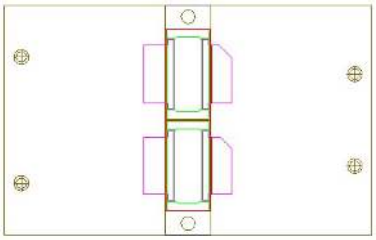
1011GN-2200VP

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
η_D	Drain Efficiency	P_{IN} = 25.1W, Freq=1030/1090MHz	62	72		%
Dr	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	
Θ_{JC}	Thermal Resistance	32µs, 2% duty cycle			0.095	°C/W

- **Bias Condition: Vdd=+50V, Idq=300mA average current (Vgs= -2.0 ~ -4.5V typical)**

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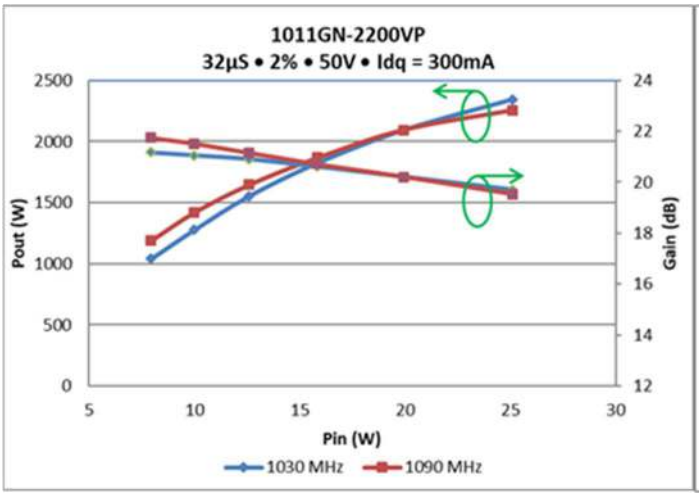
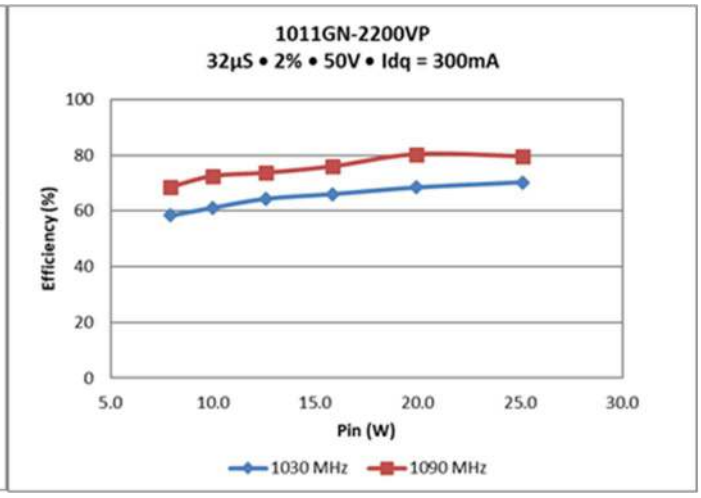
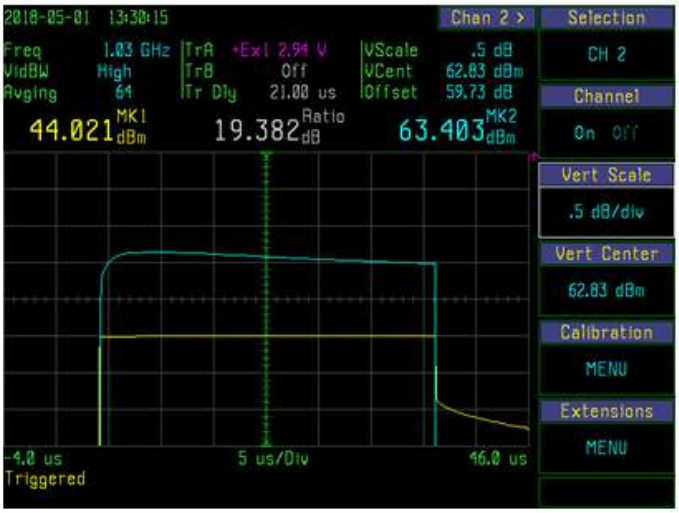
TYPICAL BROADBAND PERFORMANCE DATA
32µS – 2%

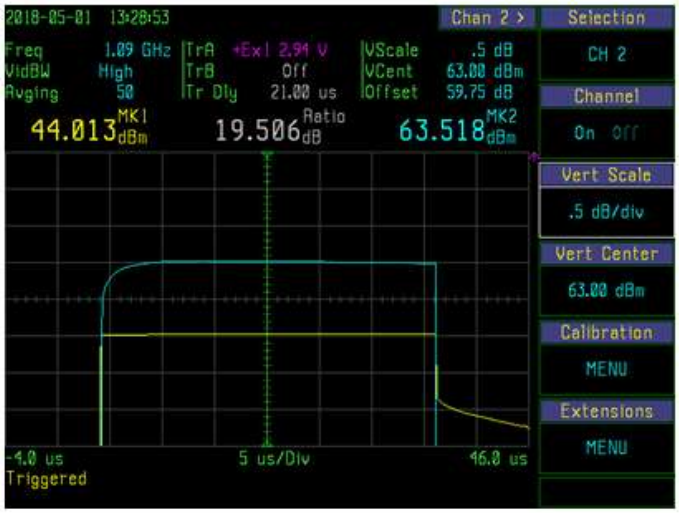
Frequency	P_{IN} (W)	P_{OUT} (W)	I_D (mA)	η_D (%)	G_P (dB)	Droop (dB)
1030 MHz	25.1	2344	1600	70.2	19.7	0.25
1090 MHz	25.1	2254	1310	79.5	19.5	0.25







1030 MHz - 32uS - 2%



1090MH - 32uS - 2%

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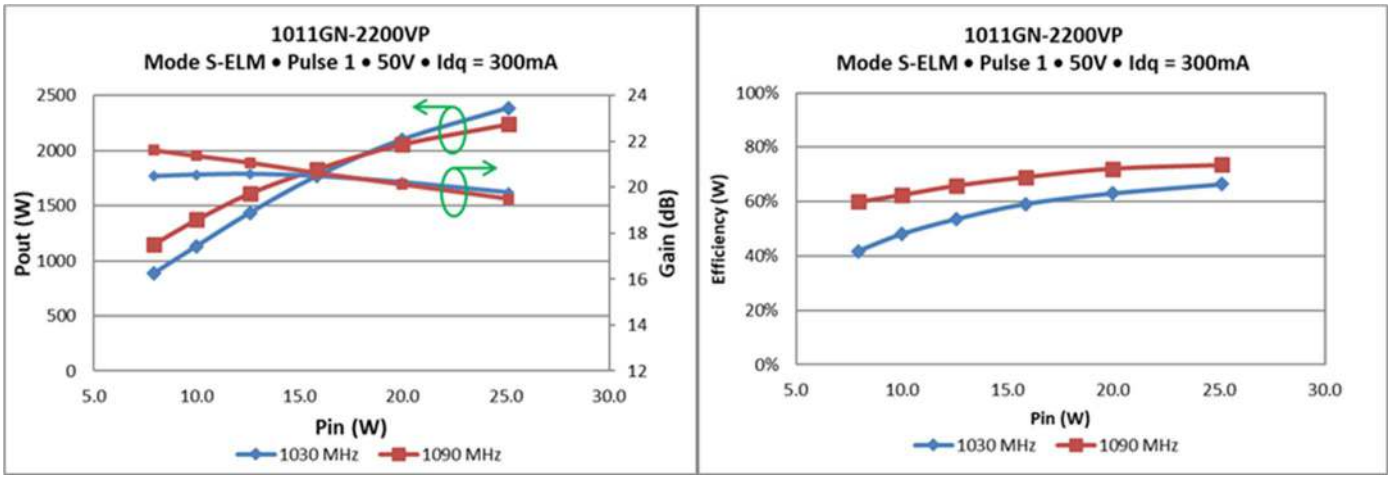
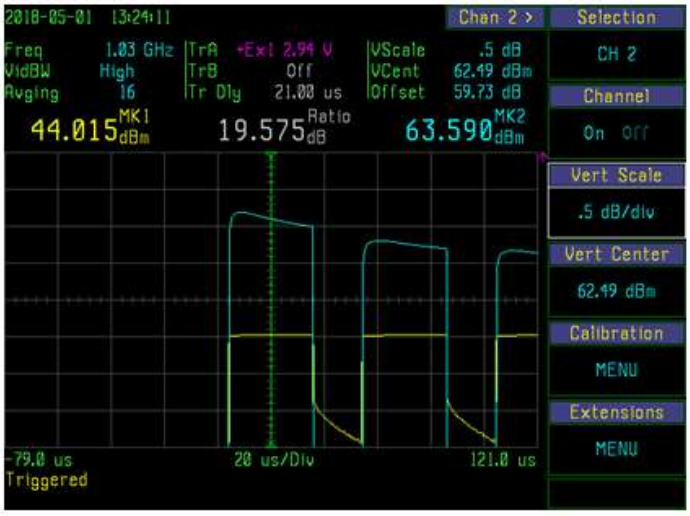
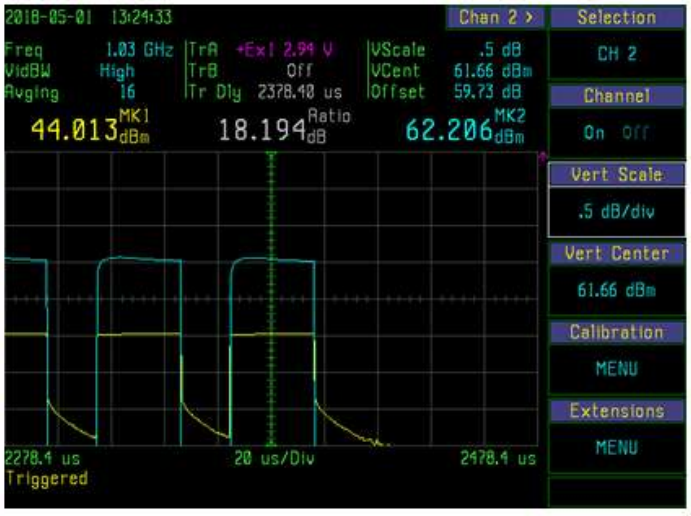
TYPICAL BROADBAND PERFORMANCE DATA
MODE-S ELM (32µS on 18µS off, N=48 pulses, DF=6.4%) Measure Pulse 1&48

Frequency	P_{IN} (W)	Po_1(W)	Id (mA)	Nd (%)	G_1(dB)	G_{48}(dB)	Po_{48}(W)	Droop (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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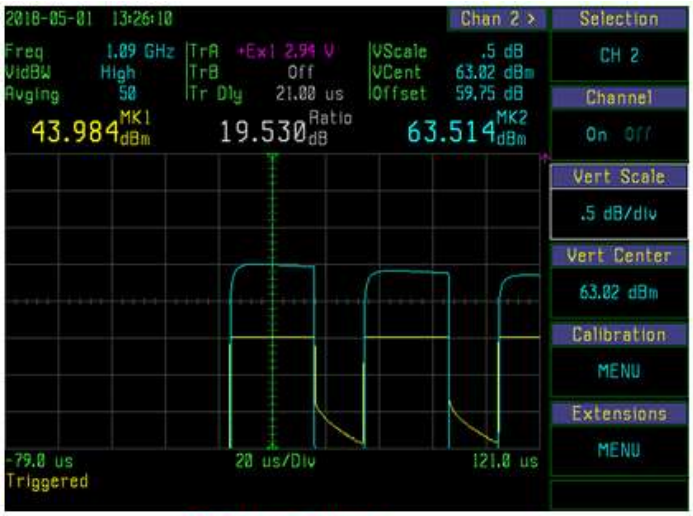
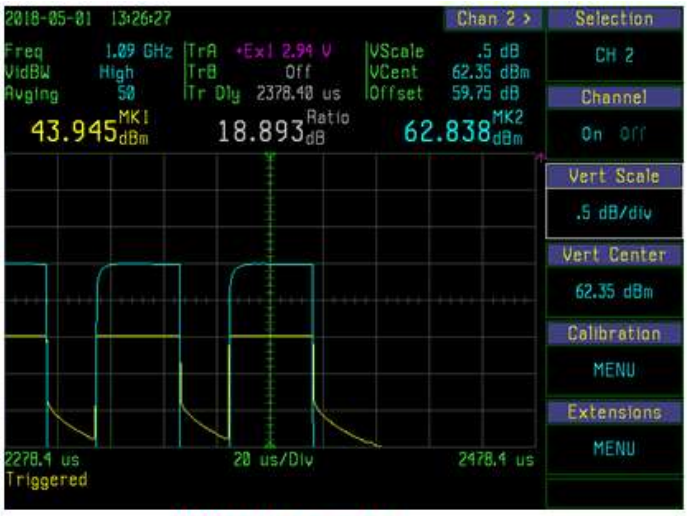


1090MHz - Pulse 1



1090MHz - Pulse 48

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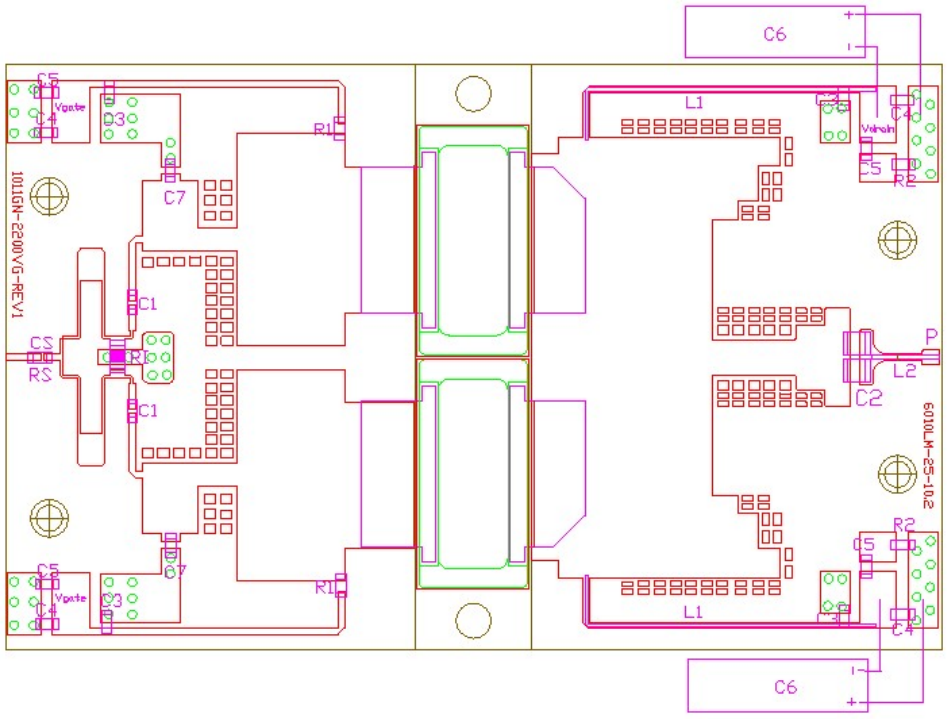
TEST CIRCUIT (inches)

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
RI	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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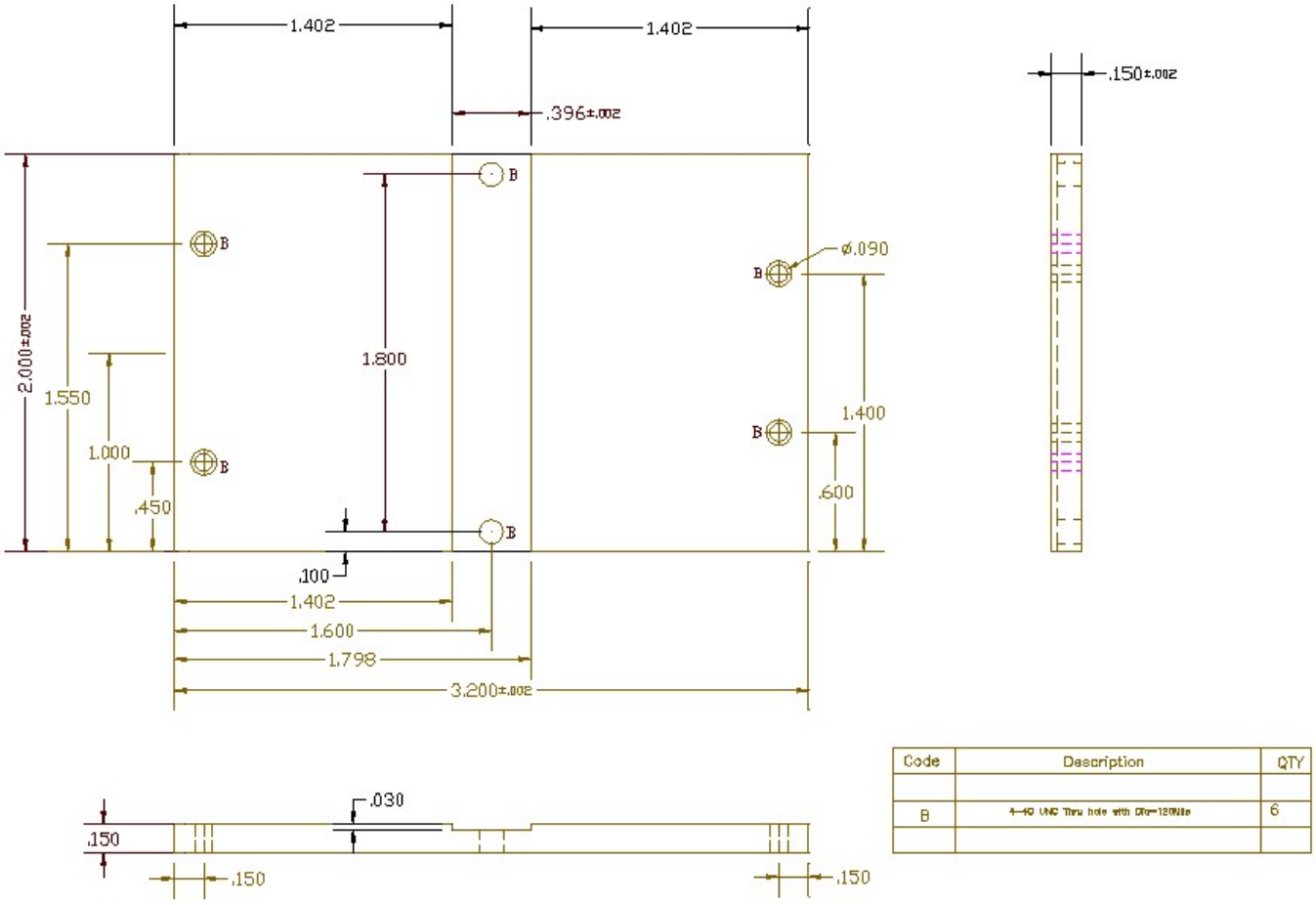
Pallet Dimensions
(Inches)



Code	Description	QTY
B	4-40 UNC Thru hole with CBo=120Nite	6

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

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About Microsemi

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Revision History

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