

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

Product Description

RFMD's SLD-1083CZ is a robust 4Watt 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

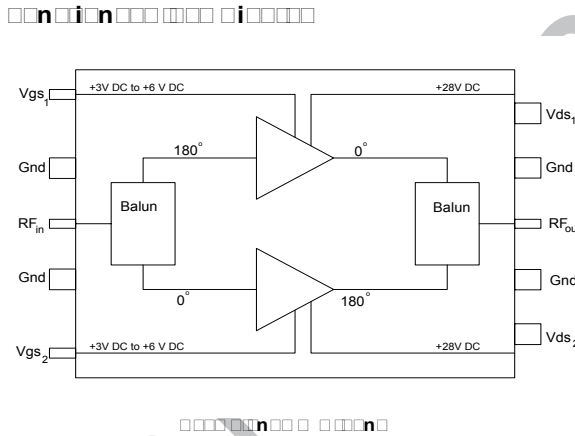
- 4 Watt Output P_{1dB}
- Single Polarity Supply Voltage
- High Gain; 18dB at 915MHz
- High Efficiency: 43% at 3W CW
- XeMOS II LDMOS
- Integrated ED Protection, Class 1B

Applications

- Base Station PA Driver
- Repeater
- 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		$^{\circ}C/W$	
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

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.



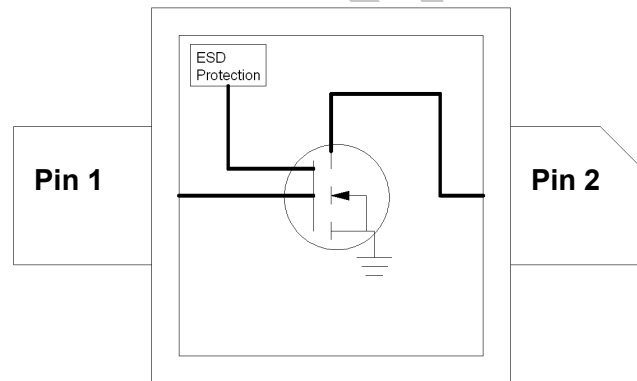
Caution! ESD sensitive device.

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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Pin Diagram



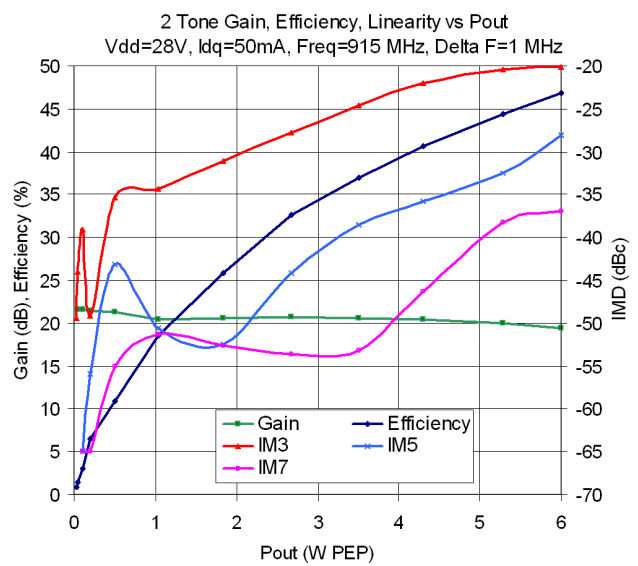
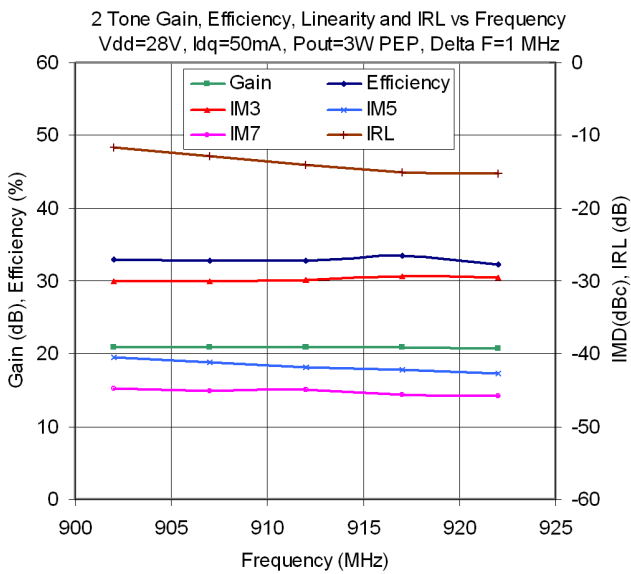
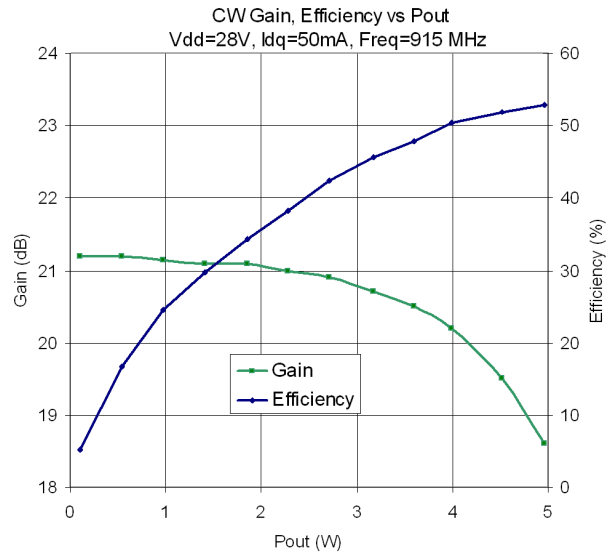
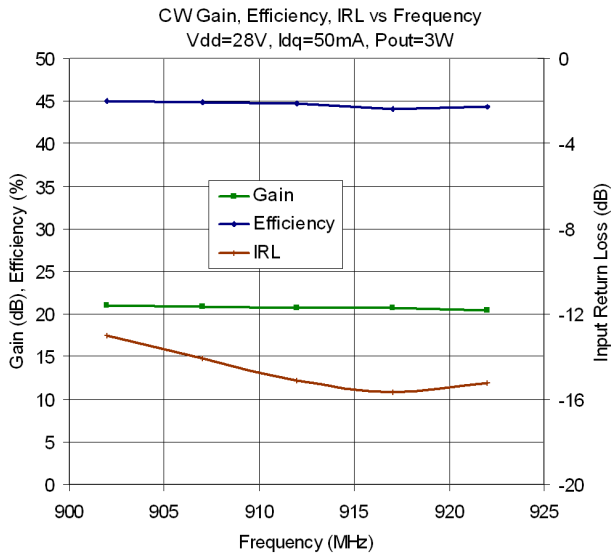
Case Flange = Ground

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.

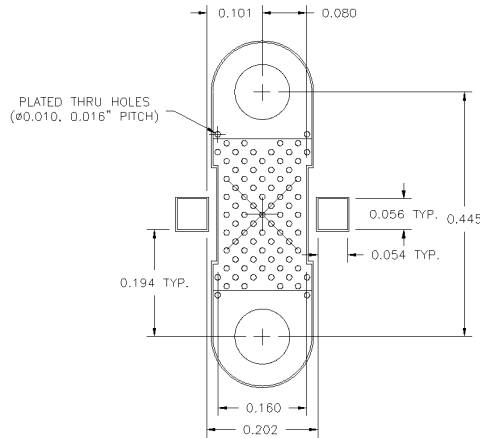
Typical Performance Curves in 90MHz Application Circuit



NC

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.

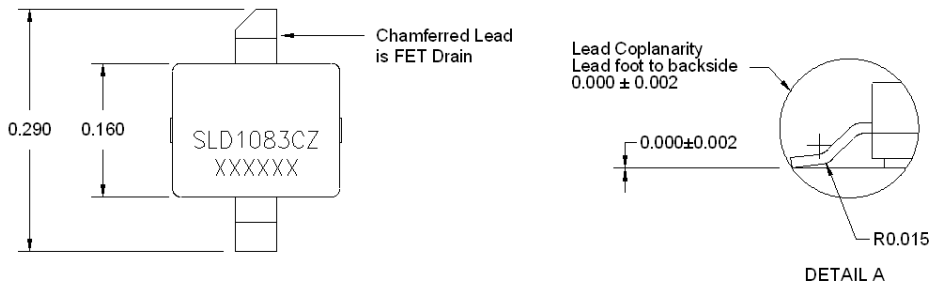
Suggested Pad Layout



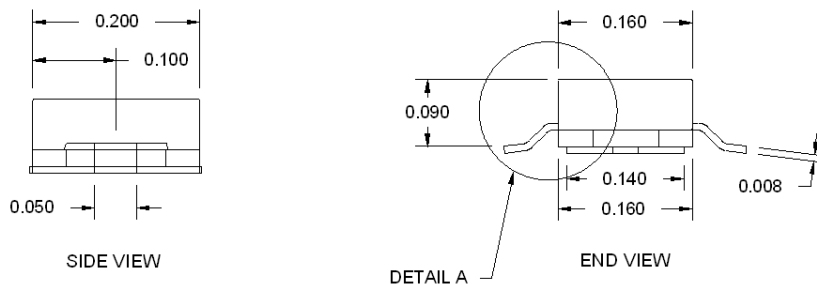
Package Drawing

Dimensions in inches

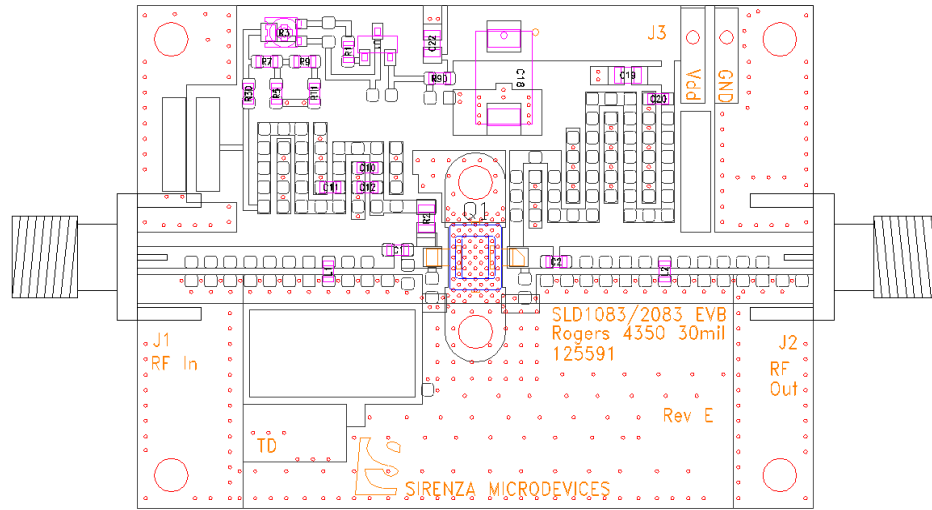
Refer to drawing posted at www.rfmd.com for tolerances.



TOP VIEW



90 MHz Application Circuit



Bill of Materials - 900MHz Application Circuit

Reference Description	Description	Mfg	Mfg Part Number
C1	CAP 68 pF 250V 5% 0603	ATC	600S680JT250XT
C2	CAP 18 pF 250V 2% 0604	ATC	600S180GT250XT
L1	IND, 16 nH 5% 0603	Coilcraft	0603CS-160XJB
L2	IND, 9.5 nH 5% nH 0603	Coilcraft	0603CS-9N5XJB
C10	CAP 0.1 uF 16V 10% 0603	AVX	0603YG104ZA2A
C11, C20	CAP 1000 pF 50V 10% 603	AVX	06035C102KAT2A
C12	CAP 68 pF 250V 5% 603	ATC	600S680JT250XT
C18	CAP 10 uF 35V 20% TAN T ELECT	Kemet	T494D106M035AS
C19, C22	CAP 0.1 uF 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-J1W104J
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

NOT FOR NEW DESIGNS