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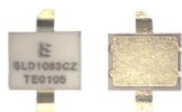
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SLD-1083CZ

4 WATT DISCRETE LDMOS FET IN CERAMIC PACKAGE



RFMD Green, RoHS Compliant, Pb-Free
 Package: RF083

Product Description

RFMD's SLD-1083CZ is a robust 4 Watt high performance LDMOS transistor designed for operation to 1600MHz, It is an excellent solution for applications requiring high linearity and efficiency at a low cost. The SLD-1083CZ is typically used in the design of driver stages for power amplifiers, repeaters, and RFID applications. The power transistor is fabricated using RFMD's latest, high performance LDMOS II process.

Features

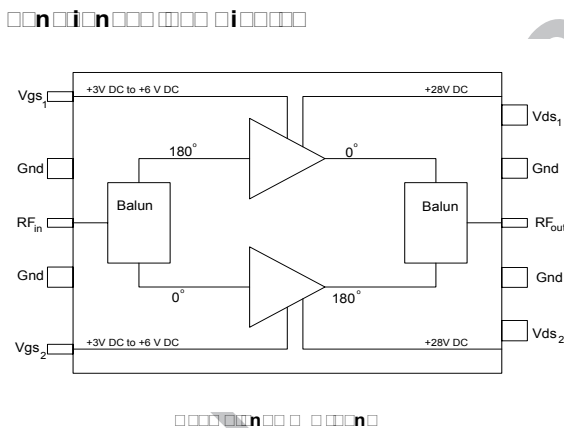
- 4 Watt Output P_{1dB}
- Single Polarity Supply Voltage
- High Gain; 18dB at 915MHz
- High Efficiency: 43% at 3W CW
- XeMOS II LDMOS
- Integrated ED Protection, Class 1B

Applications

- Base Station PA Driver
- Repeaters
- RFID
- Military Communication
- GSM/CDMA

Optimum Technology Matching® Applied

- GaAs HBT
- GaAs MESFET
- InGaP HBT
- SiGe BiCMOS
- Si BiCMOS
- SiGe HBT
- GaAs pHEMT
- Si CMOS
- Si BJT
- GaN HEMT
- InP HBT
- RF MEMS
- LDMOS



| Parameter | Specification | | | Unit | Condition |
|--------------------------------------|---------------|------|------|-------|---|
| | Min. | Typ. | Max. | | |
| RF Specifications | | | | | |
| Frequency of Operation | | | 1600 | MHz | $V_{DS}=28.0V, I_{DQ}=50mA, T_{FLANGE}=25^{\circ}C$ |
| Gain | 18 | 19 | | dB | 3Watt CW, 902MHz to 928MHz |
| Drain Efficiency | 40 | 43 | | % | 3Watt CW, 915MHz |
| Input Return Loss | -9.5 | -12 | | dB | 3Watt output Power, 915MHz |
| Third Order IMD | | -30 | -26 | dBc | 3Watt PEP (Two Tone), 915MHz |
| 1dB Compression | | 4 | | Watt | 915MHz |
| IS-95, 9 Ch Fwd, Offset=750KHz | | 21 | | dBm | ACPR Integrated Bandwidth, ACPR=-55dB |
| | | 29 | | dBm | ACPR Integrated Bandwidth, ACPR=-45dB |
| Thermal Resistance (Junction - Case) | | 11 | | °C/W | |
| DC Specifications | | | | | |
| Forward Transconductance | | 150 | | mA/V | |
| V _{GS} Threshold | | 4.2 | | Volts | $I_{DS}=3mA, V_{DS}=28V$ |
| V _{GS} Quiescent | | 4.2 | | Volts | $I_{DS}=50mA, V_{DS}=28V$ |
| V _{DS} Breakdown | | 65 | | Volts | 1mA V _{DS} current |
| Input Capacitance (Gate to Source) | | 5.2 | | pF | $V_{GS}=0V, V_{DS}=28V$ |
| Reverse Capacitance (Gate to Drain) | | 0.2 | | pF | $V_{GS}=0V, V_{DS}=28V$ |
| Output Capacitance (Drain to Source) | | 3.2 | | pF | $V_{GS}=0V, V_{DS}=28V$ |
| Drain to Source Resistance | | 3.0 | | Ω | $V_{GS}=10V, V_{DS}=250mV$ |

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Absolute Maximum Ratings

| Parameter | Rating | Unit |
|--|-------------------|-------|
| Drain Voltage (V_{DS}) | 35 | V |
| Gate Voltage (V_{GS}) | 20 | V |
| RF Input Power | +30 | 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 | -40 to +90 | °C |
| Storage Temperature Range | -40 to +100 | °C |
| ESD Rating - Human Body Model | 750 | V |
| MTTF - 85 °C Leadframe, 200 °C Channel | 1.2×10^6 | Hours |



Caution! ESD sensitive device.

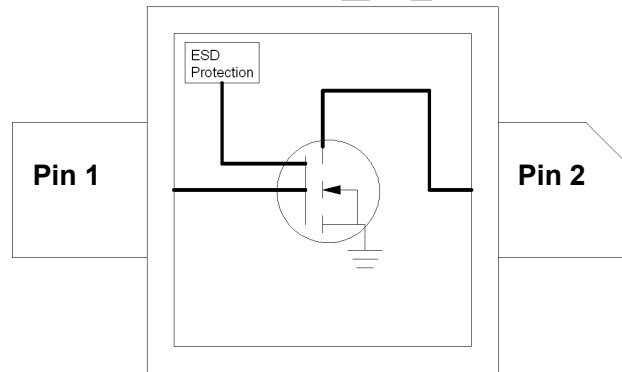
Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

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Operation of this device beyond any one of these limits may cause permanent damage. For reliable continuous operation, the device voltage and current must not exceed the maximum operating values specified in the table on page one.

Pin Diagram



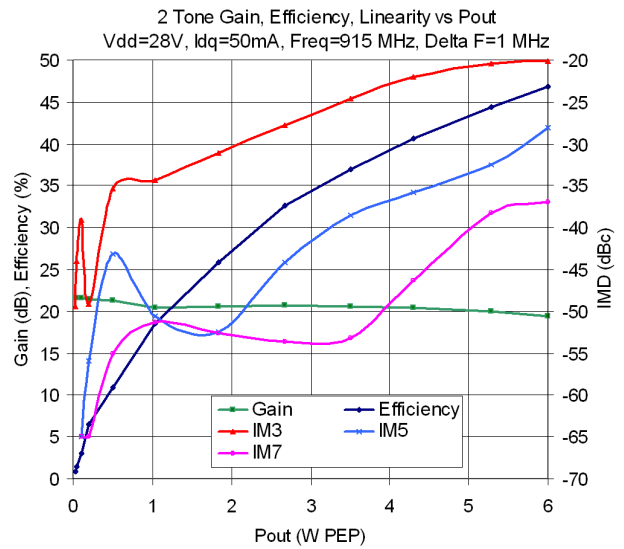
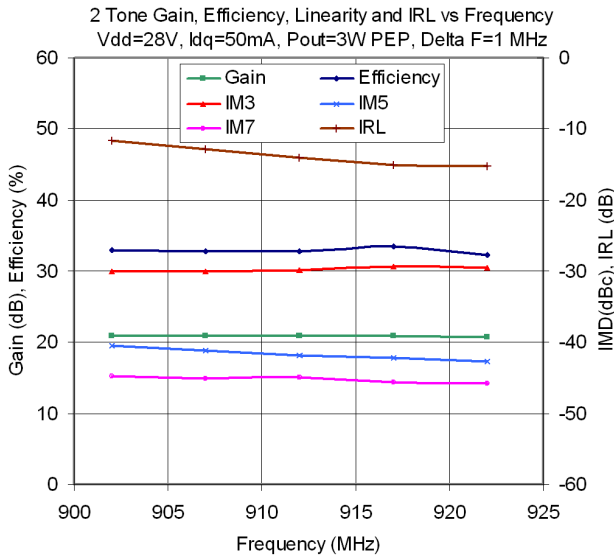
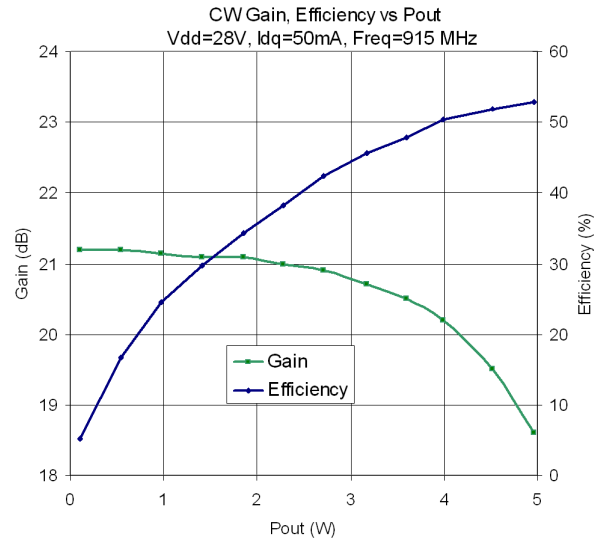
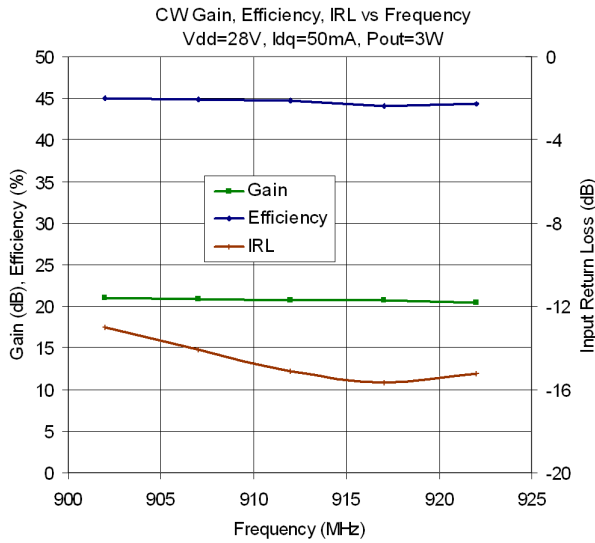
Case Flange = Ground

Note 1: Gate voltage must be applied to V_{GS} lead 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.

Typical Performance Curves in 90MHz Application Circuit



NC

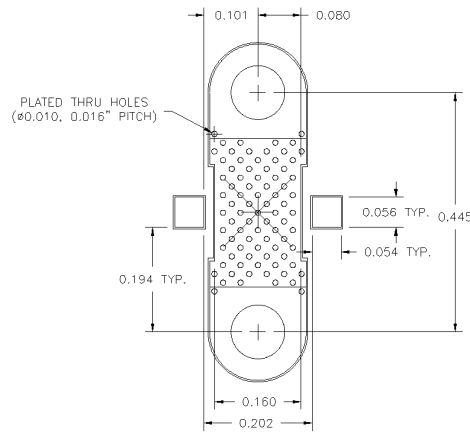
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| Pin | Function | Description |
|--------|-------------|--|
| 1 | Gate | Transistor RF input and gate bias voltage. The gate bias voltage must be temperature compensated to maintain constant bias current over the operating temperature range. Care must be taken to protect against video transient that exceed the maximum input power or voltage. |
| 2 | Drain | Transistor RF output and drain bias voltage. Typical voltage 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. |

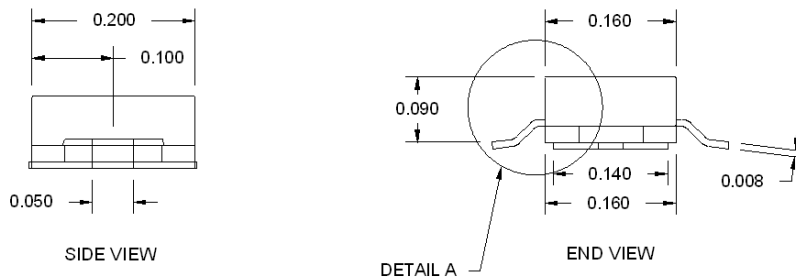
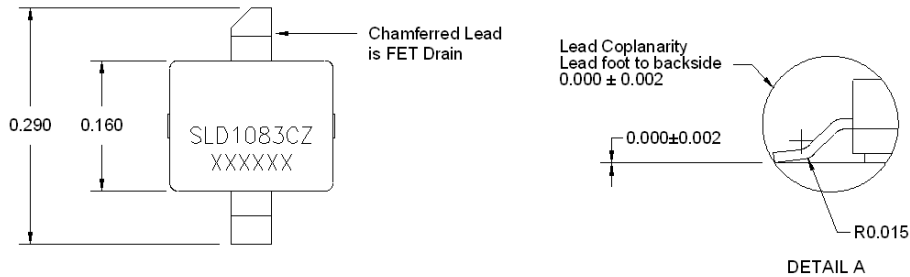
Suggested Pad Layout



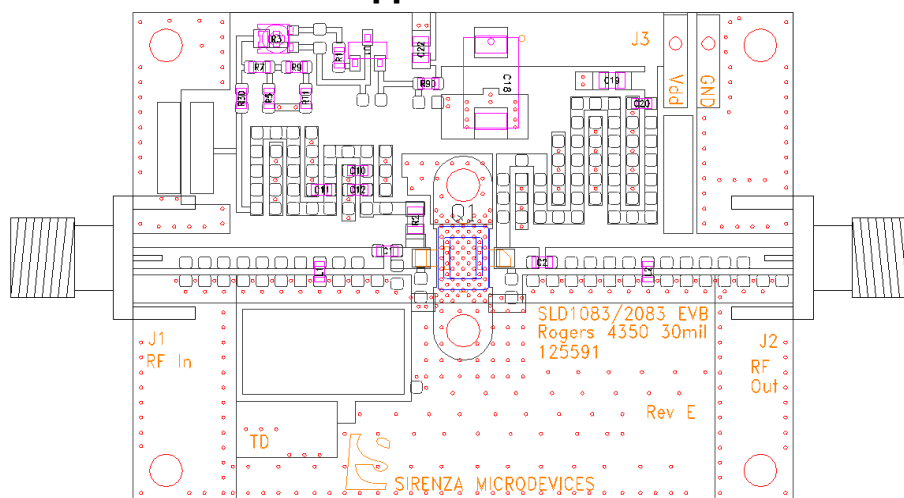
Package Drawing

Dimensions in inches

Refer to drawing posted at www.rfmd.com for tolerances.



90MHz Application Circuit



Bill of Materials - 900MHz Application Circuit

| Reference Description | Description | Mfg | Mfg Part Number |
|-----------------------|------------------------------|-----------|-------------------|
| C1 | CAP 68pF 250V 5% 0603 | ATC | 600S680JT250XT |
| C2 | CAP 18pF 250V 2% 0604 | ATC | 600S180GT250XT |
| L1 | IND, 16nH 5% 0603 | Coilcraft | 0603CS-160XJB |
| L2 | IND, 9.5nH 5% nH 0603 | Coilcraft | 0603CS-9N5XJB |
| C10 | CAP 0.1uF 16V 10% 0603 | AVX | 0603YG104ZA2A |
| C11, C20 | CAP 1000 pF 50V 10% 603 | AVX | 06035C102KAT2A |
| C12 | CAP 68pF 250V 5% 603 | ATC | 600S680JT250XT |
| C18 | CAP 10uF 35V 20% TAN T ELECT | Kemet | T494D106M035AS |
| C19, C22 | CAP 0.1uF 50V 10% 805 | Panasonic | ECJ2YB1H104K |
| J1, J2 | Connector SMA END 0.037 | Johnson | 142-0751-821 |
| J3 | Connector MTA SMD R/A 2 PIN | Amp | 640455-2 |
| R1 | RES 324 1/16W 1% 603 | Panasonic | ERJ-3EKF3240V |
| R2 | RES 0Ω jumper 805 | Panasonic | ERJ6GEY0R00V |
| R3 | POT TRIM 500Ω 2MM | Panasonic | EVM-2WSX80B52 |
| R30 | RES 49.9 1/16W 1% 603 | Panasonic | ERJ-EKF49R9V |
| R5 | RES 130 1/16 W 1% 603 | Panasonic | ERJ-3EKF1300V |
| R7 | RES 210 1/16W 1% 603 | Phillips | 9C06031A2100FKHFT |
| R9 | RES 0 1/16W 5% 603 | Panasonic | ERJ-3GSY0R00V |
| R90 | RES 1.0K 1/16W 1% 603 | Panasonic | ERJ-3EKF1001V |
| RT1 | THERMISTOR 100K 5% 603 | Panasonic | ERT-J1VW104J |
| U1 | IC VOLT REG 100MA 5V SOT-23 | National | LM3480IM3-5.0 |
| 6 screws | SCREW #2-56 PHILIPS PAN HEAD | various | - |
| 6 washers | WASHER #2 FLAT SS | various | - |
| PCB | PCB, 30mils thick DK=3.48 | Rogers | 4350 |
| Heatsink | machined aluminum | various | - |

Ordering Information

| Part Number | Reel Size | Devices/Reel |
|-------------|-----------|--------------|
| SLD-1083CZ | 7" | 500 |

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NOT FOR NEW DESIGNS