



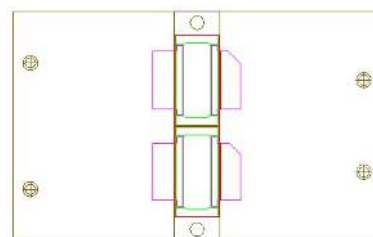
# 1011GN-2200VP

2200 Watts • 50 Volts • 32us, 2%  
L-Band Avionics 1030/1090 MHz

## GENERAL DESCRIPTION

The 1030/1090MHz, 50V, 1011GN-2200VP is a state of the art internally matched to 50Ω plug and play pallet, common source, class AB, GaN on SiC HEMT that capable of providing greater than 2200 Watts of pulsed output power with over 19.4 dB gain and greater than 70% drain efficiency at both 32us pulse width, 2% duty cycle, Mode-S ELM, and IFF pulse formats. The pallet incorporates internally pre-matched transistors for optimal performance and utilizes gold metallization and eutectic die attach to provide highest reliability and superior ruggedness. Best Size, Weight, and Power (SWaP) output stage designs can be achieved by taking advantage of this small footprint pallet with dual gate and drain bias feeds combined with the benefits of two single-ended industry standard earless 1011GN-1200VEL transistors which are capable of handling the same pulsing formats as the 1011GN-2200VP, all in a very small footprint 2.0" x 3.4" 50Ω INPUT/OUTPUT Plug-and-Play Pallet.

## PALLET OUTLINE



2.0" x 3.4" x 0.175"



## ABSOLUTE MAXIMUM RATINGS

### Maximum Power Dissipation

Device Dissipation @ 25°C 3900W

### Maximum Voltage and Current

Drain-Source Voltage ( $V_{DSS}$ ) 150 V

Gate-Source Voltage ( $V_{GS}$ ) -8 to +0 V

### Maximum Temperatures

Storage Temperature ( $T_{STG}$ ) -55 to +125° C

Operating Junction Temperature +200° C

## ELECTRICAL CHARACTERISTICS @ 25°C, 50V, 32μs Pulse Width, 2% Duty Cycle

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
$P_{OUT}$	Input Power	$P_{IN} = 25.1W$ , Freq=1030/1090MHz		2200	2345	W
$G_P$	Power Gain	$P_{IN} = 25.1W$ , Freq=1030/1090MHz		19.4	19.7	dB
$\eta_D$	Drain Efficiency	$P_{IN} = 25.1W$ , Freq=1030/1090MHz	62	72		%
$D_r$	Droop	$P_{IN} = 25.1W$ , Freq=1030/1090MHz		0.25	0.5	dB
VSWR-T	Load Mismatch Tolerance	$P_{IN} = 25.1W$ , Freq=1030MHz			3:1	
$\Theta_{JC}$	Thermal Resistance	32μs, 2% duty cycle			0.095	°C/W

- Bias Condition:  $V_{dd}=+50V$ ,  $I_{dq}=300mA$  average current ( $V_{gs} = -2.0 \sim -4.5V$  typical)

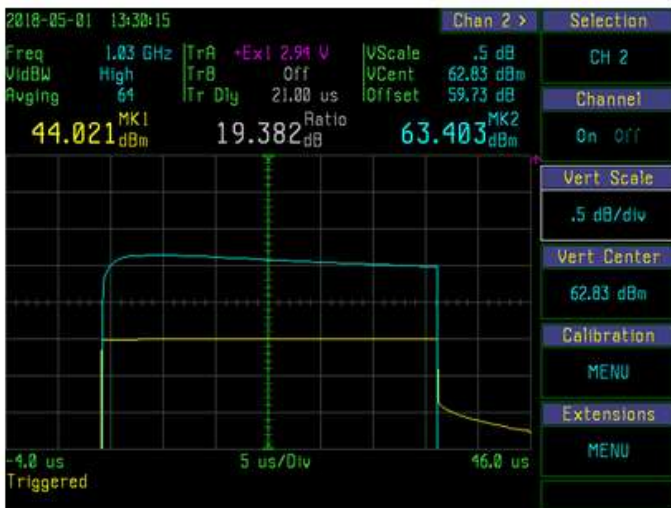
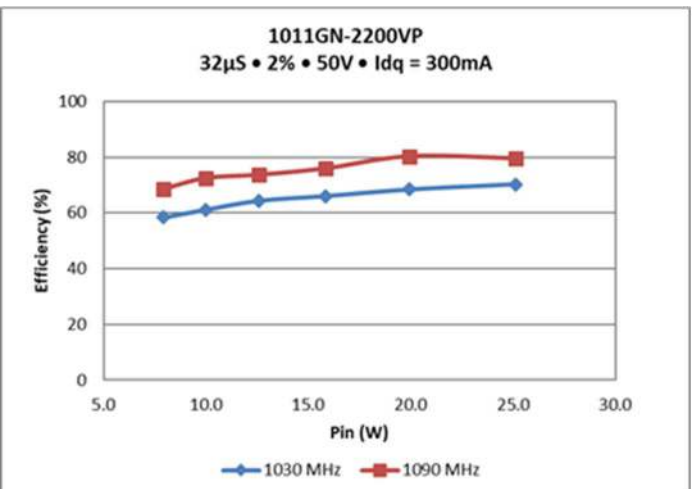
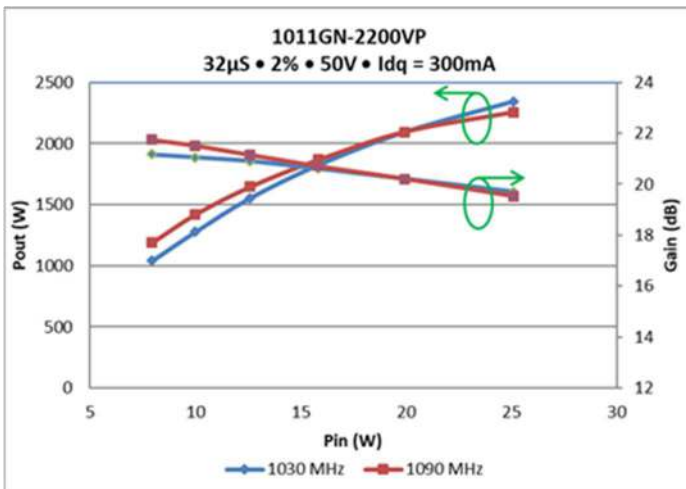


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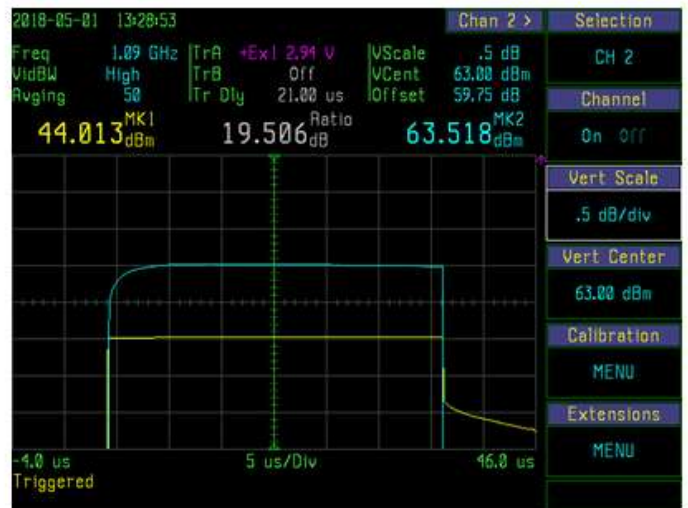
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## TYPICAL BROADBAND PERFORMANCE DATA 32μS – 2%

Frequency	P <sub>IN</sub> (W)	P <sub>OUT</sub> (W)	I <sub>D</sub> (mA)	η <sub>D</sub> (%)	G <sub>P</sub> (dB)	Droop (dB)
1030 MHz	25.1	2344	1600	70.2	19.7	0.25
1090 MHz	25.1	2254	1310	79.5	19.5	0.25



1030 MHz - 32us - 2%



1090MHz - 32us - 2%



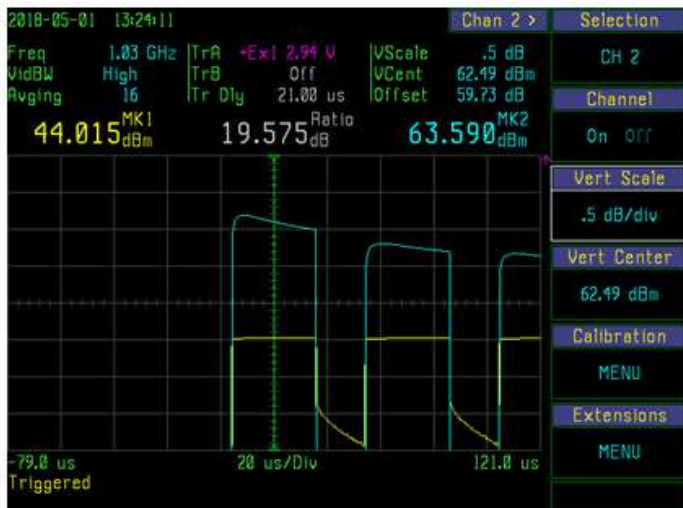
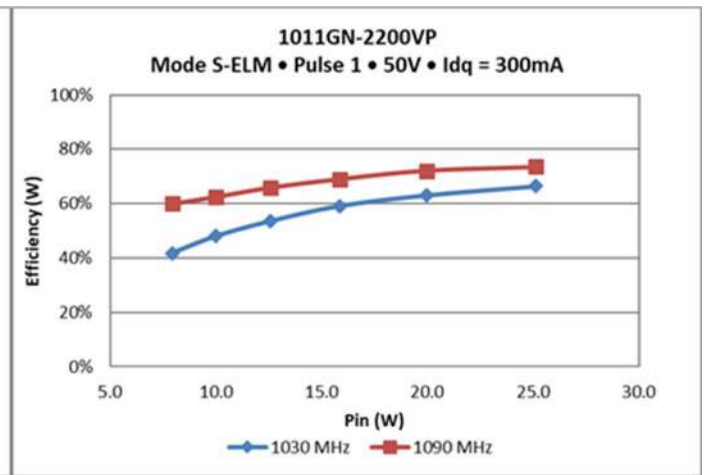
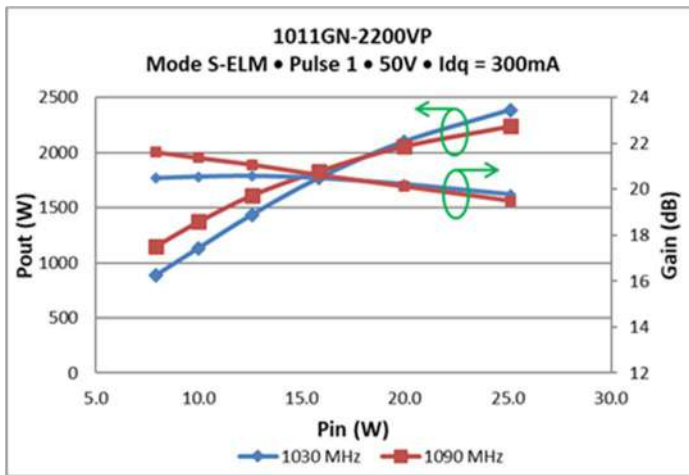
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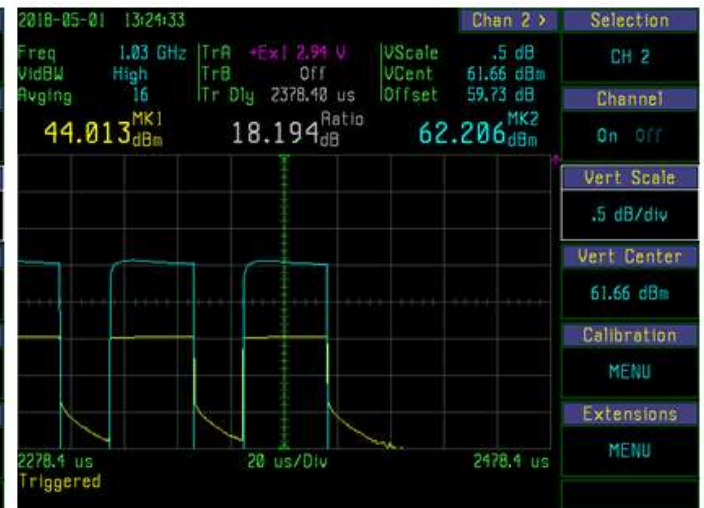
## TYPICAL BROADBAND PERFORMANCE DATA

MODE-S ELM (32μS on 18μS off, N=48 pulses, DF=6.4%) Measure Pulse 1&48

Frequency	P <sub>IN</sub> (W)	P <sub>O1</sub> (W)	I <sub>d</sub> (mA)	N <sub>d</sub> (%)	G <sub>1</sub> (dB)	G <sub>48</sub> (dB)	P <sub>O48</sub> (W)	Drop (dB)
1030 MHz	25.1	2388	4600	66.4	19.7	18.5	1762	1.30
1090 MHz	25.1	2238	3900	73.5	19.6	18.9	1963	0.57



1030MHz - Pulse 1

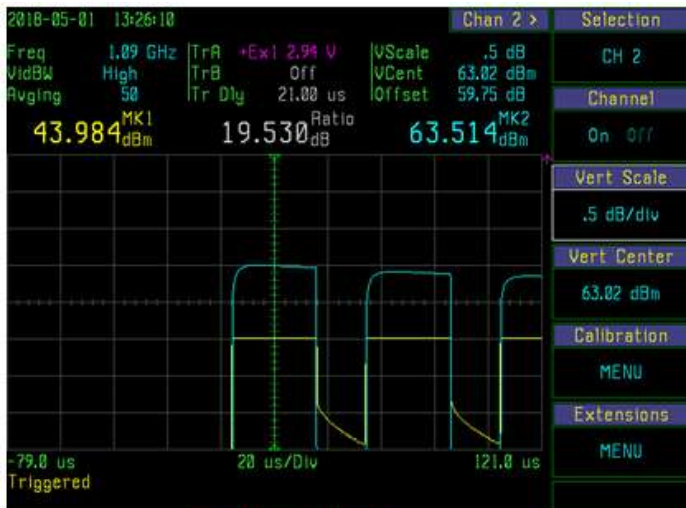


1030MHz - Pulse 48

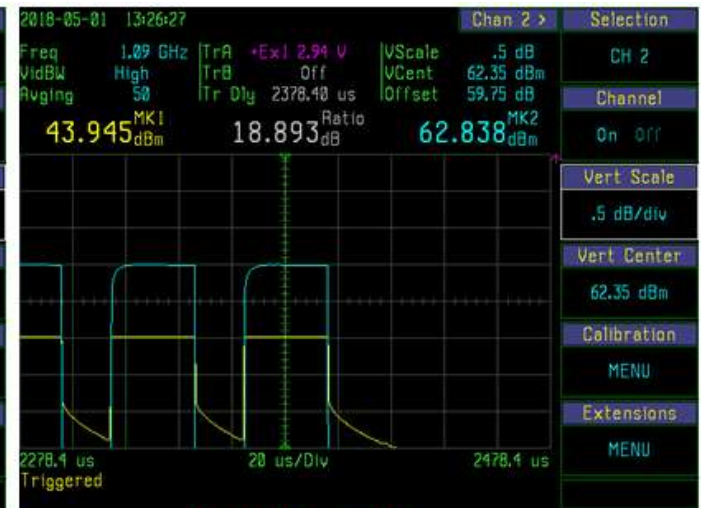


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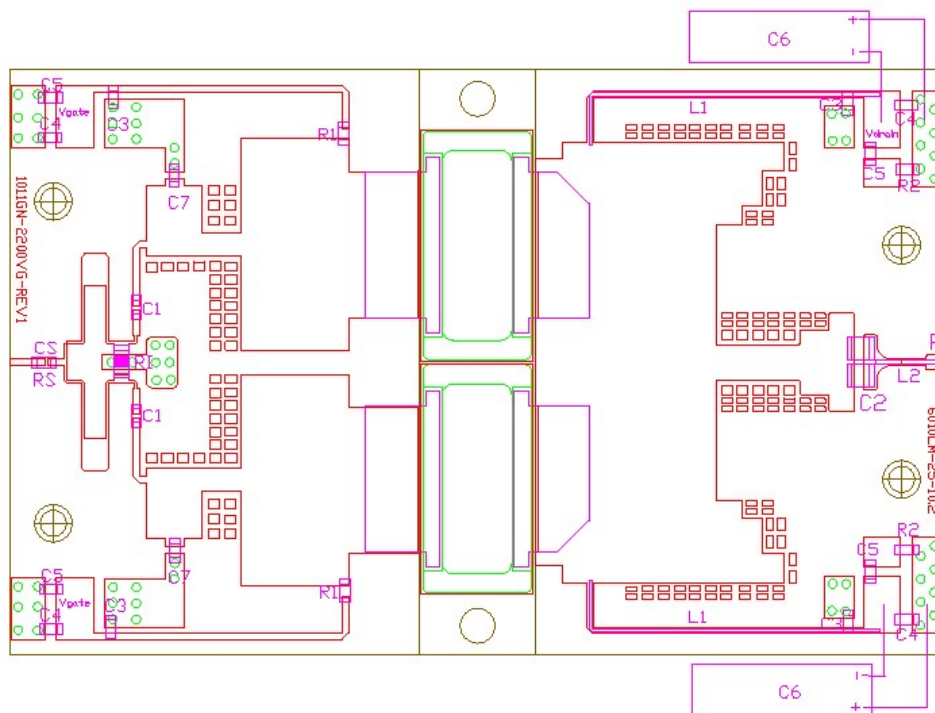
1090MHz - Pulse 1



1090MHz - Pulse 48

## TEST CIRCUIT (inches)

Board Material: Roger Duroid 6010 @ H=25 mils, Er=10.2, 2 Oz Copper



(DXF file available upon request)

### Component List

Item	Description	Value	Qty
C1	Chip Cap A size	100 pF	2
C2	PPI (1111C101JW152X), 1500V	100 pF	2
C3	Chip Cap A size	100 pF	2
C4	Chip Cap B size	1,000 pF	2
C5	Chip Cap 1210 size	4.7μF	2
C6	Electrolytic Cap (63V)	12,000 μF	2
C7	Chip cap A size	4.7 pF	2
R1	Chip Resistor size 0805	20 Ω	2
R2	Chip Resistor size 0805	2.02 Ω	2
Rl	Barry Industry (RYX1206CB-1000HN-98)	100 Ω	1
Rs	Chip Resistor size 0805	316 Ω	1
Cs	Chip Cap A size	9.1 pF	1
L2	20 AWG copper wire	L=230 Mil	1
L1	20 AWG copper wire	L=1150 Mil	2
P	Adjust the width from 53 Mil to 22 Mil (if not using N-type connector)		

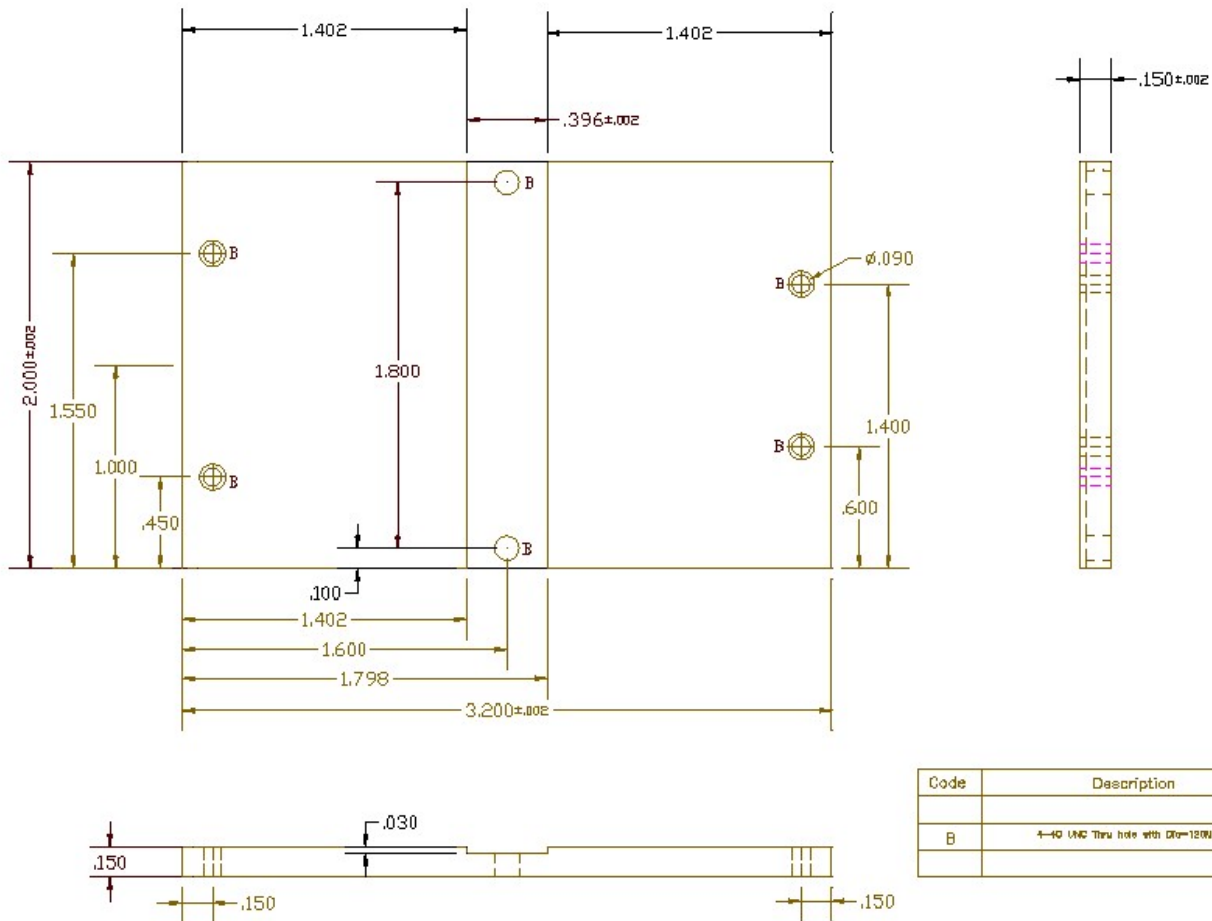
Note: 12,000μF is only for ELM signal and reduce C6 for shorter pulse (32μS – 2%)



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## Pallet Dimensions (Inches)



**Note:** The dimension shows only the Al (Aluminum) back material without 25 mil board's thickness



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#### Revision History

Revision Level / Date	Para. Affected	Description
01 / June 4, 2018	-	Initial Preliminary Release