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RF POWER TRANSISTOR

2SC1946

NPN EPITAXIAL PLANAR TYPE

DISCRIPTION

2SC1946 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers on VHF band mobile radio applications.

FEATURES

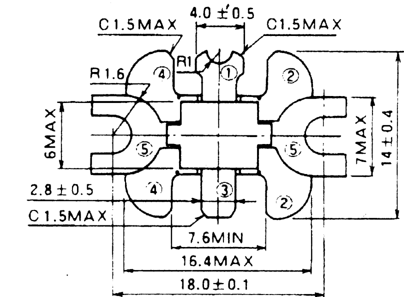
- High power gain: $G_{pe} \geq 6.7dB$ @V_{CC} = 13.5V, P_o = 28W, f = 175MHz
- Emitter ballasted construction and gold metallization for high reliability and good performances.
- Low thermal resistance ceramic package with flange.
- Ability of withstanding more than 20:1 load VSWR when operated at V_{CC} = 15.2V, P_o = 30W, f = 175MHz.

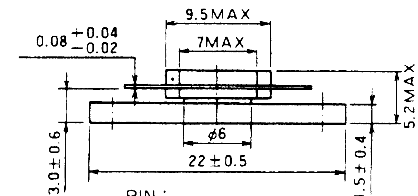
APPLICATION

25 watts output power amplifiers applications in VHF band.

OUTLINE DRAWING

Dimensions in mm





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

T-31E

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise specified)

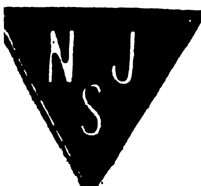
Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		35	V
V_{EBO}	Emitter to base voltage		4	V
V_{CEO}	Collector to emitter voltage	$R_{BE} = \infty$	17	V
I_C	Collector current		7	A
P_C	Collector dissipation	Ta = 25°C	3	W
		T_C = 25°C	50	W
T_j	Junction temperature		175	°C
Tstg	Storage temperature		−65 to 175	°C
Rth-a	Thermal resistance	Junction to ambient	50	°C/W
Rth-c		Junction to case	3	°C/W

Note. Above parameters are guaranteed independently

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Limits Min	Limits Typ	Limits Max	Unit
$V_{(BR)EBO}$	Emitter to base breakdown voltage	I_E = 10mA, I_C = 0	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C = 10mA, I_E = 0	35			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C = 100mA, $R_{BE} = \infty$	17			V
I_{CBO}	Collector cutoff current	V_{CB} = 25V, I_E = 0			2	mA
I_{EBO}	Emitter cutoff current	V_{EB} = 3V, I_C = 0			1	mA
h_{FE}	DC forward current gain *	V_{CE} = 10V, I_C = 0.2A	10	50	180	—
P_O	Output power	V_{CC} = 13.5V, P_{in} = 6W, f = 175MHz	28	32		W
η_C	Collector efficiency		60	70		%

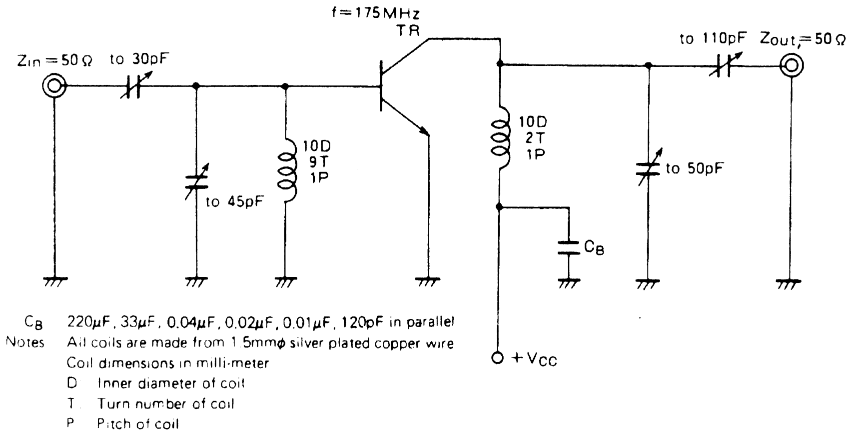
Note * Pulse test, P_W = 150μs, duty = 5%.
Above parameters, ratings, limits and conditions are subject to change.



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders

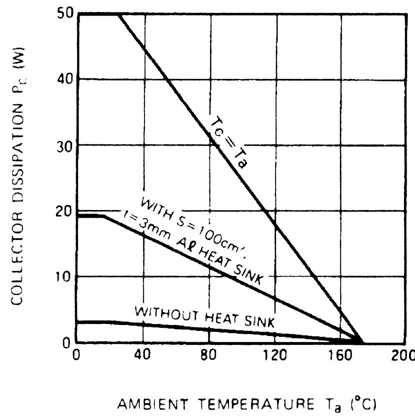
NPN EPITAXIAL PLANAR TYPE

TEST CIRCUIT

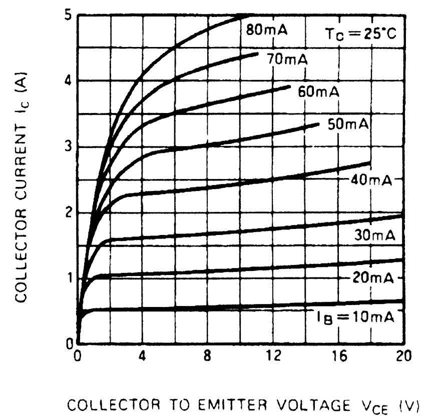


TYPICAL PERFORMANCE DATA

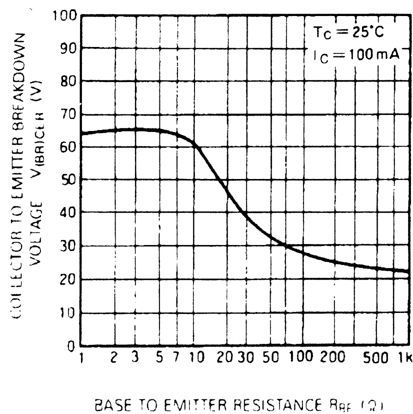
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



DC CURRENT GAIN VS. COLLECTOR CURRENT