MITSUBISHI RF POWER TRANSISTOR

2SC3241

NPN EPITAXIAL PLANAR TYPE

DISCRIPTION

2SC3241 is a silicon NPN epitaxial planar type transistor specifically designed for high power amplifiers in HF band.

FEATURES

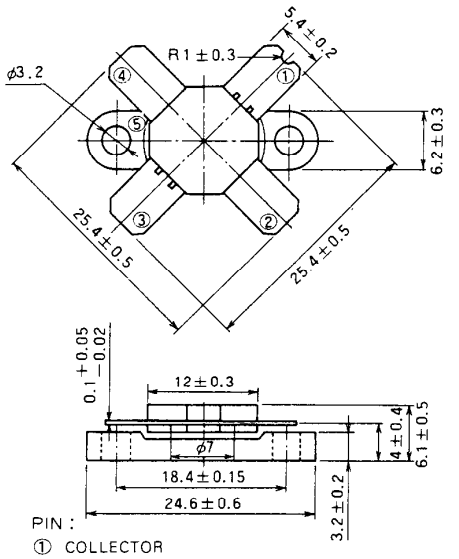
- High gain: $G_{pe} \geqq 12.3$dB
  @f = 30MHz, V_{CC} = 12.5V, P_{in} = 4W
- High ruggedness: Ability to withstand 20:1 load VSWR when operated at f = 30MHz, V_{CC} = 15.2V, P_O = 75W, T_C = 25°C.
- Emitter ballasted construction
- Low thermal resistance ceramic package with flange
- Input-output impedance: Z_{in} = 0.5 – j1.0(Ω), Z_{out} = 1.15 – j1.4(Ω) @f = 30MHz, V_{CC} = 12.5V, P_O = 75W

APPLICATION

Output stage of transmitter in HF band SSB mobile radio sets.

OUTLINE DRAWING

Dimensions in mm



PIN :
① COLLECTOR
② EMITTER
③ BASE
④ EMITTER
⑤ FIN

NOTE: EMITTER ELECTRODES ARE CONNECTED WITH FLANGE.

T-45E

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		50	V
V_{EBO}	Emitter to base voltage		5	V
V_{CEO}	Collector to emitter voltage	R_{BE} = ∞	20	V
I_C	Collector current		18	A
P_C	Collector dissipation	T_a = 25°C	7.5	W
		T_C = 25°C	180	W
T_j	Junction temperature		175	°C
T_{stg}	Storage temperature		−55 to 175	°C
R_{th-a}	Thermal resistance	Junction to ambient	20	°C/W
R_{th-c}		Junction to case	0.83	°C/W

Note. Above parameters are guaranteed independently.

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

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	I_E = 20mA, I_C = 0	5			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C = 10mA, I_E = 0	50			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C = 100mA, R_{BE} = ∞	20			V
I_{CBO}	Collector cutoff current	V_{CB} = 25V, I_E = 0			5	mA
I_{EBO}	Emitter cutoff current	V_{EB} = 2V, I_C = 0			4	mA
h_{FE}	DC forward current gain*	V_{CE} = 10V, I_C = 0.1A	10	50	180	—
P_O	Output power	f = 30MHz, V_{CC} = 12.5V, P_{in} = 4W	75	85		W
η_C	Collector efficiency		55	65		%

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

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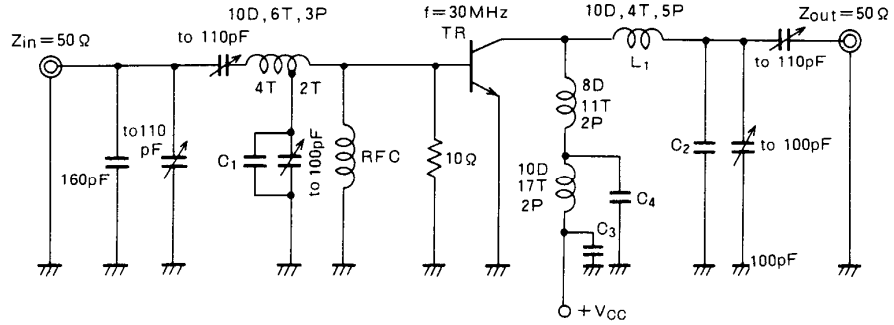
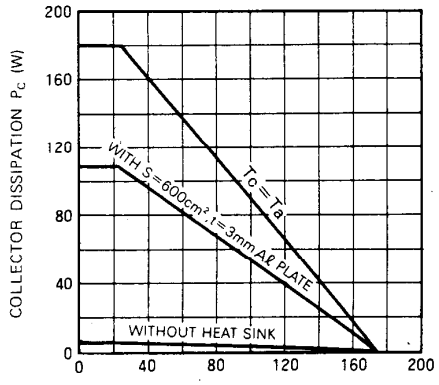
TEST CIRCUIT



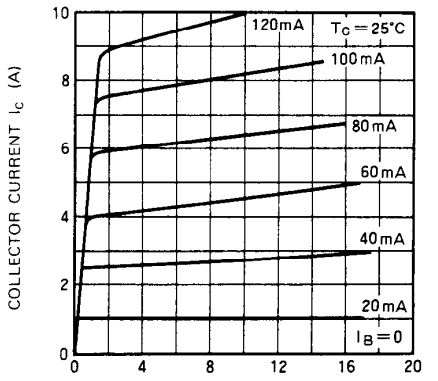
C_1: 160pF, 160pF, 82pF in parallel
C_2: 82pF, 82pF, 82pF in parallel
C_3: 100pF, 4700pF, 4700pF, 0.22μF, 0.22μF, 33μF, 330μF in parallel
C_4: 100pF, 220pF, 4700pF, 0.1μF, 330μF in parallel
RFC: 27 Turns 1φ enameled wire
NOTES: All coils but L_1 are made from 1.5φmm silver plated coper wire, L_1 is made from 2.3φmm copper wire.
D: Inner diameter of coil
T: Turn number of coil
P: Pitch of coil
Dimension is milli-meter

TYPICAL PERFORMANCE DATA

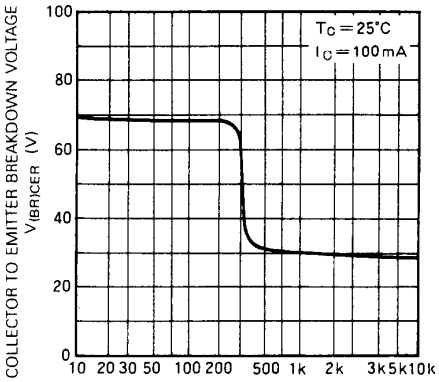
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



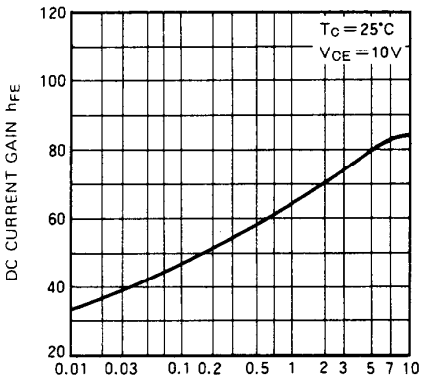
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



DC CURRENT GAIN VS. COLLECTOR CURRENT



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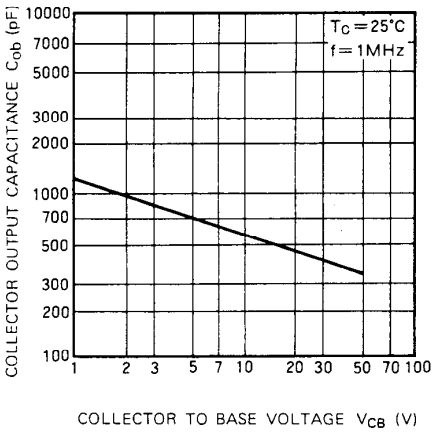
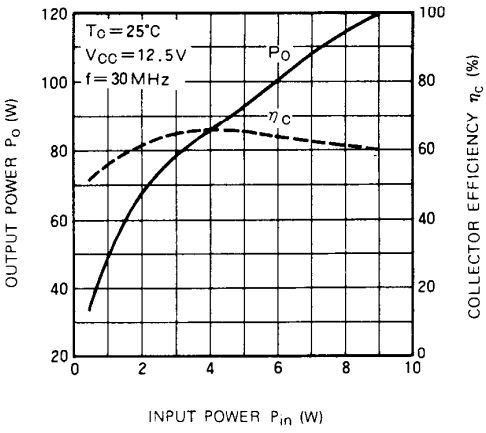
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE