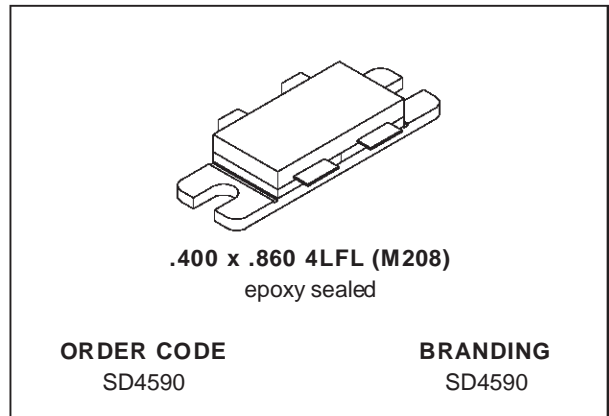
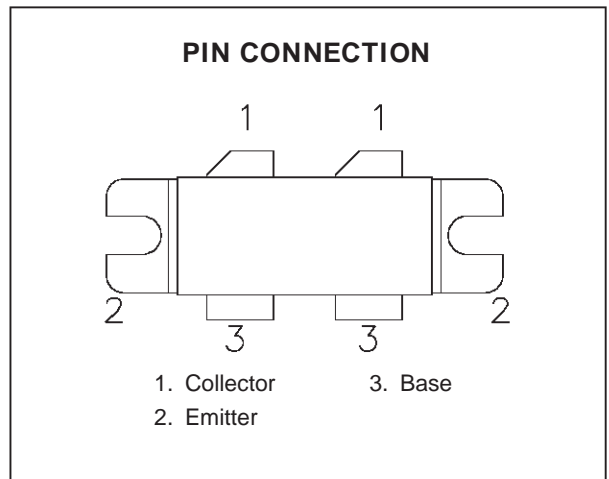


RF & MICROWAVE TRANSISTORS 800-960 MHz CELLULAR BASE STATION

- GOLD METALLIZATION
- DIFFUSED EMITTER BALLASTING
- INTERNAL INPUT/OUTPUT MATCHING
- COMMON EMITTER CONFIGURATION
- DESIGNED FOR LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- 26 VOLT, 900 MHz PERFORMANCE
 - $P_{OUT} = 150\text{ W MIN.}$
 - $GAIN = 8.5\text{ dB MIN.}$
 - $IMD_3 = -28\text{ dB MAX. @ } P_{OUT} = 150\text{ W PEP}$
- INHERENT RUGGEDNESS:
 - LOAD MISMATCH TOLERANCE OF 5:1 MIN. VSWR
 - 3 dB OVERDRIVE CAPABILITY


DESCRIPTION

The SD4590 is designed for both analog and digital cellular base stations over the 800 to 960 MHz frequency range, specifically those systems requiring the high linearity and efficiency afforded by class AB operation. Integrated input/output pre-matching simplifies amplifier design. Ruggedness, MTTF, and linearity are enhanced using diffused emitter resistors and refractory/gold metallization.


ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-Emitter Voltage	65	V
V _{CEO}	Collector-Emitter Voltage	28	V
V _{EBO}	Emitter-Base Voltage	3.5	V
I _C	Device Current	25	A
P _{DISS}	Power Dissipation	300	W
T _J	Junction Temperature	+200	°C
T _{STG}	Storage Temperature	- 65 to +150	°C

THERMAL DATA

R _{TH(j-c)}	Junction-Case Thermal Resistance	0.60	°C/W
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SD4590

ELECTRICAL SPECIFICATIONS ($T_{case} = 25^{\circ}C$)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 50mA$	$V_{BE} = 0V$	65	80	—	V
BV_{CEO}	$I_C = 100mA$	$I_B = 0mA$	28	30	—	V
BV_{CER}	$I_C = 100mA$	$R_{BE} = 75\Omega$	33	40	—	V
BV_{EBO}	$I_E = 10mA$	$I_C = 0mA$	3.5	4.0	—	V
I_{CEO}	$V_{CE} = 30V$	$V_{BE} = 0V$	—	—	10	mA
h_{FE}	$V_{CE} = 5V$	$I_C = 6A$	25	45	120	—

Tested per side

DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
C_{OB}	$f = 1.0\text{ MHz}$ for information only - this part is collector matched	$V_{CB} = 26V$	—	75	—	pF

Tested per side

DYNAMIC (CW)

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P_{IN}	$f = 900MHz$	$V_{CE} = 26V$ $I_{CQ} = 2 \times 200mA$ $P_{OUT} = 150W$	—		21	W
P_{OUT}	$f = 900MHz$	$V_{CE} = 26V$ $I_{CQ} = 2 \times 200mA$ $P_{IN} = 21W$	150	175		W
G_P	$f = 900MHz$	$V_{CE} = 26V$ $I_{CQ} = 2 \times 200mA$ $P_{OUT} = 150W$	8.5	9.5	—	dB
η_C	$f = 900MHz$	$V_{CE} = 26V$ $I_{CQ} = 2 \times 200mA$ $P_{OUT} = 150W$	50	55	—	%
P_{1dB}	$f = 900MHz$	$V_{CE} = 26V$ $I_{CQ} = 2 \times 200mA$	150	160		W
OVD	$f = 900MHz$	$V_{CC} = 26V$ $I_{CQ} = 2 \times 200mA$ Set $P_{OUT} = 150W$; Increase P_{IN} 3dB	No Degradation in Device Performance			

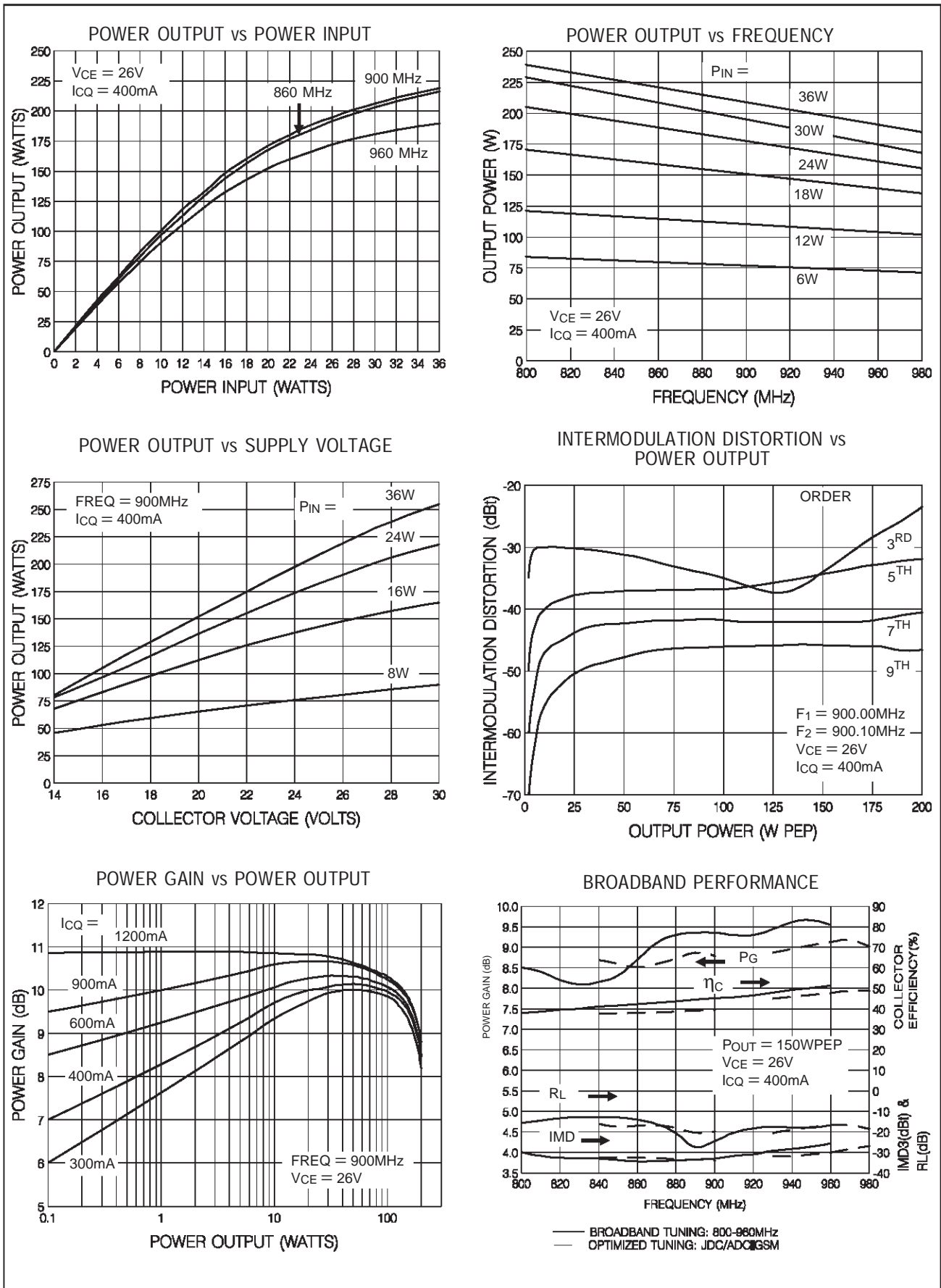
DYNAMIC (Two-Tone)

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
* G_P	$V_{CE} = 26V$	$I_{CQ} = 2 \times 200mA$ $P_{OUT} = 150W$ PEP	8.5	9.5	—	dB
* η_C	$V_{CE} = 26V$	$I_{CQ} = 2 \times 200mA$ $P_{OUT} = 150W$ PEP	30	35	—	%
* IMD_3	$V_{CE} = 26V$	$I_{CQ} = 2 \times 200mA$ $P_{OUT} = 150W$ PEP	—	-32	-28	dB
*Load Mismatch	$V_{CE} = 26V$	$I_{CQ} = 2 \times 200mA$ $P_{OUT} = 150W$ PEP $V_{SWR} = 5:1$ MIN @ All phase angles	No Degradation in Device Performance			
*OVD	$V_{CE} = 26V$	$I_{CQ} = 2 \times 200mA$ Set $P_{OUT} = 150W$ PEP; Increase P_{IN} 3dB	No Degradation in Device Performance			

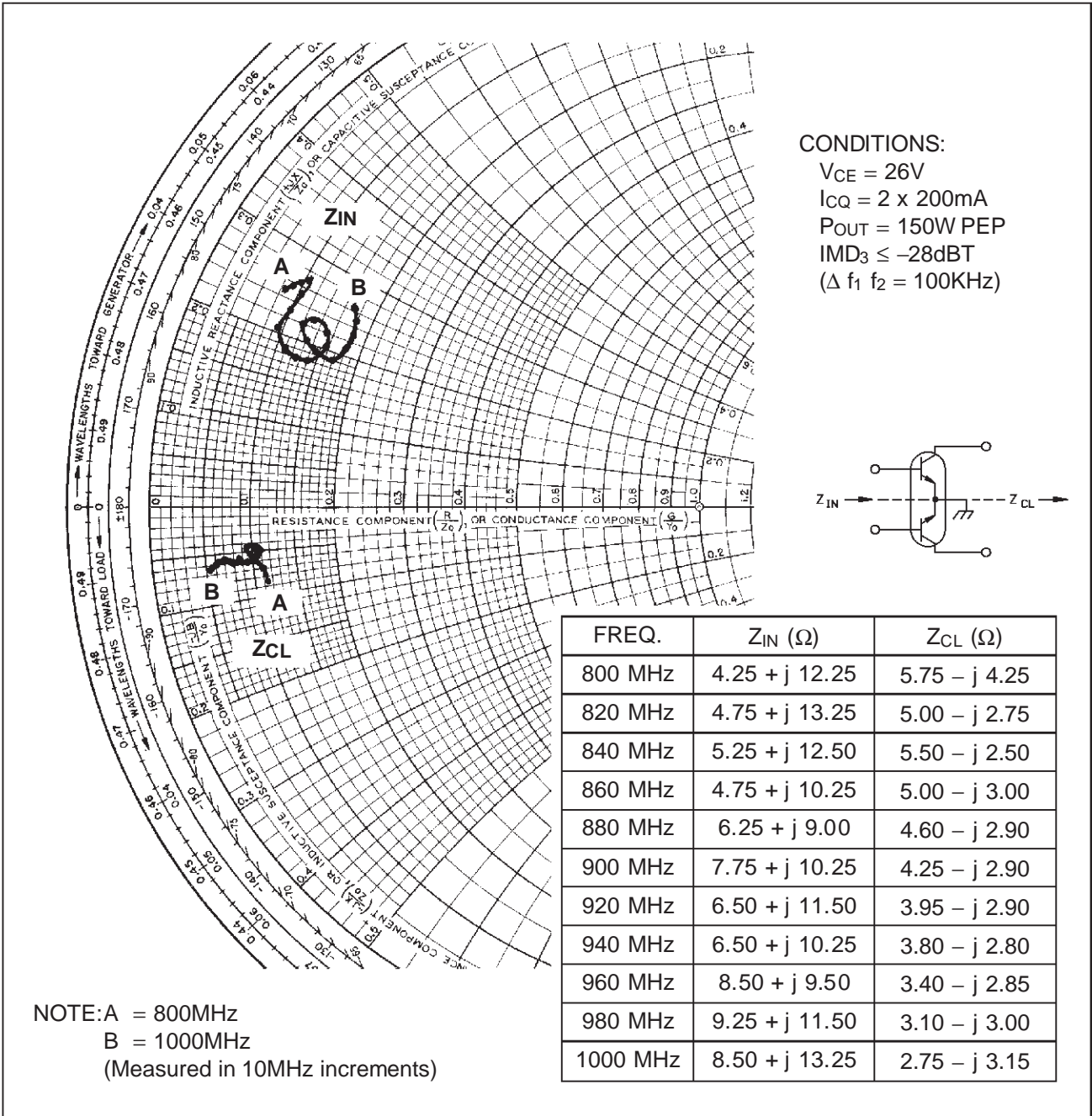
*Note: $f_1 = 900.00\text{ MHz}$

$f_2 = 900.10\text{ MHz}$

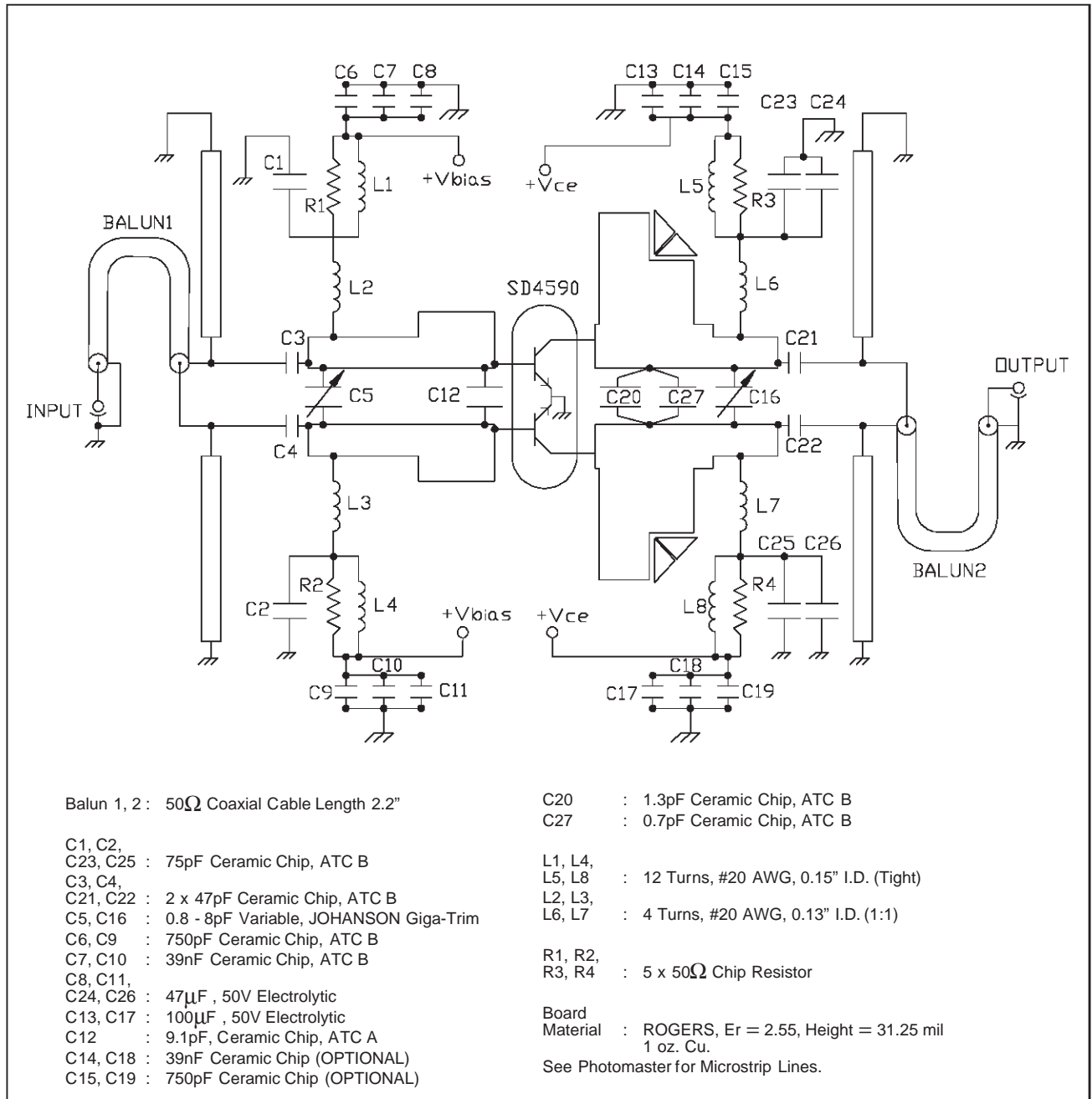
TYPICAL PERFORMANCE



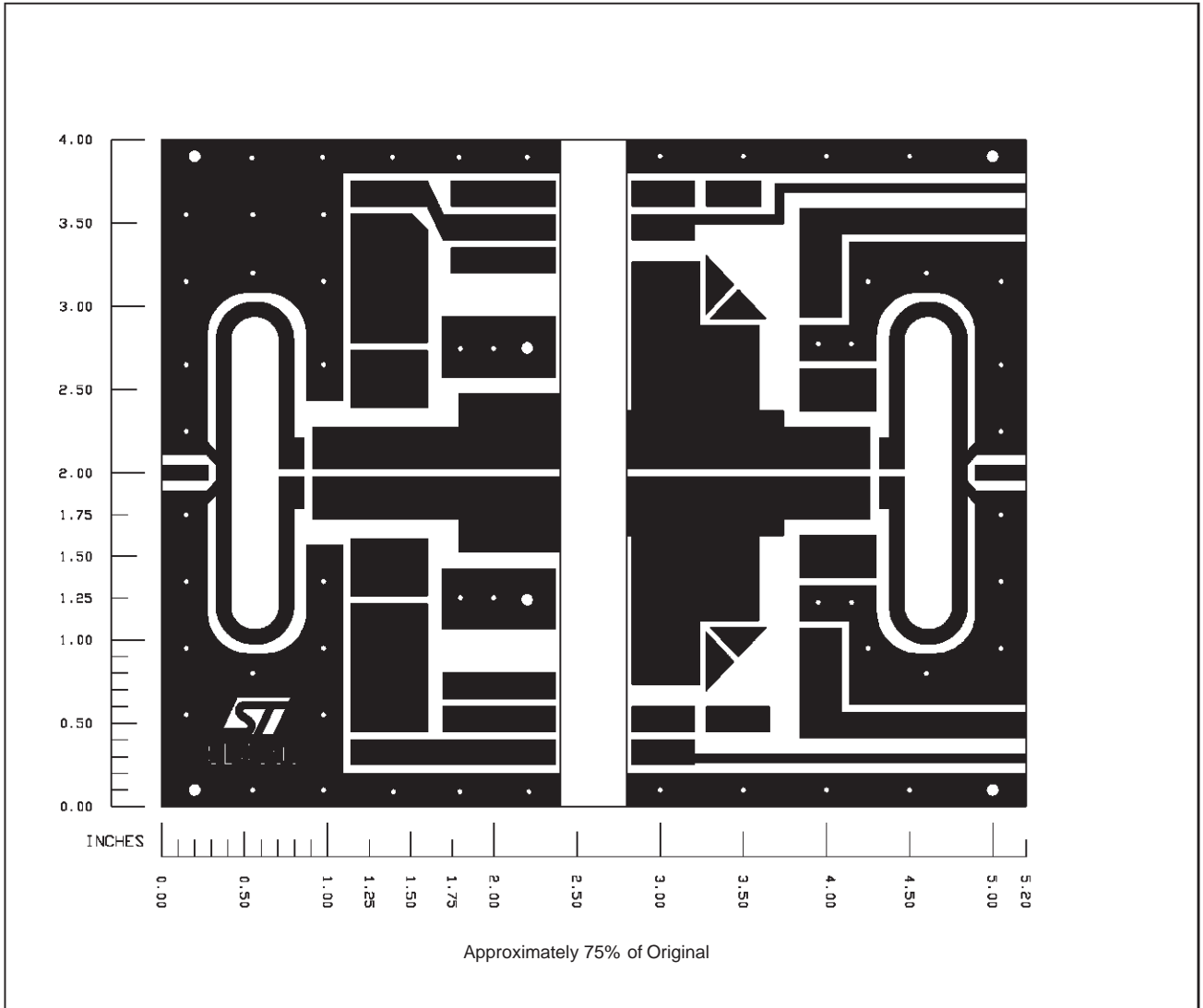
SERIES EQUIVALENT INPUT/OUTPUT IMPEDANCES



TEST CIRCUIT

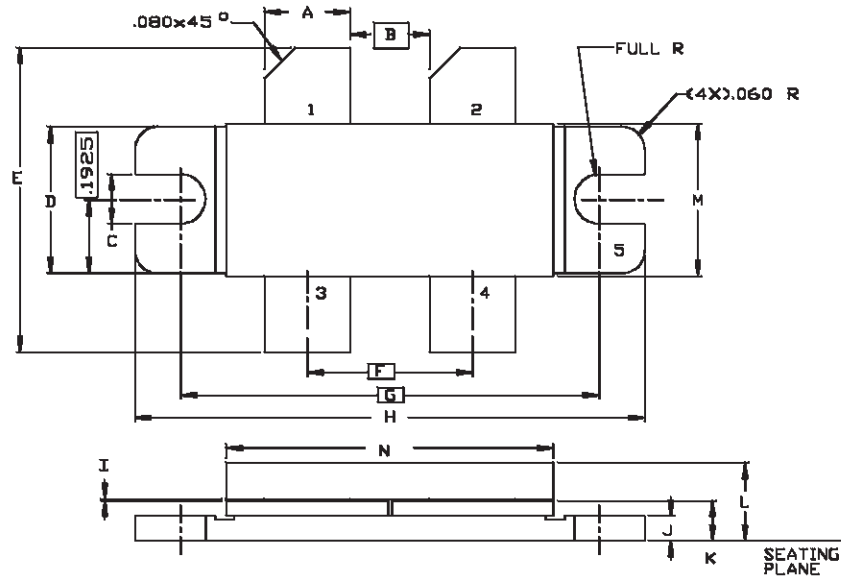


PHOTOMASTER OF TEST CIRCUIT



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0208
UDCS No. 1011409 rev C



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.220/5,59	.230/5,84	K	.082/2,08	.100/2,54
B	.210/5,33		L	.205/5,21	
C	.120/3,05	.130/3,30	M	.395/10,03	.407/10,34
D	.380/9,65	.390/9,91	N	.850/21,59	.870/22,10
E	.780/19,81	.820/20,83			
F	.435/11,05				
G	1.100/27,94				
H	1.335/33,91	1.345/34,16			
I	.003/0,08	.007/0,18			
J	.060/1,52	.070/1,78			

PIN: 1. COLLECTOR
2. COLLECTOR
3. BASE
4. BASE
5. EMITTER

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