



2731-100M

100 Watts, 36 Volts, 250 μ s, 10%
Radar 2700-3100 MHz

GENERAL DESCRIPTION

The 2731-100M is an internally matched, COMMON BASE bipolar transistor capable of providing 100 Watts of pulsed RF output power at 250 μ s pulse width, 10% duty factor across the 2700 to 3100 MHz band. The transistor prematch and test fixture has been optimized through the use of 10 Ohm TRL Analysis. This ceramic sealed transistor is specifically designed for S-band radar applications. It utilizes gold metallization and emitter ballasting to provide high reliability and supreme ruggedness.

CASE OUTLINE

55KS-1
Common Base

ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25 $^{\circ}$ C¹ 575 W

Maximum Voltage and Current

Collector to Base Voltage (BV_{ces}) 65 V

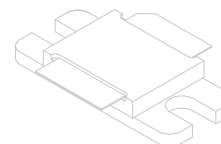
Emitter to Base Voltage (BV_{ebo}) 3.0 V

Collector Current (I_c) 15.0 A

Maximum Temperatures

Storage Temperature -65 to +200 $^{\circ}$ C

Operating Junction Temperature +200 $^{\circ}$ C



ELECTRICAL CHARACTERISTICS @ 25 $^{\circ}$ C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
P _{out}	Power Output	F=2700-3100 MHz	100	115	140	W
P _g	Power Gain	Pulse Width = 250 μ s	8.0	8.5	9.4	dB
η_c	Collector Efficiency	Duty Factor = 10 %	40			%
R _l	Return Loss	Power Input = 16W	-7			dB
P _d	Pulse Droop	V _{cc} = +36V			0.6	dB
VSWR-T	Load Mismatch Tolerance	F = 2700, 2900, 3100 MHz			2:1	

FUNCTIONAL CHARACTERISTICS @ 25 $^{\circ}$ C

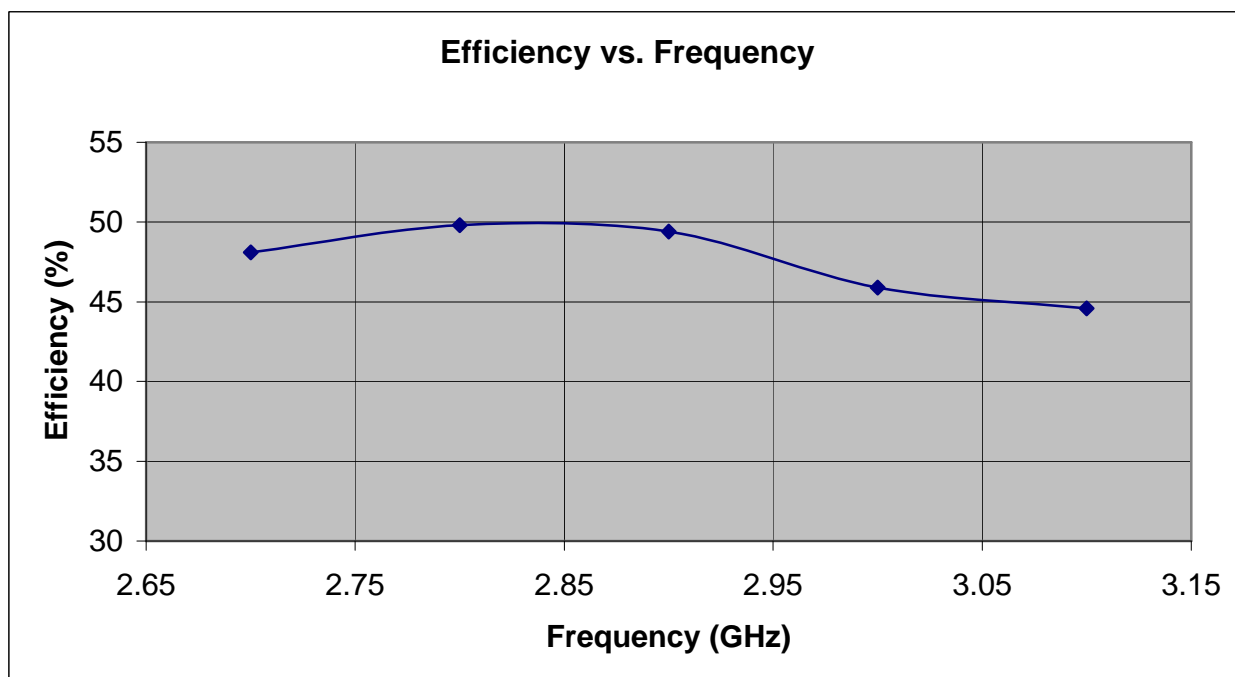
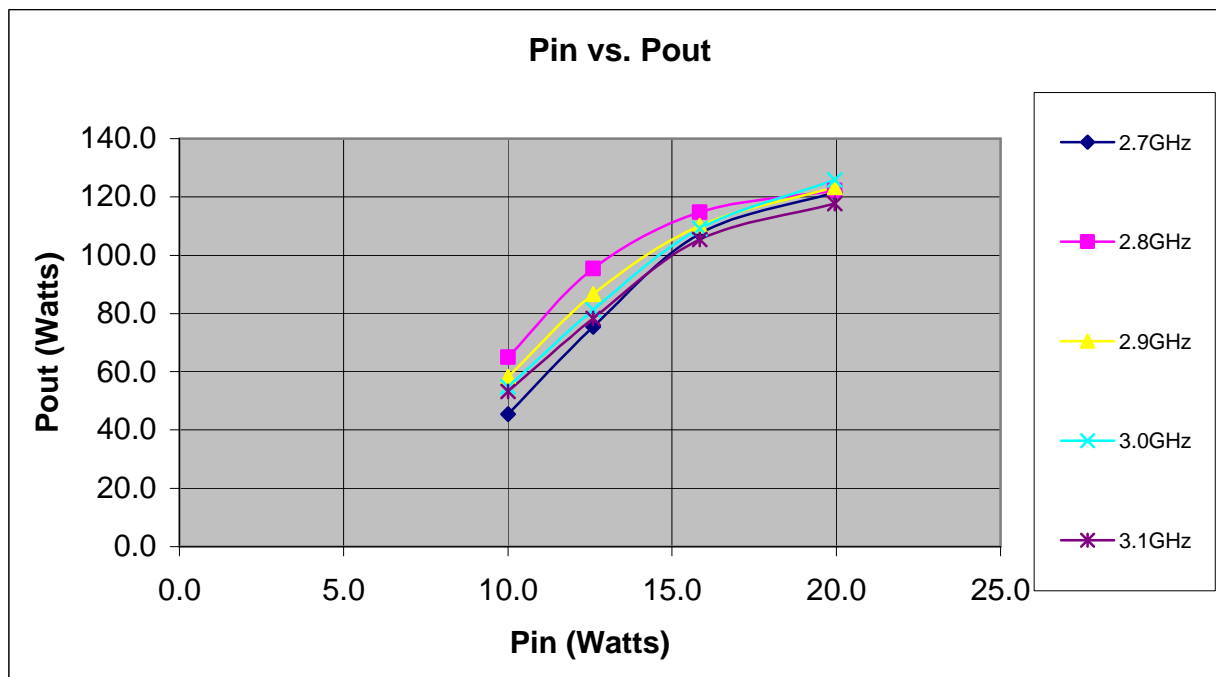
BV _{ebo}	Emitter to Base Breakdown	I _e = 30 mA	3.0			V
BV _{ces}	Collector to Emitter Breakdown	I _c = 120 mA	65			V
h _{FE}	DC – Current Gain	V _{ce} = 5V, I _c = 600 mA		15		
θ_{jc} ¹	Thermal Resistance				0.43	$^{\circ}$ C/W

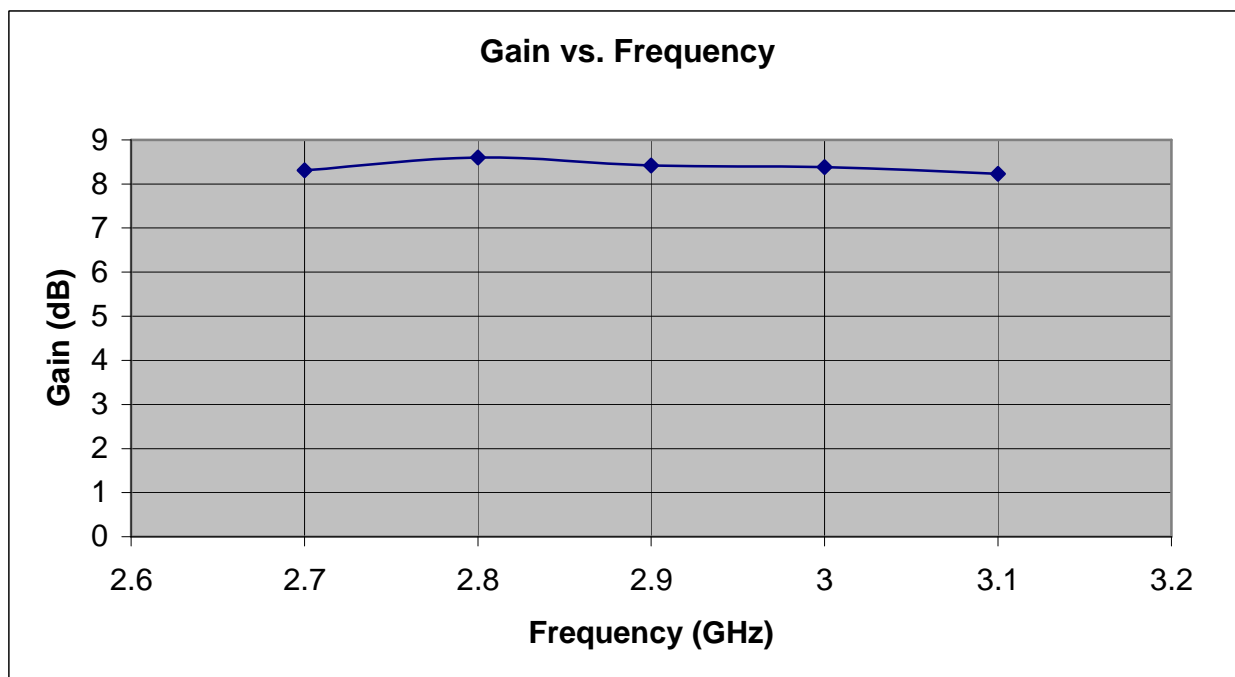
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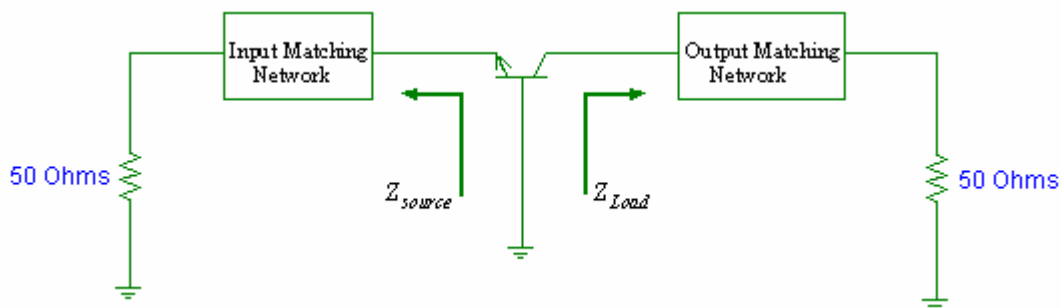
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V_{cc} = 36 Volts, Pulse Width = 250ms, Duty = 10 %

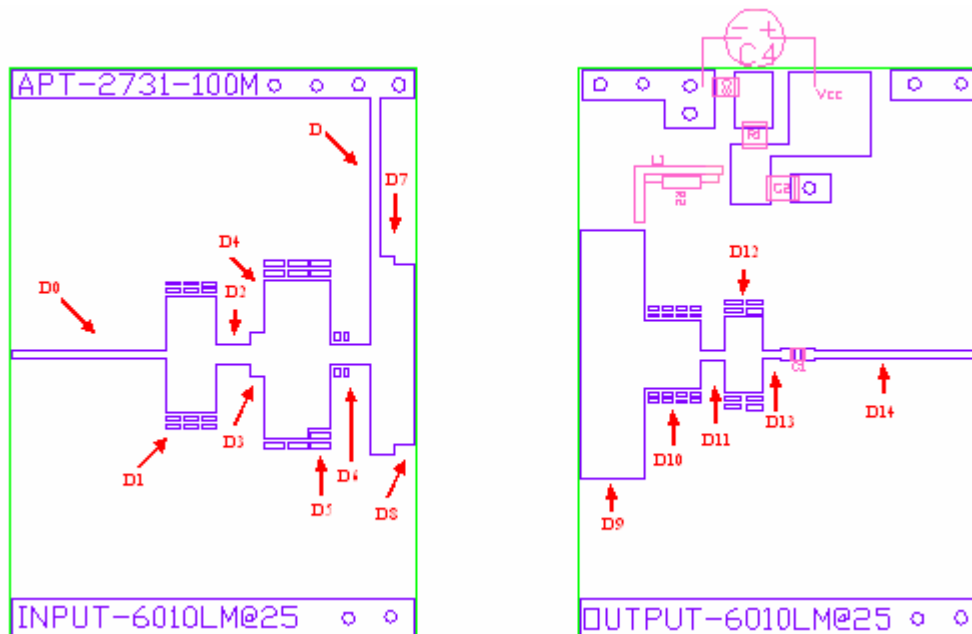




Impedance curves will be added at the completion of the characterization.



Impedance Data		
Freq (GHz)	Zs	Zl
2.7	7.98 - j11.22	3.91 - j3.20
2.8	7.72 - j8.70	4.02 - j3.45
2.9	8.34 - j6.25	3.96 - j3.78
3.0	10.29 - j3.82	3.72 - j4.10
3.1	14.82 - j2.03	3.31 - j4.32



Circuit Component			Physical Circuit Dimension		
Item	Description	Value	Item	L	W
C1	Chip Cap A Size	10pF	D	0.387	0.022
C2	Chip Cap B Size	1000pF	D0	0.377	0.022
C3	Chip Cap B Size	10,000pF	D1	0.125	0.280
C4	Electrolytic Cap	2200uF	D2	0.085	0.050
R1	Chip Resistor	20 Ohms	D3	0.035	0.110
R2	Fix Resistor	1.5 Ohms	D4	0.105	0.385
L1	Silver Ribbon	Silver Ribbon L=870 Mil, W=70 Mil	D5	0.056	0.362
Material	Roger Duroid	Duroid 6010 LM, 25 Mils, Er=10.2	D6	0.110	0.050
			D7	0.056	0.488
			D8	0.049	0.440
			D9	0.156	0.615
			D10	0.140	0.167
			D11	0.060	0.024
			D12	0.093	0.187
			D13	0.042	0.022
			D14	0.415	0.022

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