

### 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 [http://www.analog.com/marketSolutions/militaryAerospace/pdf/Die\\_Broc.pdf](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/AD8041](http://www.analog.com/AD8041)

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

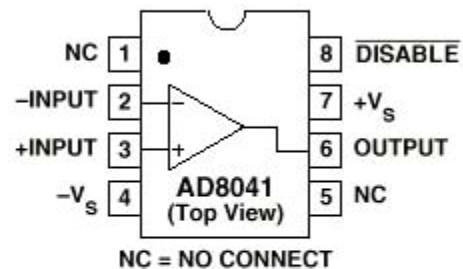
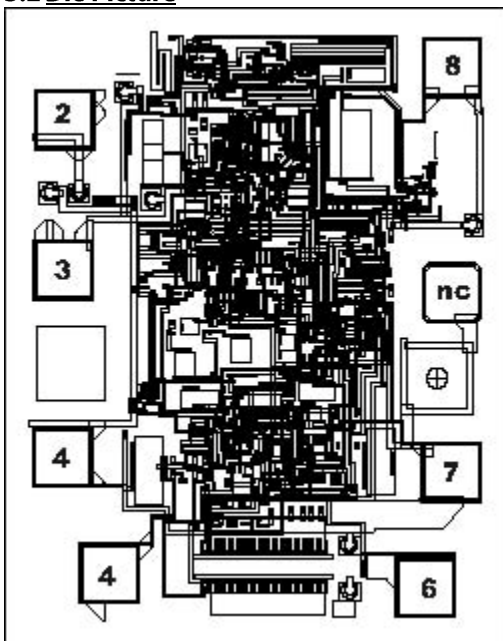
Part Number	Description
AD8041-000C	160MHz Rail-to-Rail Amplifier with Disable

### 3.0 Die Information

#### 3.1 Die Dimensions

Die Size	Die Thickness	Bond Pad Metalization
42 x 50 mil	19 mil $\pm$ 2 mil	Al/Cu

#### 3.2 Die Picture



ASD0012808

Rev. F

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### 3.3 Absolute Maximum Ratings <sup>1/</sup>

Supply Voltage ( $V_S$ ).....	+12.6V
Input Common Mode Range ( $V_{IN}$ ) .....	$\pm V_S$
Storage Temperature.....	-65°C to +125°C
Junction Temperature ( $T_J$ ).....	+175°C
Operating Ambient Temperature Range ( $T_A$ ) .....	-55°C to +125°C

Absolute Maximum Ratings Notes:

<sup>1/</sup> 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.

### 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 <sup>1/</sup>	Limit Min	Limit Max	Units
Input Offset Voltage	$V_{OS}$			9.5	mV
Input Bias Current	$I_{IB}$			3.4	$\mu A$
Input Offset Current	$I_{OS}$			0.7	$\mu A$
Input Voltage Range	IVR		$\pm 1$		V
Common Mode Rejection Ratio	CMRR	$V_{CM} = IVR$	65		dB
Power Supply Rejection Ratio	PSRR	$V_S = 0V; +5V, \pm 1V$	65		dB
Open Loop Gain	$A_{OL}$	$V_O = \pm 1V, R_L = 1k\Omega$	15		kV/V
Output Swing Voltage	$V_{OUT}$	$R_L = 2k\Omega$	$\pm 2$		V
Quiescent Supply Current	$I_S$			6.1	mA
		Disabled		1.7	

Table I Notes:

<sup>1/</sup>  $V_S = \pm 2.5V$ ,  $T_A = 25^\circ C$  unless otherwise specified.

Table II - Electrical Characteristics for Qual Samples

Parameter	Symbol	Conditions <u>1/</u>	Sub-groups	Limit Min	Limit Max	Units
Input Offset Voltage	$V_{OS}$		1, 2, 3		9.5	mV
Input Bias Current	$I_{IB}$		1, 2, 3		3.4	$\mu$ A
Input Offset Current	$I_{OS}$		1, 2, 3		0.7	$\mu$ A
Input Voltage Range	IVR		1, 2, 3	$\pm 1$		V
Common Mode Rejection Ratio	CMRR	$V_{CM} = IVR$	1, 2, 3	65		dB
Power Supply Rejection Ratio	PSRR	$V_S = 0V; +5V, \pm 1V$	1, 2, 3	65		dB
Open Loop Gain	$A_{OL}$	$R_L = 1k\Omega$	1, 2, 3	15		kV/V
Output Swing Voltage	$V_{OUT}$	$R_L = 2k\Omega$	1	$\pm 2$		V
Quiescent Supply Current	$I_S$		1, 2, 3		6.1	mA
		Disabled			1.7	

Table II Notes:

1/  $V_S = \pm 2.5V$ ,  $V_{CM} = 0V$ , unless otherwise specified.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	$V_{OS}$	1		$\pm 9$		$\pm 11$	$\pm 2$	$\mu$ V
		2,3				$\pm 12$		
Input Bias Current	$I_{IB}$	1		$\pm 2.6$		$\pm 3.2$	$\pm 0.6$	$\mu$ A
		2,3				$\pm 4.4$		

## 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.

# AD8041

<b>Rev</b>	<b>Description of Change</b>	<b>Date</b>
A	Initiate	7-Feb-02
B	Update 1.0 Scope Description	30 July 2007
C	Update header/footer and add to 1.0 Scope description	19-Feb-08
D	Add Junction Temperature ( $T_J$ )...175°C to 3.3 Absolute Max. Ratings	March 31, 2008
E	Updated Section 4.0c note to indicate pre-screen temp testing being performed.	6-JUN-2009
F	Update fonts and sizes to ADI standards	27-Sept-2011