Part Number: ILD1214M60

Integra
TECHNOLOGIES, INC.

60W L-Band Radar LDMOS

The high power transistor part number ILD1214M60 is designed for the frequency band 1215-1400 MHz. Operating 3at 300us-10% pulse conditions this LDMOS FET device supplies a minimum of 60 watts of power across the instantaneous operating bandwidth of 1215-1400 MHz. All devices are 100% screened for large signal RF parameters.

Silicon LDMOS FET
- High Power Gain
- Superior thermal stability

Class AB Operation
- Gate biased to I_{DQ} = 550 mA

Configuration
- Common Source

Gold Metal
- Maximum Reliability

Package
- Thermally enhanced
- Pb-free and RoHS-compliant

Epoxy Sealed Lid
- Gross Leak Qualified

RF Test Fixture
- Broadband
- Matched to 50Ω
- Long-term Correlation
- 100% Device RF Screening
- No External Tuning required

TYPICAL DATA TYPICAL DATA TYPICAL DATA TYPICAL DATA

General Information ILD1214M60		Test Sequence Name	Freq (MHz)	PIN (W)	RL (dB)	POUT (W)	GP (dB)	dG (dB)	Id (A)	nd (%)	Droop (dB)	VSWR-LMT 3:1	VSWR-LMT 3:1 (P-F)
Date:	5/6/2009												
Assbly Lot - SN :	D3792-3	Nominal	1215	3	-18.0	78	14.15		9.490	65.2	0.11	P	P
Wafer :	NA												
Test Fixture :	NA	Nominal	1300	3	-17.0	68	13.55	0.73	9.400	58.1	0.06	P	P
Pass / Fail :	Device Passes												
OPERATOR:	FB	Nominal	1400	3	-15.0	66	13.42		9.250	58.7	0.03	P	P
Vd=30V	Pulse:300us-10%												
Idq=550mA													

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MAXIMUM RATINGS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Drain-Source Voltage	V_{DSS}	--	65	V	--
BD	Gate-Source Voltage	V_{GS}	-0.5	12	V	--
BD	Storage Temperature Range	T_{STG}	-40	+150	°C	--
BD	Operating Junction Temperature Range	T_J	-55	+200	°C	--
Note	Screen 'BD' = parameter qualified By Design.					

THERMAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Thermal Resistance	$R_{TH(JC)}$	--	TBD	°C/W	V_{DS}=30V, I_{DQ}=550mA, T_F=25±5°C, P_{IN}=3W, 300us/10%.
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_D = 10mA,V_{GS} = 0V, T_F = 25±5°C
100%	Drain Leakage Current	I_{DSS}	--	2	µA	V_{DS} = 30V, V_{GS} = 0V, T_F = 25±5°C
100%	Gate Threshold Voltage	V_{GSTH}	1.5	2.5	V	I_{DQ} = 100mA, V_{DS} = 5V, T_F = 25±5°C
100%	Gate Leakage Current	I_{GSS}	--	1	µA	V_{GS} = 5V, V_{DS} = 0V, T_F = 25±5°C

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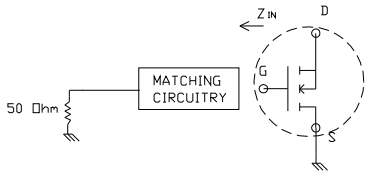
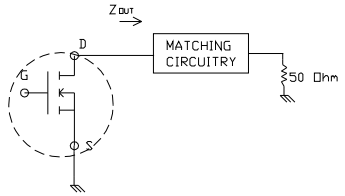
RF ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	RL	-18	-10	dB	V_d=30V, P_{IN} = 3W, 300us/10%, Idq=550mA, T_F=25±5°C, F=F1, F2, F3.
100%	Power Gain	G_p	13.0	15.0	dB	V_d=30V, P_{IN} = 3W, 300us/10%, Idq=550mA, T_F=25±5°C, F=F1, F2, F3.
100%	Output Power	Pout	60	95	W	V_d=30V, P_{IN} = 3W, 300us/10%, Idq=550mA, T_F=25±5°C, F=F1, F2, F3.
100%	Drain Efficiency	N_d	42	100	%	V_d=30V, P_{IN} = 3W, 300us/10%, Idq=550mA, T_F=25±5°C, F=F1, F2, F3.
100%	Load Mismatch Tolerance	VSWR-LMT	3:1	--	--	V_d=30V, P_{IN} = 3W, 300us/10%, Idq=550mA, T_F=25±5°C, F=F1, F2, F3, Rotate 3:1 output VSWR through 360° phase. Survival.
100%	Gain Flatness	GF	O	2	dB	V_d=30V, P_{IN} = 3W, 300us/10%, Idq=550mA, T_F=25±5°C, F=F1, F2, F3.
100%	Signal Amplitude Droop	Droop	-0.5	0.5	dB	V_d=30V, P_{IN} = 3W, 300us/10%, Idq=550mA, T_F=25±5°C, F=F1, F2, F3.
Note 1	F1= 1215 MHz, F2= 1300 MHz, F3= 1400 MHz.					
Note 2	T_F = Device flange temperature.					
Note 3	Screen 'BD' = parameter qualified By Design.					

RF TEST FIXTURE IMPEDANCE CHARACTERISTICS

Frequency (MHz)	Z_{IF} (Ω)	Z_{OF} (Ω)
1215	2.83 – j0.32	4.03 – j1.20
1300	2.49 - j0.38	3.97 – j1.00
1400	1.91 – j0.13	3.69 – j0.82
		

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PACKAGE DIMENSIONAL OUTLINE DRAWING

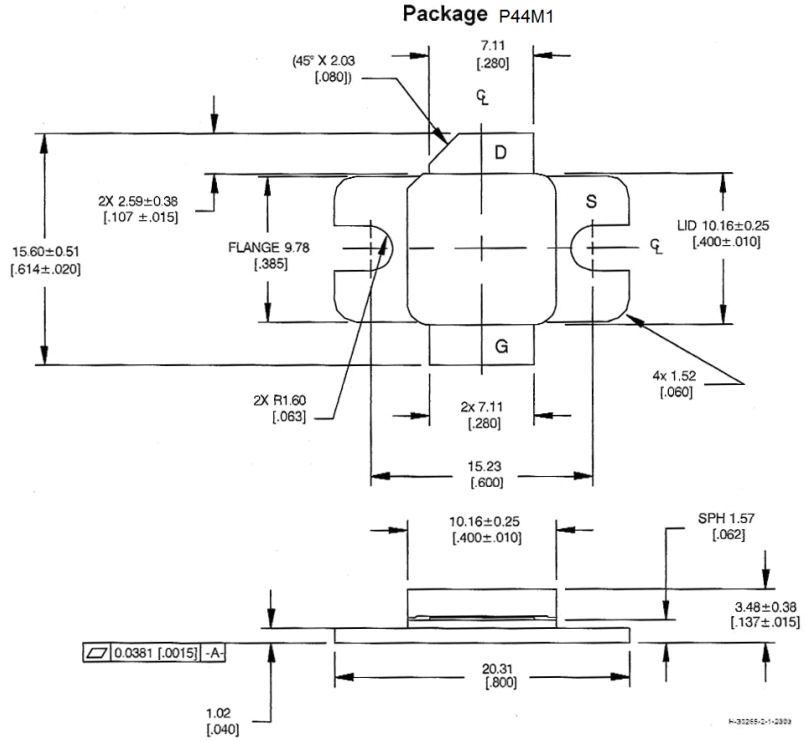

Diagram Notes:

1. Lead thickness: 0.10 +0.051/–0.025 [.004 +.002/–.001].
2. All tolerances ± 0.127 [.005] unless specified otherwise.
3. Pins: D = drain, S = source, G = gate.
4. Interpret dimensions and tolerances per ASME Y14.5M-1994.
5. Primary dimensions are mm. Alternate dimensions are inches.
6. Gold plating thickness:
   S - flange: 2.54 micron [100 microinch] (min)
   D, G - leads: 1.14 micron ± 0.38 micron [45 microinch ± 15 microinch]

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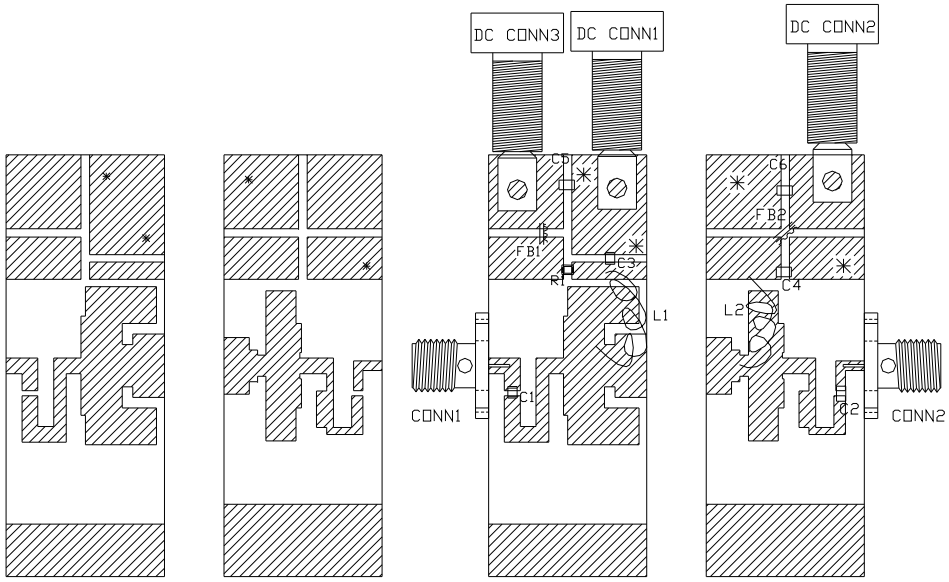
RF TEST FIXTURE – ASSEMBLY AND PARTS LIST



COMPONENT	DESCRIPTION
DUT	TRANSISTOR #ILD1214M60, MOUNT HARD TO THE RIGHT
PC BOARD	ROGERS RT6010.2LM 1oz. Cu BOTH SIDES
C1, C2, C3, C4	CHIP CAPACITOR, 33 pF
C5	CHIP CAPACITOR, 3300 pF
C6	CHIP CAPACITOR, 1uF
GS	GROUND SHIM, COPPER, TH=0.001" *
CONN1, CONN2	SMA CONNECTOR, TYPE OS #2052-5636-02
INPUT PC BOARD CARRIER	2 INCH BRASS - 02
OUTPUT PC BOARD CARRIER	2 INCH BRASS - 02
TRANSISTOR CARRIER	2 INCH COPPER - 15
TRANSISTOR CLAMP	NORYL CLAMP -15
HEATSINK	2 INCH HEATSINK - 11
DC CONN1	BANANA JACK, BLACK
DC CONN2	BANANA JACK, RED
DC CONN3	BANANA JACK, BLUE
FB1, FB2	FERRITE BEAD
R1	CHIP RESISTOR, 10 ohms
L1, L2	INDUCTOR, 6 TURNS, WIRE# 22, ID= 0.100"
NOTE	FIXTURE HARDWARE DRAWINGS AVAILABLE ON REQUEST

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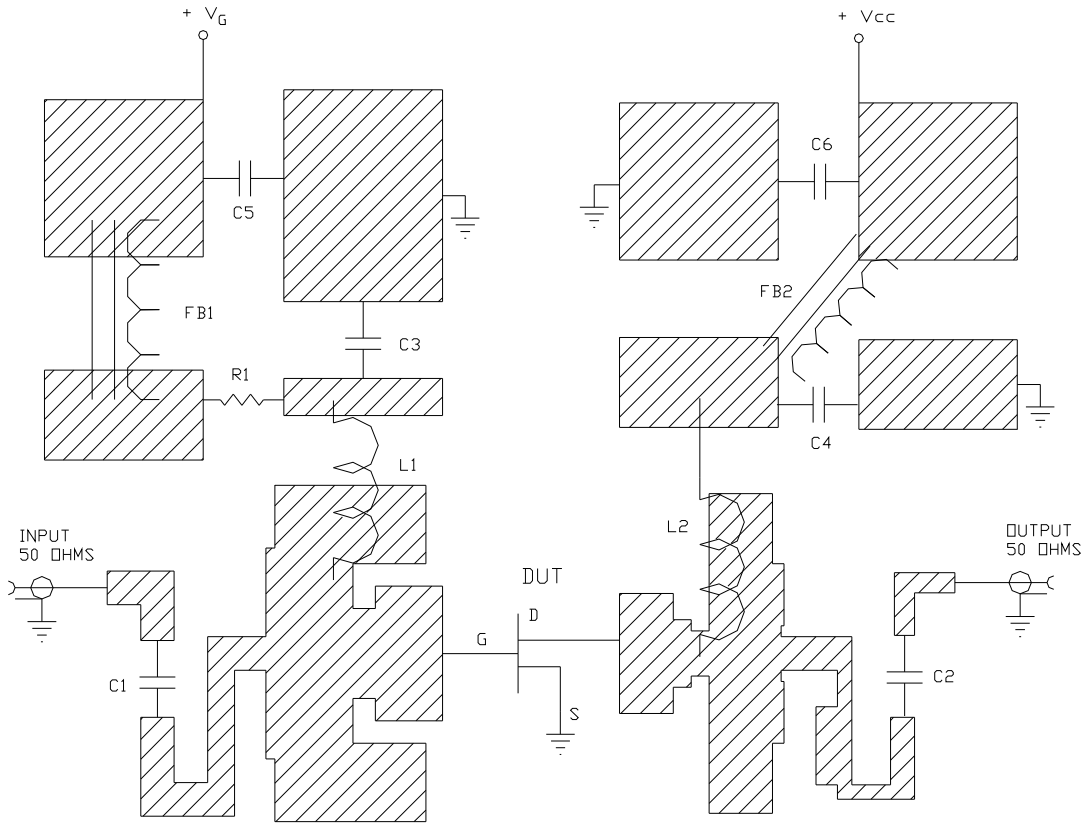
RF TEST FIXTURE – ELECTRICAL SCHEMATIC



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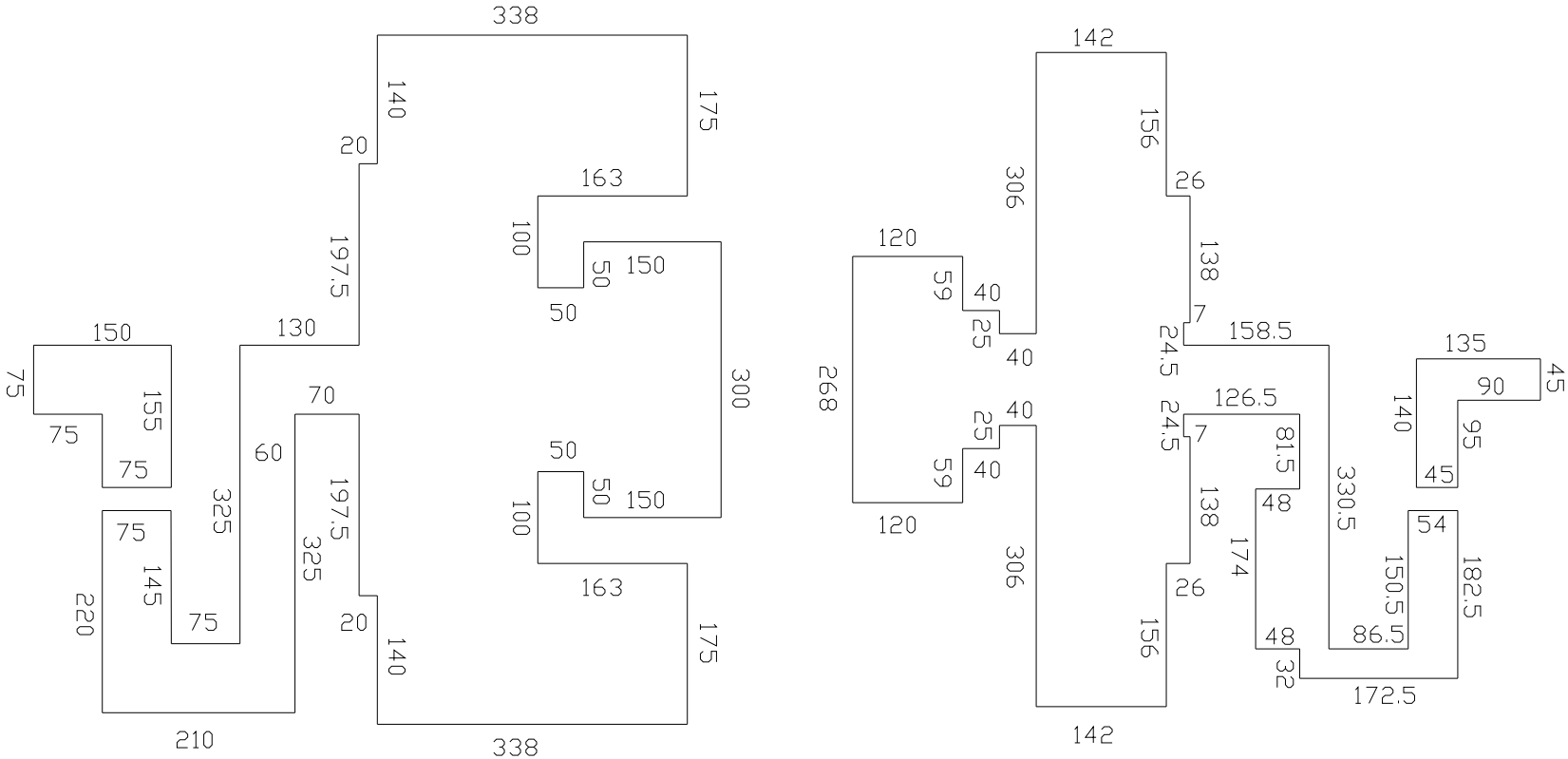
RF TEST FIXTURE – CIRCUIT DIMENSIONS IN MILS



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DEFINITIONS

Data Sheet Status	
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.

Maximum Ratings
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.

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