



# SD57120

## RF POWER TRANSISTORS The *Ldmo*ST FAMILY

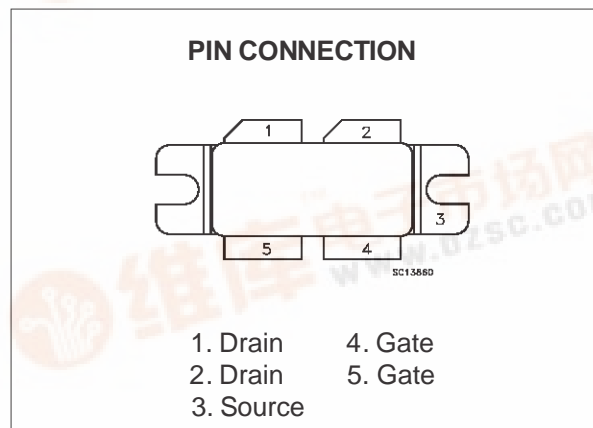
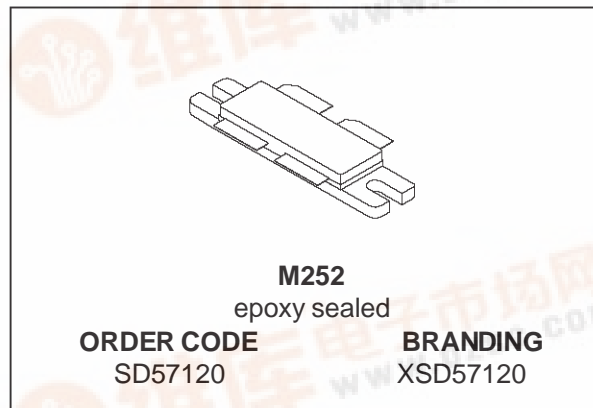
PRELIMINARY DATA

### 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 28V. 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 (@ $T_c = 70^{\circ}\text{C}$ )	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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# SD57120

## ELECTRICAL SPECIFICATION (T<sub>case</sub> = 25 °C)

### STATIC (Per Section)

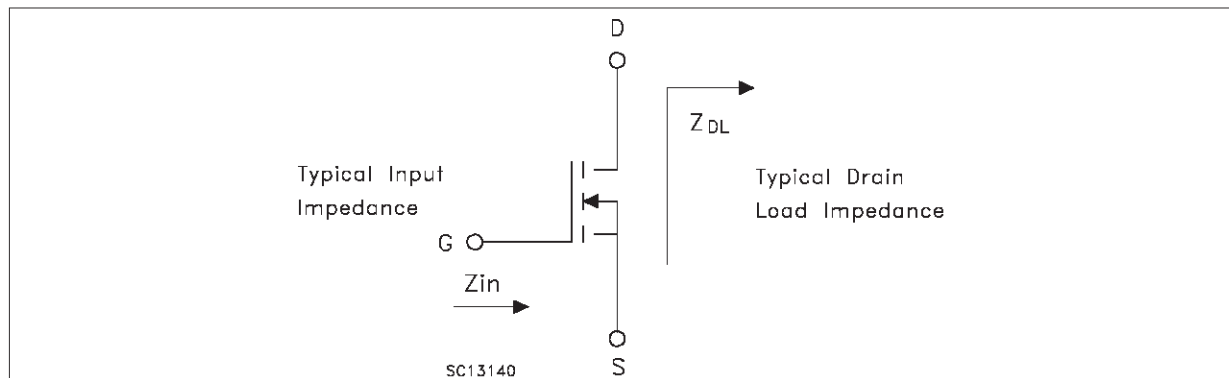
Symbol	Parameter		Min.	Typ.	Max.	Unit
V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V	I <sub>DS</sub> = 10 mA	65			V
I <sub>DSS</sub>	V <sub>GS</sub> = 0V	V <sub>DS</sub> = 28 V			1	μA
I <sub>GSS</sub>	V <sub>GS</sub> = 20V	V <sub>DS</sub> = 0 V			1	μA
V <sub>GS(Q)</sub>	V <sub>DS</sub> = 28V	I <sub>D</sub> = 100 mA	3.0		5.0	V
V <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V	I <sub>D</sub> = 3 A		0.7	0.8	V
G <sub>FS</sub>	V <sub>DS</sub> = 10V	I <sub>D</sub> = 3 A		3		mho
C <sub>ISS</sub> *	V <sub>GS</sub> = 0V	V <sub>DS</sub> = 28 V		175		pF
C <sub>OSS</sub>	V <sub>GS</sub> = 0V	V <sub>DS</sub> = 28 V		44		pF
C <sub>RSS</sub>	V <sub>GS</sub> = 0V	V <sub>DS</sub> = 28 V		1.7		pF

\* Includes Internal Input Moscap.

### DYNAMIC

Symbol	Parameter			Min.	Typ.	Max.	Unit
P <sub>OUT</sub>	V <sub>DD</sub> = 28V	f = 960 MHz	I <sub>DQ</sub> = 800 mA	120			W
G <sub>PS</sub>	V <sub>DD</sub> = 28 V	P <sub>out</sub> = 120 W	I <sub>DQ</sub> = 800 mA	13	14		dB
η <sub>D</sub>	V <sub>DD</sub> = 28 V	P <sub>out</sub> = 120W	I <sub>DQ</sub> = 800 mA	50			%
Load Mismatch	f = 960 MHz	V <sub>DD</sub> = 28 V	P <sub>out</sub> = 120 W	I <sub>DQ</sub> = 800 mA	10:1		VSWR
	ALL PHASE ANGLES						

### IMPEDANCE DATA

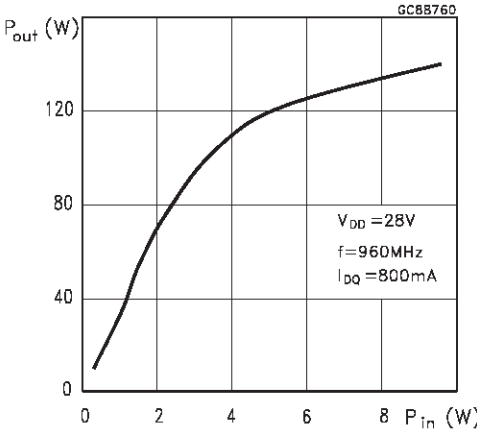


FREQ.	Z <sub>IN</sub> (Ω)	Z <sub>DL</sub> (Ω)
945 MHz	3.9 + j 4.9	3.6 - j 5.1
960 MHz	4.1 - j 4.6	3.24 - j 4.74
980 MHz	3.9 + j 5.2	3.27 - j 6.9

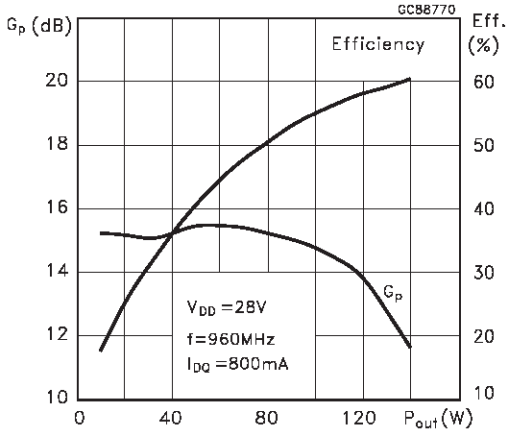
Measured gate to gate and drain to drain respectively.

TYPICAL PERFORMANCE

Output Power vs. Input Power

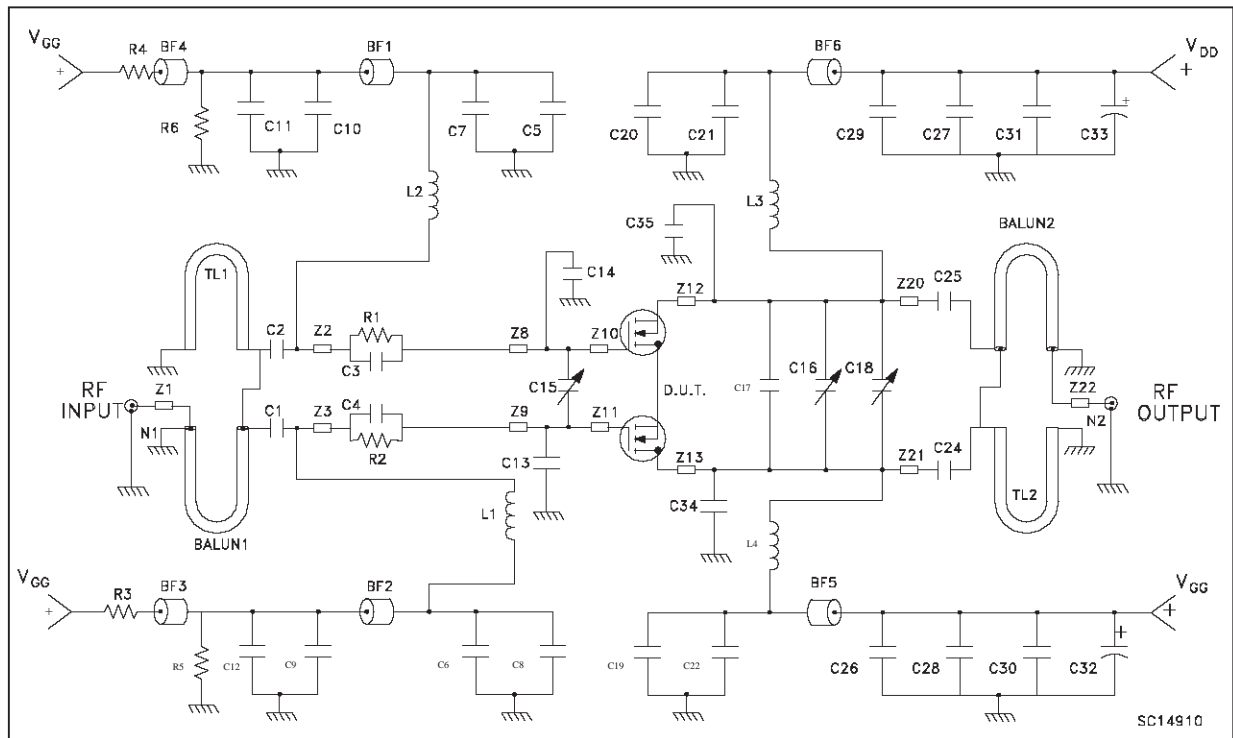


Power Gain and Efficiency vs. Output Power



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## 960 MHz Test Circuit Schematic

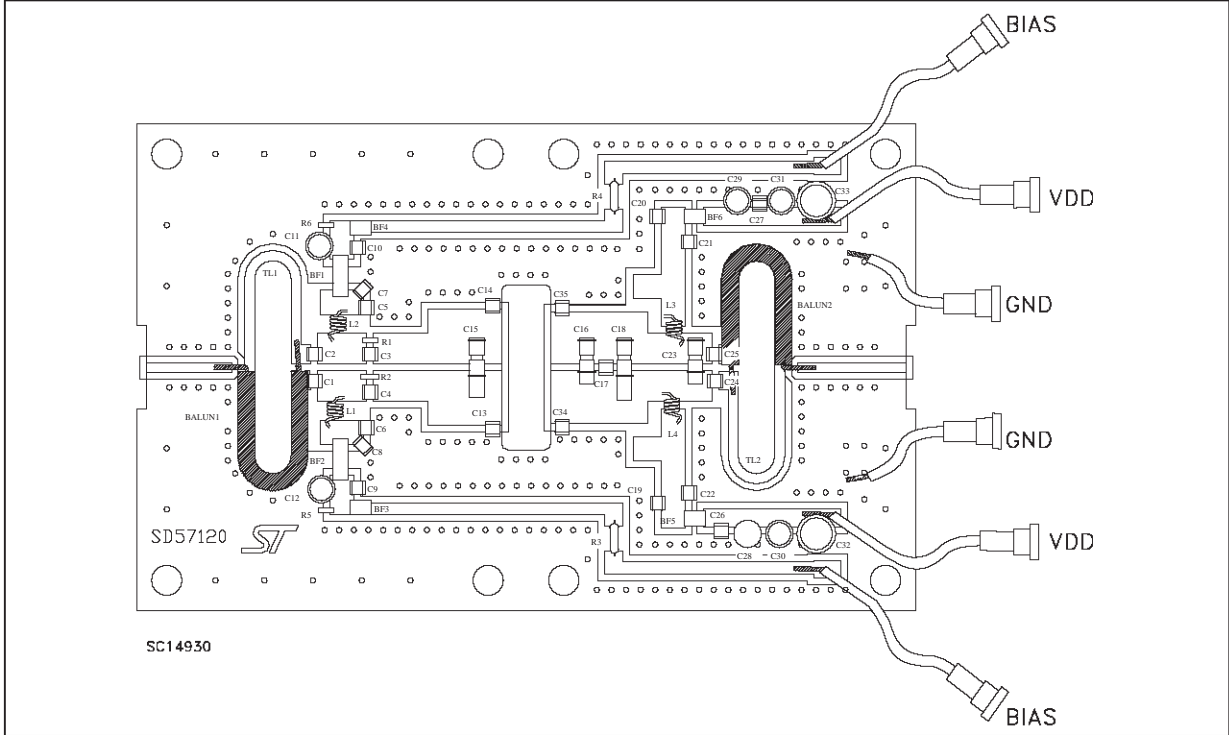


## 960 MHz Test Circuit Component Part List

BF1-BF4	FAIR RITE PRODUCTS SHORT FERRIT BEAD 2743021447
C1, C2, C24, C25	47pf
C3, C4,	42pf CHIP CAP
C5, C6, C7, C8,	300pf CHIP CAP
C19, C20, C21, C22,	
C9, C10	10000pf CHIP CAP
C11, C12	10µF, 50V ELECTROLYTIC CAPACITOR
C28, C29, C30, C31	
C13, C14, C17	1.7pf CHIP CAP
C15, C18,	.8-8pf VARIABLE CAPACITOR
C16, C23,	.6-4.5pf VARIABLE CAPACITOR
C26, C27,	20000pf CHIP CAP
C32, C33	220µF, 50V ELECTROLYTIC CAPACITOR
C34, C35	5.6pf CHIP CAP
BALUN1, BALUN2	2.2, 50 Ω, .086" O.D. SEMI - RIGID COAX
L1, L2, L3, L4	3 TURNS, #20AWG, IDIA 0.126", 24.7nH
N1, N2	TYPE N CONNECTOR
R1, R2	75Ω,
R3, R4	1K Ω,
R5, R6	1.2KΩ,
T1, T2	50 Ω, TRANSMISSION LINE
BOARD	30mil GLASS TEFLON $\epsilon_r = 2.55$
COMPONENT	DESCRIPTION

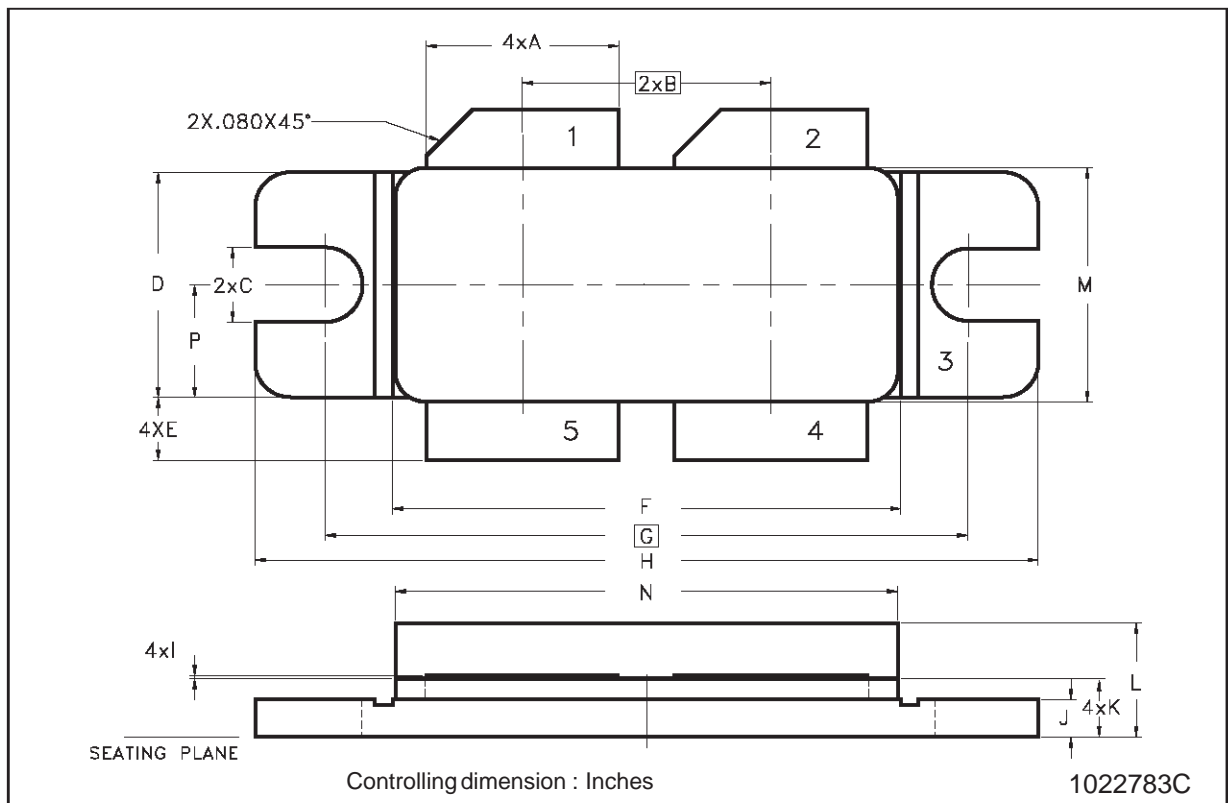
SC14920

960 MHz Production Test Fixture



**M252 (.400 X .800 4L BAL N/HERM W/FLG) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	8.13		8.64	0.320		0.340
B		10.80			0.425	
C	3.00		3.30	0.118		0.130
D	9.65		9.91	0.380		0.390
E	2.16		2.92	0.085		0.115
F	21.97		22.23	0.865		0.875
G		27.94			1.100	
H	33.91		34.16	1.335		1.345
I	0.10		0.15	0.004		0.006
J	1.52		1.78	0.060		0.070
K	2.36		2.74	0.093		0.108
L	4.57		5.33	0.180		0.210
M	9.96		10.34	0.392		0.407
N	21.64		22.05	0.852		0.868



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