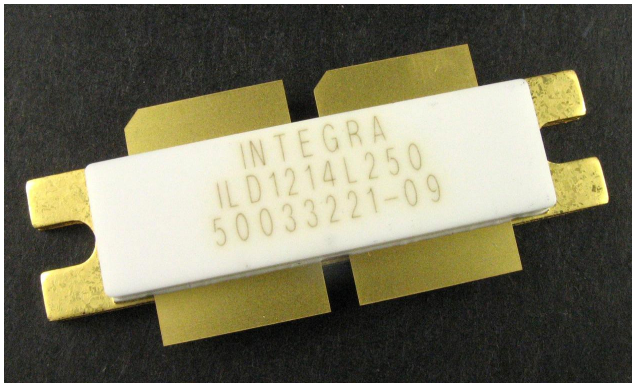
Part Number: ILD1214L250

Integra
TECHNOLOGIES, INC.

L-Band RF Power LDMOS Transistor

The high power pulsed transistor part number ILD1214L250 is designed for L-Band systems operating at 1.2–1.4 GHz. Operating at a pulse width of 1ms with a duty factor of 10%, this dual MOSFET device supplies a minimum of 250 watts of peak pulse power across the instantaneous operating bandwidth of 1.215-1.400 GHz. Fabricated with all gold metal contact, wire bonding and package for maximum reliability. All devices are 100% screened for large signal RF parameters in the broadband RF test fixture across the entire specified operating bandwidth with no variable or external tuning.



Silicon LDMOS
- High Power Gain
- Superior thermal stability

Class AB Operation
- Gate biased to I_{DQ}=2x250mA

Configuration
- Common Source

Gold Metal
- Gold Chip Metal
- Gold Wire Bond
- Maximum Reliability

Package
- Thermally Enhanced
- Gold Metal based

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*

Device	Bias (A)	Freq (MHz)	PW (ms)	Duty (%)	V_{DD} (V)	P_{IN} (W)	IRL (dB)	P_{OUT} (W)	G_P (dB)	I_d (A)	η_D (%)
D4445-3	0.5	1400	1	10	30.0	17.4	-19	250	11.6	13.80	60
		1400	1	10	30.0	12.0	-20	200	12.2	11.40	58
		1400	1	10	30.0	7.0	-20	120	12.3	7.48	53
		1300	1	10	30.0	14.1	-20	250	12.5	14.40	58
		1300	1	10	30.0	11.0	-20	200	12.6	12.40	54
		1300	1	10	30.0	6.9	-20	120	12.4	8.60	47
		1215	1	10	30.0	11.3	-20	250	13.5	13.20	63
		1215	1	10	30.0	8.4	-20	200	13.7	10.80	62
		1215	1	10	30.0	5.2	-20	120	13.7	7.14	56

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

MAXIMUM RATINGS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Drain-Source Voltage	V_{DS}	--	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	$R_{TH(JC)}$	--	0.15	°C/W	V_{dd}=30V, I_{DQ}=2x250mA, T_F=70±5°C, P_{OUT}=250W
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 (each side)	BV_{DSS}	65	--	V	I_D = 40mA, V_{GS} = 0V, T_F = 25±5°C
100%	Drain Leakage Current (each side)	I_{DSS}	--	10	µA	V_{DS} = 28V, V_{GS} = 0V, T_F = 25±5°C
100%	Gate Threshold Voltage (each side)	V_{GS}	1.5	2.5	V	I_D = 100mA, V_{DS} = 5V, T_F = 25±5°C
100%	Gate Leakage Current (each side)	I_{GSS}	--	1.0	µA	V_{GS} = 5V, V_{DS} = 0V, T_F = 25±5°C

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

RF ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	IRL	-18	-7	dB	V_{DD}=V1; I_{DQ}=I_{DQ1}: T_F=T_{F1}: P_O=P_{OUT1}: F=F1, F2, F3: PW1,DF1
100%	Input Power	P_{in}	5.60	25.00	W	V_{DD}=V1; I_{DQ}=I_{DQ1}: T_F=T_{F1}: F=F1, F2, F3: PW1,DF1
100%	Power Gain	G_P	10	16.5	dB	V_{DD}=V1; I_{DQ}=I_{DQ1}: T_F=T_{F1}: P_O=P_{OUT1}: F=F1, F2, F3: PW1,DF1
100%	Pulse Amplitude Droop	Drp	-0.5	0.5	dB	V_{DD}=V1; I_{DQ}=I_{DQ1}: T_F=T_{F1}: P_O=P_{OUT1}: F=F1, F2, F3: PW1,DF1
100%	Gain Flatness versus Frequency	dG	0	2.5	dB	V_{DD}=V1; I_{DQ}=I_{DQ1}: T_F=T_{F1}: P_O=P_{OUT1}: F=F1, F2, F3: PW1,DF1
100%	Drain Efficiency	Nd'	40	75	%	V_{DD}=V1; I_{DQ}=I_{DQ1}: T_F=T_{F1}: P_O=P_{OUT1}: F=F1, F2, F3: PW1,DF1
100%	Stability into 2:1 VSWR	VSWR-S	S	--	--	V_{DD}=V1; I_{DQ}=I_{DQ1}: T_F=T_{F1}: P_O=P_{OUT1}: F=F1, F2, F3: PW1,DF1 Rotate 2:1 output VSWR through 360° phase. No oscillatory or pulse break-up characteristics allowed on detected output pulse.
100%	3:1 Load Mismatch Tolerance	LMT	P	--	--	V_{DD}=V1; I_{DQ}=I_{DQ1}: T_F=T_{F1}: P_O=P_{OUT1}: F=F1, F2, F3: PW1,DF1 Rotate 3:1 output VSWR through 360° phase. Post test P_O = Pre test P_O±10W.
Note	V1=30V; I_{DQ1} (Drain Quiescent Current)=250mA/side PW1(Pulse Width 1) =1ms; DF1(Duty Factor 1)=10%; P_{OUT1}=250W; F1=1.215GHz, F2=1.300GHz, F3=1.400GHz T_{F1} (Flange Temp)=25±5°C RF Electrical characteristics tested in broadband RF test fixture					

BROADBAND RF TEST FIXTURE IMPEDANCE CHARACTERISTICS

Frequency (GHz)	Z_{IF} (Ω)	Z_{OF} (Ω)
1.215	1.8 –j1.2	1.2 –j2.9
1.300	1.7 –j0.4	1.2 –j2.1
1.400	1.6 +j0.6	1.2 –j1.4

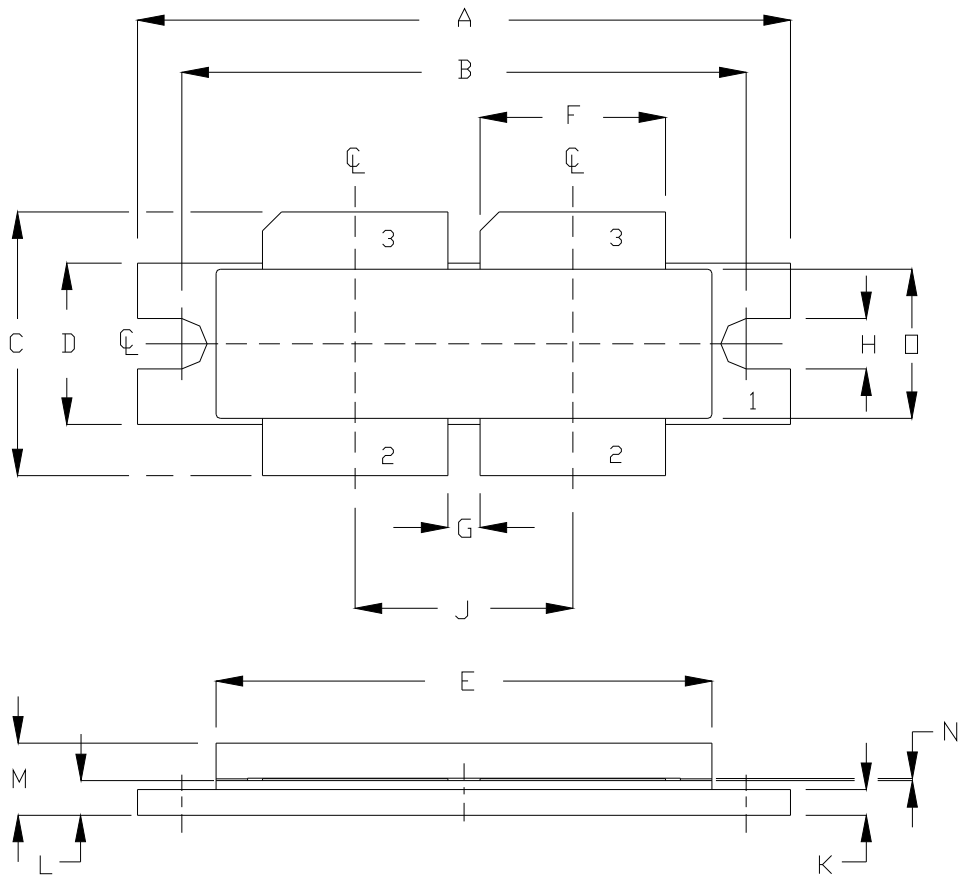
Z_{IF} = The test fixture input impedance for each side.

Z_{OF}= The test fixture output impedance for each side.

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

PACKAGE DIMENSIONAL OUTLINE DRAWING



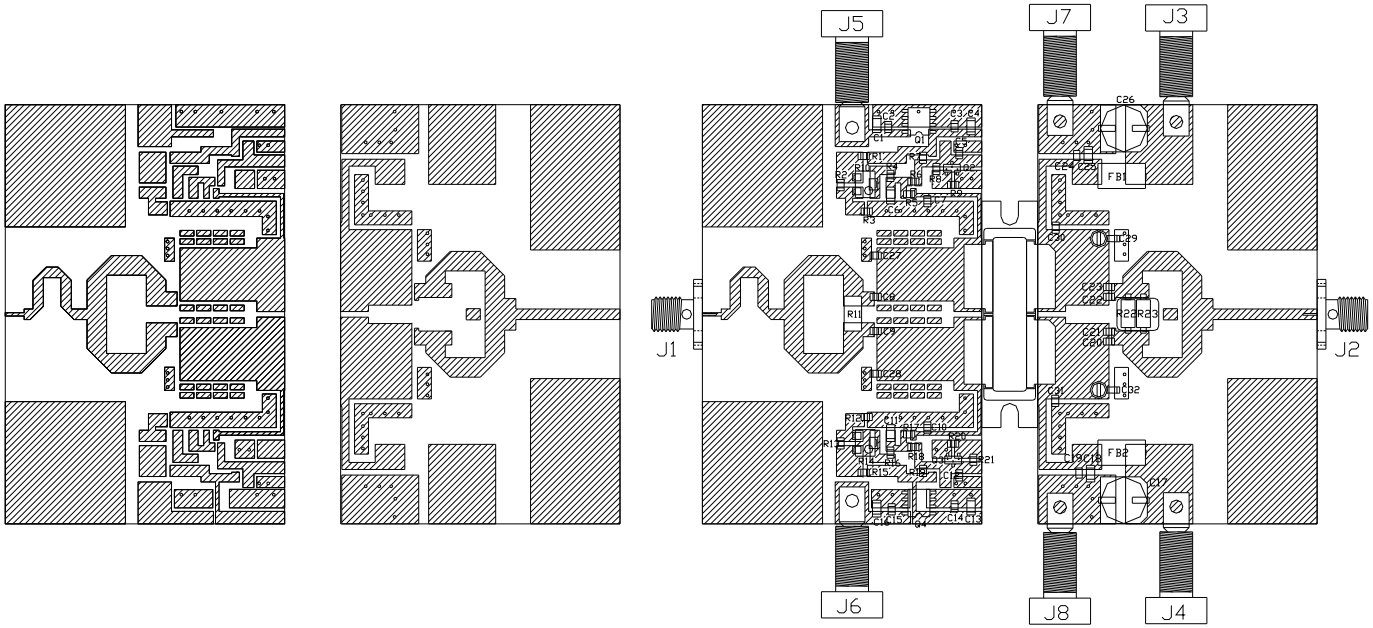
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.615	1.625	41.02	41.27
B	1.395	1.405	35.43	35.69
C	0.634	0.674	16.10	17.12
D	0.395	0.405	10.03	10.29
E	1.219	1.241	30.96	31.52
F	0.455	0.465	11.56	11.81
G	0.075	0.085	1.90	2.16
H	0.120	0.130	3.05	3.30
J	0.535	0.545	13.59	13.84
K	0.059	0.069	1.499	1.753
L	0.081	0.091	2.06	2.31
M	0.164	0.194	4.16	4.93
N	0.004	0.007	0.10	0.18
□	0.354	0.364	8.99	9.24

PIN	SCHEDULE
1	SOURCE
2	GATE
3	DRAIN

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

RF-TEST-FIXTURE ASSEMBLY AND PART LIST



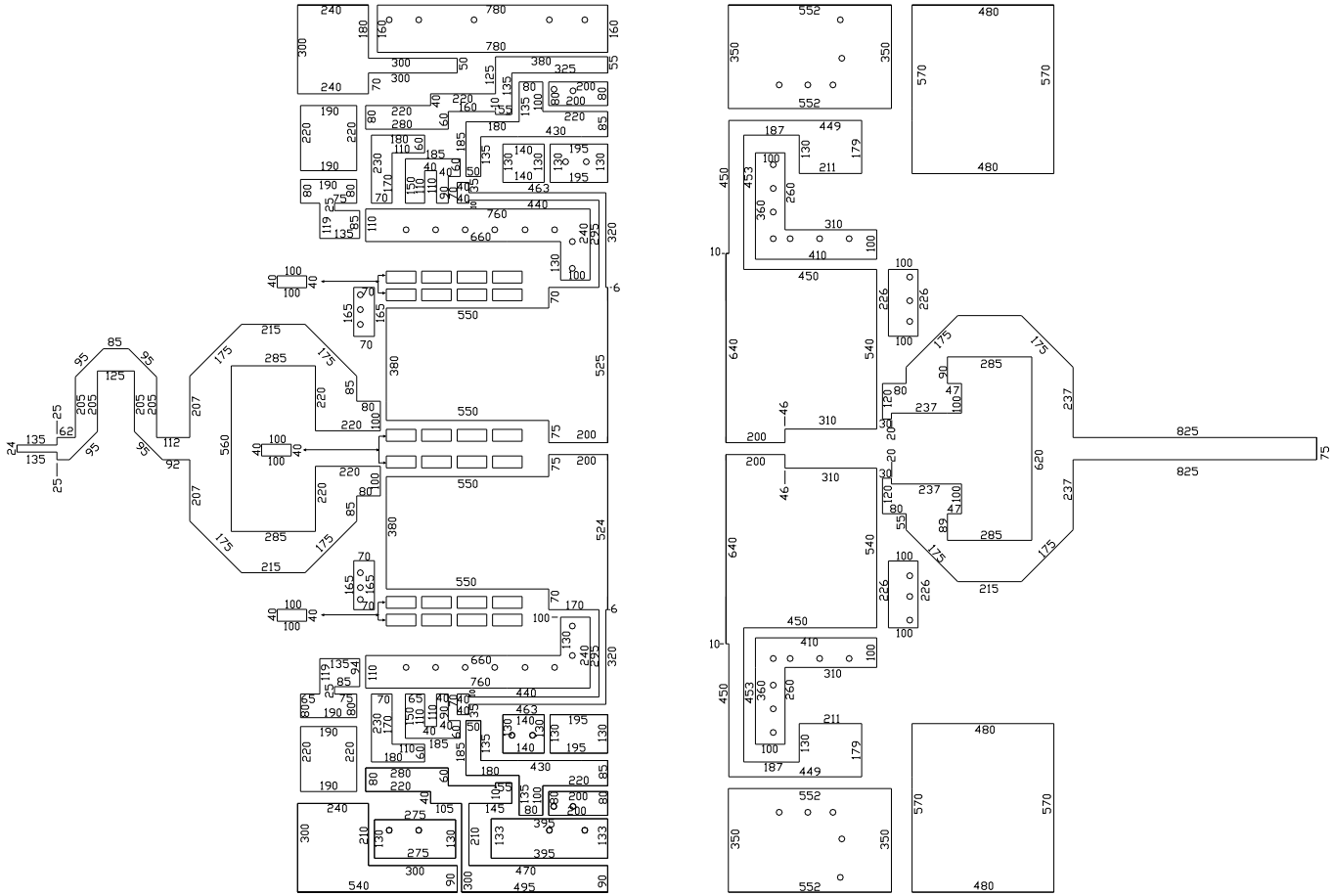
COMPONENT	DESCRIPTION
DUT	TRANSISTOR DUT MOUNT HARD TO THE RIGHT
PC BOARD	ROGERS #RO 6010, 25mil, 1oz COPPER
C1, C4, C6, C11, C13, C16, C18, C25	CHIP CAPACITOR 1206, 1uF, MURATA GRM31CR72A105KA01L
C2, C3, C5, C7, C8, C9, C10, C12, C14, C15, C19, C24	CHIP CAPACITOR 100pF, ATC 600F101JW250XT
C17, C26	ELECTROLYTIC CAPACITOR 68uF / 50V, 8x10mm NICHICON UUD1H680MNL1GS
C20, C21, C22, C23	CHIP CAPACITOR 0505, 47pF, ATC 100A
C27, C28	CHIP CAPACITOR 0805, 3.3pF, ATC 600F3R3BW250
C29, C32	CHIP CAPACITOR 0.4-2.5pF, TRIMMER JOHANSON #27283
C30	CHIP CAPACITOR 0805, 3pF, ATC 600F3R0CW250
C31	CHIP CAPACITOR 0805, 3pF, ATC 600F2R0CW250
C33,C34 (External)	ELECTROLYTIC CAPACITOR, 4700uF / 50V
FB1, FB2	BEAD, 10A STEWARD #28F0181-1SR-10
R1, R15	RESISTOR 0805, 820ohm
R2, R13	RESISTOR 0805, 390ohm
R3, R12	RESISTOR 0805, 150ohm
R4, R16	RESISTOR 0805, 1.8Kohm
R5, R17	RESISTOR 0805, 5.1ohm
R6, R18	RESISTOR 0805, 10Kohm
R7, R19	RESISTOR 0805, 1Kohm
R8, R21	RESISTOR 0805, 8.2Kohm

COMPONENT	DESCRIPTION
R9, R20	RESISTOR 0805, 1.5Kohm
R10, R14	RESISTOR POT, 200ohm BOURNS #3224W-1-201E
R11	RESISTOR 20ohm, 1W, 5%, 2512
R22, R23	RESISTOR 50ohm, 30W, 2010 ATC LR12010T0050 JBK
Q1, Q4	IC, VREG, SOIC8 #UA78L08ACD
Q2, Q3	TRANSISTOR NPN, SOT-23, MMBT2222AFSCT-ND
J1,J2	SMA CONNECTOR DS #2052-5636-02
INPUT PC BOARD CARRIER	3 INCH BRASS-07 RPK
OUTPUT PC BOARD CARRIER	3 INCH BRASS-07 RPK
TRANSISTOR CARRIER	4 INCH COPPER-24 RPK
TRANSISTOR CLAMP	NORYL CLAMP-TBD
ALUMINUM HEATSINK	4 INCH HEATSINK-03
J7, J8	BANANA JACK, BLACK
J3, J4	BANANA JACK, RED
J5, J6	BANANA JACK, BLUE
NOTE	FIXTURE HARDWARE DRAWINGS AVAILABLE ON REQUEST

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

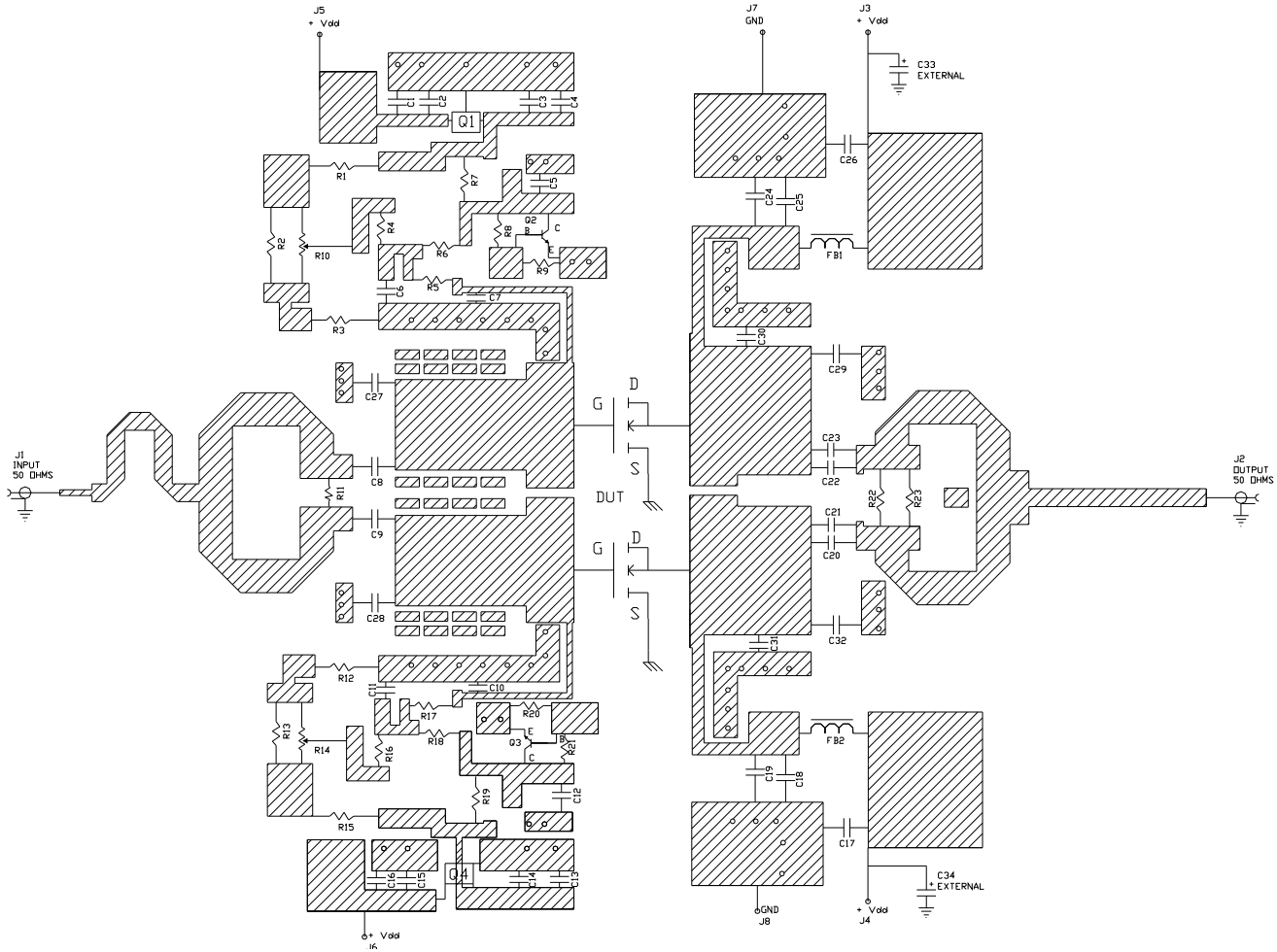
RF-TEST-FIXTURE CIRCUIT DIMENSIONS



www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

RF-TEST-FIXTURE ELECTRICAL SCHEMATIC



www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

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.

DISCLAIMER

Integra Technologies Inc. reserves the right to make changes without further notice to any products herein. Integra Technologies Inc. makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Integra Technologies Inc. assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. Integra Technologies Inc. products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Integra Technologies Inc. customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Integra Technologies Inc. for any damages resulting from such improper use or sale.

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620