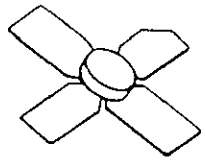
SGS-THOMSON MICROELECTRONICS

SD1390

RF & MICROWAVE TRANSISTORS UHF BASE STATION APPLICATIONS

PRELIMINARY DATA

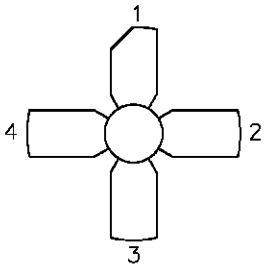
- 470 MHZ
- 24 VOLTS
- P_{OUT} = 1.5 W WITH 13.0 dB MIN. GAIN
- CLASS A
- COMMON EMITTER
- POWER SATURATION 2.2 W MIN.



.280 x 4LSL (M123)

ORDER CODE	BRANDING
SD1390	SD1390

PIN CONNECTION



1. Collector
2. Emitter
3. Base
4. Emitter

DESCRIPTION

The SD1390 is a gold metallized NPN planar transistor using diffused emitter ballast resistors for reliability and ruggedness.

The SD1390 is specifically designed as a low power, high gain driver and can be operated in Class A, B or C.

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	40	V
V_{CEO}	Collector-Emitter Voltage	24	V
V_{EBO}	Emitter-Base Voltage	3.5	V
I_C	Collector Current	0.35	A
P_{DISS}	Power Dissipation ($T_C \leq$ +75°C)	8.33	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	12	°C/W

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

STATIC

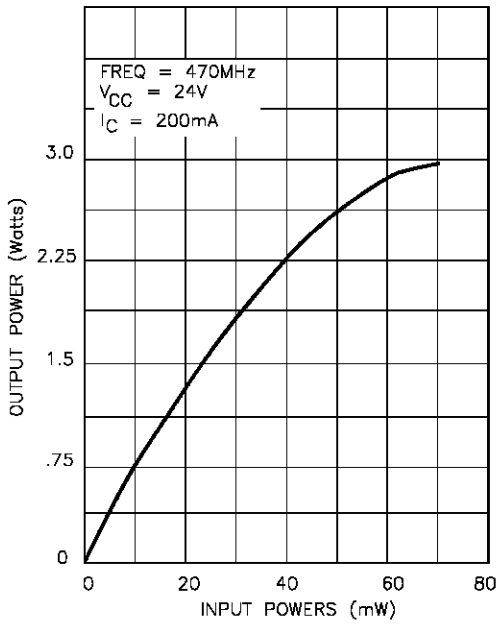
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1 mA	I_E = 0 mA	40	—	—	V
BV_{CEO}	I_C = 1 mA	I_B = 0 mA	24	—	—	V
BV_{EBO}	I_E = 1 mA	I_C = 0 mA	3.5	—	—	V
I_{CBO}	V_{CB} = 24 V	I_E = 0 mA	—	—	1.0	mA
h_{FE}	V_{CE} = 5 V	I_C = 0.1 A	20	—	120	—

DYNAMIC

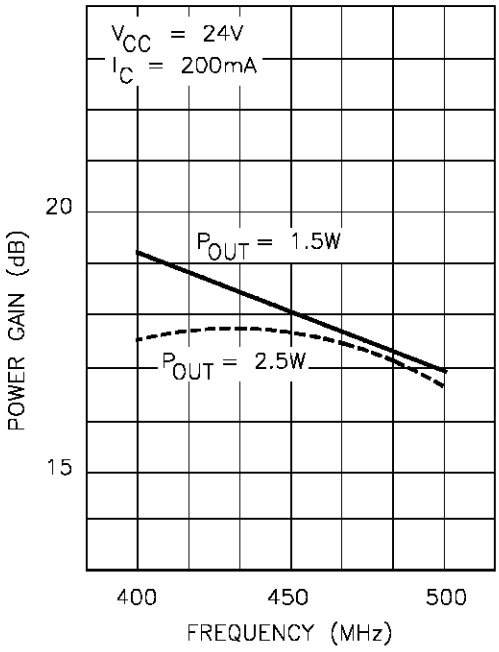
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	f = 470 MHz P_{IN} = 75 mW V_{CC} = 24V I_{CQ} = 200 mA	1.5	—	—	W
C_{OB}	f = 1 MHz V_{CB} = 28 V	—	—	5.0	pF

TYPICAL PERFORMANCE

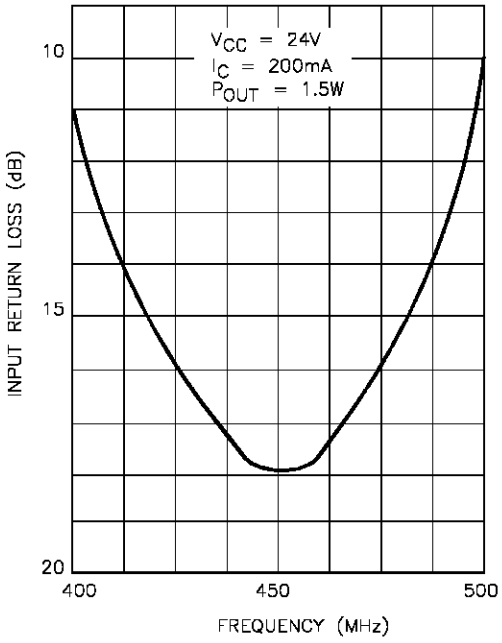
OUTPUT POWER vs INPUT POWER



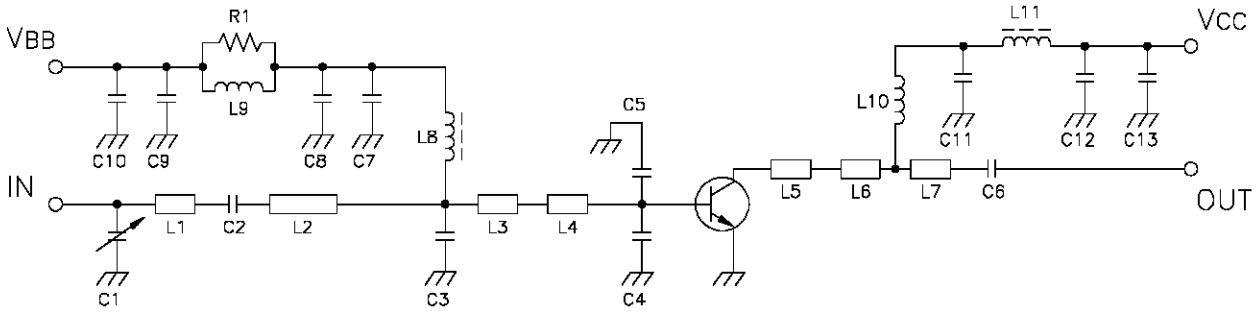
POWER GAIN vs FREQUENCY



INPUT RETURN LOSS vs FREQUENCY



TEST CIRCUIT



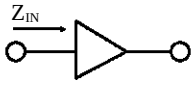
C1 : Trim Capacitor GKU10056 2.8-10pf
C2, C6 : Chip Capacitor LCC AC12CE221J / 220pf
C3 : Chip Capacitor VITRAMON "High Q" / 15+4.7pf
C4,C5 : Chip Capacitor LCC AC 12CE270J / 27 pf
C7,C9,C11:
C12 : Chip Capacitor LCC AC20CD102K+AC12CE220J / 1nF+220 pf
C8,C10 :
C13 : Tantle 10 mF, 35V

L1 : Microstrip lin W = 2.1 mm, L = 10mm
L2 : Microstrip line W = 1.0mm, L = 26mm
L3 : Microstrip line W = 10mm, L = 10mm
L4 : Microstrip line W = 8.0mm, L = 5mm
L5 : Microstrip line W = 8.0mm, L = 5mm
L6 : Microstrip line W = 1.0mm, L = 15mm
L7 : Microstrip line W = 1.0mm, L = 30mm
L8 : 4 Turns ID = 2.5mm, 0.5mm Wire
L9 : 11 turns ID = 2.5mm, 0.5mm Wire
L10 : 2 Turns ID = 5.0mm, 1.0mm Wire
L11 : Choke

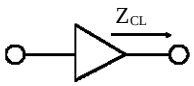
R1 : 220 ohms - 1/4 Watts

IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE



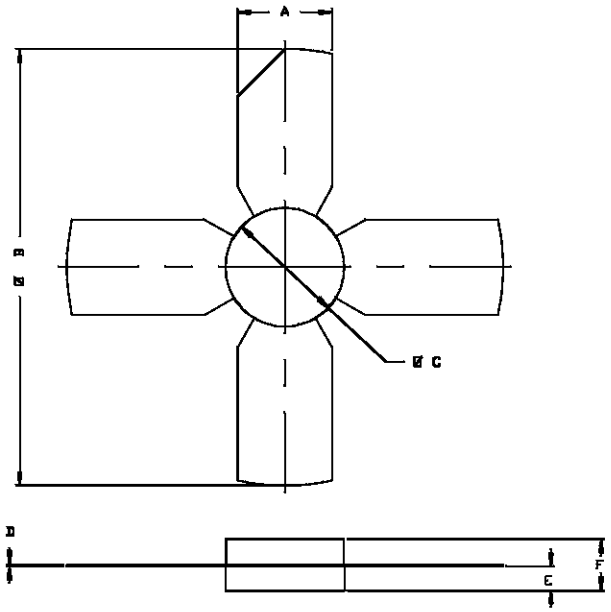
TYPICAL COLLECTOR LOAD IMPEDANCE



FREQ.	$Z_{IN}(\Omega)$	$Z_{CL}(\Omega)$
400 MHz	2.8 + j 3.0	33 + j 47
430 MHz	2.6 + j 4.0	36 + j 49
470 MHz	2.4 + j 4.5	41 + j 52
500 MHz	2.0 + j 5.0	45 + j 54

PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0123 rev. A
UDCS No. 1010947



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.228/5,59	.230/5,84
B	------	1.055/26,8
C	.275/6,99	.285/7,24
D	.004/0,10	.006/0,15
E	.050/1,27	.060/1,52
F	.118/3,00	.130/3,30