

MITSUBISHI RF POWER TRANSISTOR 2SC1965

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

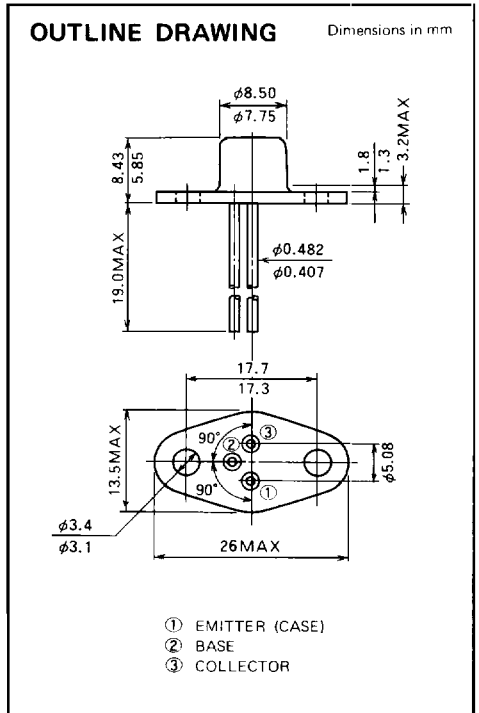
2SC1965 is a silicon NPN epitaxial planar type transistor designed for industrial use RF power amplifiers on VHF band mobile radio applications.

FEATURES

- High power gain: $G_{pe} \geq 10\text{dB}$
@ $V_{CC} = 13.5\text{V}$, $P_O = 6\text{W}$, $f = 175\text{MHz}$
- T_C -17 metal seled package for high reliability.
- Emitter ballasted construction for good performances.
- Emitter electrode is connected electrically to the case.
- Ability of withstanding more than 20:1 load VSWR when operated at $V_{CC} = 15.2\text{V}$, $P_O = 6\text{W}$, $f = 175\text{MHz}$, $T_C = 25^\circ\text{C}$.

APPLICATION

4 watt pauer amplifiers in VHF band mobile radio applications.



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

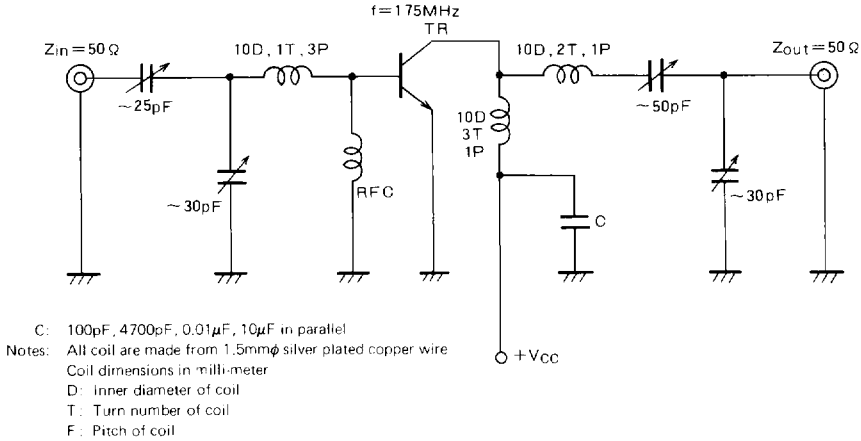
Symbol	Parameter	Conditions	Ratings	Unit
V_{CB0}	Collector to base voltage		35	V
V_{EB0}	Emitter to base voltage		4	V
V_{CE0}	Collector to emitter voltage	$R_{BE} = \infty$	17	V
I_C	Collector current		1	A
P_C	Collector dissipation	$T_a = 25^\circ\text{C}$	1.5	W
		$T_C = 25^\circ\text{C}$	15	W
T_j	Junction temperature		+175	$^\circ\text{C}$
T_{stg}	Storage temperature		-65 ~ +175	$^\circ\text{C}$
R_{th-a}	Thermal resistance	Junction to ambient	100	$^\circ\text{C}/\text{W}$
R_{th-c}		Junction to case	10	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 5\text{mA}$, $I_C = 0$	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 10\text{mA}$, $I_E = 0$	35			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 50\text{mA}$, $R_{BE} = \infty$	17			V
I_{CBO}	Collector cutoff current	$V_{CB} = 25\text{V}$, $I_E = 0$			500	μA
I_{EBO}	Emitter cutoff current	$V_{EB} = 3\text{V}$, $I_C = 0$			500	μA
h_{FE}	DC forward current gain*	$V_{CE} = 10\text{V}$, $I_C = 0.1\text{A}$	10	50	180	—
P_O	Output power**	$V_{CC} = 13.5\text{V}$, $P_{in} = 0.6\text{W}$, $f = 175\text{MHz}$	6	6.5		W
η_C	Collector efficiency		50	60		%

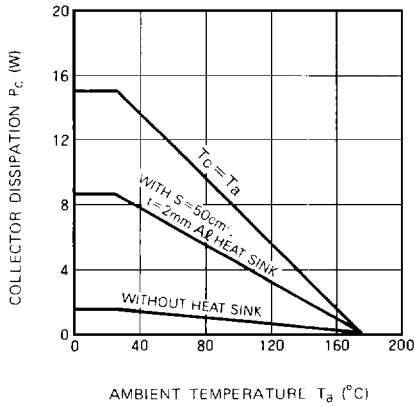
* Note: Pulse test, $P_W = 150\mu\text{s}$, duty = 5%.
Note: In case of the case grounded.

TEST CIRCUIT

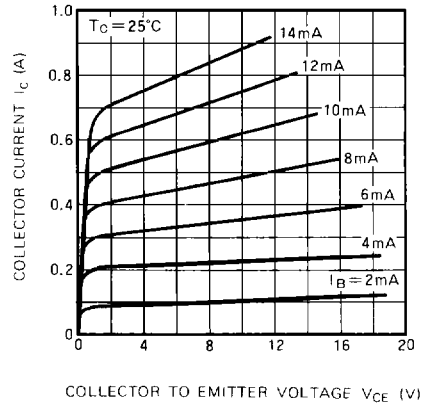


TYPICAL PERFORMANCE DATA

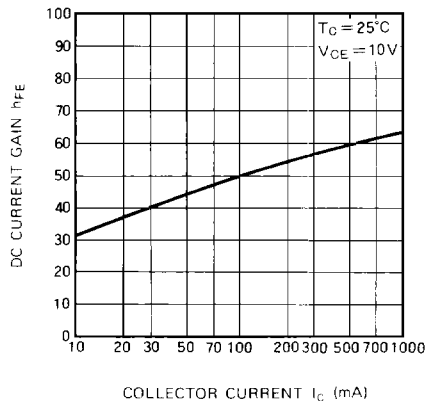
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



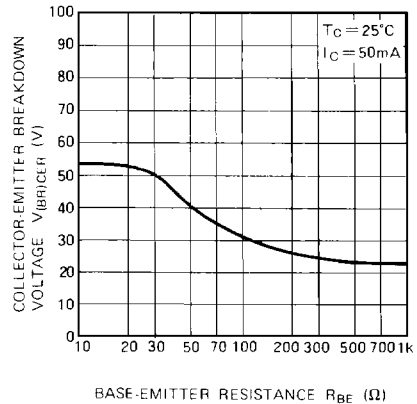
OUTPUT CHARACTERISTICS, COMMON EMITTER



DC CURRENT GAIN VS. COLLECTOR CURRENT

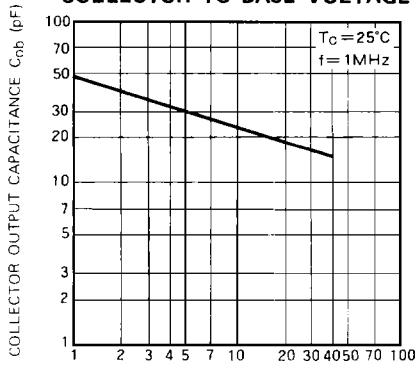


COLLECTOR-EMITTER BREAKDOWN VOLTAGE VS. BASE-EMITTER RESISTANCE



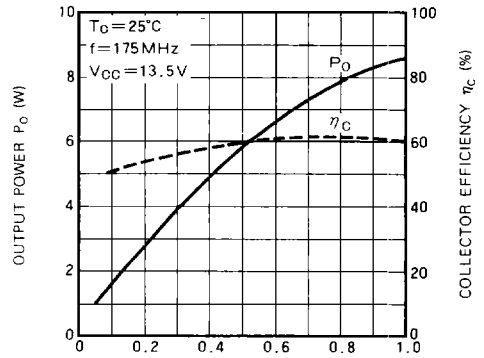
NPN EPITAXIAL PLANAR TYPE

COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



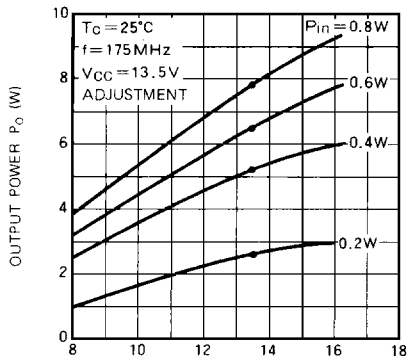
COLLECTOR TO BASE VOLTAGE V_{CB} (V)

OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



INPUT POWER P_{in} (W)

OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE



COLLECTOR SUPPLY VOLTAGE V_{CC} (V)