



2730GN – 100L

100 Watts, 3 mS , 30%, +55 Volts
2700 - 3000 MHz

GENERAL DESCRIPTION

The 2730GN-100M is an internally matched, COMMON SOURCE, class AB GaN on SiC transistor capable of providing 11dB gain, 100 Watts of pulsed RF output power at 3mS pulse width, 30% duty factor across the 2700 to 3000 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

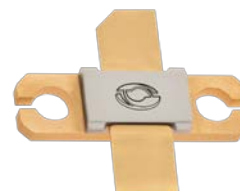
Storage Temperature (T_{STG}) -55 to +125 °C

Operating Junction Temperature +250 °C

CASE OUTLINE

55-QP

Common Source



Typical Performance Data:

Test at 3mS, 30% duty cycle, +55V

<u>Frequency</u>	<u>Pin (W)</u>	<u>Pout (W)</u>	<u>Id (A)</u>	<u>RL (dB)</u>	<u>Nd (%)</u>	<u>G (dB)</u>
2700 MHz	7.9	117	1.20	-11	56	11.7
2800 MHz	7.9	120	1.19	-14	55	11.8
2900 MHz	7.9	131	1.16	-15	62	12.2
3000 MHz	7.9	135	1.20	-9	61	12.3



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ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
P _{out}	Output Power	P _{in} =7.9W, Freq=2.7, 2.8, 2.9, 3.0 GHz	100	120		W
G _p	Power Gain	P _{in} =7.9W, Freq=2.7, 2.8, 2.9, 3.0 GHz	11	12		dB
η _d	Drain Efficiency	P _{in} =7.9W, Freq=2.7, 2.8, 2.9, 3.0 GHz	50	55		%
R/L	Input Return Loss	P _{in} =7.9W, Freq=2.7, 2.8, 2.9, 3.0 GHz	-8			dB
VSWR-T	Load Mismatch Tolerance	P _{out} =100W, Freq=2.9 GHz			3:1	
Θ _{jc}	Thermal Resistance	P _{out} =100W, Pulse Width=3mS, Duty=30%		0.8		°C/W

- **Bias Condition:** $V_{DD} = +55V$, $I_{dq} = 150mA$ peak current ($V_{gs} = -2.0 \sim -4.5V$ typical)
- **Pulse Format :** 3ms, 30%

FUNCTIONAL CHARACTERISTICS @ 25°C

I _{D(Off)}	Drain leakage current	$V_{gs} = -8V$, $V_D = +55V$			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

Issue June 2011

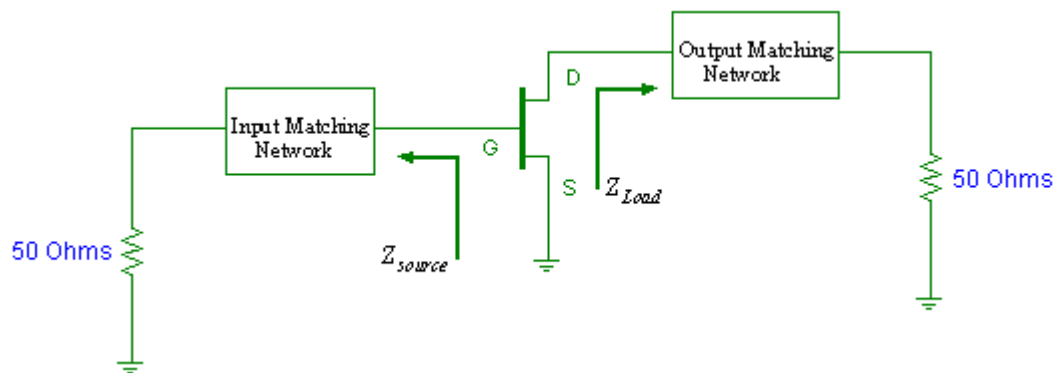


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Transistor Impedance Information

Impedance Data		
Freq (GHz)	Zs	ZI
2.7	7.29 – j10.88	4.51 – j1.68
2.8	6.90 – j10.66	4.65 – j1.21
2.9	6.52 – j10.44	4.83 – j0.76
3.0	6.14 – j10.2	5.03 – j0.31



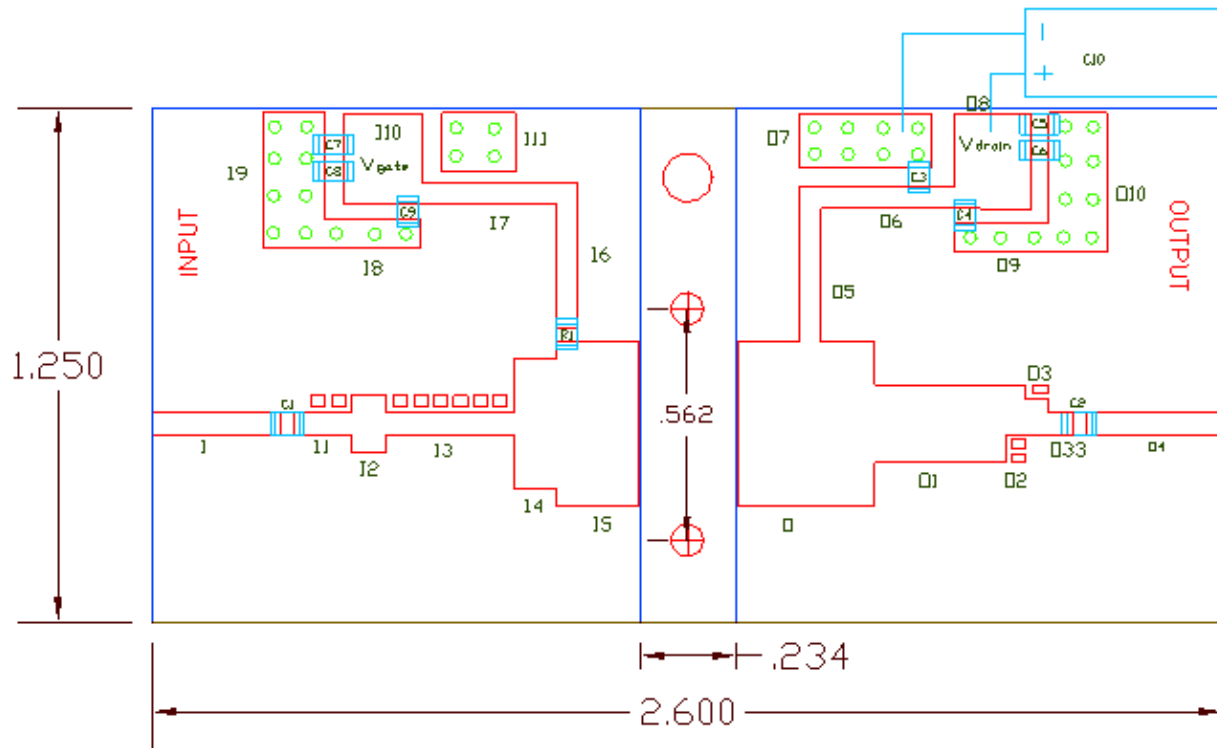
Note: Z_{source} is looking into the input circuit;
 Z_{Load} is looking into the output circuit.



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Test Circuit Layout



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

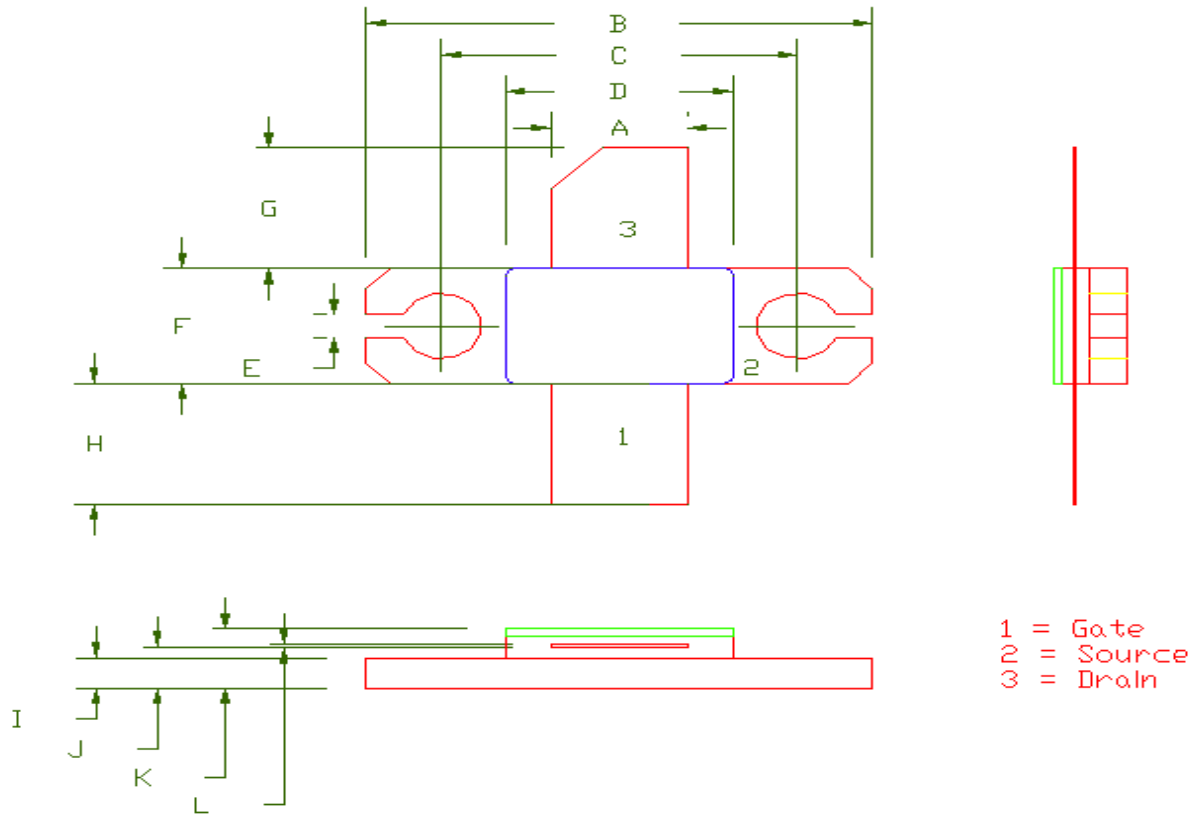
Component List			Input Physical Circuit Layout			Output Physical Circuit Layout		
Item	Description	Value	Item	W (mil)	L (mil)	Item	W (mil)	L (mil)
C1	Chip Cap A size	9.1pF	I	52	308	O	400	330
C2	Chip Cap A size	9.1pF	I1	52	137	O1	190	318
C3	Chip Cap B size	120pF	I2	137	85	O2	121	50
C4	Chip Cap B size	1000pF	I3	52	310	O3	54	87
C5	Chip Cap B size	10,000pF	I4	318	103	O33	52	62
C6	Chip Cap B size	1,000pF	I5	400	200	O4	52	330
C7	Chip Cap B size	10,000pF	I6	52	320	O5	52	340
C8	Chip Cap B size	1,000pF	I7	52	340	O6	52	340
C9	Chip Cap B size	120pF	I8	70	230	O7	130	320
C10	Electrolytic Cap (63V)	2200uF	I9	330	190	O8	230	190
R1	Chip Resistor size 0805	11.5 ohms	I10	220	190	O9	70	230
			I11	140	180	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