

## GENERAL DESCRIPTION

The 1011GN-1200V is an internally matched, COMMON SOURCE, class AB, GaN on SiC HEMT transistor capable of providing over 18.5 dB gain, 1200 Watts of pulsed RF output power at 32us, 2% duty cycle pulse format across the 1030 to 1090 MHz band. The transistor has internal pre-match for optimal performance. It utilizes gold metallization and eutectic attach to provide highest reliability and superior ruggedness.

## ABSOLUTE MAXIMUM RATINGS

### Maximum Power Dissipation

Device Dissipation @ 25°C      2400W

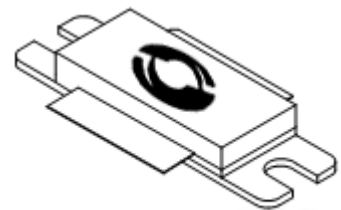
### Maximum Voltage and Current

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

## CASE OUTLINE 55-Q03 Common Source



## ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
$P_{IN}$	Input Power	$P_{OUT}=1200W$ , Freq=1030,1090 MHz		10.5	15	W
$G_P$	Power Gain	$P_{OUT}=1200W$ , Freq=1030,1090 MHz	18.5	20		dB
$\eta_D$	Drain Efficiency	$P_{OUT}=1200W$ , Freq=1030,1090 MHz		75		%
Dr	Droop	$P_{OUT}=1200W$ , Freq=1030,1090 MHz			0.3	dB
VSWR-T	Load Mismatch Tolerance	$P_{OUT}=1200W$ , Freq= 1030MHz			3:1	
$\Theta_{JC}$	Thermal Resistance	32us, 2% duty cycle			0.25	°C/W

- Bias Condition:  $V_{DD}=+50V$ ,  $I_{DQ}=150mA$  average current ( $V_{GS}= -2.0 \sim -4.5V$  typical)

## FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(OFF)}$	Drain leakage current	$V_{GS} = -8V$ , $V_D = 150V$			64	mA
$I_{G(OFF)}$	Gate leakage current	$V_{GS} = -8V$ , $V_D = 0V$			20	mA

*Export Classification: EAR 99*

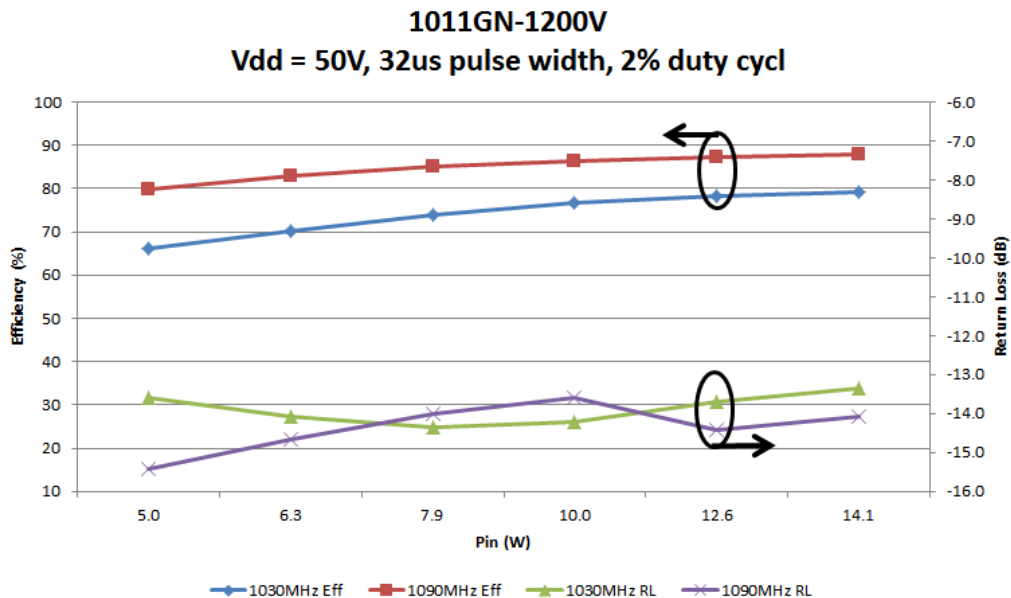
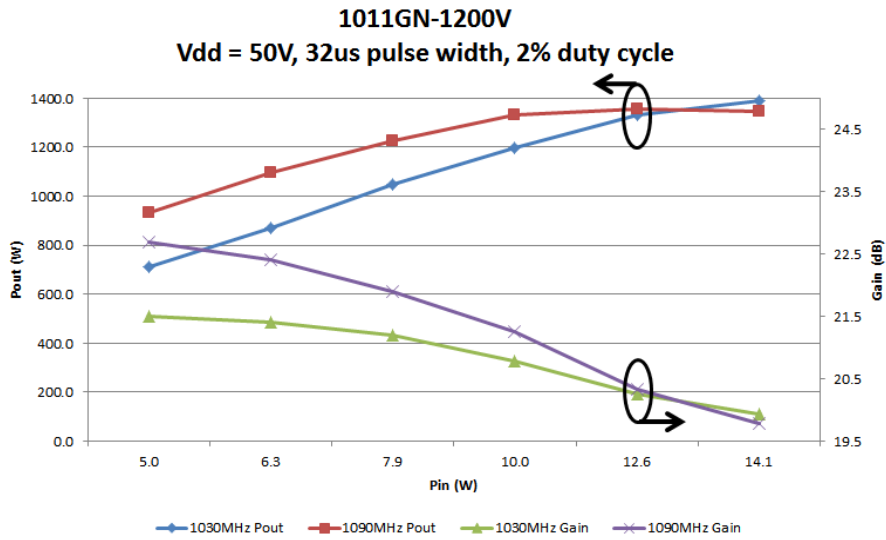


# 1011GN-1200V

1200 Watts • 50 Volts • 32us, 2%  
L-Band Avionics 1030/1090 MHz

## TYPICAL BROAD BAND PERFORMANCE DATA

1030 MHz				1090 MHz		
P <sub>IN</sub> (W)	P <sub>OUT</sub> (W)	IRL (dB)	Eff (%)	P <sub>OUT</sub> (W)	IRL (dB)	Eff (%)
7.9	1045	-14	74	1220	-14	84
10.0	1200	-14	76	1330	-14	86
12.6	1330	-13	78	1360	-14	87
14.1	1390	-13	79	1350	-14	87

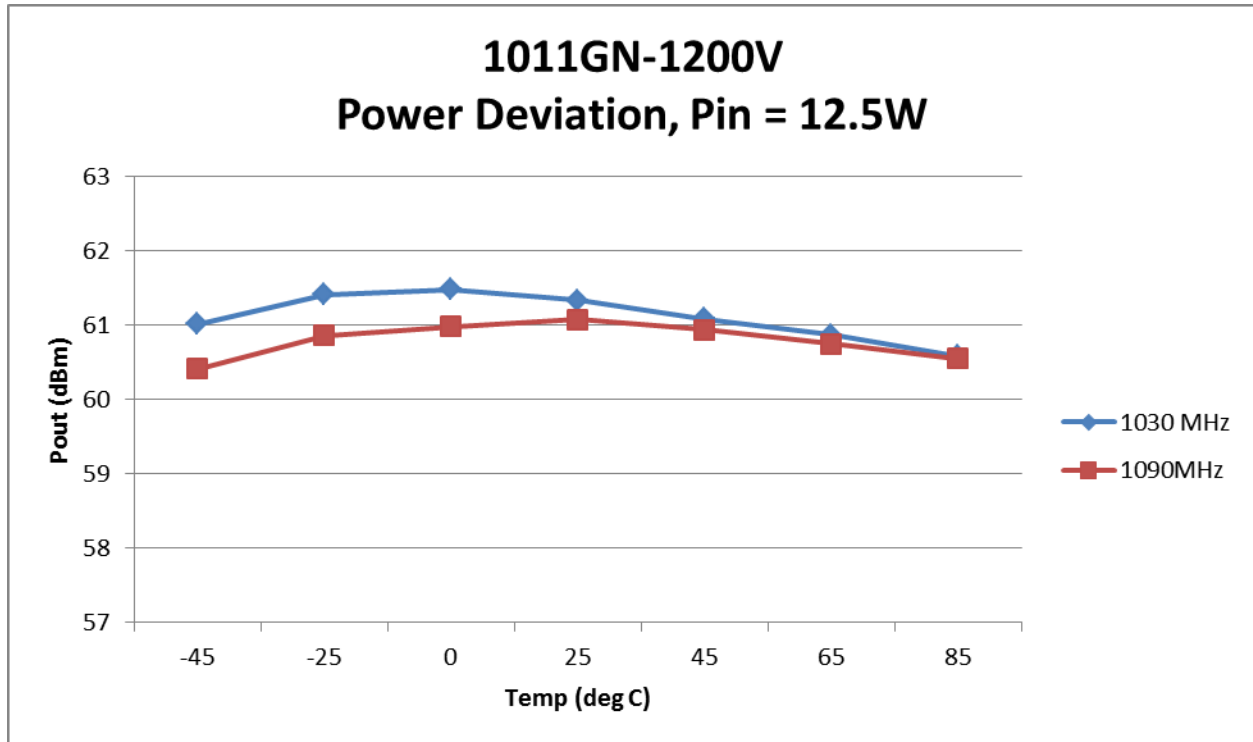




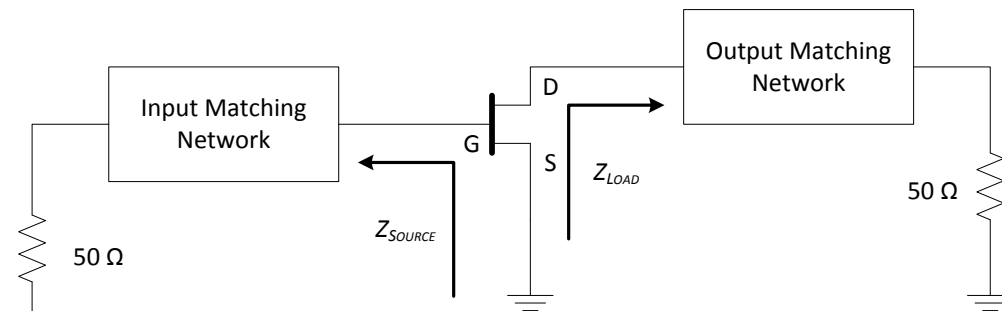
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## TYPICAL OVER TEMPERATURE PERFORMANCE



## TRANSISTOR IMPEDANCE INFORMATION



Note:  $Z_{SOURCE}$  is looking into the input circuit  
 $Z_{LOAD}$  is looking into the output circuit

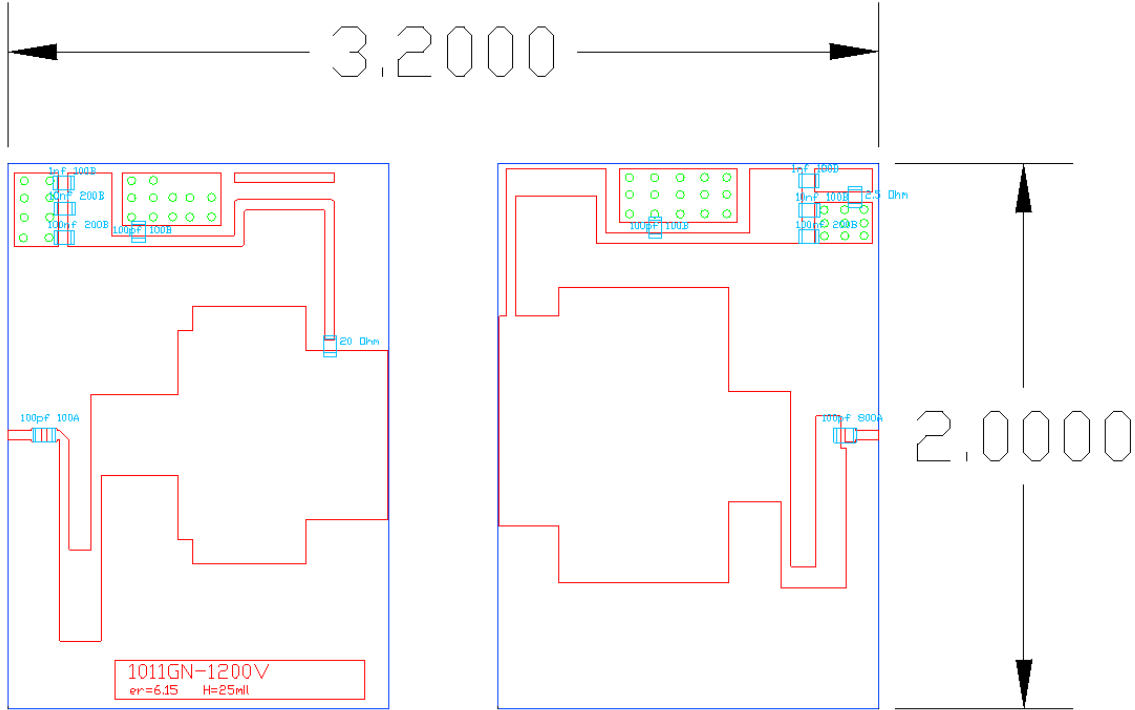
Frequency	$Z_{SOURCE}$	$Z_{LOAD}$
1030 MHz	1.32-j0.37 Ω	0.86-j1.1 Ω
1060 MHz	1.38-j0.2 Ω	0.80-j0.94 Ω
1090 MHz	1.46-j0.08 Ω	0.74-j0.82 Ω



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## TEST CIRCUIT (inches)



- **Board Material: Roger Duroid 6006 @ H=25 mils, Er=6.15**
- **DXF file available upon request**

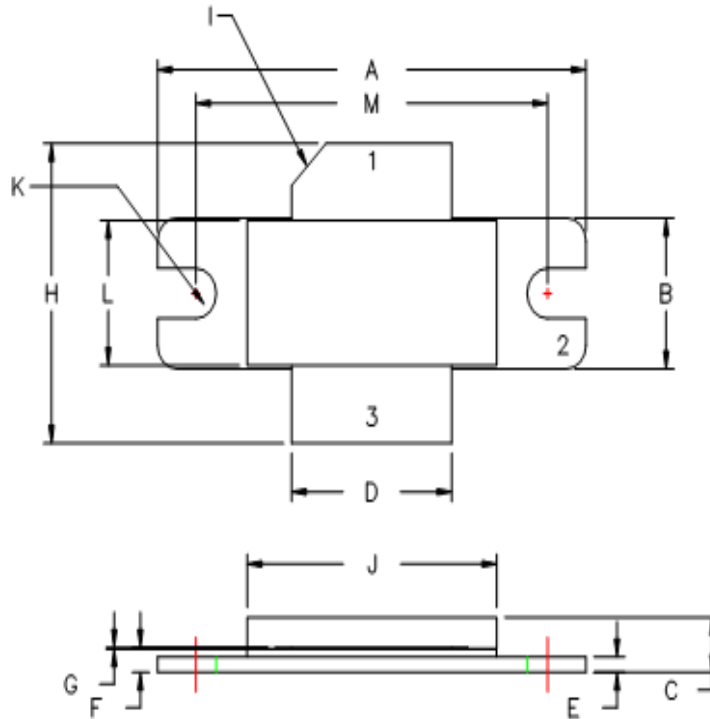
## BILL OF MATERIALS

Item	Description	Value
C1	ATC 100A	100pF
C2	ATC 800A	100pF
C3	ATC 100B	100pF
C4	ATC 100B	1nF
C5	ATC 200B	10nF
C6	ATC 200B	100nF
R1	0805	20Ω
R2	0805	2.5Ω



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DIM	MILLIMETER	TOL	INCHES	TOL
A	34.03	.25	1.340	.010
B	9.78	.25	.385	.010
C	3.55	.19	.140	.007
D	12.70	.13	.500	.005
E	1.02	.13	.040	.005
F	1.65	.13	.065	.005
G	0.13	.03	.005	.001
H	19.43	.76	.765	.030
I	45°	5°	45°	5°
J	19.81	.25	.780	.030
K	3.30 DIA	.13	.130 DIA	.005
L	9.40	.13	.370	.005
M	27.94	MAX	1.100	MAX

PIN 1 = DRAIN  
PIN 2 = SOURCE  
PIN 3 = GATE



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#### Revision History

Revision Level / Date	Para. Affected	Description
06/ March 20 2015	-	Initial Preliminary Release