



# SD57120

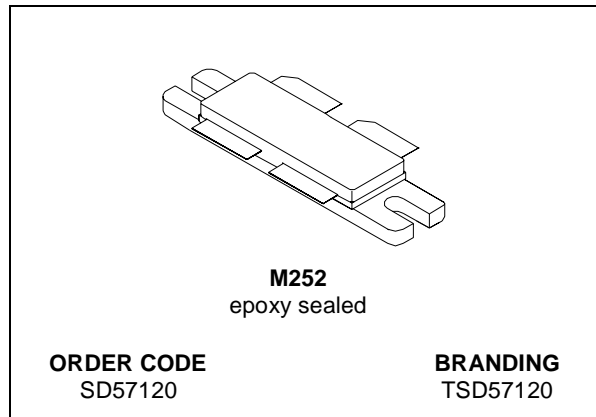
## RF POWER TRANSISTORS

### The LdmoST FAMILY

ADVANCE DATA

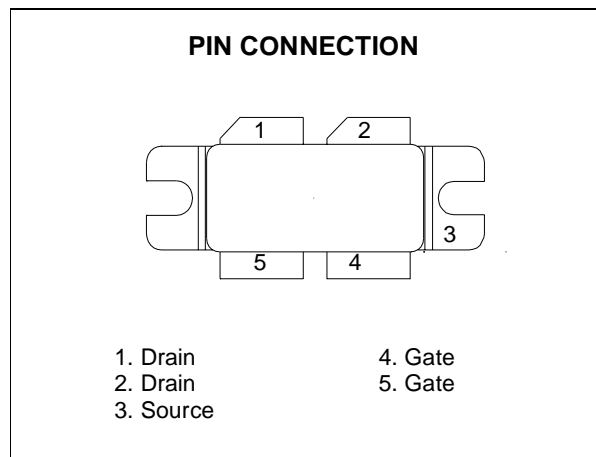
#### N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION, PUSH-PULL
- $P_{OUT} = 120\text{ W}$  WITH 13 dB gain @ 960 MHz
- BeO FREE PACKAGE
- INTERNAL INPUT MATCHING



#### DESCRIPTION

The SD57120 is a common source N-Channel enhancement-mode lateral Field-Effect RF power transistor designed for broadband commercial and industrial applications at frequencies up to 1.0 GHz. The SD57120 is designed for high gain and broadband performance operating in common source mode at 28 V. Its internal matching makes it ideal for base station applications requiring high linearity.



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

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current	14	A
$P_{DISS}$	Power Dissipation (@ $T_c = 70\text{ }^{\circ}\text{C}$ )	236	W
$T_j$	Max. Operating Junction Temperature	200	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	-65 to +150	$^{\circ}\text{C}$

#### THERMAL DATA

$R_{th(j-c)}$	Junction -Case Thermal Resistance	0.55	$^{\circ}\text{C/W}$
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**ELECTRICAL SPECIFICATION** ( $T_{CASE} = 25\text{ }^{\circ}\text{C}$ )

**STATIC** (Per Section)

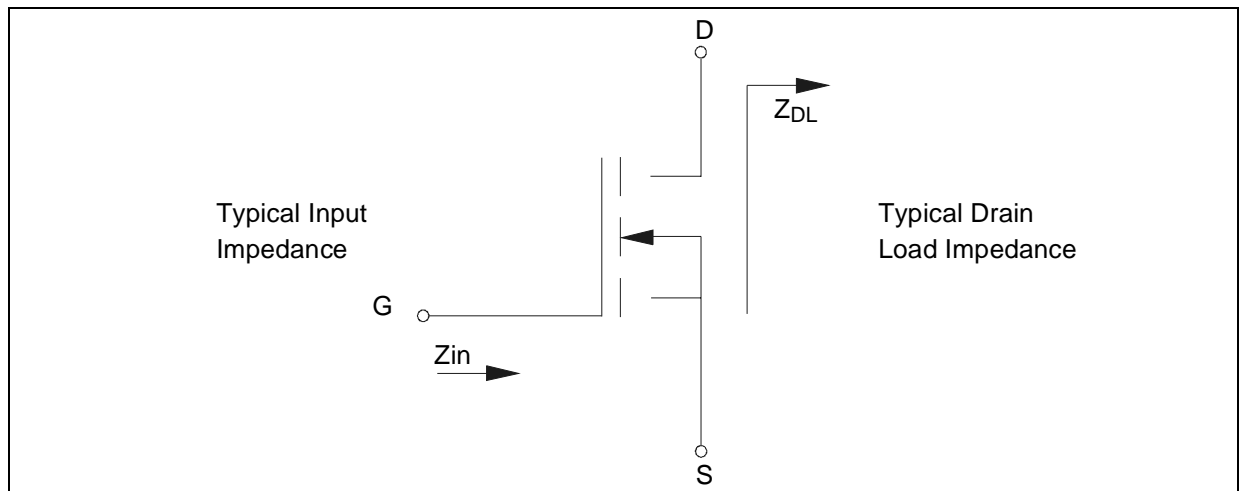
Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$	$I_{DS} = 10\text{ mA}$	65			V
$I_{DSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 28\text{ V}$			1	$\mu\text{A}$
$I_{GSS}$	$V_{GS} = 20\text{ V}$	$V_{DS} = 0\text{ V}$			1	$\mu\text{A}$
$V_{GS(Q)}$	$V_{DS} = 28\text{ V}$	$I_D = 100\text{ mA}$	2.0		5.0	V
$V_{DS(ON)}$	$V_{GS} = 10\text{ V}$	$I_D = 3\text{ A}$		0.7	0.9	V
$G_{FS}$	$V_{DS} = 10\text{ V}$	$I_D = 3\text{ A}$		3		mho
$C_{ISS}^*$	$V_{GS} = 0\text{ V}$	$V_{DS} = 28\text{ V}$		169		pF
$C_{OSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 28\text{ V}$		48		pF
$C_{RSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 28\text{ V}$		2.7		pF

\* Includes Internal Input Moscap.

**DYNAMIC**

Symbol	Test Conditions				Min.	Typ.	Max.	Unit
$P_{OUT}$	$V_{DD} = 28\text{ V}$	$I_{DQ} = 800\text{ mA}$		$f = 960\text{ MHz}$	120			W
$G_{PS}$	$V_{DD} = 28\text{ V}$	$I_{DQ} = 800\text{ mA}$	$P_{OUT} = 120\text{ W}$	$f = 960\text{ MHz}$	13	14		dB
$\eta_D$	$V_{DD} = 28\text{ V}$	$I_{DQ} = 800\text{ mA}$	$P_{OUT} = 120\text{ W}$	$f = 960\text{ MHz}$	50			%
Load mismatch	$V_{DD} = 28\text{ V}$	$I_{DQ} = 800\text{ mA}$	$P_{OUT} = 120\text{ W}$	$f = 960\text{ MHz}$	10:1			VSWR
	ALL PHASE ANGLES							

**IMPEDANCE DATA**

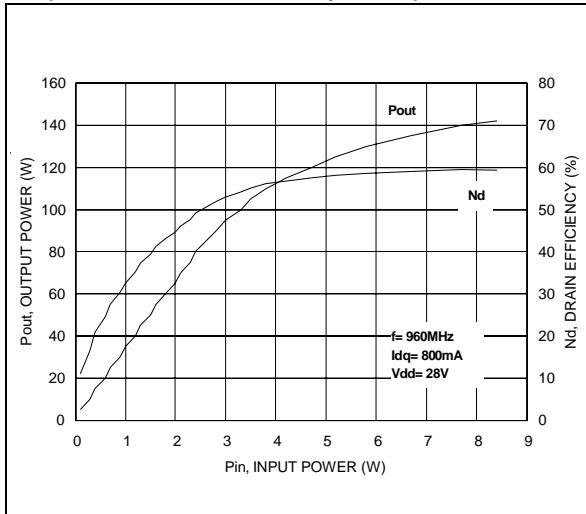


FREQ.	$Z_{IN} (\Omega)$	$Z_{DL}(\Omega)$
945 MHz	$3.9 + j 4.9$	$3.26 - j 5.1$
960 MHz	$4.1 + j 4.6$	$3.24 - j 4.74$
980 MHz	$3.9 + j 5.2$	$3.27 - j 6.9$

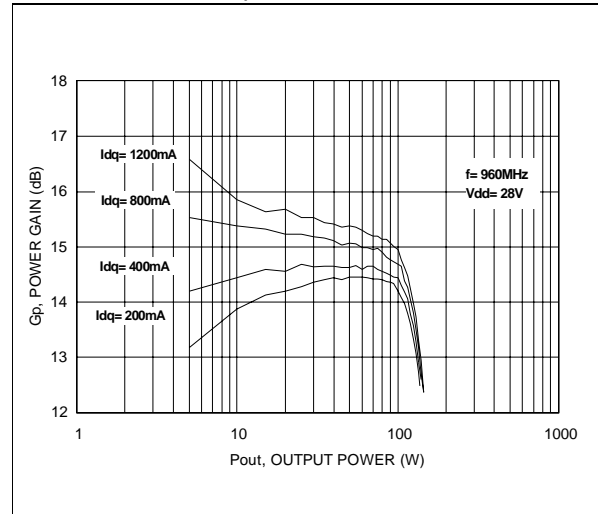
Measured gate and drain to drain respectively.

TYPICAL PERFORMANCE

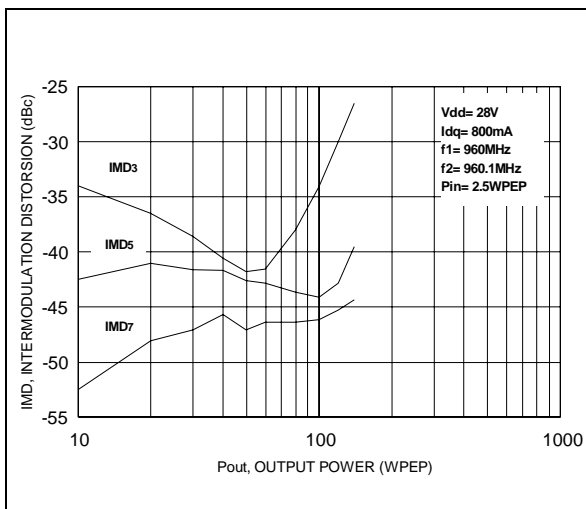
Output Power and Efficiency vs. Input Power



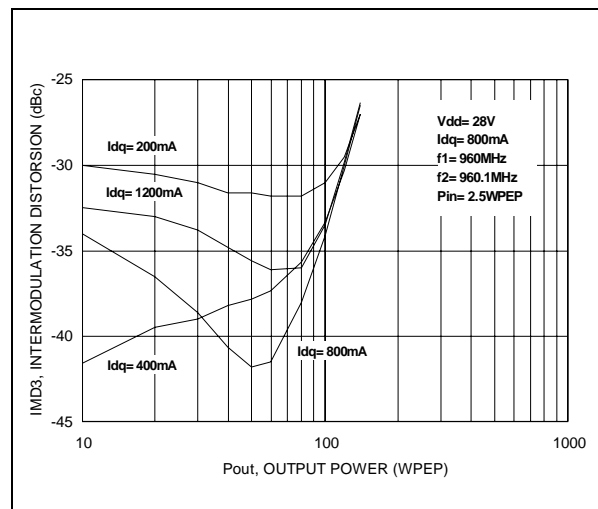
Power Gain vs. Output Power



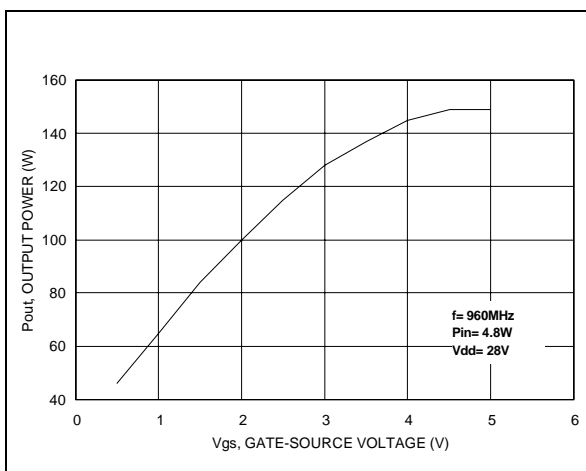
Intermodulation Distortion vs. Output Power



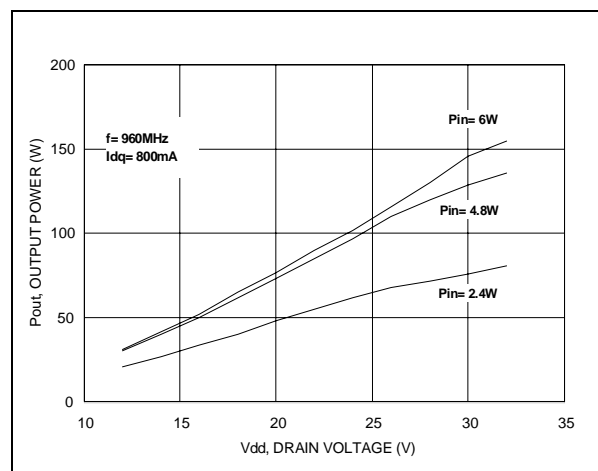
Intermodulation Distortion vs. Output Power



Output Power vs. Gate Voltage



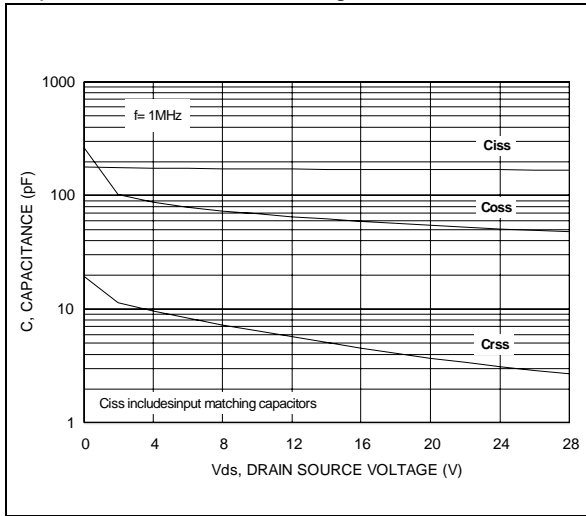
Output Power vs. Drain Voltage



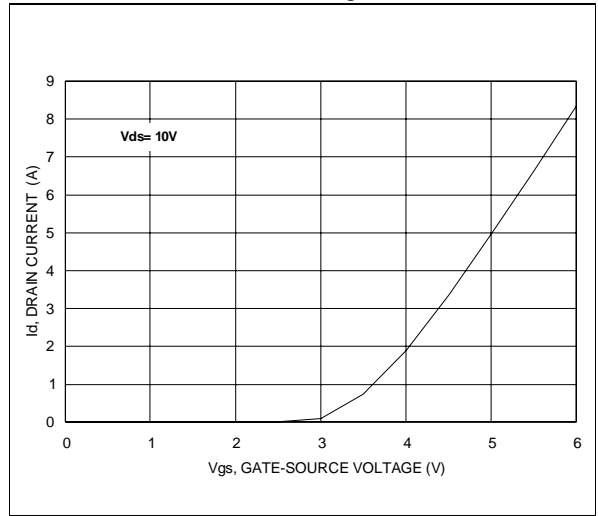
# SD57120

## TYPICAL PERFORMANCE

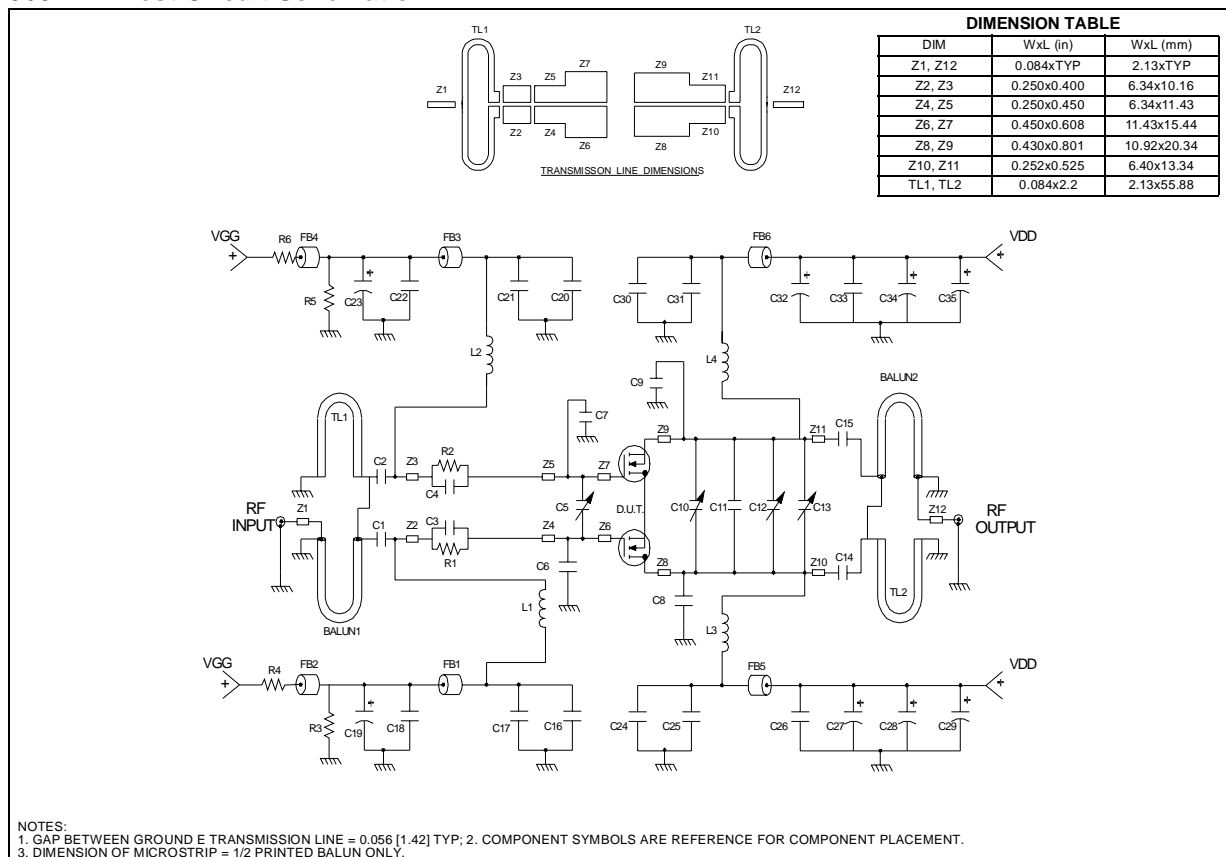
### Capacitance vs. Drain Voltage



### Drain Current vs. Gate Voltage



## 960 MHz Test Circuit Schematic

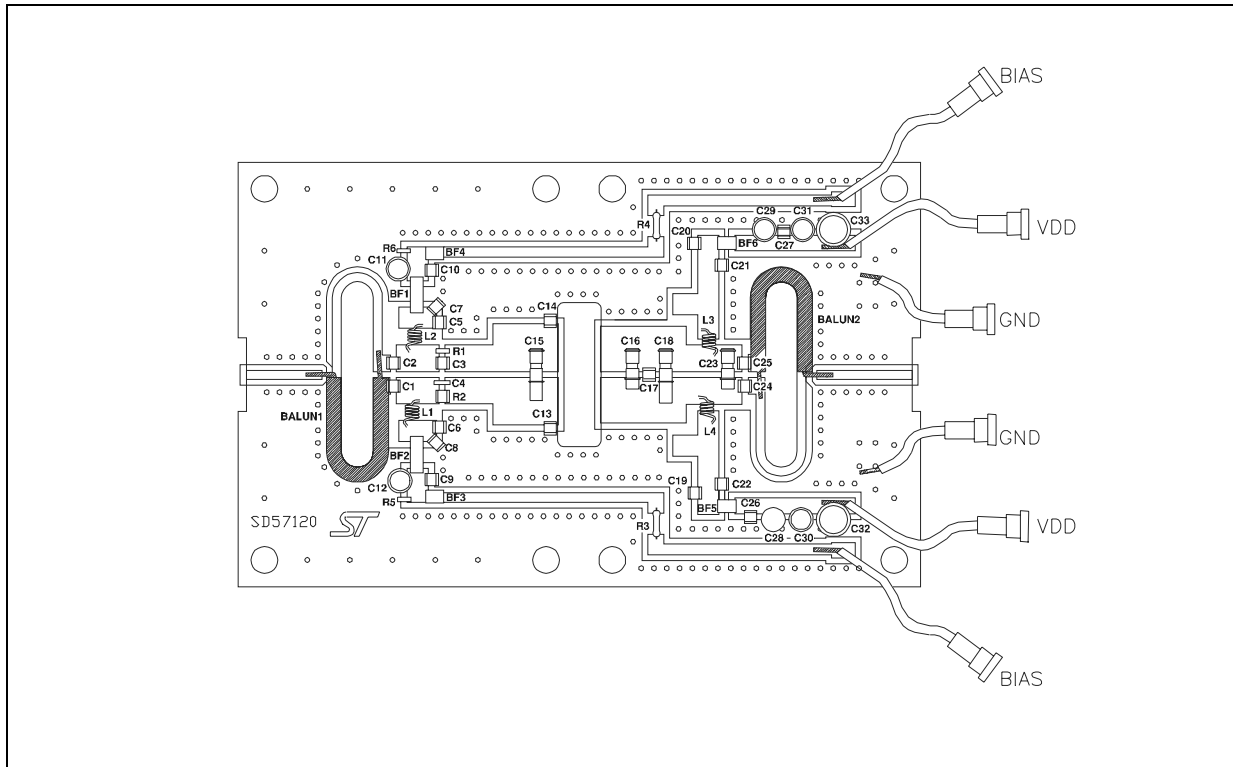


Ref. 7160637

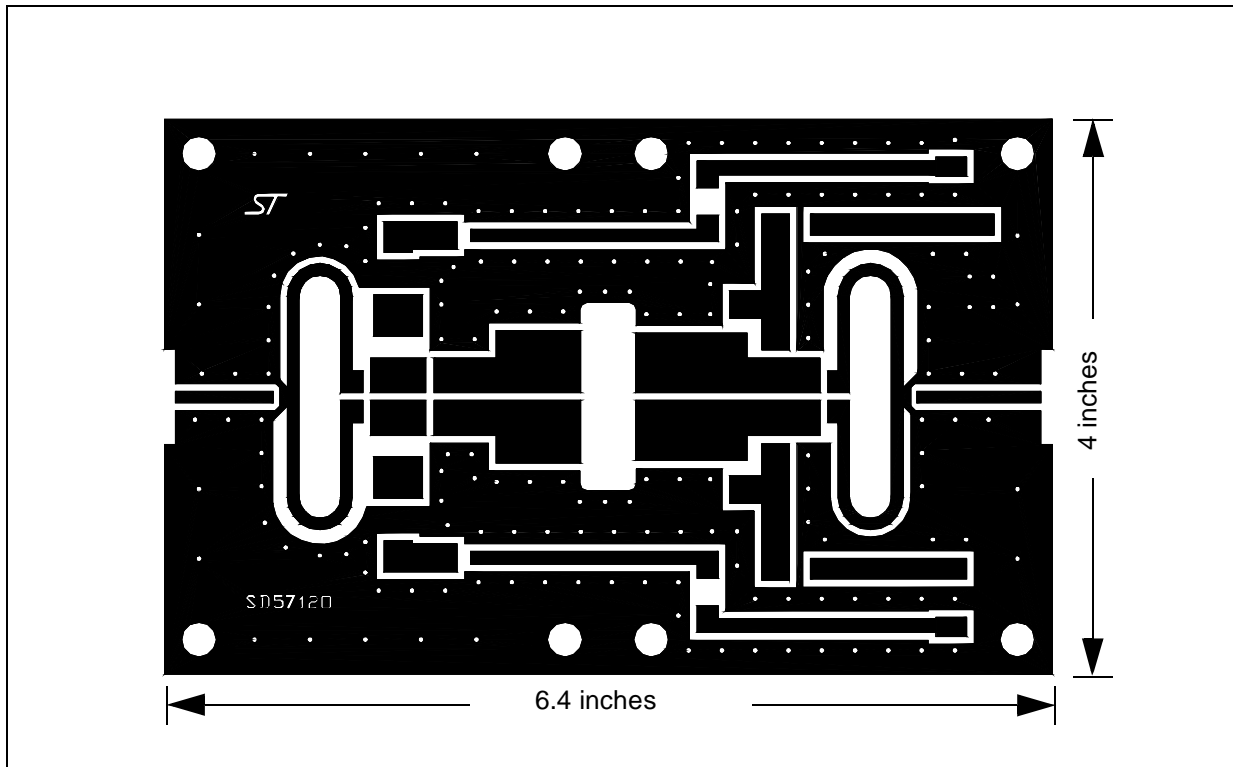
## 960 MHz Test Circuit Component Part List

COMPONENT	DESCRIPTION
BF1-BF4	SURFACE MOUNT EMI SHIELD BEAD
L1,L2,L3,L4	INDUCTOR, 3 TURN AIR-WOUND #20AWG ID=0.126[3.20] 24.7nH MAGNET WIRE
B1, B2	BALUN, 50 OHM SUCOFORM, OD 0.141. 2.20 LG COAXIAL CABLE OR EQUIVALENT
R1,R2	75 OHM 1 W SURFACE MOUNT CHIP RESISTOR
R3,R5	1.2 K OHM 1 W SURFACE MOUNT CHIP RESISTOR
R4,R6	1 K OHM 1 W SURFACE MOUNT CHIP RESISTOR
C1,C2,C14,C15	47 pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C3,C4	42 pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C5,C12	0.8-8 pF GIGATRIM VARIABLE CAPACITOR
C6,C7,C11	1.7 pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C8,C9	5.6 pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C10,C13	0.6-4.5 pF GIGATRIM VARIABLE CAPACITOR
C16,C17,C20,C21,C24,C25,C30,C31	300 pF ATC 700B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C18,C22	10000 pF ATC 200B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C19,C23,C27,C28,C32,C34	10 $\mu$ F, 50 V ALUMINUM ELECTROLYTICS RADIAL LEAD CAPACITOR
C26,C33	20000 pF ATC 900B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C29,C35	220 $\mu$ F, 50 V ALUMINUM ELECTROLYTICS RADIAL LEAD CAPACITOR
BOARD	ULTRA LAM 2000. 0.030" THK, $\epsilon_r = 2.55$ , 2 O <sub>2</sub> ED CU BOTH SIDES

960 MHz Production Test Fixture



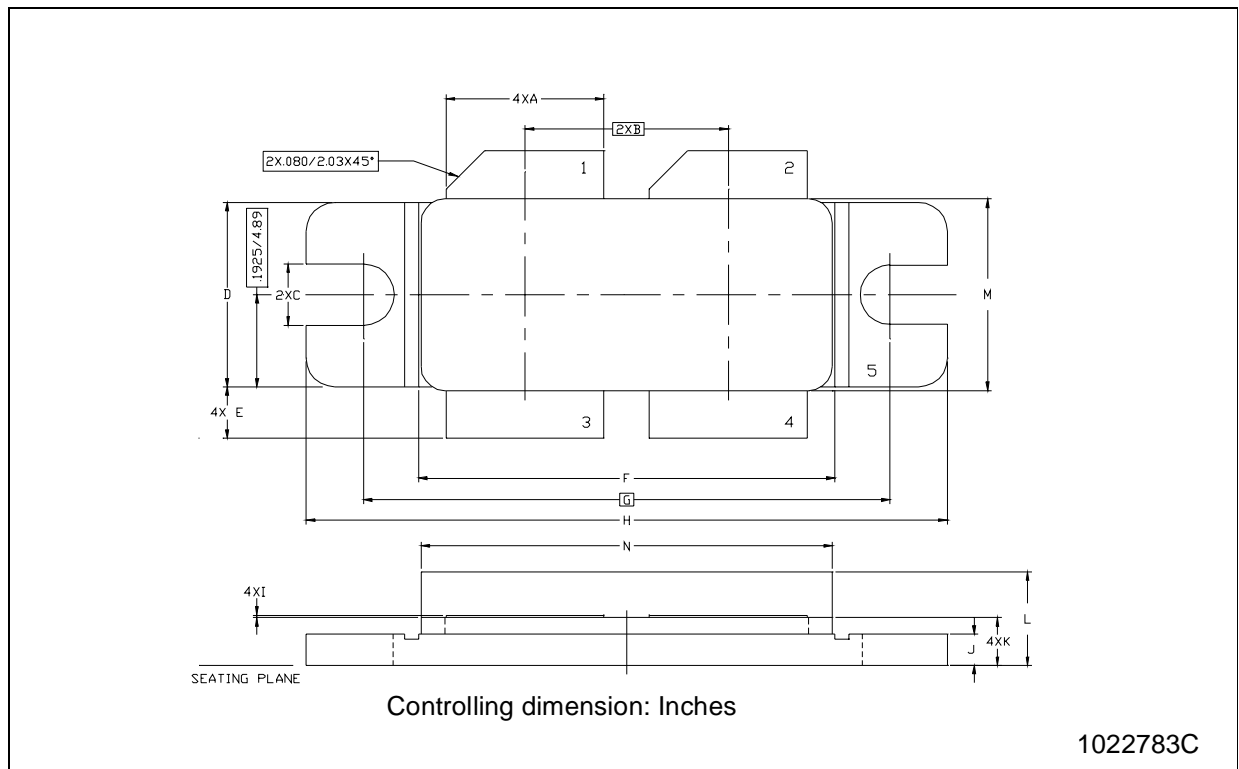
960 MHz Test Circuit Photomaster



Ref. 7160637

## M252 (.400 x .860 4L BAL N/HERM W/FLG) MECHANICAL DATA

DIM.	mm			Inch		
	MIN.	TYP.	MAX	MIN.	TYP.	MAX
A	8.13		8.64	.320		.340
B		10.80			.425	
C	3.00		3.30	.118		.130
D	9.65		9.91	.380		.390
E	2.16		2.92	.085		.115
F	21.97		22.23	.865		.875
G		27.94			1.100	
H	33.91		34.16	1.335		1.345
I	0.10		0.15	.004		.006
J	1.52		1.78	.060		.070
K	2.36		2.74	.093		.108
L	4.57		5.33	.180		.210
M	9.96		10.34	.392		.407
N	21.64		22.05	.852		.868



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