



2731GN – 110M

110 Watts - 60 Volts, 200 μ s, 10%
2700 - 3100 MHz

GENERAL DESCRIPTION

The 2731GN-110M is an internally matched, COMMON SOURCE, class AB GaN on SiC transistor capable of providing 12dB gain, 110 Watts of pulsed RF output power at 200 μ s pulse width, 10% duty factor across the 2700 to 3100 MHz band. The transistor has internal pre-match for optimal performance. This hermetically sealed transistor is designed for S-Band Radar applications. It utilizes gold metallization and eutectic attach to provide highest reliability and superior ruggedness.

ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25°C 250 W

Maximum Voltage and Current

Drain-Source Voltage (V_{DS}) 150 V

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

Maximum Temperatures

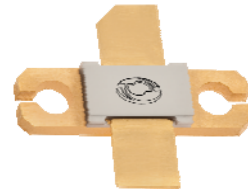
Storage Temperature (T_{STG}) -55 to +125 °C

Operating Junction Temperature +200 °C

CASE OUTLINE

55-QP

Common Source



ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
Pout	Output Power	Pin=7.5W, Freq=2.7, 2.9, 3.1 GHz	110	125		W
Gp	Power Gain	Pin=7.5W, Freq=2.7, 2.9, 3.1 GHz	11.7	12.2		dB
η_d	Drain Efficiency	Pin=7.5W, Freq=2.7, 2.9, 3.1 GHz	42	50		%
R/L	Input Return Loss	Pin=7.5W, Freq=2.7, 2.9, 3.1 GHz	-7			dB
VSWR-T	Load Mismatch Tolerance	Pout=110W, Freq=2.7 GHz			5:1	
Θ_{jc}	Thermal Resistance	Pulse Width=200 μ s, Duty=10%			1.1	°C/W

- Bias Condition: $V_{DD}=+60V$, $I_{DQ}=250mA$ peak current ($V_{GS} = -2.0 \sim -4.5V$ typical)

FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(Off)}$	Drain leakage current	$V_{GS} = -8V$, $V_D = 60V$			2.5	mA
$I_{G(Off)}$	Gate leakage current	$V_{GS} = -8V$, $V_D = 0V$			2	mA
BV_{DSS}	Drain-source breakdown voltage	$V_{GS} = -8V$, $I_D = 3mA$	250			V

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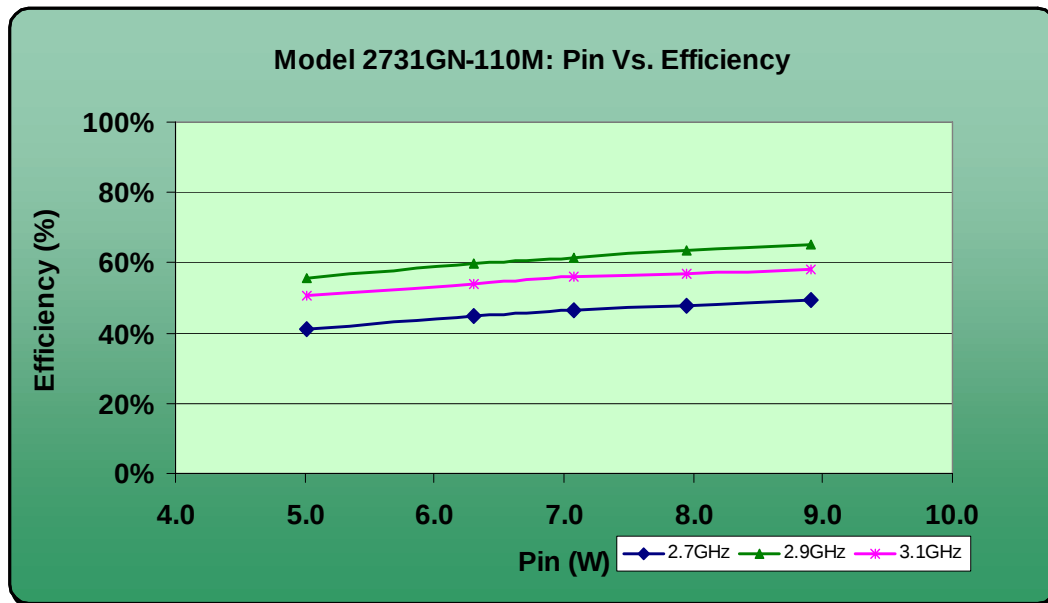
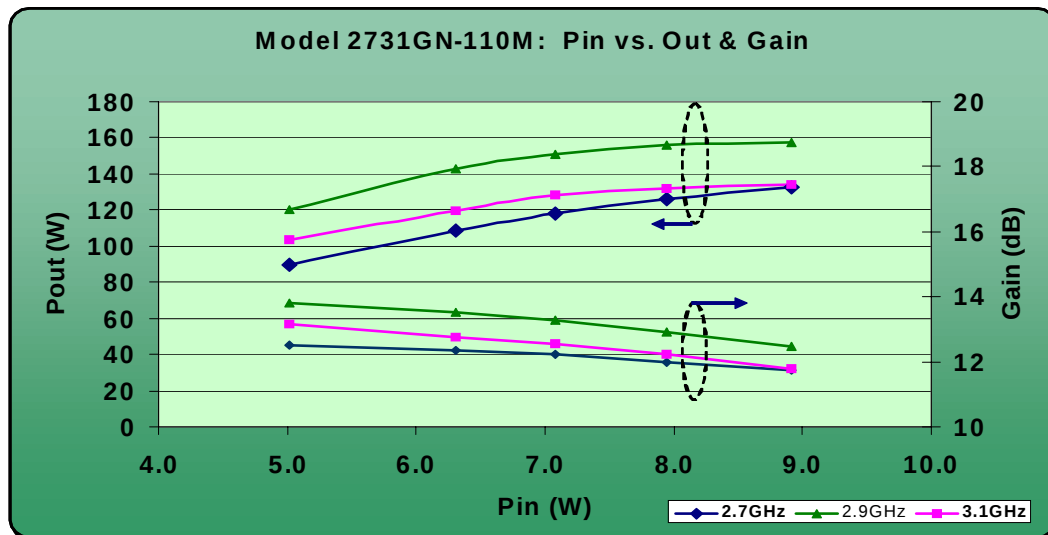


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Typical Performance Data:

Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	Nd (%)	G (dB)
2700 MHz	7	118	0.45	-11	46	12.2
2900 MHz	7	151	0.43	-13	62	13.3
3100 MHz	7	128	0.40	-8	56	12.5



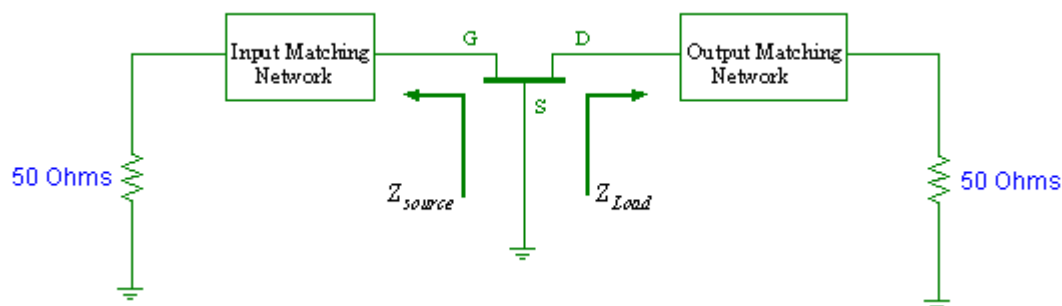


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Transistor Impedance Information

Freq (GHz)	Zs	ZI
2.7	5.63 – j11.15	5.28 – j3.20
2.8	5.27 – j10.74	5.37 – j2.74
2.9	4.94 – j10.34	5.49 – j2.28
3.0	4.62 – j9.92	5.64 – j1.84
3.1	4.34 – j9.52	5.82 – j1.42



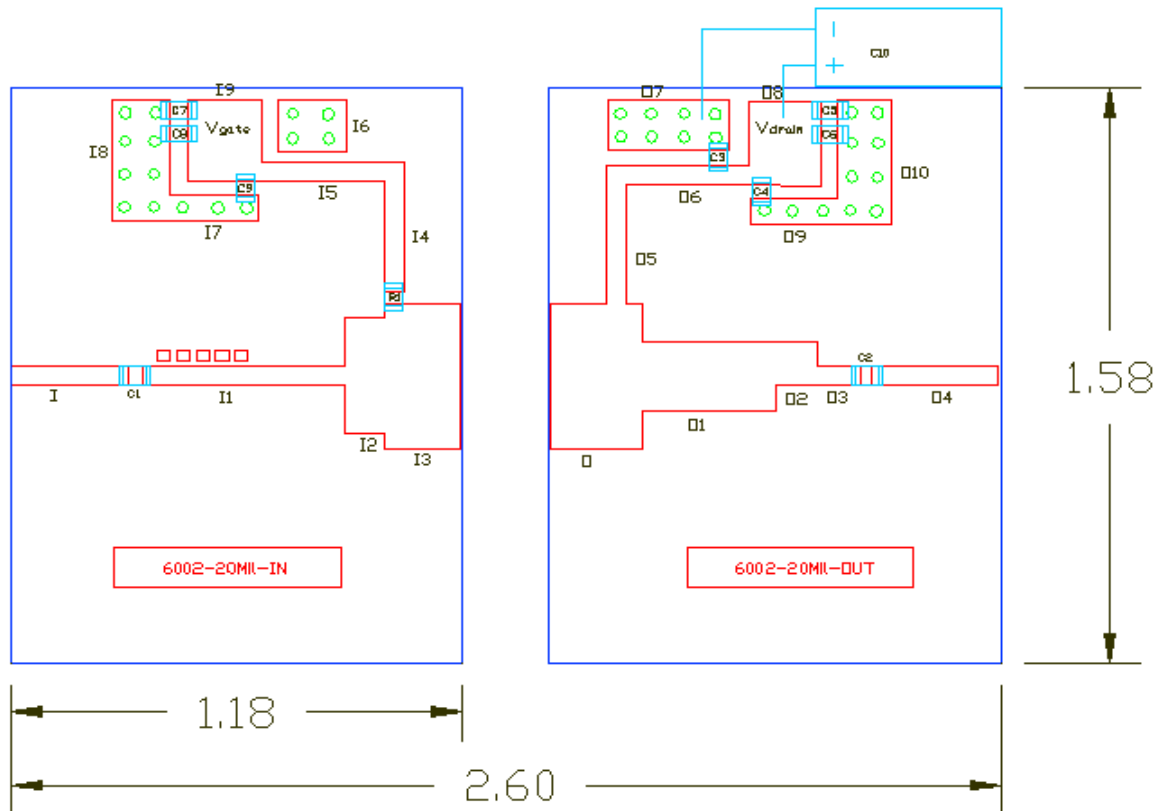
Note: Z_{in} is looking into the input circuit;
 Z_{Load} is looking into the output circuit.



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Test Circuit Layout



Board Material: Roger Duroid 6002 @ 20 mils thickness, 1 oz Cu, Er = 2.9

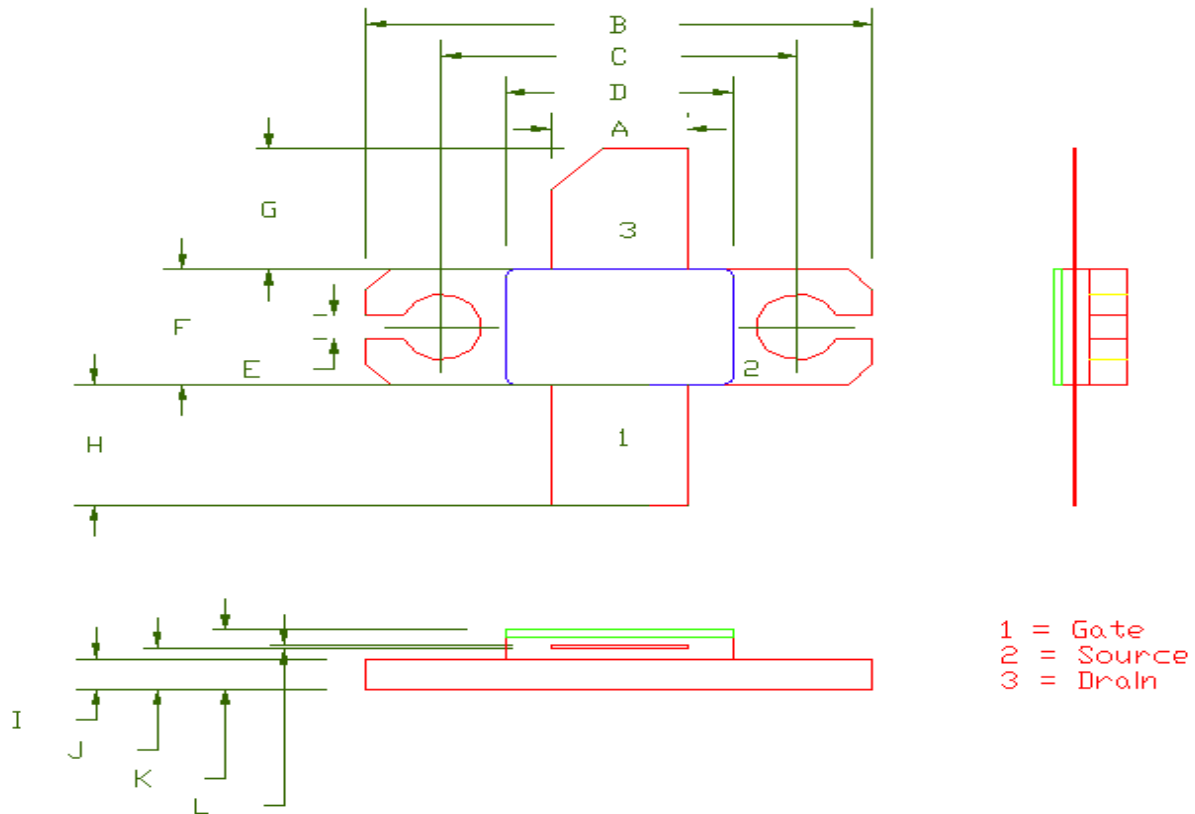
Component List			Input Physical Circuit Layout			Output Physical Circuit Layout		
Item	Description	Value	Item	W (mil)	L (mil)	Item	W (mil)	L (mil)
C1	Chip Cap A size	9.1pF	I	52	320	O	400	242
C2	Chip Cap A size	9.1pF	I1	52	530	O1	190	350
C3	Chip Cap B size	120pF	I2	318	103	O2	121	105
C4	Chip Cap B size	1000pF	I3	400	200	O3	52	116
C5	Chip Cap B size	10,000pF	I4	52	320	O4	52	340
C6	Chip Cap B size	1,000pF	I5	52	340	O5	52	340
C7	Chip Cap B size	10,000pF	I6	140	180	O6	52	340
C8	Chip Cap B size	1,000pF	I7	70	230	O7	130	320
C9	Chip Cap B size	120pF	I8	330	150	O8	230	190
C10	Electrolytic Cap (63V)	2200uF	I9	220	190	O9	70	230
R1	Chip Resistor size 0805	11.5 ohms				O10	340	140



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55-QP Package Dimension



Dimension	Min (mil)	Min (mm)	Max (mil)	Max (mm)
A	213	5.41	217	5.51
B	798	20.26	802	20.37
C	560	14.22	564	14.32
D	258	6.55	362	9.19
E	43	1.09	47	1.19
F	226	5.74	230	5.84
G	235	5.96	239	6.07
H	235	5.96	239	6.07
I	60	1.52	62	1.57
J	81	2.06	82	2.08
K	116	2.94	118	2.99
L	4	.102	6	.152