ANALOG DEVICES

Dual Precision JFET-Input Operational Amplifier

OP215

1.0 SCOPE

This specification documents the detailed requirements for Analog Devices space qualified die including die qualification as described for Class K in MIL-PRF-38534, Appendix C, Table C-II except as modified herein.

The manufacturing flow described in the STANDARD DIE PRODUCTS PROGRAM brochure at http://www.analog.com/marketSolutions/militaryAerospace/pdf/Die_Broc.pdf is to be considered a part of this specification.

This data sheet specifically details the space grade version of this product. A more detailed operational description and a complete data sheet for commercial product grades can be found at www.analog.com/OP215

2.0 Part Number

Part Number. The complete part number(s) of this specification follow:

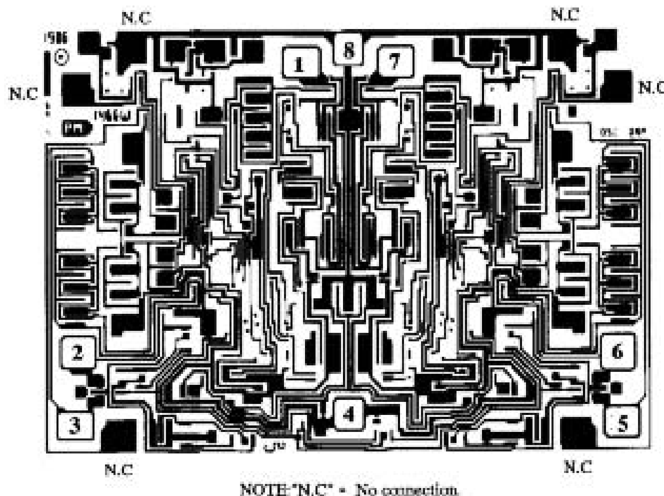
Part Number	Description
OP215-000C	Dual Precision JFET-Input Operational Amplifier
OP215R000C	Radiation Tested Dual Precision JFET-Input Operational Amplifier

3.0 Die Information

3.1 Die Dimensions

Die Size	Die Thickness	Bond Pad Metalization
75 mil x 110 mil	19 mil ± 2 mil	Al/Cu

3.2 Die Picture



1 OUTPUT A

2 -INPUT A

3 +INPUT A

4 $-V_S$

5 +INPUT B

6 -INPUT B

7 OUTPUT B

8 $+V_S$

ASD0012876 Rev. F

Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective companies.

One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.

Tel: 781.329.4700 www.analog.com

Fax: 781.326.8703

© 2009 Analog Devices, Inc. All rights reserved.

3.3 Absolute Maximum Ratings 1/

Supply Voltage (V_S) ....±22V
Differential Input Voltage ....±40V
Input Voltage (V_{IN}) 2/...±20V
Output Short-Circuit Duration...Indefinite
Storage Temperature Range ....-65°C to +150°C
Junction Temperature (T_J)..+150°C
Ambient Operating Temperature..-55°C to +125°C

Absolute Maximum Ratings Notes:

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

2/ Unless otherwise specified, the absolute maximum negative input voltage is equal to the negative power supply.

4.0 Die Qualification

In accordance with class-K version of MIL-PRF-38534, Appendix C, Table C-II, except as modified herein.

(a) Qual Sample Size and Qual Acceptance Criteria – 10/0

(b) Qual Sample Package – DIP

(c) Pre-screen electrical test over temperature performed post-assembly prior to die qualification.

Table I - Dice Electrical Characteristics

Parameter	Symbol	Conditions 1/	Limit Min	Limit Max	Units
Input Offset Voltage	V_{IO}	$R_S = 50\Omega$		±1	mV
Input Offset Current	I_{IO}			±50	pA
Input Bias Current	I_{IB}			±100	pA
Large Signal Voltage Gain	A_{VO}	$V_{OUT} = \pm10V$, $R_L \geq 2k\Omega$	150		V/mV
Output Voltage Swing	V_O	$R_L \geq 2k\Omega$	±11		V
Supply Current	I_S	$V_O = 0$ V		8.5	mA
Slew Rate	SR	$A_{VCL} = +1$, RL ≥ 2kΩ , $C_L = 100pF$	10		V/µs
Common-Mode Rejection Ratio	CMRR	$V_{CM} = IVR$	86		dB
Power Supply Rejection Ratio	PSRR	$V_S = \pm10V$ to $\pm16V$		51	µV/V
Input Voltage Range	IVR		±10.2		V

Table I Notes:

1/ $V_S = \pm15V$, $V_{CM} = 0$ V, and $T_A = +25°C$, unless otherwise specified.

Table II - Electrical Characteristics for Qual Samples							
Parameter	Symbol	Conditions 1/		Sub-groups	Limit Min	Limit Max	Units
Input Offset Voltage	V_{IO}	$R_S = 50\Omega$		1		±1	mV
				2,3		±2	
			M, D, L, R	1		±3	
Input Offset Current 2/	I_{IO}	T_J = +25°C, -55°C		1, 3		±50	pA
		T_J = +125°C		2		±8	nA
			M, D, L, R	1		±300	pA
Input Bias Current 2/	I_{IB}	T_J = +25°C, -55°C		1, 3		±100	pA
		T_J = +125°C		2		±10	nA
			M, D, L, R	1		±6	
Large Signal Voltage Gain	A_{VO}	$V_{OUT} = \pm10V$, $R_L \geq 2k\Omega$		4	150		V/mV
				5, 6	30		
			M, D, L, R	1	10		
Output Voltage Swing 3/	V_O	$R_L \geq 2k\Omega$		4	±11		V
		$R_L \geq 10k\Omega$		5, 6	±12		
Supply Current	I_S	V_O = 0 V		1		8.5	mA
			M, D, L, R	4		8.5	
Slew Rate 3/	SR	$A_{VCL} = +1$, $R_L \geq 2k\Omega$, C_L = 100pF		4	10		V/µs
Common-Mode Rejection Ratio 3/	CMRR	V_{CM} = IVR		1	86		dB
				2, 3	82		
Power Supply Rejection Ratio 3/	PSRR	$V_S = \pm10V$ to $\pm16V$		1		51	µV/V
				2, 3		100	
Input Voltage Range 3/	IVR			1, 2, 3	±10.2		V

Table II Notes:

. 1/ $V_S = \pm15V$ and $V_{CM} = 0V$, unless otherwise specified.

2/ T_A = -55°C for I_{IO} and I_{IB} tests, subgroup 3, is guaranteed by T_A = +25°C test.

3/ Not tested post irradiation.

Table III - Life Test Endpoint and Delta Parameter (Product is tested in accordance with Table II with the following exceptions)								
Parameter	Symbol	Sub-groups	Post Burn In Limit		Post Life Test Limit		Life Test Delta	Units
			Min	Max	Min	Max		
Input Offset Voltage	V_{IO}	1		±2		±3	±1	mV
		2, 3				±4		
Input Bias Current	I_{IB}	1, 3		±175		±250	±75	pA
		2				±10		nA
Input Offset Current	I_{IO}	1, 3		±87		±125		pA
		2				±8		nA

5.0 Life Test/Burn-In Information

5.1 HTRB is not applicable for this drawing.

5.2 Burn-in is per MIL-STD-883 Method 1015 test condition B or C.

5.3 Steady state life test is per MIL-STD-883 Method 1005.

Rev	Description of Change	Date
A	Initiate	06-NOV-01
B	Add radiation limits. Update web address. Exchange file name with PM108.	9-JAN-03
C	Update 1.0 Scope Description	20-Jul-2007
D	Update header/footer and add to 1.0 Scope description.	Mar. 3, 2008
E	Add Junction Temperature (T_J).....+150°C to 3.3 Absolute Max. Ratings	April 2, 2008
F	Updated Section 4.0c note to indicate pre-screen temp testing being performed	5-JUN-2009

© 2009 Analog Devices, Inc. All rights reserved. Trademarks and registered trademarks are the property of their respective companies.
Printed in the U.S.A. 6/09

ANALOG DEVICES

www.analog.com