Current Source	I_O			1.4			mA
Temperature Stability	K_{CGT}	$T_{MIN} < T_{AMB} < T_{MAX}$		500			ppm/°C
Line Regulation	C_{gliR}	$4.5V < V_{CC} < 32V$		0.003	0.030		mV
Voltage at the enable pin to have $I_O=1.4mA$	V_{CSEN}	$T_{MIN} < T_{AMB} < T_{MAX}$			0.6		V
Voltage at the enable pin to have $I_O=0mA$	V_{CSDIS}	$T_{MIN} < T_{AMB} < T_{MAX}$	2				V
Input Current on the Csen pin	I_{CSEN}	$T_{MIN} < T_{AMB} < T_{MAX}$			30		μA
Leakage Current	I_{CSLEAK}	$V_{CS}=2V$, $T_{MIN} < T_{AMB} < T_{MAX}$		0.5	2		μA

UTC 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 UTC products described or contained herein. UTC 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.