Part Number: MPAL3035M30

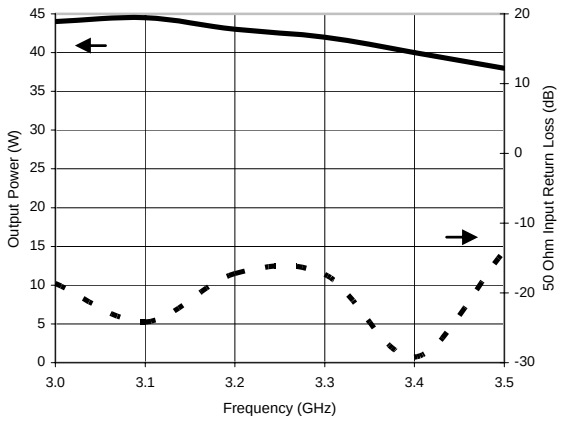
Integra
TECHNOLOGIES, INC.

S-Band Radar Miniature Power Amplifier

Part number MPAL3035M30 is a miniaturized power amplifier which is internally matched to 50 ohms. It is designed for S-Band radar systems and operates over the instantaneous bandwidth of 3.0-3.5 GHz. It utilizes gold metal LDMOS transistor technology operating in common source configuration. It may be operated in class B, AB and A mode. It is operable over nearly any pulse width and duty factor. Under 100us / 10% pulsed operation it can be used to supply any output power from less than 1 watt to more than 35 watts of peak pulse power over the instantaneous frequency range of 3.0-3.5 GHz. All devices are 100% screened for large signal RF parameters.

PROJECTED DATA PROJECTED DATA PROJECTED DATA

MPAL3035M30 : Pin = 4W / 100us / 10% / 28V / Idq=10mA



50 Ohm Matched
- Requires no external impedance matching circuitry

Silicon LDMOS Transistor
- Gold Metal

Class B, AB or A Operation
- Minimal Quiescent Current in Class B mode

Common Source Configuration
- Linear Transfer Characteristic

Gold Metal System
- Complete Gold System Including Bond-wires
- Maximum Reliability

Be0 Free Package
- Metal Based
- Epoxy seal

RF High Power Test
- 100% Device RF High Power Screening

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}	-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	$R_{TH(JC)}$ *	--	0.6	°C/W	V_{DD}=V1, I_{DQ}=I_{DQ}1, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F0.
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_{DS} = 20uA, V_{GS} = 0V, T_F = 25±5°C.
100%	Drain Leakage Current	I_{DSS}	--	1.0	µA	V_{DS} = 28V, V_{GS} = 0V, T_F = 25±5°C.
100%	Operating Gate Voltage	V_{GS}	2.5	4.0	V	V_{DS} = 28V, I_D = 0.1A, T_F = 25±5°C.
100%	Gate Leakage Current	I_{GSS}	--	1.0	µA	V_{GS} = 10V, 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

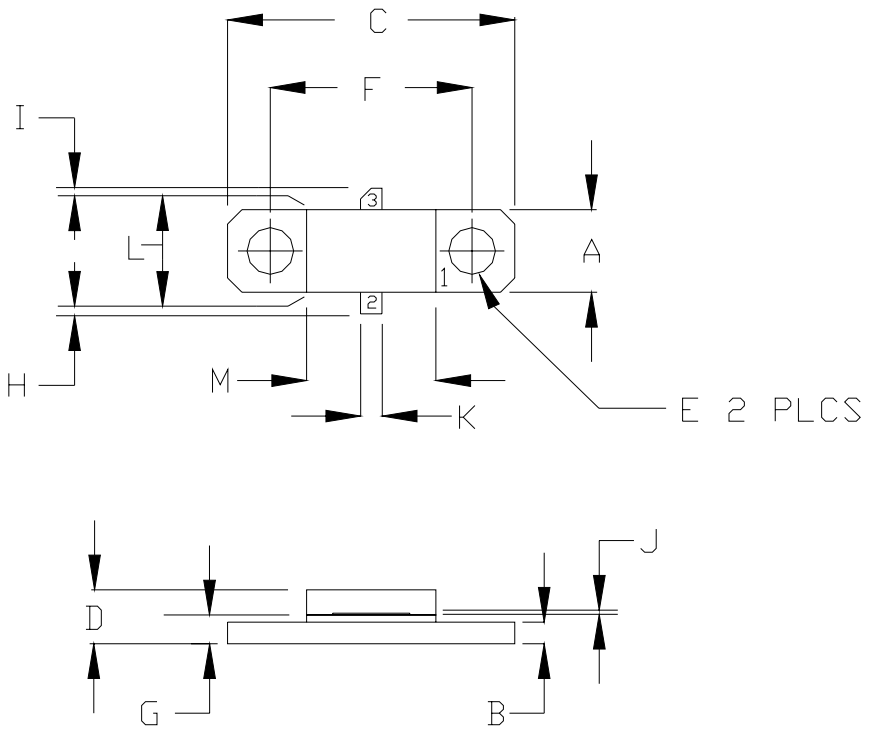
Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	IRL	10	--	dB	V_{DD}=V1, I_{DQ}=I_{DQ}1, PW=PW1, DF=DF1, T_F=TF1, P_{IN}= P_{IN0}, P_{IN1}, P_{IN2}, P_{IN3}, P_{IN4}, P_{IN5}, F=F0, F1, F2, F3, F4, F5.
100%	Power Gain	G_P	11.0	--	dB	V_{DD}=V1, I_{DQ}=I_{DQ}1, PW=PW1, DF=DF1, T_F=TF1, P_{IN}= P_{IN0}, P_{IN1}, P_{IN2}, P_{IN3}, P_{IN4}, P_{IN5}, F=F0, F1, F2, F3, F4, F5.
100%	Power Gain Flatness versus Frequency	GF	--	1.3	dB	V_{DD}=V1, I_{DQ}=I_{DQ}1, PW=PW1, DF=DF1, T_F=TF1, P_{IN}= P_{IN0}, P_{IN1}, P_{IN2}, P_{IN3}, P_{IN4}, P_{IN5}, F=F0, F1, F2, F3, F4, F5.
100%	Drain Current - Peak	I_D	--	1.75	A	V_{DD}=V1, I_{DQ}=I_{DQ}1, PW=PW1, DF=DF1, T_F=TF1, P_{IN}= P_{IN0}, P_{IN1}, P_{IN2}, P_{IN3}, P_{IN4}, P_{IN5}, F=F0, F1, F2, F3, F4, F5.
100%	Pulse Amplitude Droop	D	--	0.30	dB	V_{DD}=V1, I_{DQ}=I_{DQ}1, PW=PW1, DF=DF1, T_F=TF1, P_{IN}= P_{IN0}, P_{IN1}, P_{IN2}, P_{IN3}, P_{IN4}, P_{IN5}, F=F0, F1, F2, F3, F4, F5.
100%	Stability into 3:1 VSWR	VSWR-S *	--	--	--	V_{DD}=V1, I_{DQ}=I_{DQ}1, PW=PW1, DF=DF1, T_F=TF1, P_{IN}= P_{IN0}, P_{IN1}, P_{IN2}, P_{IN3}, P_{IN4}, P_{IN5}, F=F0, F1, F2, F3, F4, F5. Rotate 3:1 output VSWR through 360° phase. No oscillatory or pulse break-up characteristics allowed on detected output pulse. All non-harmonically related signals must be at least –65 dBc.
100%	3:1 Load Mismatch Tolerance	LMT *	--	--	--	V_{DD}=V1, I_{DQ}=I_{DQ}1, PW=PW1, DF=DF1, T_F=TF1, P_{IN}= P_{IN0}, P_{IN1}, P_{IN2}, P_{IN3}, P_{IN4}, P_{IN5}, F=F0, F1, F2, F3, F4, F5. Rotate 3:1 output VSWR through 360° phase. Post-test Gain = Pre-test Gain ±0.1dB.

Note 1	V1 = 28V; I_{DQ}1 = 10mA; PW1 = 100µs; DF1 = 10%
Note 2	Input Power Test Levels: P_{IN0} = P_{IN1} = P_{IN2} = P_{IN3} = P_{IN4} = P_{IN5} = 2.0W
Note 3	Test Frequencies: F0 = 3.00 GHz, F1 = 3.10 GHz, F2 = 3.20 GHz, F3 = 3.30 GHz, F4 = 3.40 GHz, F5 = 3.50 GHz
Note 3	T_F = 25±5°C = Device Flange Temperature
Note 5	* = Preliminary

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	0.225	0.235	5.71	5.96
B	0.055	0.065	1.40	1.65
C	0.795	0.805	20.19	20.44
D	0.140	0.160	3.55	4.06
E	0.125	0.135	3.18	3.43
F	0.557	0.567	14.14	14.40
G	0.077	0.087	1.95	2.20
H	0.050	0.070	1.27	1.77
I	0.050	0.070	1.27	1.77
J	0.004	0.006	0.10	0.15
K	0.055	0.065	1.40	1.65
L	0.225	0.235	5.71	5.96
M	0.355	0.365	9.01	9.27

PIN SCHEDULE	
1	SOURCE
2	GATE
3	DRAIN

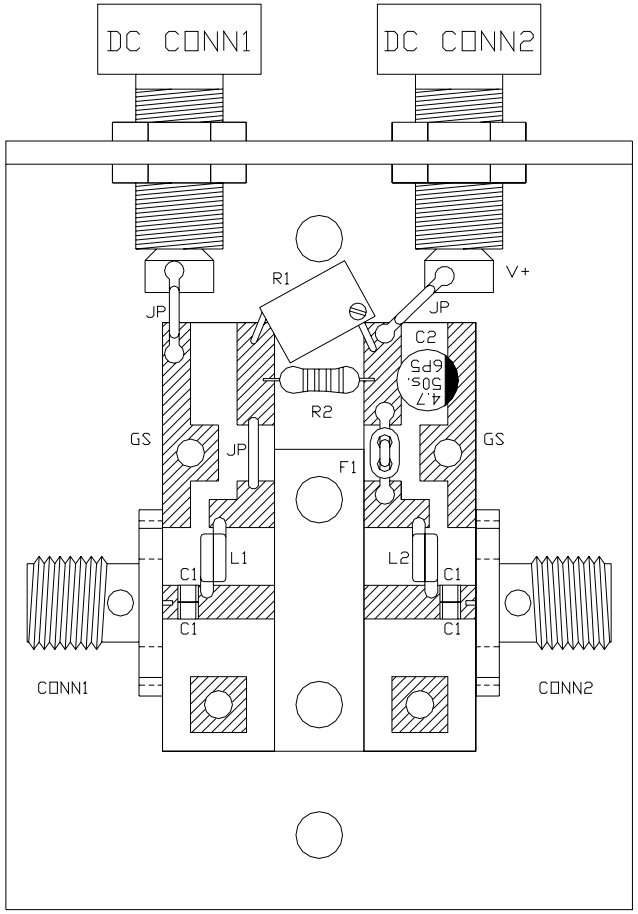
NOTES:

LID: LID-PL32-1

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



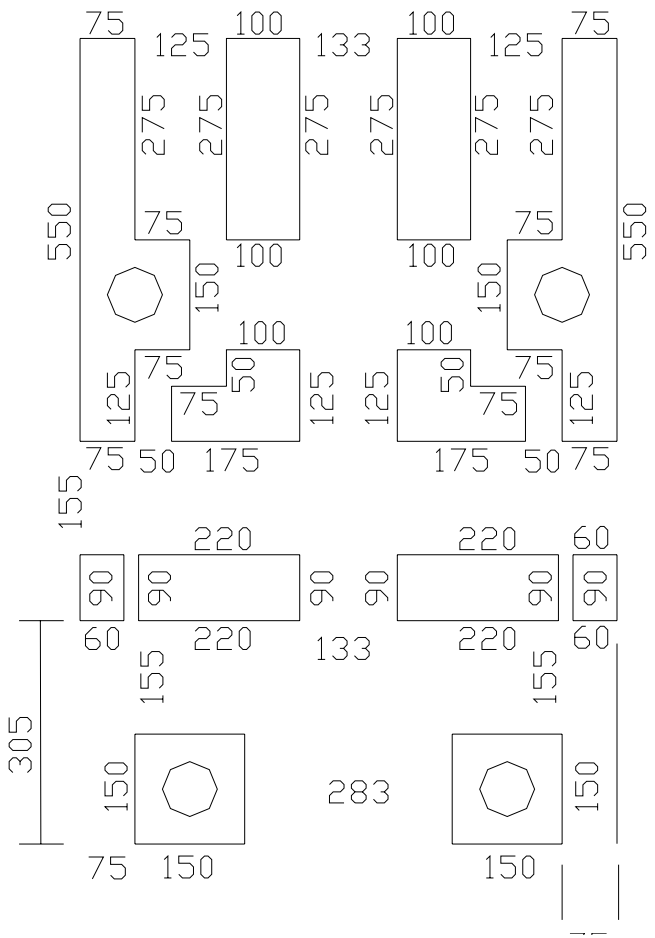
COMPONENT	DESCRIPTION
DUT	DEVICE# MPAL3035M30, MOUNT HARD TO THE RIGHT
PC BOARD	ROGERS# 5880, TH=0.031" 1E/1E
C1	CHIP CAPACITOR, TYPE ATC100A, 39 pF
C2	ELECTROLYTIC CAPACITOR, 4.7uF / 50V DIGI-KEY PN# PCE3931CT-ND, PANASONIC# EEE-1HA4R7WR
R1	POTENTIOMETER 1/4" 100Kohms 10%, MOUSER P/N: 652-3266W-1-104LF, MFG P/N: 3266W-1-104LF
R2	AXIAL RESISTOR, 10K OHMS, 1/4W
L1	COIL: 2 TURN AWG# 22 INSULATED, .076" DIA, PULL TIGHT AND FULLY CLOSED, LEFT HAND.
L2	COIL: 2 TURN AWG# 22 INSULATED, .076" DIA, PULL TIGHT AND FULLY CLOSED, RIGHT HAND.
F1	FERRITE TWIN HOLE CORE, FERRONICS PN# 12-315-J, 1 TURN AWG# 22 INSULATED.
GS	GROUND SHIM, COPPER, TH=0.001"
CONN1, CONN2	SMA CONNECTOR, TYPE OS# 2052-5636-02
HEATSINK	2 INCH HEATSINK - 09
DC CONN1	BANANA JACK, BLACK
DC CONN2	BANANA JACK, RED
JP	JUMPER WIRE, AWG# 20
NOTE	FIXTURE HARDWARE DRAWINGS AVAILABLE ON REQUEST

ASSEMBLY AND PARTS LIST

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

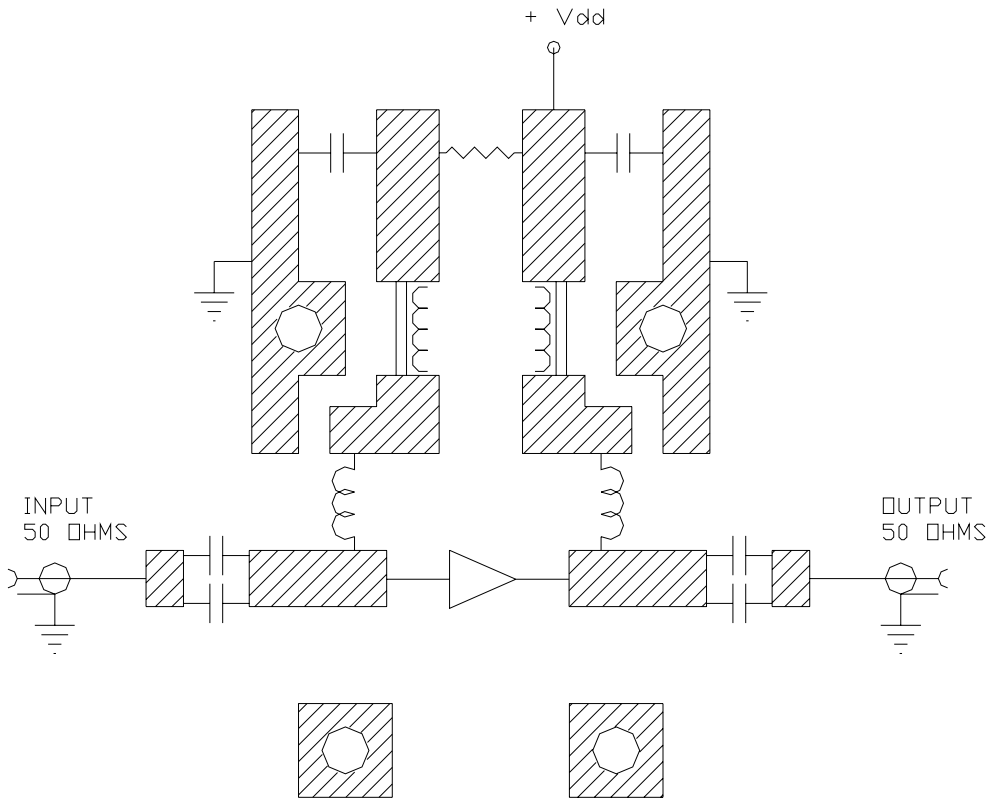


CIRCUIT DIMENSIONS

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.

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.

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