

Features

- 120 V/ μ S Slew Rate
- 200 nS Settling Time to 0.1%
- 2.0 MHz Full Power Bandwidth
- 20 MHz Gain Bandwidth

Applications

- Video Amplifiers
- Pulse Amplifiers
- Signal Generators
- High Speed Sample-and-Hold Amplifiers

Description

The SP-2520/22/25 are high slew rate, wide bandwidth operational amplifiers which are stable at closed loop gains of 3 or greater without external compensation. These devices also exhibit fast settling times, high input impedance, and low input offset currents. These characteristics combine to make the SP-2520/22/25 prime candidates for high frequency analog processing applications.

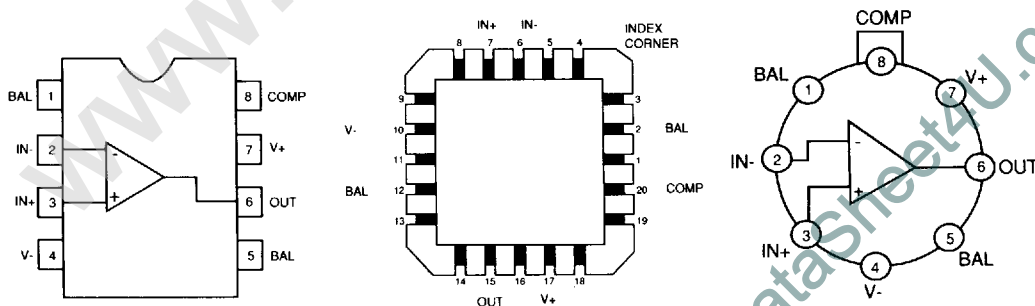
These amplifiers provide the designer with the ability to tailor its transfer characteristics through compensation. Offsets can be trimmed by connecting a nulling potentiometer between its balance pins, and connecting the wiper to the positive supply, V^+ . A 200K Ω potentiometer is recommended.

The SP-2522 and SP-2525 are the relaxed specification military temperature range and the commercial temperature range of the SP-2520.

All versions are available in metal can, ceramic mini DIP packages, and in die form. The SP-2520 is also available in ceramic LCC packages.

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Connection Diagrams



Uncompensated, High Slew Rate Operational Amplifiers

Absolute Maximum Ratings

SIPEX CORP

Voltage Between V^+ and V^- Terminals

40.0V

Operating Temperature Range

Differential Input Voltage, V_d

$\pm 15.0V$

SP-2520

$-55^\circ C \leq T_A \leq 125^\circ C$

Internal Power Dissipation, P_d

300mW

Storage Temperature Range

$-65^\circ C \leq T_A \leq 150^\circ C$

Peak Output Current, I_p

50mA

Electrical Characteristics: $V^+ = +15V$, $V^- = -15V$, $T_A = 25^\circ C$ unless otherwise specified in "Conditions".

SP-2520

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input Characteristics						
Offset Voltage	V_{OS}	$-55^\circ C \leq T_A \leq 125^\circ C$		4	8	mV
					11	mV
Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	$-55^\circ C \leq T_A \leq 125^\circ C$; average		20		$\mu V/^\circ C$
Bias Current	I_b	$-55^\circ C \leq T_A \leq 125^\circ C$		100	200	nA
					400	nA
Offset Current	I_{OS}	$-55^\circ C \leq T_A \leq 125^\circ C$		10	25	nA
					50	nA
Input Impedance	Z_{in}	Guaranteed by Design	50	100		M Ω
Common Mode Range	V_{cm}	$-55^\circ C \leq T_A \leq 125^\circ C$	± 10.0			V
Transfer Characteristics						
Large Signal Voltage Gain	A_{VOL}	$R_L = 2K\Omega$, $V_O = \pm 10V$ $-55^\circ C \leq T_A \leq 125^\circ C$, $R_L = 2K\Omega$, $V_O = \pm 10V$	10K 7.5K	15K		V/V V/V
Common Mode Rejection Ratio	CMRR	$-55^\circ C \leq T_A \leq 125^\circ C$, $V_{cm} = \pm 10V$	80	90		dB
Gain Bandwidth Product	GBW	$A_v > 10$, Guaranteed by Design	10	20		MHz
Output Characteristics						
Output Voltage Swing	V_O	$-55^\circ C \leq T_A \leq 125^\circ C$, $R_L = 2K\Omega$	± 10.0	± 12.0		V
Output Current	I_{OUT}	$V_O = \pm 10V$	± 10	± 20		mA
Full Power Bandwidth	FPBW	$V_O = \pm 10V$, $FPBW = (SR) (2\pi V_p)^{-1}$	1500	2000		KHz
Transient Response						
Rise Time	t_r	$R_L = 2K\Omega$, $C_L = 50pF$, $V_O = \pm 200mV$, $A_v = 3$		25	50	nS
Overshoot	γ	$R_L = 2K\Omega$, $C_L = 50pF$, $V_O = \pm 200mV$, $A_v = 3$		25	40	%
Slew Rate	SR	$R_L = 2K\Omega$, $C_L = 50pF$, $V_O = \pm 5V$, $A_v = 3$	± 100	120		V/S
Settling Time to 0.1%	t_s	$R_L = 2K\Omega$, $C_L = 50pF$, $V_O = \pm 5V$, $A_v = 3$		0.20		μS
Power Supply						
Supply Current	I_s			4	6	mA
Power Supply Rejection Ratio	PSRR	$-55^\circ C \leq T_A \leq 125^\circ C$, $\Delta V_s = \pm 5V$	80	90		dB

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Absolute Maximum Ratings

Voltage Between V^+ and V^- Terminals

40.0V

Operating Temperature Range

Differential Input Voltage, V_d $\pm 15.0V$

SP-2522

 $-55^\circ C \leq T_A \leq 125^\circ C$ Internal Power Dissipation, P_d

300mW

Storage Temperature Range $-65^\circ C \leq T_A \leq 150^\circ C$ Peak Output Current, I_p

50mA

Electrical Characteristics: $V^+ = +15V$, $V^- = -15V$, $T_A = 25^\circ C$ unless otherwise specified in "Conditions".

SP-2522

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<u>Input Characteristics</u>						
Offset Voltage	V_{os}	$-55^\circ C \leq T_A \leq 125^\circ C$		5	10	mV
					14	mV
Offset Voltage Drift	$\Delta V_{os}/\Delta T$	$-55^\circ C \leq T_A \leq 125^\circ C$; average		25		$\mu V/^\circ C$
Bias Current	I_b	$-55^\circ C \leq T_A \leq 125^\circ C$		125	250	nA
					500	nA
Offset Current	I_{os}	$-55^\circ C \leq T_A \leq 125^\circ C$		20	50	nA
					100	nA
Input Impedance	Z_{in}	Guaranteed by Design	40	100		M Ω
Common Mode Range	V_{cm}	$-55^\circ C \leq T_A \leq 125^\circ C$	± 10.0			V
<u>Transfer Characteristics</u>						
Large Signal Voltage Gain	$A_{v_{OL}}$	$R_L = 2K\Omega$, $V_o = \pm 10V$ $-55^\circ C \leq T_A \leq 125^\circ C$, $R_L = 2K\Omega$, $V_o = \pm 10V$	7.5K 5K	15K		V/V V/V
Common Mode Rejection Ratio	CMRR	$-55^\circ C \leq T_A \leq 125^\circ C$, $V_{cm} = \pm 10V$	74	90		dB
Gain Bandwidth Product	GBW	$A_v > 10$, Guaranteed by Design	10	20		MHz
<u>Output Characteristics</u>						
Output Voltage Swing	V_o	$-55^\circ C \leq T_A \leq 125^\circ C$, $R_L = 2K\Omega$	± 10.0	± 12.0		V
Output Current	I_{OUT}	$V_o = \pm 10V$	± 10	± 20		mA
Full Power Bandwidth	FPBW	$V_o = \pm 10V$, $FPBW = (SR) / (2\pi V_p)^{1/2}$	1200	1600		KHz
<u>Transient Response</u>						
Rise Time	t_R	$R_L = 2K\Omega$, $C_L = 50pF$, $V_o = \pm 200mV$, $A_v = 3$		25	50	nS
Overshoot	γ	$R_L = 2K\Omega$, $C_L = 50pF$, $V_o = \pm 200mV$, $A_v = 3$		25	50	%
Slew Rate	SR	$R_L = 2K\Omega$, $C_L = 50pF$, $V_o = \pm 5V$, $A_v = 3$	± 80	120		V/S
Settling Time to 0.1%	t_s	$R_L = 2K\Omega$, $C_L = 50pF$, $V_o = \pm 5V$, $A_v = 3$		0.20		μS
<u>Power Supply</u>						
Supply Current	I_s			4	6	mA
Power Supply Rejection Ratio	PSRR	$-55^\circ C \leq T_A \leq 125^\circ C$, $\Delta V_s = \pm 5V$	74	90		dB

SP-2520/22/25

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Uncompensated, High Slew Rate Operational Amplifiers

Absolute Maximum Ratings

Voltage Between V^+ and V^- Terminals

40.0V

Operating Temperature Range

Differential Input Voltage, V_d
 $\pm 15.0V$

SP-2525

 $0^\circ C \leq T_A \leq 75^\circ C$

Internal Power Dissipation, P_d

300mW

Storage Temperature Range $-65^\circ C \leq T_A \leq 150^\circ C$

Peak Output Current, I_p

50mA

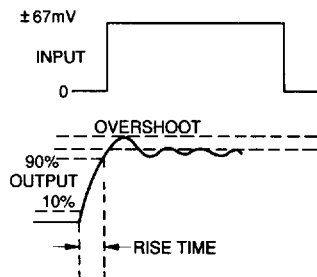
Electrical Characteristics: $V^+ = +15V$, $V^- = -15V$, $T_A = 25^\circ C$ unless otherwise specified in "Conditions".

SP-2525

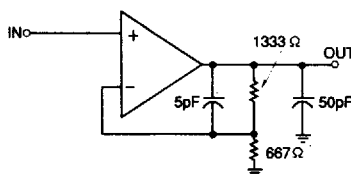
Parameter	Symbol	Conditions	Min	Typ	Max	Units
<u>Input Chars.</u>						
Offset Voltage	V_{os}	$0^\circ C \leq T_A \leq 75^\circ C$		5	10	mV
Offset Voltage Drift	$\Delta V_{os}/\Delta T$	$0^\circ C \leq T_A \leq 75^\circ C$; average		30	14	$\mu V/^\circ C$
Bias Current	I_b	$0^\circ C \leq T_A \leq 75^\circ C$		125	250	nA
Offset Current	I_{os}	$0^\circ C \leq T_A \leq 75^\circ C$		20	50	nA
Input Impedance	Z_{in}	Guaranteed by Design	40	100	100	nA
Common Mode Range	V_{cm}	$0^\circ C \leq T_A \leq 75^\circ C$	± 10.0			M Ω V
<u>Transfer Characteristics</u>						
Large Signal Voltage Gain	A_{VOL}	$R_L = 2K\Omega$, $V_o = \pm 10V$ $0^\circ C \leq T_A \leq 75^\circ C$, $R_L = 2K\Omega$, $V_o = \pm 10V$	7.5K 5K	15K		V/V V/V
Common Mode Rejection Ratio	CMRR	$0^\circ C \leq T_A \leq 75^\circ C$, $V_{cm} = \pm 10V$	74	90		dB
Gain Bandwidth Product	GBW	$A_v > 10$, Guaranteed by Design	10	20		MHz
<u>Output Characteristics</u>						
Output Voltage Swing	V_o	$0^\circ C \leq T_A \leq 75^\circ C$, $R_L = 2K\Omega$	± 10.0	± 12.0		V
Output Current	I_{OUT}	$V_o = \pm 10V$	± 10	± 20		mA
Full Power Bandwidth	FPBW	$V_o = \pm 10V$, $FPBW = (SR) (2\pi V_o)^{-1}$	1200	1600		KHz
<u>Transient Response</u>						
Rise Time	t_r	$R_L = 2K\Omega$, $C_L = 50pF$, $V_o = \pm 200mV$, $A_v = 3$		25	50	nS
Overshoot	γ	$R_L = 2K\Omega$, $C_L = 50pF$, $V_o = \pm 200mV$, $A_v = 3$		25	50	%
Slew Rate	SR	$R_L = 2K\Omega$, $C_L = 50pF$, $V_o = \pm 5V$, $A_v = 3$	± 80	120		V/S
Settling Time to 0.1%	t_s	$R_L = 2K\Omega$, $C_L = 50pF$, $V_o = \pm 5V$, $A_v = 3$		0.20		μS
<u>Power Supply</u>						
Supply Current	I_s			4	6	mA
Power Supply Rejection Ratio	PSRR	$0^\circ C \leq T_A \leq 75^\circ C$, $\Delta V_s = \pm 5V$	74	90		dB

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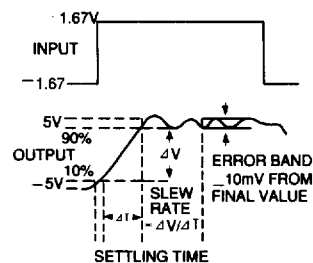
A.C. Performance



Transient Response



A.C. Test Circuit



Slew Rate/Settling Time

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Ordering Information

When ordering the SP-2520/22/25, specify the package and screening according to the following :

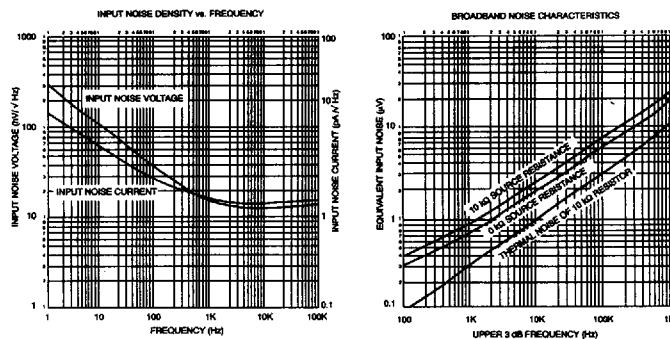
SP 2 - 2520 - 2	
Prefix: _____	Generic Part # _____
SP (SIPEX)	
PACKAGE : _____	SCREENING _____
1 - 14 pin ceramic DIP	-2 : -55 °C to 125 °C
2 - Metal Can	-4 : -25 °C to 85 °C
3 - 8 Pin Plastic DIP	-5 : 0 °C to 75 °C
4 - 20 Pin LCC	-6 : 25 °C 100% D.C. Probe (Dice Only)
7 - 8-Pin Cerdip	/883 : -55 °C to 125 °C
0 - DICE	Full Mil Processing

NOTES: 1. Not all package types and screening option combinations are available. Consult local sales office or factory for availability information.

2. Consult factory for special package or screening requirements.

3. Consult factory for 883 revision C compliant data sheet.

4. Consult factory for package mechanical dimensions.



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