



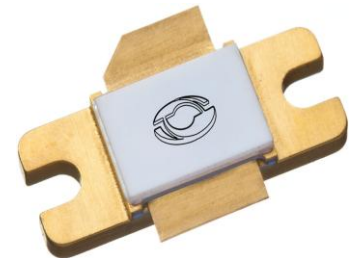
2731GN-400V

400 Watts - 52 Volts, 100 μ s, 10%
S-Band Radar 2700 - 3100 MHz

GENERAL DESCRIPTION

For S-band pulsed radar applications, with typically over 10.5dB gain, the 2731GN-400V is an internally matched, common source, class AB, GaN on SiC HEMT transistor capable of delivering more than 400 Watts of pulsed RF output power under 100 μ s, 10% pulsing across the 2700 to 3100 MHz band. Proprietary state of the art GaN on SiC semiconductor technology, internal pre-matching, hermetic seal, all gold metallization, and eutectic attachment result in a device that delivers the highest reliability and excellent ruggedness while making the 2731GN-400V the best choice to gain superior performance in the most demanding system designs.

CASE OUTLINE 55-QP Common Source



ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25°C 1170 W

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 +250 °C

ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
Pout	Output Power	Pin=36W Freq=2700,2900,3100 MHz	400	415		W
Gp	Power Gain	Pin=36W Freq=2700,2900,3100 MHz	10.5	10.6		dB
η_d	Drain Efficiency	Pin=36W Freq=2700,2900,3100 MHz	37	40		%
Dr	Droop	Pin=36W Freq=2700,2900,3100 MHz			1.0	dB
VSWR-T	Load Mismatch Tolerance	Pout=400W, Freq= 2700MHz			3:1	
Θ_{jc}	Thermal Resistance	Pulse Width=100 μ s, Duty=10%			0.18	°C/W

- Bias Condition: Vdd=+52V, Idq=100mA constant current (Vgs= -2.0 ~ -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
BV_{DSS}	Drain-source breakdown voltage	$V_{GS} = -8V, I_D = 64mA$	150			V

Export Classification: EAR-99

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www.microsemi.com or contact RF Integrated Solutions at GaN@microsemi.com or call (408) 986-8031.

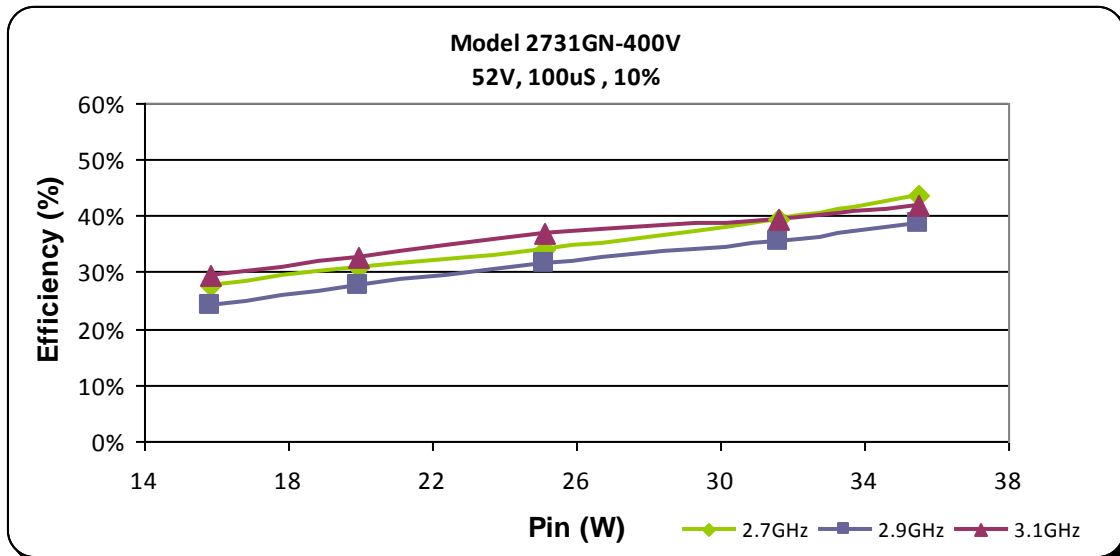
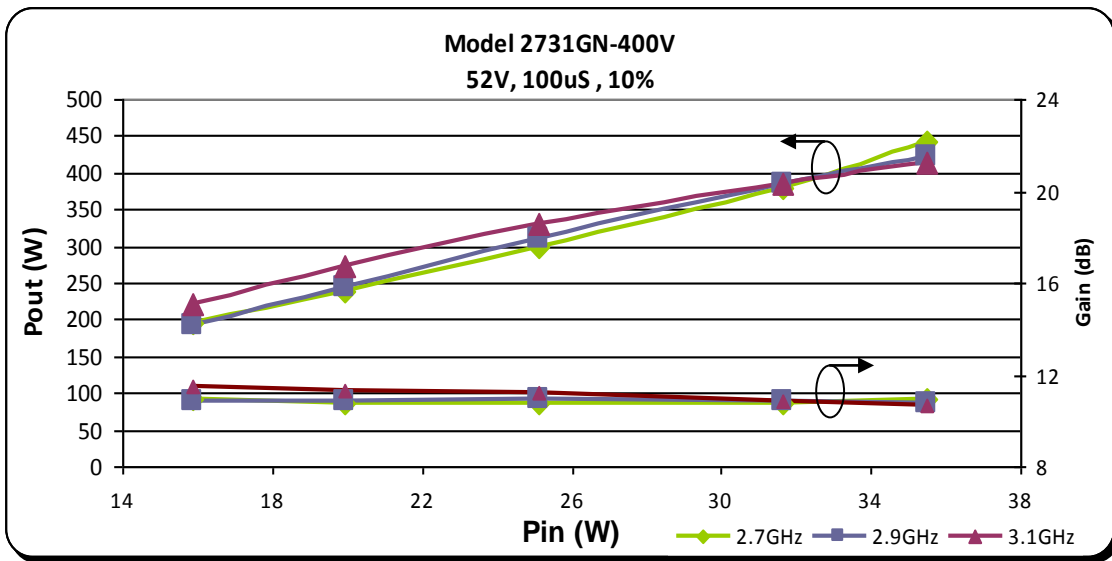


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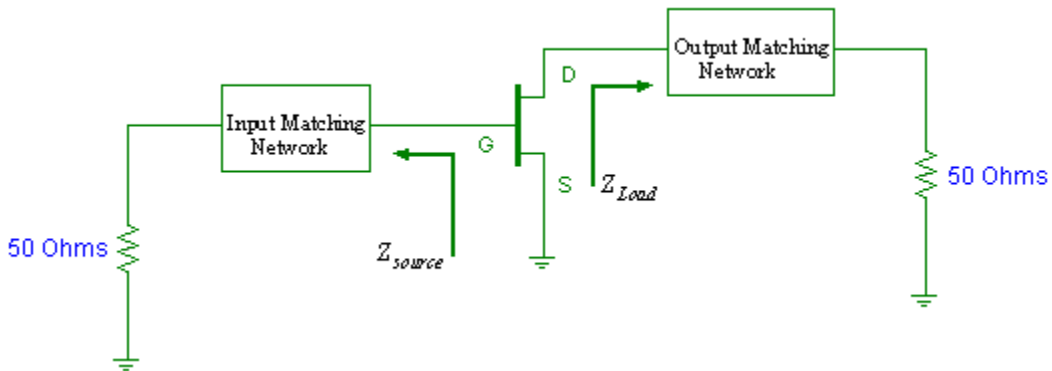
TYPICAL BROAD BAND PERFORMANCE DATA

Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	η_d (%)	Gp (dB)	Droop (dB)
2700 MHz	36	442	2.04	-7.2	44	10.95	0.6
2900 MHz	36	422	2.20	-15.5	39	10.75	0.5
3100 MHz	36	415	2.01	-9.2	42	10.68	0.4



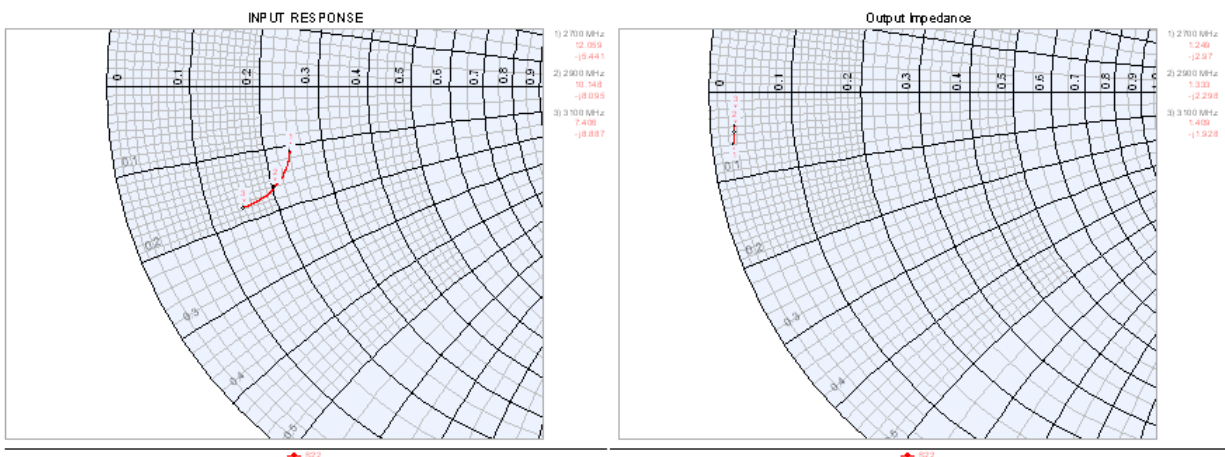
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TRANSISTOR IMPEDANCE INFORMATION



Note: Z_{source} is looking into the input circuit;
 Z_{load} is looking into the output circuit.

Impedance Data		
Freq (GHz)	Z_{source}	Z_{load}
2.7	12.06 – j5.44	1.25 – j2.97
2.9	10.14 – j8.09	1.33 – j2.29
3.1	7.40 – j8.88	1.40 – j1.92

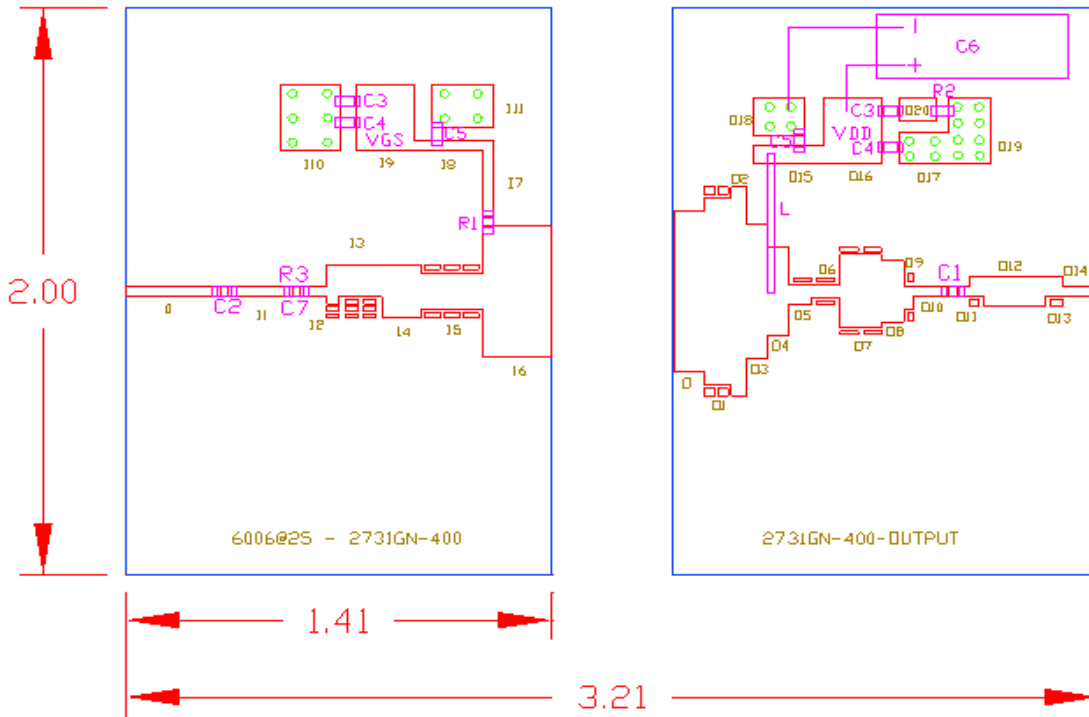




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TEST CIRCUIT DIAGRAM

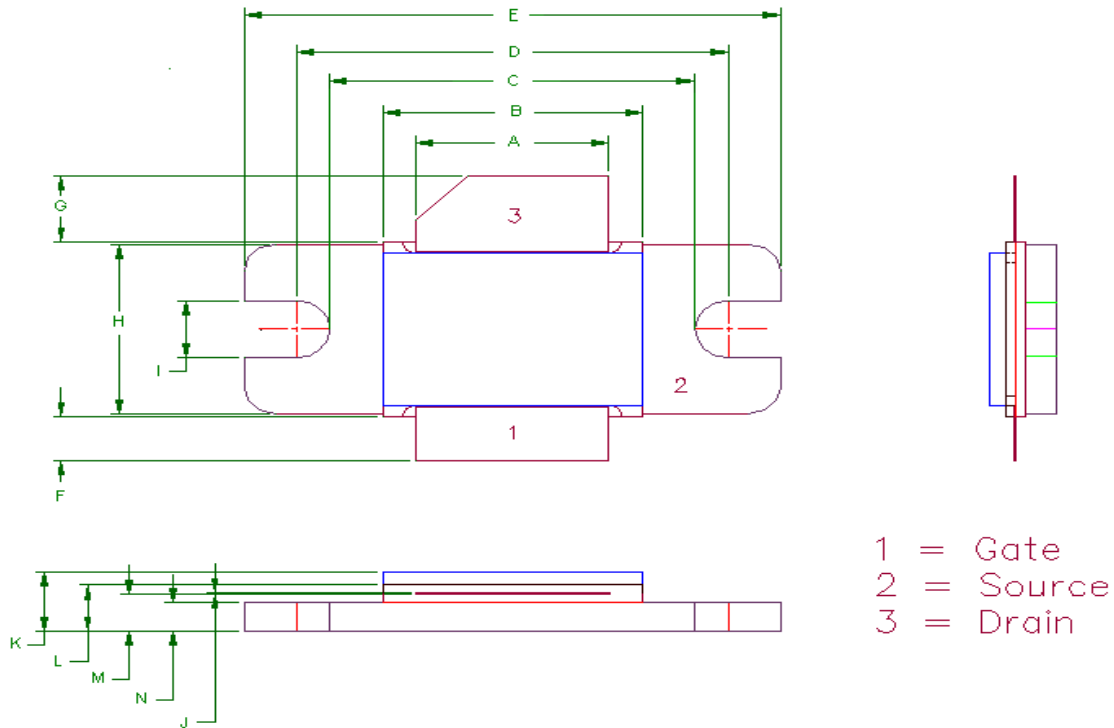


Board Material: Roger Duriod 6006 @ 25 Mil Thickness, Er=6.15

Component List			Input Physical Circuit Layout			Output Physical Circuit Layout			Output Physical Circuit Layout		
Item	Description	Value	Item	W (mil)	L (mil)	Item	W (mil)	L (mil)	Item	W (mil)	L (mil)
C1	Chip Cap A size	9.1pF	I	35	312	O	570	99	O12	100	250
C2	Chip Cap A size	9.1pF	I1	35	210	O1	660	89	O13	68	57
C3	Chip Cap B size	10,000pF	I2	35	90	O2	736	50	O14	35	118
C4	Chip Cap B size	1000pF	I3	113	182	O3	476	70	O15	64	230
C5	Chip Cap B size	100pF	I4	190	128	O4	310	70	O16	230	180
C10	Electrolytic Cap (63V)	4700uF	I5	130	204	O5	71	75	O17	110	160
R1	Chip Resistor size 0805	11.5 ohms	I6	460	229	O6	45	95	O18	135	170
R2	Chip Resistor size 0805	2 Ohms	I7	35	250	O7	260	134	O19	230	140
R3	Chip Resistor size 0805	523 ohms	I8	35	245	O8	215	74	O20	80	124
C7	Chip Cap A size	6.8pF	I9	230	190	O9	82	34			
L	Cu wire 20AWG, L=670 mil		I10	230	200	O10	35	115			
Board: Duroid 6006 - 25 Mil Thick - Er = 6.15			I11	150	206	O11	35	42			

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55-QP PACKAGE DIMENSION



Dimension	Min (mil)	Min (mm)	Max (mil)	Max (mm)
A	370	9.40	372	9.44
B	498	12.65	500	12.7
C	700	17.78	702	17.83
D	830	21.08	832	21.13
E	1030	26.16	1032	26.21
F	101	2.56	102	2.59
G	151	3.84	152	3.86
H	385	9.78	387	9.83
I	130	3.30	132	3.35
J	003	.076	004	0.10
K	135	3.43	137	3.48
L	105	2.67	107	2.72
M	085	2.16	86	2.18
N	065	1.65	66	1.68



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Revision History

Revision Level / Date	Details
0.2 / 08-30-13	52V, 100us, 10% Initial Preliminary Release

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