

S-Band Radar Miniature Power Amplifier

Part number MPAB3134M40 is a completely internally matched miniaturized power amplifier. It is designed for S-Band radar systems operating with an instantaneous bandwidth of 3.1-3.4 GHz. It utilizes gold metal bipolar transistor technology operating in common base configuration and class C mode. It supplies a minimum of 40 watts of peak pulse power under the conditions of 100µs pulse width and 10% duty cycle over the frequency range of 3.1-3.4 GHz. All devices are 100% screened for large signal RF parameters.



50 Ohm Matched

- Requires no external impedance matching circuitry

Silicon Bipolar Transistor

- Ultra-high f_T

Class C Operation

- No Quiescent Current
- High Efficiency

Common Base Configuration

- Simple Biasing
- Single Power Supply

Gold Metal

- Maximum Reliability

Emitter Ballasting

- Optimum Thermal Distribution

Be0 Package

- Unmatched Thermal Reliability

RF High Power Test

- 100% Device RF High Power Screening

TYPICAL DATA TYPICAL DATA TYPICAL DATA TYPICAL DATA

Freq (GHz)	PW (us)	Duty (%)	Vcc (V)	P _{IN} (W)	IRL (dB)	P _{OUT} (W)	G _p (dB)	I _c (A)	n _c (%)
3.1	100	10	36.0	6.0	-16	50	9.2	3.30	42
3.2	100	10	36.0	7.0	-18	50	8.5	3.30	42
3.3	100	10	36.0	8.0	-14	50	8.0	3.50	40
3.4	100	10	36.0	8.0	-17	45	7.5	3.30	38

MAXIMUM RATINGS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Collector-Emitter Voltage	V_{CES}	--	85	V	--
BD	Emitter-Base Voltage	V_{EBO}	--	2	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.					

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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%	Collector-Emitter Breakdown Voltage	BV_{CES}	85	--	V	$I_C = 100\text{mA}$, $V_{BE} = 0\text{V}$, $T_F = 25 \pm 5^\circ\text{C}$.
100%	Zero Base Voltage Collector Leakage Current	I_{CES}	--	20	mA	$V_{CE} = 48\text{V}$, $V_{BE} = 0\text{V}$, $T_F = 25 \pm 5^\circ\text{C}$.
100%	DC Current Gain	H_{FE}	10	100	--	$V_{CE} = 5\text{V}$, $I_C = 0.5\text{A}$, $T_F = 25 \pm 5^\circ\text{C}$.

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RF EL

Screen

100%

100%

100%

100%

100%	Pulse Amplitude Droop	D	--	0.5	dB	$V_{CC}=48V$, $P_{IN}=5.0W$, Pulse = Note 2, $T_F=25\pm 5^\circ C$, $F=F1$.
100%	Stability into 1.5:1 VSWR	VSWR-S	--	--	--	$V_{CC}=48V$, $P_{IN}=5.0W$, Pulse = Note 2, $T_F=25\pm 5^\circ C$, $F=F1$. Rotate 1.5:1 output VSWR through 360° phase. No oscillatory or pulse break-up characteristics allowed on detected output pulse.
100%	Load Mismatch Tolerance	LMT	3:1	--	--	$V_{CC}=48V$, $P_{IN}=5.0W$, Pulse = Note 2, $T_F=25\pm 5^\circ C$, $F=F1$. Rotate 3:1 output VSWR through 360° phase. Survival.
BD	Pulse Risetime	RT	--	80	ns	$V_{CC}=48V$, $P_{IN}=5.0W$, Pulse = Note 2, $T_F=25\pm 5^\circ C$, $F=F1$. Measure between 10% and 90% detected power points.
Note 1	F1 = 1030 MHz.					
Note 2	Pulse format = Mode S - ELM (32µs on / 18µs off x 48, overall duty cycle 6.4%)					
Note 3	T_F = Device flange temperature.					
Note 4	Screen 'BD' = parameter qualified By Design.					

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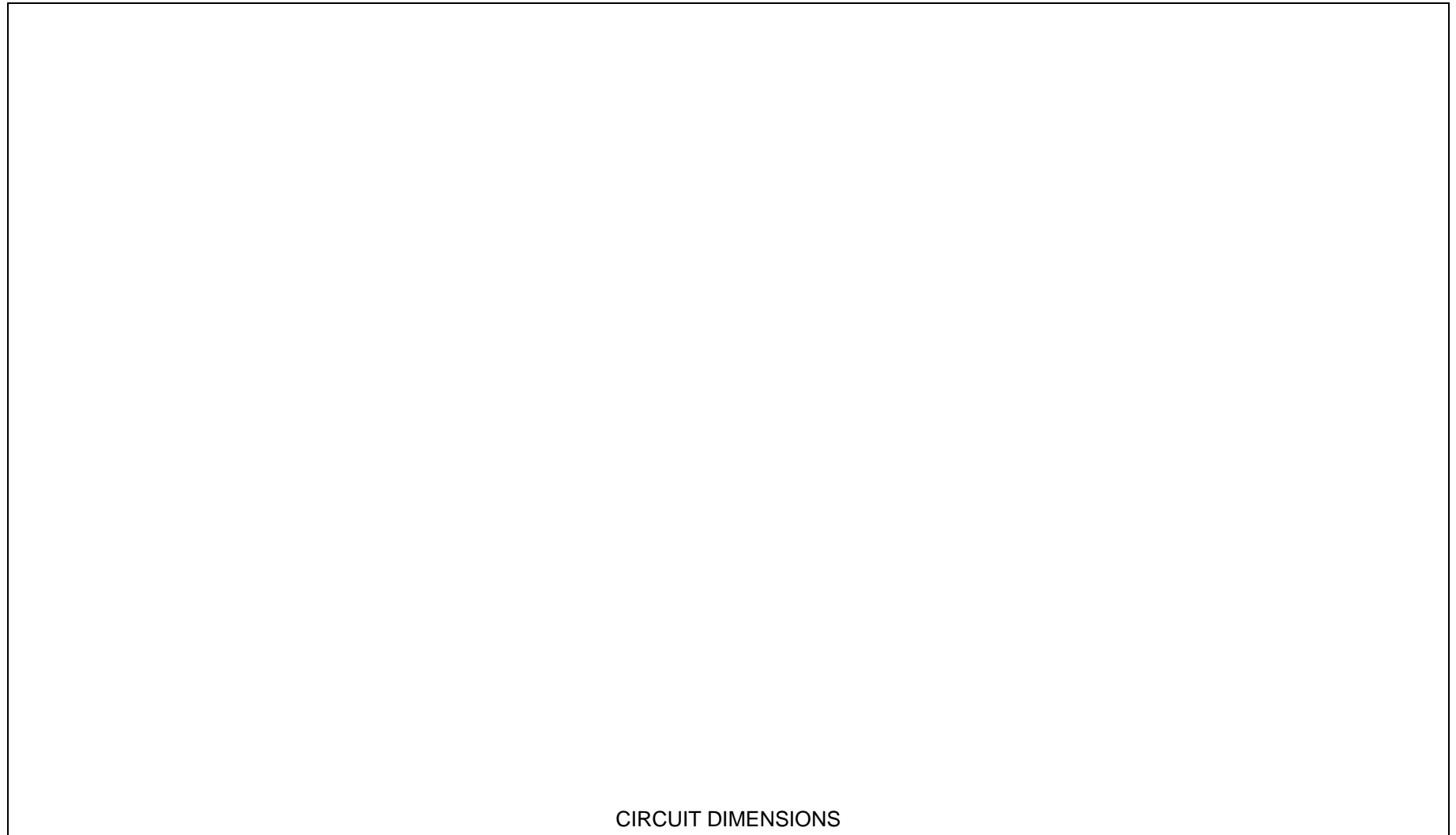
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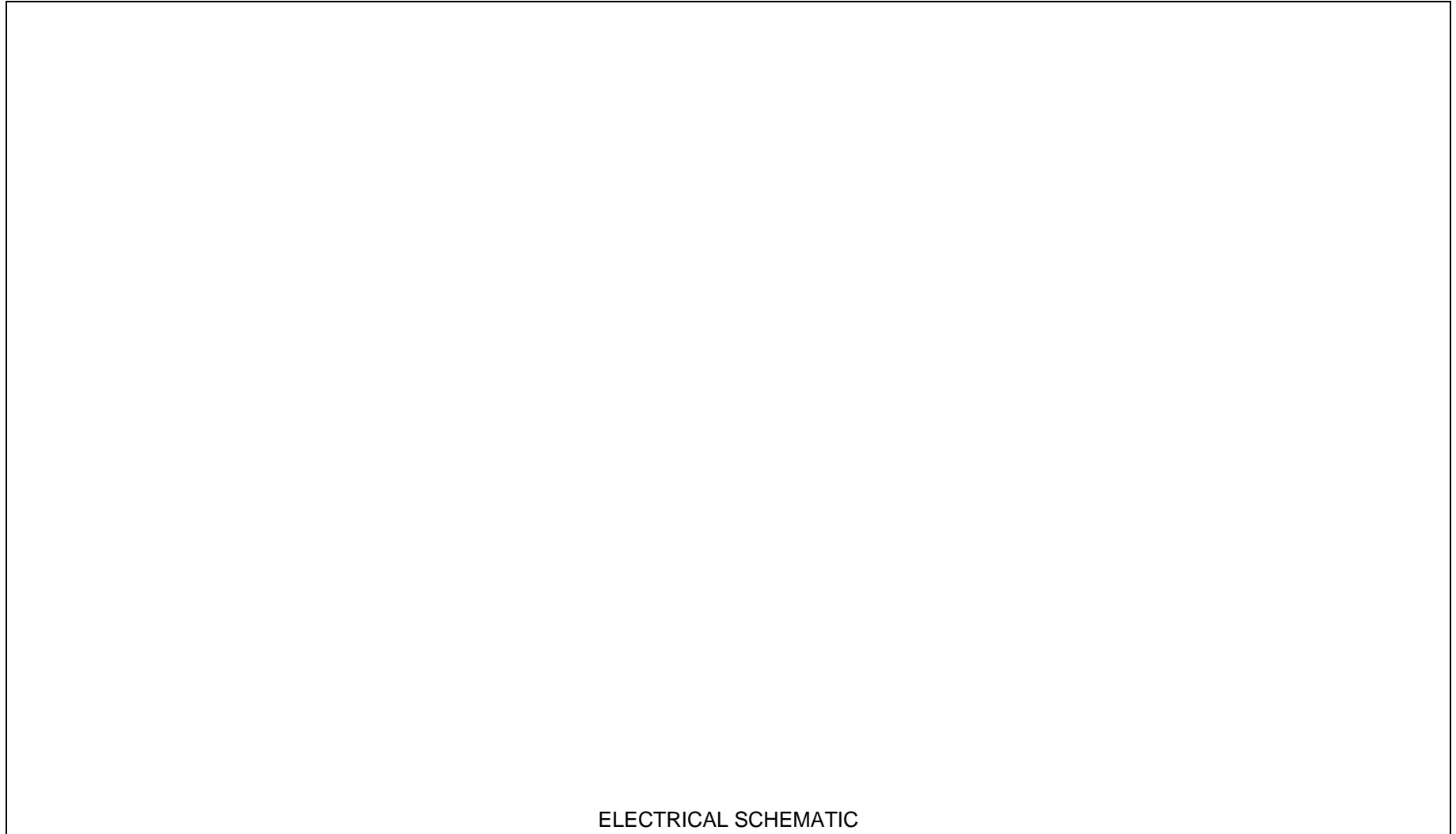
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ASSEMBLY AND PARTS LIST

RF TEST FIXTURE



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. 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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