Part Number: IB0810M12

Integra
TECHNOLOGIES, INC.

L-Band Radar Transistor

The high power pulsed radar transistor device part number IB0810M12 is designed for L-Band radar systems operating over the instantaneous bandwidth of 870-990 MHz. While operating in class C mode this common base device supplies a minimum of 12 watts of peak pulse power under the conditions of 300µs pulse width and 15% duty cycle. All devices are 100% screened for large signal RF parameters in a broadband RF test fixture with no external tuning. Excellent spectral stability into output mismatch over a broad input power range make it ideal for use in reliable high power solid state transmitters.

- Silicon Bipolar
  - Ultra-high f_T
- Class C Operation
  - High Efficiency
- Common Base Configuration
  - Single Power Supply
- Gold Metal
  - Maximum Reliability
- Emitter Ballasting
  - Optimum Thermal Distribution
- Internal Impedance Matching
  - Ease of Use
  - Ultra-low Loss Design
- Be0 Package
  - Unmatched Thermal Reliability
- RF Test Fixture
  - Broadband
  - Matched to 50Ω
  - Long-term Correlation
  - 100% Device RF Screening
  - No External Tuning Allowed

TYPICAL DATA TYPICAL DATA TYPICAL DATA TYPICAL DATA

FREQ (MHz)	Pout (W)	1 dB-OD-Pout (W)	Pin (W)	Ic (A)	IRL (dB)	Droop (dB)	Gain (dB)	Nc (%)	Δ Gain (dB)	VSWR 2:1	VSWR 3:1
870	12	13.7	2.1	0.627	19	-0.12	7.5	53	0.77	S	P
930	12	14.2	2.0	0.620	18	-0.12	7.7	54		S	P
990	12	13.6	1.8	0.620	17	-0.13	8.3	54		S	P

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MAXIMUM RATINGS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Collector-Emitter Voltage	V_{CES}	--	75	V	V_{BE}=0V.
BD	Emitter-Base Voltage	V_{EBO}	--	3.0	V	--
BD	Storage Temperature Range	T_{STG}	-65	+200	°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	$R_{TH(JC)}$	--	3.25	°C/W	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=12W.
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.
BD	Fine leak test	--	--	--	--	MIL-STD-750D, Method 1071, Test Condition H.
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.					
Note	Screen 'BD' = parameter qualified By Design.					

DC ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Collector-Emitter Breakdown Voltage	BV_{CES}	75	--	V	I_C=5mA, V_{BE}=0V, T_F=25±5°C.
100%	Zero Base Voltage Collector Leakage Current	I_{CES}	--	1	mA	V_{CE}=30V, V_{BE}=0V, T_F=25±5°C.
100%	DC Current Gain	H_{FE}	10	100	--	V_{CE}=5V, I_C=0.1A, T_F=25±5°C.

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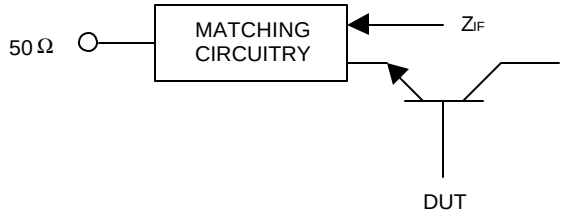
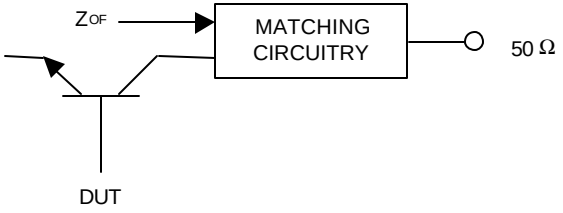
RF ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	IRL	10	--	dB	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=P_{OUT1}, F=F1, F2, F3.
100%	Input Power	P_{IN}	1.5	2.4	W	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=P_{OUT1}, F=F1, F2, F3.
100%	Collector Efficiency ($P_O/I_C/V_{CC}$)	N_C	45	--	%	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=P_{OUT1}, F=F1, F2, F3.
100%	Power Gain	G	7.0	9.0	dB	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=P_{OUT1}, F=F1, F2, F3.
100%	Pulse Amplitude Droop	D	--	0.5	dB	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=P_{OUT1}, F=F1, F2, F3. Delta peak power between 10 and 290us time positions.
100%	Power Gain Flatness versus Frequency	PGF	--	1.0	dB	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=P_{OUT1}, F=F1, F2, F3. Calculate from G_{MAX} – G_{MIN} @ F=F1, F2 & F3.
100%	Stability into 2:1 VSWR	VSWR-S	--	--	--	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=P_{OUT1}, F=F1, F2, F3. Repeat P_O. Rotate 2:1 output VSWR through 360° phase. No oscillatory or pulse break-up characteristics allow ed on detected output pulse. All non-harmonically related signals must be at least –65 dBc.
100%	3:1 Load Mismatch Tolerance	LMT	--	--	--	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=P_{OUT1}, F=F1, F2, F3. Repeat P_O. Rotate 3:1 output VSWR through 360° phase. Post-test P_O = Pre-test P_O±2.5W.
Note	V1 = 36V; PW1 = 300µs; DF1 = 15%; P_{OUT1} = 12W; F1 = 870 MHz, F2 = 930 MHz, F3 = 990 MHz.					
Note	T_F = Device flange temperature.					

BROADBAND RF TEST FIXTURE IMPEDANCE CHARACTERISTICS

Frequency (MHz)	Z_{IF} (Ω)	Z_{OF} (Ω)
870	3.8 - j4.8	8.4 + j11.2
930	3.8 - j4.5	8.9 + j10.3
990	3.7 - j4.5	8.5 + j13.4
Impedance Definition		

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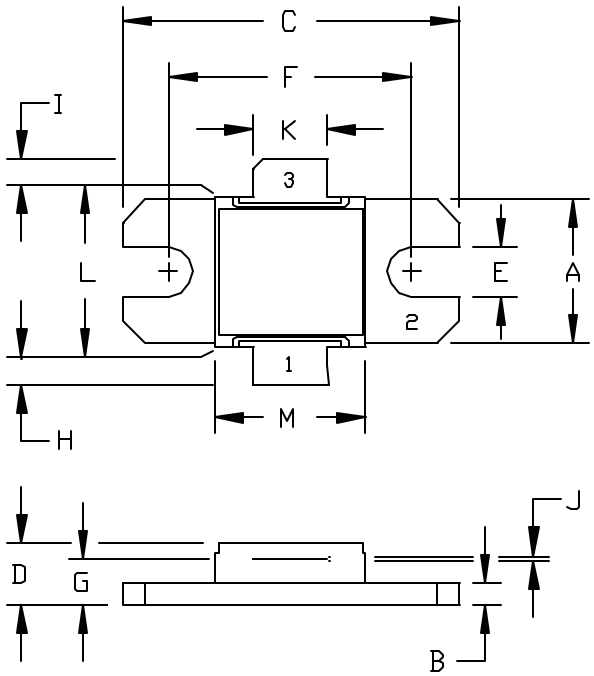
PACKAGE DIMENSIONAL OUTLINE DRAWING



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.380	0.390	9.65	9.91
B	0.058	0.062	1.47	1.57
C	0.895	0.905	22.73	22.99
D	0.157	0.177	3.99	4.50
E	0.125	0.135	3.18	3.43
F	0.645	0.655	16.38	16.64
G	0.112	0.132	2.84	3.35
H	0.090	0.255	2.29	6.48
I	0.090	0.255	2.29	6.48
J	0.003	0.005	0.08	0.13
K	0.195	0.205	4.95	5.21
L	0.395	0.405	10.03	10.29
M	0.395	0.405	10.03	10.29

PIN SCHEDULE	
1	EMITTER
2	BASE
3	COLLECTOR

DOCUMENT NUMBER:	REV:
IB0810M12	NC
SHEET NAME:	REV:
06-OUTLINE	NC

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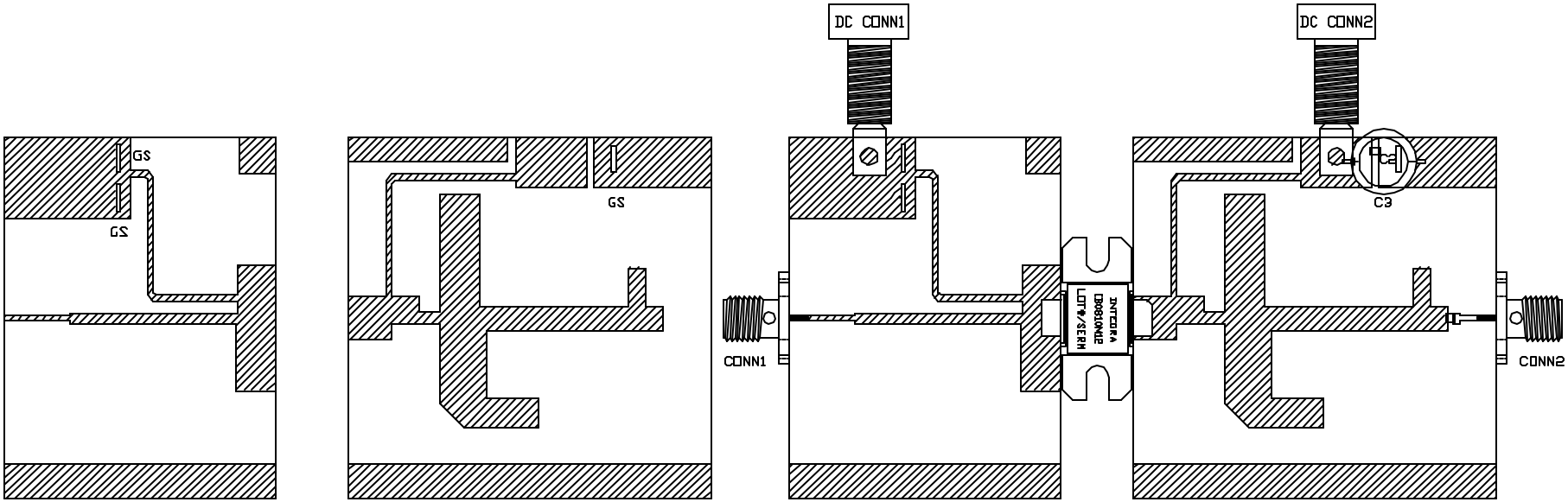
BROADBAND RF TEST FIXTURE



COMPONENT	DESCRIPTION
DUT	TRANSISTOR #IB0810M12, MOUNT HARD TO THE RIGHT
PC BOARD	ROGERS #RO3010, TH=0.025"
C1, C2	CHIP CAPACITOR, TYPE ATC100A, 100 pF
C3	ELECTROLYTIC CAPACITOR, 68uF / 63V
GS	GROUND SHIN, COPPER, TH=0.001"
CONN1, CONN2	SMA CONNECTOR, TYPE GS #2052-5636-02
INPUT PC BOARD CARRIER	2 INCH BRASS - 05 (1.5")
OUTPUT PC BOARD CARRIER	2 INCH BRASS - 06 (2.0")
TRANSISTOR CARRIER	2 INCH COPPER - 02
TRANSISTOR CLAMP	NORYL CLAMP - 03
HEATSINK	2 INCH HEATSINK - 11
DC CONN1	BANANA JACK, BLACK
DC CONN2	BANANA JACK, RED
NOTE	FIXTURE HARDWARE DRAWINGS AVAILABLE ON REQUEST

ASSEMBLY AND PARTS LIST

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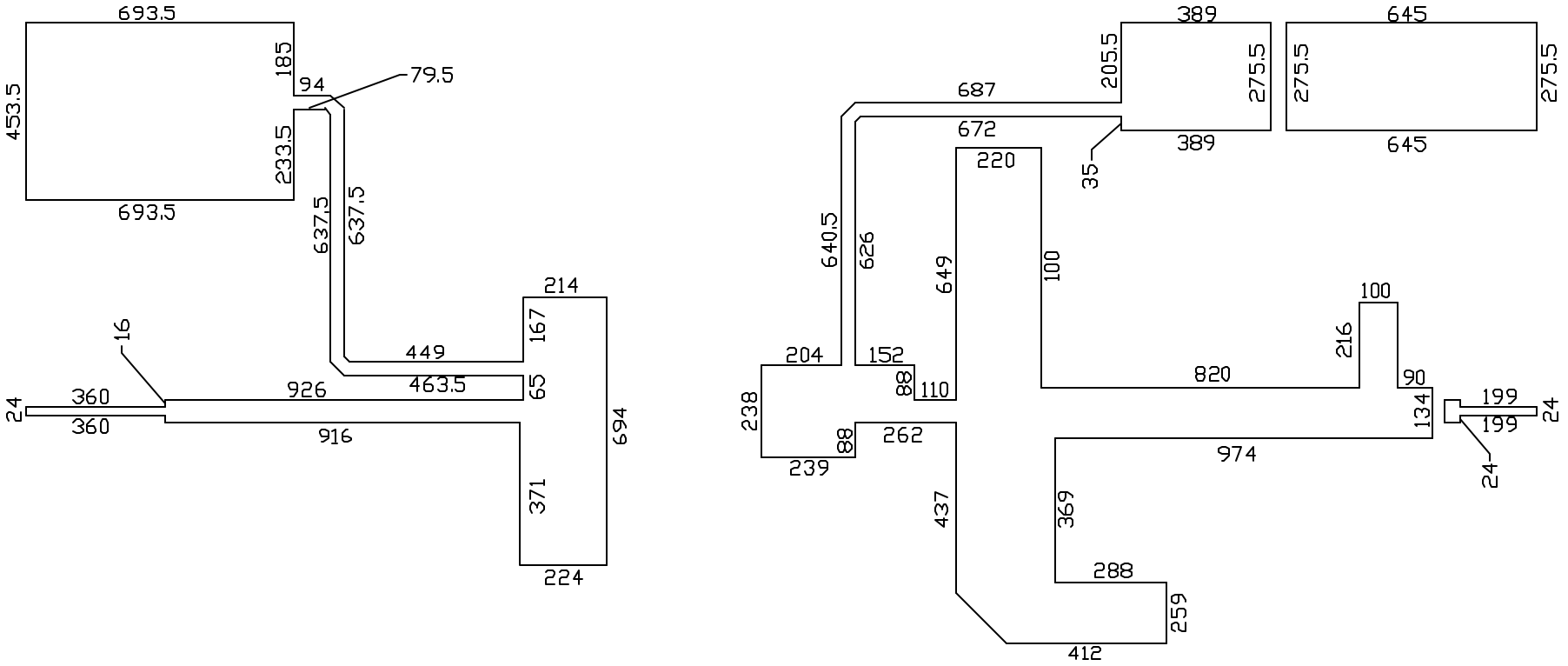

CIRCUIT DIMENSIONS IN MILS (1 MIL = 0.001")

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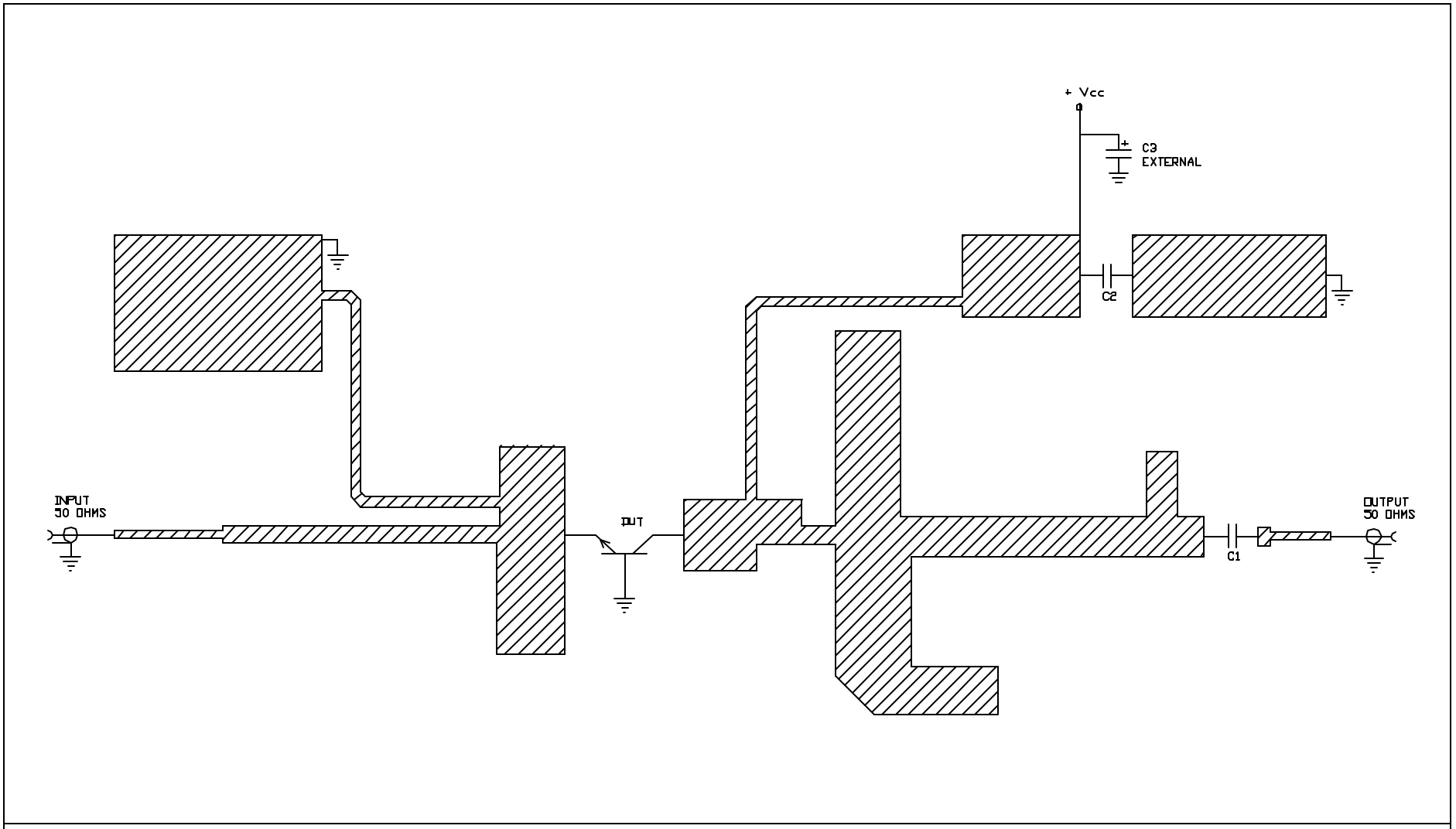

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DEFINITIONS

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 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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微波光电部专业代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波 CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件： 晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子元器件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适 配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

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