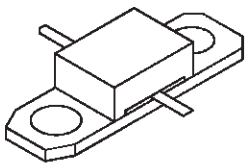
SGS-THOMSON MICROELECTRONICS

SD1894

RF & MICROWAVE TRANSISTORS SATELLITE COMMUNICATIONS APPLICATIONS

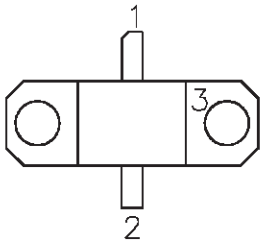
- CLASS C
- 1.6 GHz
- COMMON BASE
- REFRACTORY/GOLD METALLIZATION
- EFFICIENCY = 50% MIN.
- P_{OUT} = 4.5 W MIN. WITH 10 dB GAIN



.250 x .320 2LFL (M170)
epoxy sealed

ORDER CODE	BRANDING
SD1894	SD1894

PIN CONNECTION



1. Collector
2. Emitter
3. Base

DESCRIPTION

The SD1894 is a common base silicon NPN bipolar device optimized for 1.6 GHz SATCOM applications.

The SD1894 offers superior gain and collector efficiency, making it an ideal choice for Class C power amplifiers used in portable as well as fixed SATCOM terminals.

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	45	V
V_{CES}	Collector-Emitter Voltage	45	V
V_{EBO}	Emitter-Base Voltage	3.0	V
I_C	Device Current	375	mA
P_{DISS}	Power Dissipation	12.5	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	14.0	°C/W

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

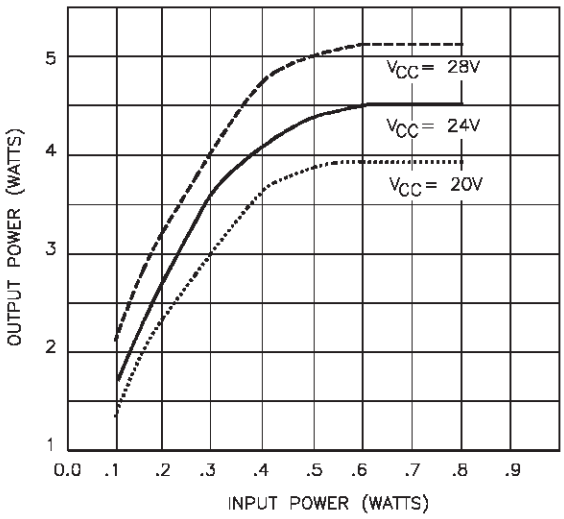
STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1 mA	I_E = 0 mA	45	—	—	V
BV_{CES}	I_C = 1 mA	V_{BE} = 0 V	45	—	—	V
BV_{EBO}	I_E = 1 mA	I_C = 0 mA	3.0	—	—	V
I_{CBO}	V_{CB} = 28 V	I_E = 0 mA	—	—	.25	mA
h_{FE}	V_{CE} = 5 V	I_C = .2 A	15	—	150	—

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{IN}	f = 1650 MHz	V_{CC} = 28 V	P_{OUT} = 4.5 W	—	.35	.45	W
η_C	f = 1650 MHz	V_{CC} = 28 V	P_{OUT} = 4.5 W	50	55	—	%
P_G	f = 1650 MHz	V_{CC} = 28 V	P_{OUT} = 4.5 W	10.0	11.1	—	dB
Load Mismatch	V_{CC} = 28 V	P_{OUT} = 4.5 W	VSWR = 20:1	No Degradation in Output Power			

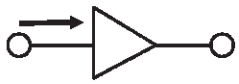
INPUT POWER vs OUTPUT POWER



IMPEDANCE DATA

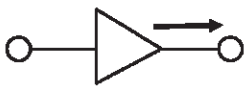
TYPICAL INPUT IMPEDANCE

Z_{IN}



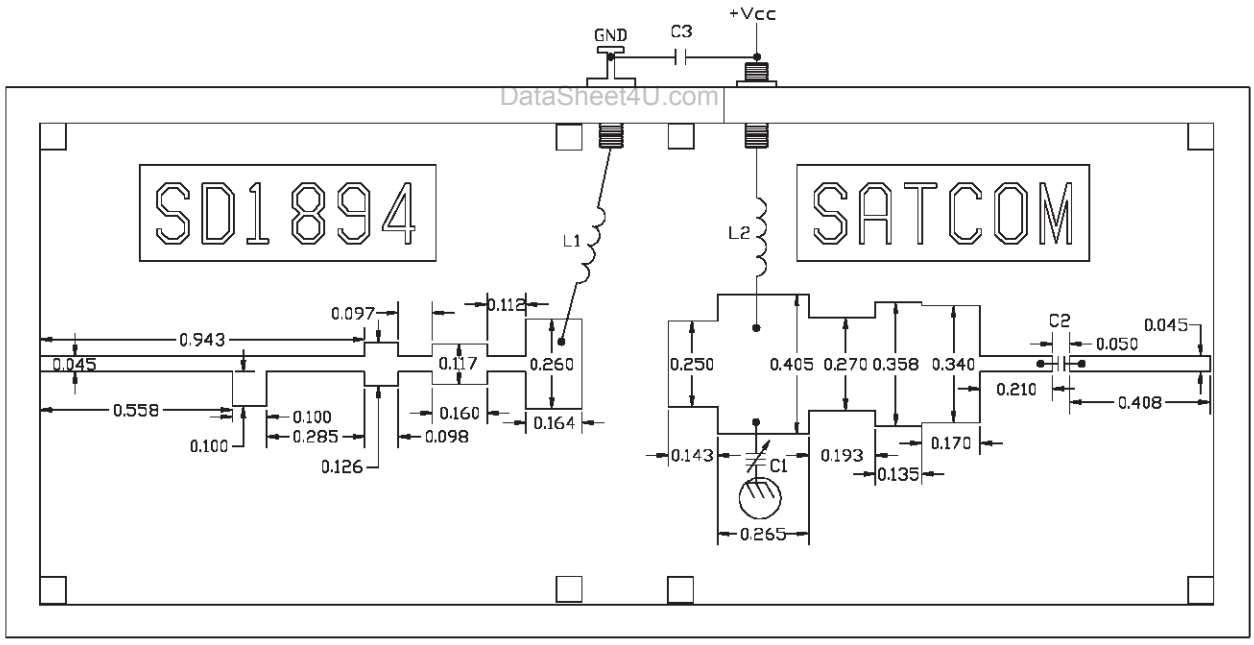
TYPICAL COLLECTOR LOAD IMPEDANCE

Z_{CL}



FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
1600 MHz	31.6 + j 21.4	5.2 + j 14.7
1620 MHz	38.0 + j 15.0	5.6 + j 14.55
1635 MHz	38.8 + j 11.3	5.85 + j 14.45
1650 MHz	36.0 + j 9.1	6.1 + j 14.3
1665 MHz	34.3 + j 8.77	6.37 + j 14.2

TEST CIRCUIT



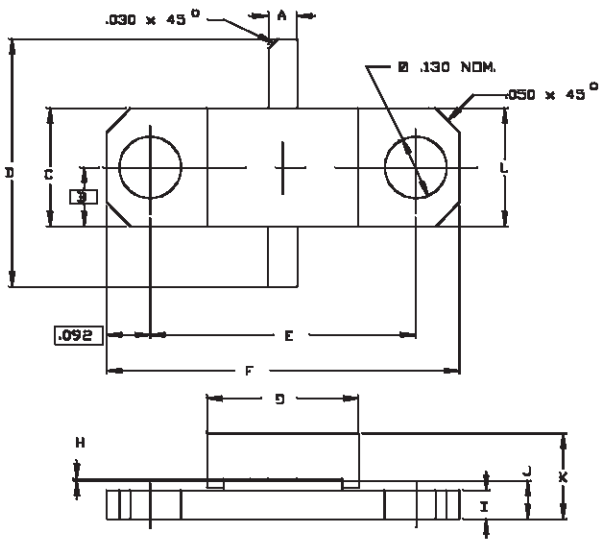
C1 : .6 - 4.5 pf Johanson
C2 : 39pf ATC Chip Capacitor
C3 : .1µf Ceramic

L1 : 10 Turns, AWG #28, .080"I.D.
L2 : 4 Turns, AWG #28, .)80" I.D.

Board Material: Er = 10.2, Thickness .050"

PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0170
UDCS No. 1010996 rev B



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.055/1,40	.065/1,65
B	.124/3,15	
C	.243/6,17	.253/6,43
D	.635/16,13	.665/16,89
E	.555/14,10	.565/14,35
F	.739/18,77	.749/19,02
G	.315/8,00	.325/8,26
H	.002/0,05	.006/0,15
I	.055/1,40	.065/1,65
J	.075/1,91	.095/2,41

CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
K		.190/4,83
L	.245/6,22	.255/6,48