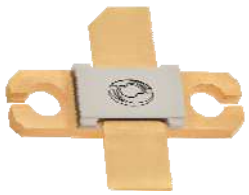
2731GN – 200M

200 Watts - 60 Volts, 200 µs, 10%
2700 - 3100 MHz

GENERAL DESCRIPTION

The 2731GN-200M is an internally matched, COMMON SOURCE, class AB GaN on SiC transistor capable of providing 12dB gain, 200 Watts of pulsed RF output power at 200µs 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.

CASE OUTLINE
55-QP
Common Source



ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25°C 400 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 +200 °C

ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
Pout	Output Power	Pin=12W, Freq=2.7, 2.9, 3.1 GHz	200	225		W
Gp	Power Gain	Pin=12W, Freq=2.7, 2.9, 3.1 GHz	12.2	12.7		dB
ηd	Drain Efficiency	Pin=12W, Freq=2.7, 2.9, 3.1 GHz	42	50		%
R/L	Input Return Loss	Pin=12W, Freq=2.7, 2.9, 3.1 GHz	-7			dB
VSWR-T	Load Mismatch Tolerance	Pout=200W, Freq=2.7 GHz			5:1	
Θjc	Thermal Resistance	Pulse Width=200uS, Duty=10%			0.6	°C/W

- **Bias Condition: Vdd=+60V, Idq=500mA peak current (Vgs= -2.0 ~ -4.5V typical)**

FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(Off)}$	Drain leakage current	V_{gS} = -8V, V_D = 60V			5	mA
$I_{G(Off)}$	Gate leakage current	V_{gS} = -8V, V_D = 0V			4	mA
BV_{DSS}	Drain-source breakdown voltage	V_{gs} =-8V, I_D = 5mA	250			V

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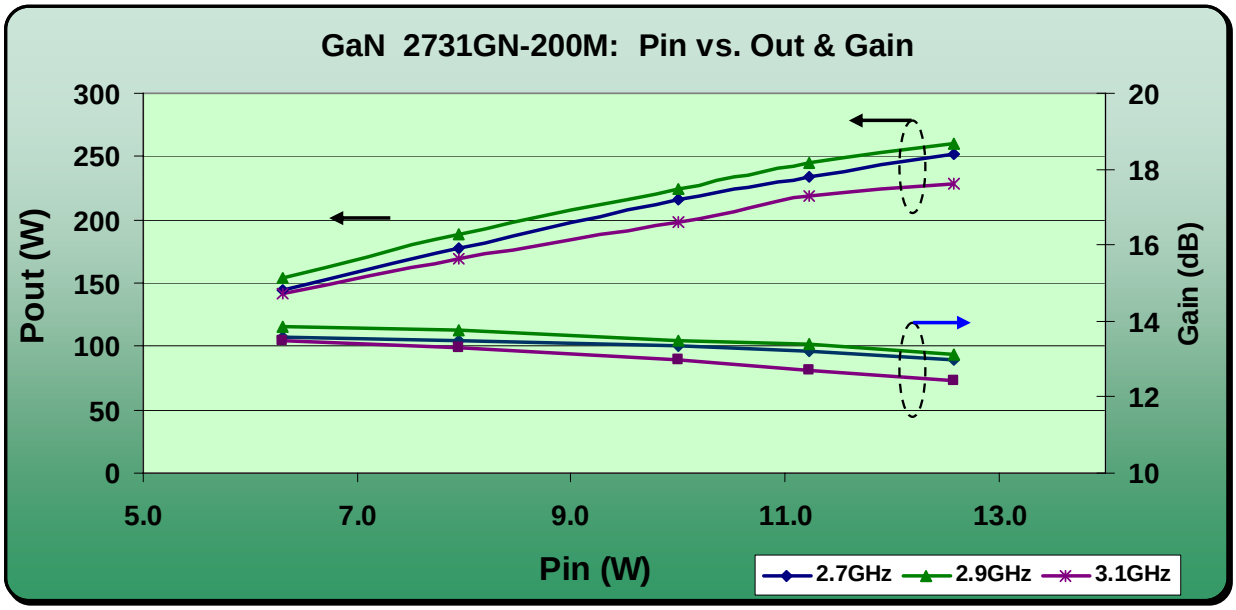
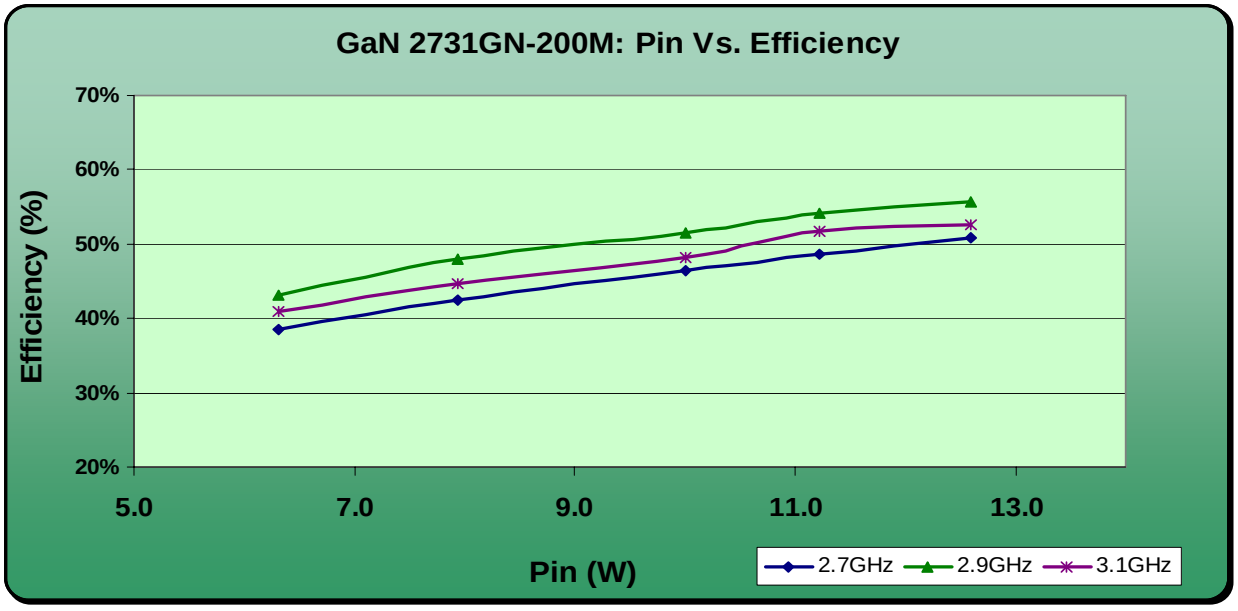
Typical Performance Data:

Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	Nd (%)	G (dB)
2700 MHz	12	251	0.85	-13	49	13.2
2900 MHz	12	243	0.80	-8	51	13.0
3100 MHz	12	214	0.75	-10	47	12.5





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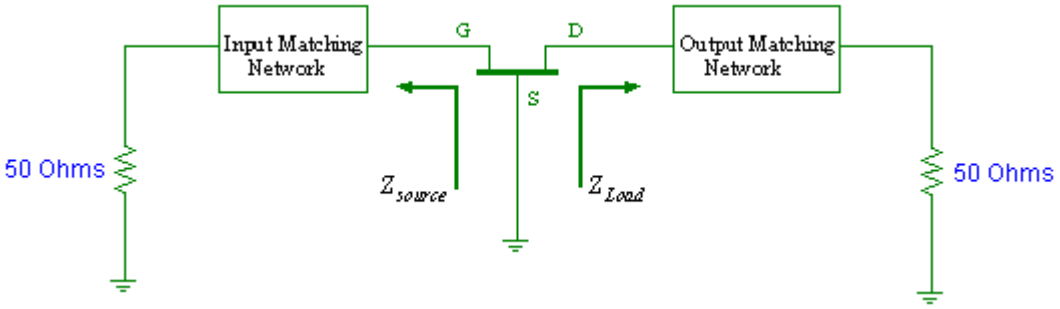
Transistor Impedance Information

Impedance Data		
Freq (GHz)	**Zs**	**Zl**
2.7	3.28 – j7.50	3.24 – j3.74
2.8	3.10 – j7.14	3.24 – j3.44
2.9	2.94 – j6.78	3.26 – j3.14
3.0	2.79 – j6.44	3.27 – j2.84
3.1	2.65 – j6.10	3.00 – j2.56



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

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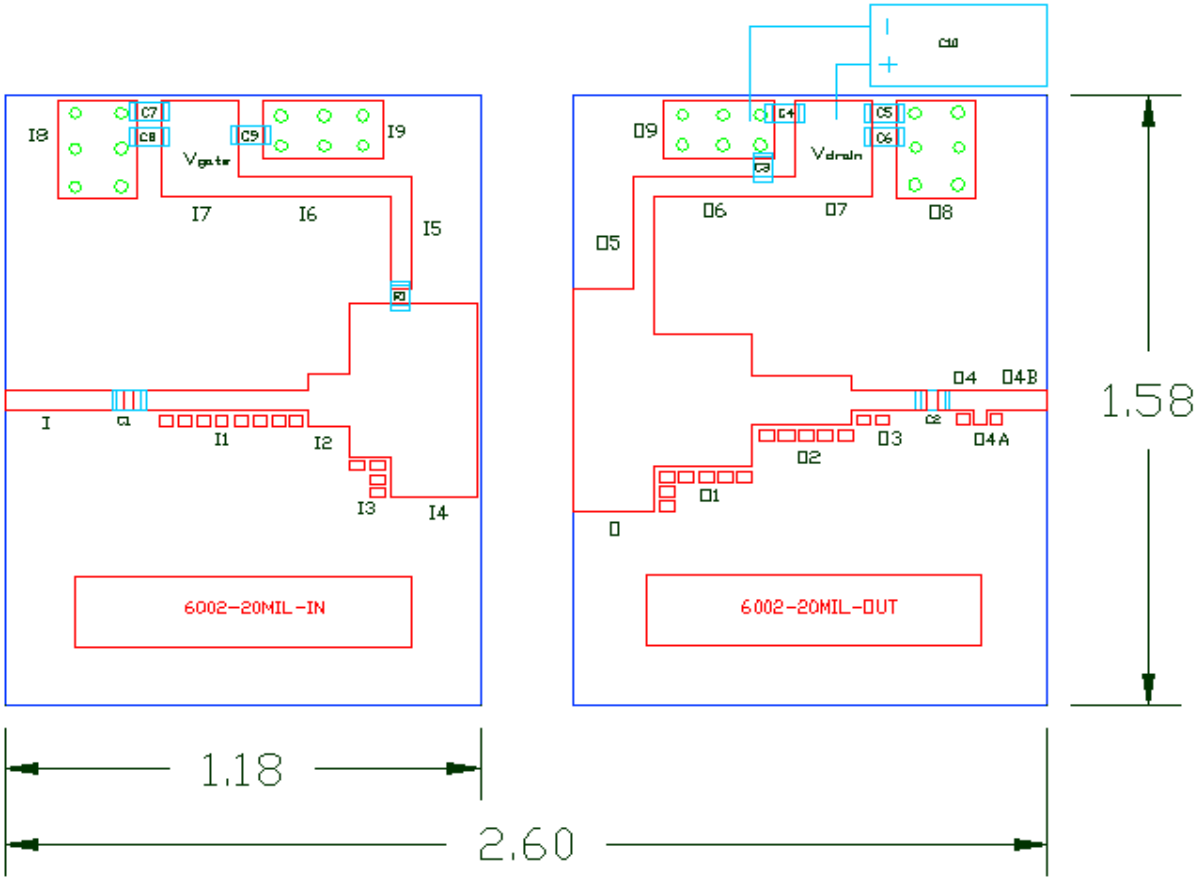
Test Circuit Layout



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

Component List		
Item	Description	Value
C1	Chip Cap A size	9.1pF
C2	Chip Cap A size	9.1pF
C3	Chip Cap B size	120pF
C4	Chip Cap B size	10000pF
C5	Chip Cap B size	10,000pF
C6	Chip Cap B size	1,000pF
C7	Chip Cap B size	10,000pF
C8	Chip Cap B size	1,000pF
C9	Chip Cap B size	120pF
C10	Electrolytic Cap (63V)	2200uF
R1	Chip Resistor size 0805	11.5 ohms

Input Physical Circuit Layout		
Item	W (mil)	L (mil)
I	52	290
I1	52	438
I2	140	104
I3	400	100
I4	500	220
I5	52	260
I6	52	390
I7	250	190
I8	250	200
I9	150	310

Output Physical Circuit Layout		
Item	W (mil)	L (mil)
O	580	198
O1	340	246
O2	126	250
O3	52	188
O4	52	92
O4A	90	30
O4B	52	150
O5	52	260
O6	52	380
O7	250	190
O8	250	190
O9	150	280

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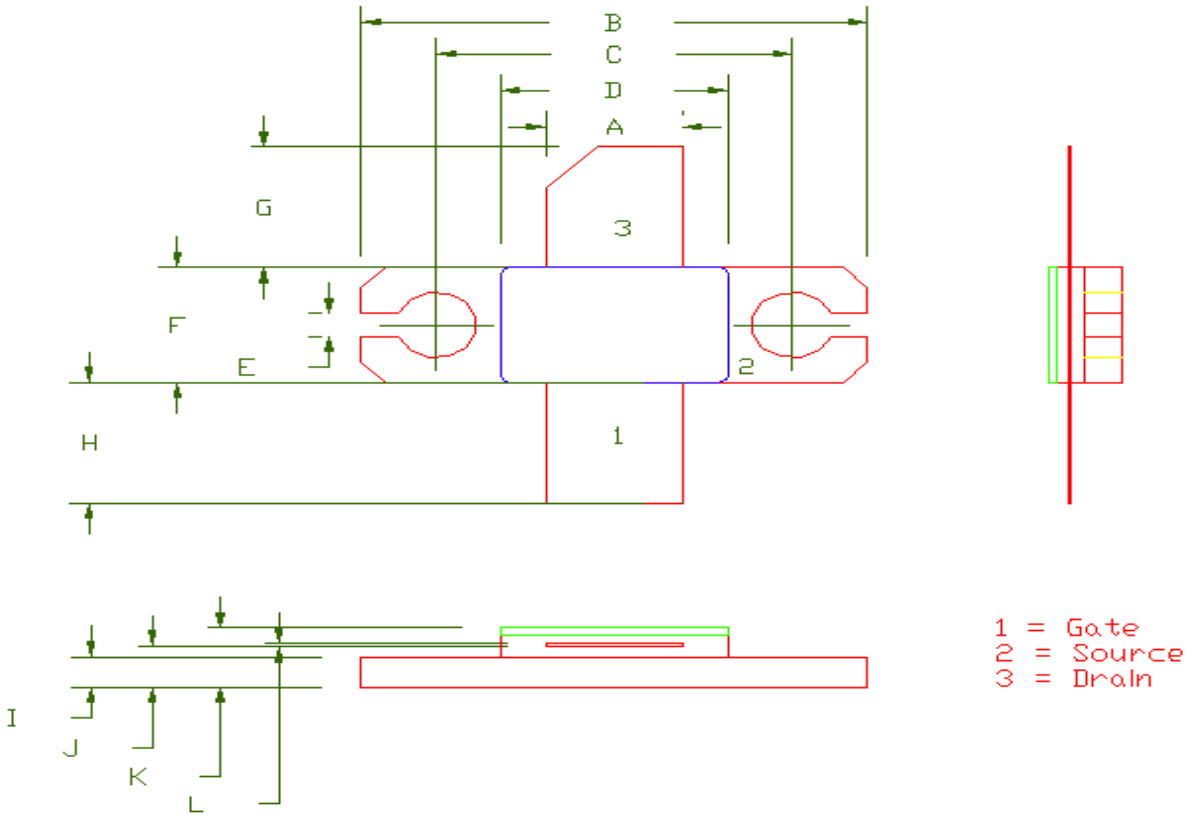
55-QP Package Dimension



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