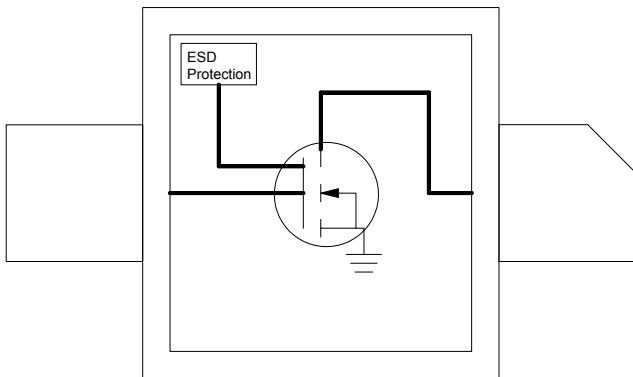




Product Description

Sirenza Microdevices' **SLD-3091FZ** is a robust 30 Watt high performance LDMOS transistor designed for operation from 10 to 2200MHz. It is an excellent solution for applications requiring high linearity and efficiency at a low cost. The SLD-3091FZ is typically used in power amplifiers, repeaters, and radio amplifier applications. The power transistor is fabricated using Sirenza's high performance XeMOS II™ process.

Functional Schematic Diagram



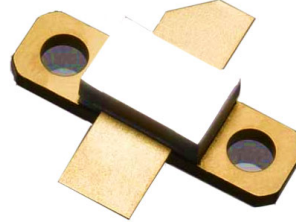
Case Flange = Ground

Preliminary

SLD-3091FZ



30 Watt Discrete LDMOS FET in Ceramic Flanged Package



Product Features

- 30 Watt Output P_{1dB}
- Single Polarity Supply Voltage
- High Gain: 18 dB at 915 MHz
- High Efficiency: 45% at 30W CW
- XeMOS II LDMOS
- Integrated ESD Protection, 1B

Applications

- Base Station PA driver
- Repeaters
- Radio Amplifier
- Military Communication
- GSM, CDMA, RFID, Point-to-Point

Key RF Specifications

Symbol	Parameter	Units	Min.	Typ.	Max.
Frequency	Frequency of Operation	MHz	10	-	2200
Gain	30 Watt CW, 915 MHz	dB		19	
Efficiency	Drain Efficiency at 30 Watt CW, 915 MHz	%		45	
IRL	Input Return Loss, 30 Watt Output Power, 915 MHz	dB		-15	
Linearity	3 rd Order IMD at 30 Watt PEP (Two Tone), 915 MHz	dBc		-28	
	1dB Compression (P_{1dB}), 915 MHz	Watt		35	
R_{TH}	Thermal Resistance (Junction-to-Case)	°C/W		2.4	

Test Conditions $V_{DS} = 28.0V$, $I_{DQ} = 300mA$, $T_{Flange} = 25^{\circ}C$

Key DC Parameters

Symbol	Parameter	Unit	Min	Typ.	Max
g_m	Forward Transconductance @ 425mA I_{DS}	mA / V		1650	
V_{GS} Threshold	$I_{DS}=3mA$	Volt		3.3	
V_{DS} Breakdown	1mA I_{DS} current	Volt		65	
C_{iss}	Input Capacitance (Gate to Source) $V_{GS}=0V$, $V_{DS}=28V$	pF		66	
C_{rss}	Reverse Capacitance (Gate to Drain) $V_{GS}=0V$, $V_{DS}=28V$	pF		1.4	
C_{oss}	Output Capacitance (Drain to Source) $V_{GS}=0V$, $V_{DS}=28V$	pF		30	
R_{DSon}	Drain to Source Resistance, $V_{GS}=10V$, $V_{DS}=250mV$	Ω		0.2	

The information provided herein is believed to be reliable at press time. Sirenza Microdevices assumes no responsibility for inaccuracies or omissions. Sirenza Microdevices assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. Sirenza Microdevices does not authorize or warrant any Sirenza Microdevices product for use in life-support devices and/or systems. Copyright 2005 Sirenza Microdevices, Inc. All worldwide rights reserved.

303 S. Technology Court,
Broomfield, CO 80021

Phone: (800) SMI-MMIC

1

<http://www.sirenza.com>
EDS-104668 Rev C



Preliminary

SLD-3091FZ 30 Watt LDMOS FET

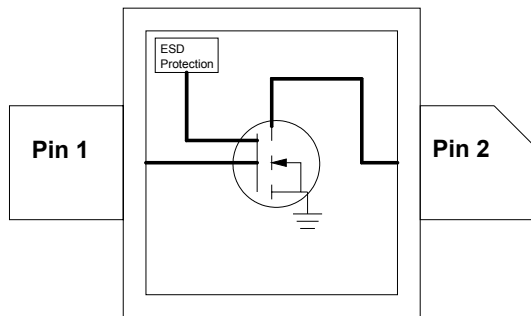
Quality Specifications

Parameter	Description	Rating
ESD Rating	Human Body Model	1B

Pin Description

Pin #	Function	Description
1	Gate	Transistor RF input and gate bias voltage. The gate bias voltage must be temperature compensated to maintain constant bias current over the operating temperature range. Care must be taken to protect against video transients that exceed the recommended maximum input power or voltage.
2	Drain	Transistor RF output and drain bias voltage. Typical voltage is 28V.
Flange	Source, Gnd	Exposed area on the bottom side of the package needs to be mechanically attached to the ground plane of the board for optimum thermal and RF performance. See mounting instructions for recommendation.

Pin Diagram



Case Flange = Ground

Note 1:

Gate voltage must be applied to the device concurrently or after application of drain voltage to prevent potentially destructive oscillations. Bias voltages should never be applied to the transistor unless it is properly terminated on both input and output.

Note 2:

The required V_{GS} corresponding to a specific I_{DQ} will vary from device to device due to the normal die-to-die variation in threshold voltage with LDMOS transistors.

Note 3:

The threshold voltage (V_{GSTH}) of LDMOS transistors varies with device temperature. External temperature compensation may be required. See Sirenza application notes AN-067 LDMOS Bias Temperature Compensation.

Absolute Maximum Ratings

Parameters	Value	Unit
Drain Voltage (V_{DS})	35	V
Gate Voltage (V_{GS})	20	V
RF Input Power	+36	dBm
Load Impedance for Continuous Operation Without Damage	10:1	VSWR
Output Device Channel Temperature	+200	°C
Lead Temperature During Solder Reflow	+270	°C
Operating Temperature Range	-20 to +90	°C
Storage Temperature Range	-40 to +100	°C

Operation of this device beyond any one of these limits may cause permanent damage. For reliable continuous operation see typical setup values specified in the table on page one.

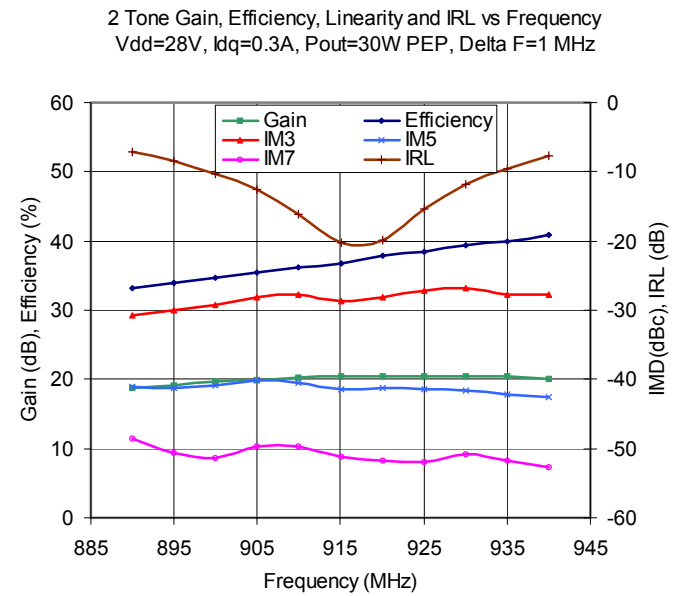
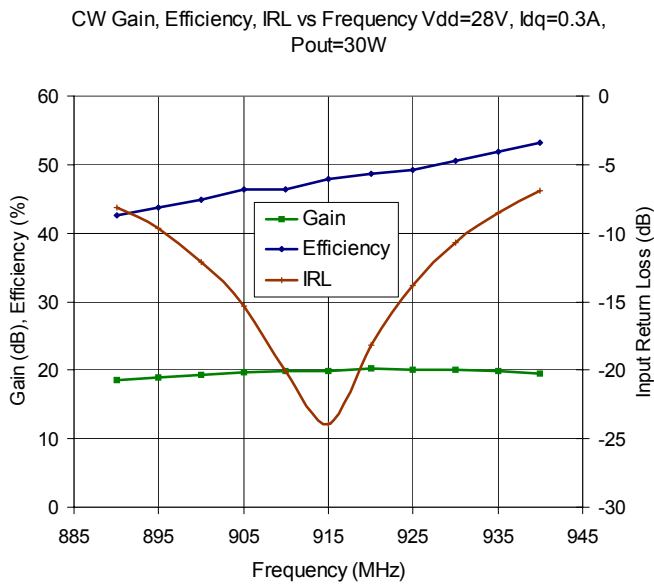
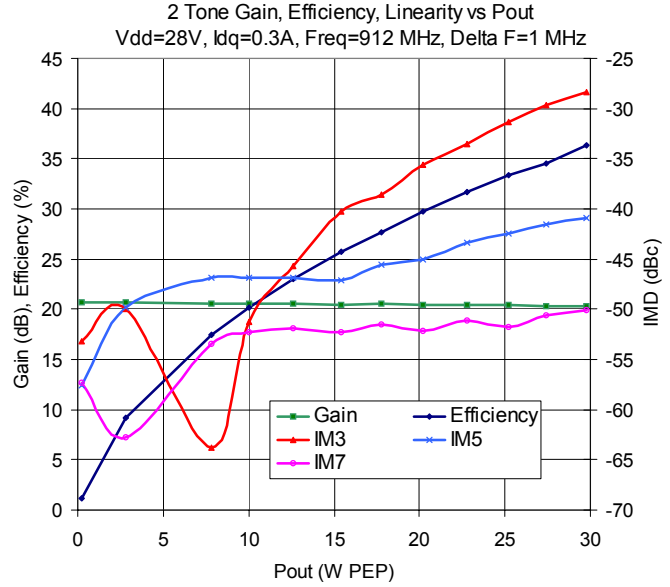
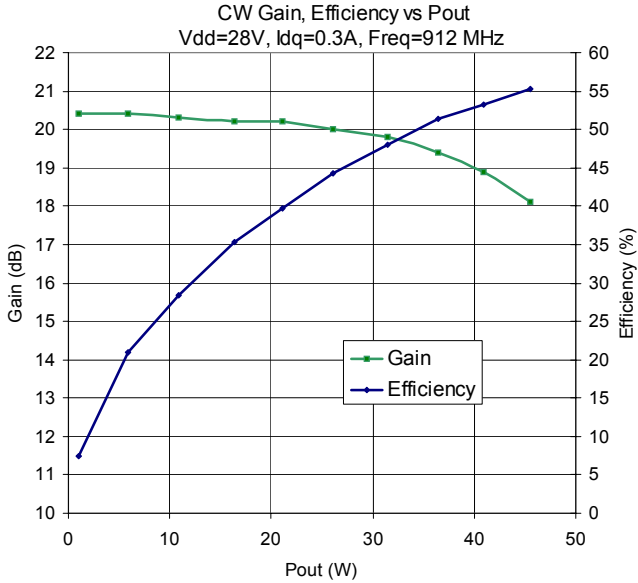


Caution: ESD Sensitive

Appropriate precaution in handling, packaging and testing devices must be observed.



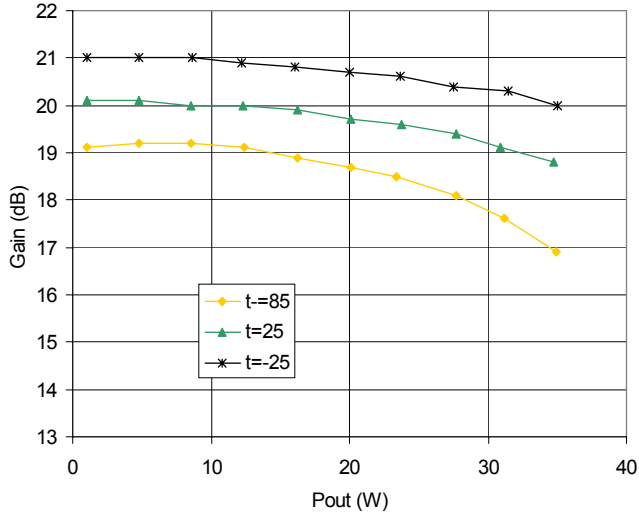
Typical Performance Curves in 900 MHz Application Circuit



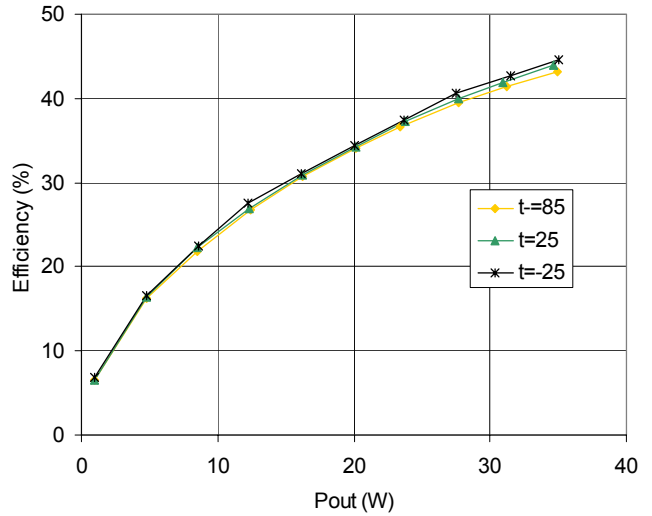


Typical Performance Curves in 900 MHz Application Circuit over Temperature

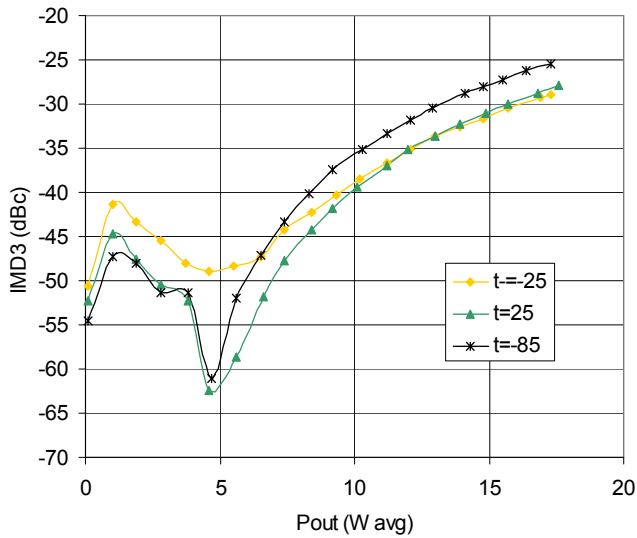
CW Gain vs Pout over Temperature
Vdd=28V, Idq=300mA, Freq=920 MHz



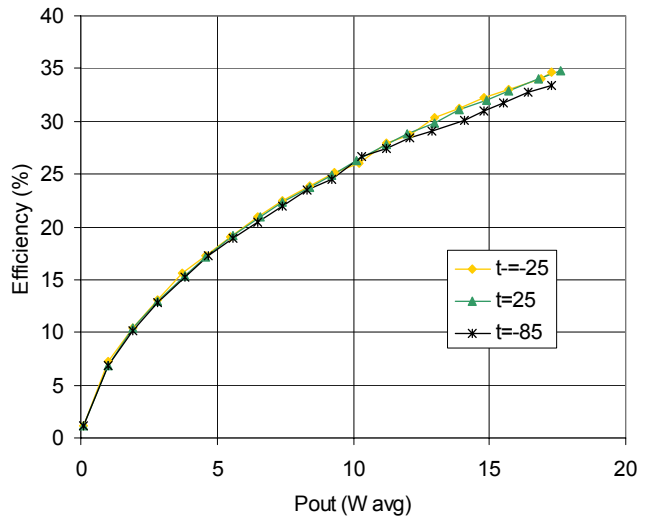
Efficiency vs Pout over Temperature
Vdd=28V, Idq=300mA, Freq=912 MHz



IMD3 vs Pout over Temperature
Vdd=28V, Idq=300mA, Freq=912 MHz



2 tone Efficiency vs Pout over Temperature
Vdd=28V, Idq=300mA, Freq=912 MHz

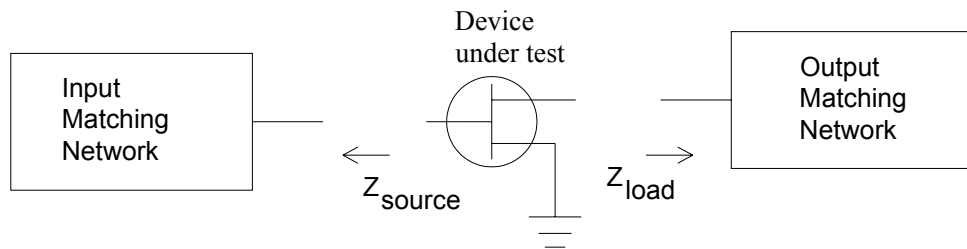
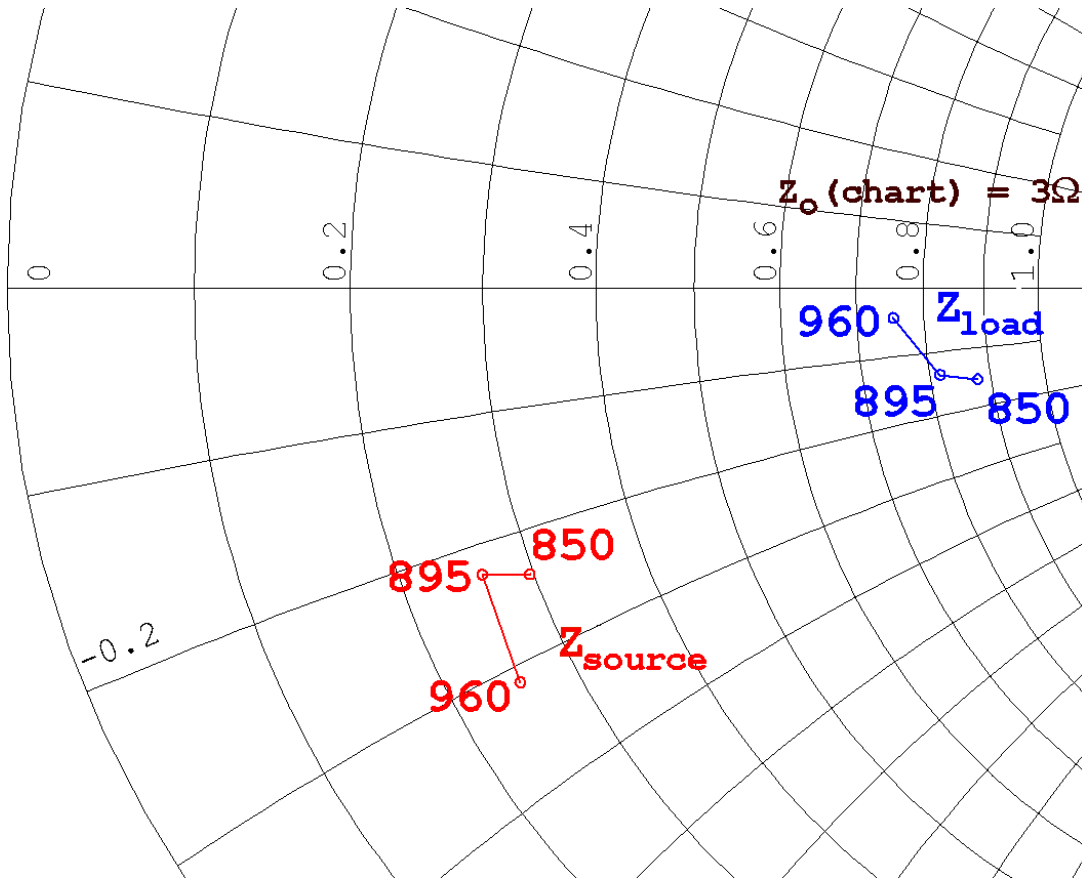




Impedance Data

Frequency (MHz)	Z_{source}	Z_{load}
850	0.9 - j 0.7	2.6 - j 0.5
895	0.8 - j 0.7	2.4 - j 0.4
960	0.7 - j 0.9	2.3 - j 0.1

Impedances Referenced to Wirebond/PCB Interface.

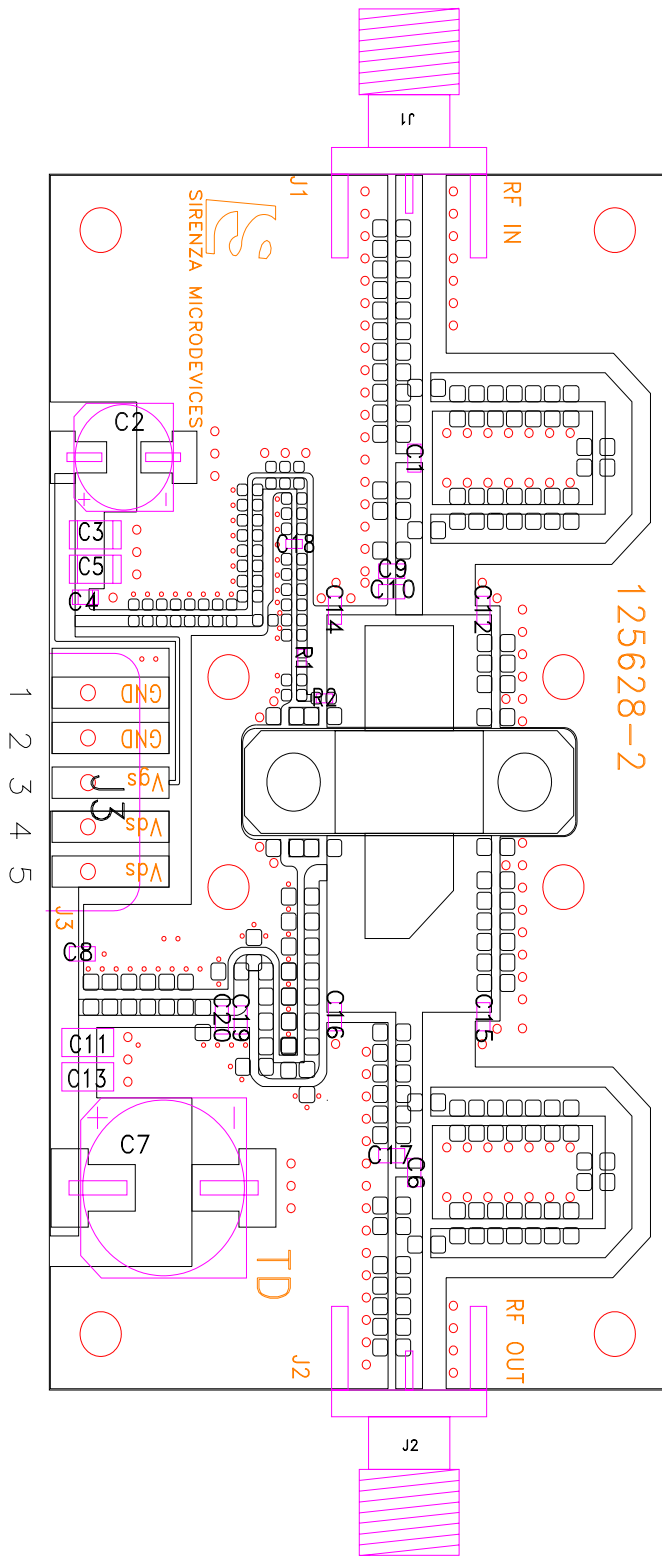


Z_{source} and Z_{load} are the optimal impedances presented to the SLD-3091FZ when operating at 28V, $I_{dq}=300\text{mA}$, $P_{out}=30\text{ W PEP}$



Preliminary
SLD-3091FZ 30 Watt LDMOS FET

900 MHz Application Circuit



Pin Descriptions - 900 MHz Application Circuit

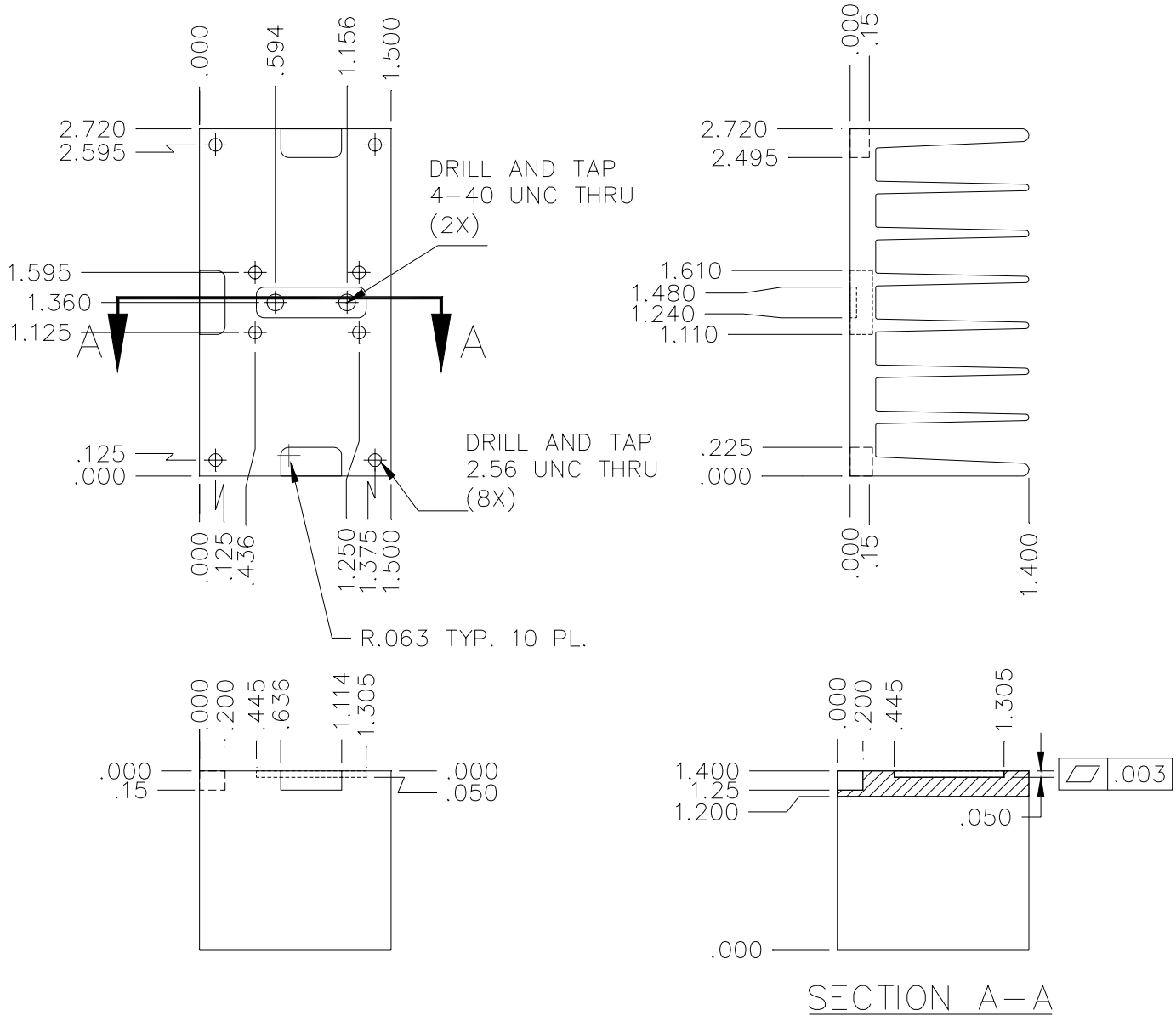
Connector	Pin #	Function	Description
J1	Coax	RF in	RF input to test fixture (50 Ohm system)
J2	Coax	RF out	RF output to test fixture (50 Ohm system)
J3	1	Gnd	DC ground for D package module. Also connected to RF ground.
J3	2	Gnd	DC ground for D package module. Also connected to RF ground.
J3	3	V _{GS}	Gate voltage for the SLD3091FZ. Nominally +4Vdc.
J3	4	V _{DS}	Drain voltage for the SLD3091FZ. Nominally +28Vdc.
J3	5	V _{DS}	Drain voltage for the SLD3091FZ. Nominally +28Vdc.

Bill of Materials - 900 MHz Application Circuit

Component	Description	Manufacturer
PCB	Rogers 4350, $\epsilon_r=3.5$ Thickness=30 mils	Rogers
J1, J2	Connector, SMA END 0.037"	Johnson
J3	MTA Post Header, 5 Pin, Rectangle, Polarized, Surface Mount	AMP
C2	Capacitor, Lytic 22F, 35V	Panasonic
C3, C11	Cap, 0.1 μ F, 100V, 10%, 1206	Johanson
C5, C13	Cap, 1000pF, 100V, 10%, 1206	Johanson
C7	Capacitor, Lytic 220uF, 50V	Panasonic
C1, C4, C6, C8, C19	CAP, 68PF, 250V, 5%, 0603	ATC
C10, C12, C14	CAP, 12PF, 250V, 1%, 0603	ATC
C15, C16	CAP, 10PF, 250V, 1%, 0603	ATC
C17	CAP, 7.5 PF, 250V, 0603	ATC
C18	CAP, 27PF, 250V, 5%, 0603	ATC
C2	CAP, 0.22UF, 50V, CERAMIC, X7R, 1206,	Kemet
C9	CAP, 4.3 PF, 250V, 0603	ATC
R2	RES, 560, 1/16W, 5%, 0402	Panasonic
R1	RES, 0.0, 1/16W, 5%, 0402	Panasonic
Mounting Screws	4-40 X 0.250"	Various



900 MHz Application Circuit Heatsink



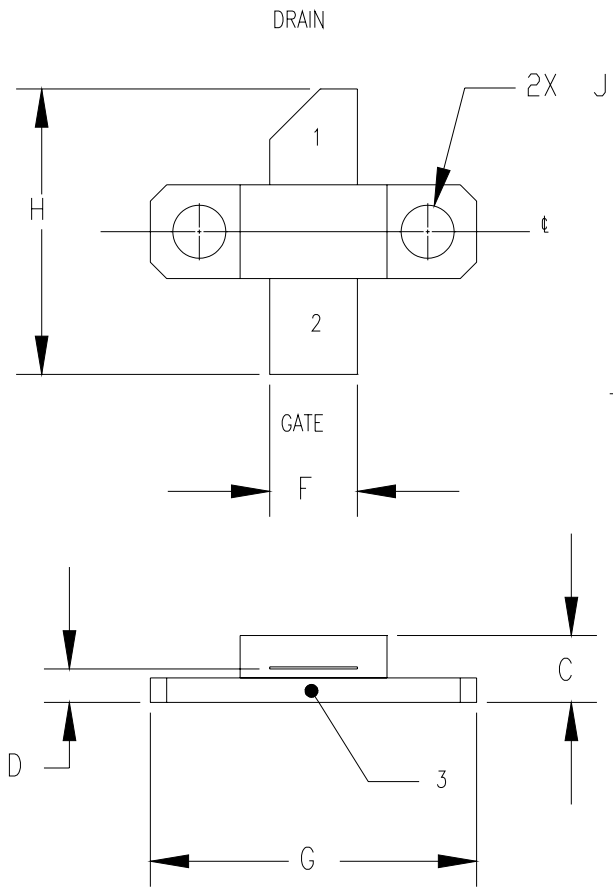
To receive Gerber files, DXF drawings, and assembly recommendations for the test board with fixture, contact applications support at support@sirenza.com.



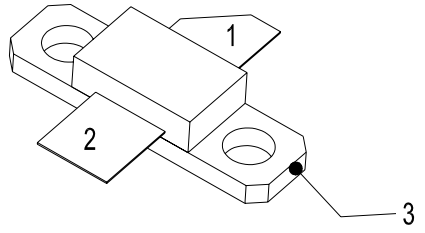
Package Outline

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ADHESIVE FROM LID MAY EXTEND A MAXIMUM OF 0.020" BEYOND EDGE OF LID.
4. LID MAY BE MISALIGNED TO THE BODY OF THE PACKAGE BY A MAXIMUM OF 0.008" IN ANY DIRECTION.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.225	0.235	5.72	5.97
B	0.004	0.006	0.102	0.152
C	0.149	0.178	3.78	4.52
D	0.077	0.087	1.96	2.21
E	0.355	0.365	9.02	9.27
F	0.210	0.220	5.33	5.59
G	0.795	0.805	20.19	20.45
H	0.697	0.703	17.70	17.86
J	DIA 0.130		DIA 3.30	



PIN 1. DRAIN
PIN 2. GATE
PIN 3. SOURCE

SUNSTAR 商斯达实业集团是集研发、生产、工程、销售、代理经销、技术咨询、信息服务等为一体的高科技企业，是专业高科技电子产品生产厂家，是具有 10 多年历史的专业电子元器件供应商，是中国最早和最大的仓储式连锁规模经营大型综合电子零部件代理分销商之一，是一家专业代理和分销世界各大品牌 IC 芯片和电子元器件的连锁经营综合性国际公司，专业经营进口、国产名厂名牌电子元件，型号、种类齐全。在香港、北京、深圳、上海、西安、成都等全国主要电子市场设有直属分公司和产品展示展销窗口门市部专卖店及代理分销商，已在全国范围内建成强大统一的供货和代理分销网络。我们专业代理经销、开发生产电子元器件、集成电路、传感器、微波光电元器件、工控机/DOC/DOM 电子盘、专用电路、单片机开发、MCU/DSP/ARM/FPGA 软件硬件、二极管、三极管、模块等，是您可靠的一站式现货配套供应商、方案提供商、部件功能模块开发配套商。商斯达实业公司拥有庞大的资料库，有数位毕业于著名高校——有中国电子工业摇篮之称的西安电子科技大学（西军电）并长期从事国防尖端科技研究的高级工程师为您精挑细选、量身订做各种高科技电子元器件，并解决各种技术问题。

微波光电部专业代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波 CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件：晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子器件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

更多产品请看本公司产品专用销售网站：

商斯达中国传感器科技信息网：<http://www.sensor-ic.com/>

商斯达工控安防网：<http://www.pc-ps.net/>

商斯达电子元器件网：<http://www.sunstare.com/>

商斯达微波光电产品网：[HTTP://www.rfoe.net/](http://www.rfoe.net/)

商斯达消费电子产品网：<http://www.icasic.com/>

商斯达实业科技产品网：<http://www.sunstars.cn/> 微波元器件销售热线：

地址：深圳市福田区福华路福庆街鸿图大厦 1602 室

电话：0755-82884100 83397033 83396822 83398585

传真：0755-83376182 (0) 13823648918 MSN: SUNS8888@hotmail.com

邮编：518033 E-mail:szss20@163.com QQ: 195847376

深圳赛格展销部：深圳华强北路赛格电子市场 2583 号 电话：0755-83665529 25059422

技术支持：0755-83394033 13501568376

欢迎索取免费详细资料、设计指南和光盘；产品凡多，未能尽录，欢迎来电查询。

北京分公司：北京海淀区知春路 132 号中发电子大厦 3097 号

TEL: 010-81159046 82615020 13501189838 FAX: 010-62543996

上海分公司：上海市北京东路 668 号上海赛格电子市场 D125 号

TEL: 021-28311762 56703037 13701955389 FAX: 021-56703037

西安分公司：西安高新开发区 20 所(中国电子科技集团导航技术研究所)

西安劳动南路 88 号电子商城二楼 D23 号

TEL: 029-81022619 13072977981 FAX:029-88789382