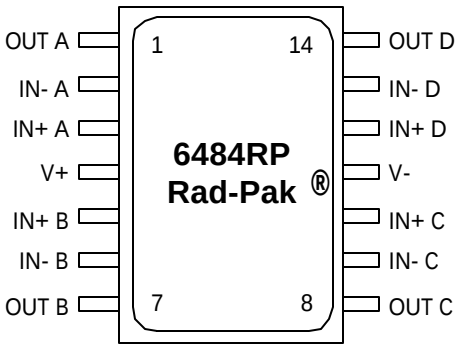
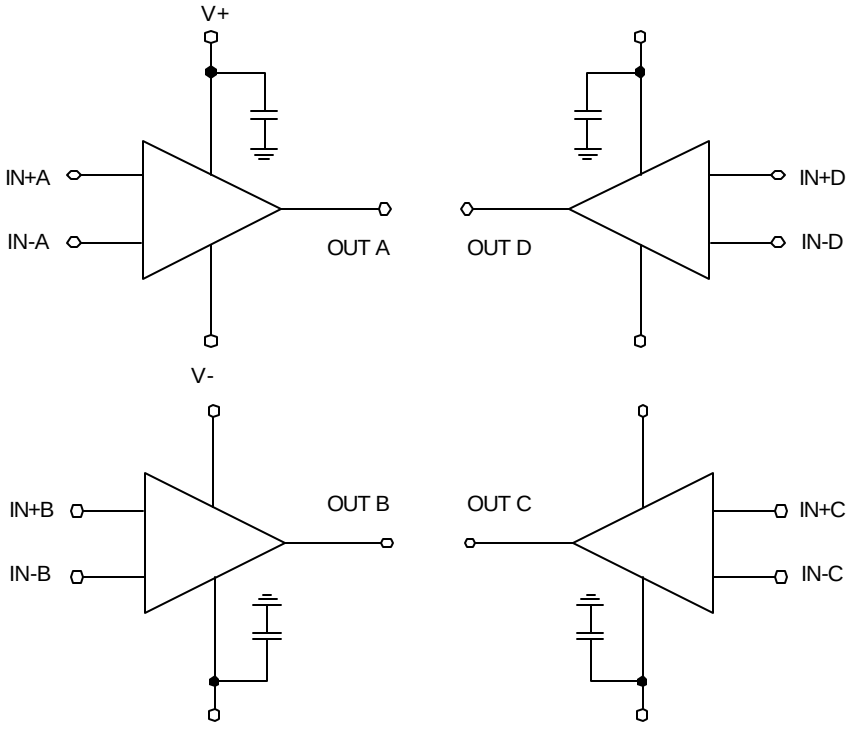
PRELIMINARY

SPACE ELECTRONICS INC.
SPACE PRODUCTS

CMOS QUAD RAIL-TO-RAIL I/O OP AMP

6484RP





FEATURES:

- Rail-to-Rail input common-mode voltage range (guaranteed over temperature
- Rail-to-Rail output swing (withing 20 mV of supply rail, 100 kΩ load)
- Guaranteed 3V, 5V and 15V performance
- Excellent CMRR and PSRR: 82 dB
- Ultra low input current: 20 pA
- High voltage gain (RL = 500 kΩ): 130 dB
- Specified for 2 kΩ and 600 Ω loads

DESCRIPTION:

Space Electronics' 6484RP (RP for Rad-Pak®) provides a common-mode range that extends to both supply rails. This rail-to-rail performance combined with excellent accuracy, due to a high CMRR< makes it unique among rail-to-rail input amplifiers. It is ideal for systems, such as data acquisition, that require a large input signal range.

Maximum dynamic signal range is assured in low voltage and single supply systems by the 6484RP's rail-to-rail output swing. The device's rail-to-rail output swing is guaranteed for loads down to 600W. Guaranteed low voltage characteristics and low power dissipation make the 6484RP especially well-suited for battery-operated systems.

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TABLE 1. ABSOLUTE MAXIMUM RATINGS [1]

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage (V+ - V-)	V_{SS}	--	16	V
Differential Input Voltage		$-V_{SS}$	V_{SS}	V
Voltage at I/O Pin		(V+) + 0.3	(V-) - 0.3	V
Current at Input Pin [2]		-5	5	mA
Current at Output Pin [3,4]		-30	30	mA
Current at Power Supply Pin		--	40	mA
Maximum Junction Temperature	T_J	--	150	°C
Power Dissipation	P_D	--	315	mW
Storage Temperature Range	T_{STG}	-65	150	°C
Operating Temperature Range	T_{OPR}	-55	125	°C
Thermal Resistance				
ThetaJA				C/W
- 14-pin ceramic DIP (still air)		--	86	
(500LF/min air flow)		--	49	
- 14-pin ceramic SOIC (still air)		--	116	
(500LF/min air flow)		--	72	
ThetaJC				C/W
- 14-pin ceramic DIP		--	16	
- 14-pin ceramic SOIC		--	11	
Package Weight				mg
- Ceramic DIP		--	TBD	
- Ceramic SOIC		--	460	
Lead Temperature (soldering 10 seconds)		--	260	°C
ESD Tolerance [5]		--	3.0	kV

1. Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.
2. Limiting input pin current is only necessary for input voltages that exceed absolute maximum input voltage ratings.
3. Applies to both single-supply and split-supply operation. Continuous short circuit operation at elevated ambient temperature can result in exceeding the maximum allowed junction temperature of 150 oC. Output currents in excess of ±30 mA over long term may adversely affect reliability.
4. Do not short circuit output to V+, when V+ is greater than 13V or reliability will be adversely affected.
5. Human body model, 1.5k ohms in series with 100 pF. All pins rated per method 3015.6 of MIL-STD-883. This is a Class 2 device rating.

TABLE 2. RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage	V_{SS}	3.0	15.5	V

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TABLE 3. DC ELECTRICAL CHARACTERISTICS

(V+ = 5V, V- = 0V, R1 > 1M, $V_{CM} = V_O = V+/2$, UNLESS OTHERWISE SPECIFIED)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Input Offset Voltage	V_{IO}		-- --	0.75 1.35	mV
Input Bias Current	I_{IB}		-- --	25 100	pA
Input Offset Current	I_{IO}		-- --	25 100	pA
Common Mode Rejection Ratio	CMRR	$0V \le V_{CM} \le 15V$, V+ = 15V	65 62	-- --	dB
		$0V \le V_{CM} \le 5V$	65 62	-- --	
Positive Power Supply Rejection Ratio	+PSRR	$5V \le V+ \le 15V$, $V_O = 2.5V$	65 62	-- --	dB
Negative Power Supply Rejection Ratio	-PSRR	$-5V \le V- \le -15V$, $V_O = -2.5V$, V+ = 0V	65 62	-- --	dB
Input Common Mode Voltage Range	V_{CM}	5V ≥ VCM ≥ 15V, For CMRR ≥ 50 dB	(V+) + 0.25 V+	-0.25 0	V
Output Short Circuit Current	I_{SC}	Sourcing, $V_O = 0V$	16 12	-- --	mA
		Sinking, $V_O = 5V$	11 9	-- --	
		V+ = 15V, Sourcing, $V_O = 0V$	28 22	-- --	
		V+ = 15V, Sinking, $V_O = 12V$ [1]	30 24	-- --	
Supply Current	I_{CC}	All four amps	-- --	2.8 3.6	mA
		All four amps, V+ = 15V	-- --	3.0 4.0	
Output Swing	V_O	V+ = 5V, R1 = 2k Ohms to V+/2	4.8 4.7	0.18 0.24	V
		V+ = 5V, R1 = 600 Ohms to V+/2	4.5 4.24	0.50 0.65	
		V+ = 15V, R1 = 2k Ohms to V+/2	14.4 14.2	0.32 0.45	
		V+ = 15V, R1 = 600 Ohms to V+/2	13.4 13.0	1.00 1.30	

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TABLE 3. DC ELECTRICAL CHARACTERISTICS

(V+ = 5V, V- = 0V, R1 > 1M, $V_{CM} = V_O = V+/2$, UNLESS OTHERWISE SPECIFIED)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Large Signal Voltage Gain [2]	A_V	R1 = 2k Ohms Sourcing	140 84	-- --	V/mV
		R1 = 2k Ohms Sinking	35 20	-- --	
		R1 = 600 Ohms Sourcing	80 48	-- --	
		R1 = 600 Ohms Sinking	18 13	-- --	

1. Do not short circuit output to V+, when V+ is greater than 13V or reliability will be adversely affected.
2. V+ = 15V, V_{CM} = 7.5V and R1 connected to 7.5V. For sourcing tests, $7.5V \leq V_O \leq 11.5V$. For sinking tests, $3.5V \leq V_O \leq 7.5V$.

TABLE 4. AC PARAMETER

(V+ = 5V, V- = 0V, R1 > 1M, $V_{CM} = V_O = V+/2$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Slew Rate [1]	S_R		0.9 0.6	-- --	V/uS
Gain Bandwidth	G_{BW}	V+ = 15V, set up for non-inverting	1.25 1.15	-- --	MHz

1. V+ = 15V. Connected as Voltage Follower with 10V step input, 2.5V to 12.5V for +Slew, and 12.5V to 2.5V for -Slew. Number specified is the slower of either the positive or negative slew rates.

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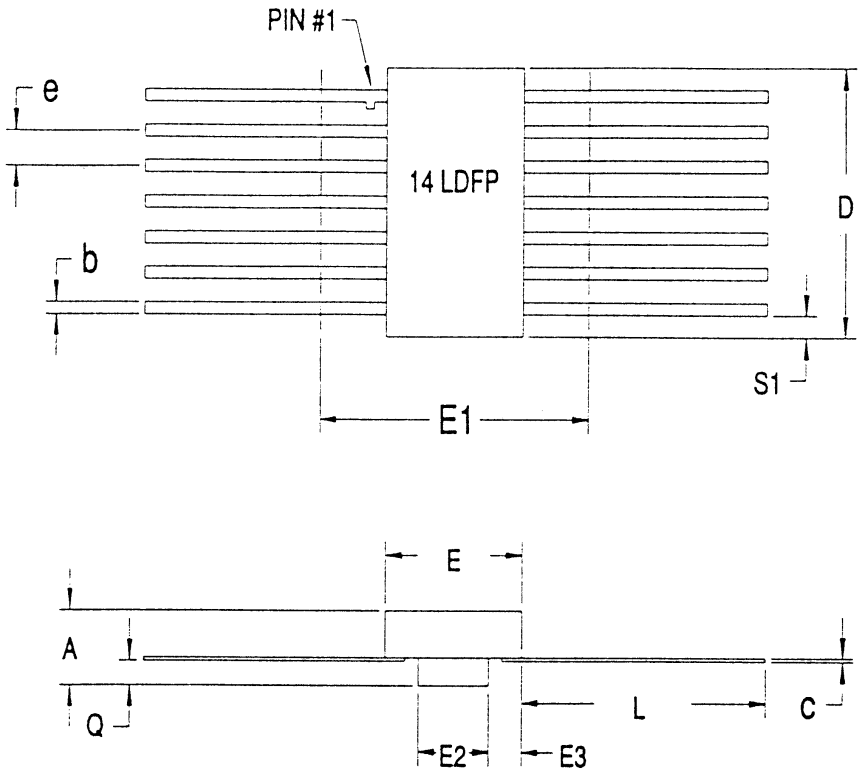

14 PIN FLAT PACKAGE

SYMBOL	DIMENSION		
	MIN	NOM	MAX
A	0.125	0.140	0.155
b	0.010	0.017	0.022
c	0.004	0.005	0.009
D	--	0.380	0.390
E	0.250	0.255	0.260
E1	--	--	0.290
E2	0.090	0.095	--
E3	0.030	0.060	--
e	0.050 BSC		
L	0.270	0.325	0.370
Q	0.026	0.030	0.045
S1	0.005	--	--
N	14		

Note: All dimensions in inches.

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