

MITSUBISHI RF POWER TRANSISTOR

2SC4838

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

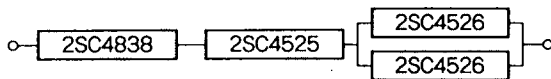
2SC4838 is a silicon NPN epitaxial planar type transistor specifically designed for RF power amplifiers in 1.65GHz.

FEATURES

- High power gain : $G_{pb} \geq 9.3\text{dB}$, $P_o \geq 6\text{W}$
 @ $V_{cc} = 28\text{V}$, $f = 1.65\text{GHz}$, $P_{in} = 0.7\text{W}$
- Emitter ballasted construction.
- High reggedness : Ability to withstand 16 : 1 load VSWR when operated at $V_{cc} = 28\text{V}$, $P_o = 6\text{W}$, $f = 1.65\text{GHz}$.
- High reliability due to gold metalization die.
- Flange type ceramic package.
- Common base configuraion.

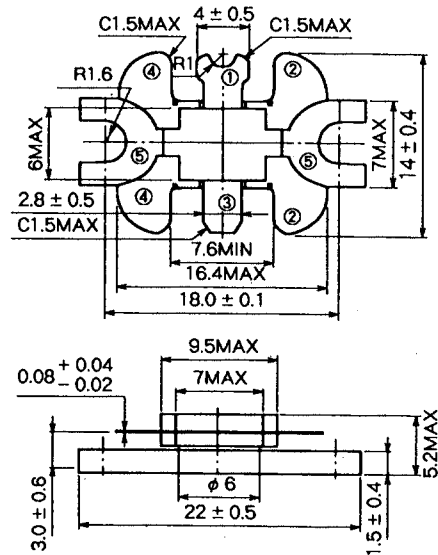
APPLICATIONS

For pre-amplifier stage of 50W, 1.65GHz, 28V.



OUTLINE DRAWING

Dimension in mm



- PIN :
 ① COLLECTOR ④ BASE
 ② BASE ⑤ FLANGE (BASE)
 ③ EMITTER

T-31B

ABSOLUTE MAXIMUM RATINGS ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CB0}	Collector-base voltage		50	V
V_{EB0}	Emitter-base voltage		4	V
V_{CES}	Collector-emitter voltage	$R_{BE} = 0$	45	V
I_c	Collector current		2	A
P_c	Collector dissipation		17.5	W
T_j	Junction temperature		175	$^\circ\text{C}$
T_{stg}	Storage temperature range		-55 to 175	$^\circ\text{C}$

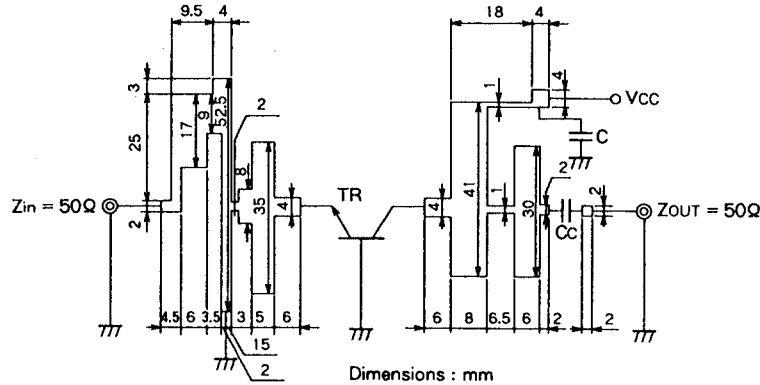
Note. Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_E = 5\text{mA}$, $I_C = 0$	4.0			V
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C = 10\text{mA}$, $I_E = 0$	50			V
$V_{(BR)CES}$	Collector-emitter breakdown voltage	$I_C = 10\text{mA}$, $R_{BE} = 0$	45			V
I_{CBO}	Collector cutoff current	$V_{CB} = 25\text{V}$, $I_E = 0$			1000	μA
h_{FE}	DC forward current gain *	$V_{CE} = 5\text{V}$, $I_C = 1\text{A}$	10	50	180	-
P_o	Output power	$V_{cc} = 28\text{V}$, $P_{in} = 0.7\text{W}$, $f = 1.65\text{GHz}$	6.0	7.0		W
η_c	Collector efficiency		45	50		%

Note. Above parameters, ratings, limits and conditions are subject to change.

TEST CIRCUIT (f=1.65GHz)



Dimensions : mm

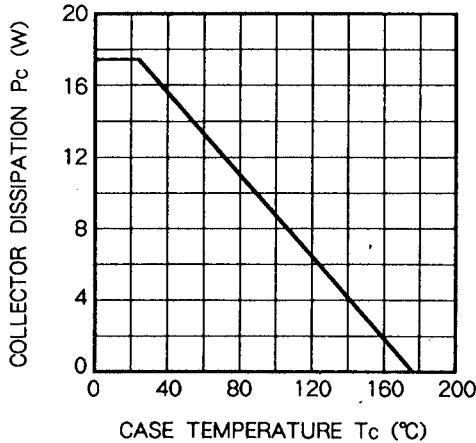
Cc : 47pF Chip capacita

C : 49pF, 2200pF, 22000pF, 100 μ F

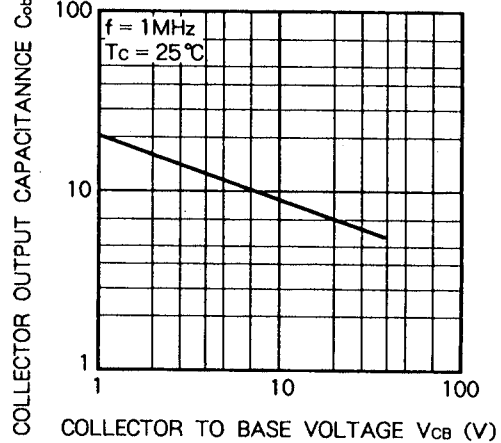
Board Material : Tefron-Glass h = 0.8mm

TYPICAL PERFORMANCE DATA

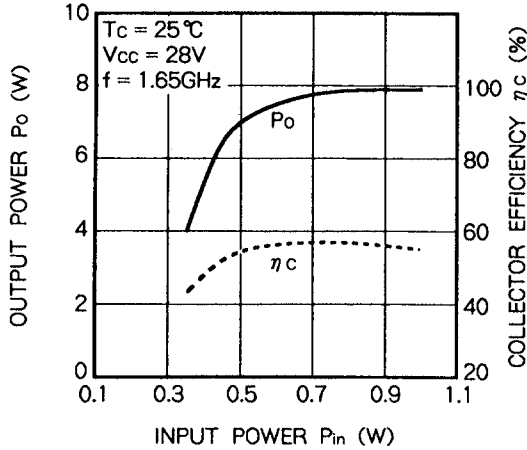
COLLECTOR DISSIPATION VS. CASE TEMPERATURE CHARACTERISTICS



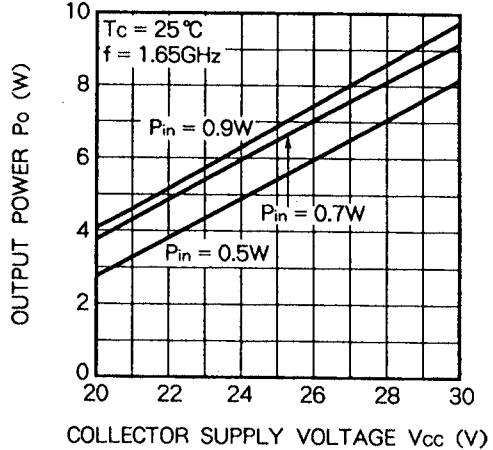
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE CHARACTERISTICS

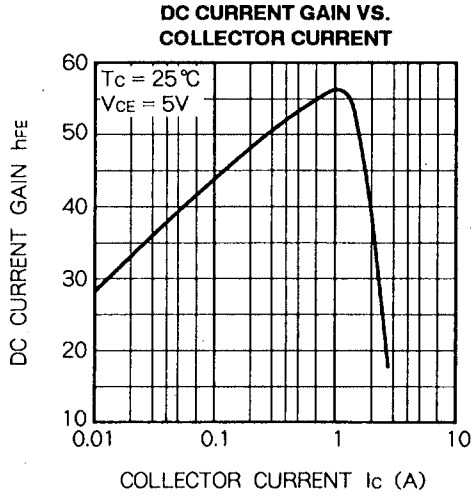


OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER CHARACTERISTICS



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE CHARACTERISTICS

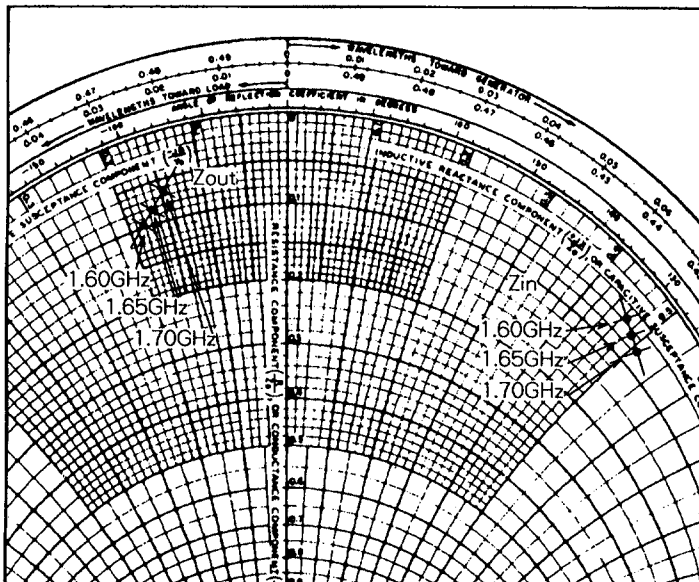




f (GHz)	Z_{in} (Ω)	Z_{out} (Ω)
1.60	$2.86 + j23.31$	$4.39 - j8.99$
1.65	$3.30 + j24.41$	$4.13 - j8.24$
1.70	$3.47 + j25.56$	$3.09 - j7.19$

CONDITIONS : $V_{cc} = 28V$, $f = 1.6 \sim 1.7GHz$
 $P_o = 6W$ CW

$Z_o = 50 \Omega$



INPUT AND OUTPUT SERIES IMPEDANCE 2SC4838