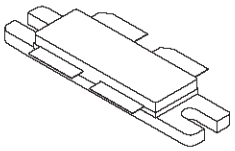
SD57120

RF POWER TRANSISTORS
The *LdmoST* FAMILY

PRELIMINARY DATA

N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

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



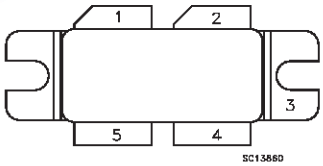
M252
epoxy sealed

ORDER CODE	BRANDING
SD57120	XSD57120

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.

PIN CONNECTION



1. Drain
2. Drain
3. Source
4. Gate
5. Gate

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25 °C)

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

THERMAL DATA

$R_{th(j-c)}$	Junction-Case Thermal Resistance	0.55	°C/W

ELECTRICAL SPECIFICATION (T_{case} = 25 °C)

STATIC (Per Section)

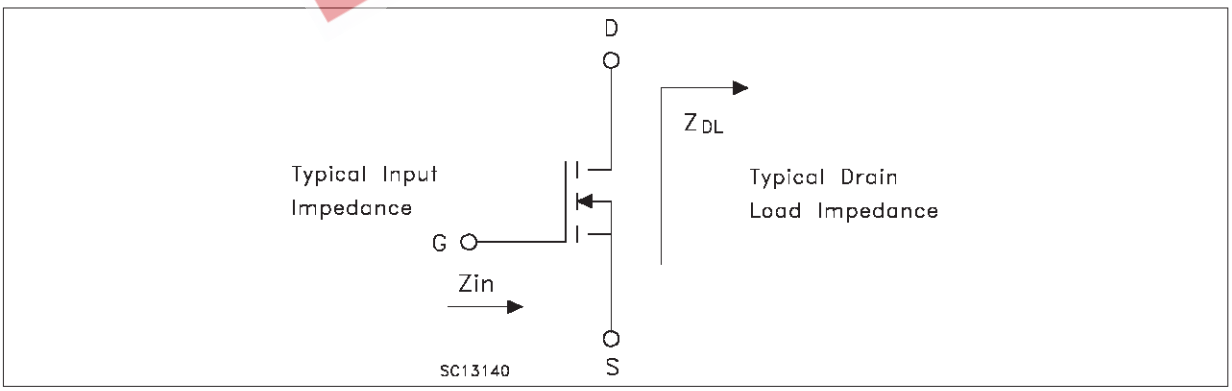
Symbol	Parameter			Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	V_{GS} = 0V	I_{DS} = 10 mA		65			V
I_{DSS}	V_{GS} = 0V	V_{DS} = 28 V				1	µA
I_{GSS}	V_{GS} = 20V	V_{DS} = 0 V				1	µA
$V_{GS(Q)}$	V_{DS} = 28V	I_D = 100 mA		3.0		5.0	V
$V_{DS(ON)}$	V_{GS} = 10V	I_D = 3 A			0.7	0.8	V
G_{FS}	V_{DS} = 10V	I_D = 3 A			3		mho
C_{ISS}*	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		175		pF
C_{OSS}	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		44		pF
C_{RSS}	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		1.7		pF

* Includes Internal Input Moscap.

DYNAMIC

Symbol	Parameter				Min.	Typ.	Max.	Unit
P_{OUT}	V_{DD} = 28V	f = 960 MHz	I_{DQ} = 800 mA		120			W
G_{PS}	V_{DD} = 28 V	P_{out} = 120 W	I_{DQ} = 800 mA		13	14		dB
η_D	V_{DD} = 28 V	P_{out} = 120W	I_{DQ} = 800 mA		50			%
Load Mismatch	f = 960 MHz ALL PHASE ANGLES	V_{DD} = 28 V	P_{out} = 120 W	I_{DQ} = 800 mA	10:1			VSWR

IMPEDANCE DATA

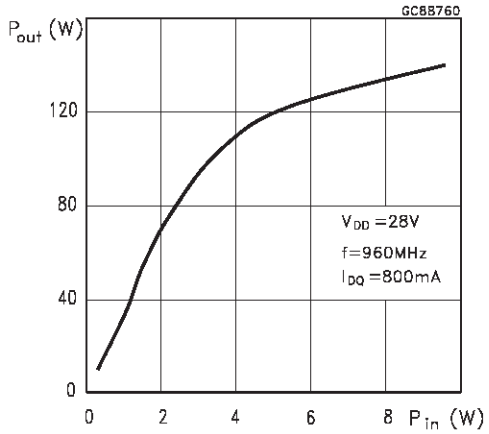


FREQ.	Z_{IN} (Ω)	Z_{DL} (Ω)
945 MHz	3.9 + j 4.9	3.6 - j 5.1
960 MHz	4.1 - j 4.6	3.24 - j 4.74
980 MHz	3.9 + j 5.2	3.27 - j 6.9

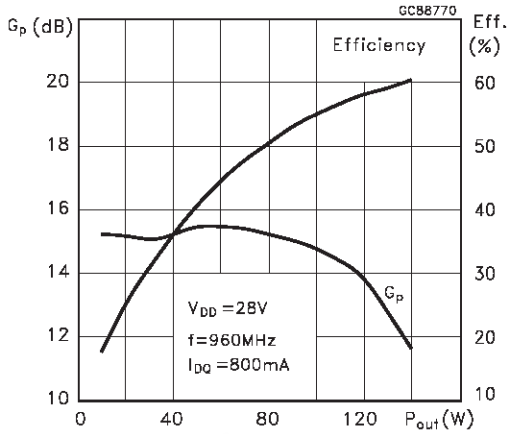
Measured gate to gate and drain to drain respectively.

TYPICAL PERFORMANCE

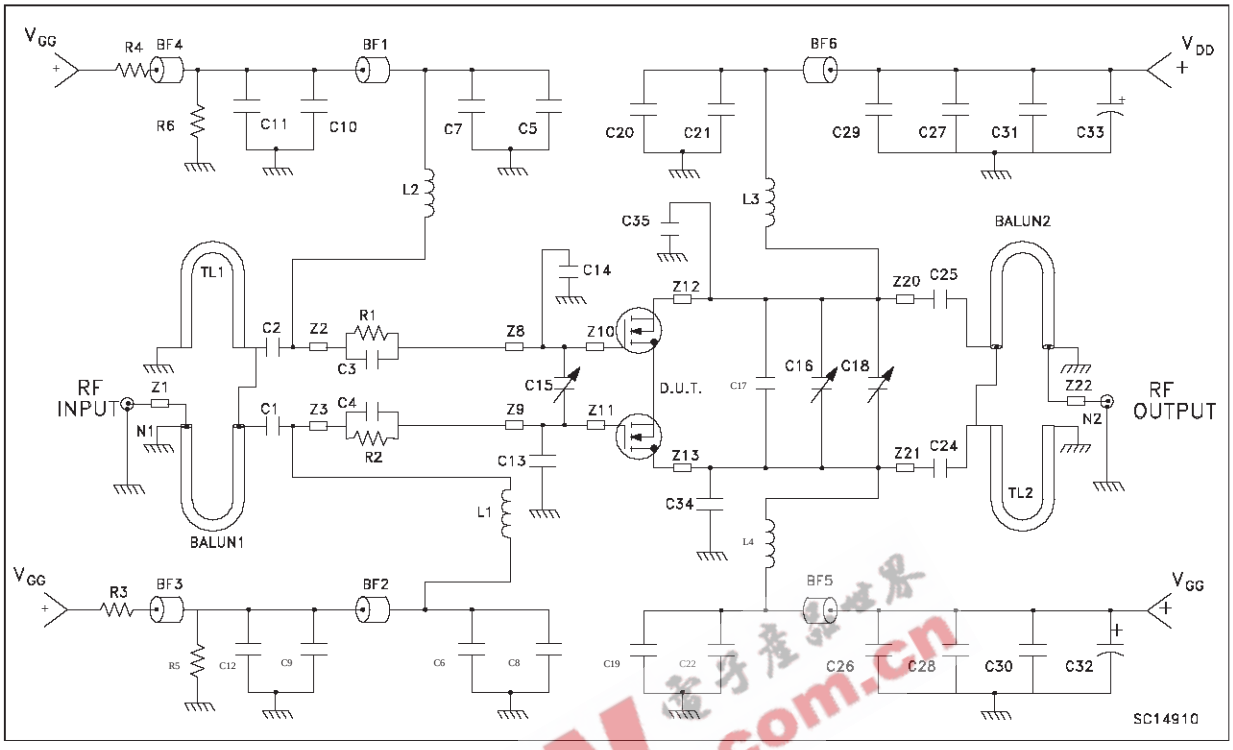
Output Power vs. Input Power



Power Gain and Efficiency vs. Output Power



960 MHz Test Circuit Schematic

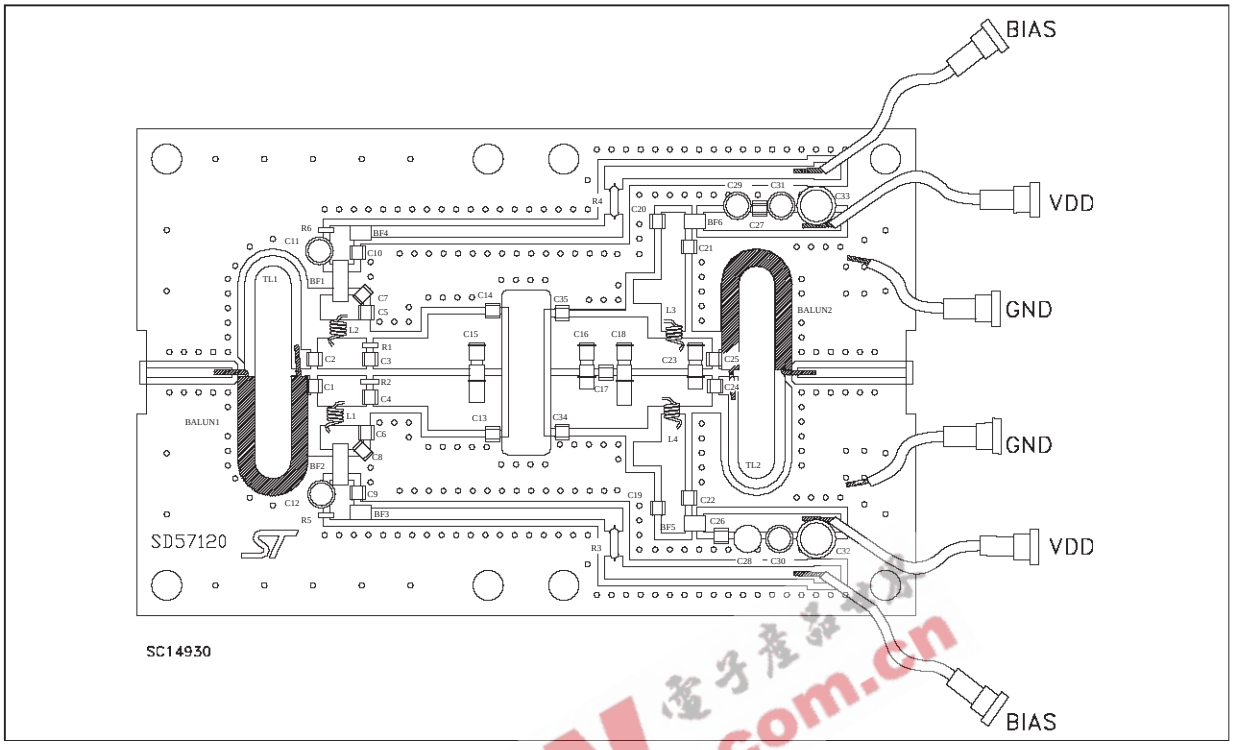


960 MHz Test Circuit Component Part List

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, TRANSMITION LINE
BOARD	30mil GLASS TEFLON ε_r = 2.55
COMPONENT	DESCRIPTION

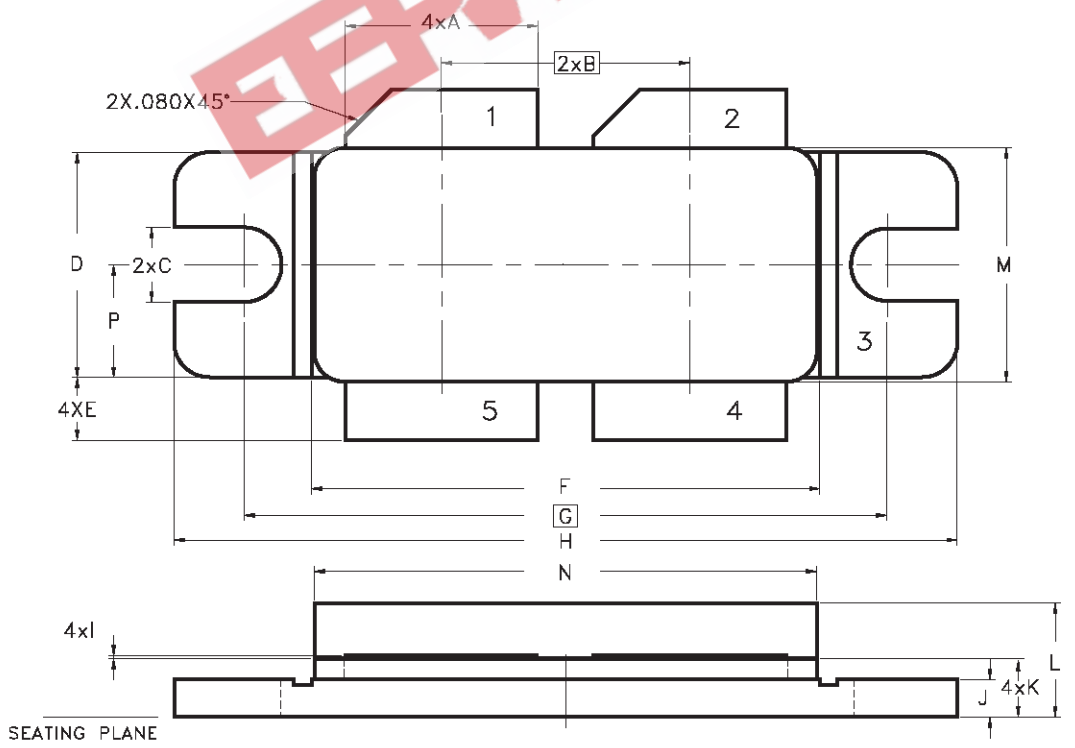
SC14920

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



Controlling dimension : Inches

1022783C