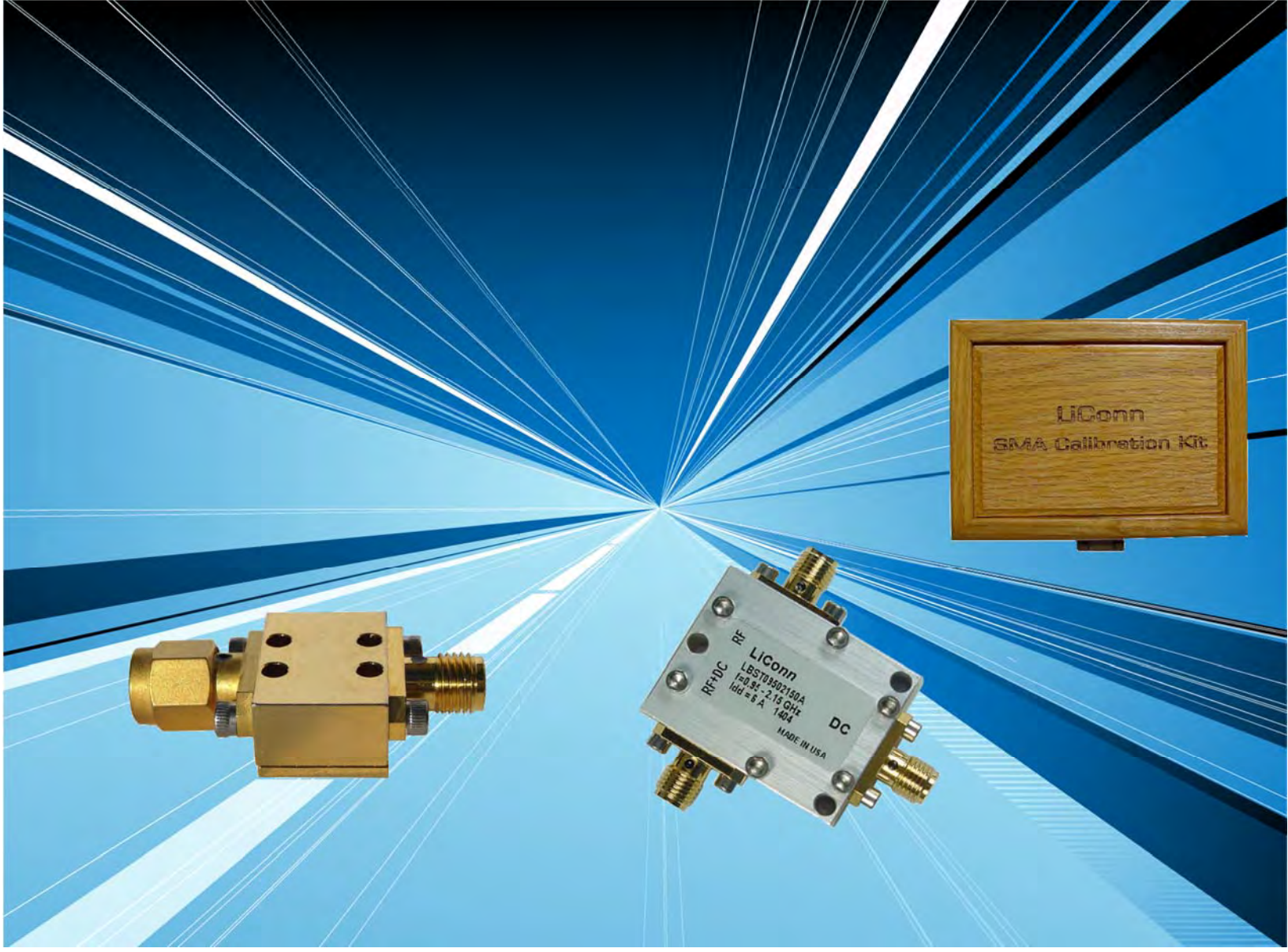


Attenuators

Bias-Ts

Calibration Kit for VNA

DC Blocks

Limiters

Low Noise Amplifiers

Modulators

Notch Filters

Power Amplifiers

Terminators

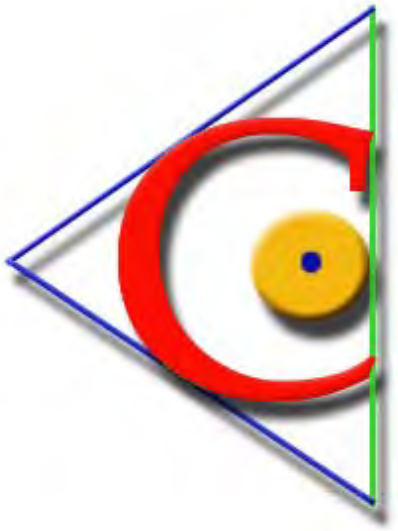
LiConn

Richardson Electronics

POWER & MICROWAVE TECHNOLOGIES

LiConn designs, develops, and manufactures high performance, high quality, and cost competitive RF/Microwave products. The products cover frequency bands from several KHz up to 27GHz of cellular, PCS, 3G, C, X, Ku band and millimeter wave applications.

We are dedicated to serve dynamic needs of telecommunication, fiber optics, medical and defense industries globally.



COMMITMENT

- OEM Grade Performance and Quality
- Small Quantity Always In Stock
- Very Competitive Price
- Total Customer Satisfaction

KEY ADVANTAGES

- Super Wide Band, Low Noise Figure and Exceptional VSWR
- Speedy Turnaround for both Standard and Custom Products
- Flexible Order Quantity: Low or High Volume

QUALITY

- Precision Machine Housing
- MIL-STD-202g
- RoHS Compliant
- 100% Tested
- Made in USA
- 3 Year Warranty

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Attenuators

Part Number	Frequency (GHz)	Attenuation (dB)	VSWR Input	VSWR Output	RF Input Power Max. (W)	RF Output Power Max. (W)
LATTN04A	DC ~ 4.0	8.3	1.10:1	1.25:1	20	10
LATTN06A	DC ~ 6.0	33	1.25:1	1.25:1	35	20

Bias-Ts

Part Number	Frequency (MHz)	Insertion Loss Max. (dB)	RF/DC Isolation (dB)	RF Average Power Max. (W)	VSWR Max.	V_{dd} Max. (V)	I_{dd} Max. (mA)
LBST009A	100~9000	0.6	40	50	1.22:1	50	170
LBST013A	200 ~ 12700	0.8	40	20	1.3:1	50	240
LBST020A	20 ~ 20000	1.0	40	20	1.5:1	16	250
LBST024A	20 ~ 24000	1.0	40	20	1.5:1	16	250
LBST00204000A	25 ~ 4000	1.5	40	20	1.5:1	32	5,000
LBST00250512A	25 ~ 512	0.6	40	200	1.35:1	50	20,000
LBST09502150A	950 ~ 2150	0.1	40	200	1.5:1	50	6,000

DC Blocks

Part Number	Frequency (MHz)	Insertion Loss (dB)	RF Power Dissipation Max.(W)	VSWR Max.	V_{dd} Max. (V)
LDCB020A	10 ~ 20000	1	10	1.5:1	16
LDCB024A	10 ~ 24000	1	10	1.5:1	16

(Actual Size)

Dimension: 1.0” x 1.3” X 0.4”
Material: Aluminum 6061
Finish: Clear Conductive Coating

Dimension: 1.0” x 0.9” X 0.4”
Material: Brass
Finish: Gold Plated

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Limiters

Part Number	Frequency (MHz)	Insertion Loss Max. (dB)	RF Input Power Max. (W)	P_{sat} Max. (dBm)	VSWR Max.	V_{dd} Max. (V)
LLDB009A	3 ~ 90	0.2	2	10	1.22:1	50
LLDB004A	100 ~ 3500	0.5	2	22	1.25:1	50

Modulator

Part Number	Frequency (GHz)	Rising Time (ns)	Falling Time (ns)	Insertion Loss (dB)	VSWR Input	VSWR Output	RF Input Power Max. (W)
LPM0535A	0.5 ~ 3.5	90	70	0.2	1.22:1	1.22:1	2

Notch Filter

Part Number	Frequency (MHz)	Lower Pass Band Frequency	Upper Pass Band Frequency	Notch Band Rejection	Pass Band Insertion	Power Handling (W)	V_{dd} (V)	I_{dd} (mA)
LBNF0912A	900 ~ 1200	DC ~ 300	2000 ~ 18000	-40	0.3	5	25	300

Terminators

Part Number	Frequency (MHz)	RF Power Average (W)	VSWR Max.
LR010A	DC ~ 6000	10	1.22:1
LR010C	DC ~ 15000	10	1.5:1
LR020A	DC ~ 6000	20	1.22:1
LR020C	DC ~ 15000	20	1.5:1

Dimension: 0.5” x 0.7” X 0.4”
Material: Brass
Finish: Gold Plated

(Actual Size)

Low Noise Amplifiers

Part Number	Frequency (MHz)	Gain (dB)	Gain Flatness (±dB)	NF (dB)	P_{1dB} (dBm)	IP_3 (dBm)	VSWR Input/Output	V_{dd} (V)	I_{dd} (mA)
LNA05004000A	500 ~ 4000	26	1.0	1.2	14	27	1.8:1/1.5:1	5	65
LNA06002500A	600 ~ 2500	30	1.5	1.0	14	26	1.4:1/1.4:1	5	50
LNA02004000A	200 ~ 4000	29	0.5	1.3	13	26	1.6:1/1.6:1	5	50
LNA09001300B	900 ~ 1300	18	0.5	0.6	15	30	1.5:1/1.5:1	5	50
LNA20002600A	2000 ~ 2600	26	0.75	0.7	12.5		1.4:1/1.4:1	5	55
LNA20006000B	2000 ~ 6000	25	1.5	1.0	12	22	1.8:1/1.5:1	5	40
LNA08001400A	800 ~ 1400	35	1.0	0.6	20	30	1.35:1/1.35:1	5	85
LNA08001400B	800 ~ 1400	35	1.0	0.6	20	30	1.35:1/1.35:1	12	85
LNA00203500A	20 ~ 3500	15	1.0	1.2	12	26	1.35:1/1.35:1	12	25
LNA12001600A	1200 ~ 1600	33	0.7	0.5	7	17	1.3:1/1.3:1	12	25
LNA50007000A	5000 ~ 7000	22	1.0	0.9	10	21	1.5:1/1.35:1	12	40
LNA800018000A	8000 ~ 18000	21	1.0	2.2	10		1.8:1/1.5:1	12	60
LNA01006000A	100 ~ 6000	14		1.1	15	27	1.25:1/1.5:1	5	30
LNA100012000A	1000 ~ 12000	13	2.0	3.1	17	27	1.35:1/1.25:1	5	65
LNA12009000A	1200 ~ 9000	24	3.0	3.0	17.5	29	1.43:1/1.7:1	5	110

Power Amplifiers

Part Number	Frequency (MHz)	Gain (dB)	Gain Flatness	NF (dB)	P_{1dB} (dBm)	IP_3 (dBm)	VSWR Max. Input/Output	V_{dd} (V)	I_{dd} (mA)
LPA00010150B	0.1 ~ 150	17	0.2	3.0	30	45	2.0:1/1.5:1	12	200
LPA00010150A	1 ~ 150	17	0.2	3.0	30	45	2.0:1/1.5:1	12	200
LPA00010600A	1 ~ 600	16	0.5	3.0	30	45	2.0:1/2.0:1	12	200
LPA00011500A	1 ~ 1500	14	0.5	5.0	29	45	2.2:1/2.2:1	12	200
LPA600018000A	6000 ~ 18000	12	1.0	4.5	19	28	2.2:1/2.0:1	12	110

Part Number	Frequency (MHz)	Gain (dB)	NF (dB)	P_{sat} (dBm)	VSWR Input/Output Max.	Reverse Isolation Min. (dB)	V_{dd} (V)	I_{dd} (mA)
LPA00206000A	20 ~ 6000	18	3.5	33	2.4:1/2.4:1	30	28	120

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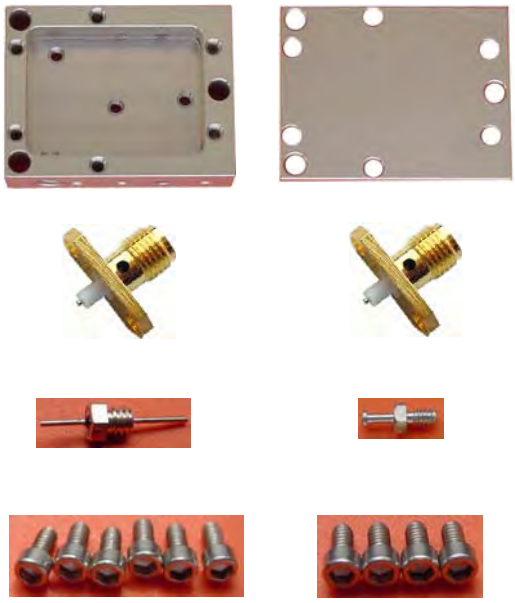
DESIGNER KIT - DK001

- Frequency: DC ~ 18GHz
- Precision Machine Housing
- RoHS Compliant



Dimension: 1.0” x 1.3” X 0.4”
Material: Aluminum 6061
Finish: Clear Conductive Coating
PCB Core Thickness Supported:
20~40mil

DESIGNER KIT - DK002

- Frequency: DC ~ 27GHz
- Precision Machine Housing
- RoHS Compliant

Dimension: 0.5” x 0.7” X 0.4”
Material: Brass
Finish: Gold Plated
PCB Core Thickness Supported:
20mil

Sub-Model	SMA Connector
DK002-1	SMA Female x 2
DK002-2	SMA Male x 2
DK002-3	SMA Female x 1 SMA Male x 1

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DC ~ 6.0 GHz SMA Precision Calibration Kit for Vector Network Analyzer (VNA)

High precision SMA calibration Kits LCAL06A (Female Connection), LCAL06B (Male Connection) and LCAL06C (Female and Male Connections) for the calibration of DC-6GHz Vector Network Analyzer (VNA).

The Calabrian kit can be used for:

- **Short-Open-Load-Thru (SOLT)**
- **Line-Reflect-Match (LRM)**
- **Full-Two-Port Calibration**

Dimension: 4.12" x 3.45" x 1.5"
Material: Oak

Dimension: 2.56" x 2.56" x 0.5"
Material: ESD Safe Plastic

Summary of the electrical specifications of a sample LCAL06A at 21°C:

Index	Testing Item	Symbol	Test Constraints	Min.	Nom.	Max.	Unit
1	Load Return Loss	$S_{11,L}$	DC-3.0GHz	40			dB
			3.0-6.0GHz	35			
2	Thru Return Loss	$S_{11,T}$	DC-3.0GHz	40			dB
			3.0-6.0GHz	35			
3	Thru Insertion Loss	$S_{21,T}$	DC-6.0GHz			0.05	dB
4	Thru Offset	T_{to}			55.7		pS
5	Load Offset	T_{Lo}			0		pS
6	Short Offset	T_{so}			55.7		pS
7	Open Offset	T_{oo}			55.7		pS
8	Open Capacitance	C_0			45		10^{-15}F
		C_1			6		10^{-27}F/Hz
		C_2			-2.5		10^{-36}F/Hz^2
		C_3			0		10^{-45}F/Hz^3

** Each Calibration Kit will be measured for its own parameters.*

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DC ~ 9.0 GHz SMA Precision Calibration Kit for Vector Network Analyzer (VNA)

High precision SMA calibration Kits LCAL09A (Female Connection) for the calibration of DC ~ 9 GHz Vector Network Analyzer (VNA). The Calabrian kit can be used for:

- **Short-Open-Load-Thru (SOLT)**
- **Line-Reflect-Match (LRM)**
- **Full-Two-Port Calibration**

Dimension: 4.12" x 3.45" x 1.5"
Material: Oak

Dimension: 2.56" x 2.56" x 0.5"
Material: ESD Safe Plastic

Summary of the electrical specifications of a sample LCAL09A at 21°C:

Index	Testing Item	Symbol	Test Constraints	Min.	Nom.	Max.	Unit
1	Load Return Loss	$S_{11, L}$	DC ~ 3.0 GHz	40			dB
			3.0 ~ 9.0 GHz	35			
2	Thru Return Loss	$S_{11, T}$	DC ~ 3.0 GHz	40			dB
			3.0 ~ 9.0 GHz	35			
3	Thru Insertion Loss	$S_{21, T}$	DC ~ 9.0 GHz			0.10	dB
4	Thru Offset	T_{to}			56.57		pS
5	Load Offset	T_{Lo}			0		pS
6	Short Offset	T_{so}			56.57		pS
7	Open Offset	T_{oo}			56.57		pS
8	Open Capacitance	C_0			45		10^{-15}F
		C_1			6		10^{-27}F/Hz
		C_2			-2.5		10^{-36}F/Hz^2
		C_3			0		10^{-45}F/Hz^3

** Each Calibration Kit will be measured for its own parameters.*

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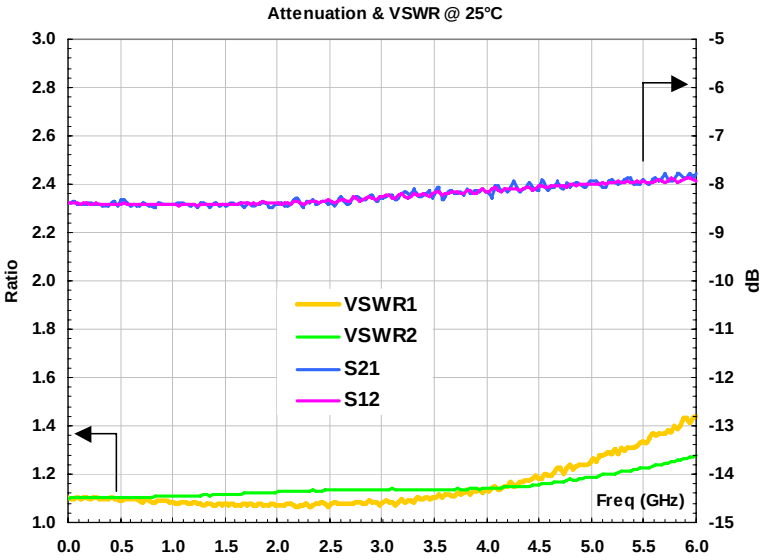
FEATURED PRODUCT — LATTN04A

Product Description: LATTN04A (DC ~ 4 GHz 20 Watt Precision Attenuator)

LiConn has developed wide band Attenuator with low cost. The attenuator offers maximum 8.5 dB attenuation and 1.20:1 maximum VSWR throughout DC to 4 GHz band.

The attenuator can be used in varieties of circuitries such as high power testing and power monitoring. The attenuator is designed to meet MIL-STD-202g.

Key Performance



- DC ~ 4 GHz
- 1.20:1 MAX VSWR
- Attenuation: 8.3 dB
- RF CW Input Power: 20 W
- SMA Connector I/O
- Miniature Size
- RoHS Compliance

Typical Performance (Tc=25°C)

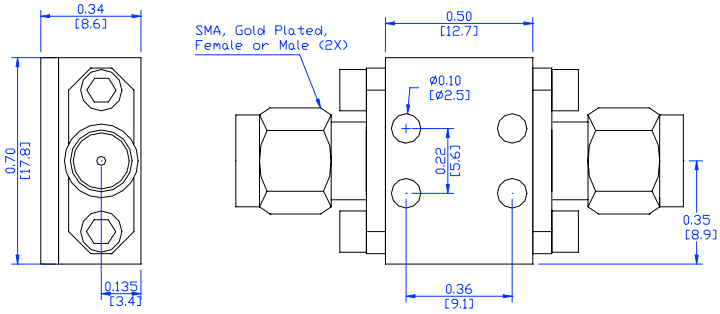
Parameters	Min	Typ.	Max.	Units
Frequency	DC		4	GHz
Attenuation	7.8	8.3	8.8	dB
VSWR - Input		1.10:1	1.20:1	Ratio
VSWR - Output			1.25:1	Ratio
RF CW Input Power			20	W
RF CW Output Power			10	W

Absolute Maximum Ratings

Parameters	Units	Ratings
RF Peak Power	W	500
Thermal Resistance, Junction to Case	°C/W	2.5
Storage Temperature	°C	-65 ~ 150
Operating Temperature	°C	-54 ~ +85

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: Inch[mm]
Base Material: Brass
Finish: Gold Plating

Application

- High Power Test
- Power Monitoring

Order Information

Model Number
LATTN04A

ADDITIONAL HEAT SINK REQUIRED AND AVAILABLE!

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FEATURES:

- **DC ~ 6.0 GHz;**
- **33.0 dB Attenuation;**
- **30 W CW Power Handling;**
- **+/- 1.0 dB Variation;**
- **1.25:1 VSWR;**
- **RoHS Compliant**

APPLICATIONS:

- **Cellular;**
- **GPS;**
- **PCS;**
- **3G;**
- **WiMAX;**
- **C-Band;**
- **Test & Measurement;**

LATTN06A: DC ~ 6.0 GHz 30W (CW), 33 dB ATTENUATOR

ELECTRICAL SPECIFICATIONS @ 25 ^{0}C

Item	Parameters/Conditions	Unit	Min	Nom	Max
Z_0	Impedance	Ohm		50	
F	Operating Frequency	GHz	DC		6
IL	**Attenuation**	**dB**	**32**	**33**	**34**
ΔIL	Attenuation Variation	dB			+/-1
$P_{IN,MAX}$	Input Maximum CW PWR	W		30	35
$P_{O,MAX}$	Output Maximum CW PWR	W		10	20
$VSWR_1$	VSWR – Input	Ratio		1.25:1	1.5:1
$VSWR_2$	VSWR – Output	Ratio		1.25:1	1.5:1

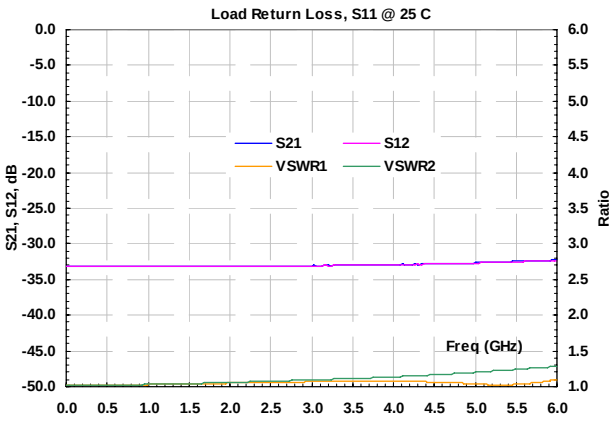
ABSOLUTE MAXIMUM RATINGS*

Parameters/Conditions	Unit	Max
Input Maximum CW PWR	W	35
Output Maximum CW PWR	W	20
Maximum Operating Temp	^{o}C	70
Thermal Resistance, Junction to Case	^{o}C/W	2.5

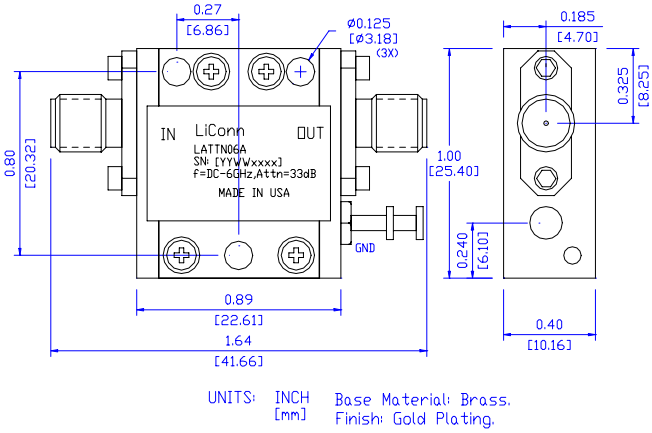
**Operation beyond any one of these parameters may cause permanent damage*

Additional Heat Sink Required!

ELECTRICAL PERFORMANCE



MECHANICAL OUTLINE



ORDERING INFORMATION

Model Number	Input	Output
LATTN06A-1	**SMA Male**	**SMA Female**
LATTN06A-2	**SMA Female**	**SMA Male**
LATTN06A-3	**SMA Male**	**SMA Male**
LATTN06A-4	**SMA Female**	**SMA Female**

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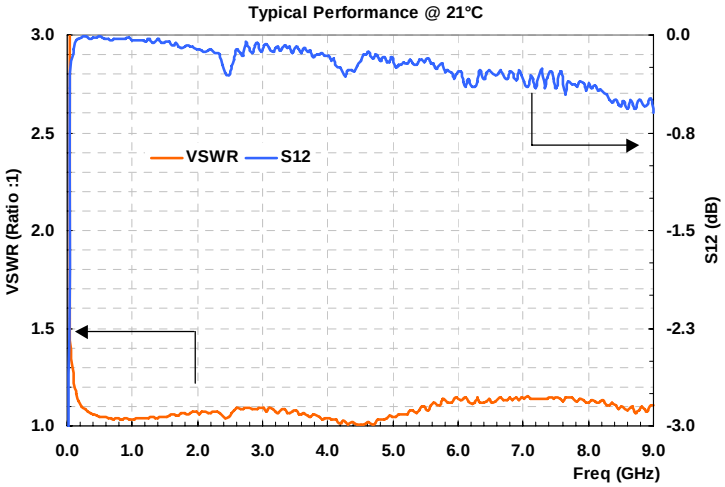
FEATURED PRODUCT — LBST009A

Product Description: LBST009A (100.0 MHz ~ 9.0 GHz Bias-T)

LiConn has developed super wide band Bias-T with low cost. The bias-T offers maximum 0.6 dB insertion loss and maximum 1.22:1 VSWR throughout 100MHz to 9GHz band.

The Bias-T can be used in varieties of circuitries such as wide band amplifiers, broadcast, and measurement. The bias-T is designed to meet MIL-STD-202g.

Key Performance



- 100 MHz ~ 9 GHz
- Max 1.22:1 VSWR
- Max 0.6 dB Insertion Loss
- 50 Volts DC Voltage Rating
- 40 dB RF/DC Isolation
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

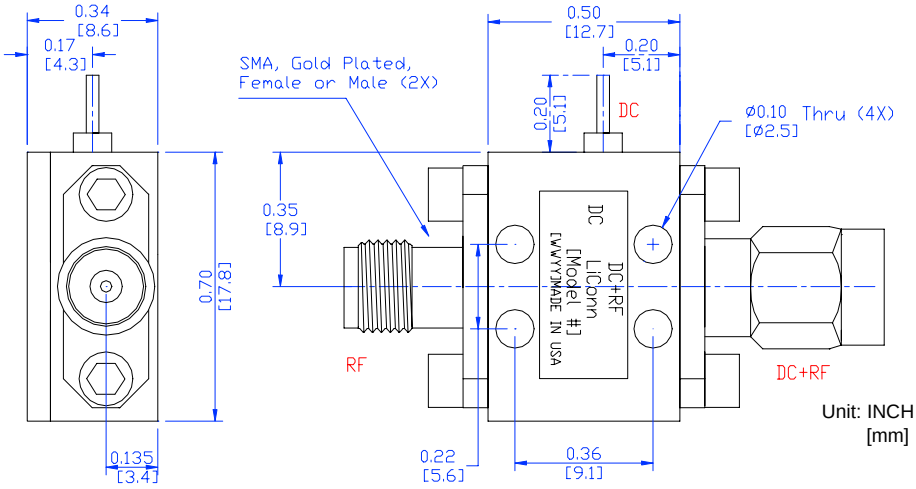
Model Number	RF+DC Port	RF Port
LBST009A-1	SMA Male	SMA Female
LBST009A-2	SMA Female	SMA Male
LBST009A-3	SMA Male	SMA Male
LBST009A-4	SMA Female	SMA Female

Absolute Maximum Ratings

Parameters	Units	Ratings
RF Average Power	W	50
Maximum DC Voltage Rating	V	50
Maximum DC Current	mA	170
RF/DC Isolation	dB	40
Operating Temperature	°C	-54 ~ +85
Storage Temperature	°C	-65 ~ 150

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: INCH Base Material: Brass
[mm] Finish: Gold Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

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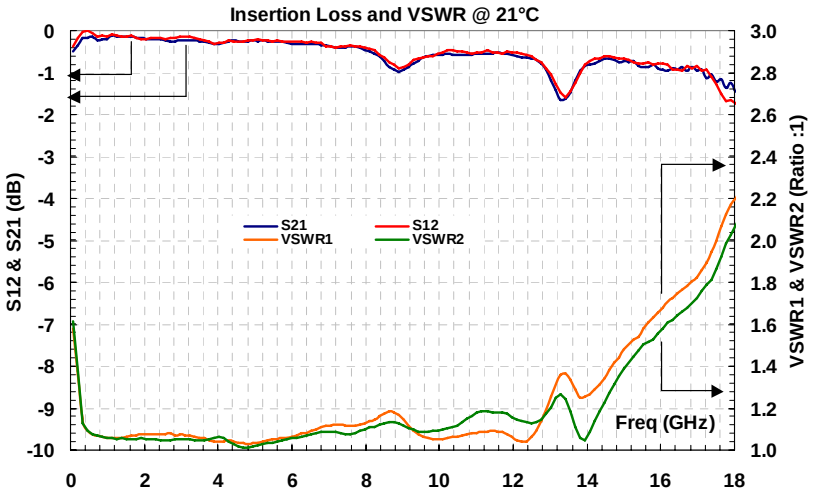
FEATURED PRODUCT — LBST013A

Product Description: LBST013A (200.0 MHz ~ 12.7 GHz Bias-T)

LiConn has developed super wide band Bias-T with low cost. The bias-T offers 0.50 dB typical insertion loss and 1.2:1 typical VSWR throughout 200 MHz to 12.7 GHz band.

The Bias-T can be used in varieties of circuitries such as wide band amplifiers, broadcast, and measurement. The bias-T is designed to meet MIL-STD-202g.

Key Performance



- 200 MHz ~ 12.7 GHz
- 1.2:1 Typical VSWR
- 1.3:1 Max. VSWR
- 0.5 dB Typical Insertion Loss
- 0.8 dB Max. Insertion Loss
- 40 dB RF/DC Isolation
- 50 Volts DC voltage Rating
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

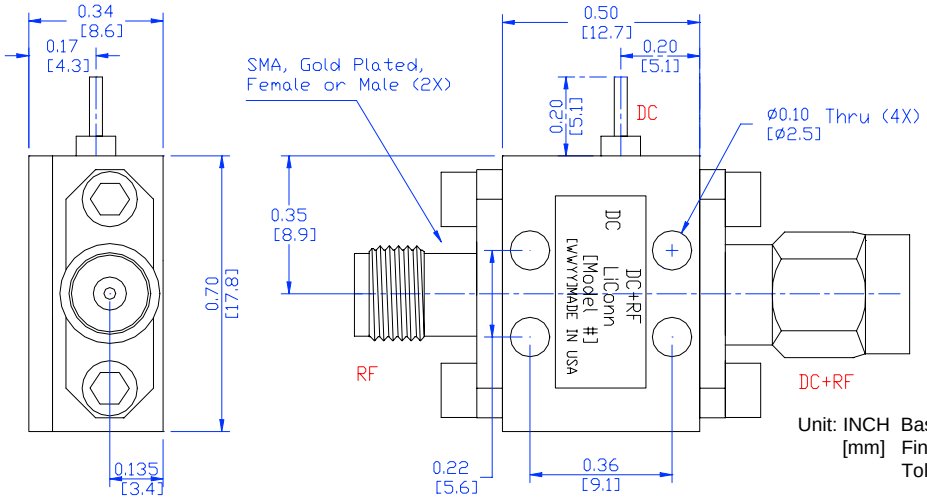
Model Number	RF+DC Port	RF Port
LBST013A-1	SMA Male	SMA Female
LBST013A-2	SMA Female	SMA Male
LBST013A-3	SMA Male	SMA Male
LBST013A-4	SMA Female	SMA Female

Absolute Maximum Ratings

Parameters	Units	Ratings
RF Average Power	W	20
Maximum DC Voltage Rating	V	50
Maximum DC Current	mA	240
Operating Temperature	°C	-54 ~ +85
Storage Temperature	°C	-65 ~ 150

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: INCH Base Material: Brass
[mm] Finish: Gold Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

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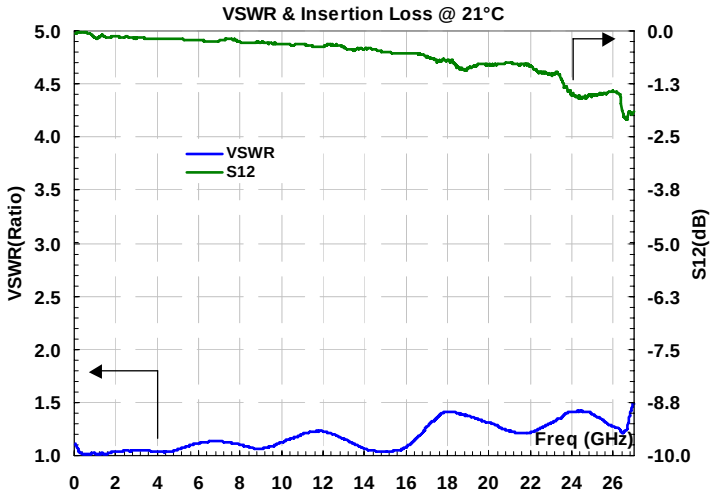
FEATURED PRODUCT — LBST020A

Product Description: LBST020A (20.0 MHz ~ 20.0 GHz Bias-T)

LiConn has developed super wide band Bias-T with low cost. The bias-T offers maximum 1.0 dB insertion loss and maximum 1.5:1 VSWR throughout 20MHz to 20GHz band.

The Bias-T can be used in varieties of circuitries such as wide band amplifiers, broadcast, and measurement. The bias-T is designed to meet MIL-STD-202g.

Key Performance



- 20.0 MHz ~ 20.0 GHz
- <1.5:1 VSWR
- < 1.0 dB Insertion Loss
- 40 dB RF/DC Isolation
- 16 Volts DC Voltage Rating
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

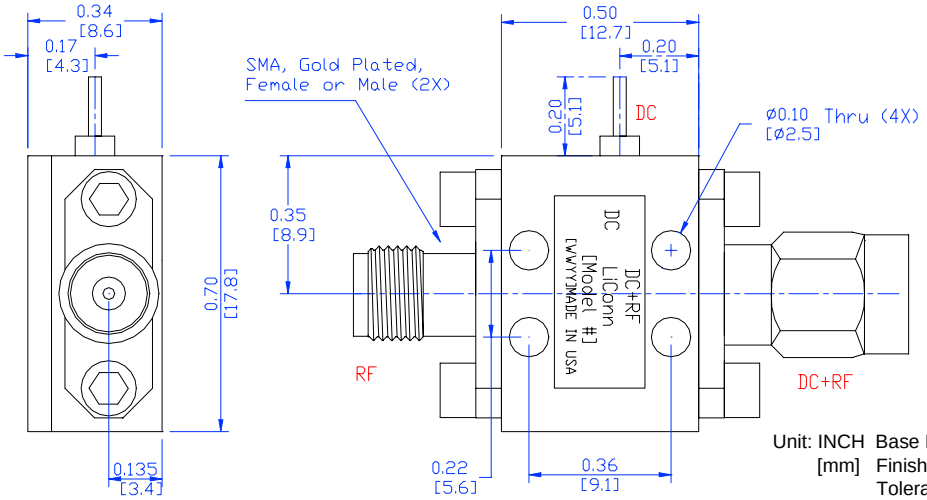
Model Number	RF+DC Port	RF Port
LBST020A-1	SMA Male	SMA Female
LBST020A-2	SMA Female	SMA Male
LBST020A-3	SMA Male	SMA Male
LBST020A-4	SMA Female	SMA Female

Absolute Maximum Ratings

Parameters	Units	Ratings
RF Average Power	W	20
Maximum DC Voltage Rating	V	16
Maximum DC Current	mA	250
Operating Temperature	°C	-54 ~ +85
Storage Temperature	°C	-65 ~ +150

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: INCH Base Material: Brass
[mm] Finish: Gold Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

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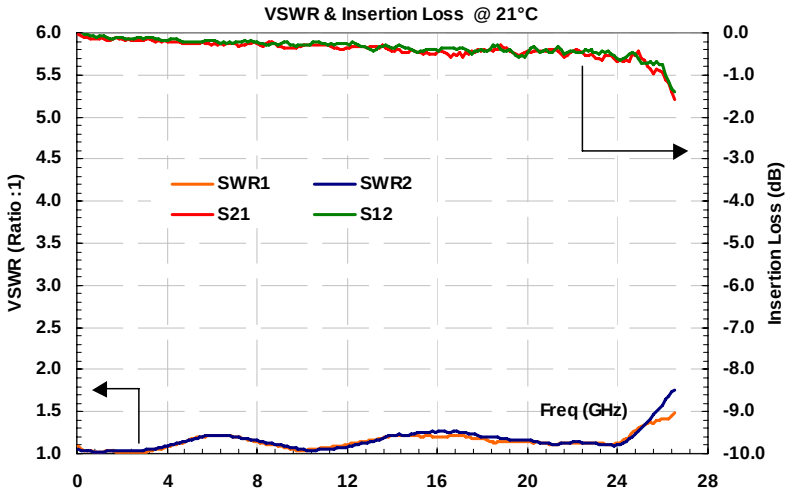
FEATURED PRODUCT — LBST024A

Product Description: LBST024A (20.0 MHz ~ 24.0 GHz Bias-T)

LiConn has developed super wide band Bias-T with low cost. The bias-T offers maximum 1.0 dB insertion loss and maximum 1.5:1 VSWR throughout 20MHz to 24GHz band.

The Bias-T can be used in varieties of circuitries such as wide band amplifiers, broadcast, and measurement. The bias-T is designed to meet MIL-STD-202g.

Key Performance



- 20.0 MHz ~ 24.0 GHz
- <1.5:1 VSWR
- < 1.0 dB Insertion Loss
- 40 dB RF/DC Isolation
- 16 Volts DC Voltage Rating
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

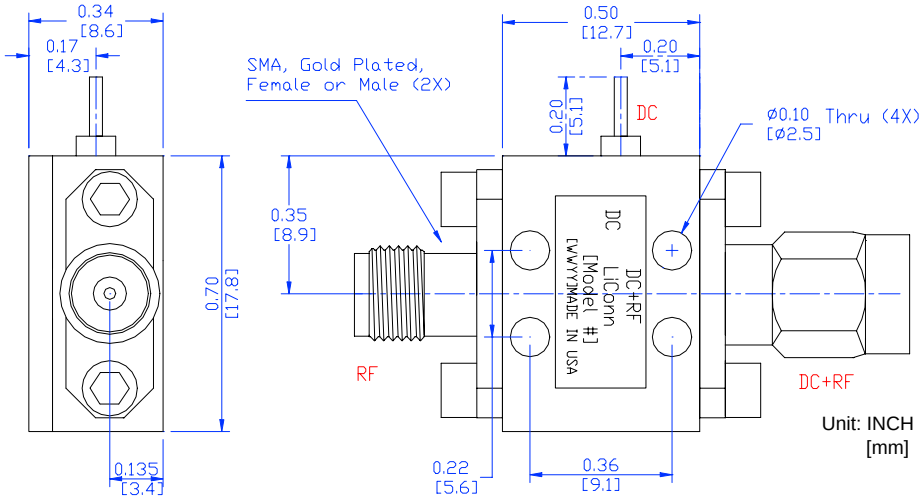
Model Number	RF+DC Port	RF Port
LBST024A-1	SMA Male	SMA Female
LBST024A-2	SMA Female	SMA Male
LBST024A-3	SMA Male	SMA Male
LBST024A-4	SMA Female	SMA Female

Absolute Maximum Ratings

Parameters	Units	Ratings
RF Average Power	W	20
Maximum DC Voltage Rating	V	16
Maximum DC Current	mA	250
Operating Temperature	°C	-54 ~ +85
Storage Temperature	°C	-65 ~ 150

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: INCH Base Material: Brass
[mm] Finish: Gold Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

LiConn, Inc.

Tel: 1-651-482-1848
Fax: 1-651-482-1573
sales@liconn.com

FEATURES:

- 25 MHz ~ 4.0 GHz;
- 0.6 dB Insertion Loss;
- 5.0 Amp DC Current;
- 20 Watts RF CW Power;
- 32 Volt DC Rating;
- RoHS Compliant.

APPLICATIONS:

- SW;
- VHF, UHF;
- Cellular;
- PCS, 3G;
- L, S, & C Band.

LBST00204000A, 25 MHz ~ 4.0 GHz WIDE BAND 5.0 AMP BIAS-T

ELECTRICAL SPECIFICATIONS @ 21 °C

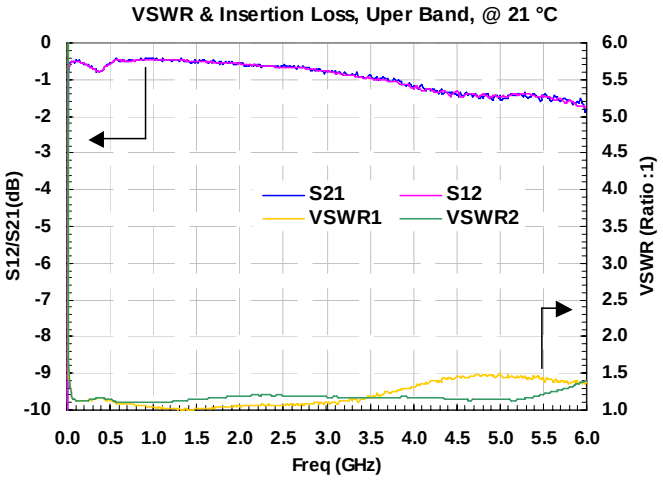
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
f	Passband	MHz	25		4000
IL	Insertion Loss	dB		0.60	1.5
I_{dc}	DC Current Handling	A			5.0
V_{dc}	DC Voltage Handling	V			32
P_o	RF CW Power Handling	W			20
$VSWR_{ij}$	Input/Output VSWR	Ratio		1.35:1	1.5:1
Z_0	Impedance	Ohm		50	

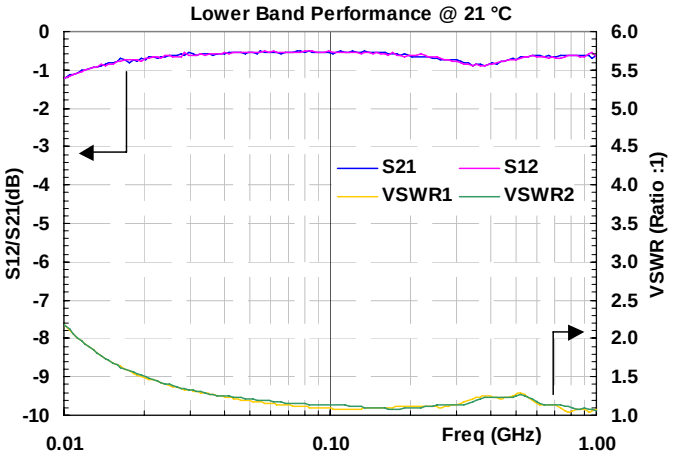
ABSOLUTE MAXIMUM RATINGS[1]

Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
DC Supply Voltage	V	32
DC Current	A	5.0
RF CW Power	W	20
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-65 ~ +125

[1] Operation beyond these limits may cause permanent damage.

ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE

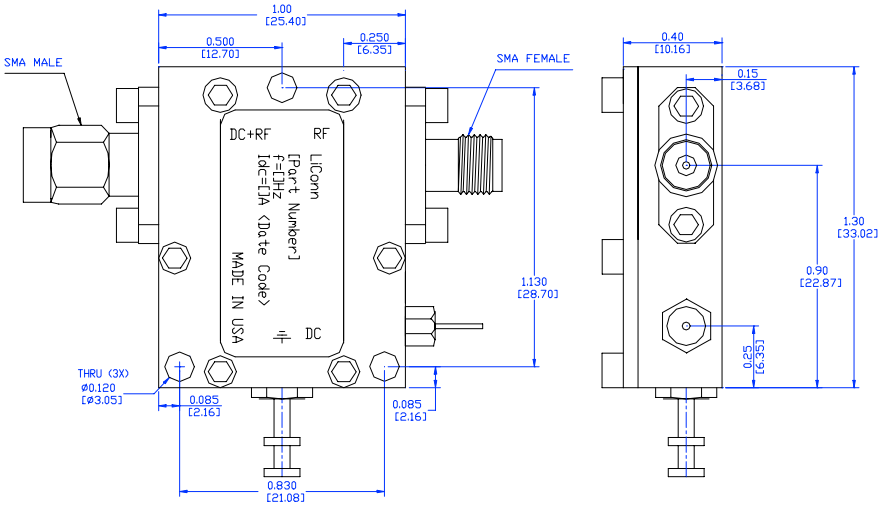




Heat Sink Required For CW High Power Application!

ORDERING INFORMATION:

LBST00204000A



Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Platin
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

Tel: 1-651-482-1848
Fax: 1-651-482-1573

sales@liconn.com
http://www.liconn.com

FEATURES:

- 25 MHz ~ 512 MHz;
- 0.6 dB Insertion Loss;
- 20 Amp DC Current;
- 200 Watts RF CW Power;
- 50 Volt DC Rating;
- RoHS Compliant.

APPLICATIONS:

- SW;
- VHF, UHF.

ORDERING INFORMATION:

Model Number	RF	RF+DC
LBST00250512A-1	N Female	N Female
LBST00250512A-2	N Female	N Male
LBST00250512A-3	N Male	N Female
LBST00250512A-4	N Male	N Male

LBST00250512A, 25 MHz ~ 512 MHz WIDE BAND 20 AMP BIAS-T

ELECTRICAL SPECIFICATIONS @ 21 °C

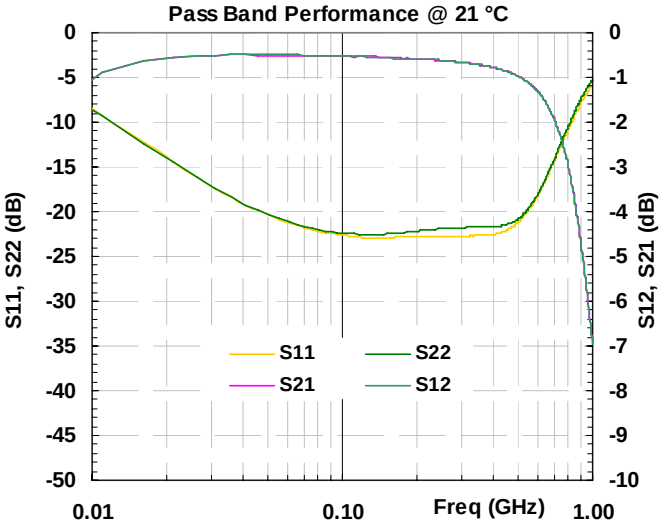
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
f	Passband	MHz	25		512
IL	Insertion Loss	dB		0.6	1.0
I_{dc}	DC Current Handling	A			20
V_{dc}	DC Voltage Handling	V			50
P_o	CW RF Power Handling	W			200
$VSWR_{ij}$	Input/Output VSWR	Ratio		1.35:1	1.5:1
Z_0	Impedance	Ohm		50	

ABSOLUTE MAXIMUM RATINGS[1]

Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Power	W	200
DC Current	A	20
DC Supply Voltage	V	50
Operating Temperature	°C	-40 ~ +70
Storage Temperature	°C	-65 ~ + 85

[1] Operation beyond these limits may cause permanent damage.

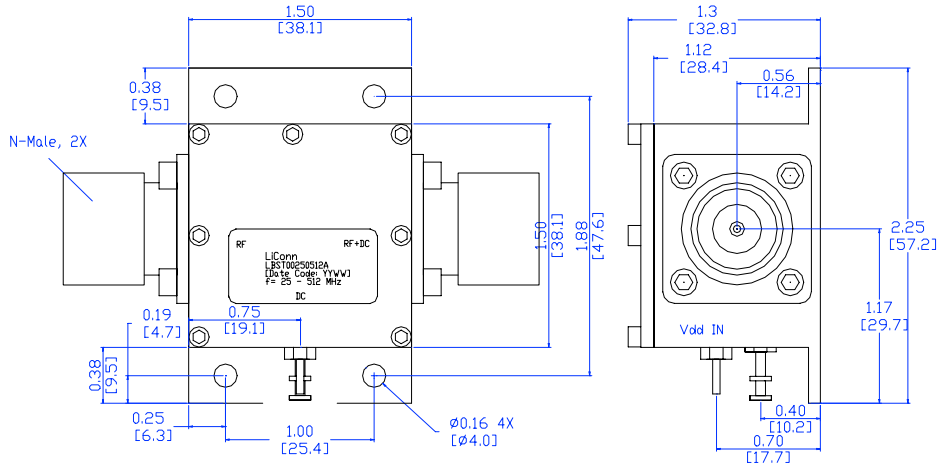
ELECTRICAL PERFORMANCE



Heat sink is required for CW high power application!

MECHANICAL OUTLINE

Unit: INCH [mm]
Base Material: Aluminium Alloy 6061
Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"



Tel: 1-651-482-1848
Fax: 1-651-482-1573

Rev 1.6

sales@liconn.com
http://www.liconn.com

FEATURES:

- **950 MHz ~ 2150 MHz;**
- **0.2 dB Insertion Loss;**
- **6.0 Amp DC Current;**
- **200 Watts CW RF Power;**
- **50 Volt DC Rating;**
- **RoHS Compliant.**

APPLICATIONS:

- **Cellular;**
- **GPS;**
- **PCS, 3G.**

LBST09502150A, 950 MHz ~ 2150 MHz WIDE BAND 6.0 AMP BIAS-T

ELECTRICAL SPECIFICATIONS @ 21 °C

Symbol	Parameters/Conditions	Unit	Min	Typical	Max
f	Passband	MHz	950		2150
IL	Insertion Loss: DC to 10MHz, Ports: 'DC' to 'DC+RF'	dB		0.1	0.3
VSWR	Return VSWR: DC to 10MHz, Ports: 'DC' to 'DC+RF'	Ratio			1.5:1
IL	Insertion Loss: 950 - 2150MHz, Ports: 'RF+DC' to 'RF'	dB		0.1	0.3
VSWR	Return VSWR: 950 - 2150MHz, Ports: 'RF+DC' to 'RF'	Ratio		1.22:1	1.5:1
I_{dc}	DC Current Handling	A			6.0
V_{dc}	DC Voltage Handling	V			50
P_o	RF CW Power Handling	W			200
S_{12}	Reverse Isolation: 950 - 2150MHz, Ports: 'RF+DC' to 'DC', 'RF' to 'DC'	dB	40		
Z_0	Impedance	Ohm		50	

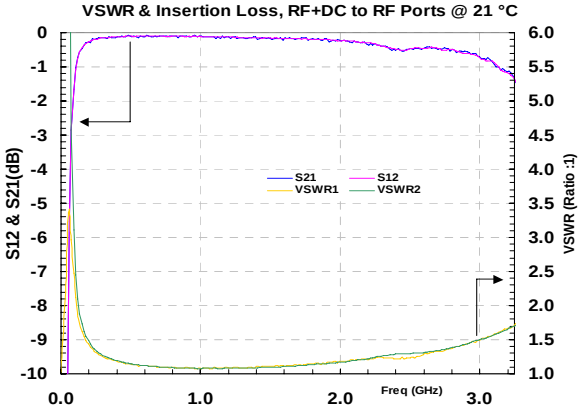
ABSOLUTE MAXIMUM RATINGS[1]

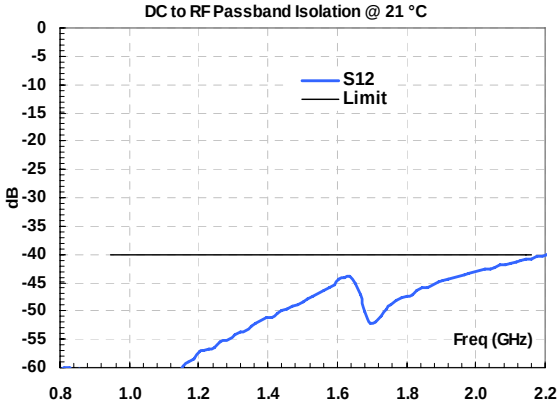
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Power	W	200
DC Supply Voltage	V	50
DC Current	A	6.0
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-65 ~ +125

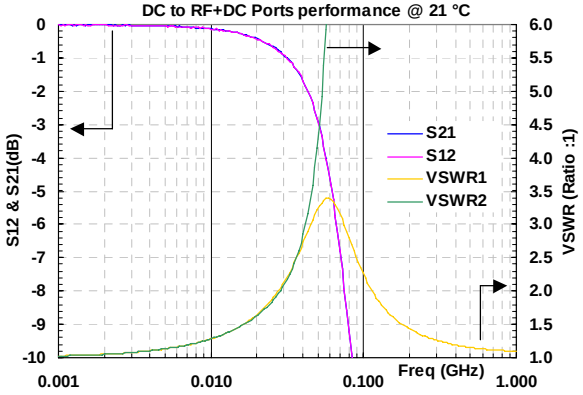
[1] Operation beyond these limits may cause permanent damage.

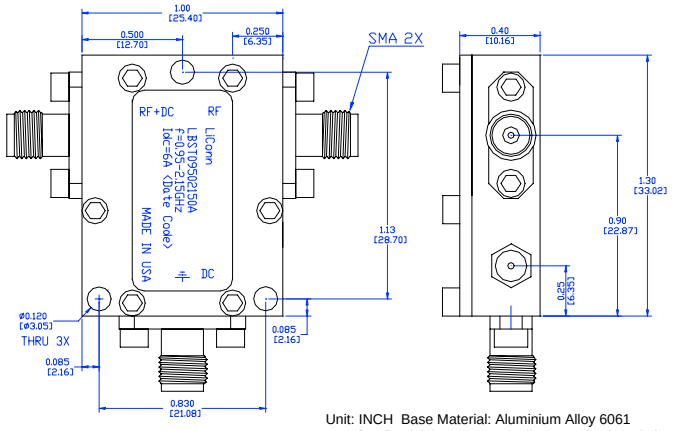
Heat Sink Required For CW High Power Application!

ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE









Unit: INCH [mm] Base Material: Aluminium Alloy 6061
Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LBST09502150A

Tel: 1-651-482-1848
Fax: 1-651-482-1573

Rev 2.2

sales@liconn.com
http://www.liconn.com

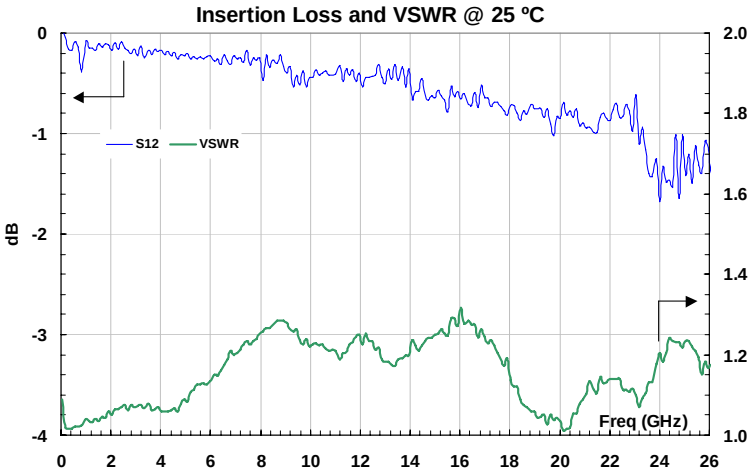
FEATURED PRODUCT — LDCB020A

Product Description: LDCB020A (10.0 MHz – 20.0 GHz DC Block)

LiConn has developed super wide band DC block with low cost. The block offers maximum 1.0 dB insertion loss and maximum 1.5:1 VSWR throughout 10 MHz to 20 GHz band.

The block can be used in varieties of circuitries such as wide band high power amplifiers, broadcast, and measurement. The block is designed to meet MIL-STD-202g.

Key Performance



- 10 MHz ~ 20.0 GHz
- 1.5:1 Max. VSWR
- 1.0 dB Max. Insertion Loss
- 16 Volts DC voltage Rating
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

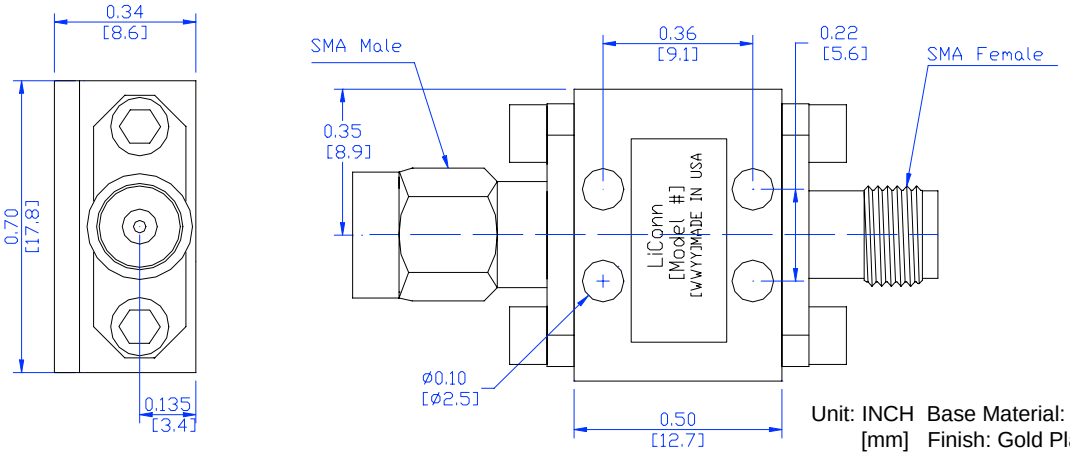
Model Number	LDCB020A

Absolute Maximum Ratings

Parameters	Units	Ratings
Maximum RF Power Dissipation	W	10
Maximum DC Voltage Rating	V	16
Storage Temperature	°C	-65 ~ 150
Operating Temperature	°C	-54 ~ +85

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: INCH Base Material: Brass
[mm] Finish: Gold Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

LiConn, Inc.
Tel: 1-651-482-1848
Fax: 1-651-482-1573
sales@liconn.com

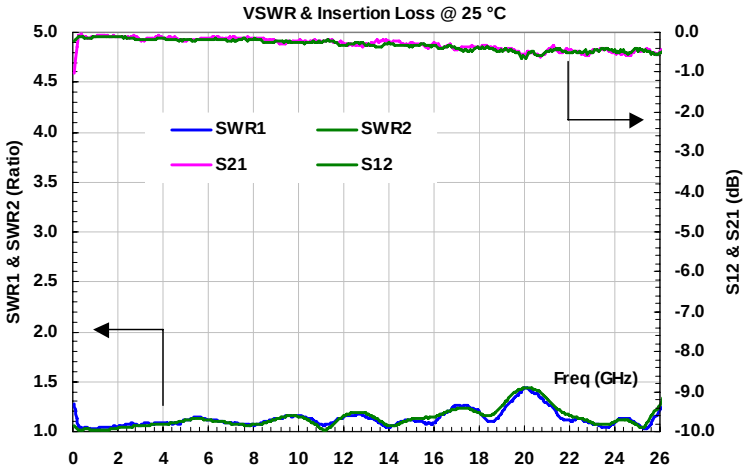
FEATURED PRODUCT — LDCB024A

Product Description: LDCB024A (10.0 MHz – 24.0 GHz DC Block)

LiConn has developed super wide band DC block with low cost. The block offers maximum 1.0 dB insertion loss and maximum 1.5:1 VSWR throughout 10 MHz to 24 GHz band.

The block can be used in varieties of circuitries such as wide band high power amplifiers, broadcast, and measurement. The block is designed to meet MIL-STD-202g.

Key Performance



- 10 MHz ~ 24.0 GHz
- 1.5:1 Max. VSWR
- 1.0 dB Max. Insertion Loss
- 16 Volts DC voltage Rating
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

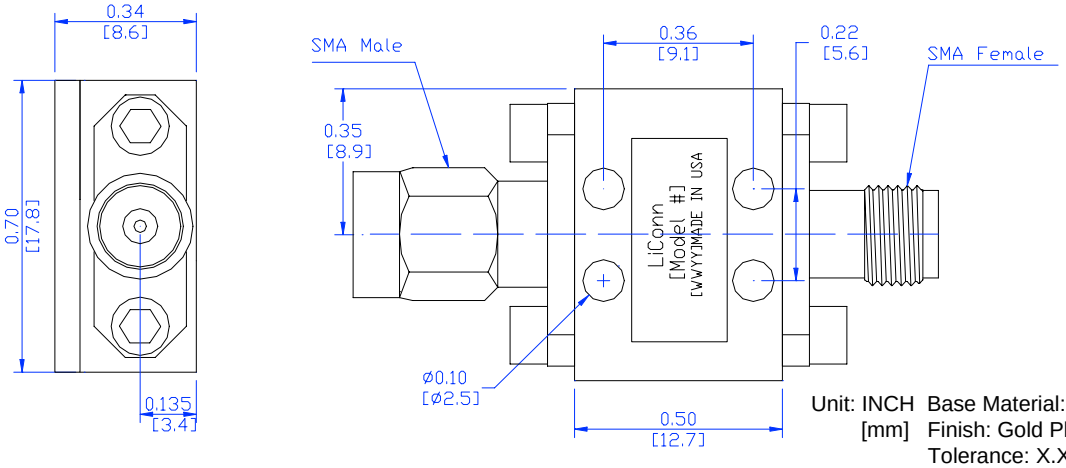
Model Number	LDCB024A

Absolute Maximum Ratings

Parameters	Units	Ratings
Maximum RF Power Dissipation	W	10
Maximum DC Voltage Rating	V	16
Operating Temperature	°C	-54 ~ +85
Storage Temperature	°C	-65 ~ 150

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: INCH Base Material: Brass
[mm] Finish: Gold Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

Rev 1.2

LiConn, Inc.
Tel: 1-651-482-1848
Fax: 1-651-482-1573
sales@liconn.com

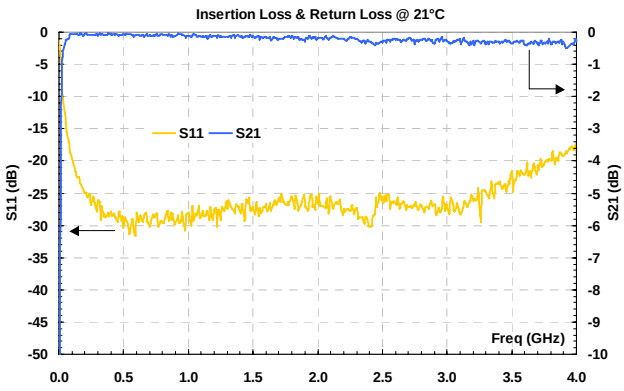
FEATURED PRODUCT — LLDB004A

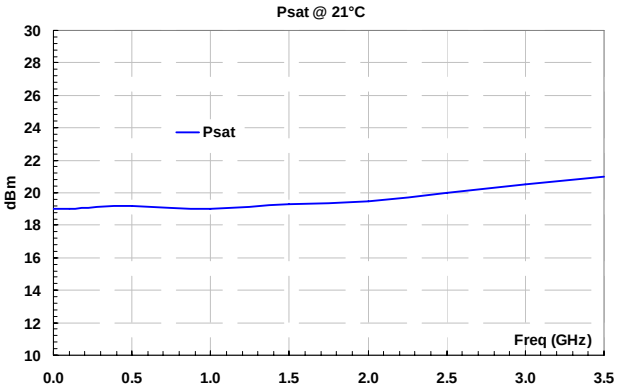
Product Description: LLDB004A (100 MHz – 3.5 GHz Limiter)

LiConn has developed super wide band Limiter with low cost. The limiter offers maximum 0.50 dB insertion loss and 1.25:1 maximum VSWR throughout 100 MHz to 3.5 GHz band.

The limiter can be used in varieties of Test equipment input protection, such as Network Analyzer, Noise Figure meter, Spectrum Analyzer, Amplifiers, and other Wireless Test Equipments. The limiter is designed to meet MIL-STD-202g.

Key Performance





- 100 MHz ~ 3.5 GHz
- 1.25:1 MAX VSWR
- 0.50 dB Max. Insertion Loss
- 50 Volts DC Voltage Rating
- SMA Connector I/O
- Miniature Size
- RoHS Compliance

Ordering Information

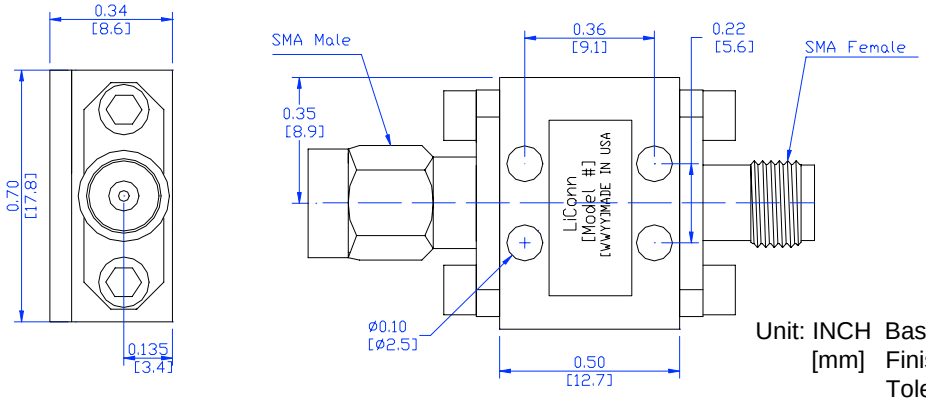
Model Number	Input	Output
LLDB004A-1	SMA Male	SMA Female
LLDB004A-2	SMA Female	SMA Male

Absolute Maximum Ratings

Parameters	Units	Ratings
RF Average Input Power	W	2
Max. Saturated Output Power	dBm	22
Maximum DC Voltage Rating	V	50
Operating Temperature	°C	-54 ~ +85
Storage Temperature	°C	-65 ~ 150

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: INCH [mm]
Base Material: Brass
Finish: Gold Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

LiConn, Inc.
Tel: 1-651-482-1848
Fax: 1-651-482-1573
sales@liconn.com

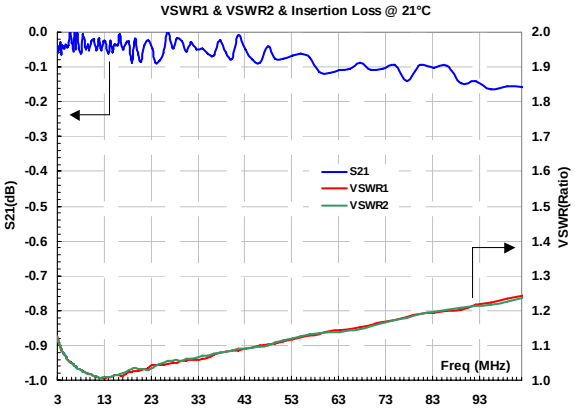
FEATURED PRODUCT — LLDB009A

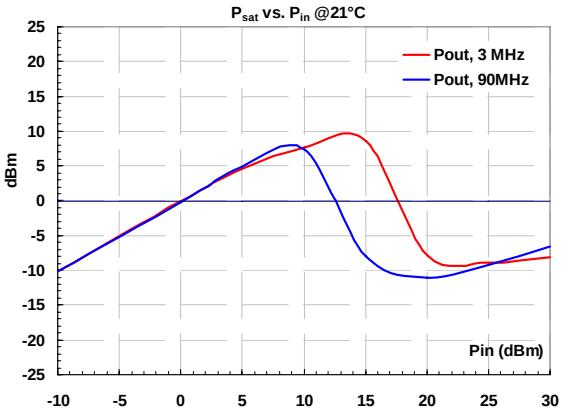
Product Description: LLDB009A (3 MHz – 90 MHz Limiter)

LiConn has developed super wide band Limiter with low cost. The limiter offers maximum 0.20 dB insertion loss and 1.22:1 maximum VSWR throughout 3 MHz to 90 MHz band.

The limiter can be used in varieties of Test equipment input protection, such as Network Analyzer, Noise Figure meter, Spectrum Analyzer, Amplifiers, and other Wireless Test Equipments. The limiter is designed to meet MIL-STD-202g.

Key Performance





- 3 MHz ~ 90 MHz
- 1.22:1 MAX VSWR
- 0.20 dB Max. Insertion Loss
- 50 Volts DC Voltage Rating
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

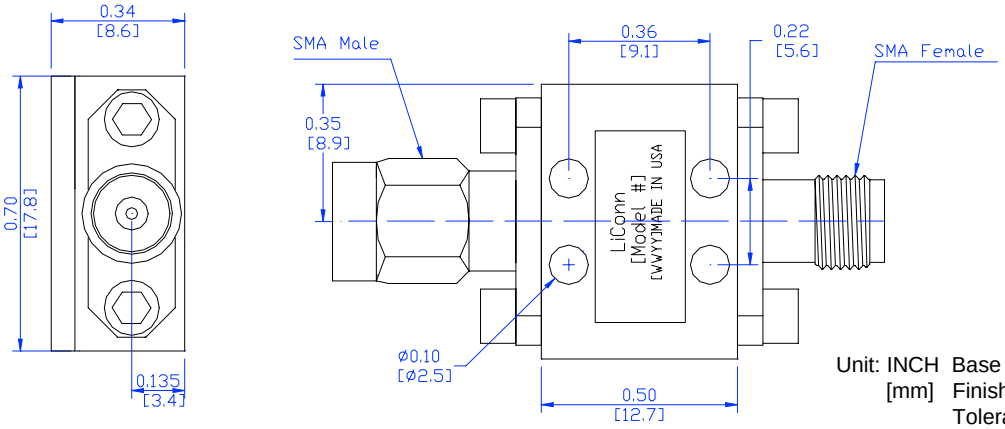
Model Number	Input (SMA)	Output(SMA)
LLDB009A-1	Male	Female
LLDB009A-2	Female	Male
LLDB009A-3	Male	Male
LLDB009A-4	Female	Female

Absolute Maximum Ratings

Parameters	Units	Ratings
RF Average Input Power	W	2
Max. Saturated Output Power	dBm	10
Maximum DC Voltage Rating	V	50
Operating Temperature	°C	-55 ~ +85
Storage Temperature	°C	-65 ~ 150

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



Unit: INCH Base Material: Brass
[mm] Finish: Gold Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

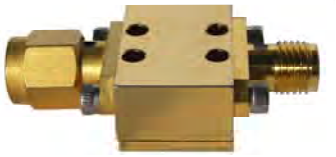
LiConn, Inc.
Tel: 1-651-482-1848
Fax: 1-651-482-1573
sales@liconn.com

FEATURES:

- 900 – 1200 MHz Rejection;
- - 40 dB Rejection;
- 0.45 dB Insertion Loss;
- DC – 300MHz Passband;
- 2.0 – 18.0GHz Passband;
- 5W CW Power Rated;
- -40 ~ +85 °C Operation;
- RoHS Compliant

APPLICATIONS:

- Radar;
- Receivers;
- ECM System;
- WBA Systems;
- Point to Point;
- Test & Measurement;
- Wide Band PA Driver



LBNF0912A – 900 ~ 1200 MHz Notch Filter

ELECTRICAL SPECIFICATIONS @ 25 °C

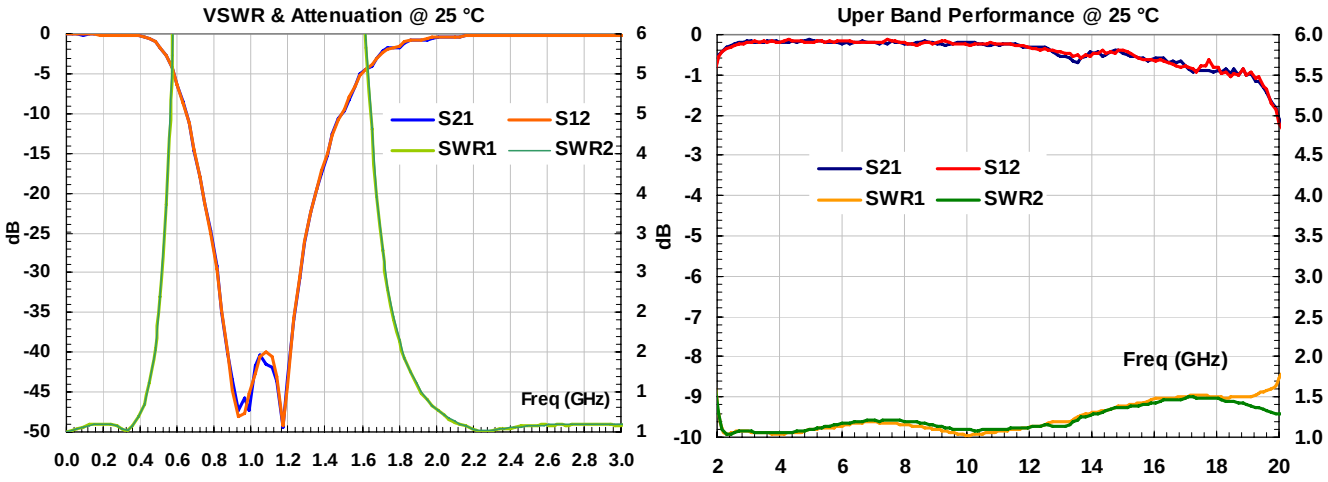
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
F_{Notch}	Notch Band	MHz	900		1200
IL_N	Notch Band Rejection	dB		-40	-35
IL_P	Passband Insertion Loss	dB		0.3	1.5
F_{LP}	Lower Passband	MHz	DC		300
F_{HP}	Upper Passband	GHz	2.0		18.0
P_o	CW Power handling	W		5.0	
$VSWR_1$	VSWR – Input	Ratio		1.25:1	2:1
$VSWR_2$	VSWR – Output	Ratio		1.25:1	2:1

ABSOLUTE MAXIMUM RATINGS[1]

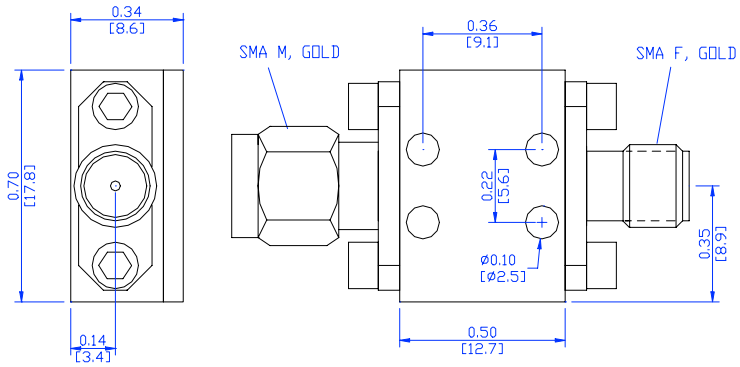
Parameters/Conditions	Unit	Maximum
Operating Temperature	°C	-40/+85
Drain Current	mA	300
DC Voltage	V	25
RF Input Power	W	6
Storage Temperature	°C	+150

[1] Operation beyond these limits may cause permanent damage.

ELECTRICAL PERFORMANCE



MECHANICAL OUTLINE



ORDERING INFORMATION:

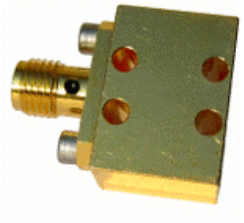
LBNF0912A

Tel: 1-651-482-1848
Fax: 1-651-482-1573

sales@liconn.com
http://www.liconn.com

FEATURED PRODUCT — LR010A

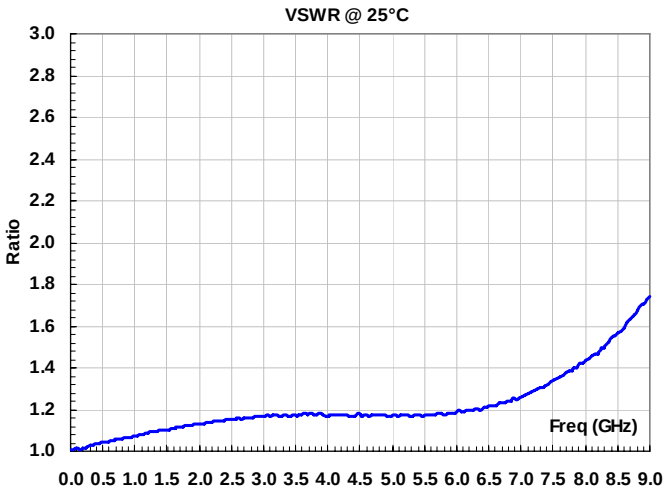
Product Description: LR010A (DC – 6 GHz 10 Watts High Precision Load)



LiConn has developed high precision, high power, and miniature 50 Ohm load with low cost. The load offers maximum 10 Watts continuous RF power dissipation and 1.22:1 maximum VSWR throughout DC to 6 GHz band.

The load can be used in varieties of circuitries such as wide band high power amplifiers, broadcast, and measurement. The load is designed to meet MIL-STD-202g.

Key Performance



- DC ~ 6 GHz
- 1.22:1 MAX VSWR
- 10 Watts Continuous RF Power
- SMA Connector I/O
- Miniature Size
- RoHS Compliant
- Usable up to 9 GHz

Ordering Information

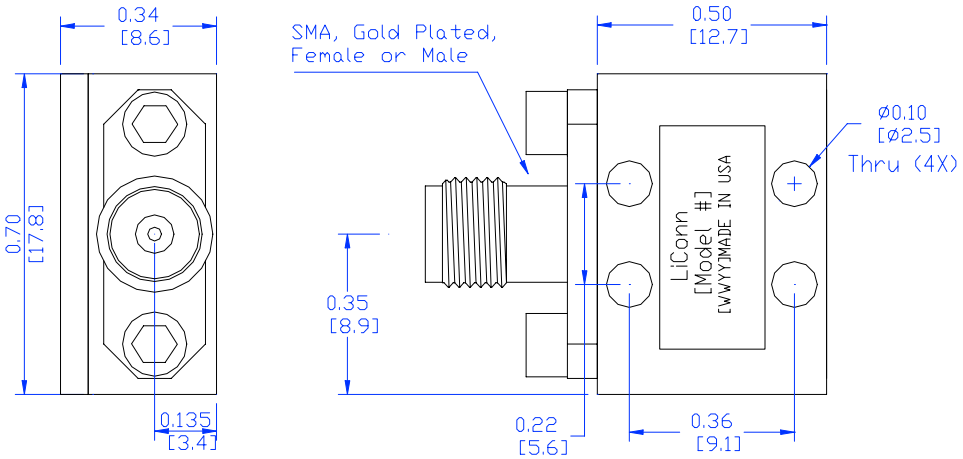
Model Number	SMA Connector
LR010A	Female
LR010B	Male

Absolute Maximum Ratings

Parameters	Units	Ratings
Maximum RF Power Dissipation	W	10
Storage Temperature	°C	-65 ~ 150
Operating Temperature	°C	-54 ~ +85

**Operation beyond any one of these parameters may cause permanent damage.*

Outline

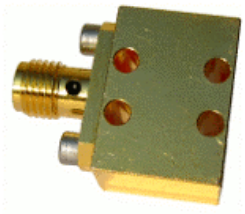


ADDITIONAL HEAT SINK REQUIRED AND AVAILABLE!

LiConn, Inc.
Tel: 1-651-482-1848
Fax: 1-651-482-1573
sales@liconn.com

FEATURED PRODUCT — LR010C

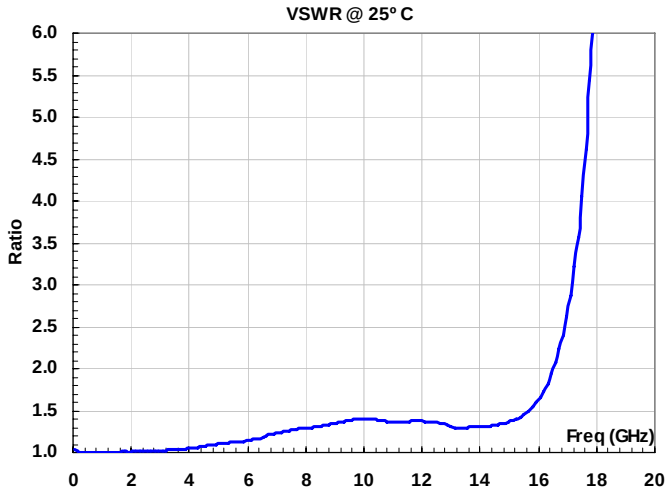
Product Description: LR010C (DC – 15 GHz 10 Watts High Power Load)



LiConn has developed high power and miniature 50 Ohm load with low cost. The load offers maximum 10 Watts continuous RF power dissipation and 1.5:1 maximum VSWR throughout DC to 15 GHz band.

The load can be used in varieties of circuitries such as wide band high power amplifiers, broadcast, and measurement. The load is designed to meet MIL-STD-202g.

Key Performance



- DC ~ 15 GHz
- 1.5:1 MAX VSWR
- 10 Watts Continuous RF Power
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

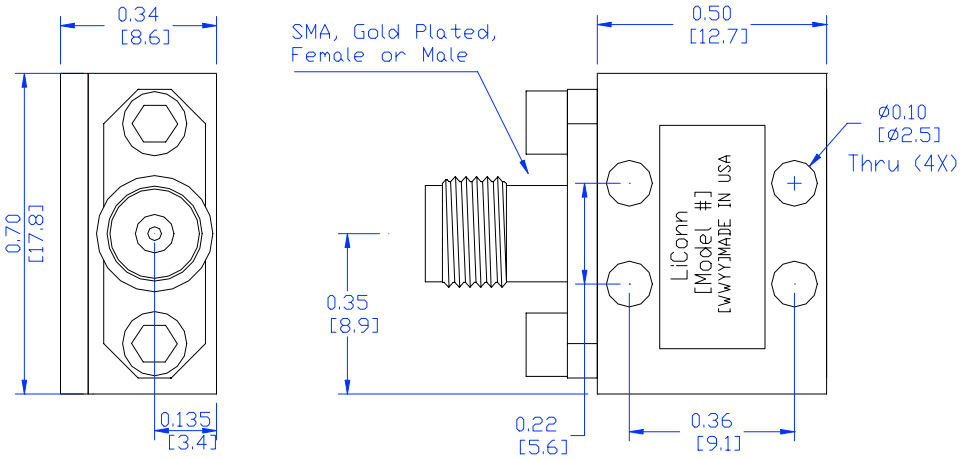
Model Number	SMA Connector
LR010C	Female
LR010D	Male

Absolute Maximum Ratings

Parameters	Units	Ratings
Maximum RF Power Dissipation	W	10
Storage Temperature	°C	-65 ~ 150
Operating Temperature	°C	-54 ~ +85

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



ADDITIONAL HEAT SINK REQUIRED AND AVAILABLE!

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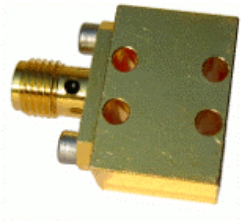
FEATURED PRODUCT — LR020A

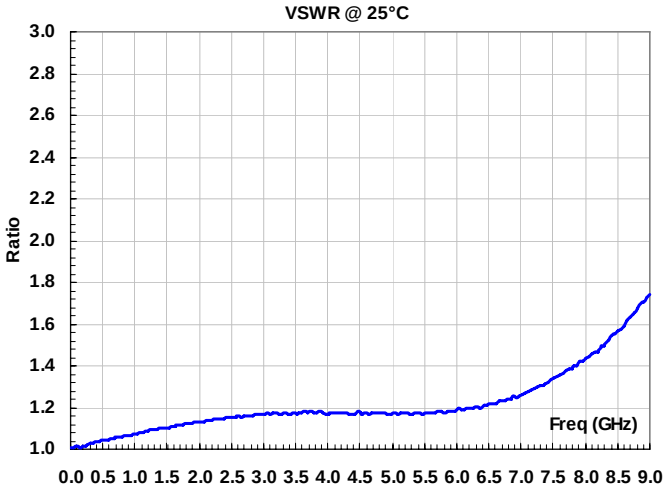
Product Description: LR020A (DC – 6 GHz 20 Watts High Precision Load)



LiConn has developed high precision, high power, and miniature 50 Ohm load with low cost. The load offers maximum 20 Watts continuous RF power dissipation and 1.22:1 maximum VSWR throughout DC to 6 GHz band.

The load can be used in varieties of circuitries such as wide band high power amplifiers, broadcast, and measurement. The load is designed to meet MIL-STD-202g.

Key Performance



- DC ~ 6 GHz
- 1.22:1 MAX VSWR
- 20 Watts Continuous RF Power
- SMA Connector I/O
- Miniature Size
- RoHS Compliant
- Usable up to 9 GHz

Ordering Information

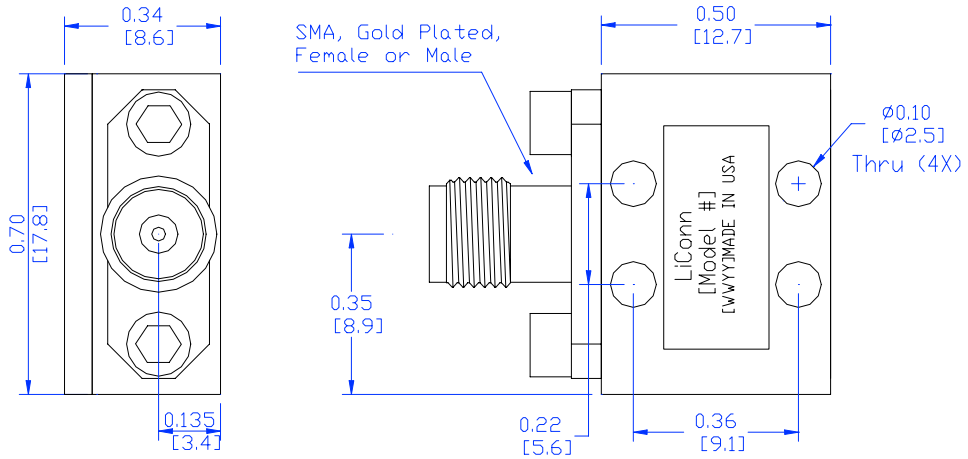
Model Number	SMA Connector
LR020A	Female
LR020B	Male

Absolute Maximum Ratings

Parameters	Units	Ratings
Maximum RF Power Dissipation	W	20
Storage Temperature	°C	-65 ~ 150
Operating Temperature	°C	-54 ~ +85

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



ADDITIONAL HEAT SINK REQUIRED AND AVAILABLE!

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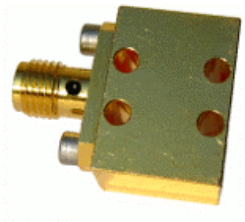
FEATURED PRODUCT — LR020C

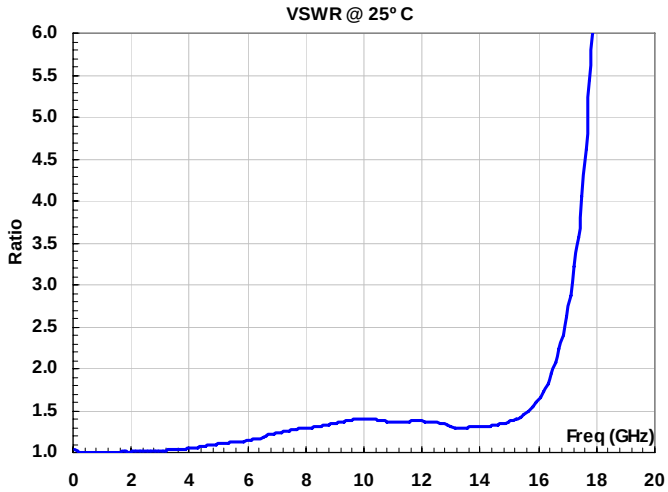
Product Description: LR020C (DC – 15 GHz 20 Watts High Power Load)



LiConn has developed high power and miniature 50 Ohm load with low cost. The load offers maximum 20 Watts continuous RF power dissipation and 1.5:1 maximum VSWR throughout DC to 15 GHz band.

The load can be used in varieties of circuitries such as wide band high power amplifiers, broadcast, and measurement. The load is designed to meet MIL-STD-202g.

Key Performance



- DC ~ 15 GHz
- 1.5:1 MAX VSWR
- 10 Watts Continuous RF Power
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

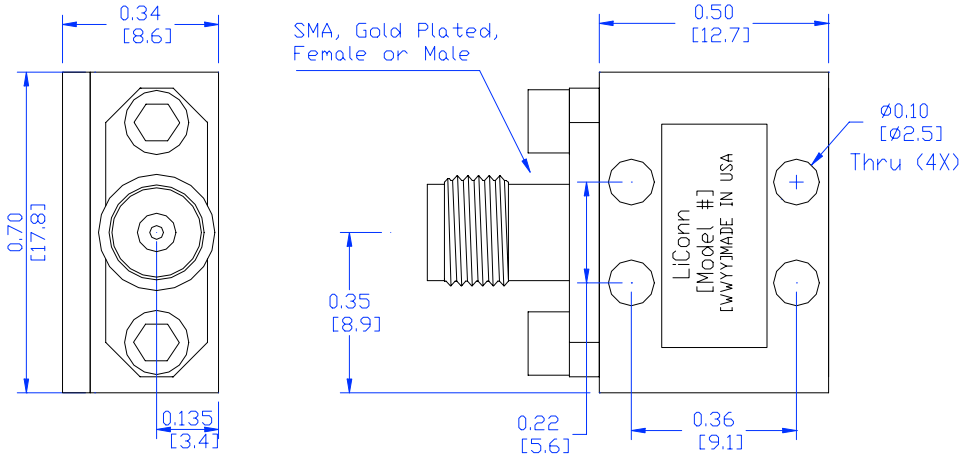
Model Number	SMA Connector
LR020C	Female
LR020D	Male

Absolute Maximum Ratings

Parameters	Units	Ratings
Maximum RF Power Dissipation	W	20
Storage Temperature	°C	-65 ~ 150
Operating Temperature	°C	-54 ~ +85

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



ADDITIONAL HEAT SINK REQUIRED AND AVAILABLE!

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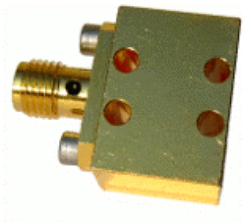
FEATURED PRODUCT — LR100A

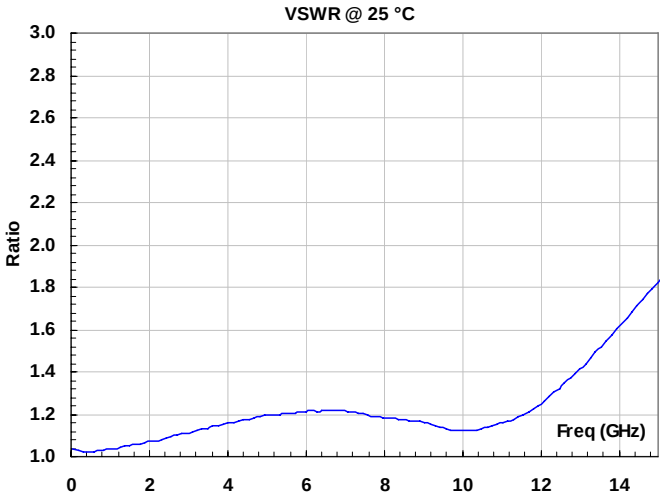
Product Description: LR100A (DC – 12 GHz 100 Watts High Power Load)



LiConn has developed high power and miniature 50 Ohm load with low cost. The load offers maximum 100 Watts continuous RF power dissipation and 1.25:1 maximum VSWR throughout DC to 12 GHz band.

The load can be used in varieties of circuitries such as wide band high power amplifiers, broadcast, and measurement. The load is designed to meet MIL-STD-202g.

Key Performance



- DC ~ 12.0 GHz
- 1.25:1 MAX VSWR
- 100 Watts Continuous RF Power
- SMA Connector I/O
- Miniature Size
- RoHS Compliant

Ordering Information

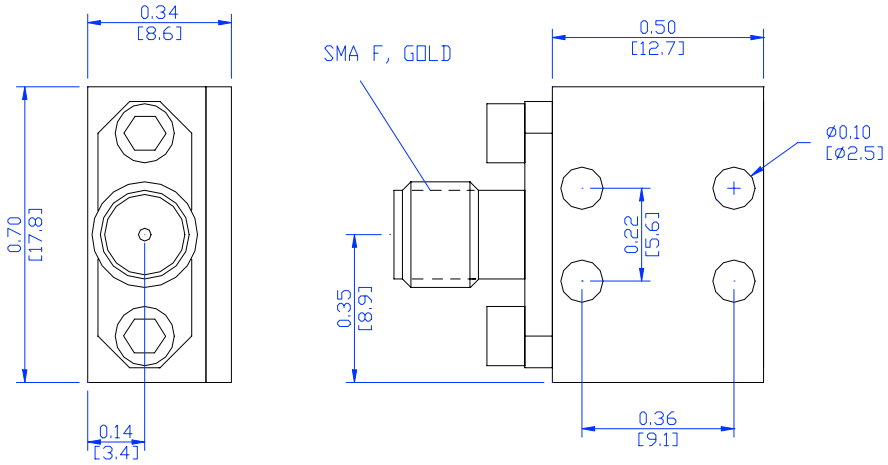
Model Number	SMA Connector
LR050A	Female
LR050B	Male

Absolute Maximum Ratings

Parameters	Units	Ratings
Maximum RF Power Dissipation	W	100
Storage Temperature	°C	-65 ~ 150
Operating Temperature	°C	-54 ~ +85

**Operation beyond any one of these parameters may cause permanent damage.*

Outline



ADDITIONAL HEAT SINK REQUIRED AND AVAILABLE!

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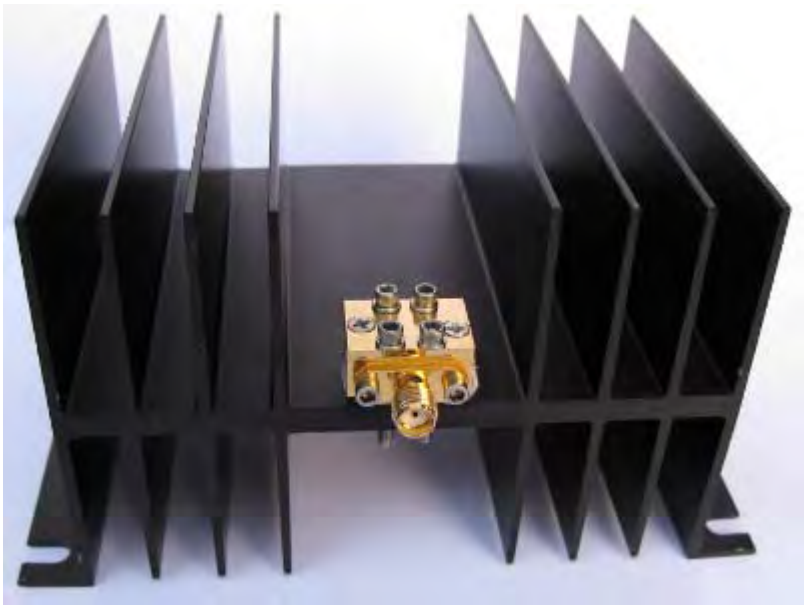
APPLICATION NOTE – HIGH POWER LOAD



Application Note For High Power Loads:

- LR010A
- LR010B
- LR010C
- LR010D

1. Heat Sink Requirement

Additional heat sink is required for LR010A, LR010B, LR010C, LR010D (10 Watt load). The maximum temperature of 175°C is allowed for the internal high power load resistor. The following equation is used to calculate the thermal dissipation of the heat sink

$$175\ °C = T_{amb}\ (°C) + P_0\ (W)\ R_{th}\ (°C/W)$$

For 85 °C ambient temperature and 100 W power dissipation, the maximum thermal resistance of the required heat sink will be

$$R_{th}\ (°C/W) = (175 - 85)/100 = 0.9\ (°C/W)$$

In order to have such low thermal resistance, the thermal compound is necessary between the bottom of the load and the heat sink. The forced air may be used to further decrease the thermal resistance, especially there is a limited room for the placement of the heat sink.

2. Load Installation

Materials Needed:

- 4 pieces #2-56 ¾" mounting screws;
- 4 pieces washers for the mounting screws;
- Thermal Compound

Tap 4 mounting holes with the depth of 0.250" on the heat sink. Make sure the location is correct so that the SMA connector of the load can be accessed easily. Apply the thermal compound on the bottom of the heat sink. Use the correct torque to mount the load on the heat sink.

For forced air thermal dissipation enhancement, the fan can be mounted on the opposite side of the heat sink so that the forced air can directly blow on bottom of side of the heat sink.

3. Existing Heat Sink for Power Amplifier

For existing heat sink such as power amplifier applications, the additional heat sink may not required if the load is used for the combiner load. The load can be directly mounted on the heat sink assuming the heat sink is sufficient for the total DC power dissipation of the PA.

4. Connecting to the External Components

No more than 8 inch-lb torque wrench shall be used to connect external cable to the SMA connector on the Load. Torque wrench with 5 ~ 6 inch-lb coupling torque setting is highly recommended, like Agilent 8710-1582 (5 inch-lb).

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FEATURES:

- **20 MHz ~ 3.5 GHz;**
- **15 dB Gain;**
- **1.2 dB Noise Figure;**
- **12.0 dBm P_{1dB};**
- **26.0 dBm IP_3;**
- **RoHS Compliant.**

APPLICATIONS:

- **Radar;**
- **Receiver;**
- **ECM System;**
- **WBA System;**
- **Point to Point;**
- **Test & Measurement;**
- **Wide Band PA Driver.**

LNA00203500A, 20 MHz ~ 3.5 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

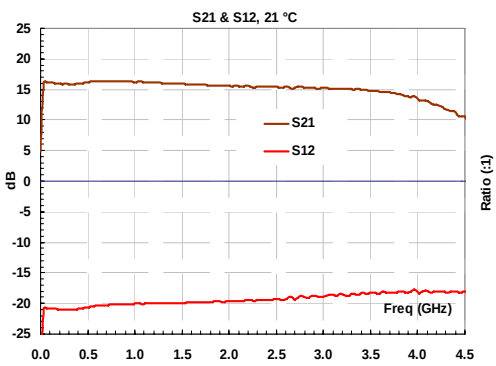
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	14	15	
ΔG	Gain Flatness	dB		±1.0	
$VSWR_1$	VSWR – Input	Ratio		1.35:1	1.8:1
$VSWR_2$	VSWR – Output	Ratio		1.35:1	1.5:1
S_{12}	Reverse Isolation	dB		20	
NF	Noise Figure	dB		1.2	1.6
OIP_3	Output 3rd Order Intercept	dBm		26	
P_{1dB}	Output 1dB Gain Compression	dBm		12	
I_{dd}	Device Current (V_{dd}=+12V)	mA		25	
V_{dd}	DC Power Supply Voltage	V	+7.0	+12.0	+30.0
Z_0	Impedance	Ohm		50	

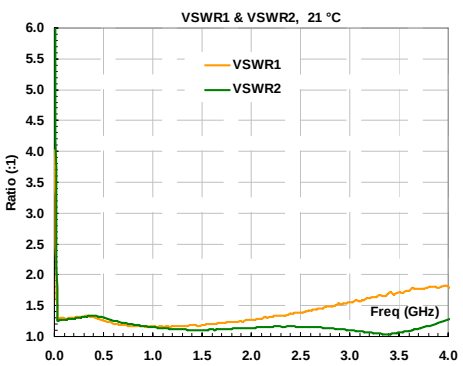
ABSOLUTE MAXIMUM RATINGS[1]

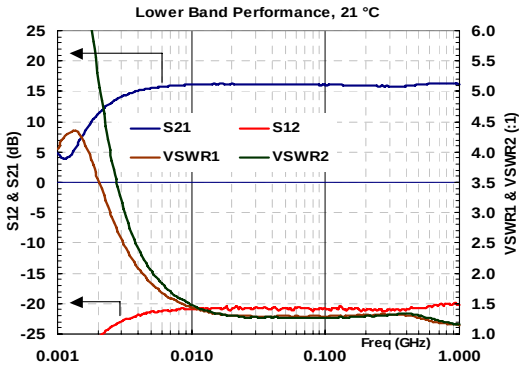
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	+13
DC Supply Voltage	V	30
Drain Current	mA	150
Thermal Resistance	°C/W	220
Total Power Dissipation	mW	600
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-65 ~ +125

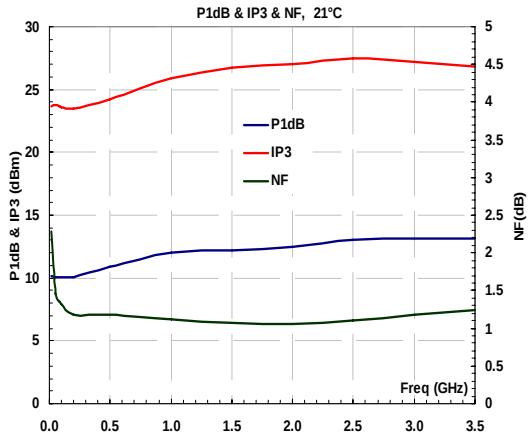
[1] Operation beyond these limits may cause permanent damage.

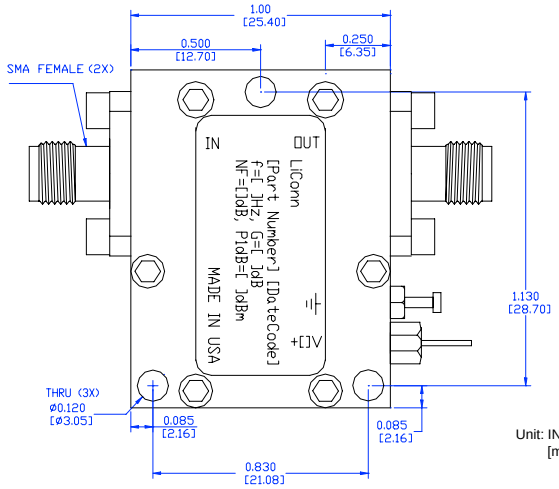
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE

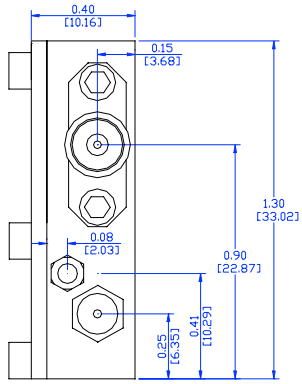












Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LNA00203500A

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FEATURES:

- **0.1 – 6.0 GHz;**
- **14.0 dB Gain;**
- **1.1 dB Noise Figure;**
- **15.0 P1dB;**
- **27.0 dBm IP3;**
- **RoHS Compliant**

APPLICATIONS:

- **Celullar;**
- **GPS; PCS; 3G;**
- **WiMAX;**
- **C-Band;**
- **Test & Measurement**

LNA01006000A – 0.1 ~ 6.0 GHz WIDE BAND AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 25 °C

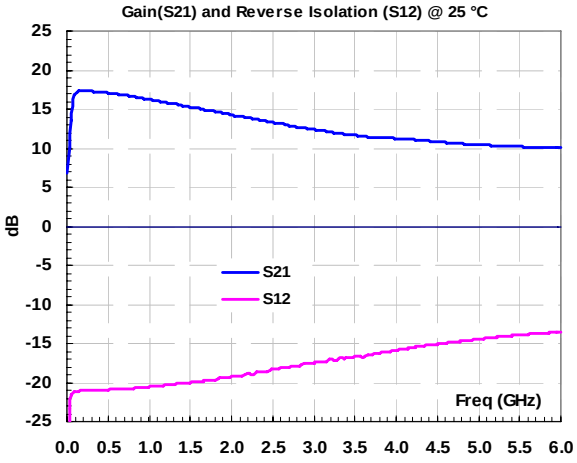
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
F	Operating Frequency	GHz	0.1		6
G	**Gain**	**dB**		**14**	
I_d	Device Current	mA		30	
Z_0	Impedance	Ohm		50	
OIP3	Output 3rd Order Intercept	dBm		27	
NF	**Noise Figure**	**dB**		**1.1**	**1.5**
P_{1dB}	Output 1dB Gain Compression	dBm		15	
S_{12}	Reverse Isolation	dB		20	
V_{dd}	DC Power Supply Voltage	V	4.5	5.0	6.0
$VSWR_1$	VSWR – Input	Ratio		1.25:1	
$VSWR_2$	VSWR – Output	Ratio		1.5:1	

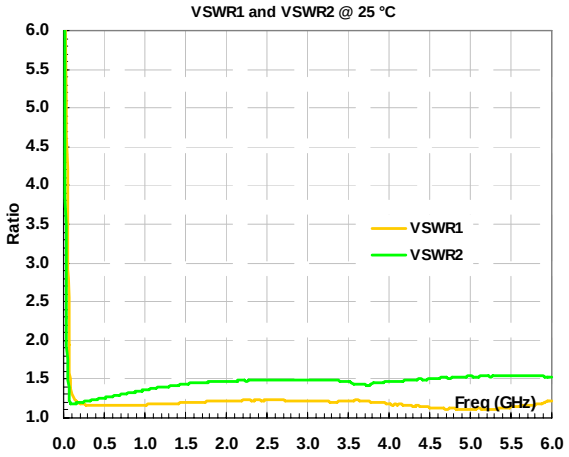
ABSOLUTE MAXIMUM RATINGS[1]

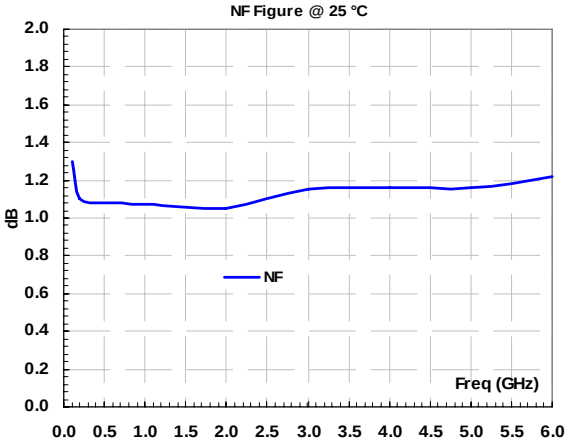
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
Drain Current	mA	70
Operating Temperature	°C	-54 ~ +85
RF Input Power	dBm	+10
RF Output Supply Voltage	V	8
Storage Temperature	°C	-65 ~ +150
Thermal Resistance	°C/W	230

[1] Operation beyond these limits may cause permanent damage.

ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE







ORDERING INFORMATION

Model Number	Input	Output
LNA01006000A-1	SMA Female	SMA Female
LNA01006000A-2	SMA Female	SMA Male
LNA01006000A-3	SMA Male	SMA Male
LNA01006000A-4	SMA Male	SMA Female
LNA01006000AG-1	SMA Female	SMA Female
LNA01006000AG-2	SMA Female	SMA Male
LNA01006000AG-3	SMA Male	SMA Male
LNA01006000AG-4	SMA Male	SMA Female

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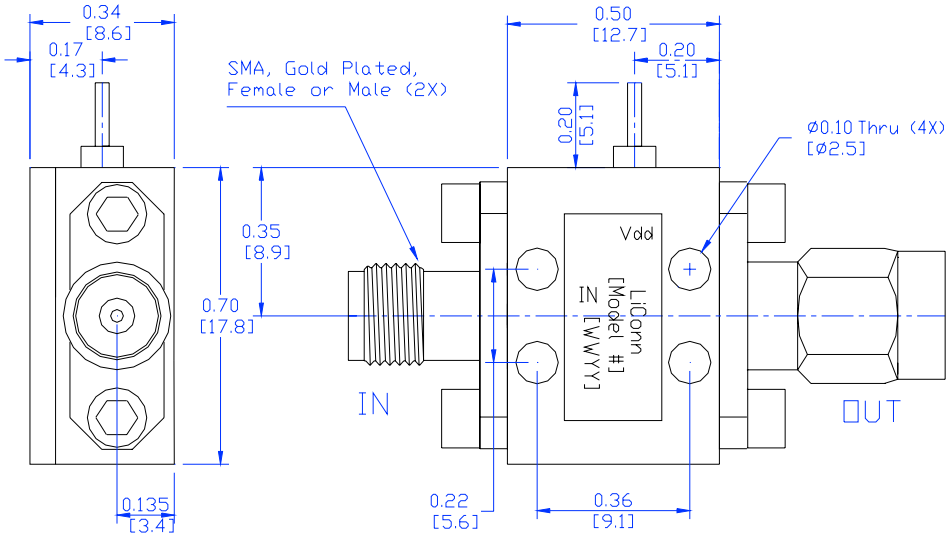
Mechanical Outline

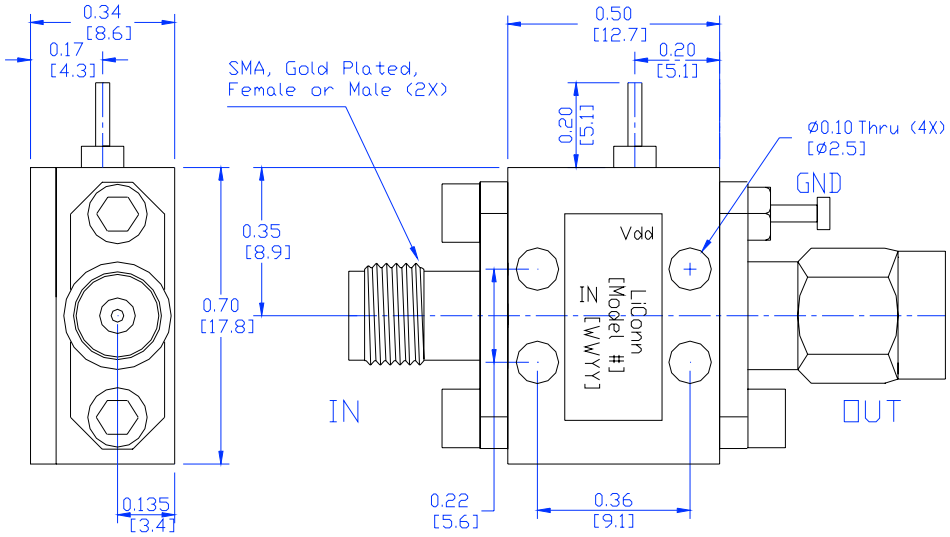
Unit: Inch/mm

Material: Brass
Finish: Gold Plating
Tolerance is Non-Accumulative

LNA01006000A-:



LNA01006000AG- (with Ground Turret on Output SMA):



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FEATURES:

- 0.2 GHz ~ 4.0 GHz;
- 29 dB Gain;
- 1.3 dB Noise Figure;
- 13.0 dBm P_{1dB};
- 26.0 dBm IP_3;
- Unconditional Stable;
- RoHS Compliant.

APPLICATIONS:

- Radar;
- Receiver;
- ECM System;
- WBA System;
- Point to Point;
- Test & Measurement;
- Wide Band PA Driver.

LNA02004000A, 0.2 GHz ~ 4.0 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

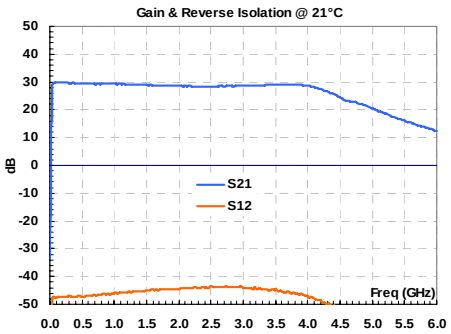
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	27	29	31
ΔG	Gain Flatness	dB		±0.5	±1.0
$VSWR_1$	VSWR – Input	Ratio		1.6:1	2:1
$VSWR_2$	VSWR – Output	Ratio		1.6:1	2:1
S_{12}	Reverse Isolation	dB		42	
NF	Noise Figure	dB		1.3	1.4
OIP_3	Output 3rd Order Intercept	dBm	24	26	
P_{1dB}	Output 1dB Gain Compression	dBm	12	13	
I_{dd}	Device Current (V_{dd}=+5V)	mA		50	
V_{dd}	DC Power Supply Voltage	V	+4.7	+5.0	+5.3
Z_0	Impedance	Ohm		50	

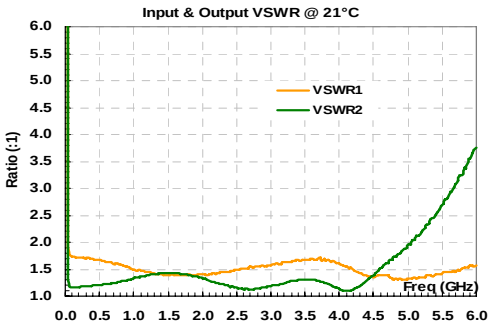
ABSOLUTE MAXIMUM RATINGS[1]

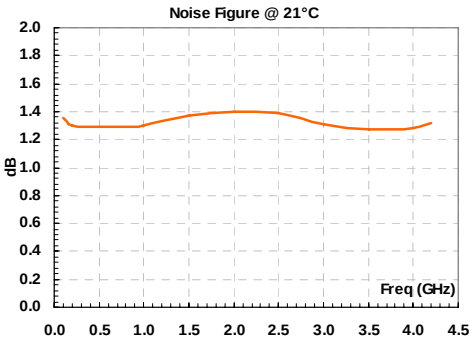
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	+10
DC Supply Voltage	V	+6.0
Drain Current	mA	70
Thermal Resistance	°C/W	220
Total Power Dissipation	mW	400
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

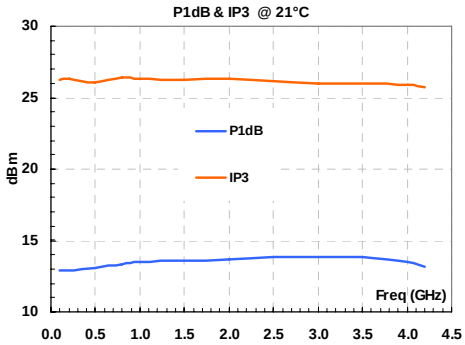
[1] Operation beyond these limits may cause permanent damage.

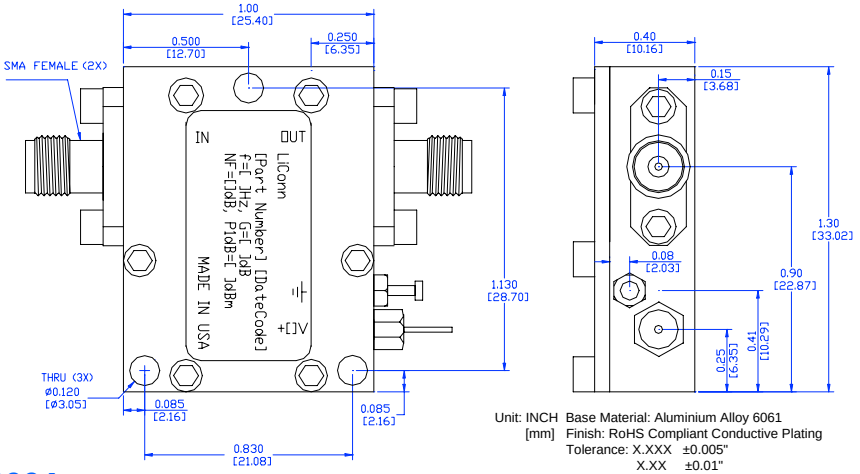
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











ORDERING INFORMATION: LNA02004000A

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FEATURES:

- 0.5 GHz ~ 4.0 GHz;
- 26 dB Gain;
- 1.2 dB Noise Figure;
- 14.0 dBm P_{1dB};
- 27.0 dBm IP_3;
- Unconditional Stable;
- RoHS Compliant.

APPLICATIONS:

- Radar;
- Receiver;
- ECM System;
- WBA System;
- Point to Point;
- Test & Measurement;
- Wide Band PA Driver.

LNA05004000A, 0.5 GHz ~ 4.0 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

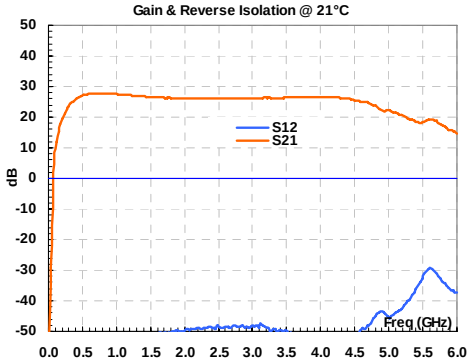
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	24	26	28
ΔG	Gain Flatness	dB		±1.0	±1.3
$VSWR_1$	VSWR – Input	Ratio		1.8:1	2:1
$VSWR_2$	VSWR – Output	Ratio		1.5:1	1.8:1
S_{12}	Reverse Isolation	dB	45	50	
NF	Noise Figure	dB		1.2	1.4
OIP_3	Output 3rd Order Intercept	dBm	24	26	
P_{1dB}	Output 1dB Gain Compression	dBm	12	14	
I_{dd}	Device Current (V_{dd}=+5V)	mA		65	
V_{dd}	DC Power Supply Voltage	V	+4.7	+5.0	+5.3
Z_0	Impedance	Ohm		50	

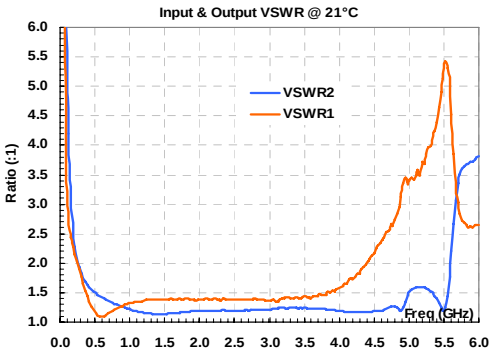
ABSOLUTE MAXIMUM RATINGS[1]

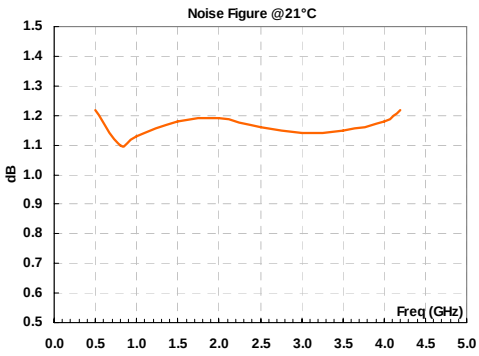
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	+10
DC Supply Voltage	V	+7.0
Drain Current	mA	80
Thermal Resistance	°C/W	215
Total Power Dissipation	mW	400
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

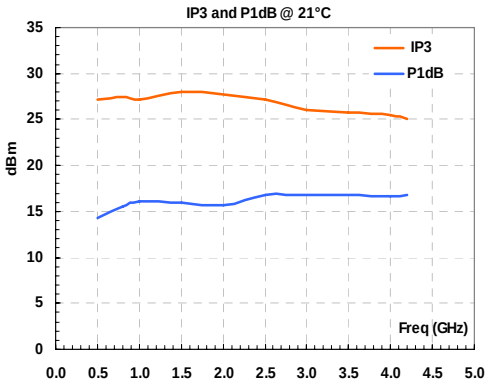
[1] Operation beyond these limits may cause permanent damage.

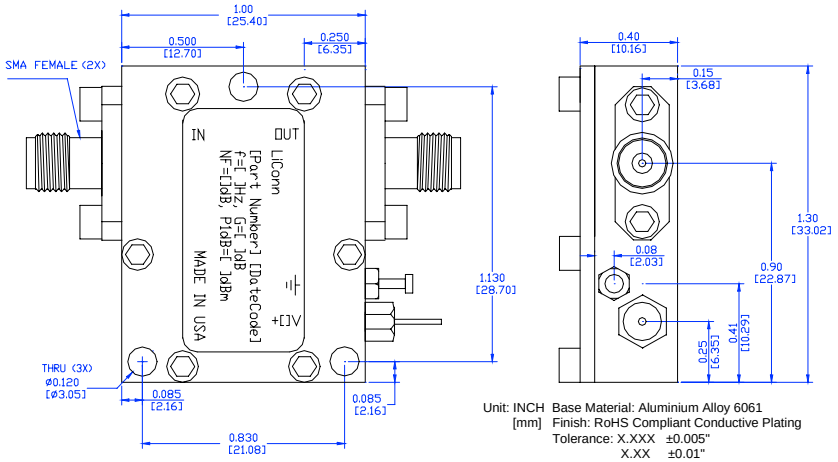
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LNA05004000A

Tel: 1-651-482-1848
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FEATURES:

- 0.6 GHz ~ 2.5 GHz;
- 30 dB Gain;
- 1.0 dB Noise Figure;
- 14.0 dBm P_{1dB};
- 26.0 dBm IP_3;
- Unconditional Stable;
- RoHS Compliant.

APPLICATIONS:

- GPS;
- Satellite;
- WiMAX;
- Defense;
- Security System;
- Test & Measurement;
- Fixed Wireless.

LNA06002500A, 0.6 GHz ~ 2.5 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

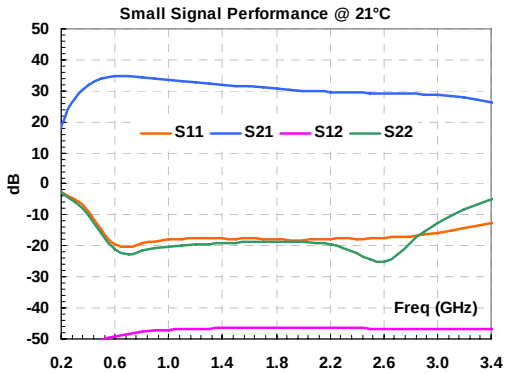
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	29	30	35
ΔG	Gain Flatness	dB		±1.5	
$VSWR_1$	VSWR – Input	Ratio		1.4:1	1.5:1
$VSWR_2$	VSWR – Output	Ratio		1.4:1	1.5:1
S_{12}	Reverse Isolation	dB	42	47	
NF	Noise Figure	dB		1.0	1.2
OIP_3	Output 3rd Order Intercept	dBm	24	26	
P_{1dB}	Output 1dB Gain Compression	dBm	10	14	
I_{dd}	Device Current (V_{dd}=+5V)	mA		50	60
V_{dd}	DC Power Supply Voltage	V	+4.7	+5.0	+5.3
Z_0	Impedance	Ohm		50	

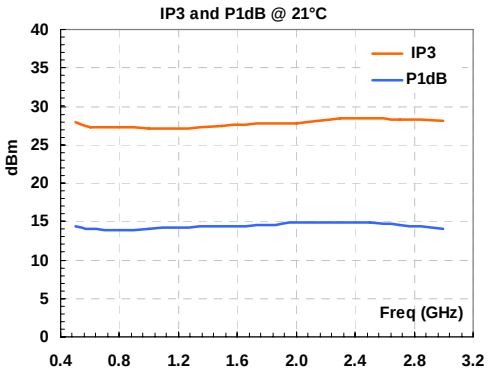
ABSOLUTE MAXIMUM RATINGS[1]

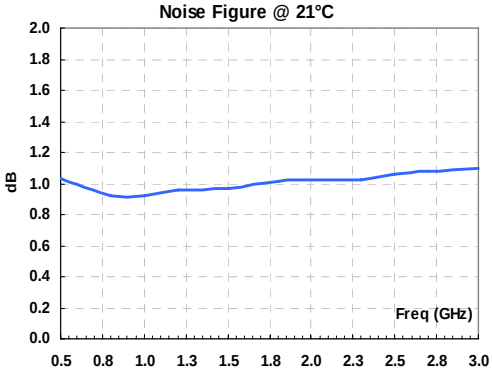
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	+5.0
DC Supply Voltage	V	+7.0
Drain Current	mA	80
Thermal Resistance	°C/W	215
Total Power Dissipation	mW	400
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

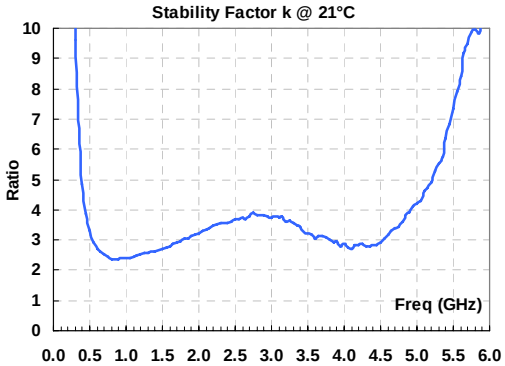
[1] Operation beyond these limits may cause permanent damage.

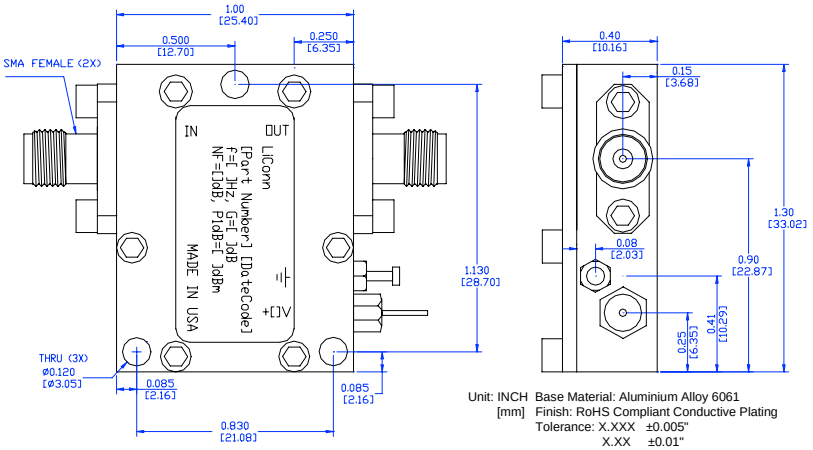
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











Unit: INCH [mm]
Base Material: Aluminium Alloy 6061
Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005" X.XX ±0.01"

ORDERING INFORMATION: LNA06002500A

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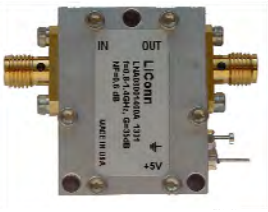
FEATURES:

- 800 MHz ~ 1.4 GHz;
- 35 dB Gain;
- 0.6 dB Noise Figure;
- 20.0 dBm P_{1dB};
- 30.0 dBm IP_3;
- Unconditional Stable;
- RoHS Compliant.

APPLICATIONS:

- GPS;
- Satellite;
- WiMax;
- Defense;
- Mobile Infrastructure;
- Measurement;
- Fixed Wireless.



LNA08001400A, 800 MHz ~ 1.4 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

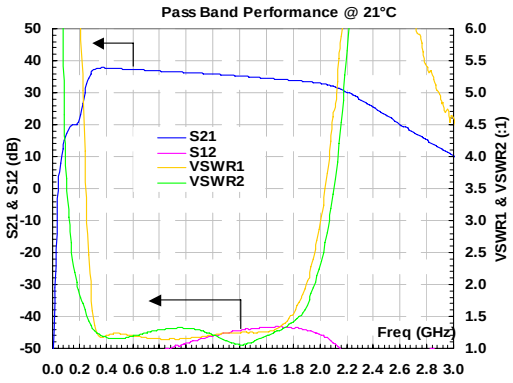
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	33	35	37
ΔG	Gain Flatness	dB		±1.0	
$VSWR_1$	VSWR – Input	Ratio		1.35:1	1.8:1
$VSWR_2$	VSWR – Output	Ratio		1.35:1	1.8:1
S_{12}	Reverse Isolation	dB	40	45	
NF	Noise Figure	dB		0.6	0.8
OIP_3	Output 3rd Order Intercept	dBm	28	30	
P_{1dB}	Output 1dB Gain Compression	dBm	19	20	
I_{dd}	Device Current (V_{dd}=+5V)	mA		85	
V_{dd}	DC Power Supply Voltage	V	+4.7	+5.0	+5.3
Z_0	Impedance	Ohm		50	

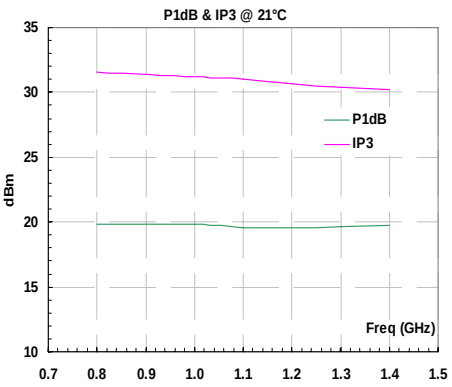
ABSOLUTE MAXIMUM RATINGS[1]

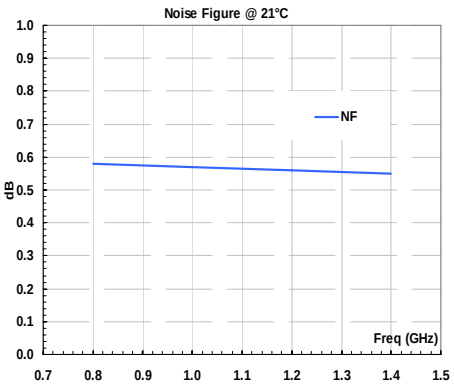
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	150
CW RF Input Power	dBm	+10
DC Supply Voltage	V	+7.0
Drain Current	mA	100
Thermal Resistance	°C/W	215
Total Power Dissipation	mW	500
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-65 ~ +125

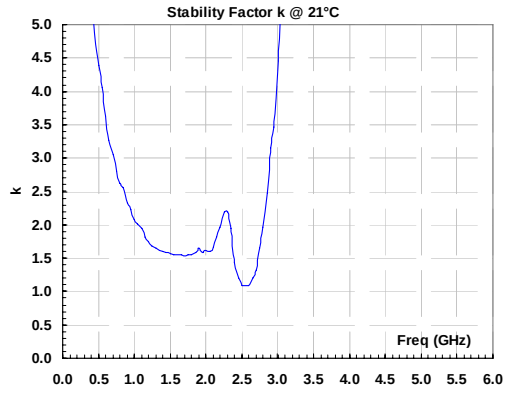
[1] Operation beyond these limits may cause permanent damage.

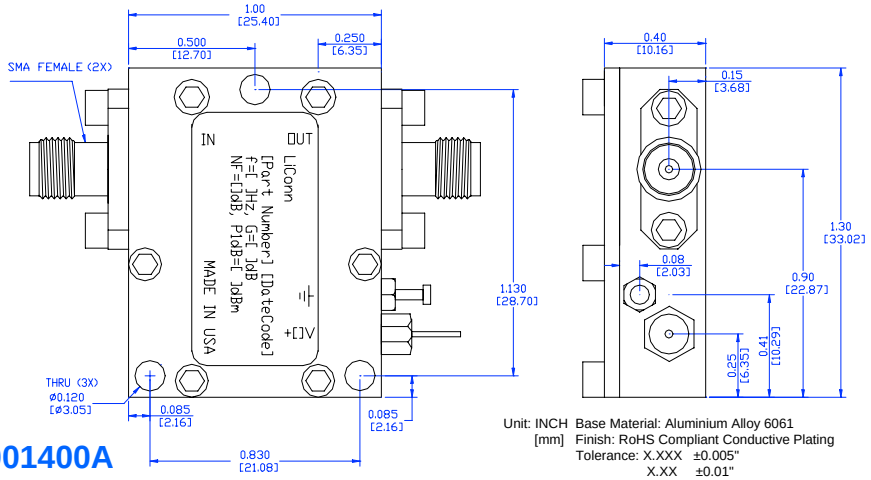
ELECTRICAL PERFORMANCE/ MECHANICAL OUTLINE











ORDERING INFORMATION: LNA08001400A

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FEATURES:

- 800 MHz ~ 1.4 GHz;
- 35 dB Gain;
- 0.6 dB Noise Figure;
- 20.0 dBm P_{1dB};
- 30.0 dBm IP_3;
- Unconditional Stable;
- RoHS Compliant.

APPLICATIONS:

- GPS;
- Satellite;
- WiMax;
- Defense;
- Mobile Infrastructure;
- Measurement;
- Fixed Wireless.

LNA08001400B, 800 MHz ~ 1.4 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

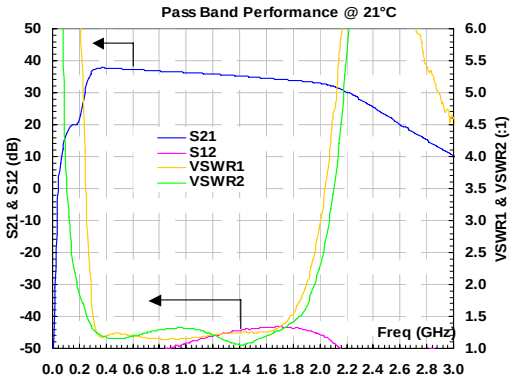
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	33	35	37
ΔG	Gain Flatness	dB		±1.0	
$VSWR_1$	VSWR – Input	Ratio		1.35:1	1.8:1
$VSWR_2$	VSWR – Output	Ratio		1.35:1	1.8:1
S_{12}	Reverse Isolation	dB	40	45	
NF	Noise Figure	dB		0.6	0.8
OIP_3	Output 3rd Order Intercept	dBm	28	30	
P_{1dB}	Output 1dB Gain Compression	dBm	19	20	
I_{dd}	Device Current (V_{dd}=+12V)	mA		85	
V_{dd}	DC Power Supply Voltage	V	+8	+12	+16
Z_0	Impedance	Ohm		50	

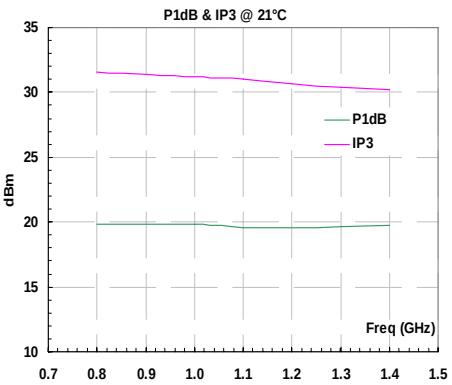
ABSOLUTE MAXIMUM RATINGS[1]

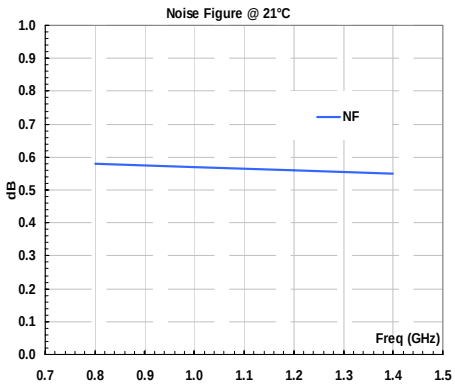
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	150
CW RF Input Power	dBm	+10
DC Supply Voltage	V	+16.0
Drain Current	mA	100
Thermal Resistance	°C/W	215
Total Power Dissipation	mW	500
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

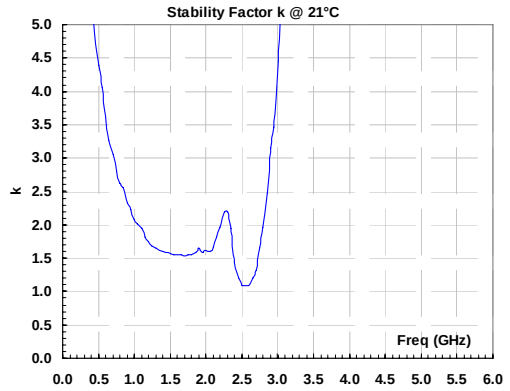
[1] Operation beyond these limits may cause permanent damage.

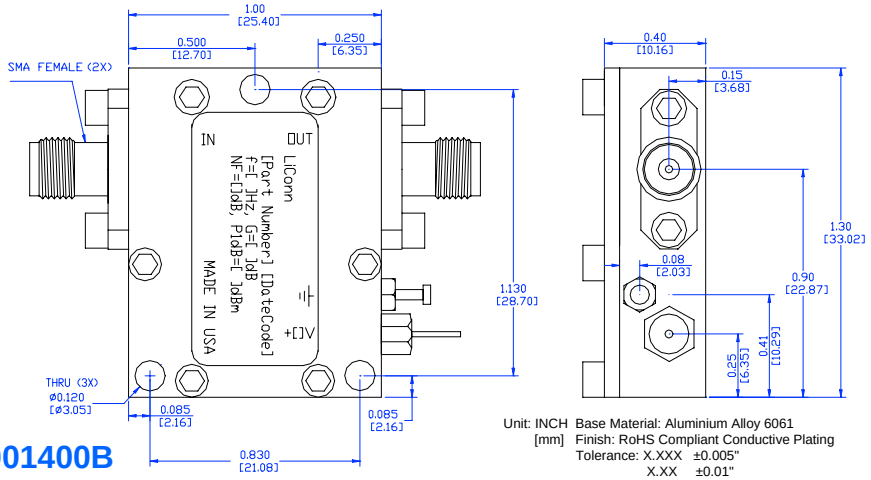
ELECTRICAL PERFORMANCE/ MECHANICAL OUTLINE











Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LNA08001400B

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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FEATURES:

- **900 MHz ~ 1300 MHz;**
- **18.0 dB Gain;**
- **0.6 dB Noise Figure;**
- **15.0 dBm P_{1dB};**
- **30.0 dBm IP_3;**
- **RoHS Compliant.**

APPLICATIONS:

- **GPS;**
- **Avionics;**
- **Defense;**
- **Security System;**
- **Test & Measurement;**
- **Fixed Wireless.**

LNA09001300B, 900 MHz ~ 1300 MHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

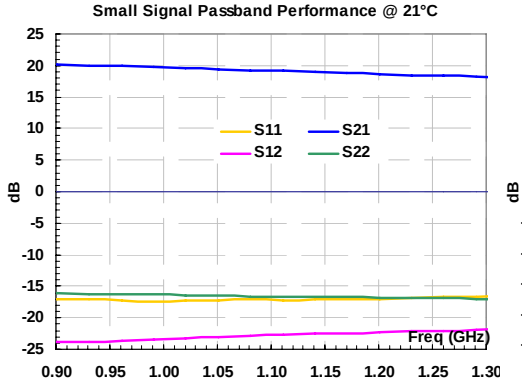
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	16	18	20
ΔG	Gain Flatness	dB		±0.5	±1.0
$VSWR_1$	Input VSWR	Ratio		1.5:1	1.6:1
$VSWR_2$	Output VSWR	Ratio		1.5:1	1.6:1
S_{12}	Reverse Isolation	dB	20	22	
NF	Noise Figure	dB		0.6	0.7
OIP_3	Output 3rd Order Intercept	dBm	26	30	
P_{1dB}	Output 1dB Gain Compression	dBm	13	15	
I_{dd}	Device Current (V_{dd}=+5V)	mA	40	50	
V_{dd}	DC Power Supply Voltage	V	+4.7	+5.0	+5.5
Z_0	Impedance	Ohm		50	

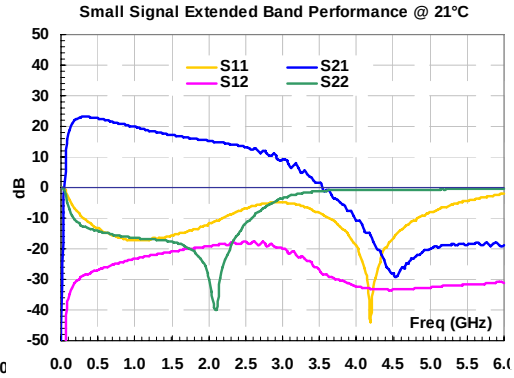
ABSOLUTE MAXIMUM RATINGS[1]

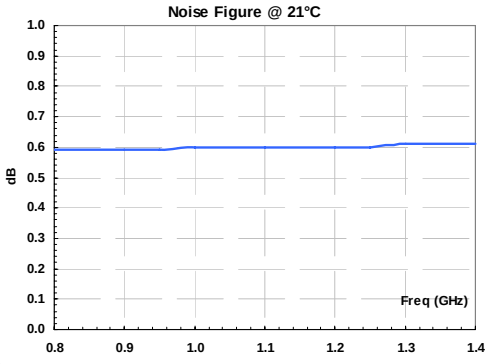
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	150
CW RF Input Power	dBm	10
DC Supply Voltage	V	7.0
Drain Current	mA	80
Thermal Resistance	°C/W	215
Total Power Dissipation	mW	400
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55~+125

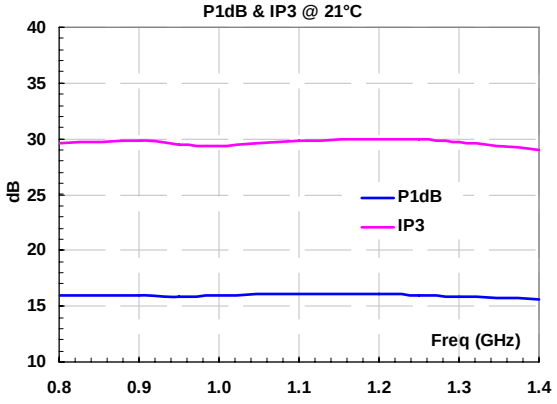
[1] Operation beyond these limits may cause permanent damage.

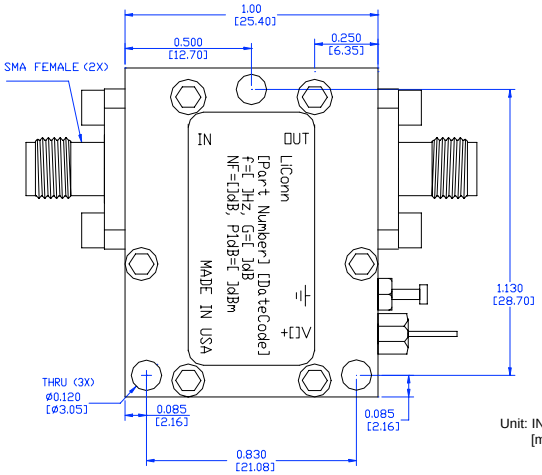
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE

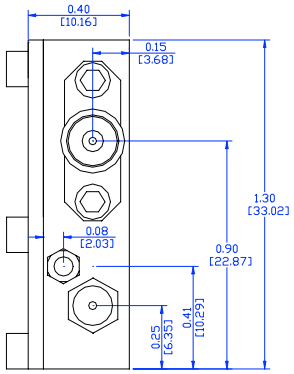












Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LNA09001300B

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Fax: 1-651-482-1573

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FEATURES:

- 1.2 GHz ~ 1.6 GHz;
- 33 dB Gain;
- 0.5 dB Noise Figure;
- 7.0 dBm P_{1dB};
- 17.0 dBm IP_3;
- RoHS Compliant.

APPLICATIONS:

- GPS;
- Satellite Communication;
- Test & Measurement;
- Mobile Communication.

LNA12001600A, 1.2 GHz ~ 1.6 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

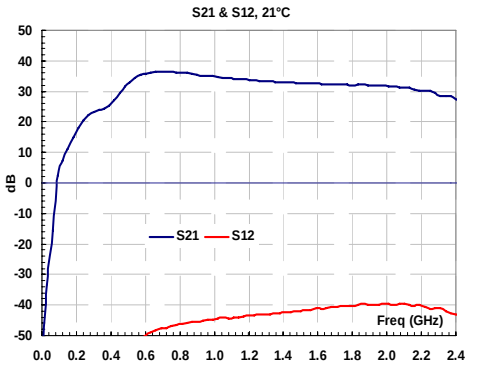
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB		33	
ΔG	Gain Flatness	dB		±0.7	
S_{11}	Input Return Loss	dB	14	18	
S_{22}	Output Return Loss	dB	14	18	
S_{12}	Reverse Isolation	dB		30	
NF	Noise Figure	dB		0.50	0.65
OIP_3	Output 3rd Order Intercept	dBm		17	
P_{1dB}	Output 1dB Gain Compression	dBm		7	
I_{dd}	Device Current (V_{dd}=+12V)	mA		25	
V_{dd}	DC Power Supply Voltage	V	+7	+12	+30
Z_0	Impedance	Ohm		50	

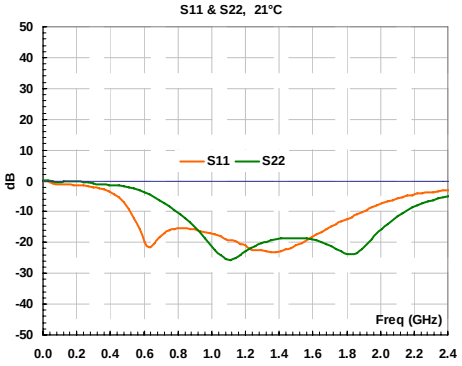
ABSOLUTE MAXIMUM RATINGS[1]

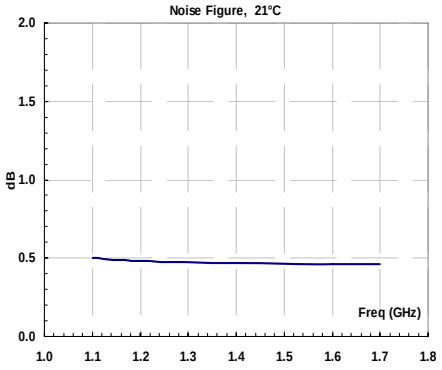
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	150
CW RF Input Power	dBm	+10
DC Supply Voltage	V	30
Drain Current	mA	150
Thermal Resistance	°C/W	220
Total Power Dissipation	mW	600
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

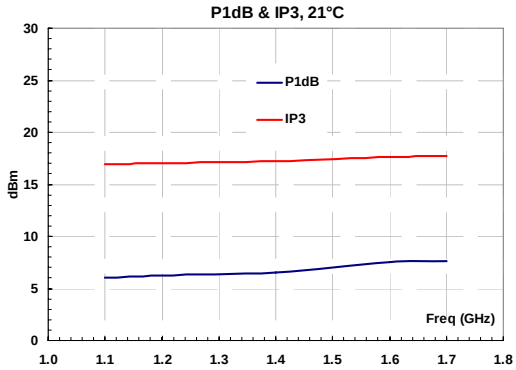
[1] Operation beyond these limits may cause permanent damage.

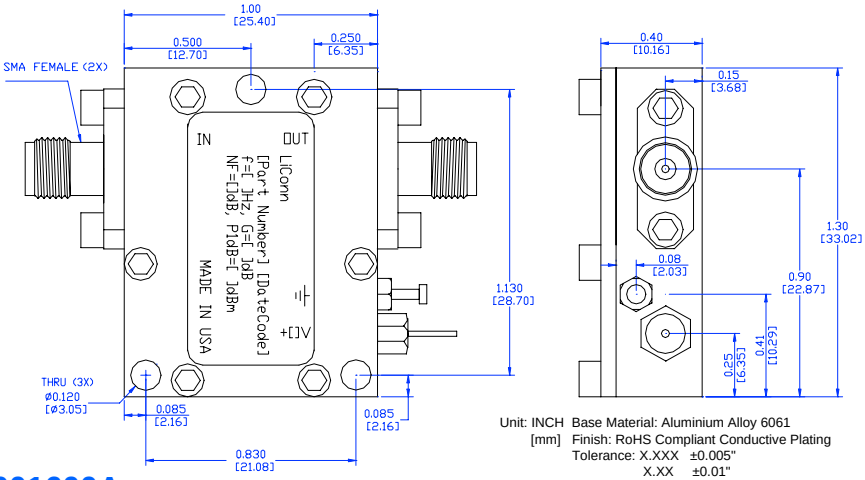
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LNA12001600A

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FEATURES:

- **1.2 – 9.0 GHz;**
- **24.0 dB Gain;**
- **3.0 dB Noise Figure;**
- **17.5 dBm P_{1dB};**
- **29.0 dBm IP_3;**
- **Unconditional Stable;**
- **RoHS Compliant**

APPLICATIONS:

- **Radar;**
- **Receivers;**
- **ECM System;**
- **WBA Systems;**
- **Point to Point;**
- **Test & Measurement;**
- **Wide Band PA Driver**

LNA12009000A – 1.2 ~ 9.0 GHz WIDE BAND AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 25 °C

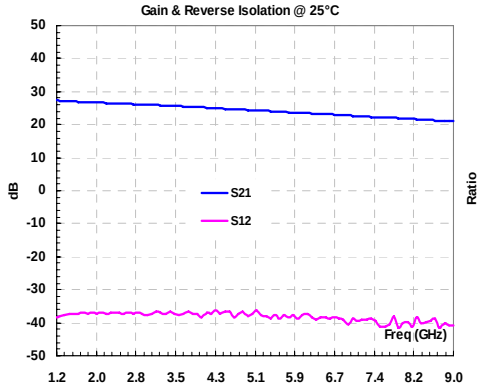
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
I_d	Device Current	mA		110	
G	Gain	dB	21	24	
ΔG	Gain Flatness	dB		±3.0	
Z_0	Impedance	Ohm		50	
OIP3	Output 3rd Order Intercept	dBm		29	
NF	Noise Figure	dB		3.0	3.7
P_{1dB}	Output 1dB Gain Compression	dBm		17.5	
S_{12}	Reverse Isolation	dB		38	
V_{dd}	DC Power Supply Voltage	V	4.5	5.0	6.0
$VSWR_1$	VSWR – Input	Ratio		1.43:1	1.80:1
$VSWR_2$	VSWR – Output	Ratio		1.70:1	1.85:1

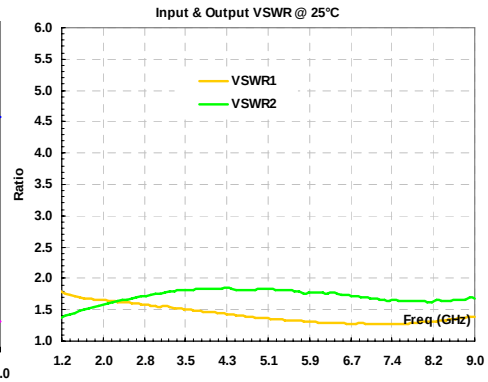
ABSOLUTE MAXIMUM RATINGS[1]

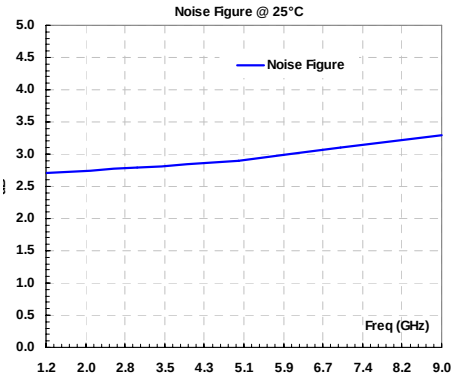
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
Drain Current	mA	150
Operating Temperature	°C	-54 ~ +85
RF Input Power	dBm	+20
RF Output Supply Voltage	V	8
Storage Temperature	°C	-65 ~ +150
Thermal Resistance	°C/W	140
Total Power Dissipation	mW	750

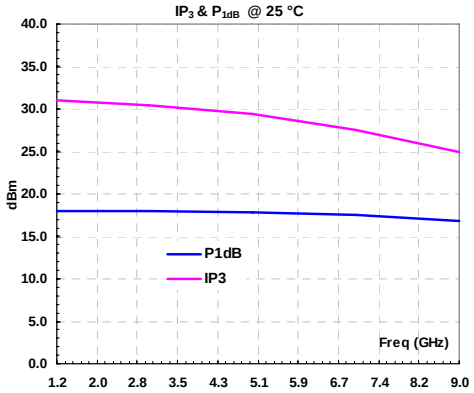
[1] Operation beyond these limits may cause permanent damage.

ELECTRICAL PERFORMANCE









ORDERING INFORMATION

Model Number	Input	Output
LNA12009000A-1	SMA Female	SMA Female
LNA12009000A-2	SMA Female	SMA Male
LNA12009000A-3	SMA Male	SMA Male
LNA12009000A-4	SMA Male	SMA Female
LNA12009000AG-1	SMA Female	SMA Female
LNA12009000AG-2	SMA Female	SMA Male
LNA12009000AG-3	SMA Male	SMA Male
LNA12009000AG-4	SMA Male	SMA Female

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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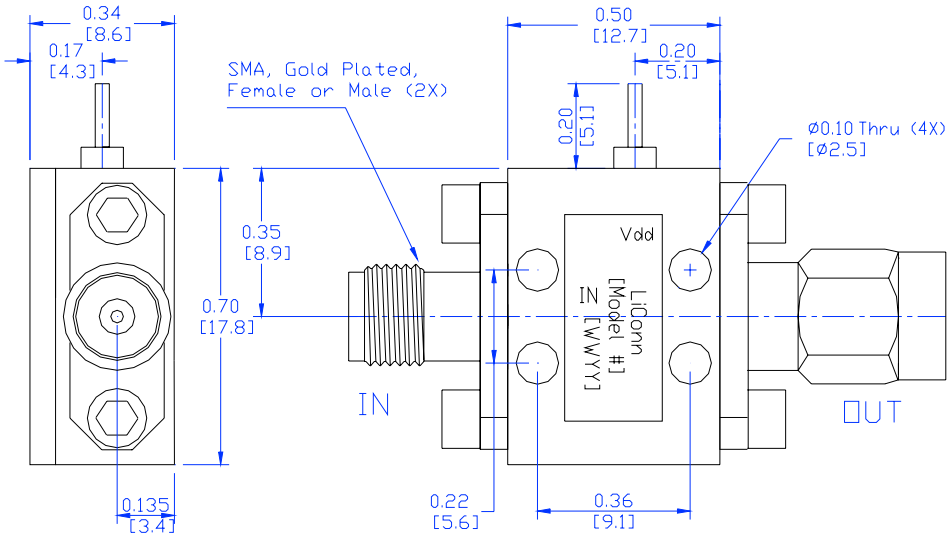
Mechanical Outline

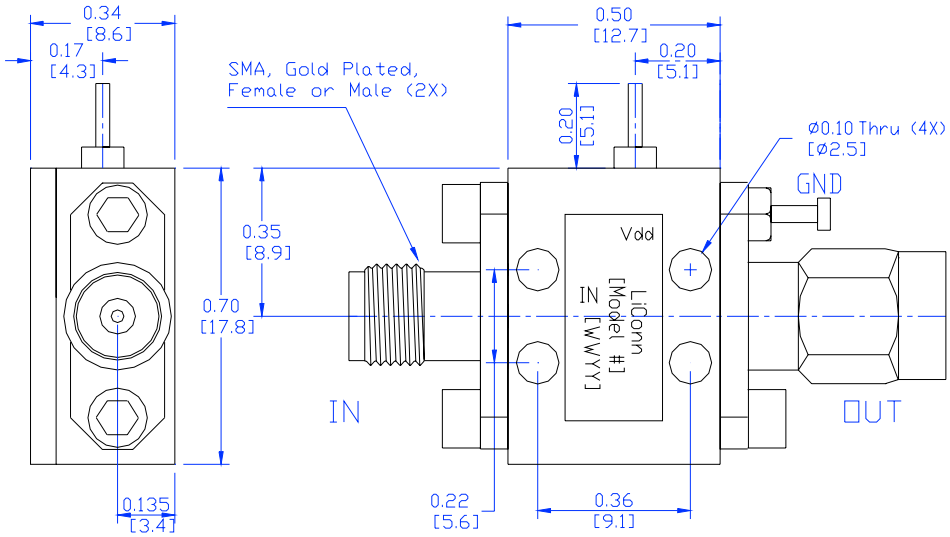
Unit: Inch/mm

Material: Brass
Finish: Gold Plating
Tolerance is Non-Accumulative

LNA12009000A-:



LNA12009000AG- (with Ground Turret on Output SMA):



FEATURES:

- 2.0 GHz ~ 2.6 GHz;
- 26 dB Gain;
- 0.7 dB Noise Figure;
- 12.0 dBm P_{1dB};
- Unconditional Stable;
- Precision machined housing;
- RoHS Compliant.

APPLICATIONS:

- Receiver;
- Wireless Data Communication;
- Measurement.

LNA20002600A, 2.0 GHz ~ 2.6 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

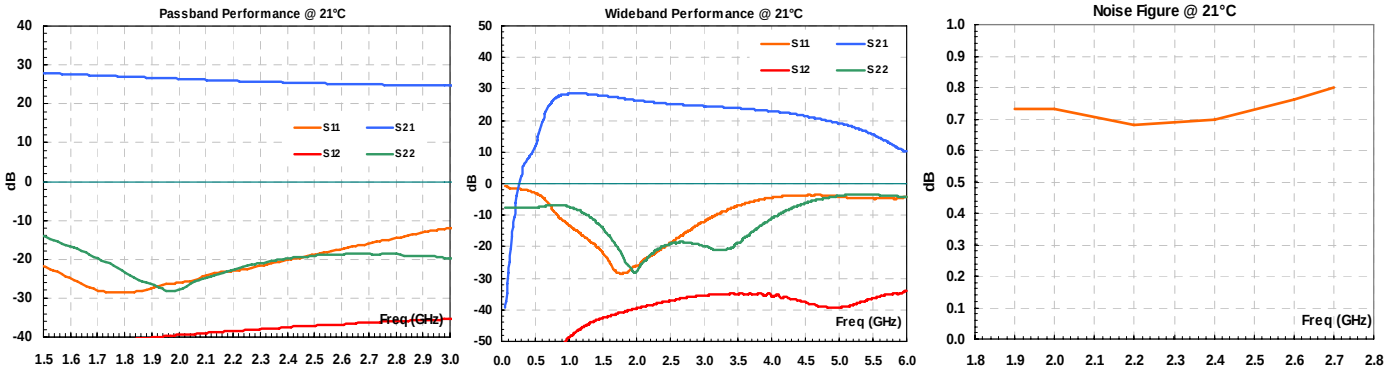
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	24	26	27
ΔG	Gain Flatness	dB		±0.75	±1.0
$VSWR_1$	Input VSWR	Ratio		1.4:1	1.5:1
$VSWR_2$	Output VSWR	Ratio		1.4:1	1.5:1
S_{12}	Reverse Isolation	dB	35	37	
NF	Noise Figure	dB		0.7	0.8
P_{1dB}	Output 1dB Gain Compression	dBm	11	12.5	
I_{dd}	Device Current (V_{dd}=+5V)	mA	50	55	60
V_{dd}	DC Power Supply Voltage	V	+4.7	+5.0	+5.3
Z_0	Impedance	Ohm		50	

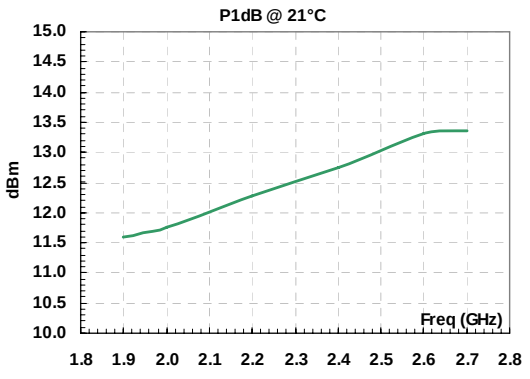
ABSOLUTE MAXIMUM RATINGS[1]

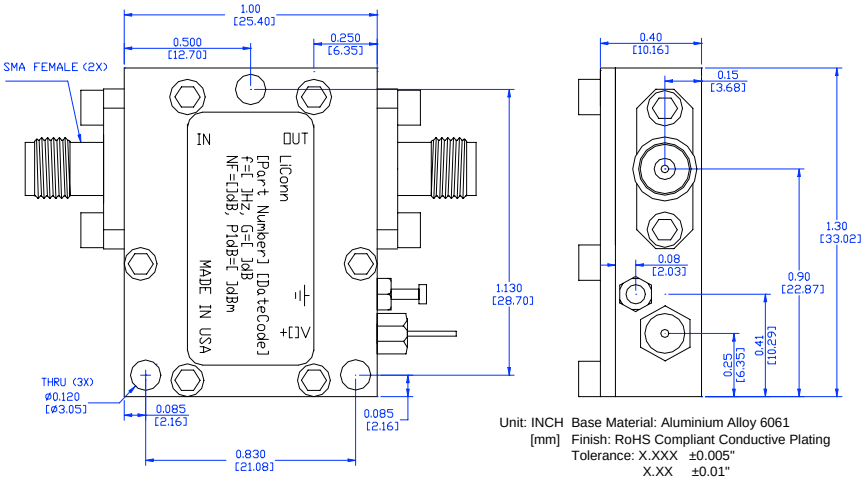
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	+10
DC Supply Voltage	V	+7.0
Drain Current	mA	80
Thermal Resistance	°C/W	220
Total Power Dissipation	mW	500
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

[1] Operation beyond these limits may cause permanent damage.

ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE







Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LNA20002600A

Tel: 1-651-482-1848
Fax: 1-651-482-1573

Rev 1.2

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FEATURES:

- 2.0 GHz ~ 6.0 GHz;
- 25 dB Gain;
- 1.0 dB Noise Figure;
- 12.0 dBm P_{1dB};
- 22.0 dBm IP_3;
- Unconditional Stable;
- Precision machined housing;
- RoHS Compliant.

APPLICATIONS:

- WiMAX;
- Security System;
- Defense;
- Measurement;
- Fixed Wireless;
- Mobile Infrastructure.

LNA20006000B, 2.0 GHz ~ 6.0 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

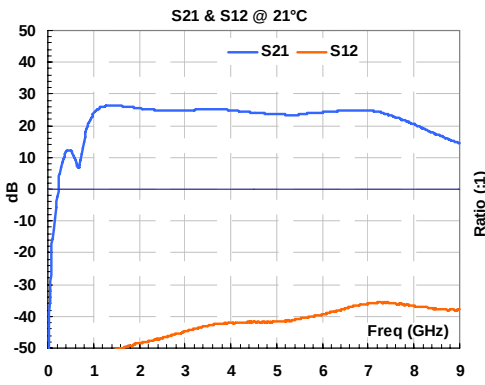
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	23	25	
ΔG	Gain Flatness	dB		±1.0	±1.5
$VSWR_1$	Input VSWR	Ratio		1.8:1	2:1
$VSWR_2$	Output VSWR	Ratio		1.5:1	2:1
S_{12}	Reverse Isolation	dB		40	
NF	Noise Figure	dB		1.0	1.2
OIP_3	Output 3rd Order Intercept	dBm		22	
P_{1dB}	Output 1dB Gain Compression	dBm	10	12	
I_{dd}	Device Current (V_{dd}=+5/12v)	mA		40	
V_{dd}	LNA20006000B	V	+4.7	+5.0	+5.3
	LNA20006000B-12		+8.0	+12.0	+16.0
Z_0	Impedance	Ohm		50	

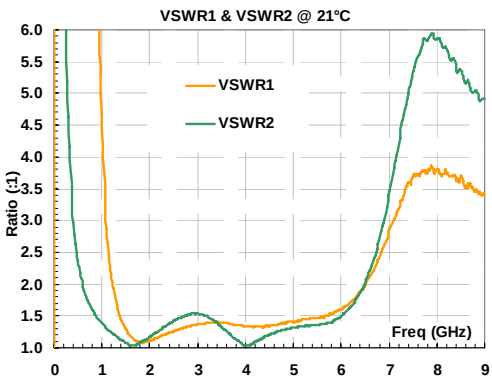
ABSOLUTE MAXIMUM RATINGS[1]

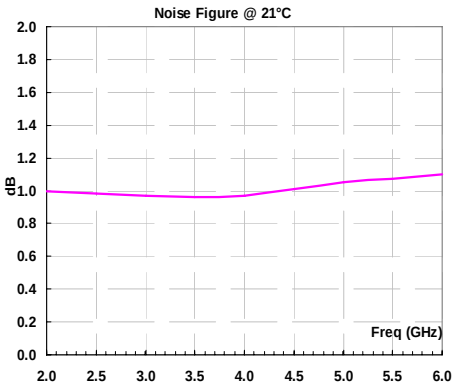
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	+10
DC Supply Voltage	V	+6.0
		+16.0
Drain Current	mA	70
Thermal Resistance	°C/W	220
Total Power Dissipation	mW	400
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

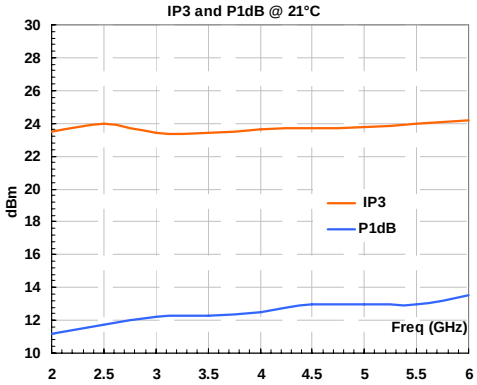
[1] Operation beyond these limits may cause permanent damage.

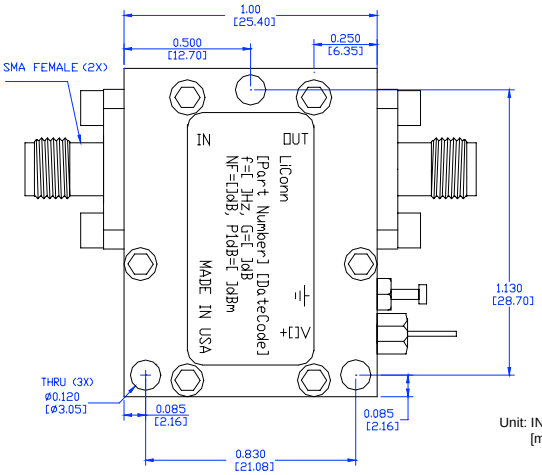
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE

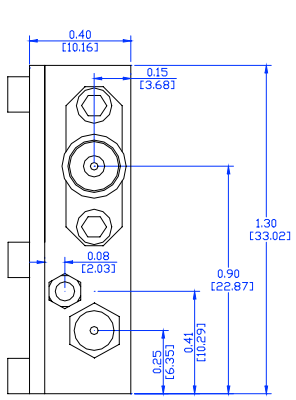












Unit: INCH [mm] Base Material: Aluminium Alloy 6061
Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION:

Part Number	V_{dd} (V)
LNA20006000B	+5.0
LNA20006000B-12	+12.0

Tel: 1-651-482-1848
Fax: 1-651-482-1573

Rev 1.3

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FEATURES:

- **5.0 GHz ~ 7.0 GHz;**
- **22 dB Gain;**
- **0.9 dB Noise Figure;**
- **10.0 dBm P_{1dB};**
- **21.0 dBm IP_3;**
- **RoHS Compliant.**

APPLICATIONS:

- **ISM;**
- **Satellite Communication;**
- **Test & Measurement;**
- **Mobile Communication.**

LNA50007000A, 5.0 GHz ~ 7.0 GHz WIDE BAND LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

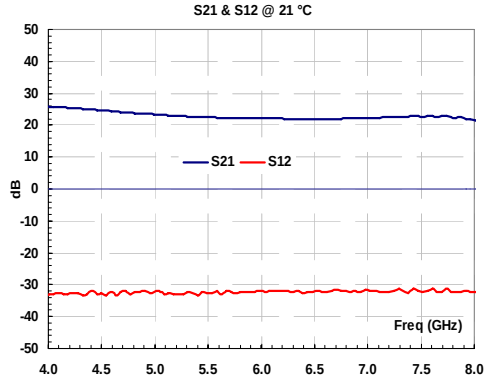
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB		22	
ΔG	Gain Flatness	dB		±1.0	
$VSWR_1$	Input VSWR	Ratio		1.5:1	1.8:1
$VSWR_2$	Output VSWR	Ratio		1.3:1	1.5:1
S_{12}	Reverse Isolation	dB		30	
NF	Noise Figure	dB		0.90	1.1
OIP_3	Output 3rd Order Intercept	dBm		21	
P_{1dB}	Output 1dB Gain Compression	dBm		10	
I_{dd}	Device Current (V_{dd}=+12V)	mA		40	
V_{dd}	DC Power Supply Voltage	V	+7	+12	+30
Z_0	Impedance	Ohm		50	

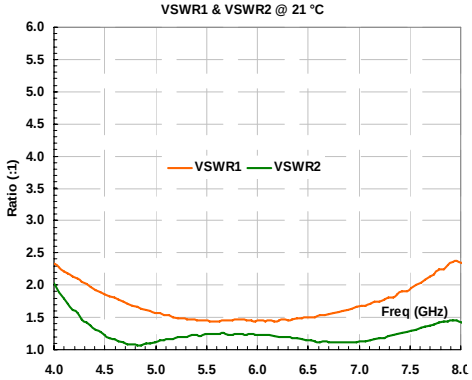
ABSOLUTE MAXIMUM RATINGS[1]

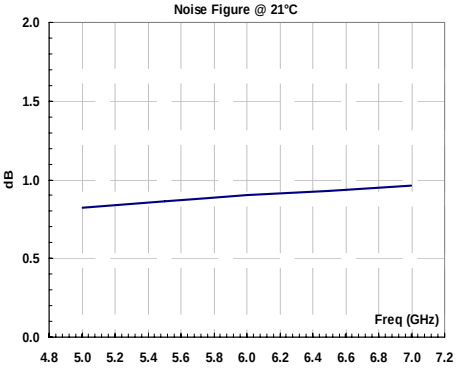
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	+10
DC Supply Voltage	V	30
Drain Current	mA	150
Thermal Resistance	°C/W	220
Total Power Dissipation	mW	600
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

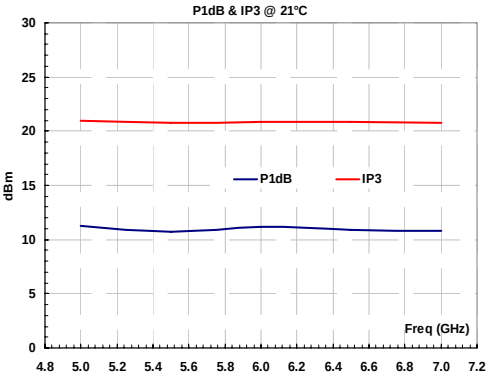
[1] Operation beyond these limits may cause permanent damage.

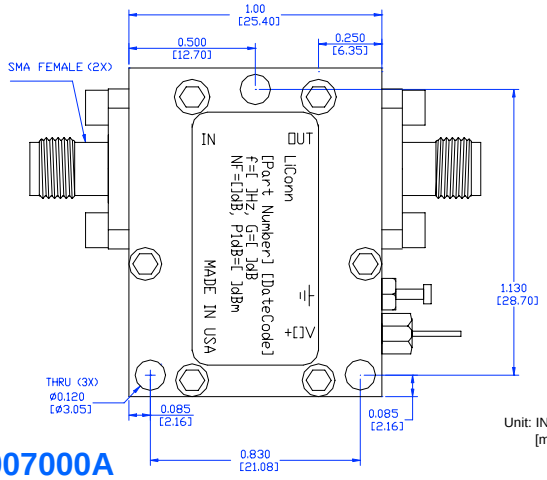
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE

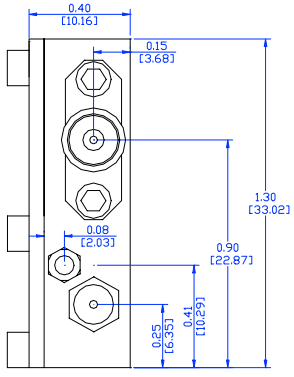












Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LNA50007000A

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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http://www.liconn.com

FEATURES:

- **1.0 – 12.0 GHz;**
- **13.0 dB Gain;**
- **3.1 dB Noise Figure;**
- **17.0 dBm P_{1dB};**
- **27.0 dBm IP_3;**
- **Unconditional Stable;**
- **RoHS Compliant**

APPLICATIONS:

- **Radar;**
- **Receivers;**
- **ECM System;**
- **WBA Systems;**
- **Point to Point;**
- **Test & Measurement;**
- **Wide Band PA Driver**

LNA100012000A – 1.0 ~ 12.0 GHz WIDE BAND AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 25 °C

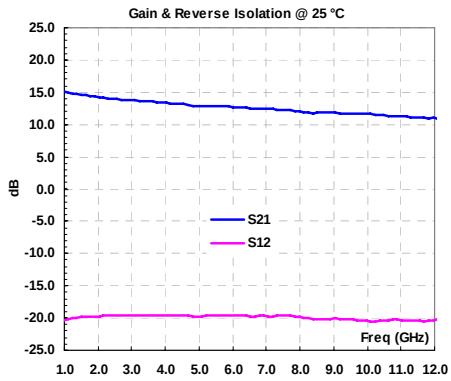
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
I_d	Device Current	mA		65	88
G	Gain	dB	11	13	
ΔG	Gain Flatness	dB		±2.0	
Z_0	Impedance	Ohm		50	
OIP3	Output 3rd Order Intercept	dBm		27	
NF	Noise Figure	dB		3.3	4.0
P_{1dB}	Output 1dB Gain Compression	dBm		17	
S_{12}	Reverse Isolation	dB		20	
V_{dd}	DC Power Supply Voltage	V	4.5	5.0	6.0
$VSWR_1$	VSWR – Input	Ratio		1.35	2.00
$VSWR_2$	VSWR – Output	Ratio		1.25	1.35

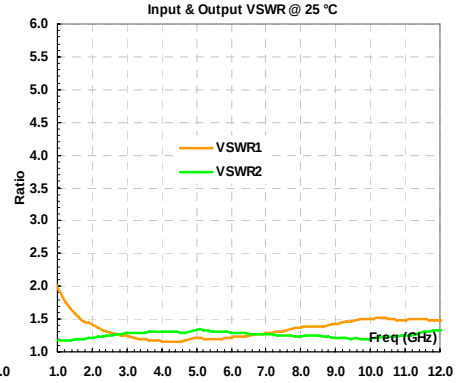
ABSOLUTE MAXIMUM RATINGS[1]

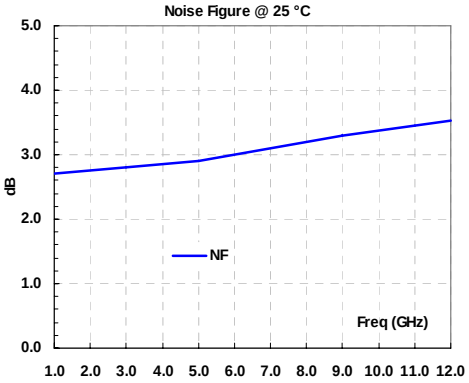
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
Drain Current	mA	100
Operating Temperature	°C	-54 ~ +85
RF Input Power	dBm	+20
RF Output Supply Voltage	V	8
Storage Temperature	°C	-65 ~ +150
Thermal Resistance	°C/W	140
Total Power Dissipation	mW	350

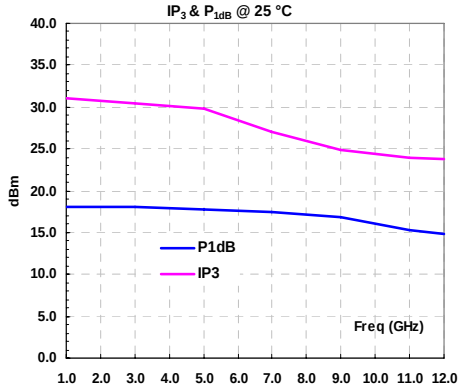
[1] Operation beyond these limits may cause permanent damage.

ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE









ORDERING INFORMATION

Model Number	Input	Output
LNA100012000A-1	SMA Female	SMA Female
LNA100012000A-2	SMA Female	SMA Male
LNA100012000A-3	SMA Male	SMA Male
LNA100012000A-4	SMA Male	SMA Female
LNA100012000AG-1	SMA Female	SMA Female
LNA100012000AG-2	SMA Female	SMA Male
LNA100012000AG-3	SMA Male	SMA Male
LNA100012000AG-4	SMA Male	SMA Female

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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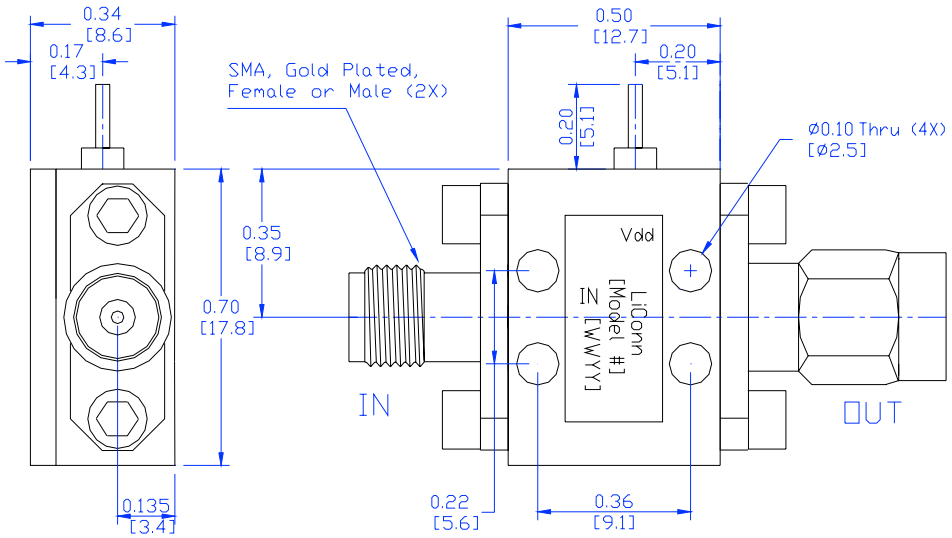
http://www.liconn.com

Mechanical Outline

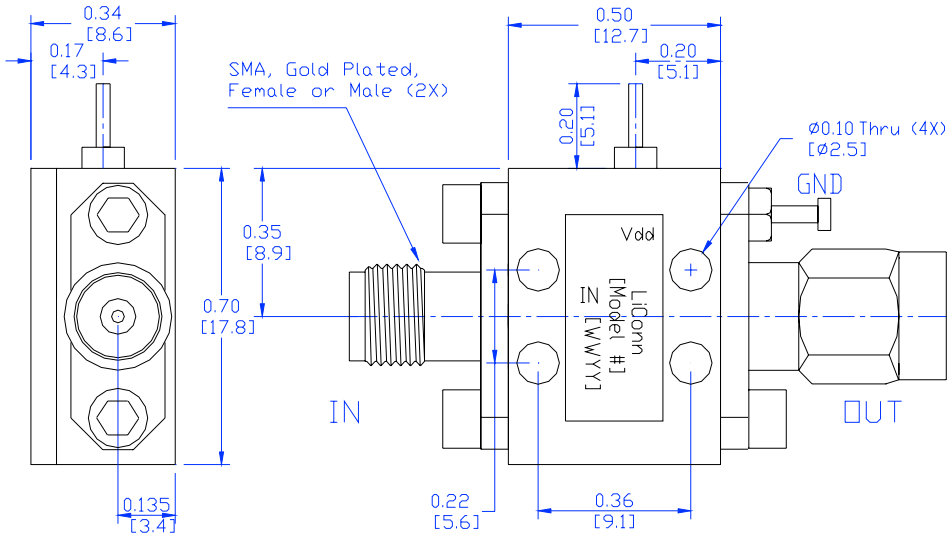
Unit: Inch/mm

Material: Brass
Finish: Gold Plating
Tolerance is Non-Accumulative

LNA100012000A-:



LNA100012000AG- (with Ground Turret on Output SMA):



FEATURES:

- **8 GHz ~ 18 GHz;**
- **21.0 dB Gain;**
- **2.2 dB Noise Figure;**
- **10.0 dBm P_{1dB};**
- **± 1.0 dB Gain Flatness;**
- **RoHS Compliant.**

APPLICATIONS:

- **Wideband;**
- **Data Communication;**
- **Measurement.**

LNA800018000A, 8 GHz ~ 18 GHz LOW NOISE AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

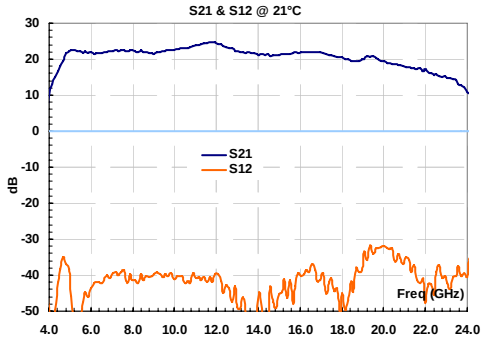
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB		21	
ΔG	Gain Flatness	dB		±1.0	±1.5
$VSWR_1$	Input VSWR	Ratio		1.8:1	2.4:1
$VSWR_2$	Output VSWR	Ratio		1.5:1	2.0:1
S_{12}	Reverse Isolation	dB		35	
NF	Noise Figure	dB		2.2	
P_{1dB}	Output 1dB Gain Compression	dBm		10	
I_{dd}	Device Current (V_{dd}=+12V)	mA		60	
V_{dd}	Positive Power Supply Voltage	V	+11.5	+12	+15
Z_0	Impedance	Ohm		50	

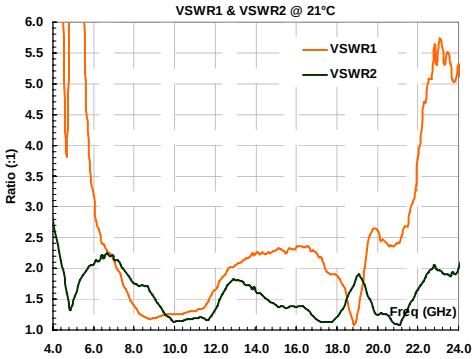
ABSOLUTE MAXIMUM RATINGS[1]

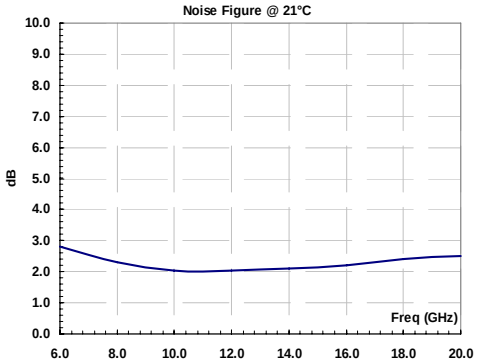
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	15
DC Supply Voltage	V	16
Drain Current	mA	80
Thermal Resistance	°C/W	50
Total Power Dissipation	W	1.2
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

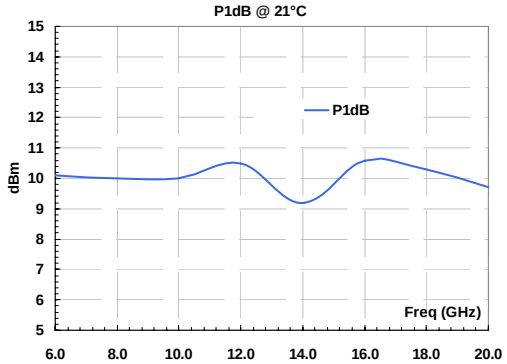
[1] Operation beyond these limits may cause permanent damage.

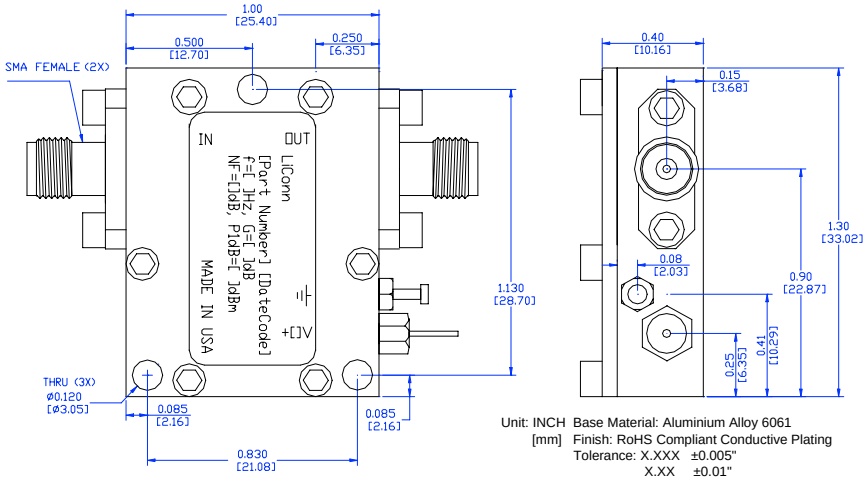
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LNA800018000A

Tel: 1-651-482-1848
Fax: 1-651-482-1573

Rev 1.1

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FEATURES:

- 1 MHz ~ 150 MHz;
- 17.0 dB Gain;
- 3.0dB Noise Figure;
- 30.0 dBm P_{1dB};
- 45.0 dBm IP_3;
- RoHS Compliant.

APPLICATIONS:

- SW;
- FM;
- VHF.

LPA00010150A, 1 MHz ~ 150 MHz WIDE BAND POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

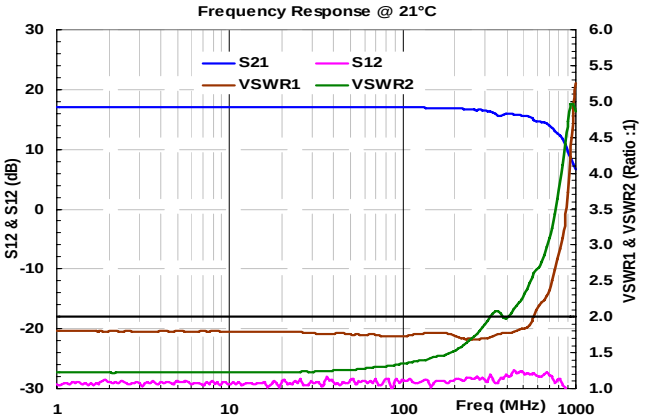
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	16	17.0	18
ΔG	Gain Flatness	dB		±0.2	
$VSWR_1$	Input VSWR	Ratio			2.0:1
$VSWR_2$	Output VSWR	Ratio		1.5:1	2.0:1
S_{12}	Reverse Isolation	dB		28	
NF	Noise Figure	dB		3.0	
OIP_3	Output 3rd Order Intercept	dBm	43	45	
P_{1dB}	Output 1dB Gain Compression	dBm	29	30.0	
I_{dd}	Device Current (V_{dd}=+12V)	mA		200	
V_{dd}	Positive Power Supply Voltage	V	+11.5	+12.0	+15.0
Z_0	Impedance	Ohm		50	

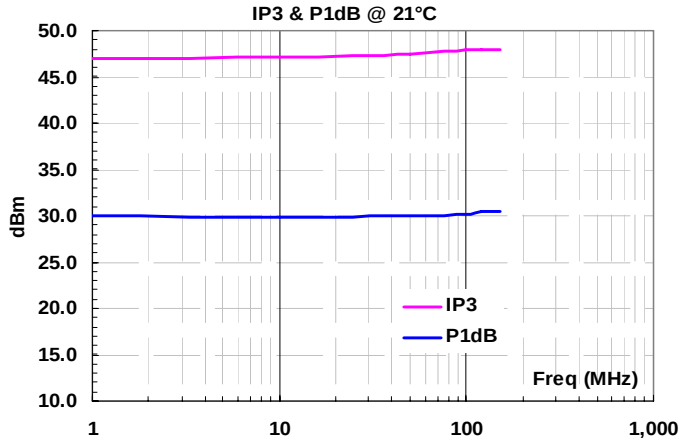
ABSOLUTE MAXIMUM RATINGS[1]

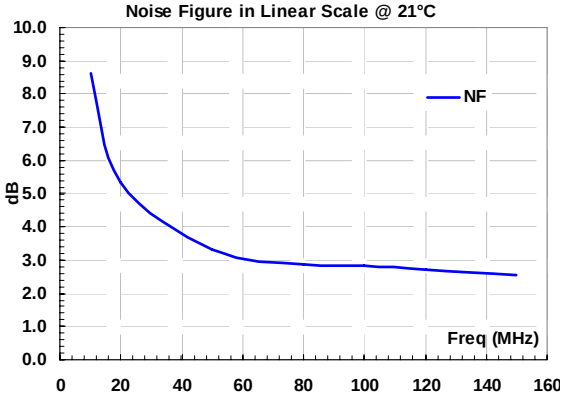
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	20
DC Supply Voltage	V	16
Drain Current	mA	250
Thermal Resistance	°C/W	32
Total Power Dissipation	W	3.0
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

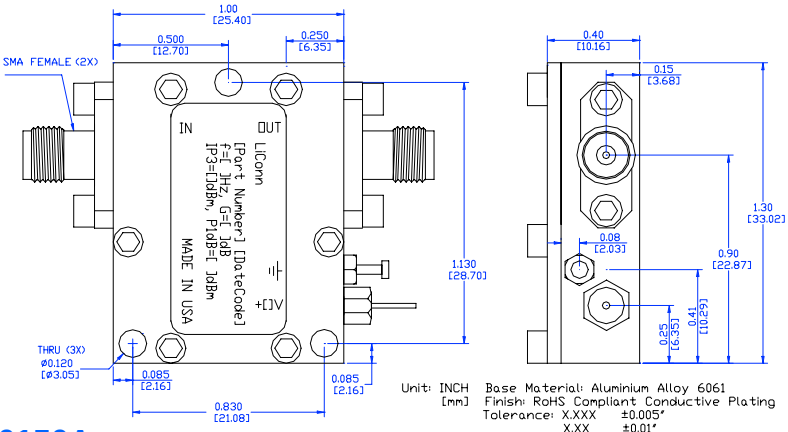
[1] Operation beyond these limits may cause permanent damage.

ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE









ORDERING INFORMATION: LPA00010150A

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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FEATURES:

- 0.1 MHz ~ 150 MHz;
- 17.0 dB Gain;
- 3.0dB Noise Figure;
- 30.0 dBm P_{1dB};
- 45.0 dBm IP_3;
- RoHS Compliant.

APPLICATIONS:

- SW;
- FM;
- VHF.

LPA00010150B, 0.1 MHz ~ 150 MHz WIDE BAND POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

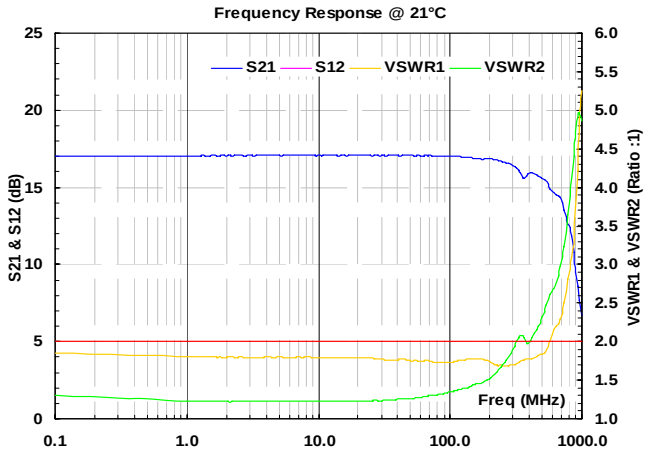
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	16	17.0	18
ΔG	Gain Flatness	dB		±0.2	
$VSWR_1$	Input VSWR	Ratio			2.0:1
$VSWR_2$	Output VSWR	Ratio		1.5:1	2.0:1
S_{12}	Reverse Isolation	dB		28	
NF	Noise Figure	dB		3.0	
OIP_3	Output 3rd Order Intercept	dBm	43	45	
P_{1dB}	Output 1dB Gain Compression	dBm	29	30.0	
I_{dd}	Device Current (V_{dd}=+12V)	mA		200	
V_{dd}	Positive Power Supply Voltage	V	+11.5	+12.0	+15.0
Z_0	Impedance	Ohm		50	

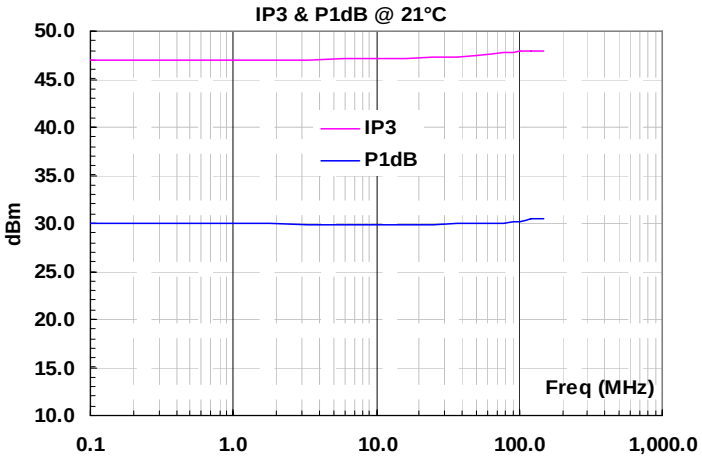
ABSOLUTE MAXIMUM RATINGS[1]

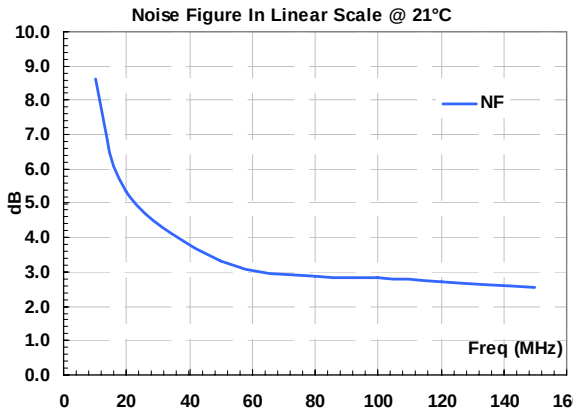
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	20
DC Supply Voltage	V	16
Drain Current	mA	250
Thermal Resistance	°C/W	32
Total Power Dissipation	W	3.0
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

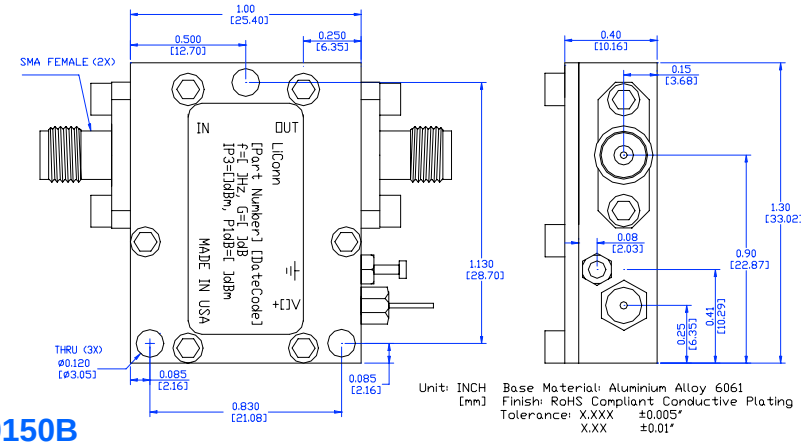
[1] Operation beyond these limits may cause permanent damage.

ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE









ORDERING INFORMATION: LPA00010150B

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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FEATURES:

- 1 MHz ~ 600 MHz;
- 16.0 dB Gain;
- 3.0 dB Noise Figure;
- 30.0 dBm P_{1dB};
- 45.0 dBm IP_3;
- RoHS Compliant.

APPLICATIONS:

- Base Station;
- Data Communication;
- Tower Top;
- Last-Mile Wireless Communication;
- Measurement.

LPA00010600A, 1 MHz ~ 600 MHz WIDE BAND POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

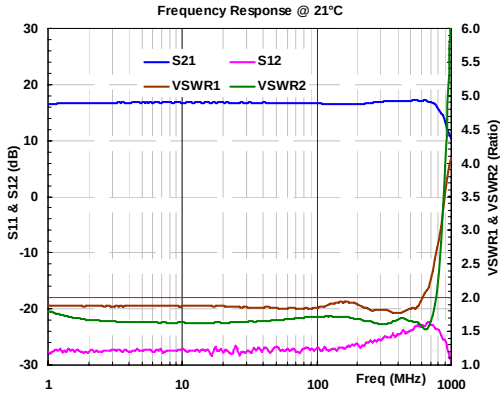
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	15	16	18
ΔG	Gain Flatness	dB		±0.5	
$VSWR_1$	Input VSWR	Ratio			2.0:1
$VSWR_2$	Output VSWR	Ratio			2.0:1
S_{12}	Reverse Isolation	dB		27	
NF	Noise Figure	dB		3.0	
OIP_3	Output 3rd Order Intercept	dBm	42	45	
P_{1dB}	Output 1dB Gain Compression	dBm	28	30	
I_{dd}	Device Current (V_{dd}=+12V)	mA		200	
V_{dd}	Positive Power Supply Voltage	V	+11.5	+12	+15
Z_0	Impedance	Ohm		50	

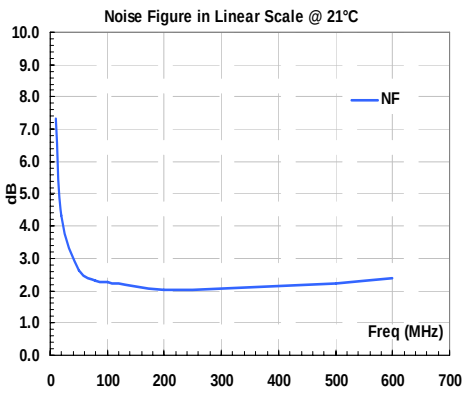
ABSOLUTE MAXIMUM RATINGS[1]

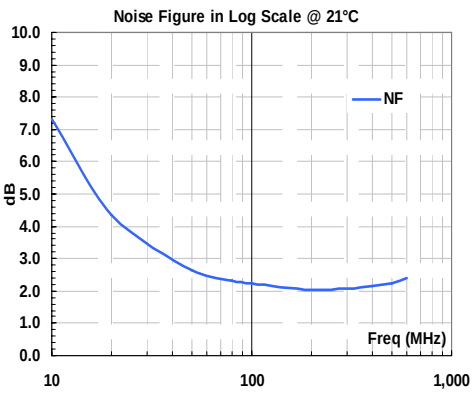
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	20
DC Supply Voltage	V	16
Drain Current	mA	250
Thermal Resistance	°C/W	32
Total Power Dissipation	W	3.0
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

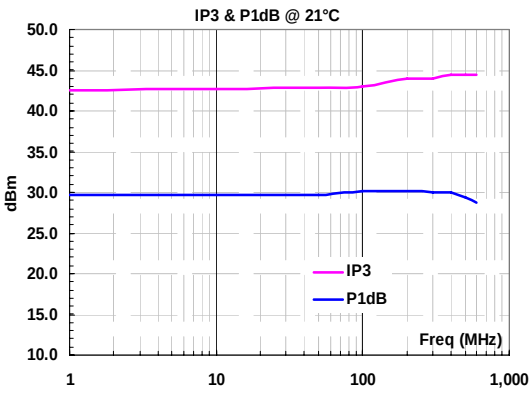
[1] Operation beyond these limits may cause permanent damage.

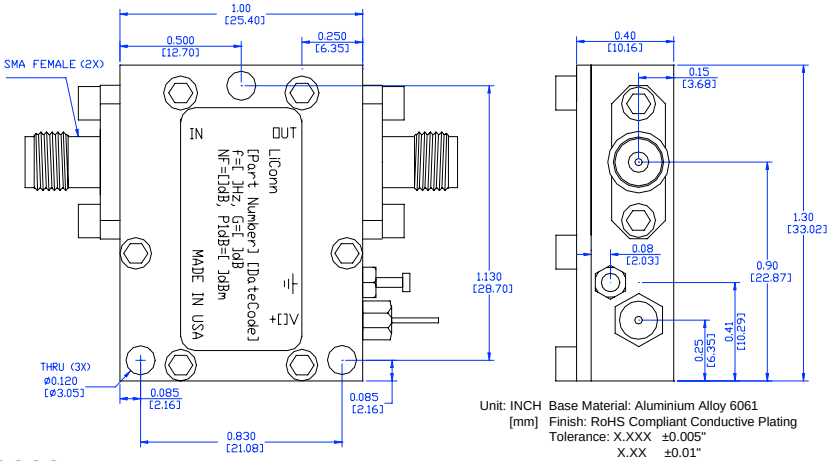
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











Unit: INCH Base Material: Aluminium Alloy 6061
[mm] Finish: RoHS Compliant Conductive Plating
Tolerance: X.XXX ±0.005"
X.XX ±0.01"

ORDERING INFORMATION: LPA00010600A

Tel: 1-651-482-1848
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FEATURES:

- 1 MHz ~ 1500 MHz;
- 14.0 dB Gain;
- 5.0dB Noise Figure;
- 29.0 dBm P_{1dB};
- 44.0 dBm IP_3;
- RoHS Compliant.

APPLICATIONS:

- Base Station;
- Data Communication;
- Tower Top;
- GPS;
- Measurement.

LPA00011500A, 1 MHz ~ 1500 MHz WIDE BAND POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

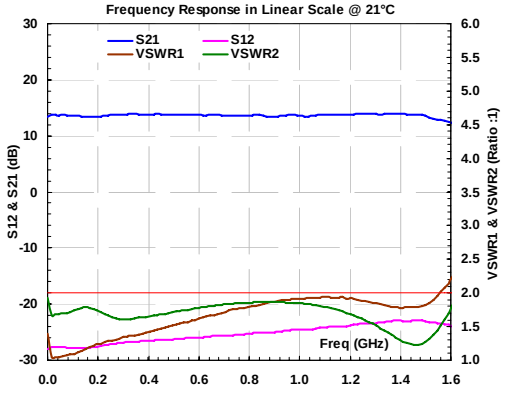
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	13	14	15
ΔG	Gain Flatness	dB		±0.5	
$VSWR_1$	Input VSWR	Ratio			2.2:1
$VSWR_2$	Output VSWR	Ratio			2.2:1
S_{12}	Reverse Isolation	dB	23	25	
NF	Noise Figure	dB		5	10
OIP_3	Output 3rd Order Intercept	dBm	42	45	
P_{1dB}	Output 1dB Gain Compression	dBm	27.0	29	
I_{dd}	Device Current (V_{dd}=+12V)	mA		200	
V_{dd}	Positive Power Supply Voltage	V	+11.5	+12	+15
Z_0	Impedance	Ohm		50	

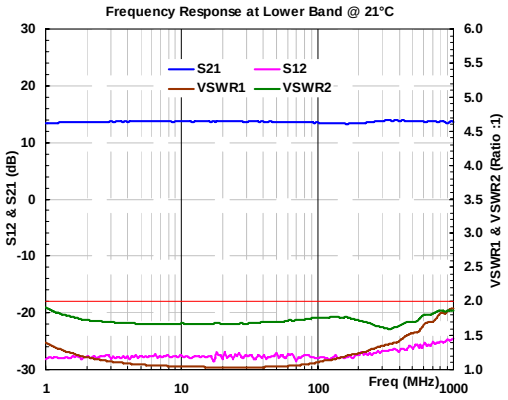
ABSOLUTE MAXIMUM RATINGS[1]

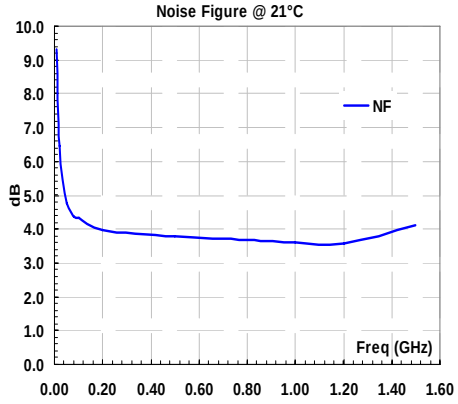
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	20
DC Supply Voltage	V	16
Drain Current	mA	250
Thermal Resistance	°C/W	40
Total Power Dissipation	W	3.0
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

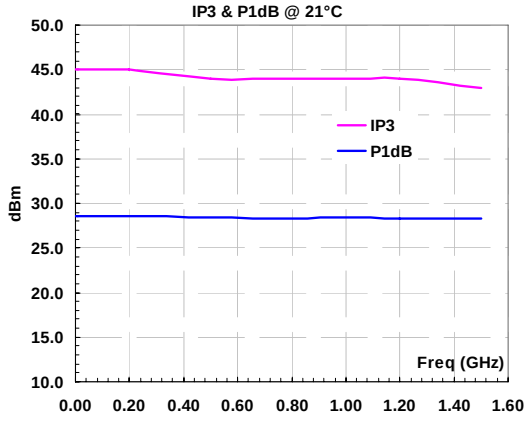
[1] Operation beyond these limits may cause permanent damage.

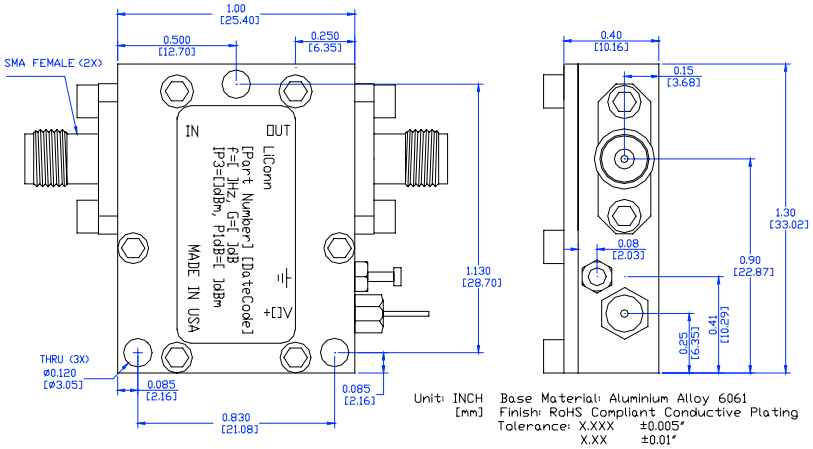
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











ORDERING INFORMATION: LPA00011500A

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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FEATURES:

- 869 MHz ~ 894MHz
- 3.0 dB Noise Figure
- 55.0 dBm output IP_3
- 43.0 dB Gain
- 47.0 dBm P_{1dB}
- 1.22:1 VSWR
- Unconditional stable
- RoHS compliant

APPLICATIONS:

- Mobile Infrastructures
- GSM
- Fixed Wireless

ORDER INFO:

LPA08690894A

LPA08690894A, 869 MHz ~ 894 MHz POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 25 °C

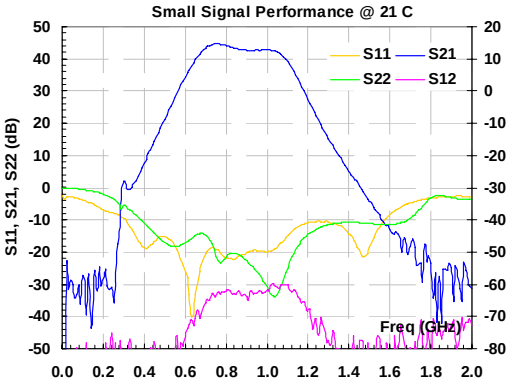
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	41	43	
ΔG	Gain Variation	dB		±0.3	±0.5
NF	Noise Figure	dB		3.0	
P_{1dB}	Output Power 1dB compression Point	dBm	45	47	
IP_3	Two-Tone, Pout +37 dBm each, 1 MHz separation	dBm	53	55	
I_{dd}	Vdd= +28 V, 0.65 A quiescent DC bias	A			4.5
V_{dd}	Power Supply Voltage	V	26	28	30
S_{11}	Input Return Loss	dB	16	20	
S_{22}	Output Return Loss	dB	16	20	
S_{12}	Reverse Isolation	dB		70	
Z_0	Impedance	Ohm		50	

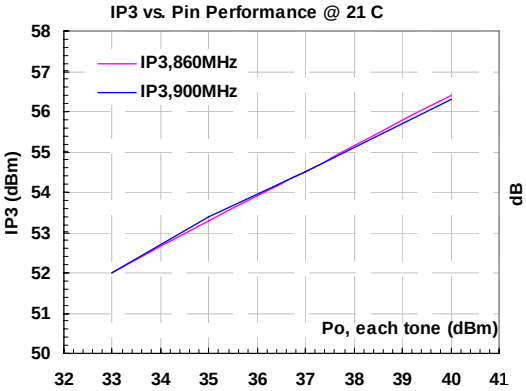
Absolute Maximum RatingS[1]

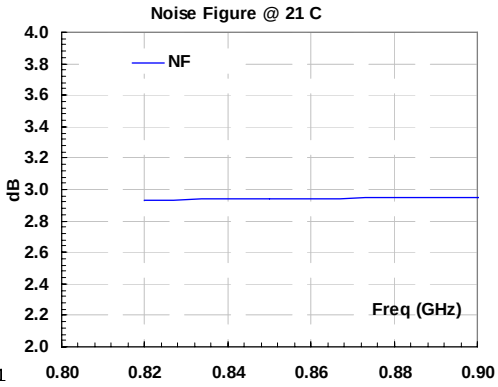
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	150
DC Supply Voltage	V	+30
Drain Current	A	5.0
RF Input Power	dBm	10
Thermal Resistance	°C/W	1.2
Total Power Dissipation	W	170
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +150

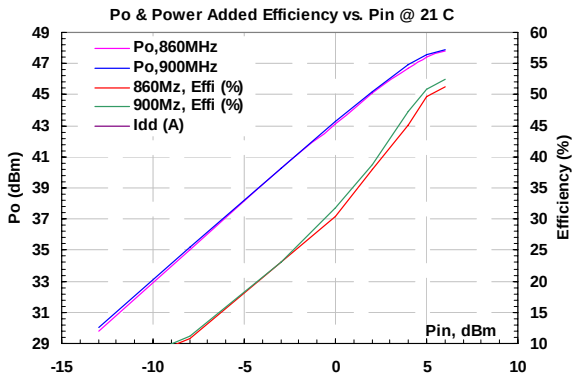
[1] Operation beyond these limits may cause permanent damage.

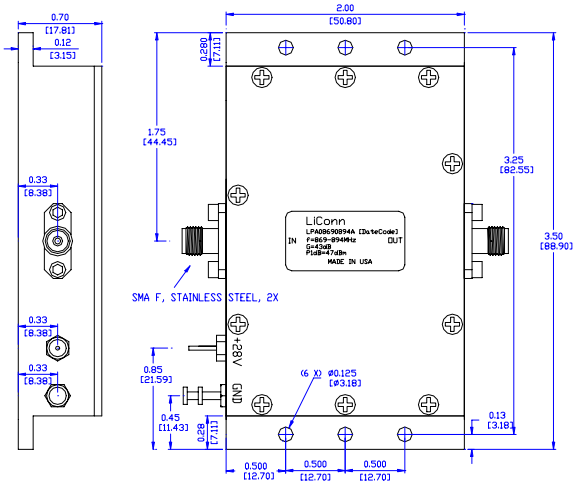
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











Unit: INCH[mm]
Material: Aluminum 6061
Finish: Clear Conductive Coating

Tel: 1-651-482-1848
Fax: 1-651-482-1573

Rev 1.1

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http://www.liconn.com

FEATURES:

- 925 MHz ~ 960MHz
- 3.0 dB Noise Figure
- 55.0 dBm output IP_3
- 43.0 dB Gain
- 47.0 dBm P_{1dB}
- 1.22:1 VSWR
- Unconditional stable
- RoHS compliant

APPLICATIONS:

- Mobile Infrastructures
- GSM
- Fixed Wireless

ORDER INFO:

LPA09250960A

LPA09250960A, 925 MHz ~ 960 MHz POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 25 °C

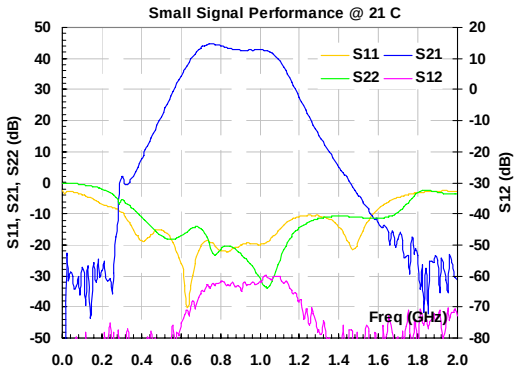
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	41	43	
ΔG	Gain Variation	dB		±0.3	±0.5
NF	Noise Figure	dB		3.0	
P_{1dB}	Output Power 1dB compression Point	dBm	45	47	
IP_3	Two-Tone, Pout +37 dBm each, 1 MHz separation	dBm	53	55	
I_{dd}	Vdd= +28 V, 0.65 A quiescent DC bias	A			4.5
V_{dd}	Power Supply Voltage	V	26	28	30
S_{11}	Input Return Loss	dB	16	20	
S_{22}	Output Return Loss	dB	16	20	
S_{12}	Reverse Isolation	dB		70	
Z_0	Impedance	Ohm		50	

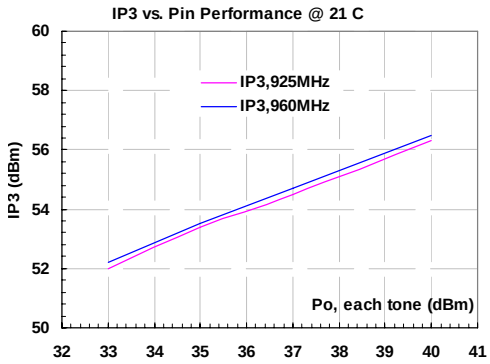
Absolute Maximum RatingS[1]

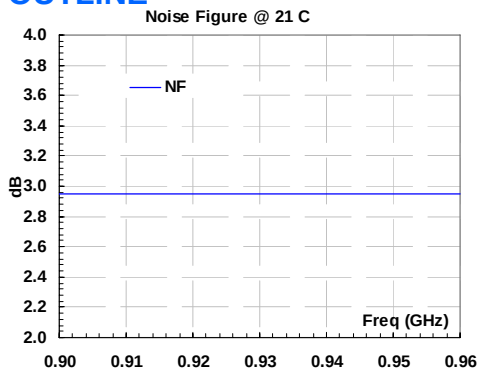
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	150
DC Supply Voltage	V	+30
Drain Current	A	5.0
RF Input Power	dBm	10
Thermal Resistance	°C/W	1.2
Total Power Dissipation	W	170
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +150

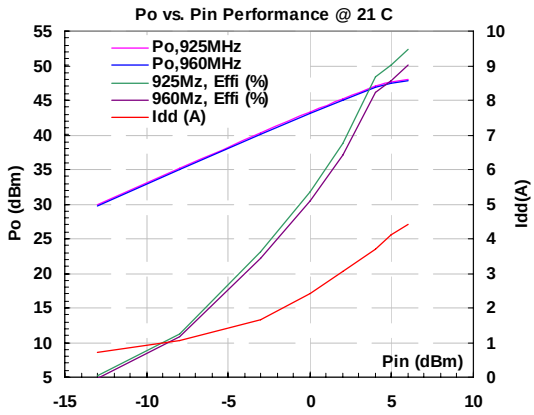
[1] Operation beyond these limits may cause permanent damage.

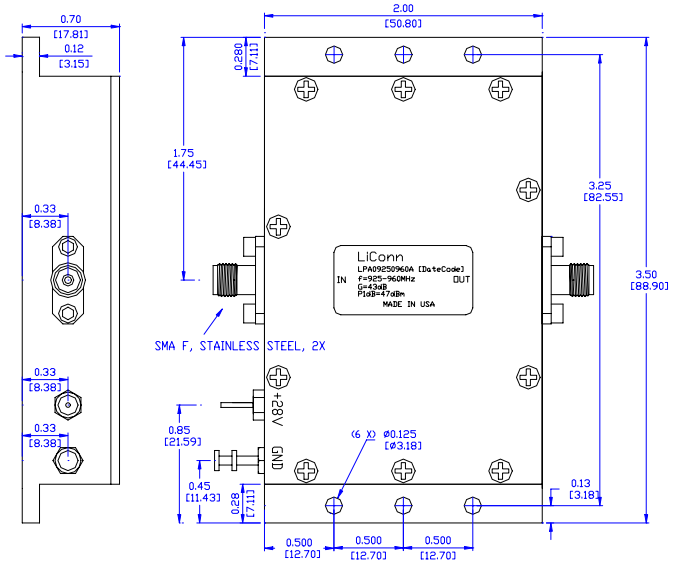
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











Unit: INCH[mm]
Material: Aluminum 6061
Finish: Clear Conductive Coating

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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FEATURES:

- **1930 MHz ~ 1990MHz**
- **2.0 dB Noise Figure**
- **56.0 dBm output IP_3**
- **43.0 dB Gain**
- **42.5 dBm P_{sat}**
- **1.25:1 VSWR**
- **Unconditional stable**
- **RoHS compliant**

APPLICATIONS:

- **Mobile Infrastructures**
- **CDMA**
- **Fixed Wireless**

ORDER INFO:

LPA19301990A

LPA19301990A, 1930 MHz ~ 1990 MHz POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 25 °C

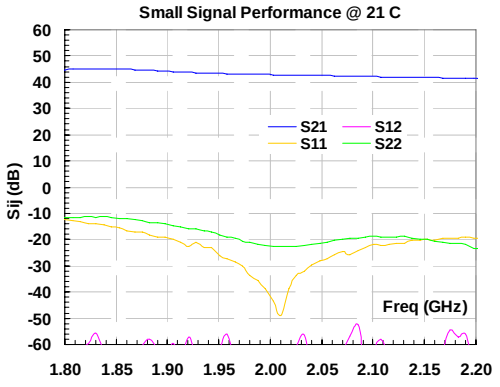
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	41	43	45
ΔG	Gain Variation	dB		±0.5	±1.0
NF	Noise Figure	dB		2.0	
P_{sat}	Output Saturated Power	dBm	41.5	42.5	
IP_3	Two-Tone, Pout +33 dBm each, 1 MHz separation	dBm	54	56	
I_{dd}	Vdd= +28 V, 0.315 A quiescent DC bias	A			2.0
V_{dd}	Power Supply Voltage	V	26	28	30
S_{11}	Input Return Loss	dB	15	20	
S_{22}	Output Return Loss	dB	15	19	
S_{12}	Reverse Isolation	dB		60	
Z_0	Impedance	Ohm		50	

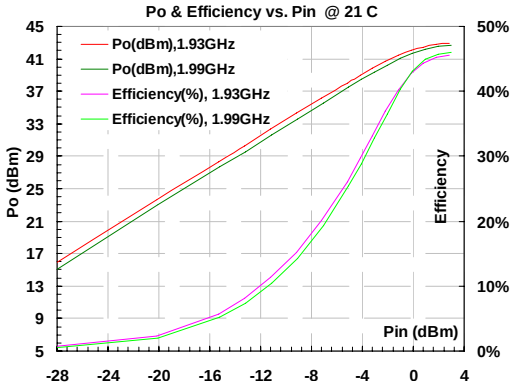
Absolute Maximum RatingS[1]

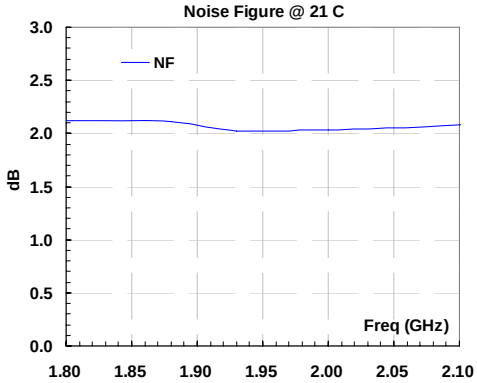
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	150
DC Supply Voltage	V	+32
Drain Current	A	2.0
RF Input Power	dBm	17
Thermal Resistance	°C/W	1.3
Total Power Dissipation	W	56
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +150

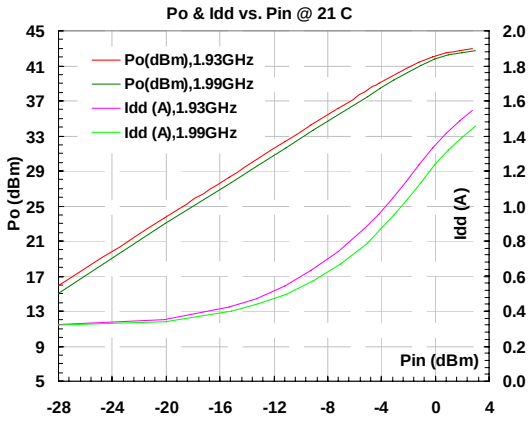
[1] Operation beyond these limits may cause permanent damage.

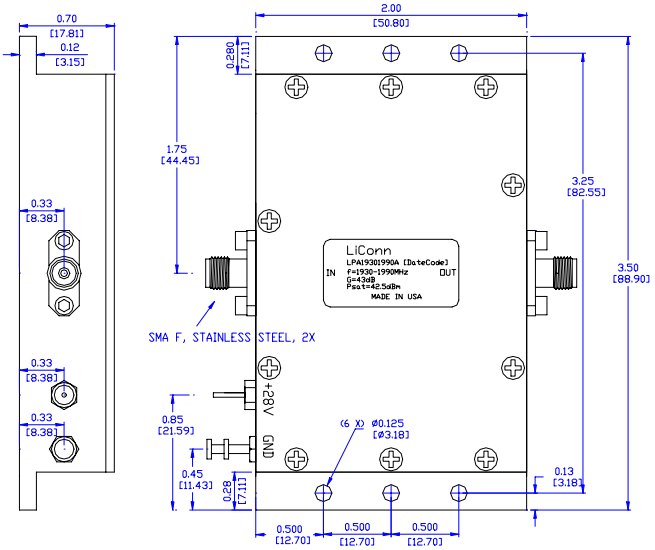
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











Unit: INCH[mm]
Material: Aluminum 6061
Finish: Clear Conductive Coating

Tel: 1-651-482-1848
Fax: 1-651-482-1573

Rev 1.1

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FEATURES:

- **6.0 GHz ~ 18.0 GHz;**
- **12.0 dB Gain;**
- **4.5 dB Noise Figure;**
- **19.0 dBm P_{1dB};**
- **28.0 dBm IP_3;**
- **RoHS Compliant.**

APPLICATIONS:

- **Wideband;**
- **Data Communication;**
- **Measurement.**

LPA600018000A, 6.0 GHz ~ 18.0 GHz MEDIUM POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

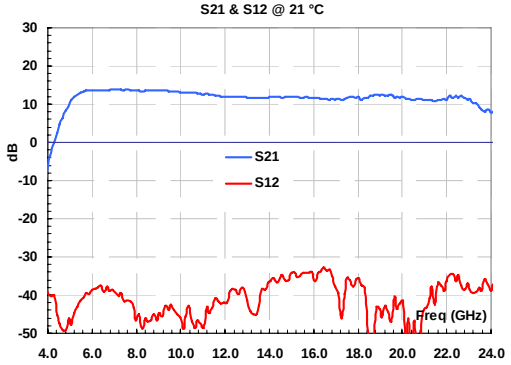
Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Gain	dB	10	12	
ΔG	Gain Flatness	dB		±1.0	±1.5
$VSWR_1$	Input VSWR	Ratio		1.5:1	2.2:1
$VSWR_2$	Output VSWR	Ratio		1.3:1	2.0:1
S_{12}	Reverse Isolation	dB		35	
NF	Noise Figure	dB		4.5	
OIP_3	Output 3rd Order Intercept	dBm		28	
P_{1dB}	Output 1dB Gain Compression	dBm	17	19	
I_{dd}	Device Current (V_{dd}=+12V)	mA		110	
V_{dd}	Positive Power Supply Voltage	V	+11.5	+12	+15
Z_0	Impedance	Ohm		50	

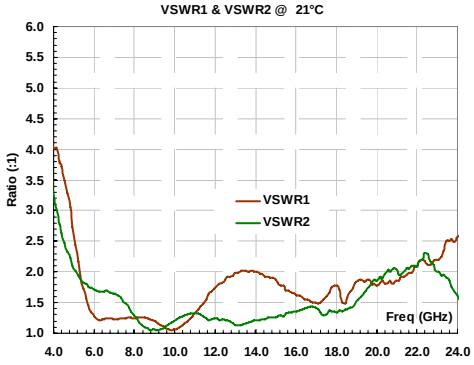
ABSOLUTE MAXIMUM RATINGS[1]

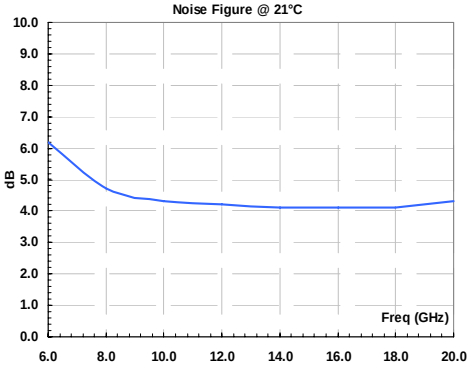
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+150
CW RF Input Power	dBm	23
DC Supply Voltage	V	16
Drain Current	mA	150
Thermal Resistance	°C/W	40
Total Power Dissipation	W	2.0
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

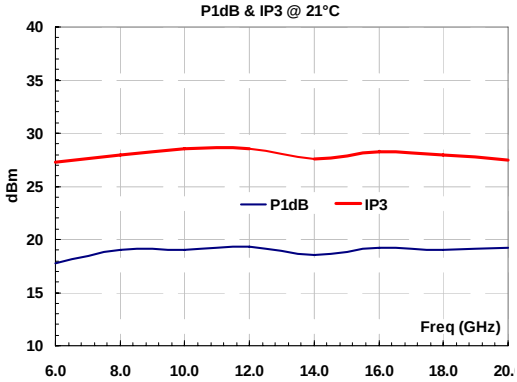
[1] Operation beyond these limits may cause permanent damage.

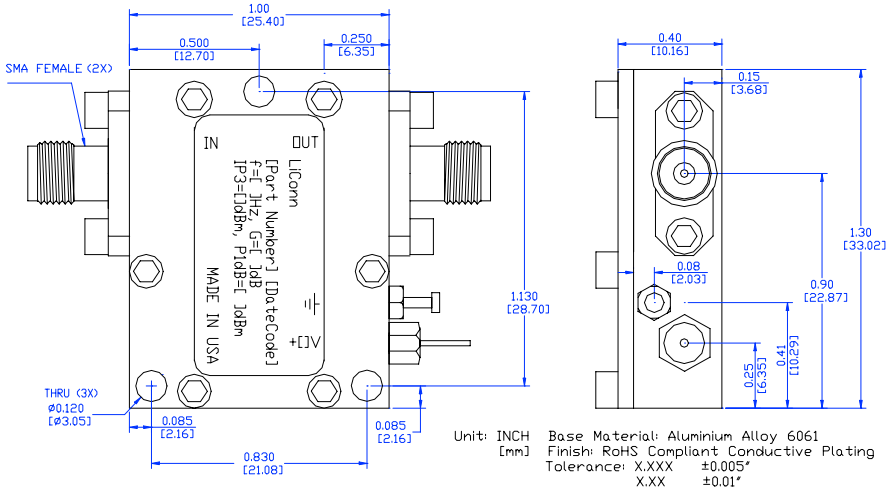
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











ORDERING INFORMATION: LPA600018000A

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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FEATURES:

- **20.0 MHz– 6.0 GHz;**
- **18 dB Gain;**
- **2 W Output Power;**
- **Single DC Power;**
- **RoHS Compliant.**

APPLICATIONS:

- **Ultra Broadband Amplifier;**
- **Fiber Optic Driver;**
- **Test Instrument;**
- **EMC Amplifier Driver;**
- **LTE Measurement.**

LPA00206000A, 20.0 MHz ~ 6.0 GHz WIDE BAND 2W AMPLIFIER

ELECTRICAL SPECIFICATIONS @ 21 °C

Symbol	Parameters/Conditions	Unit	Min	Typical	Max
G	Small Signal Gain	dB		18	
$VSWR_1$	VSWR – Input	Ratio			2.4:1
$VSWR_2$	VSWR – Output	Ratio			2.4:1
S_{12}	Reverse Isolation	dB	30		
P_{sat}	Output Saturate Power	dBm	33		
I_{dd}	Quiescent Current (V_{dd}=+28V)	mA		120	
V_{dd}	DC Power Supply Voltage	V	24	28	30
Z_0	Impedance	Ohm		50	

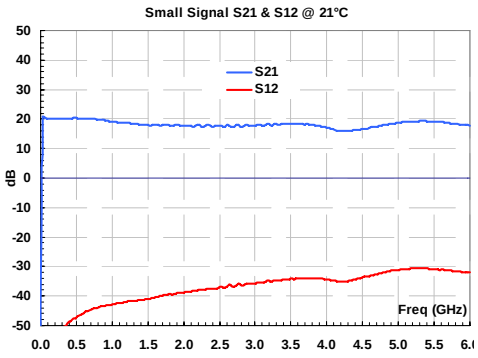
ABSOLUTE MAXIMUM RATINGS[1]

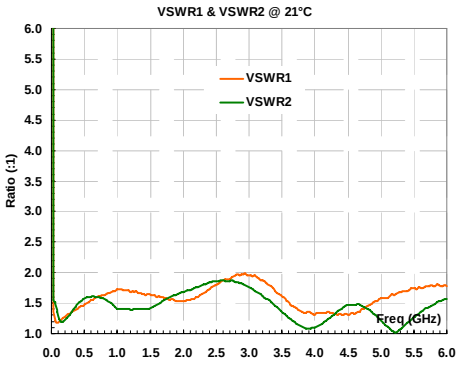
Parameters/Conditions	Unit	Maximum
Channel Temperature	°C	+220
CW RF Input Power	dBm	+27
DC Supply Voltage	V	32
Drain Current	mA	600
Thermal Resistance	°C/W	4.5
Total Power Dissipation	W	15
Operating Temperature	°C	-40 ~ +85
Storage Temperature	°C	-55 ~ +125

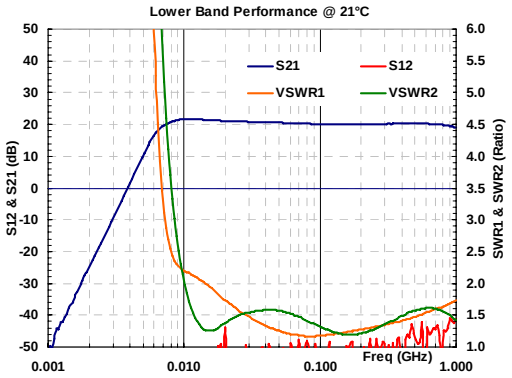
[1] Operation beyond these limits may cause permanent damage.

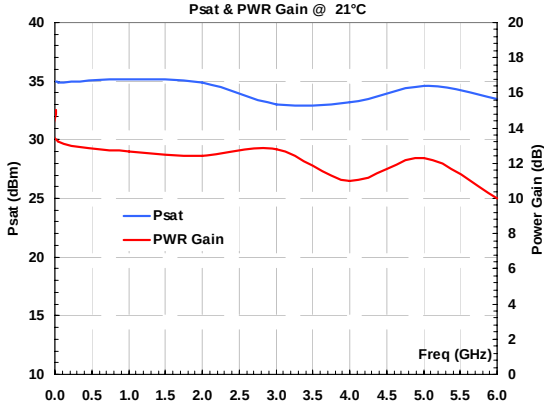
Additional Heat Sink Required

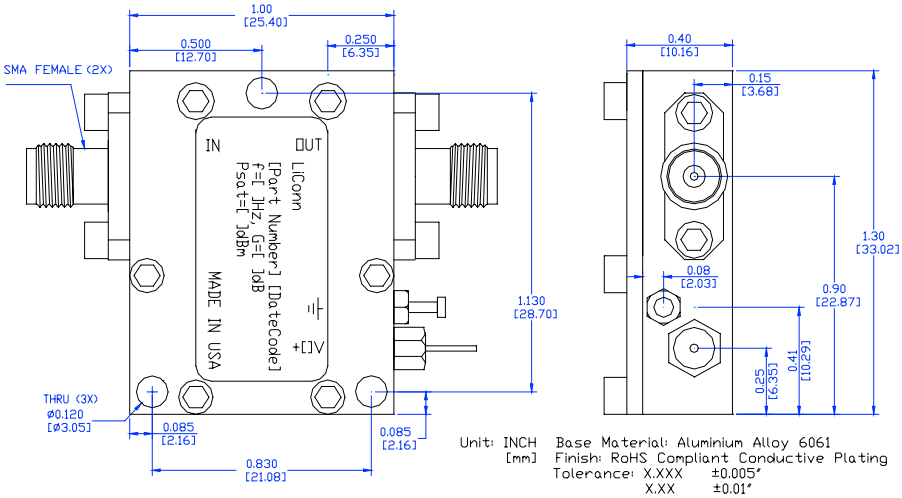
ELECTRICAL PERFORMANCE/MECHANICAL OUTLINE











ORDERING INFORMATION:

LPA00206000A,
LPA00206000A-H(Heat Sink Assembled)

Tel: 1-651-482-1848
Fax: 1-651-482-1573

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FEATURED PRODUCT — LCAL06A/B

Product Description: LCAL06A/B (DC- 6.0 GHz SMA Precision Calibration Kit)

Wooden Box
4.12" x 3.45" x 1.5"

Plastic ESD Box
2.56" x 2.56" x 0.5"

LiConn has developed high precision SMA calibration Kit for the calibration of a vector network analyzer (VNA). The calibration kit can be used for the Short-Open-Load-Thru (SOLT) or Line-Reflect-Match (LRM) Full-Two-Port calibration.

The calibration kit is compatible to or better than the brand named models but is tenth fraction of their cost. Moreover, The calibration is packaged in a miniature box and very user friendly.

Key Performance

- DC ~ 6 GHz
- 40 dB Minimum Return Loss
- SMA High Precision Short
- SMA High Precision Open
- SMA High Precision Load
- SMA High Precision Thru
- SMA Female/Male Type
- Very Low Cost
- Long Life Time
- Annual Calibration Provided
- RoHS Compliant
- All Parts and Containers are Made in USA

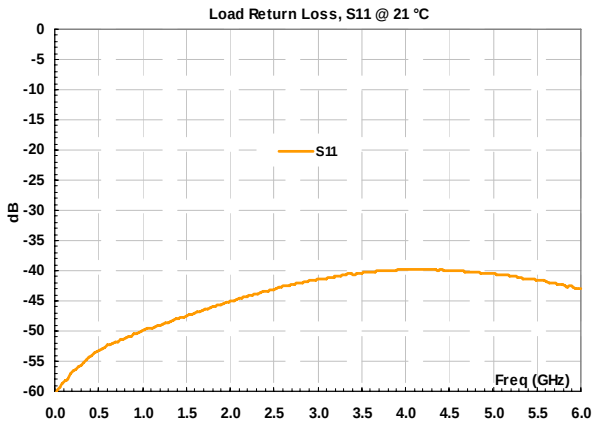
Order Information/Kit Structure

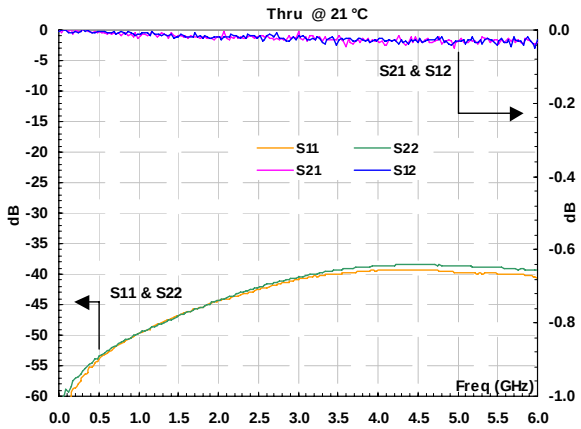
Model	LCAL06A (SMA Female Set for VNA with Male Connectors)	LCAL06B (SMA Male Set for VNA with Female Connectors)
Short	LSHOR001 (SMA Male, use with Thru)	LSHOR001
Open	LOPEN001(SMA Male, use with Thru)	LOPEN001
Load	LLOAD001X (SMA Female)	LLOAD001M (SMA Male)
Thru	LTHRU001A (SMA Female/Female)	LTHRU001B (SMA Male/Male)

Specifications

Summary of the electrical specifications of sample LCAL06A at 21°C:
Each Calibration Kit will be measured for it's own parameters.

Index	Testing Item	Symbol	Test Constraints	Min.	Nom.	Max.	Unit
1	Load Return Loss	$S_{11,L}$	DC – 3.0 GHz	40			dB
			3.0 – 6.0 GHz	35			dB
2	Thru Return Loss	$S_{11,T}$	DC – 3.0 GHz	40			dB
			3.0 – 6.0 GHz	35			dB
3	Thru Insertion Loss	$S_{21,T}$	DC – 6.0 GHz			0.05	dB
4	Thru Offset	T_{to}			55.70		pS
5	Load Offset	T_{Lo}			0		pS
6	Short Offset	T_{So}			55.70		pS
7	Open Offset	T_{oo}			55.70		pS
8	Open Capacitances	C_0			45		10^{-15} F
		C_1			6		10^{-27} F/Hz
		C_2			-2.5		10^{-36} F/Hz^2
		C_3			0		10^{-45} F/Hz^3





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LCAL06A Performance Verification Report

Introduction: LCAL06A precision network calibration kit provides an accurate and reliable Short-Open-Load-Thru (SOLT) or Load-Reflect-Match (LRM) calibration of a vector network analyzer. It has been proven having identical performance of Agilent 85033 calibration kit or Agilent 85052 kit of DC to 6 GHz range.

Performance Verification: The Agilent 85052D calibration kit and the 20 dB precision pad of HP 85053B verification kit are used to compare the measured insertion loss and phase. Agilent vector network analyzer 8753ES is used for the measurement.

Figure 1 shows the actual 20 dB precision pad connected with a 3.5 mm female to female adaptor. **Figure 2** is the measured insertion loss under the calibrations using calibration kits of 85052D and LCAL06A, respectively. The difference between the 2 measurements is less than 0.01 dB. **Figure 3** presents the measured phase, ANG[S12], difference between the 2. **Figure 4** demonstrates the worst phase difference at around 6 GHz, which is less than 1 degree.

Figure 1

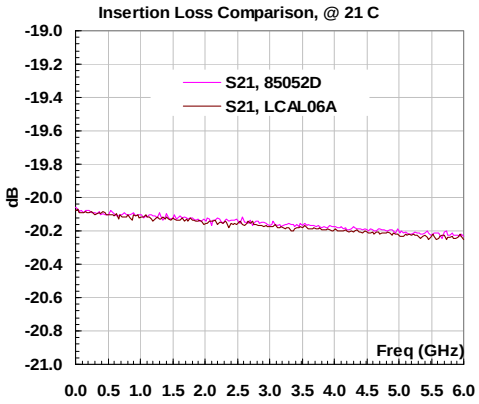


Figure 2

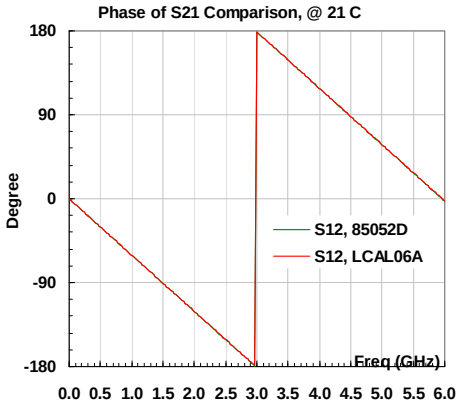


Figure 3

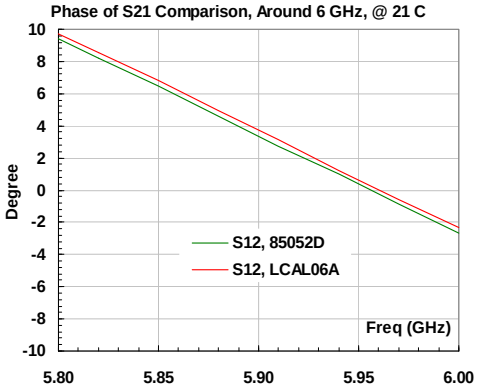


Figure 4

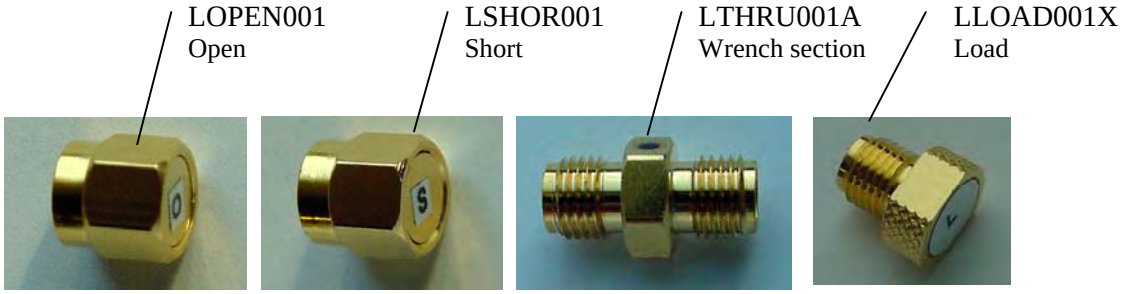
LCAL06A Application Note

Rev E.

LCAL06A precision network calibration kit provides an accurate and reliable Short-Open-Load-Thru (SOLT) or Load-Reflect-Match (LRM) calibration of a vector network analyzer. The kit consists the following items:

1) Short – SMA female, (LTHRU001A+LSHOR001*);
2) Open – SMA female, (LTHRU001A+LOPEN001*);
3) Load – SMA female, (LLOAD001X);
4) Thru – SMA female, (LTHRU001A).

*The Thru is necessary to form the SMA Female Open and Short calibration kits. Screw the Open or Short at one end of Thru and use the other one as the SMA Female Open or Short.



Each calibration kit is carefully fine tuned and measured to ensure the performance factory guaranteed specifications as described in its data sheet. In order to maintain the performance of each kit, use a correct torque wrench with 5 ~ 8 Lb-Inch to screw or unscrew the kit from a test cable at the torque section.

Define the cal kit parameters for SOLT calibration:

Turn on a network analyzer such as Agilent 8753 ES for at least 2 hours. Load an existing calibration kit file such as Agilent 85052D. Use the following steps to modify the Agilent 85052D parameters to generate a User's kit file:

a) Modify the **Short** Offset Delay to the number specified in the table comes with the LCAL06A, for example, 56.5 pS;
b) Modify the **Open** Offset Delay and fringe capacitances per the specified in the table comes with the LCAL06A, for example, 56.5 pS; C0: 45e-015; C1: 6e-027;C2:-2.5e-36;C3:0.
c) Modify the Offsets to be 0 pS for the **Load**;
d) Modify the Offset Delay to 56.1 pS for the **Thru**;
e) Save the modified Kit as User's kit and assign a name for the User's kit such as LCAL06A.

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FEATURED PRODUCT — LCAL09A

Product Description: LCAL09A (DC- 9.0 GHz SMA Precision Calibration Kit)

Wooden Box
4.12" x 3.45" x 1.5"

Plastic ESD Box
2.56" x 2.56" x 0.5"

LiConn has developed high precision SMA calibration Kit for the calibration of a vector network analyzer (VNA). The calibration kit can be used for the Short-Open-Load-Thru (SOLT) or Line-Reflect-Match (LRM) Full-Two-Port calibration.

The calibration kit is compatible to or better than the brand named models but is tenth fraction of their cost. Moreover, The calibration is packaged in a miniature box and very user friendly.

Key Performance

- DC ~ 9 GHz
- 40 dB Return Loss
- SMA High Precision Short
- SMA High Precision Open
- SMA High Precision Load
- SMA High Precision Thru
- SMA Female Set
- Very Low Cost
- Long Life Time
- Annual Calibration Provided (optional)
- RoHS Compliant
- All Parts and Containers are Made in USA

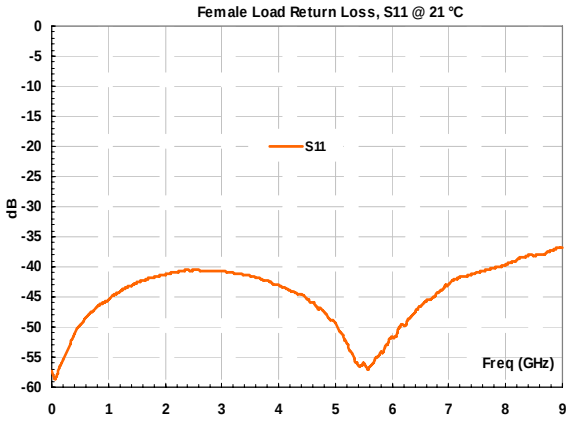
Order Information/Kit Structure

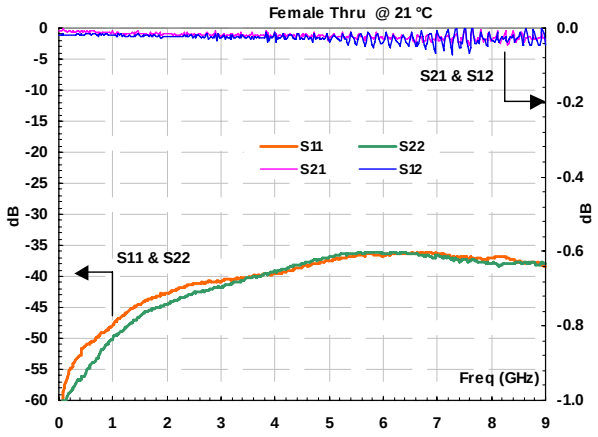
Model Number	LCAL09A (SMA Female Set for VNA with Male Connectors)
Short	L022 (SMA Male, use with L020)
Open	L023 (SMA Male, use with L020)
Load	L024 (SMA Male, use with L020)
Thru	L020 (SMA Female/Female)

Specifications

Summary of the electrical specifications of sample LCAL09A at 21°C:
Each Calibration Kit will be measured for it's own parameters.

Index	Testing Item	Symbol	Test Constraints	Min.	Nom.	Max.	Unit
1	Load Return Loss	$S_{11,L}$	DC – 3.0 GHz	40			dB
			3.0 – 9.0 GHz	35			dB
2	Thru Return Loss	$S_{11,T}$	DC – 3.0 GHz	40			dB
			3.0 – 9.0 GHz	35			dB
3	Thru Insertion Loss	$S_{21,T}$	DC – 9.0 GHz			0.10	dB
4	Thru Offset	T_{to}	L020		56.57		pS
5	Load Offset	T_{Lo}	With L020		0		pS
6	Short Offset	T_{So}	With L020		56.57		pS
7	Open Offset	T_{oo}	With L020		56.57		pS
8	Open Capacitances	C_0			45		10^{-15} F
		C_1			6		10^{-27} F/Hz
		C_2			-2.5		10^{-36} F/Hz^2
		C_3			0		10^{-45} F/Hz^3





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