3135GN-120V

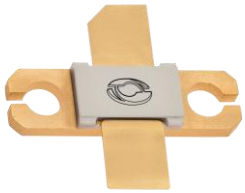
120 Watts • 50 Volts • 300 μs, 10%
S-Band Radar 3100 - 3500 MHz

GENERAL DESCRIPTION

The 3135GN-120V is an internally matched, COMMON SOURCE, class AB, GaN on SiC HEMT transistor capable of providing over 16.8 dB gain, 120 Watts of pulsed RF output power at 300 μ S pulse width, 10% duty factor across the 3100 to 3500 MHz band. This hermetically sealed transistor is utilizes gold metallization and eutectic attach to provide highest reliability and superior ruggedness.

Market Application – High Power S-Band Pulsed AESA Radar

CASE OUTLINE
55-QP
Common Source



ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25°C 240 W

Maximum Voltage and Current

Drain-Source Voltage (V_{DSS}) 125 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[1]	Min	Typ	Max	Units
Pout	Output Power	Pin=2.5W Freq=3100,3300,3500 MHz	120	150		W
Gp	Power Gain	Pin=2.5W Freq=3100,3300,3500 MHz	16.8	17.8		dB
η_D	Drain Efficiency	Pin=2.5W Freq=3100,3300,3500 MHz	55	65		%
Dr	Droop	Pin=2.5W Freq=3100,3300,3500 MHz		0.15	0.5	dB
VSWR-T	Load Mismatch Tolerance	Pin=2.5W Freq=3100 MHz			5:1	
Θjc	Thermal Resistance	Pulse Width=300 μ S, Duty=10%			1.14	°C/W

[1] Bias Condition: Vdd=+50V, Idq=30mA constant current (Vgs= -2.0 ~ -4.5V typical)

FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(Off)}$	Drain leakage current	V_{gS} = -8V, V_D = 50V			12	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 = 12mA	125			V

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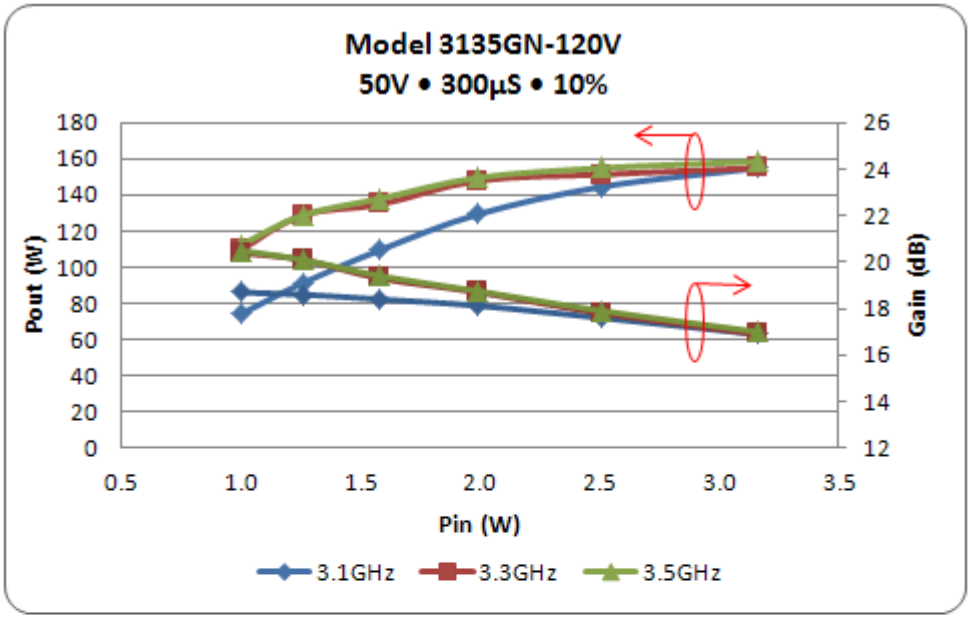
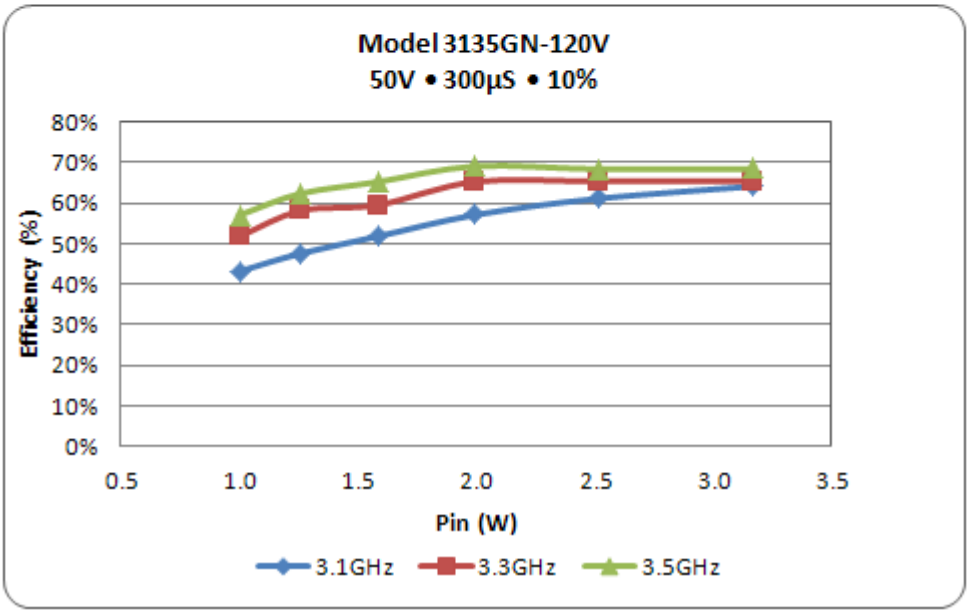
TYPICAL BROAD BAND PERFORMACE DATA

Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	η_D (%)	Gain (dB)	Droop (dB)
3100 MHz	2.5	145	.50	-7	61	17.6	0.1
3300 MHz	2.5	151	.49	-8	65	17.8	0.1
3500 MHz	2.5	155	.48	-7	68	17.9	0.1





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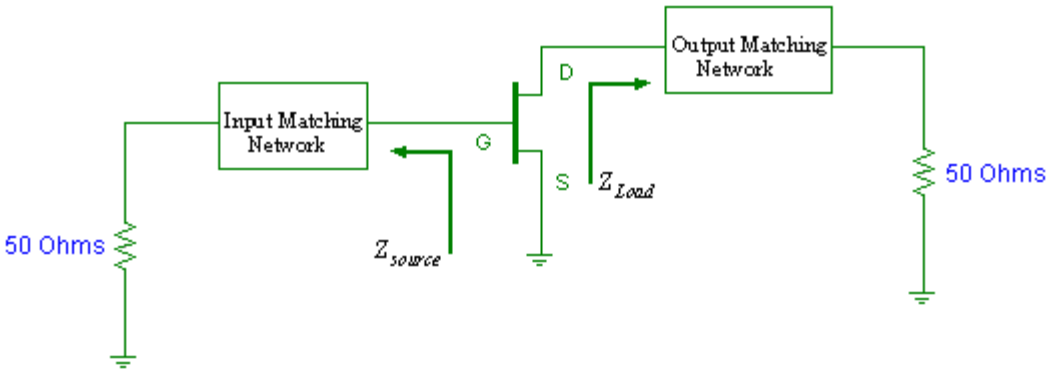
TRANSISTOR IMPEDANCE INFORMATION



Note: Z_{Source} is looking into the input circuit
Z_{Load} is looking into the output circuit

Impedance Data

Freq (GHz)	Z_{Source} (Ω)	Z_{Load} (Ω)
3.1	4.00 – j9.26	4.47 – j1.75
3.3	3.59 – j8.49	4.76 – j1.06
3.5	3.25 – j7.78	5.15 – j0.45

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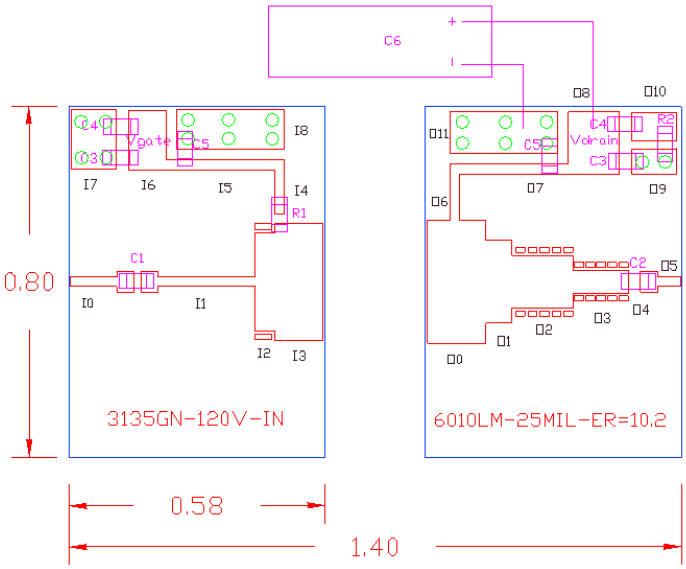
TEST CIRCUIT DIAGRAM



Board Material: Roger Duriod 6010LM @ 25 Mil Thickness, Er = 10.2

COMPONENT LIST

Item	Description	Value
C1	Chip Cap A size	9.1 pF
C2	Chip Cap A size	9.1 pF
C3	Chip Cap B size	1,000 pF
C4	Chip Cap B size	10,000 pF
C5	Chip Cap B size	100 pF
C6	Electrolytic Cap (63V)	1000 uF
R1	Chip Resistor size 0805	11.5 Ω
R2	Chip Resistor size 0805	2 Ω
Note:		
Need 2x of C3,C4,C5		
Board Material: Roger Duroid 6010LM, 0.025", ε_r =10.2		

INPUT

Item	W (mil)	L (mil)
I	22	146
I1	22	260
I2	224	45
I3	266	111
I4	22	122
I5	22	248
I6	136	88
I7	136	104
I8	92	246

OUTPUT

Item	W (mil)	L (mil)
O	280	134
O1	188	60
O2	116	139
O3	52	127
O4	46	40
O5	22	50
O6	22	128
O7	22	148
O8	140	116
O9	58	102
O10	64	102
O11	96	146

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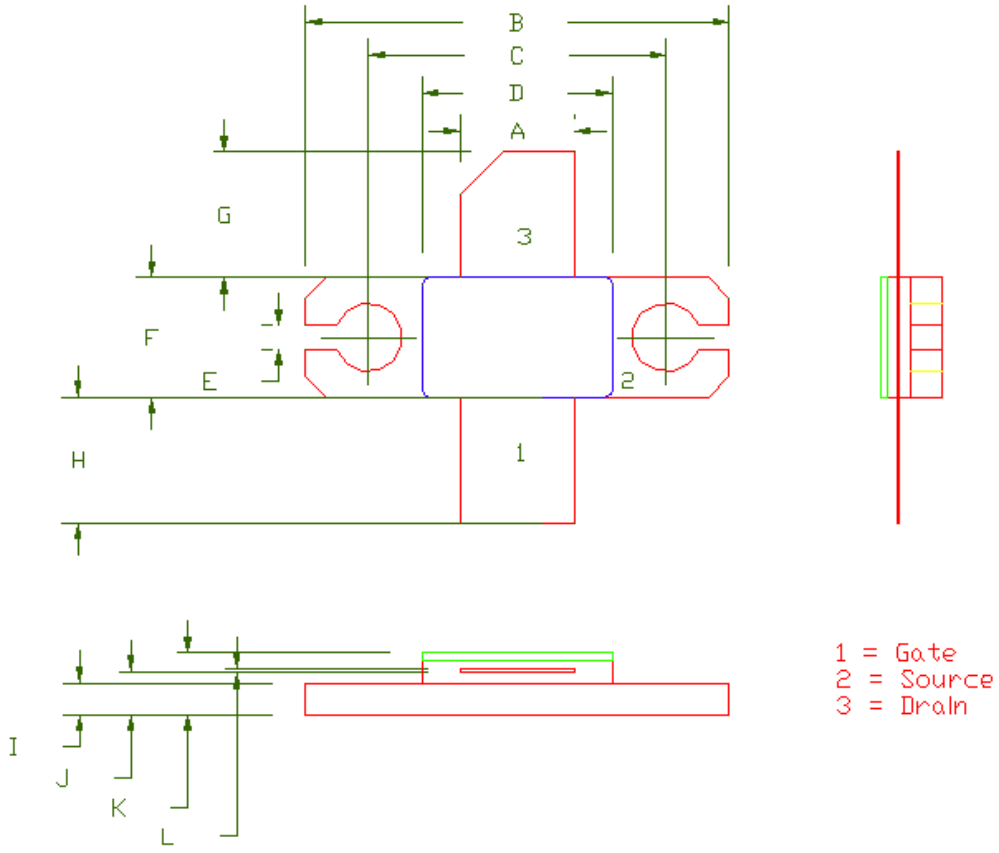
55-QP PACKAGE DIMENSION



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	0.102	6	0.152

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Revision History

Revision	Date	Affected Section(s)	Description
1.0	09-03-14	-	Initial Release