

**RF & MICROWAVE TRANSISTORS
CLASS A MICROWAVE**

- FREQUENCY 2.0GHz
- POWER OUT 1.5W
- POWER GAIN 7.0dB
- VOLTAGE 20.0V
- CURRENT 220mA
- CLASS A
- GOLD METALLIZED DIE
- OVERLAY GEOMETRY
- HERMETIC STRIPLINE PACKAGE
- COMMON EMITTER CONFIGURATION



.230 2LFL/FLM (M151)
hermetic sealed

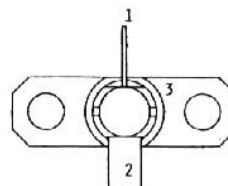
ORDER CODE
SD1853

BRANDING
20L15

DESCRIPTION

The TCC20L15 is an NPN silicon transistor designed for high gain linear performance at 2.0GHz. This part uses gold metallized die and polysilicon site ballasting to achieve high reliability and ruggedness. The part can be used for applications such as Telecommunications, Radar, ECM, Space and other commercial and military systems.

PIN CONNECTION



S88TCC20L15 01

1 collector
2 base

3 emitter

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector - Base Voltage	40	V
V_{CEO}	Collector - Emitter Voltage	21	V
V_{EBO}	Emitter - Base Voltage	3.5	V
I_C	Collector Current (max.)	0.25	A
P_{DISS}	Total Device Dissipation at + 25°C	11.7	W
T_{STG}	Storage Temperature	- 65 to + 200	°C
T_J	Junction Temperature	+ 200	°C

THERMAL DATA

$R_{TH(J-C)}$	Junction-case Thermal Resistance	15	°C/W
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TCC20L15

ELECTRICAL CHARACTERISTICS ($T_{\text{case}} = 25^{\circ}\text{C}$)

STATIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 1\text{mA}$	40	45		V
BV_{CEO}	$I_{\text{C}} = 5\text{mA}$	20	25		V
BV_{EBO}	$I_{\text{E}} = 1\text{mA}$	3.5	4		V
h_{FE}	$V_{\text{CE}} = 5\text{V}$ $I_{\text{C}} = 200\text{mA}$	15		150	

DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{O}	$f = 2\text{GHz}$ $V_{\text{CE}} = 20\text{V}$ $I_{\text{C}} = 220\text{mA}$	1.5	1.8		W
P_{G}	$f = 2\text{GHz}$ $V_{\text{CE}} = 20\text{V}$ $I_{\text{C}} = 220\text{mA}$	7	8		dB

S-PARAMETER DATA :

BIAS : Current = 208.0mA
Voltage = 20.000V

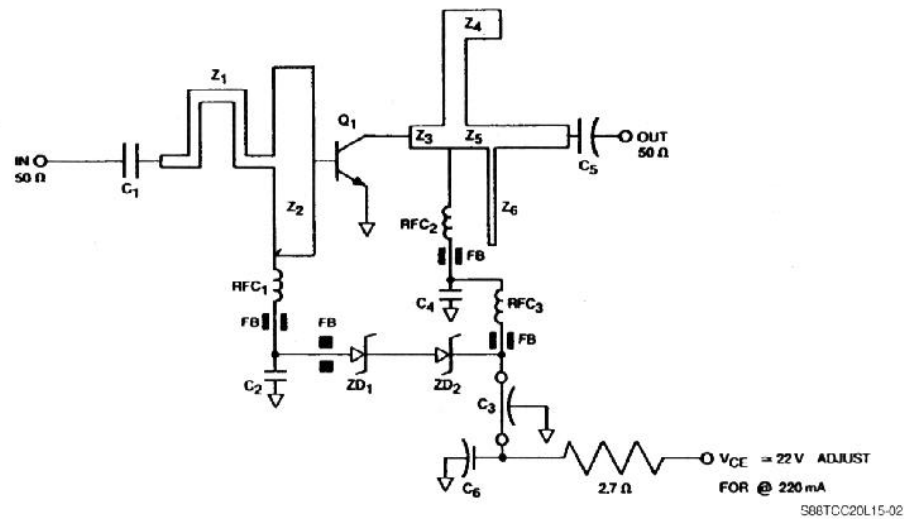
FREQUENCY

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

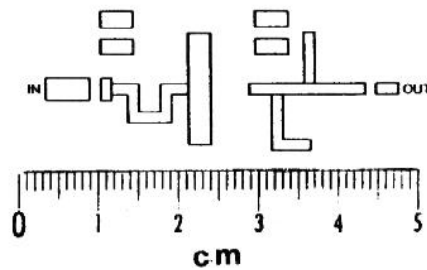
1W - 2.3GHz LINEAR AMPLIFIER

$V_{CE} = 22V$
 $I_{CQ} = 220mA$
 $G_P \geq 7dB$
 $P_{OUT} \geq 1W$

at 1dB compression

**PARTS LISTS**

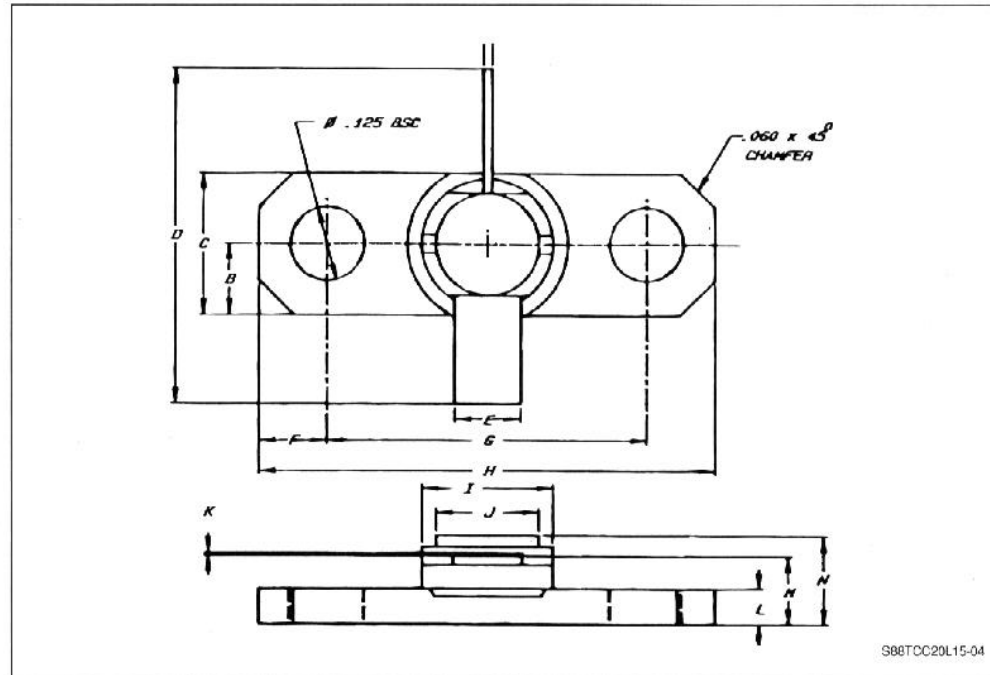
Q1	: TCC20L15	FB	: Ferrite Bead
C1, C2, C4, C5	: ~ 22pF CHIP CAP	ZD1	: 9V - 1W - ZENER
C3	: 0.001 Feed thru CAP	ZD2	: 12V - 1W - ZENER
C6	: 10μF - 25V	Z1, Z2, Z3, Z4, Z5, Z6	: MICROSTRIP
RFC1, RFC2	: 3 Turns - AWG # 28-.1" I.D.		on 1/32" Glass teflon $\epsilon_r \approx 2.55$
RFC3	: 8 Turns - AWG # 26-.15" I.D.		

P.C. ARTWORK TO SCALE

TCC20L15

PACKAGE MECHANICAL DATA

.230 2LFL/FLM



	Minimum Inches/mm	Maximum Inches/mm
A	.025/0.64	.035/0.89
B	.115/2.92 BSC	
C	.225/5.72	.235/5.97
D	.720/18.29	.750/19.05
E	.110/2.79	.120/3.05
F	.120/3.05 BSC	
G	.555/14.10	.565/14.35

	Minimum Inches/mm	Maximum Inches/mm
H	.795/20.19	.805/20.45
I	.222/5.64	.236/5.99
J	.165/4.19	.180/4.57
K	.002/0.05	.007/0.18
L	.055/1.40	.067/1.70
M	.120/3.18	.140/3.56
N		.170/4.32