

# KA103-56

Low Noise Amplifier  
2 – 18 GHz



## DESCRIPTION

The KA103-56 is a ultra-wideband GaAs Low Noise Amplifier (LNA) that operates from 2-18 GHz in a hermetic surface mount package. The KA103-56 provides a nominal gain of 15 dB with a typical noise figure of 3dB as well as a typical OP1dB of +15 dBm. Supplied in a hermetic surface mount package, this device can be manufactured and tested to the screening requirements of MIL-PRF-38534 Class H and K in addition to the required QCI which makes it highly suitable for high reliability and harsh environment applications.

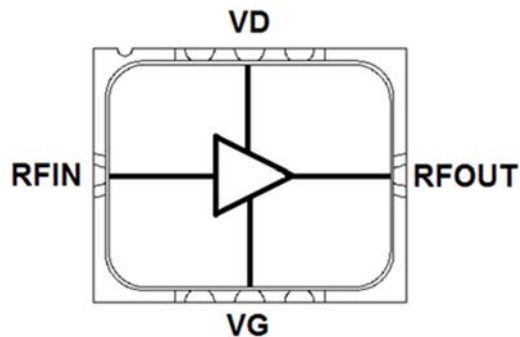


## FEATURES

- ✓ **Low Noise GaAs MMIC Design**
- ✓ **Broadband operation from 2–18 GHz**
- ✓ **Surface Mount Hermetic QFN-style Leadless Package**
- ✓ **NASA EEE-INST-002 compliant**
- ✓ **High Reliability Class H and K Screening Available**
- ✓ **See ordering information for MR HI - REL Ordering Details page 4**
- ✓ **Evaluation boards available upon request**

## APPLICATIONS

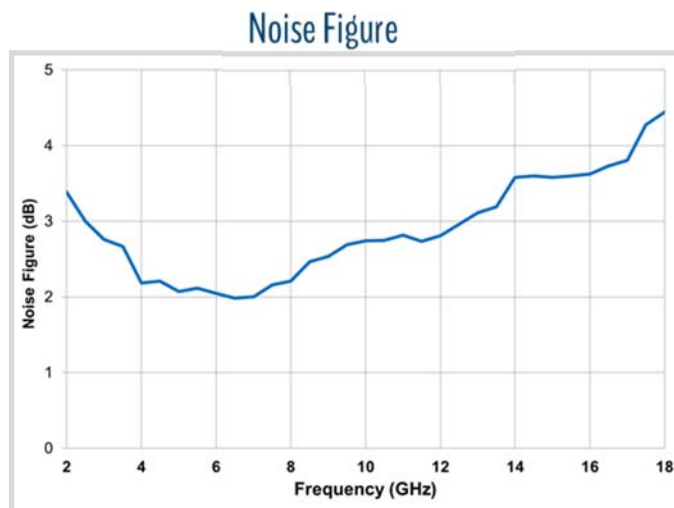
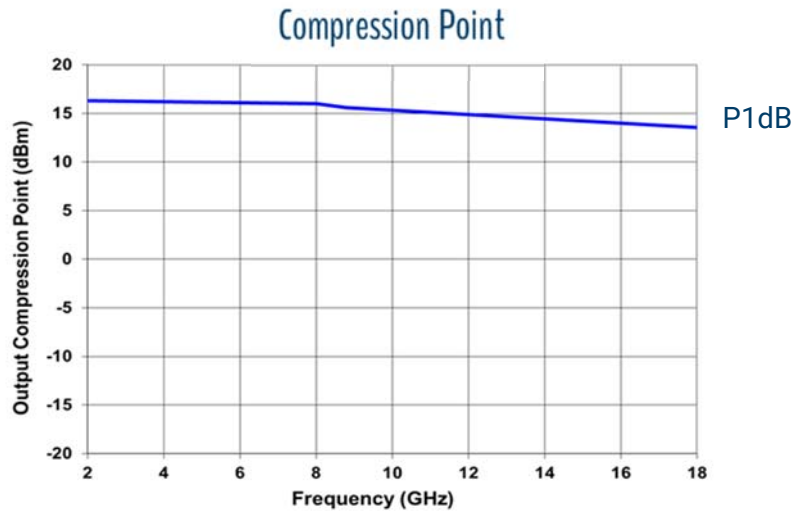
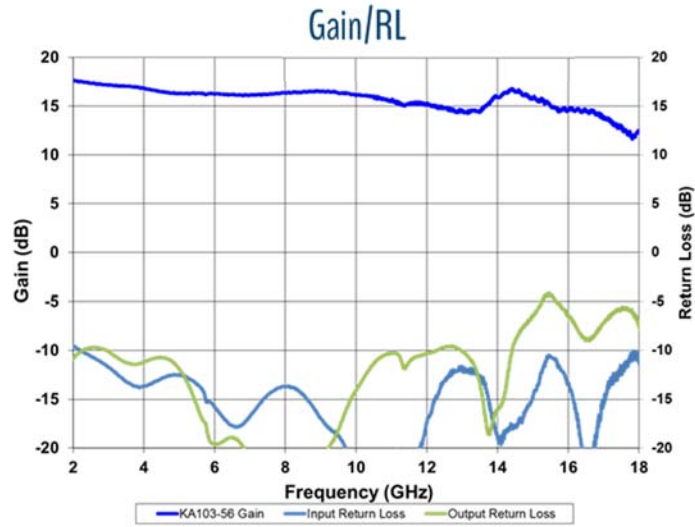
- ✓ **Aerospace and Defense**
- ✓ **Microwave Communications**
- ✓ **Wideband EW Systems**
- ✓ **Phased Array Radar Systems**
- ✓ **PA Driver Amplifier**
- ✓ **Test Equipment**



## ELECTRICAL CHARACTERISTICS (+25 C, VD = +5V, ID=85mA )

Parameter	Conditions	Min	Typical	Max	Units
Small Signal Gain	2 – 10 GHz 10 – 18 GHz	15 11	17 13		dB dB
Input Return Loss	2 – 10 GHz 10 – 18 GHz	9 7	13 12		dB dB
Output Return Loss	2 – 10 GHz 10 – 18 GHz	9 4	12 8		dB dB
Noise Figure	2 – 10 GHz 10 – 18 GHz		3 3.5	3.5 5	dB dB
Output 1dB Compression Point	2 – 10 GHz 10 – 18 GHz	14 12	15.5 14		dB dB
Quiescent Current	No RF applied		85		mA

TYPICAL PERFORMANCE ( $T_c=25^\circ\text{C}$ ,  $V_D=5\text{V}$ ,  $I_D=75\text{mA}$ )



## MAXIMUM RATING

Characteristic	Min Value	Max Value	Units
Supply Voltage ( $V_D$ )		5	Volts
Gate Voltage ( $V_G$ )	-1	0	Volts
Supply Current ( $I_D$ ) <sup>2</sup>		130	mA
Gate Current ( $I_G$ )		10	mA
Input CW Power		+21	dBm
Dissipated power ( $P_D$ )		0.5	W
Operating Channel Temperature ( $T_{CH}$ )		+200	°C
Storage Temperature	-65	+150	°C

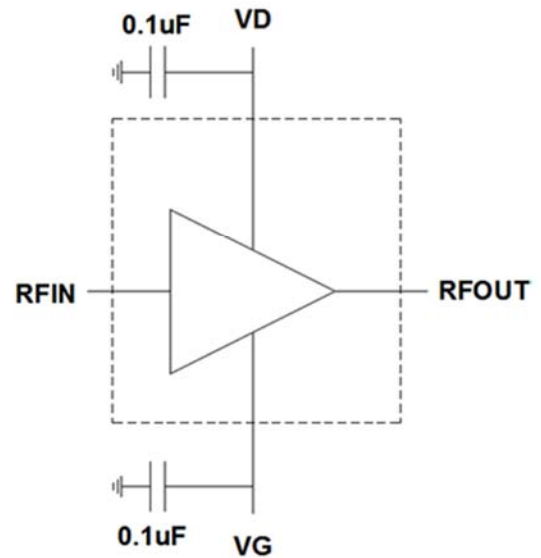
**Notes:**

1. These ratings represent the maximum operable values for this device.

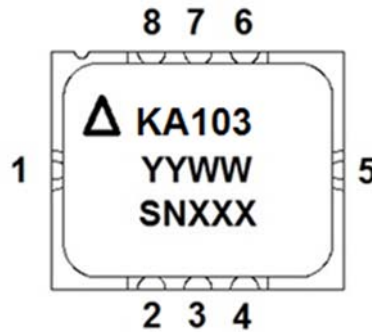
Operating the device outside of these parameters may damage or reduce life expectancy.

2. Thermal Resistance: 25°C/W typical.

## EVALUATION BOARD SCHEMATIC



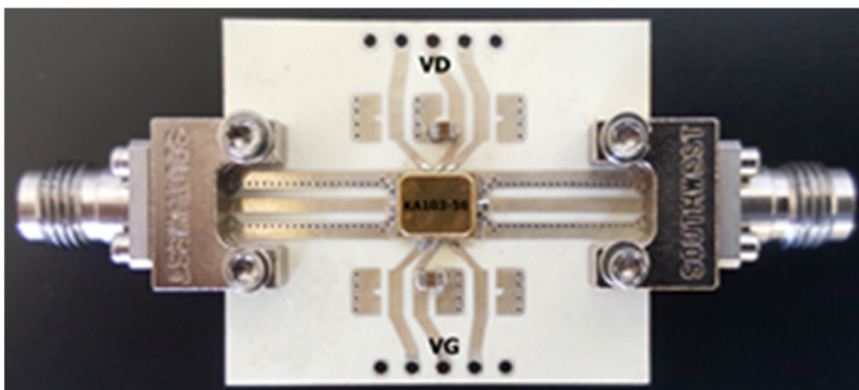
## PINOUT



1	RF IN
2	GND
3	$V_G$
4	GND
5	RF OUT
6	RF2/CTL3
7	$V_D$
8	CTL5

**Note:** Serial number not on KA103-56C

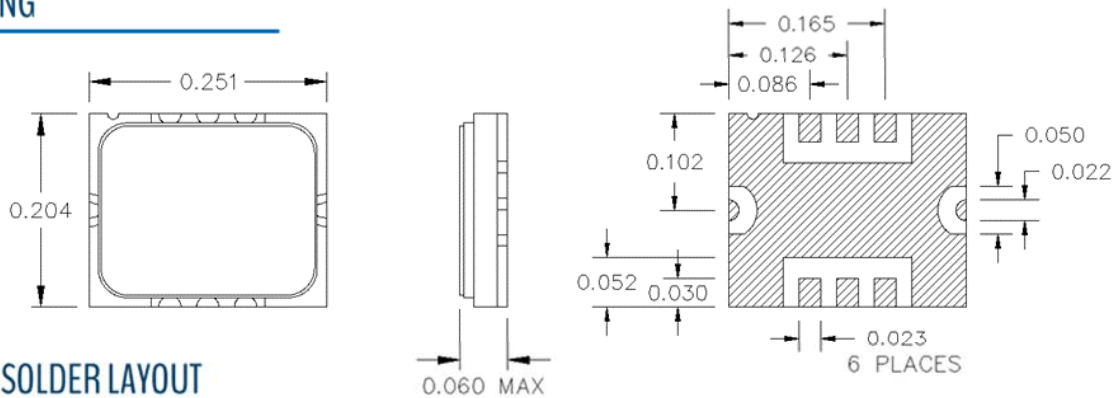
## EVALUATION BOARD



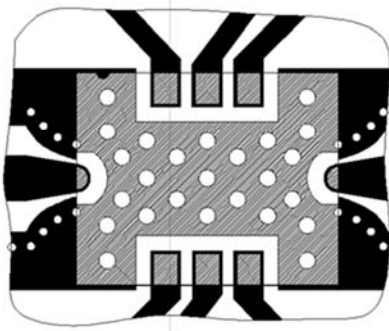
**Electrostatic Sensitive Device. Proper ESD precaution should be used when handling device.**

# KA103-56 | LOW NOISE AMPLIFIER 2 – 18 GHZ

## OUTLINE DRAWING



## RECOMMENDED SOLDER LAYOUT



### Notes:

1. Flooded ground plane in area outside device leads
2. Add ground vias under part and between corner leads

Contact KCB Solutions for further guidance on device placement and attachment

## SCREENING FLOW

Test Inspection	MIL – STD -883		Requirement	
	Method	Condition	Class H	Class K
Element Evaluation	MIL-PRF-38534	Table C-1	Per Table	Per Table
Non-Destructive Bond Pull	2023		Process under SPC	100%
Internal Visual	2010	A = Class H, B = Class K	100%	100%
Temperature Cycle	1010	C, 10 Cycles	100%	100%
Acceleration	2001	B (Y1 only)	100%	100%
PIND	2020	A (5 Cycles)	N/A	100%
Serialization	Per Product Specification		100%	100%
Radiographic	2012		N/A	100%
Electrical Test	Per Product Specification	+25°C	100%	100%
Burn In	1015	A	100%/160 Hrs/125°C	100%/320 Hrs/125°C
Final Electrical	Per Product Specification	+25°C	100%	100%
Group A Electrical	Per Product Specification	-55°C + 125°C	45/0	45/0
Seal: Fine Leak	1014	A	100%	100%
Gross Leak		C		
External Visual	2009		100%	100%

## ORDERING INFORMATION

	Unscreened	Class H	Class K
KCB Solutions Part Number	KA103-56C	KA103-56H	KA103-56K

