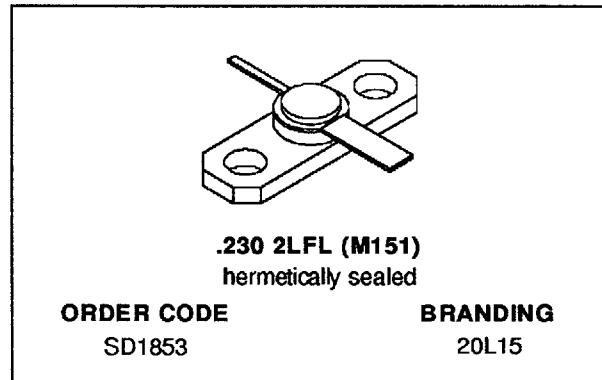


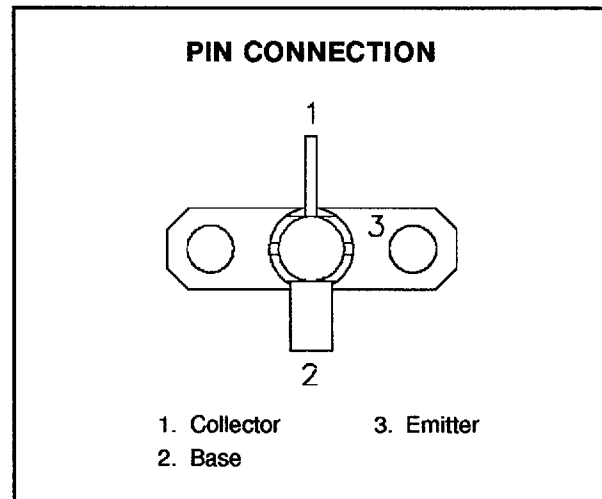
**RF & MICROWAVE TRANSISTORS  
GENERAL PURPOSE LINEAR APPLICATIONS**

- 2.0 GHz
- 20 VOLTS
- CLASS A
- OVERLAY GEOMETRY
- GOLD METALLIZATION
- COMMON EMITTER CONFIGURATION
- $P_{OUT} = 1.5 \text{ W MIN. WITH } 7.0 \text{ dB GAIN}$



**DESCRIPTION**

The SD1853 is a silicon NPN planar transistor designed for high gain linear performance at 2.0 GHz. This part uses gold metallized die and poly-silicon site ballasting to achieve high reliability and ruggedness. The SD1853 can be used for applications such as telecommunications, radar, ECM, space and other commercial and military systems.



**ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}\text{C}$ )**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	40	V
$V_{CEO}$	Collector-Emitter Voltage	25	V
$V_{EBO}$	Emitter-Base Voltage	3.5	V
$I_C$	Device Current	730	mA
$P_{DISS}$	Power Dissipation	11.7	W
$T_J$	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	15.0	$^{\circ}\text{C/W}$
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## SD1853 (TCC20L15)

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

#### STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV <sub>CBO</sub>	I <sub>C</sub> = 1 mA	I <sub>E</sub> = 0 mA	40	—	—	V
BV <sub>CEO</sub>	I <sub>C</sub> = 5 mA	I <sub>B</sub> = 0 mA	25	—	—	V
BV <sub>EBO</sub>	I <sub>E</sub> = 1 mA	I <sub>C</sub> = 0 mA	3.5	—	—	V
h <sub>FE</sub>	V <sub>CE</sub> = 5 V	I <sub>C</sub> = 200 mA	15	—	150	—

#### DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P <sub>OUT</sub> *	f = 2.0 GHz	V <sub>CE</sub> = 20 V	I <sub>CQ</sub> = 220 mA	1.5	—	—	W
G <sub>P</sub> *	f = 2.0 GHz	V <sub>CE</sub> = 20 V	I <sub>CQ</sub> = 220 mA	7.0	—	—	dB

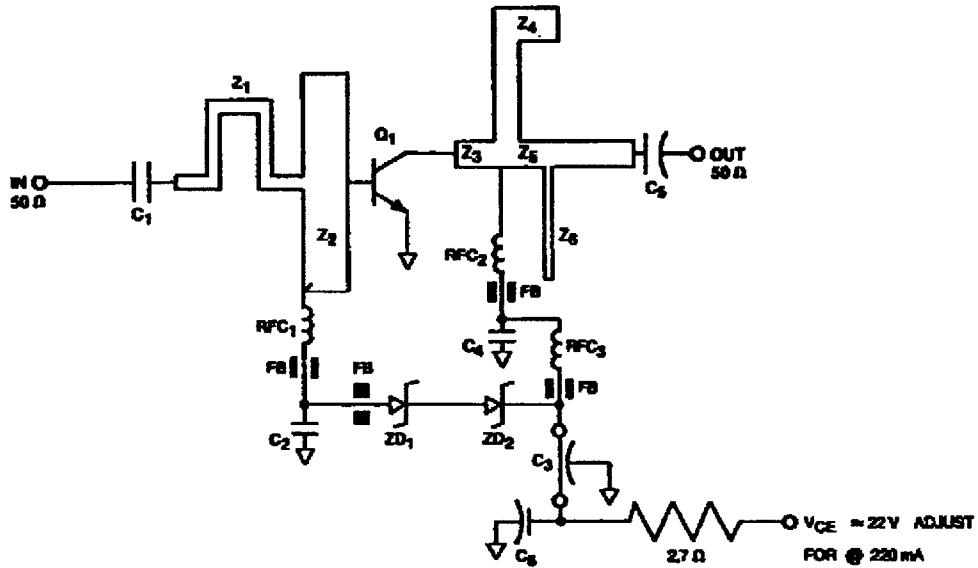
Note: \* 1 dB Compression

#### S-PARAMETERS DATA

BIAS: Current = 208mA, Voltage = 20 Volts

MHz	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
500	.92	176.0	3.53	81.9	.03	28.2	.30	-155.9
1000	.94	166.0	1.66	69.7	.03	45.1	.36	-161.3
1500	.93	156.1	1.27	57.1	.04	64.3	.43	-169.1
2000	.89	142.2	1.00	47.9	.05	70.4	.54	-172.1
2500	.82	124.4	.88	38.9	.06	74.8	.59	-178.2
3000	.76	97.5	.89	22.5	.08	71.5	.61	171.1
3500	.75	63.6	.93	2.1	.11	61.7	.66	156.0

## TEST CIRCUIT



C1, C2,  
C4, C5 : 22pF Chip Capacitor  
C3 : 0.001 Feedthru Capacitor  
C6 : 10 $\mu$ F, 25V

FB : Ferrite Bead

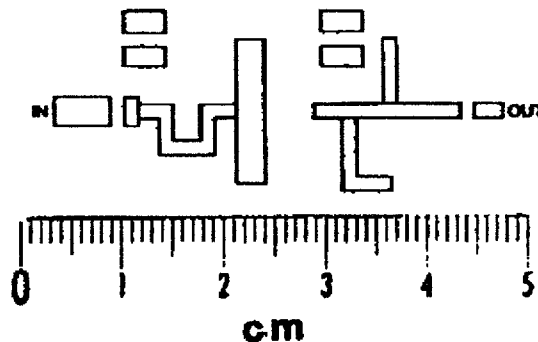
Q1 : SD1853

$P_{OUT} = 1$  W,  $V_{CE} = 22$  V,  $FREQ = 2.3$  GHz,  
 $I_{CC} = 220$  mA

RFC1,  
RFC2 : 3 Turns, AWG #28, .1" I.D.  
RFC3 : 8 Turns, AWG #26, .15" I.D.

Z1, Z2, Z3, Z4,  
Z5, Z6 : Microstrip on 1/32" Teflon Glass,  $E_r = 2.55$   
ZD1 : 9V, 1W, Zener  
ZD2 : 12V, 1W, Zener

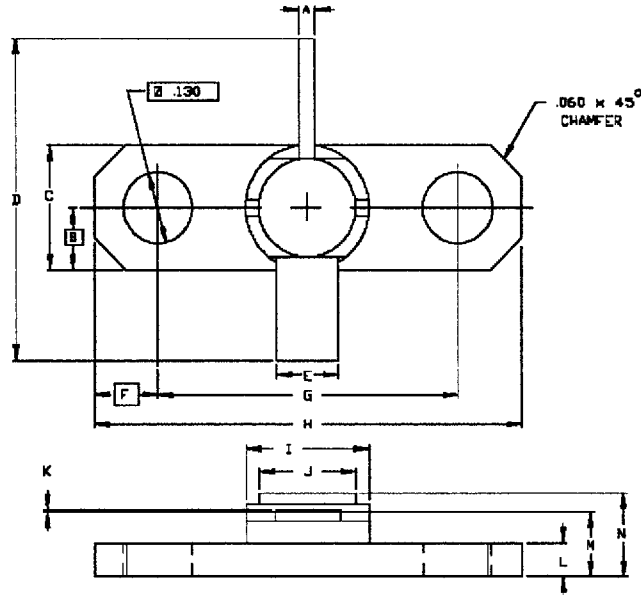
P.C. ARTWORK TO SCALE



# SD1853 (TCC20L15)

## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0151



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.025/0,64	.035/0,89	K	.003/0,08	.007/0,18
B	.115/2,92 NDM.		L	.055/1,40	.067/1,70
C	.225/5,72	.235/5,97	M	.120/3,18	.140/3,56
D	.710/18,03	.750/19,05	N		.170/4,32
E	.110/2,79	.120/3,05			
F	.120/3,05 NDM.				
G	.555/14,10	.565/14,35			
H	.795/20,19	.805/20,45			
I	.222/5,64	.236/5,99			
J	.155/4,19	.185/4,70			

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