1011GN-2200VP/VEP

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

GENERAL DESCRIPTION

The 1030/1090MHz, 50V, 1011GN-2200VP and 1011GN-2200VEP are state of the art 50Ω input and output matched plug and play pallets, integrating two in parallel common source, class AB, GaN on SiC HEMT transistors. Each pallet is 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 pallets incorporate internally pre-matched transistors for optimal performance and utilize gold metallization and eutectic attach to provide highest reliability and superior ruggedness. Best Size, Weight, and Power (SWaP) output stage designs can be achieved by taking advantage of the small footprint and GaN on SiC technology power density pallets, both of which have dual gate and drain bias feeds, one for each transistor. The 0.450" thick 1011GN-2200VEP includes installed input SMA and output N-Type connectors.

ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25°C 3900W

Maximum Voltage and Current

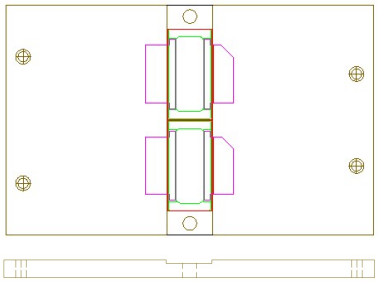
Drain-Source Voltage (V_{DSS}) 150 V
Gate-Source Voltage (V_{GS}) -8 to +0 V

Maximum Temperatures

Storage Temperature (T_{STG}) -55 to +125° C
Operating Junction Temperature +200° C

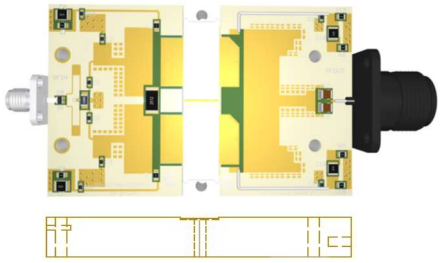
PALLET OUTLINES

1011GN-2200VP



2.0" x 3.4" x 0.175"

1011GN-2200VEP



2.0" x 3.2" x 0.450"

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		.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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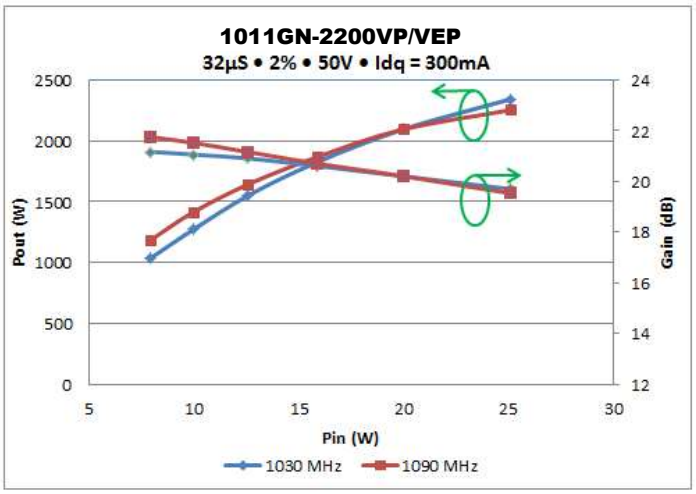
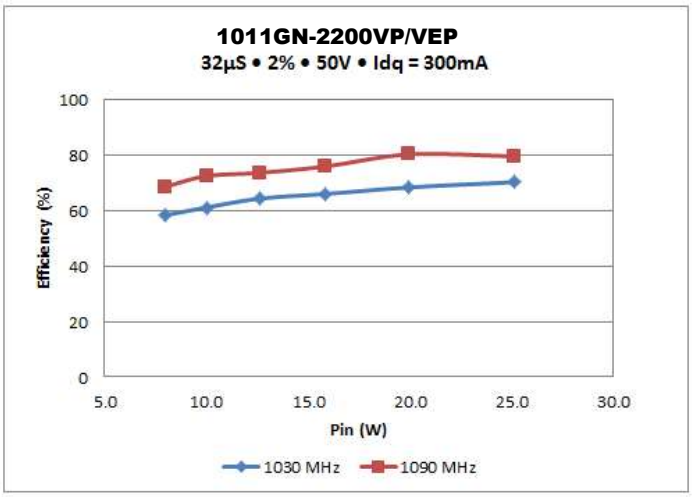
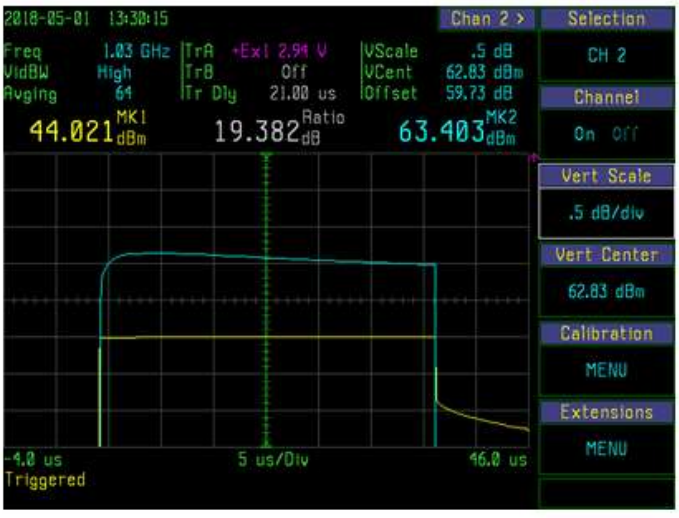
TYPICAL BROADBAND PERFORMANCE DATA
32µS – 2%

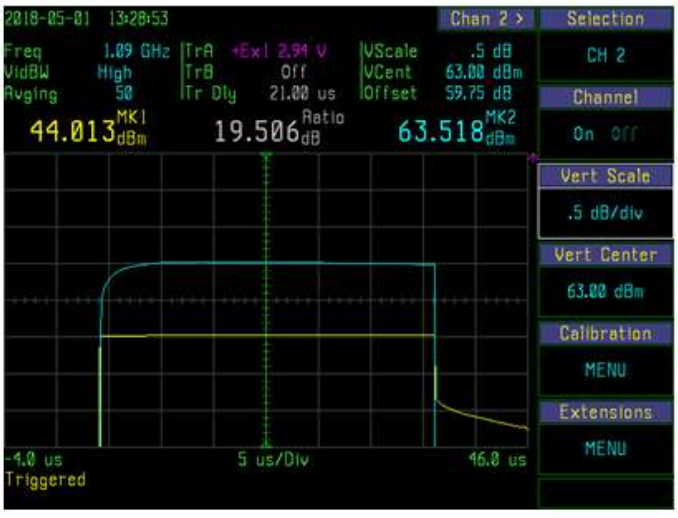
Frequency	Pin (W)	Pout (W)	Id (mA)	Nd (%)	G (dB)	Droop (dB)
1030 MHz	25.1	2344	1600	70.2	19.7	0.25
1090 MHz	25.1	2254	1310	79.5	19.5	0.25







1030 MHz - 32uS - 2%



1090MH - 32uS - 2%

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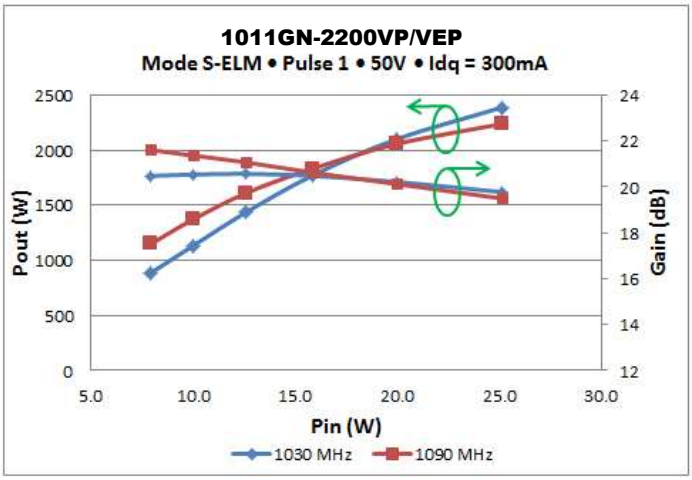
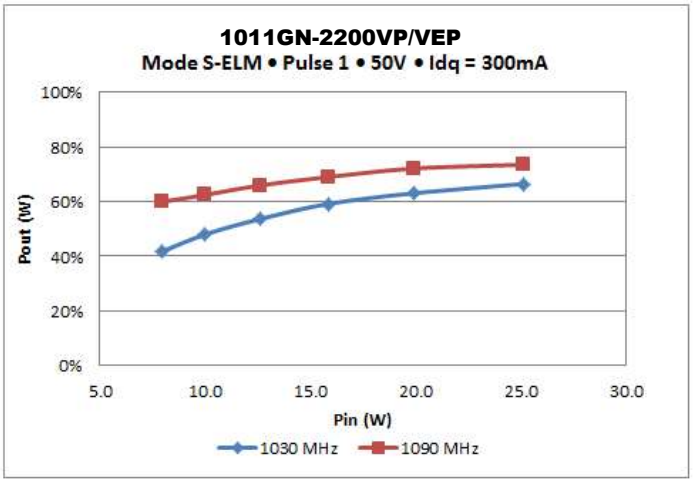
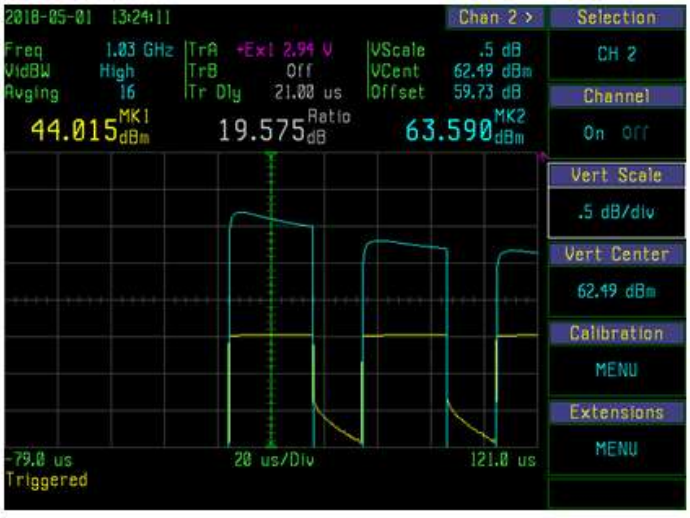
TYPICAL BROADBAND PERFORMANCE DATA
MODE-S ELM (32µS on 18µS off, N=48 pulses, DF=6.4%) Measure Pulse 1&48

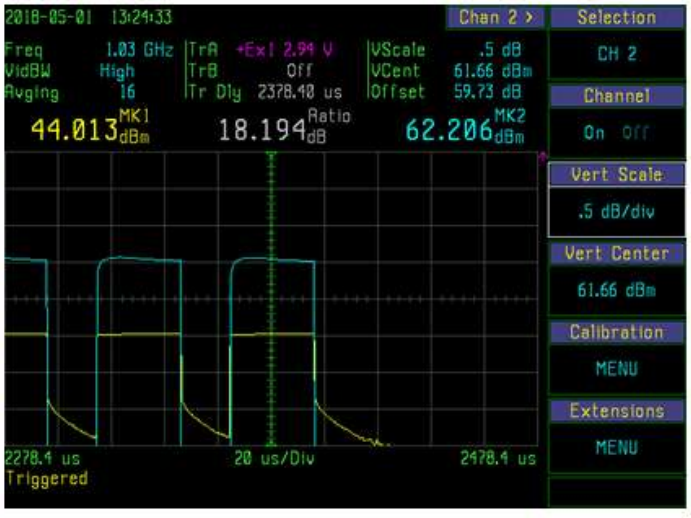
Frequency	Pin (W)	Po_1(W)	Id (mA)	Nd (%)	G_1(dB)	G_{48}(dB)	Po_{48}(W)	Droop (dB)
1030 MHz	25.1	2388	4600	66.4	19.7	18.5	1762	1.30
1090 MHz	25.1	2238	3900	73.5	19.6	18.9	1963	0.57







1030MHz - Pulse 1



1030MHz - Pulse 48

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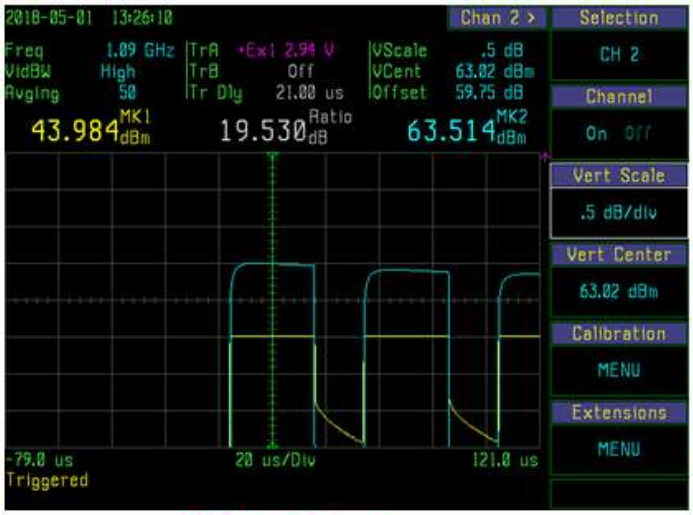
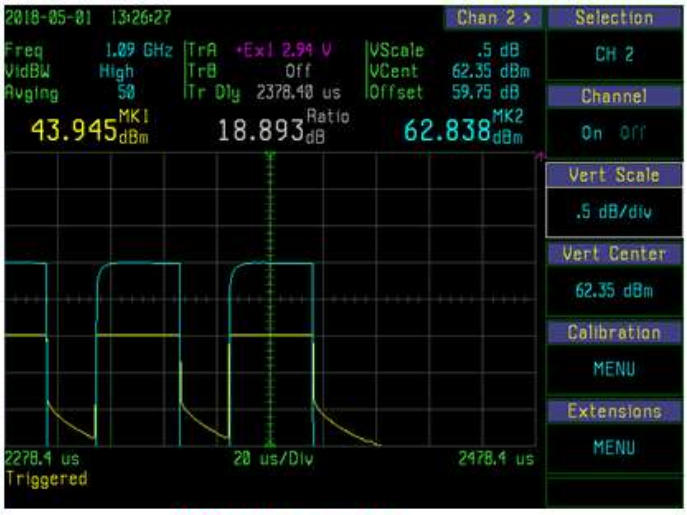


1090MHz - Pulse 1



1090MHz - Pulse 48

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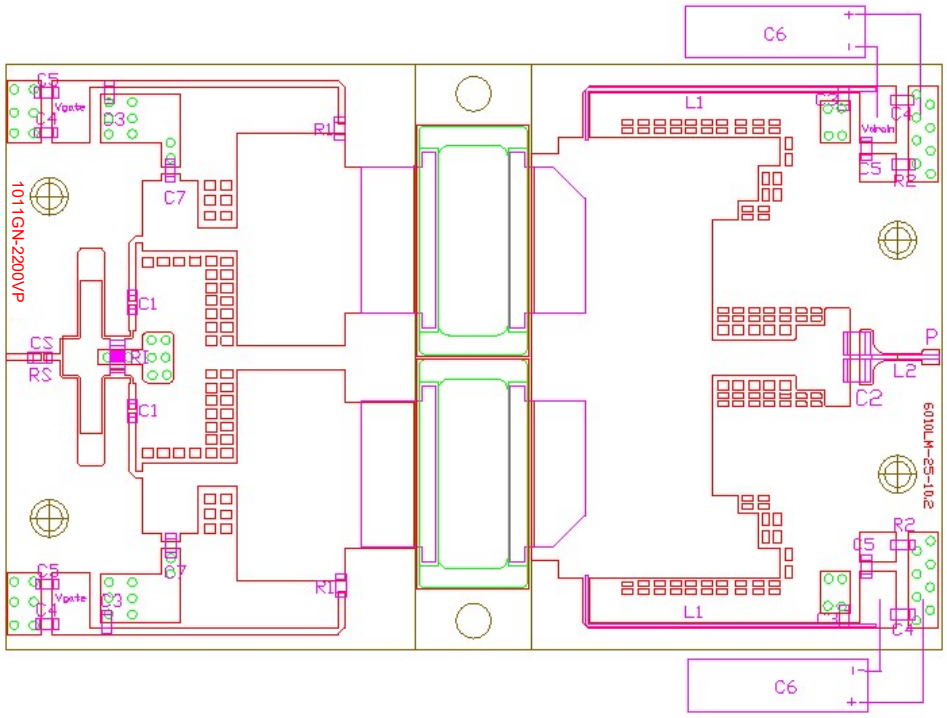
1011GN-2200VP CIRCUIT (inches)

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



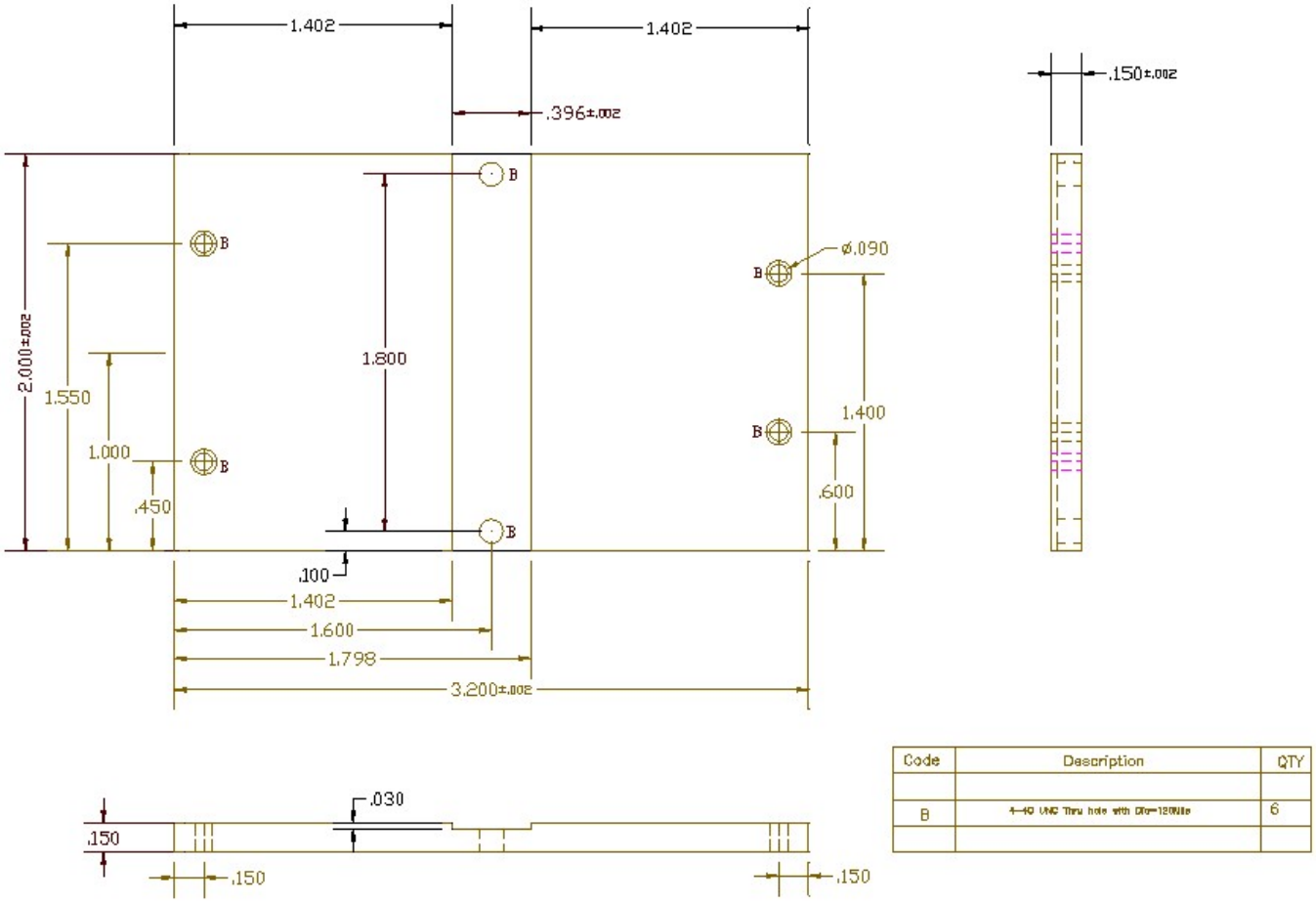
(DXF file available upon request)

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%)

1011GN-2200VP Pallet Dimensions (Inches)



Code	Description	QTY
B	4-40 UNC Thru hole with Ø0=120Min	6

Note: The dimensions show only the Al (Aluminum) back material and without 25 mil board's thickness

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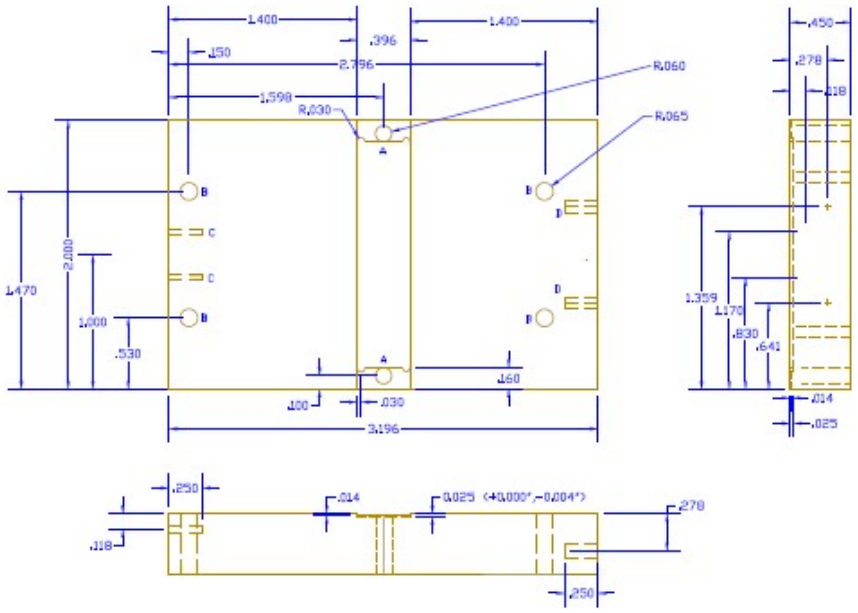
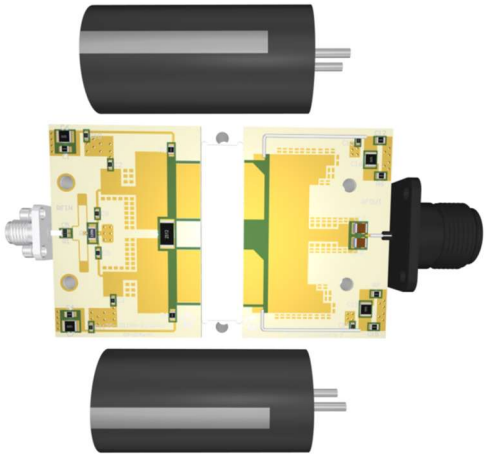
1011GN-2200VP Pallet Dimensions (Inches)



CODE	DESCRIPTION	QTY
A	DRILL THRU HOLE WITH DIA=120mils	2
B	DRILL THRU HOLE WITH DIA=130mils	4
C	TAP 2-56 UNC, 0.250" DEEP	2
D	TAP 4-40 UNC, 0.250" DEEP	2

1. MATERIAL: COPPER (Cu)
2. INSTRUCTION: REMOVE & DE-BURR ALL SHARP EDGES
3. ALL DIMENSIONS IN INCHES
4. PLATING: 3-8 MICROINCHES Au OVER 100 MICROINCHES ED NICKEL
5. QUALITY: MANUFACTURE ACCORDING TO IPC-A-600,
6. TOLERANCE: +/- 0.005" BUT INNER POCKET DEPTH NEEDS TO BE 0.025 (+0.000",-0.004")



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ISBN:

Quality Management System

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Revision History

Revision Level / Date	Para. Affected	Description
01 / June 4, 2018	-	Initial Preliminary Release
02 / August 13, 2023	-	Added 1011GN-2200VEP Added Microchip Logo, Website, and Information/disclaimer statements