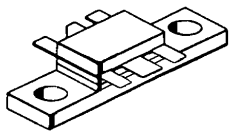
SGS-THOMSON MICROELECTRONICS

SD1398

RF & MICROWAVE TRANSISTORS 850-960 MHz APPLICATIONS

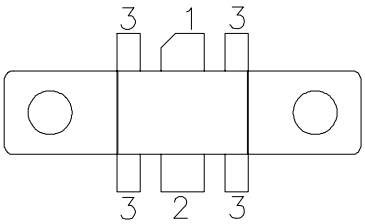
- 850 - 960 MHZ
- 24 VOLTS
- COMMON EMITTER
- OVERLAY GEOMETRY
- GOLD METALLIZATION
- P_{OUT} = 6.0 W MIN. WITH 10.0 dB GAIN



.230 6LFL (M142)
epoxy sealed

ORDER CODE	BRANDING
SD1398	SD1398

PIN CONNECTION



1. Collector
2. Base
3. Emitter

DESCRIPTION

The SD1398 is a gold metallized epitaxial silicon NPN transistor designed for high linearity Class AB operation cellular base station applications. The SD1398 can also be operated Class C.

The SD1398 is internally input matched and can be used as a driver for the SD1423 or SD1424.

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	50	V
V_{CES}	Collector-Emitter Voltage	35	V
V_{EBO}	Emitter-Base Voltage	3.5	V
I_C	Device Current	2.4	A
P_{DISS}	Power Dissipation	53	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	3.3	°C/W

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

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 5mA	I_E = 0mA	50	—	—	V
BV_{CEO}	I_C = 5mA	I_B = 0mA	24	—	—	V
BV_{EBO}	I_E = 5mA	I_C = 0mA	3.5	—	—	V
I_{CEO}	V_{CE} = 24V	I_E = 0mA	—	—	1.0	mA
I_{CBO}	V_{CB} = 24V	I_E = 0mA	—	—	1.0	mA
h_{FE}	V_{CE} = 10V	I_C = 0.1A	20	—	100	—

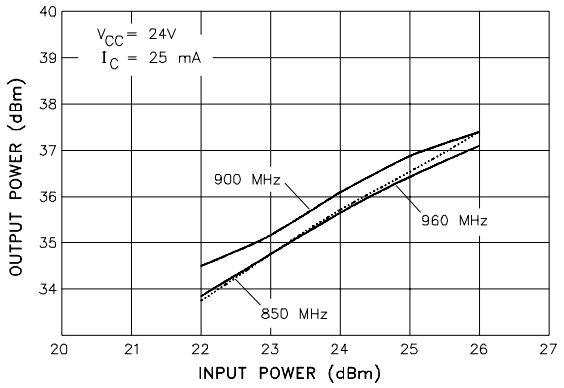
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 850 — 960 MHz	V_{CE} = 24 V	I_{CQ} = 25 mA	6	—	—	W
η_c	f = 850 — 960 MHz	V_{CE} = 24 V	I_{CQ} = 25 mA	—	50	—	%
G_P	f = 850 — 960 MHz	V_{CE} = 24 V	I_{CQ} = 25 mA	10	12	—	dB
C_{OB}	f = 1 MHz	V_{CB} = 24 V		—	7.5	8.5	pF

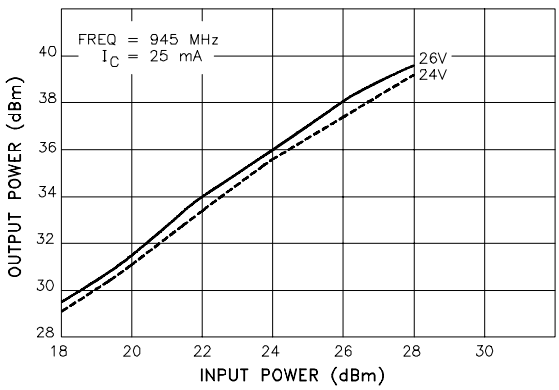
Note: P_{IN} = 0.60w

TYPICAL PERFORMANCE

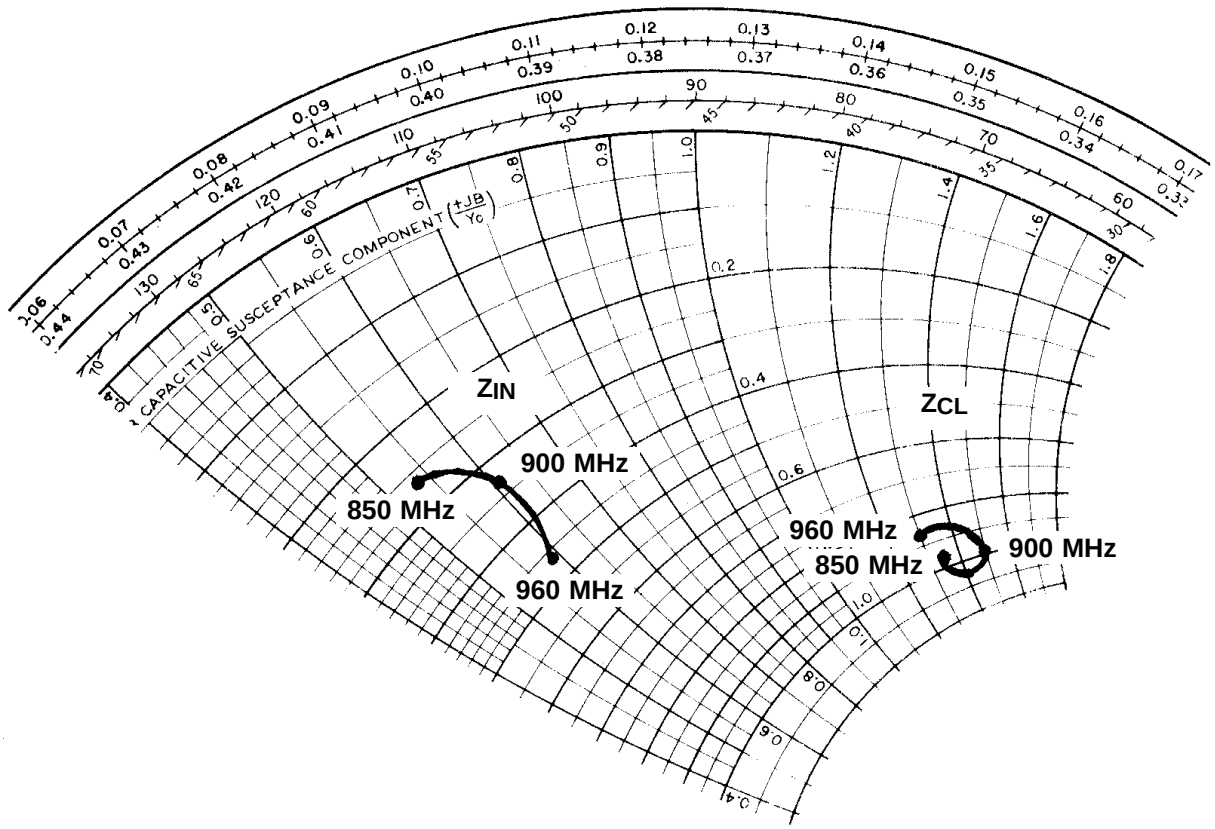
CLASS AB BROADBAND OUTPUT POWER vs INPUT POWER



OUTPUT POWER vs INPUT POWER

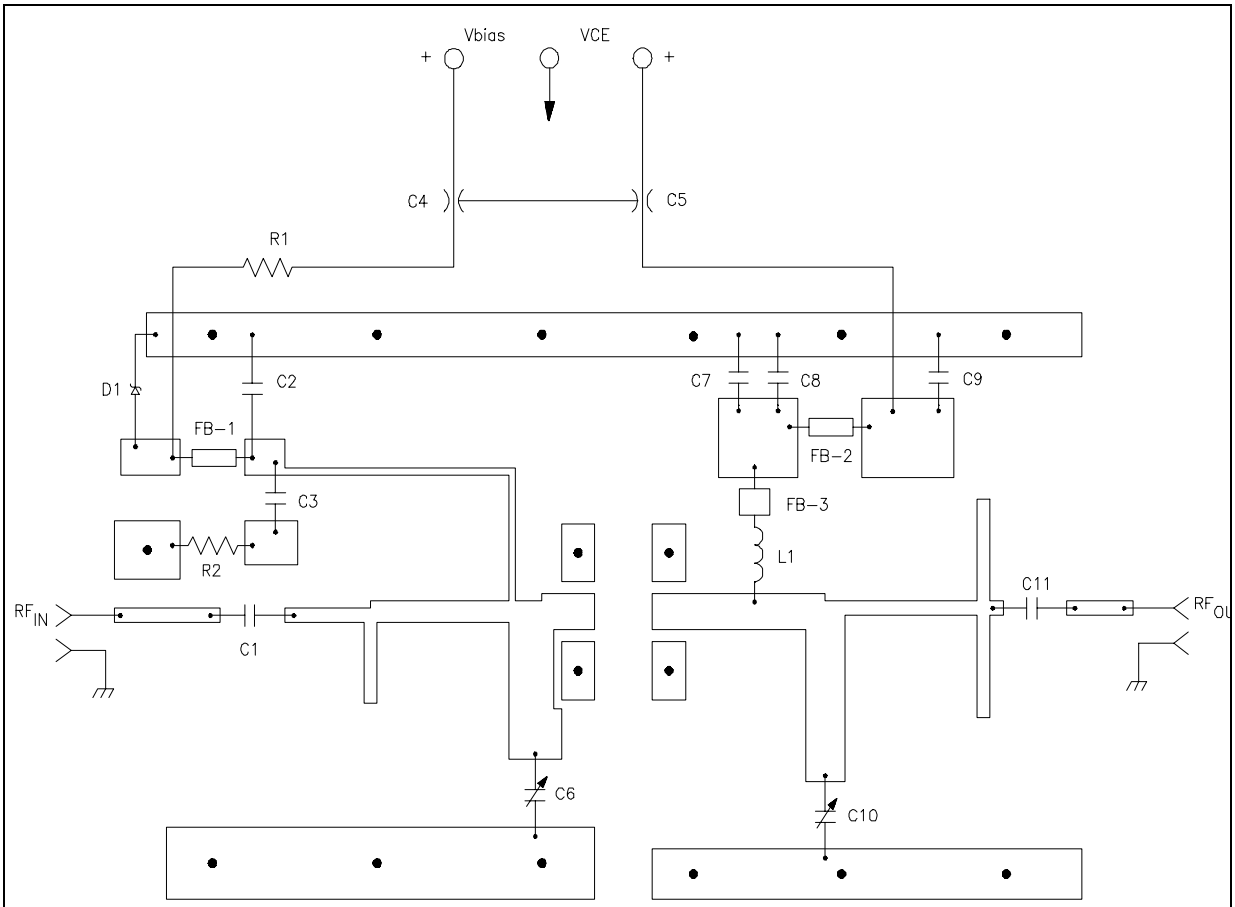


IMPEDANCE DATA



FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
850 MHz	2.6 + j 5.4	9.5 + j 13.5
900 MHz	3.3 + j 6.1	9.9 + j 15.0
950 MHz	4.6 + j 5.9	8.6 + j 13.0

TEST CIRCUIT



C1, C2
C7, C11 : 240pF ATC Size A
C3 : 0.1MFD 50Vdc, CK05 Type
C4, C5 : 1500pF Feedthru #9900-381-6004 Murata/Erie
C6, C10 : 0.8 - 8.0pF Johanson Gigatrim
C8 : 0.01 MFD 100Vdc CK05 Type
C9 : 10MFD Electrolytic, 63Vdc

D1 : IN5661

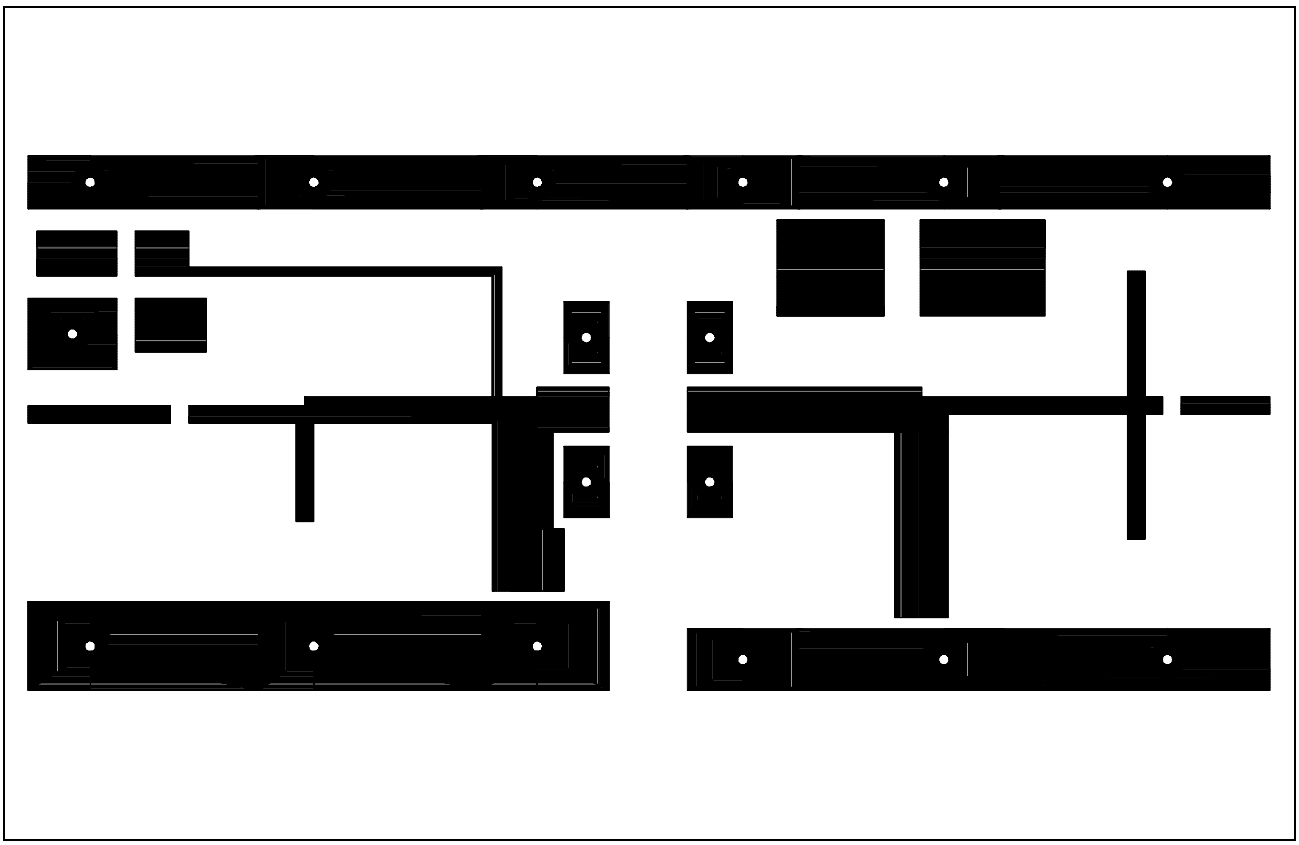
FB-1,
FB-2 : 2.5 Turns, #22 AWG, Ferrite Bead
FB-3 : Ferrite Bead L1 Cold End

L1 : 3 Turns, #22 AWG, 0.125" I.D.

R1 : 150Ω in 5% Carbon Comp
R2 : 51Ω, Chip Resistor

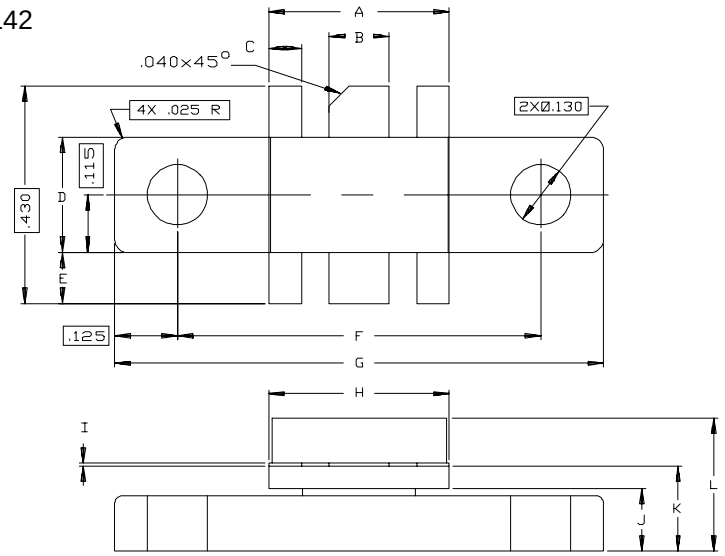
Board
Material: Er = 10.2, Height 0.05", Teflon Glass

TEST CIRCUIT LAYOUT



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0142



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.355/9,02	.365/9,27	K	.160/4,06	.180/4,57
B	.115/2,92	.125/3,18	L	.230/5,84	.260/6,60
C	.075/1,91	.085/2,16			
D	.225/5,72	.235/5,97			
E	.090/2,29	.110/2,79			
F	.720/18,29	.730/18,54			
G	.970/24,64	.980/24,89			
H	.355/9,02	.365/9,27			
I	.004/0,10	.006/0,15			
J	.120/3,05	.130/3,30			