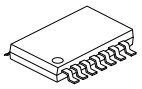
20V HIGH CURRENT DRIVE RAIL-TO-RAIL VCOM/GAMMA BUFFER



TSSOP-14

■ DESCRIPTION

The UTC **ULV1546** is the quadruple high voltage rail-to-rail Vcom/Gamma Buffer with low power dissipation. Operating on power supplies ranging from 5V to 20V, while current consuming is less than 1.2mA / per amplifier. Rail-to-rail output capability and common mode input ability beyond the rails enable these amplifiers to offer maximum dynamic range at any supply voltage.

Fast slew rate and settling times, and a high output drive capability of 300mA peak AC current (sink and source) are also provided by UTC **ULV1546**. With so many attractive characteristics， the four amplifiers inside UTC **ULV1546** are ideal for use as voltage reference buffers in TFT-LCD panel applications for TV, PC, Notebooks, and mobile computing devices.

■ FEATURES

* Wide Supply Operation Range +5V~+20V
* Beyond the rails input capability
* Rail-to-rail output swing
* Low supply current, 1.2mA per amplifier (typical)
* Wide bandwidth (unit gain) 30MHz-3dB bandwidth
* 300mA peak output AC current (typ.)
* High slew rate=30V/μs
* Unity-gain stable

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV1546L-P14-T	ULV1546G-P14-T	TSSOP-14	Tube
ULV1546L-P14-R	ULV1546G-P14-R	TSSOP-14	Tape Reel

ULV1546L-P14-T (1) Packing Type (2) Package Type (3) Lead Free	(1) T: Tube, R: Tape Reel (2) P14: TSSOP-14 (3) L: Lead Free, G: Halogen Free

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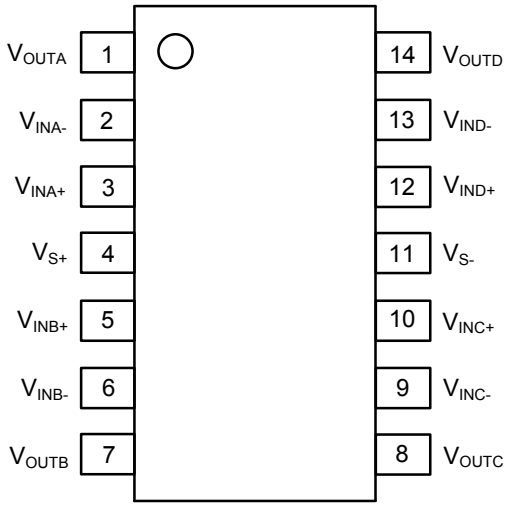
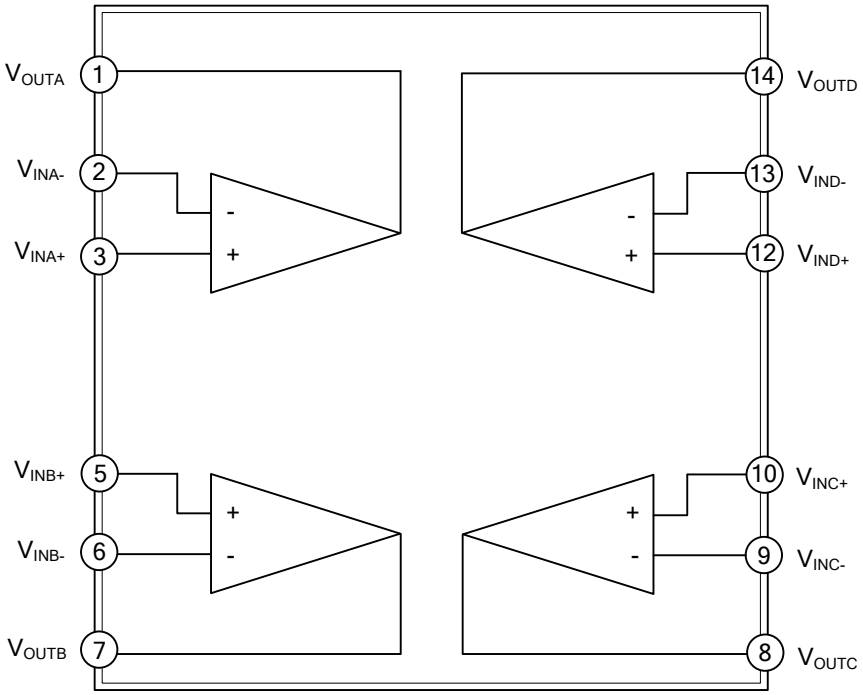
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V_{OUTA}	Output of amplifier-A
2	V_{INA-}	Inverting input of amplifier-A
3	V_{INA+}	Non-inverting input of amplifier-A
4	V_{S+}	Positive power supply
5	V_{INB+}	Non-inverting input of amplifier-B
6	V_{INB-}	Inverting input of amplifier-B
7	V_{OUTB}	Output of amplifier-B
8	V_{OUTC}	Output of amplifier-C
9	V_{INC-}	Inverting input of amplifier-C
10	V_{INC+}	Non-inverting input of amplifier-C
11	V_{S-}	Negative power supply
12	V_{IND+}	Non-inverting input of amplifier-D
13	V_{IND-}	Inverting input of amplifier-D
14	V_{OUTD}	Output of amplifier-D

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Between VS+ & VS-	VS+-VS-	+21.5	V
Input Voltage	V_I	VS- -0.5, VS+ + 0.5	V
Max. Continuous Output Current	I_{OUT}	80	mA
Max. Continuous Output AC Current	$I_{O(AC)}$	400 (20% Duty Cycle)	mA
Junction Temperature	T_J	+150	°C
Operating Temperature	T_{OPR}	-40~+85	°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

(V_{S+}=+5V, V_{S-}=-5V, with R_L=10KΩ and C_L=10pF, T_A=25°C unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Characteristics						
Input Offset Voltage	V_{OS}	V_{CM}=0V		3	15	mV
Average Offset Voltage Drift	T_{CVos}	Measured over Operating Temperature Range		5		μV/°C
Input Bias Current	I_B	V_{CM}=0V		2	50	nA
Input Impedance	R_{IN}			1		GΩ
Input Capacitance	C_{IN}			2.0		pF
Common-Mode Input Range	CMIR		-5.5		+5.5	V
Common-Mode Rejection Ratio	CMRR	-5.5V≤V_{IN}≤+5.5V	50	72		dB
Open-Loop Gain	A_{VOL}	-4.5V≤V_{OUT}≤+4.5V	65	78		dB
Output Characteristics						
Output Swing Low	V_{OL}	I_L=-5mA		-4.94	-4.88	V
Output Swing High	V_{OH}	I_L=+5mA	4.88	4.94		V
Peak Output AC Current	I_{OUT}	V_{OUT} Reaches within ±3V from Rails		±300		mA
Power Supply Performance						
Power Supply Rejection Ratio	PSRR	V_S from ±2.25V to ±7.75V	60	80		dB
Supply Current (Per Amplifier)	I_S	No Load		1.2		mA
Dynamic Performance						
Slew Rate (Rising & Falling Edges)	SR	-4.0V≤V_{OUT}≤+4.0V		27		V/μs
Settling to ±0.1% (A_V=+1)	t_s	V_O=2.0V Step @ C_L=0pF		100		ns
-3dB Bandwidth	B_W			28		MHz
Gain-Bandwidth Product	G_{BWP}			22		MHz
Phase Margin	P_M			50		°
Channel Separation	CHS	f=5MHz		90		dB

■ ELECTRICAL CHARACTERISTICS(Cont.)

(V_{S+}=+16V, V_{S-}=0V, with R_L=10KΩ and C_L=10pF, T_A=25°C unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Characteristics						
Input Offset Voltage	V_{OS}	V_{CM}=8V		3	15	mV
Average Offset Voltage Drift	T_{CVos}	Measured over Operating Temperature Range		5		μV/°C
Input Bias Current	I_B	V_{CM}=8V		2	50	nA
Input Impedance	R_{IN}			1		GΩ
Input Capacitance	C_{IN}			2.0		pF
Common-Mode Input Range	CMIR		-0.5		+15.5	V
Common-Mode Rejection Ratio	CMRR	-0.5V≤V_{IN}≤+16.5V	50	75		dB
Open-Loop Gain	A_{VOL}	+0.5V≤V_{OUT}≤+15.5V	68	80		dB
Output Characteristics						
Output Swing Low	V_{OL}	I_L=-5mA		70	120	mV
Output Swing High	V_{OH}	I_L=+5mA	15.88	15.94		V
Peak Output AC Current	I_{OUT}	V_{OUT} Reaches within ±3V from Rails		±300		mA
Power Supply Performance						
Power Supply Rejection Ratio	PSRR	V_S from +4.5V to+16.5V	60	80		dB
Supply Current (Per Amplifier)	I_S	No Load		1.2		mA
Dynamic Performance						
Slew Rate (Rising & Falling Edges)	SR	+1.0V≤V_{OUT}≤+15.0V		30		V/μs
Settling to ±0.1% (A_V=+1)	t_s	V_O=2.0V Step @ C_L=0pF		100		ns
-3dB Bandwidth	B_W			30		MHz
Gain-Bandwidth Product	G_{BWP}			24		MHz
Phase Margin	P_M			50		°
Channel Separation	CHS	f=5MHz		90		dB

■ ELECTRICAL CHARACTERISTICS

(VS+=+5V, VS-=0V, with R_L=10KΩ and C_L=10pF to 2.5V @ T_A=25°C unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Characteristics						
Input Offset Voltage	V_{OS}	V_{CM}=2.5V		3	15	mV
Average Offset Voltage Drift	T_{CVos}	Measured over Operating Temperature Range		5		μV/°C
Input Bias Current	I_B	V_{CM}=2.5V		2	50	nA
Input Impedance	R_{IN}			1		GΩ
Input Capacitance	C_{IN}			2.0		pF
Common-Mode Input Range	CMIR		-0.5		+5.5	V
Common-Mode Rejection Ratio	CMRR	-0.5V≤V_{IN}≤+5.5V	50	70		dB
Open-Loop Gain	A_{VOL}	+0.5V≤V_{OUT}≤+4.5V	60	70		dB
Output Characteristics						
Output Swing Low	V_{OL}	I_L=-5mA		70	140	mV
Output Swing High	V_{OH}	I_L=+5mA	4.86	4.94		V
Peak Output AC Current	I_{OUT}	V_{OUT} Reaches within ±3V from Rails		±300		mA
Power Supply Performance						
Power Supply Rejection Ratio	PSRR	V_S from +4.5V to+15.5V	60	80		dB
Supply Current (Per Amplifier)	I_S	No Load		1.0		mA
Dynamic Performance						
Slew Rate (Rising & Falling Edges)	SR	+1.0V≤V_{OUT}≤+4.0V		25		V/μs
Settling to ±0.1% (A_V=+1)	t_s	V_O=2.0V Step @ C_L=0pF		100		ns
-3dB Bandwidth	B_W			25		MHz
Gain-Bandwidth Product	G_{BWP}			20		MHz
Phase Margin	P_M			50		°
Channel Separation	CHS	f=5MHz		90		dB

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