

DESCRIPTION

2SC1947 is a silicon NPN epitaxial planar type transistor designed for industrial use RF power amplifiers on VHF band mobile radio applications.

FEATURES

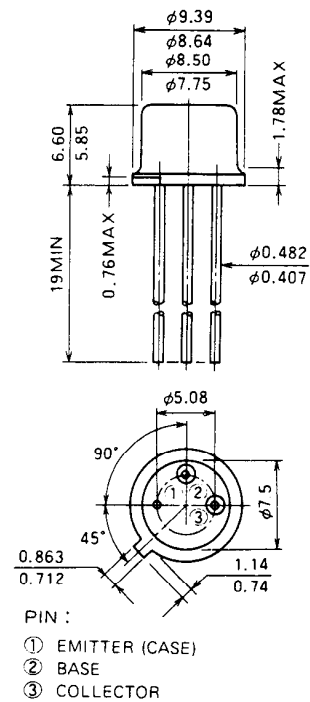
- High power gain: $G_{pe} \geq 10.7\text{dB}$
@ $V_{CC} = 13.5\text{V}$, $P_O = 3.5\text{W}$, $f = 175\text{MHz}$
- TO-39 metal sealed package for high reliability.
- Emitter electrode is connected electrically to the case.

APPLICATION

1 to 3 watt power amplifiers in VHF band mobile radio applications.

OUTLINE DRAWING

Dimensions in mm



T-8E

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		35	V
V_{EBO}	Emitter to base voltage		4	V
V_{CEO}	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	W
		$T_C = 25^\circ\text{C}$	10	W
T_j	Junction temperature		175	$^\circ\text{C}$
T_{stg}	Storage temperature		-65 to 175	$^\circ\text{C}$
R_{th-a}	Thermal resistance	Junction to ambient	150	$^\circ\text{C/W}$
R_{th-c}		Junction to case	15	$^\circ\text{C/W}$

Note: Above parameters are guaranteed independently.

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 **	$V_{CC} = 13.5\text{V}$, $P_{in} = 0.3\text{W}$, $f = 175\text{MHz}$	3.5	4		W
η_C	Collector efficiency		50	60		%

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

** In case of the case grounded.

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

TEST CIRCUIT

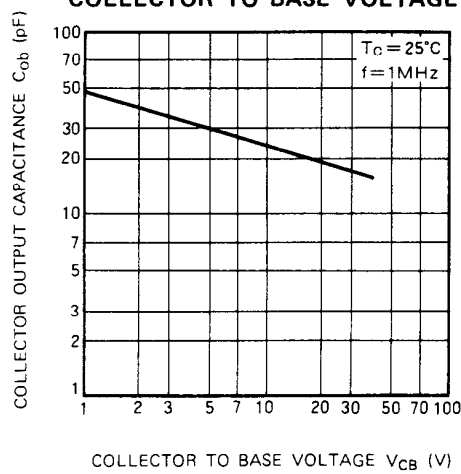


Graph showing Collector to Emitter Breakdown Voltage $V_{(BR)CE}$ (V) versus Base to Emitter Resistance R_{BE} (Ω) for a 2N4350 JFET. The graph indicates that the breakdown voltage is relatively constant at approximately 55V for low base resistance (10 Ω to 30 Ω) and then decreases as the base resistance increases, reaching about 22V at 1k Ω . Test conditions: $T_c = 25^\circ C$, $I_c = 50mA$.

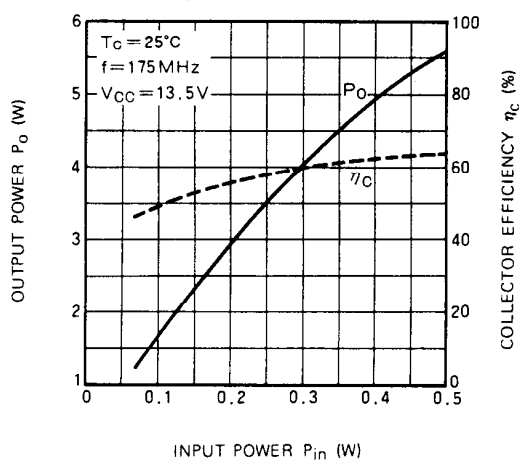
MITSUBISHI RF POWER TRANSISTOR
2SC1947

NPN EPITAXIAL PLANAR TYPE

**COLLECTOR OUTPUT CAPACITANCE VS.
COLLECTOR TO BASE VOLTAGE**



**OUTPUT POWER, COLLECTOR EFFICIENCY
VS. INPUT POWER**



**OUTPUT POWER VS. COLLECTOR
SUPPLY VOLTAGE**

