

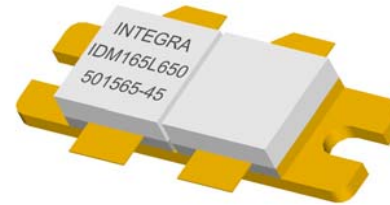
Part Number: IDM165L650



TECHNOLOGIES, INC.

VHF-Band Pulsed Power Transistor

The high power pulsed transistor part number IDM165L650 is designed for VHF-Band systems operating at 125-167 MHz. Operating at a pulse width of 1ms with a duty factor of 20%, this dual MOSFET device supplies a minimum of 650 watts of peak pulse power at a fixed input power of 80 watts across the instantaneous operating bandwidth of 125-167 MHz. 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 MOSFET

- High Power Gain
- Superior thermal stability

Class B Operation

- Gate biased to $I_{DQ}=0mA$

Configuration

- Dual In-phase operation
- Common Source

Gold Metal

- Maximum Reliability

BeO Package

- Unmatched Thermal Reliability

Epoxy Sealed Lid

- Gross Leak Qualified

RF Test Fixture

- Broadband
- Matched to 50Ω
- Long-term Correlation Maintained
- 100% Device RF Screening
- No External Tuning Allowed

TYPICAL DATA TYPICAL DATA TYPICAL DATA TYPICAL DATA

Device	Freq (MHz)	V _{DD} (V)	P _{IN} (W)	IRL (dB)	P _{OUT} (W)	G _P (dB)	I _D (A)	N _D (%)	Droop (dB)	P _{OUT} @ P _{IN} +1dB (W)
1273-16	125	34	80	14	763	9.8	35.0	64	-0.39	813
	146	34	80	21	689	9.5	32.7	62	-0.40	718
	167	34	80	12	660	9.2	31.0	63	-0.38	729

Pulse Duration = 1msec
 Duty Factor = 20%
 $I_{DQ} = 0mA$

MAXIMUM RATINGS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Drain-Source Voltage	V_{DS}	--	80	V	--
BD	Emitter-Base Voltage	V_{GS}	--	20	V	--
BD	Storage Temperature Range	T_{STG}	-55	+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	$R_{TH(JC)}$	--	0.25	°C/W	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{OUT}=650W.$
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}	80	--	V	$I_D=50mA, V_{GS}=0V, T_F=25\pm5^\circ C.$
100%	Drain Leakage Current (each side)	I_{DSS}	--	5	mA	$V_{DS}=34V, V_{GS}=0V, T_F=25\pm5^\circ C.$
100%	Gate Threshold Voltage 1 (each side)	V_{Gsth1}	1.0	--	V	$I_D=100\mu A, V_{GS}=10V, T_F=25\pm5^\circ C.$
100%	Gate Threshold Voltage 2 (each side)	V_{Gsth2}	2.0	--	V	$I_D=50mA, V_{GS}=10V, T_F=25\pm5^\circ C.$

RF ELECTRICAL CHARACTERISTICS

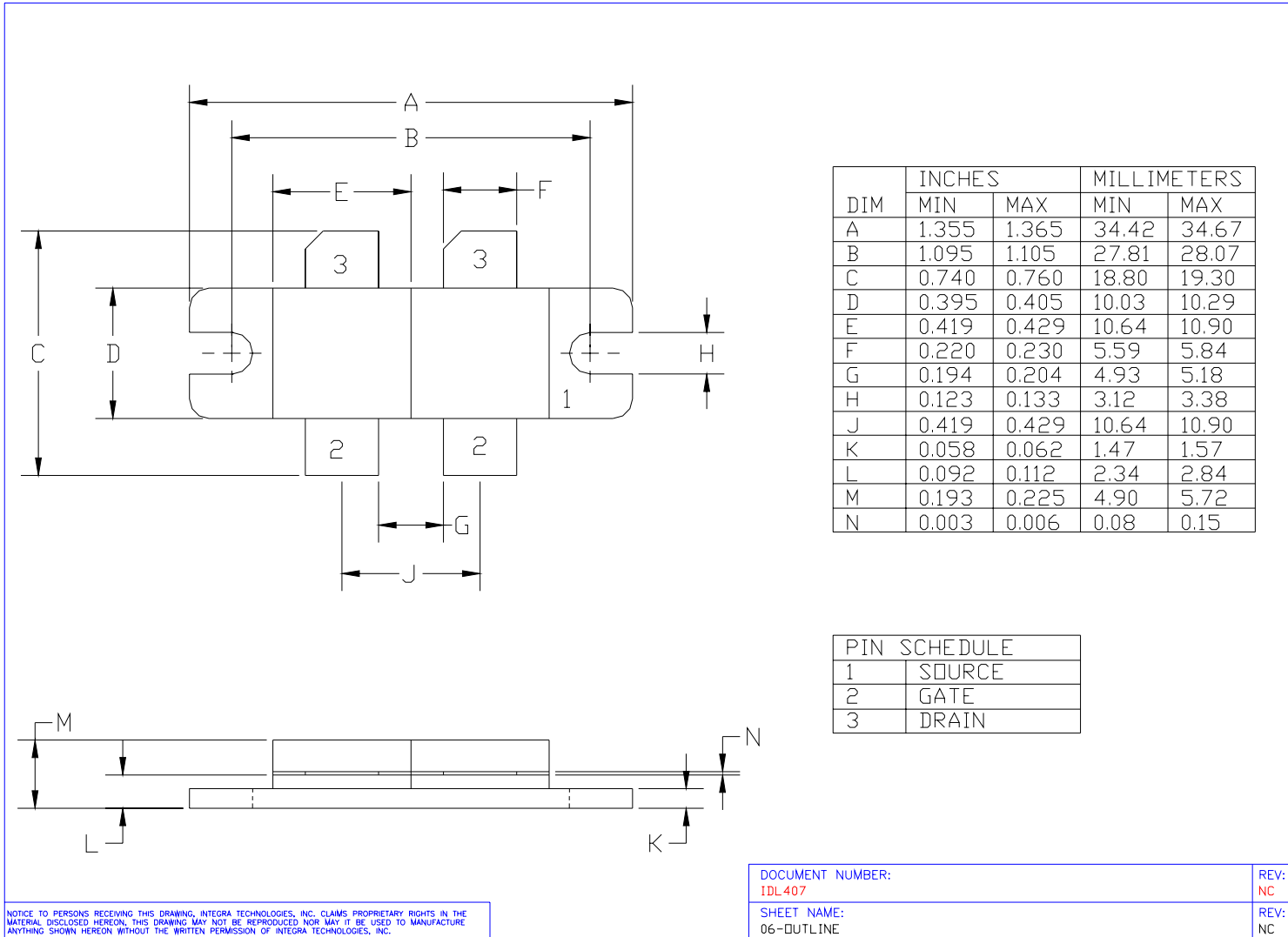
Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	IRL	10	--	dB	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Output Power	P_O	650	--	W	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Drain Efficiency ($P_O/I_D/V_{DD}$)	N_D	40	--	%	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Pulse Amplitude Droop	D	--	1.0	dB	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{IN}=P_{IN1}, F=F1, F2, F3.$ Measure between 100us and 900us time positions.
100%	Power Gain	G_P	9.1	--	dB	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Gain Flatness versus Frequency	GF	--	1.2	dB	$GF = MAX(G_P) - MIN(G_P).$
100%	Stability into 2:1 VSWR	VSWR-S	S	--	--	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{IN}=P_{IN1}, F=F1, F2, F3.$ 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	--	--	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{IN}=P_{IN1}, F=F1, F2, F3.$ Rotate 3:1 output VSWR through 360° phase. Post test $P_O =$ Pre test $P_O \pm 10W.$
100%	Overdrive Stability	OD-S	S	--	--	$V_{DD}=V1, I_{DQ}=0mA, PW=PW1, DF=DF1, T_F=25\pm5^\circ C, P_{IN}=P_{IN2}, F=F1, F2, F3.$ No oscillatory or pulse break-up characteristics allowed on detected output pulse.
Note	$V1 = 34V; PW1 = 1ms; DF1 = 20%; P_{IN1} = 80W; P_{IN2} = 100W; F1 = 125MHz, F2 = 146MHz, F3 = 167MHz.$					
Note	$T_F =$ Device flange temperature.					

BROADBAND RF TEST FIXTURE IMPEDANCE CHARACTERISTICS

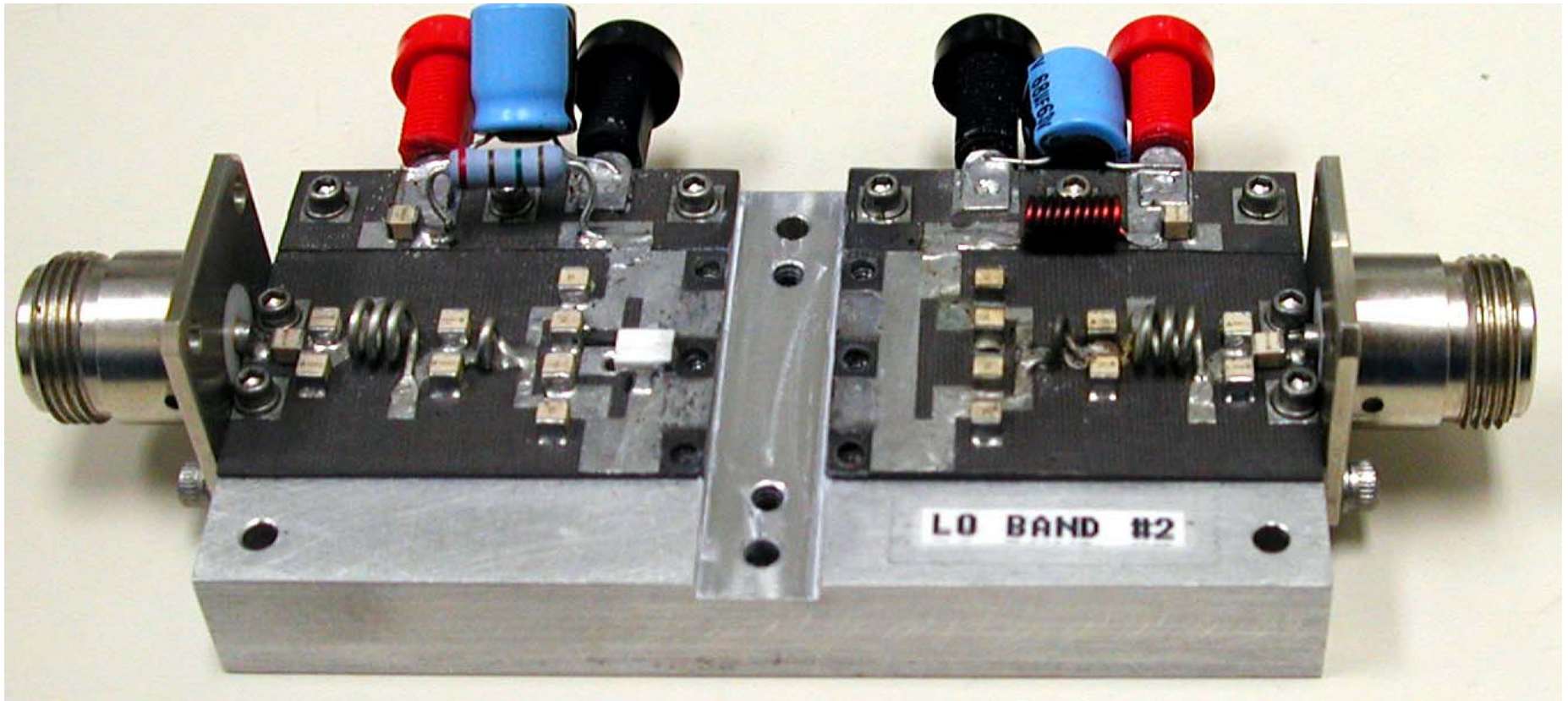
Frequency (MHz)	$Z_{IF} (\Omega)$	$Z_{OF} (\Omega)$
125	1.558 + j0.013	1.632 + j0.035
146	1.565 + j0.157	1.760 + j0.105
167	1.248 + j0.698	1.415 + j0.484

Impedance Definition		
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PACKAGE DIMENSIONAL OUTLINE DRAWING

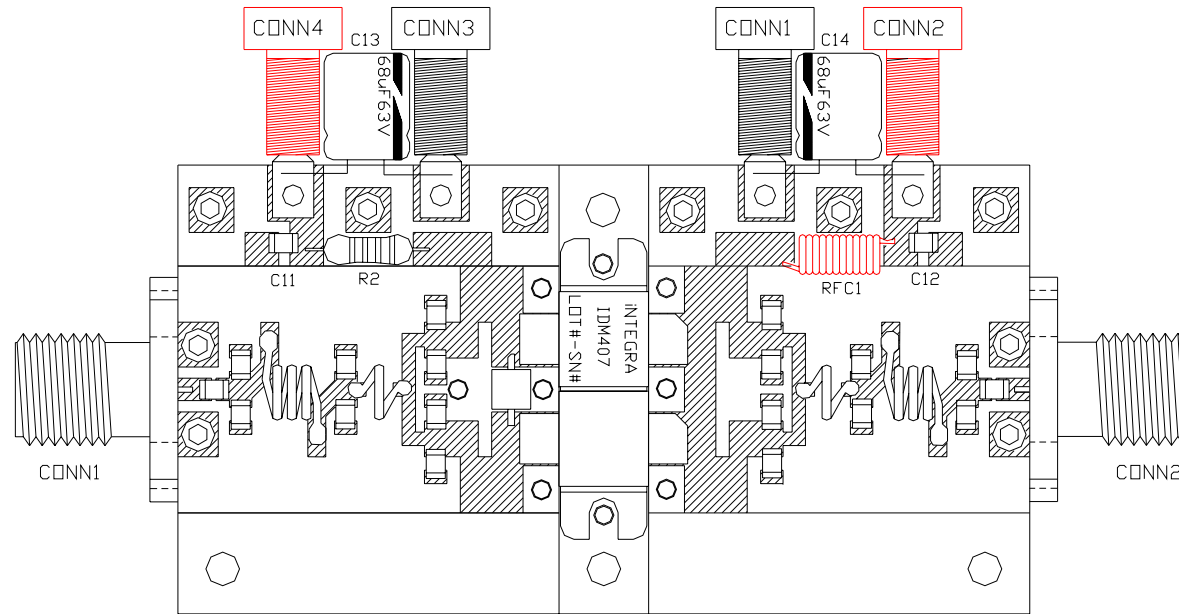


BROADBAND RF TEST FIXTURE



PHOTOGRAPH

BROADBAND RF TEST FIXTURE



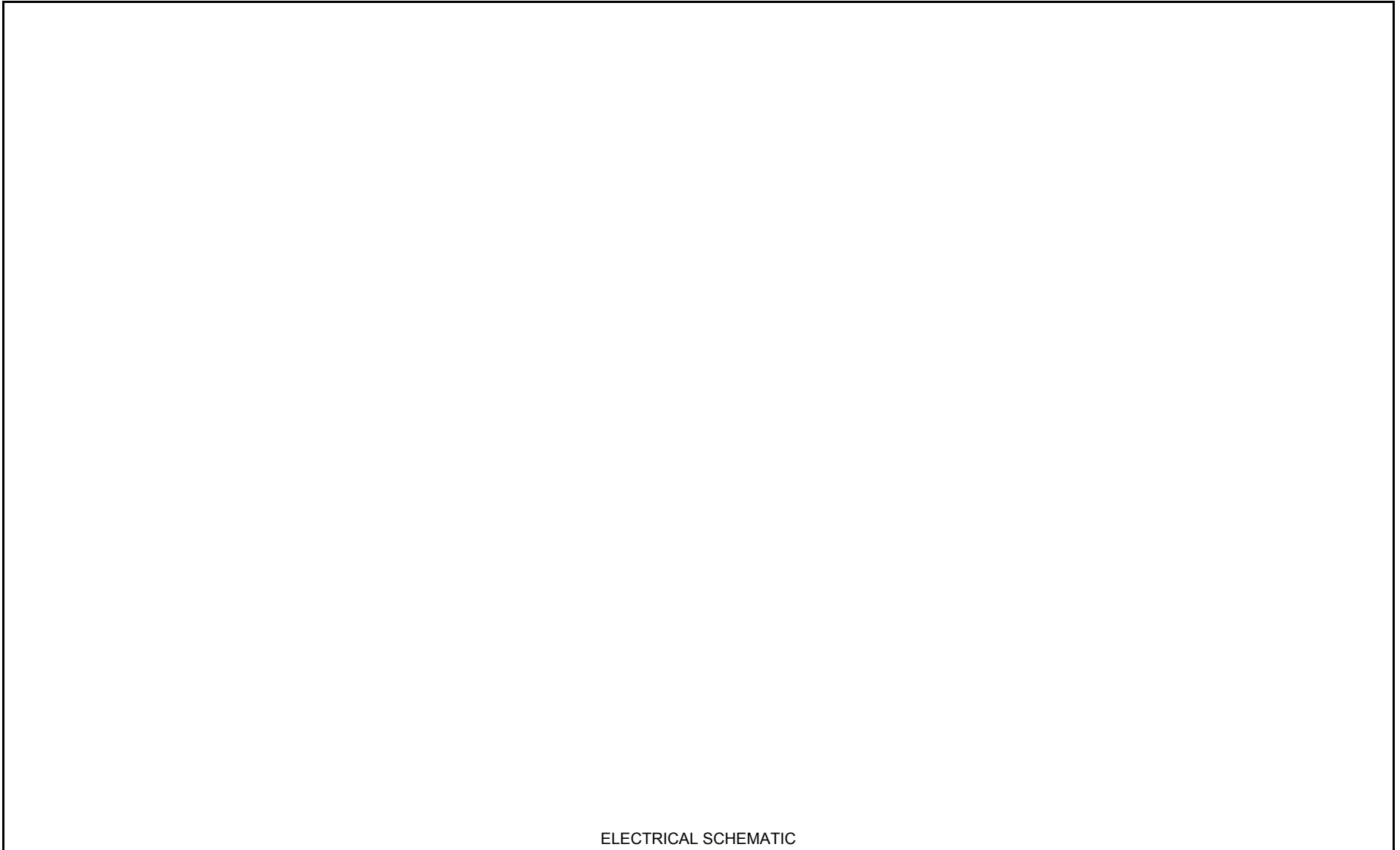
COMPONENT	DESCRIPTION
DUT	TRANSISTOR #IDM407, MOUNT HARD TO THE RIGHT
PC BOARD	DAK 601, TH=0.031", Dk=2.54
C1, C10	ATC, 100B, 561Kw (560pF)
L1, L12	3 TURNS #18 WIRE, 0.120 ID
L2, L11	1 TURN, #18 WIRE, 0.110 ID
C2, C9	1x ATC, 100B, 220JW + 1x ATC, 100B, 200J
L3-L10	SEE MICROSTRIP DIMENSIONS
C11, C12	ATC, 100B, 820pF
C3, C8	2x ATC, 100B, 101JW (100pF)
C4,C5,C6,C7	2x ATC, 100B, 181JW (180pF)
R1	INTEGRA RES1-02
R2	150 ohm, 0.5 WATT RESISTOR
RFC1	10 TURNS, #20 WIRE, 0.110 ID
DC CONN 1, 3	BANANA JACK, BLACK
DC CONN 2, 4	BANANA JACK, RED
TRANSISTOR CLAMP	NDRYL CLAMP - 06
CONN1, CONN2	N TYPE CONNECTORS
NOTE	FIXTURE HARDWARE DRAWINGS AVAILABLE ON REQUEST

ASSEMBLY AND PARTS LIST

Part Number: **IDM165L650**

Integra
TECHNOLOGIES, INC.

BROADBAND RF TEST FIXTURE



ELECTRICAL SCHEMATIC

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 and 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.

WARNING**Product and environmental safety - toxic materials**

This product contains beryllium oxide. The product is entirely safe provided that the BeO base is not damaged. All persons who handle, use or dispose of this product should be aware of its nature and of the necessary safety precautions. After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with general or domestic waste.

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