



2729GN – 270

270 Watts - 60 Volts, 100 μ s, 10%
Radar 2700 - 2900 MHz

GENERAL DESCRIPTION

The 2729GN-270 is an internally matched, COMMON SOURCE, class AB GaN on SiC transistor capable of providing 14dB gain, 280 Watts of pulsed RF output power at 100 μ s pulse width, 10% duty factor across the 2700 to 2900 MHz band. The transistor has internal pre-match for optimal performance. This hermetically sealed transistor is specifically 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 570 W

Maximum Voltage and Current

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

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

Maximum Temperatures

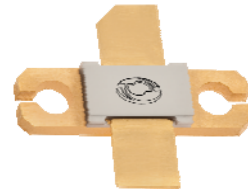
Storage Temperature (T_{STG}) -55 to +125 °C

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=12.6W, Freq=2.7, 2.8, 2.9 GHz	270	304		W
Gp	Power Gain	Pin=12.6W, Freq=2.7, 2.8, 2.9 GHz	13.3	13.8		dB
η_d	Drain Efficiency	Pin=12.6W, Freq=2.7, 2.8, 2.9 GHz	48	55		%
R/L	Input Return Loss	Pin=12.6W, Freq=2.7, 2.8, 2.9 GHz	-9			dB
VSWR-T	Load Mismatch Tolerance	Pout=270W, Freq= 2.7 GHz			5:1	
Θ_{jc}	Thermal Resistance	Pulse Width=100uS, Duty=10%			0.6	°C/W

- Bias Condition: Vdd=+60V, Idq=500mA peak current (V_{gs} = -2.0 ~ -4.5V typical)

FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(on)}$	Drain leakage current	V_{gs} = -8V, V_D = 60V			5	mA
$I_{G(on)}$	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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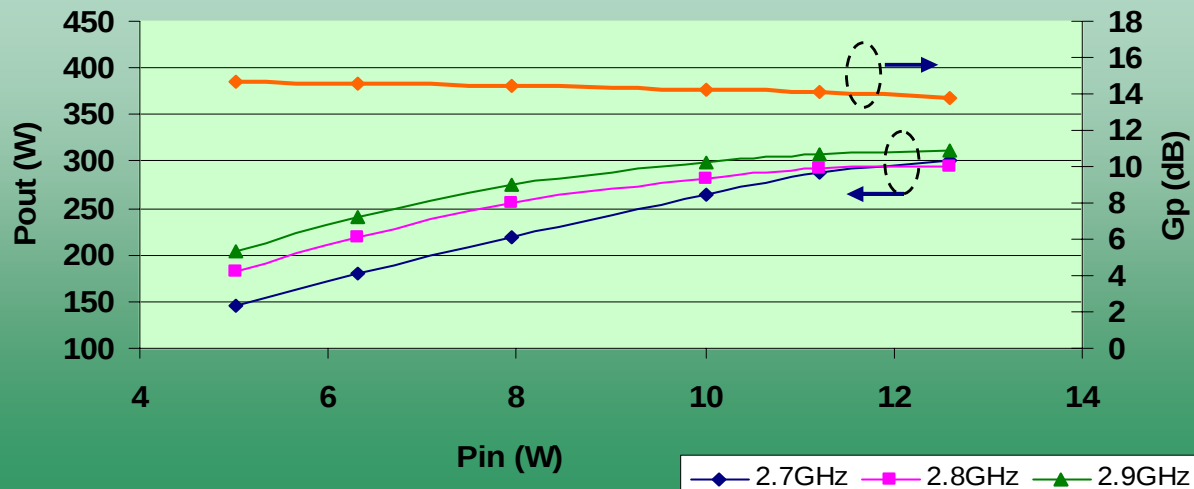
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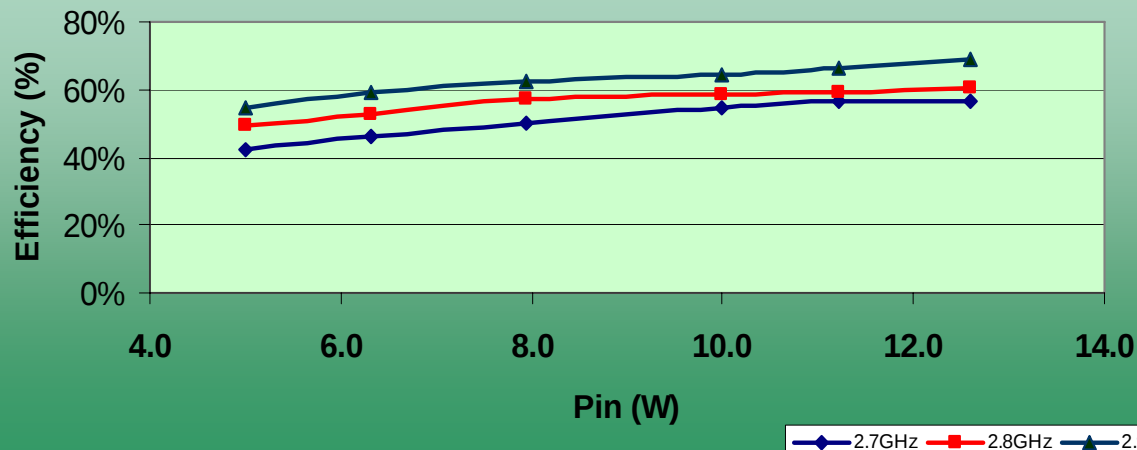
Typical Performance Data:

Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	Nd (%)	G (dB)
2700 MHz	12.6	300	0.93	-11	56	13.8
2800 MHz	12.6	295	0.86	-15	58	13.7
2900 MHz	12.6	310	0.80	-14	67	13.9

GaN 2.7 - 2.9 GHz , 280W, 13 dB Gain, 55% Efficiency



2729GN-270: Pin Vs. Efficiency



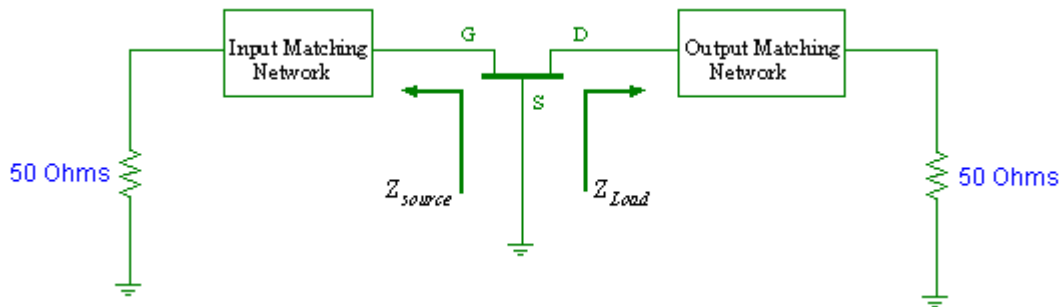


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Transistor Impedance Information

Impedance Data		
Freq (GHz)	Zs	ZI
2.7	3.28 – j7.50	2.92 – j3.72
2.8	3.10 – j7.14	2.91 – j3.40
2.9	2.94 – j2.94	2.92 – j3.08



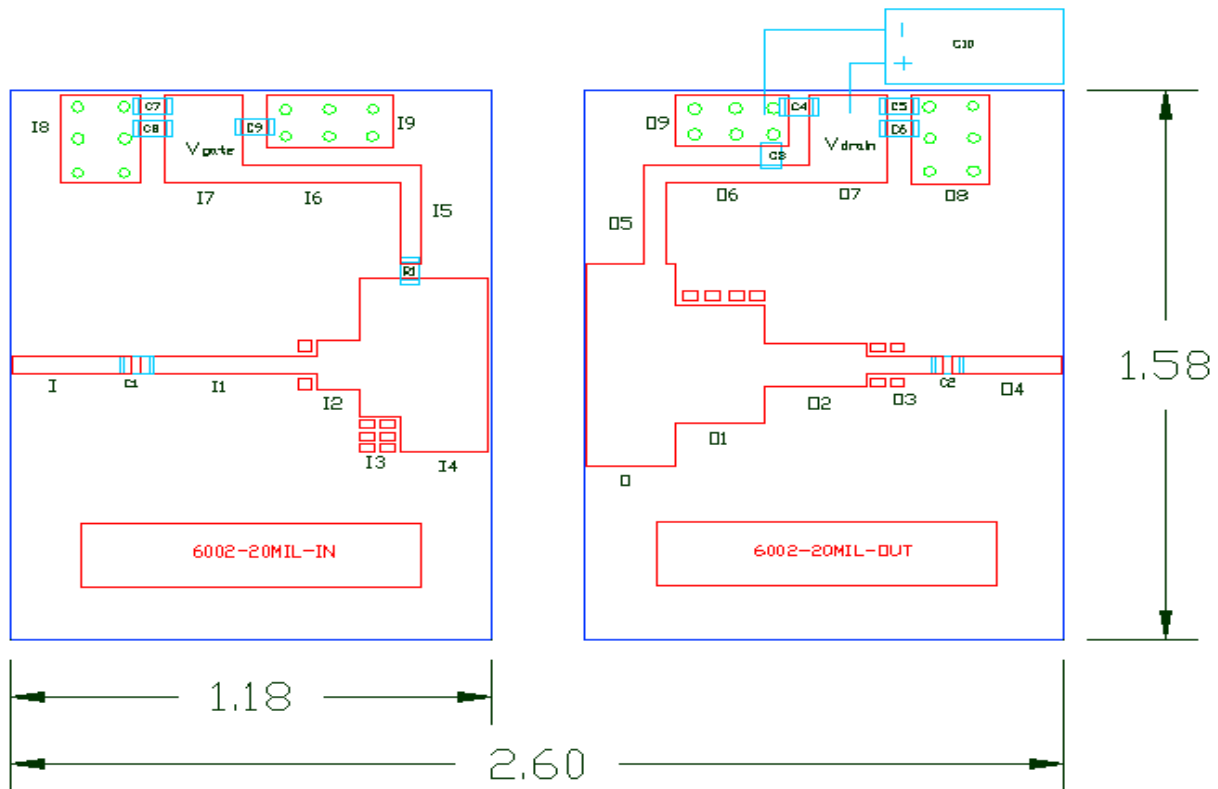
Note: Z_{in} is looking into the input circuit;
 Z_{Load} is looking into the output circuit.



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Test Circuit Diagram



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

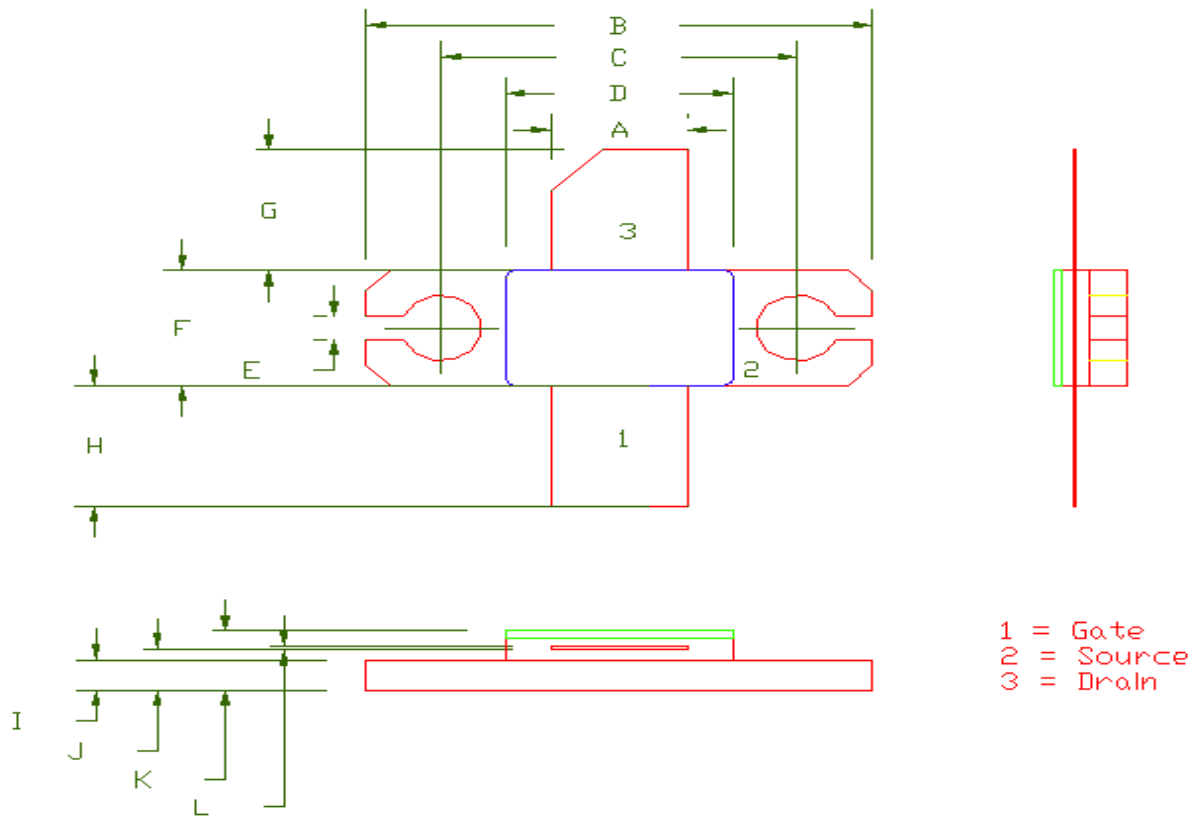
Component List			Input Physical Circuit Layout			Output Physical Circuit Layout		
Item	Description	Value	Item	W (mil)	L (mil)	Item	W (mil)	L (mil)
C1	Chip Cap A size	9.1pF	I	52	290	O	580	223
C2	Chip Cap A size	9.1pF	I1	52	438	O1	340	220
C3	Chip Cap B size	120pF	I2	140	104	O2	126	250
C4	Chip Cap B size	10000pF	I3	400	100	O3	52	188
C5	Chip Cap B size	10,000pF	I4	500	220	O4	52	270
C6	Chip Cap B size	1,000pF	I5	52	260	O5	52	260
C7	Chip Cap B size	10,000pF	I6	52	390	O6	52	380
C8	Chip Cap B size	1,000pF	I7	250	190	O7	250	190
C9	Chip Cap B size	120pF	I8	250	200	O8	250	190
C10	Electrolytic Cap (63V)	2200uF	I9	150	310	O9	150	280
R1	Chip Resistor size 0805	11.5 ohms						



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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