

## S-Band Radar Miniature Power Amplifier

Part number ILT3035M15 is a miniaturized power amplifier which is internally matched to 50 ohms. It is designed for S-Band radar systems and operates over the instantaneous bandwidth of 3.0-3.5 GHz. It utilizes gold metal LDMOS transistor technology operating in common source configuration. Production RF performance screening is performed at the 100% level while operating under class AB bias ( $I_{DQ} = 10\text{mA}$ ) with a 300us pulse width at 10% duty. The device is operable under a wide range of biasing and pulsing conditions. This device is rated for a peak output power level of  $P_{PEAK} = 15\text{W}$  @ 10% duty factor. This corresponds to an average power  $P_{AVG} = 1.5\text{W}$ .

### 50 Ohm Matched

- Requires no external impedance matching circuitry

### Silicon LDMOS Transistor

- Gold Metal

### Class AB Operation

- Operable under a wide range of bias conditions

### Common Source Configuration

- Chip internal Source grounding

### Gold Metal System

- Complete Gold System Including Bond-wires
- Maximum Reliability

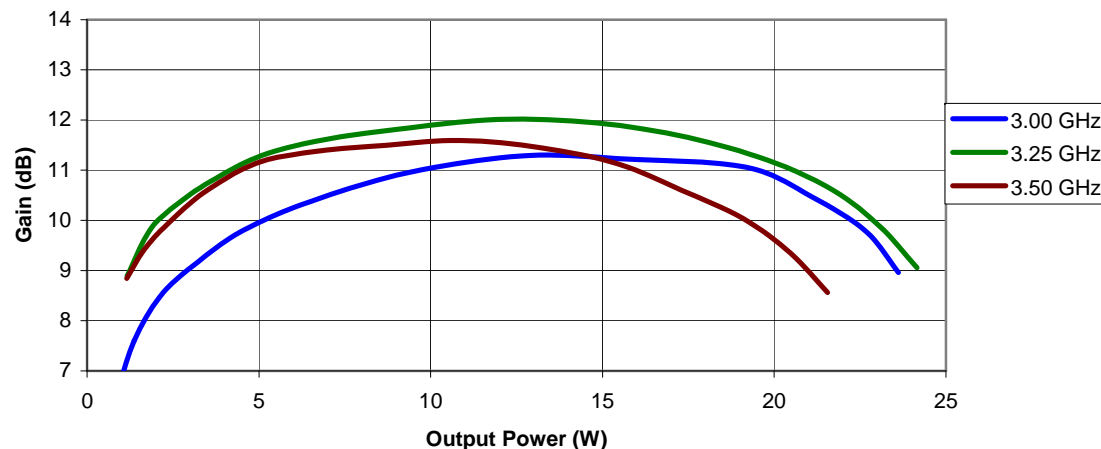
### Be0 Free Package

- Metal Based
- Epoxy seal

### RF High Power Test

- 100% Device RF High Power Screening

## TYPICAL RF GAIN VERSUS OUTPUT POWER PERFORMANCE



**MAXIMUM RATINGS**

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Drain-Source Voltage	$V_{DS}$	--	65	V	--
BD	Gate-Source Voltage	$V_{GS}$	-0.5	12	V	--
BD	Storage Temperature Range	$T_{STG}$	-55	+150	°C	--
BD	Operating Junction Temperature Range	$T_J$	-55	+200	°C	--
BD	CW Operation	--	--	--	--	Not rated for CW operation.
Note	Screen 'BD' = parameter qualified By Design.					

**THERMAL CHARACTERISTICS**

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Thermal Resistance	$R_{TH(JC)}$	--	0.75	°C/W	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, P_{OUT}=20W, I_D=1.6A$
Note	Screen 'BD' = parameter qualified By Design.					

**PROCESSING SPECIFICATIONS**

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	DC Wafer Probe	--	--	--	--	Per Integra specification.
Q1	Wafer DC and RF Qualification	--	--	--	--	Per Integra specification.
LM	Wire Bond Strength	--	--	--	--	Line monitor per Integra specification.
100%	Pre-cap visual inspection	--	--	--	--	Per Integra specification
100%	Gross leak test	--	--	--	--	MIL-STD-750D, Method 1071, Test Condition C
Note	Screen 'Q1' = parameter is qualified by assembly and test of 3 pieces minimum per wafer.					
Note	Screen 'LM' = parameter is qualified by assembly line monitor.					

**DC ELECTRICAL CHARACTERISTICS**

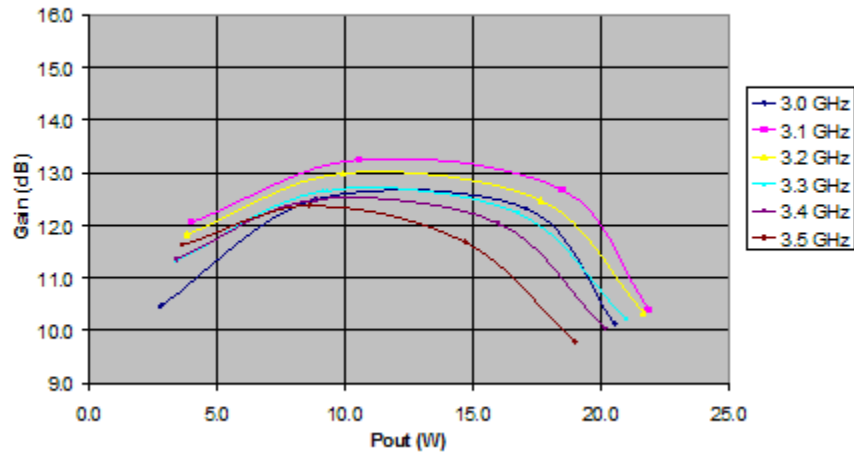
Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Drain-Source Breakdown Voltage	$BV_{DSS}$	65	--	V	$I_{DS} = 5mA, V_{GS} = 0V, T_F = 25 \pm 5^\circ C.$
100%	Drain Leakage Current	$I_{DSS}$	--	1.0	$\mu A$	$V_{DS} = 32V, V_{GS} = 0V, T_F = 25 \pm 5^\circ C.$
100%	Operating Gate Voltage	$V_{GS}$	1.5	4.0	V	$V_{DS} = 5V, I_D = 0.1A, T_F = 25 \pm 5^\circ C.$
BD	Gate Leakage Current	$I_{GSS}$	--	1.0	$\mu A$	$V_{GS} = 10V, V_{DS} = 0V, T_F = 25 \pm 5^\circ C.$

**RF ELECTRICAL CHARACTERISTICS**

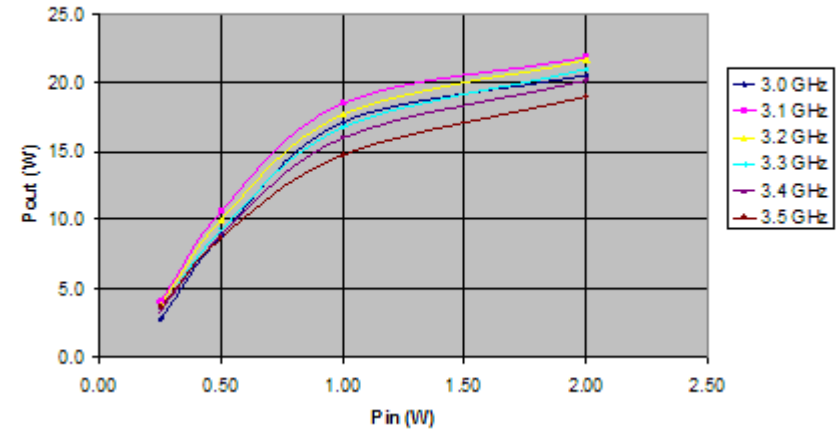
Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	IRL1	-18	-7	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}= P_{IN1}, F=F1.$
100%	Input Return Loss	IRL2	-18	-10	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}= P_{IN2}, F=F2.$
100%	Input Return Loss	IRL3	-18	-10	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}= P_{IN3}, F=F3.$
100%	Power Gain	$G_P$	11.0	15.0	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}= P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$
100%	Power Gain Flatness versus Frequency	GF	0.0	1.3	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}= P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$
100%	Drain Current - Peak	$I_D$	0.50	2.00	A	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}= P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$
100%	Pulse Amplitude Droop	D	-0.50	+0.20	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}= P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$
100%	Stability into 3:1 VSWR	VSWR-S	--	--	--	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}= P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$ Rotate 3:1 output VSWR through 360° phase. No oscillatory or pulse break-up characteristics allowed on detected output pulse. All non-harmonically related signals must be at least -65 dBc.
Note 1	$V1 = 32V; I_{DQ1} = 10mA; PW1 = 300\mu s; DF1 = 10\%$					
Note 2	Input Power Test Levels: $P_{IN1} = P_{IN2} = P_{IN3} = 1.0W$					
Note 3	Test Frequencies: $F1 = 3.0 GHz, F2 = 3.3 GHz, F3 = 3.5 GHz.$					
Note 4	$T_F = 25\pm 5^\circ C =$ Device Flange Temperature					

PERFORMANCE CURVES AT  $I_{DQ}=10\text{mA}$

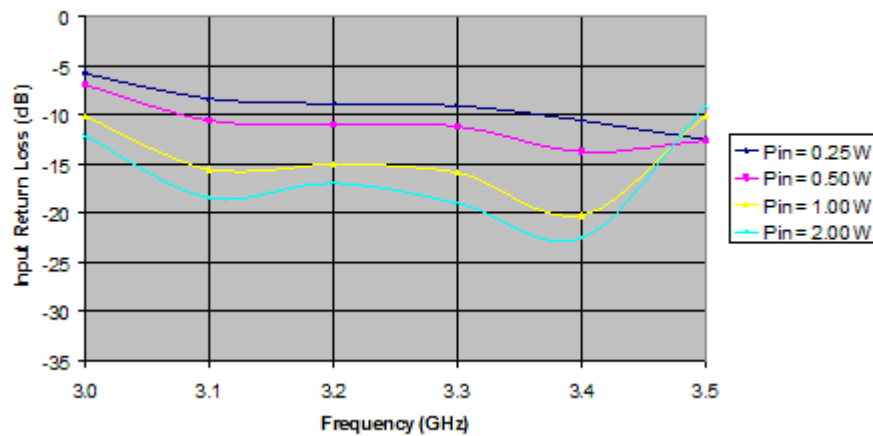
ILT3035M15: 100us / 10% / 28V / Idq -10mA



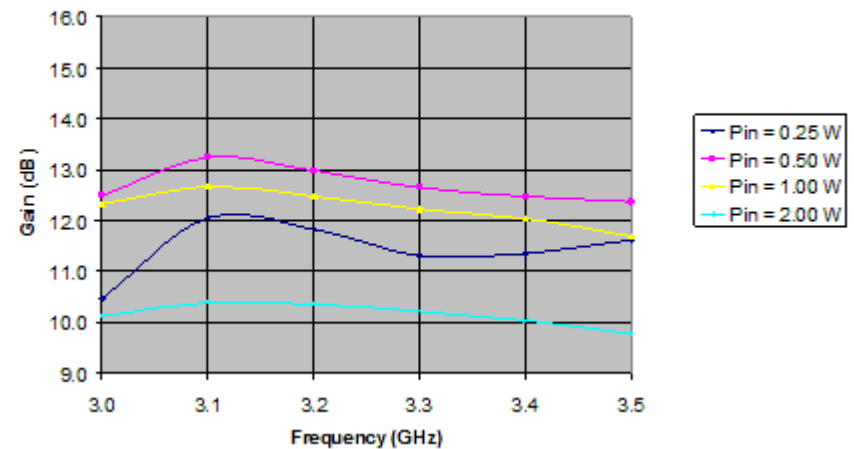
ILT3035M15: 100us / 10% / 28V / Idq -10mA



ILT3035M15: 100us / 10% / 28V / Idq -10mA

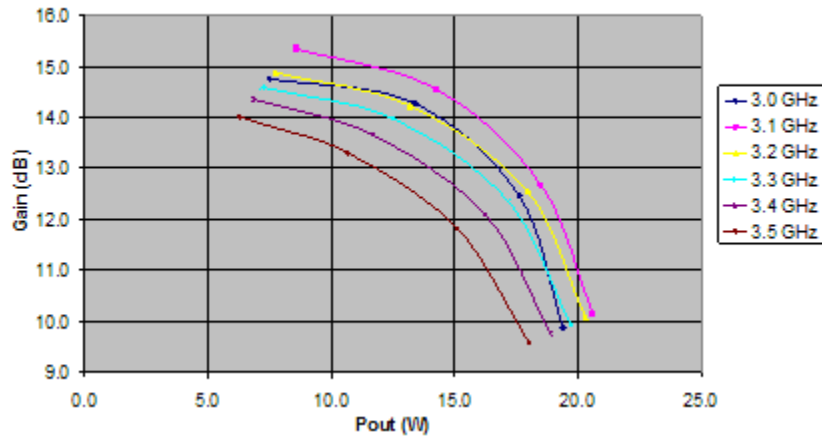


ILT3035M15: 100us / 10% / 28V / Idq -10mA

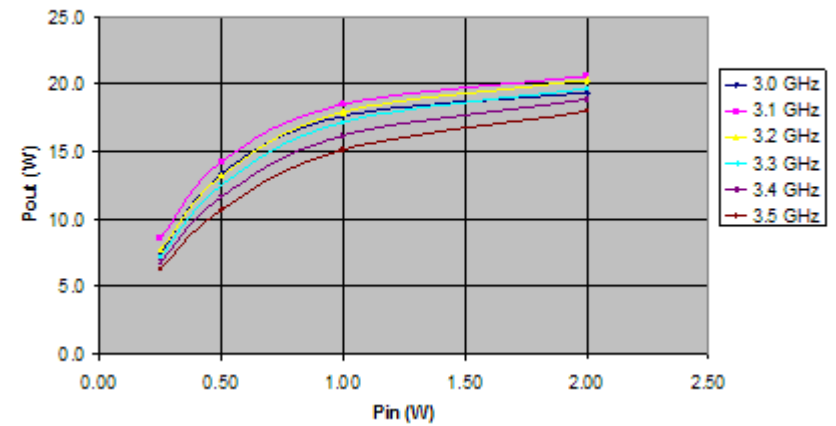


**PERFORMANCE CURVES AT  $I_{DQ}=250\text{mA}$**

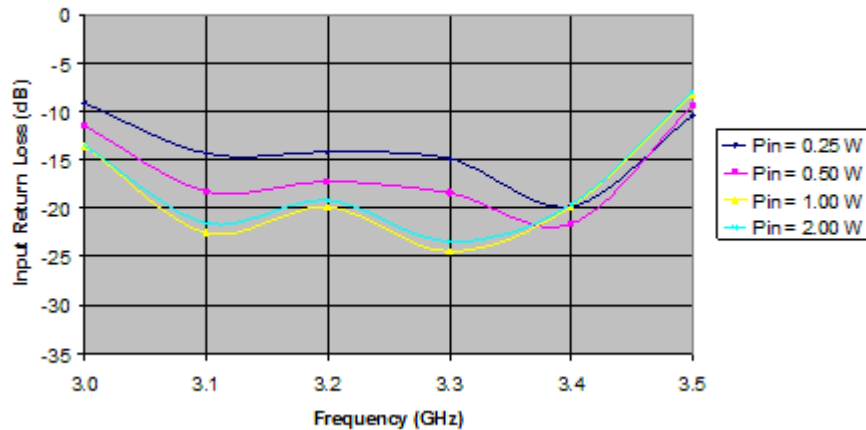
ILT3035M15: 100us / 10% / 28V /  $I_{dq} = 250\text{mA}$



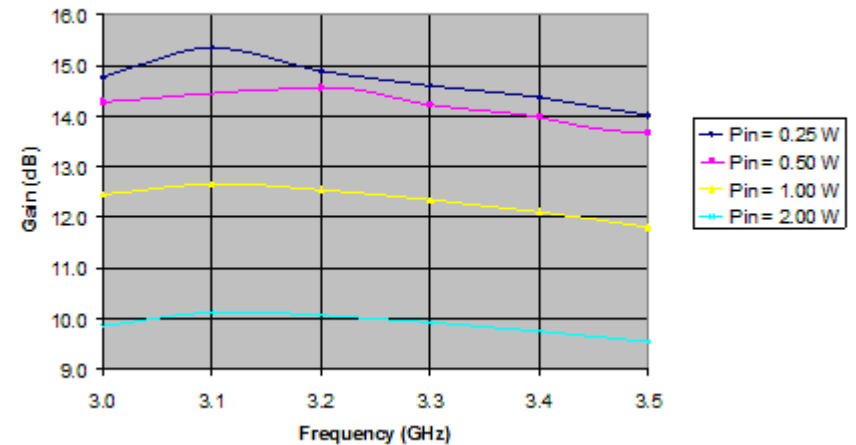
ILT3035M15: 100us / 10% / 28V /  $I_{dq} = 250\text{mA}$



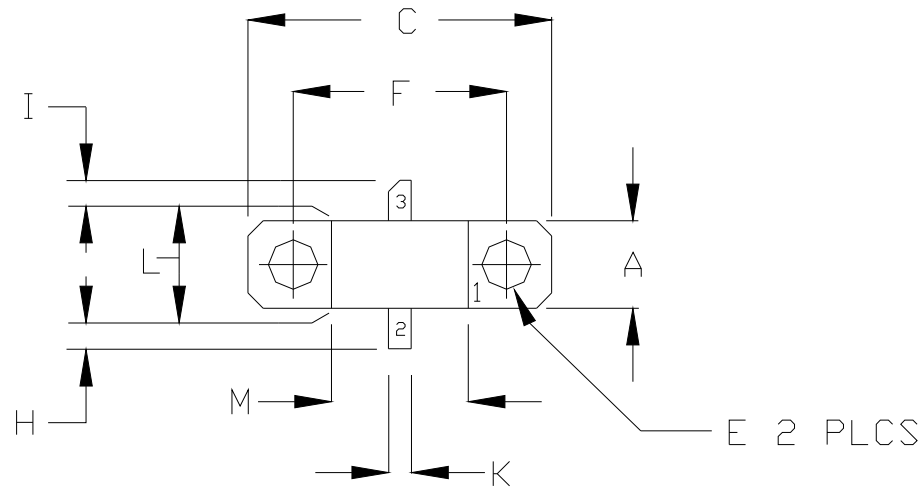
ILT3035M15: 100us / 10% / 28V /  $I_{dq} = 250\text{mA}$



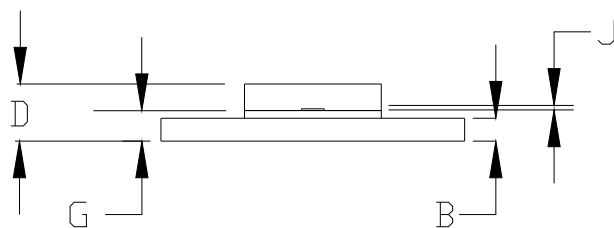
ILT3035M15: 100us / 10% / 28V /  $I_{dq} = 250\text{mA}$



**PACKAGE DIMENSIONAL OUTLINE DRAWING**



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.225	0.235	5.71	5.96
B	0.055	0.065	1.40	1.65
C	0.795	0.805	20.19	20.44
D	0.140	0.160	3.55	4.06
E	0.125	0.135	3.18	3.43
F	0.557	0.567	14.14	14.40
G	0.077	0.087	1.95	2.20
H	0.093	0.107	2.36	2.72
I	0.093	0.107	2.36	2.72
J	0.004	0.006	0.10	0.15
K	0.055	0.065	1.40	1.65
L	0.225	0.235	5.71	5.96
M	0.355	0.365	9.01	9.27

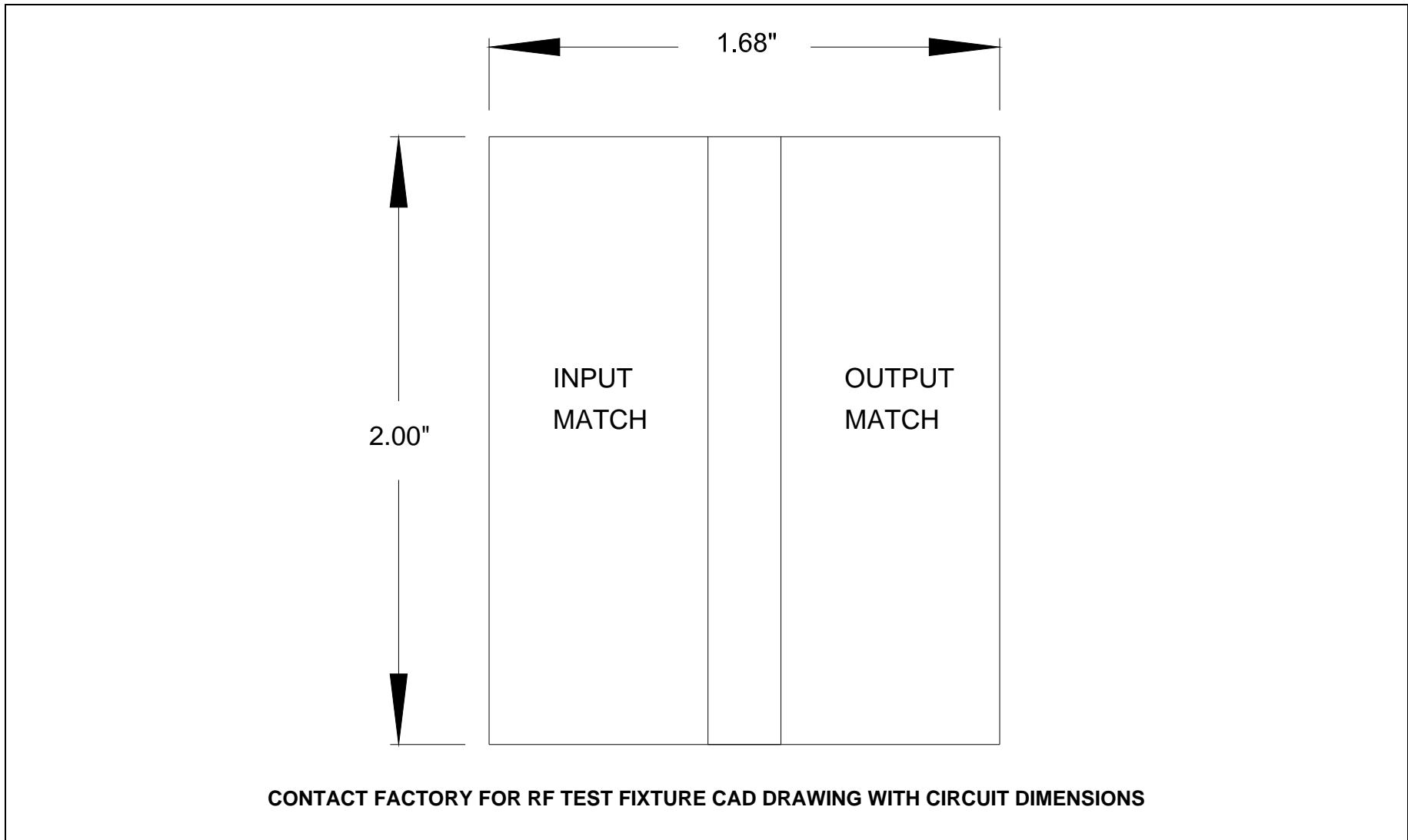


PIN SCHEDULE	
1	SOURCE
2	GATE
3	DRAIN

NOTES:

LID: LID-PL32-1

**RF TEST FIXTURE**



**DEFINITIONS**

<b>Data Sheet Status</b>	
Proposed Specification	This data sheet contains proposed specifications.
Preliminary Specification	This data sheet contains specifications based on preliminary measurements and data.
Product Specification	This data sheet contains final product specifications.
<b>Maximum Ratings</b>	
Stress above one or more of the maximum ratings may cause permanent damage to the device. These are maximum ratings only. Operation of the device at these or at any other conditions above those given in the characteristics sections of the specification is not implied. Exposure to maximum values for extended periods of time may affect device reliability.	

**DISCLAIMER**

Integra Technologies Inc. reserves the right to make changes without further notice to any products herein. Integra Technologies Inc. makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Integra Technologies Inc. assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. Integra Technologies Inc. products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Integra Technologies Inc. customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Integra Technologies Inc. for any damages resulting from such improper use or sale.