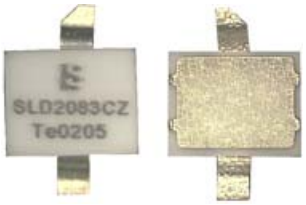
*Preliminary*

# SLD2083CZ

RoHS Compliant & Green Package

## 10 Watt Discrete LDMOS Device Ceramic Package




## Product Features

- **10 Watt Output $P_{1dB}$**
- **Single Polarity Supply Voltage**
- **High Gain: 18 dB Typical**
- **High Efficiency**
- **Advanced, XeMOS II LDMOS**
- **Integrated ESD Protection, Class 1A**

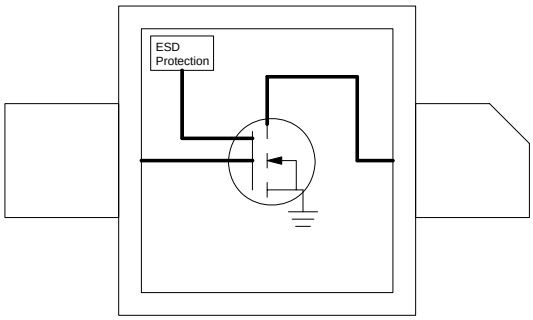
## Applications

- **Base Station PA driver**
- **Repeater**
- **RFID**

## Product Description

The **SLD2083CZ** is a 10 Watt high performance LDMOS transistor designed for operation to 2700MHz. It is an excellent solution for applications requiring high linearity and efficiency at a low cost. The SLD2083CZ is typically used in the design of driver stages for power amplifiers, repeaters, and RFID applications. The power transistor is fabricated using Sirenza's high performance XeMOS II™ process.

**Functional Schematic Diagram**




Case Flange = Ground

**RF Specifications**

| Parameter | Description: Test Conditions in Sirenza Evaluation Board $V_{DS}$ = 28.0V, $I_{DQ}$ = 125mA, $T_{Flange}$ = 25°C | Unit | Min | Typ | Max |
|---|---|---|---|---|---|
| Frequency | Frequency of Operation | MHz | - | - | 2700 |
| Gain | 10 Watt CW, 902MHz-928MHz | dB | 17 | 18 | - |
| Efficiency | Drain Efficiency at 10 Watt CW, 915MHz | % | 40 | 47 | - |
| IRL | Input Return Loss, 10 Watt Output Power, 915MHz | dB | - | -15 | -10 |
| Linearity | 3rd Order IMD at 10 Watt PEP (Two Tone), 915MHz | dBc | - | -28 | -26 |
| | 1dB Compression ($P_{1dB}$), 915MHz | Watt | 10 | 11 | - |
| | ACPR=-55dB, IS-95 | Watt | 1.8 | 1.6 | - |
| | ACPR=-45dB, IS-95 | Watt | 3.2 | 3.6 | - |

## DC Specifications

| Parameter | | Unit | Min | Typical | Max |
|---|---|---|---|---|---|
| $g_m$ | Forward Transconductance @ 125mA $I_{DQ}$ | mA / V | | 590 | |
| $V_{GS}$Threshold | $I_{DS}$=3mA | Volt | | 3.8 | |
| $V_{DS}$ Breakdown | 1mA $I_{DS}$ current | Volt | | 65 | |
| $C_{iss}$ | Input Capacitance (Gate to Source) $V_{GS}$=0V, $V_{DS}$=28V | pF | | 27.5 | |
| $C_{rss}$ | Reverse Capacitance (Gate to Drain) $V_{GS}$=0V, $V_{DS}$=28V | pF | | 0.81 | |
| $C_{oss}$ | Output Capacitance (Drain to Source) $V_{GS}$=0V, $V_{DS}$=28V | pF | | 14.65 | |
| $R_{DSon}$ | Drain to Source Resistance, $V_{GS}$=10V, $V_{DS}$=250mV | Ω | | 0.6 | |

## Quality Specifications

| Parameter | | Unit | Min | Typical | Max |
|---|---|---|---|---|---|
| ESD Rating | Human Body Model | Volts | | 500 | |
| MTTF | 85°C Leadframe, 200°C Channel | Hours | | 1.2 X $10^6$ | |
| $R_{TH}$ | Thermal Resistance (Junction to Case) | °C/W | | 4 | |

## Pin Description

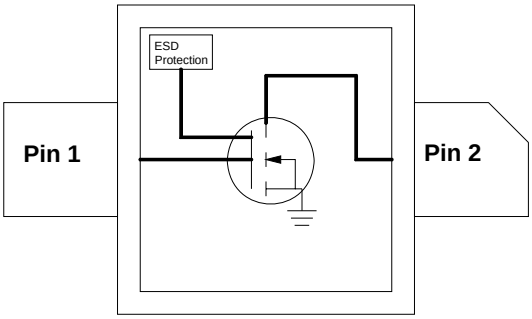
| Pin # | Function | Description |
|---|---|---|
| 1 | Gate | Transistor RF input and gate bias voltage. The gate bias voltage must be temperature compensated to maintain constant bias current over the operating temperature range. Care must be taken to protect against video transients that exceed the 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. |

## Absolute Maximum Ratings

| Parameters | Value | Unit |
|---|---|---|
| Drain Voltage ($V_{DS}$) | 35 | V |
| Gate Voltage ($V_{GS}$) | 20 | V |
| RF Input Power | +33 | dBm |
| Load Impedance for Continuous Operation Without Damage | 10:1 | VSWR |
| Output Device Channel Temperature | +200 | ºC |
| Lead Temperature During Solder Reflow | +270 | ºC |
| Operating Temperature Range | -20 to +90 | ºC |
| Storage Temperature Range | -40 to +100 | ºC |

**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.**

## Pin Diagram



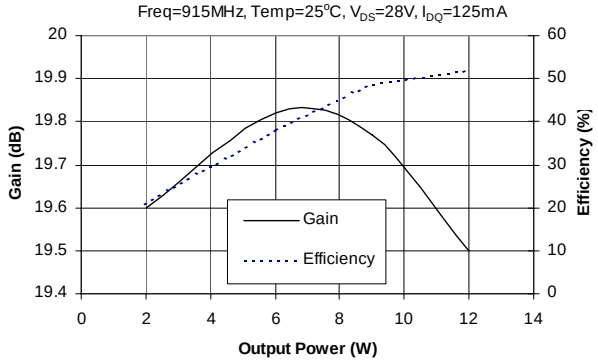

Case Flange = Ground

**Caution: ESD Sensitive**
Appropriate precaution in handling, packaging and testing devices must be observed.

## Typical EVB Test Data

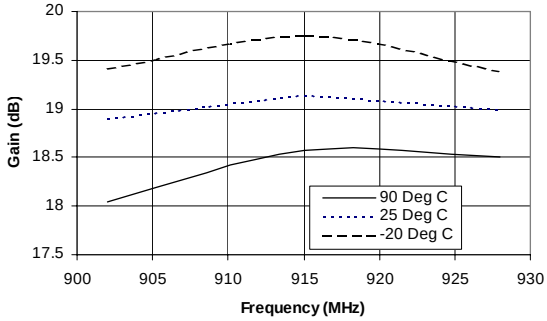
**Gain, Efficiency vs. Output Power**

Freq=915MHz, Temp=25°C, $V_{DS}$=28V, $I_{DQ}$=125mA



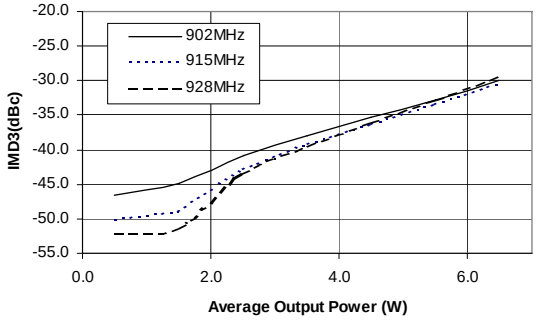

**Gain vs. Frequency and Temperature**

Pout=10W, $V_{DS}$=28V, $I_{DQ}$=125mA

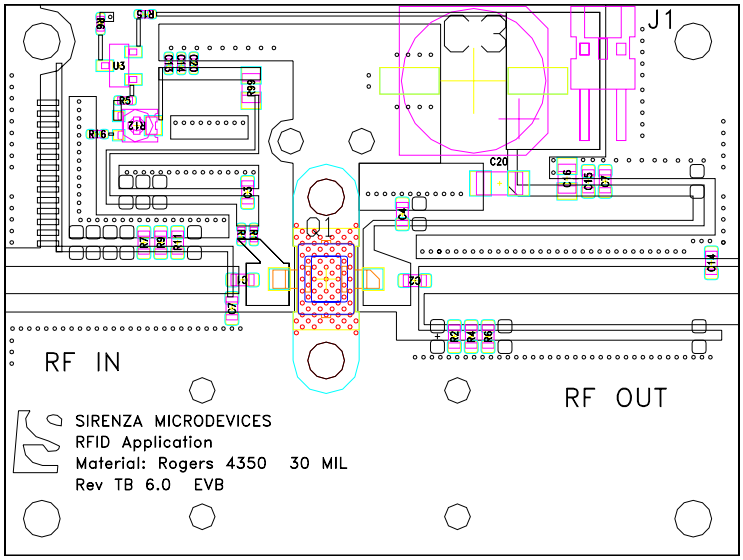



**Two Tone IM3 vs. Output Power**

Freq=915/916MHz, Temp=25°C, $V_{DS}$=28V, $I_{DQ}$=125mA



## SLD2083CZ EVB Layout and BoM




**Evaluation Board Bill of Materials**

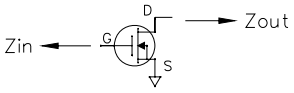
| Description | Part |
|---|---|
| Res, 10, 1/10W, 1%, 0805 | R10 |
| Polarized | J1 |
| Inductor Coilcraft 1.6nH 0603 | L1 |
| Res, 0.0, 1/16W, 5%, 0603 | R2, R4, R6, R7, R9, R11 |
| Cap, 1000 pF, 100V, 10%, 0603 | C7, C8 |
| Cap, 0.01 uF, 100V, 5%, 0805 | C10, C15 |
| Cap, 0.5 pF, 250V, +/-.1pF, 0603 | C11 |
| Cap, 3.6 pF, 250V, +/-.1pF, 0603 | C14 |
| Cap, 12 pF, 250V, 1%, 0603 | C2 |
| Cap, 15 pF, 250V, 2%, 0603 | C1 |
| Cap, 68 pF, 250V, 5%, 0603 | C3, C4, C5, C6 |
| Res, 10 Ohm, 0402 | R5, R15 |
| CAP 0.22UF 50V CERAMIC X7R 1206 | C13, C16 |
| SLD2083CZ | Q1 |

**To download Gerber files, DXF drawings, a detailed BOM, and assembly recommendations for the test board with fixture contact Sirenza applications.**

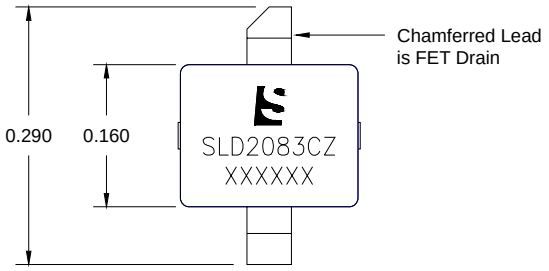
**Impedance Information (Typical)**

| Frequency (MHz) | Input R (Ohms) | Input X (Ohms) | Output R (Ohms) | Output X (Ohms) |
|---|---|---|---|---|
| 870 | 0.5 | 2.0 | 4.3 | 1.9 |
| 880 | 0.5 | 1.9 | 4.3 | 2.0 |
| 900 | 0.8 | 1.8 | 4.4 | 2.0 |
| 930 | 0.7 | 1.7 | 4.5 | 2.0 |
| 960 | 0.8 | 1.4 | 4.7 | 2.0 |

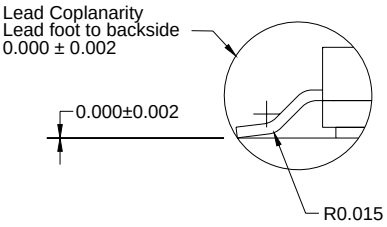
**Impedances are circuit impedances as seen from device at device lead.**



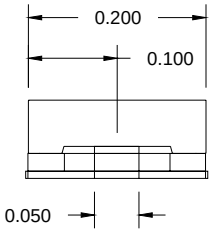
## Package Outline Drawings



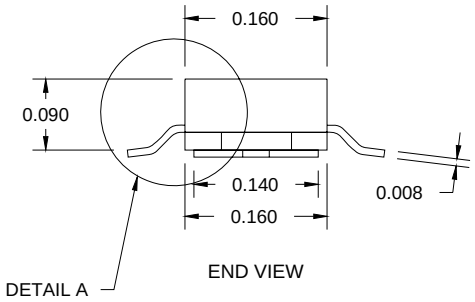

TOP VIEW




DETAIL A

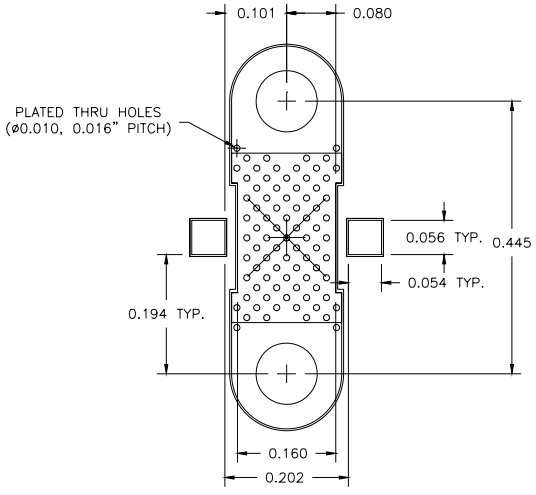



SIDE VIEW




END VIEW

## Recommended Landing Pads for the RF083 Package




## Part Number Ordering Information

| Part Number | Devices Per Reel | Reel Size |
|---|---|---|
| SLD2083CZ | 500 | 7" |

All Dimensions are in inches