MITSUBISHI RF POWER TRANSISTOR

2SC3629

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC3629 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers in UHF band 7.2 volts operation applications.

FEATURES

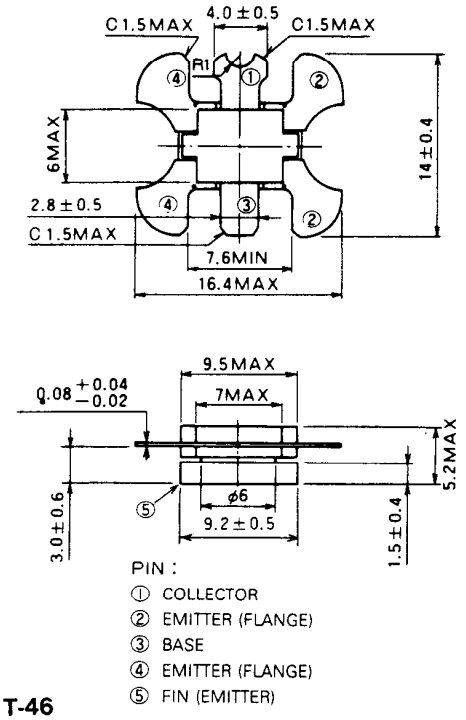
- High gain: $G_{pe} \geqq 7.7$dB
  @V_{CC} = 7.2V, f = 520MHz, P_{in} = 0.2W
- Ability of withstanding more than 20:1 load VSWR when operated at f = 520MHz, V_{CC} = 9V, P_O = 1.2W, T_C = 25°C.
- Emitter ballasted construction.
- Flange type ceramic package.

APPLICATION

Output stage of 1W output mobile radio equipment in UHF band

OUTLINE DRAWING

Dimensions in mm



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ABSOLUTE MAXIMUM RATINGS (Tc=25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		20	V
V_{EBO}	Emitter to base voltage		3.5	V
V_{CEO}	Collector to emitter voltage	$R_{BE}=\infty$	9	V
I_C	Collector current		1	A
P_C	Collector dissipation	Tc=25℃	5	W
T_j	Junction temperature		175	℃
Tstg	Storage temperature		−55 to 175	℃
Rth-c	Thermal resistance		30	℃/W

Note. Above parameters are guaranteed independently.

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

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	I_C=10mA, I_E=0	20			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_E=1mA, I_C=0	3.5			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C=10mA, $R_{BE}=\infty$	9			V
I_{CBO}	Collector cutoff current	V_{CB}=10V, I_E=0			200	μA
I_{EBO}	Emitter cutoff current	V_{EB}=2V, I_C=0			200	μA
h_{FE}	DC forward current gain *	V_{CE}=5V, I_C=0.1A	20	50	180	—
P_O	Output power	V_{CC}=7.2V, f=520MHz, Pin=0.2W	1.2	1.5		W
η_C	Collector efficiency		55	60		%

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

MITSUBISHI ELECTRIC

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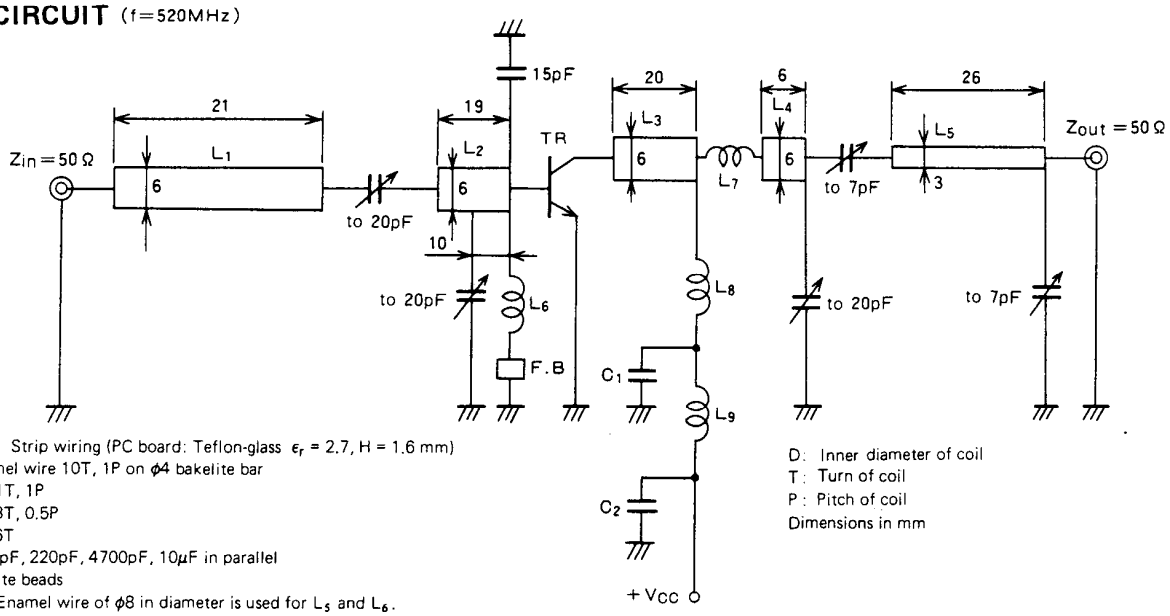
TEST CIRCUIT (f=520MHz)

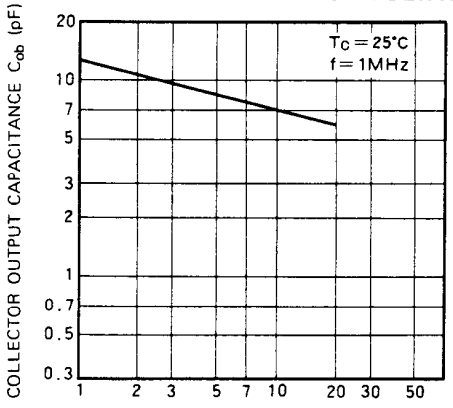


L_1 to L_5 : Strip wiring (PC board: Teflon-glass ϵ_r = 2.7, H = 1.6 mm)
L_6: Enamel wire 10T, 1P on ϕ4 bakelite bar
L_7: 8D, 1T, 1P
L_8: 5D, 3T, 0.5P
L_9: 5D, 6T
L_1, L_2: 82pF, 220pF, 4700pF, 10μF in parallel
F.B.: Ferrite beads
NOTE : Enamel wire of ϕ8 in diameter is used for L_5 and L_6.

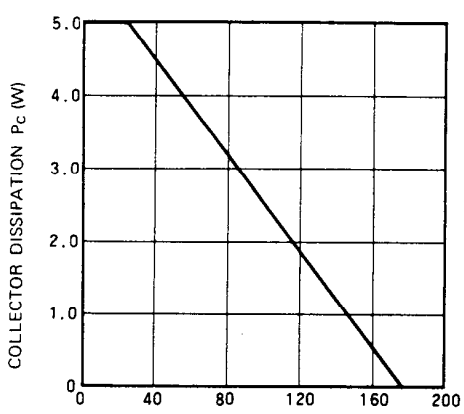
D: Inner diameter of coil
T: Turn of coil
P: Pitch of coil
Dimensions in mm

TYPICAL PERFORMANCE DATA

COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



COLLECTOR DISSIPATION VS. CASE TEMPERATURE



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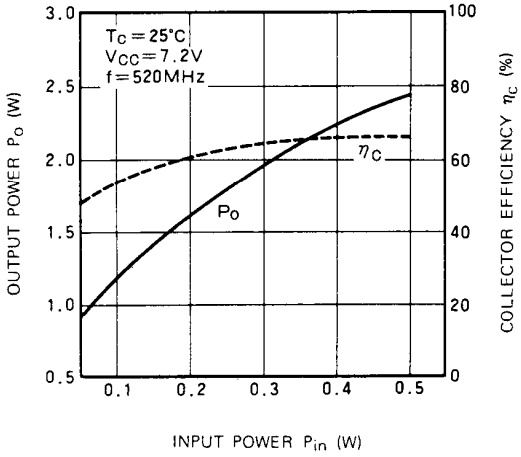
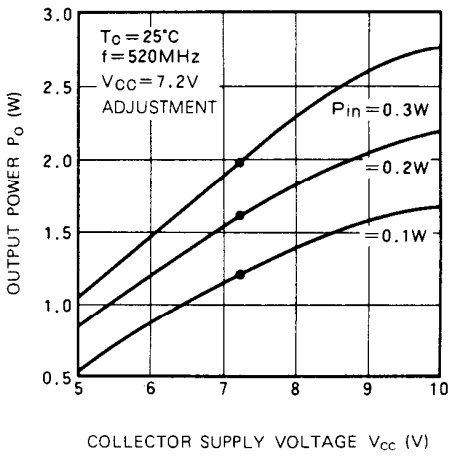
NPN EPITAXIAL PLANAR TYPE

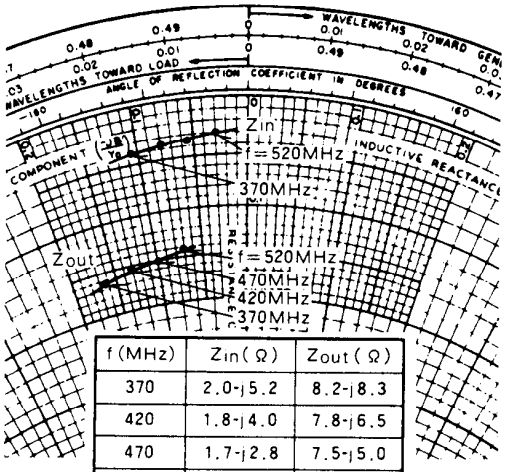
OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE VARIATION



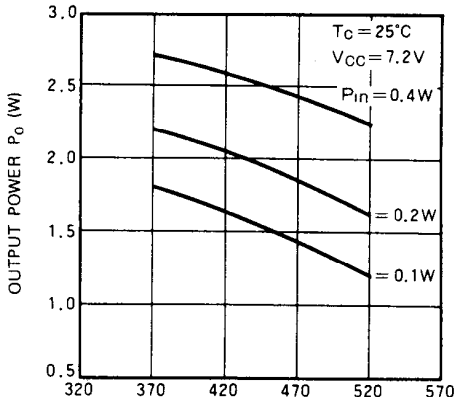
INPUT/OUTPUT IMPEDANCE VS. FREQUENCY



f (MHz)	Zin (Ω)	Zout (Ω)
370	2.0-j5.2	8.2-j8.3
420	1.8-j4.0	7.8-j6.5
470	1.7-j2.8	7.5-j5.0
520	1.5-j1.5	7.0-j3.5

CONDITIONS: V_{CC} = 7.2V, P_O = 1.5W

OUTPUT POWER VS. FREQUENCY



PRECAUTIONS FOR MOUNTING HIGH-FREQUENCY HIGH-OUTPUT TRANSISTOR FOR MOBILE RADIO EQUIPMENT

When mounting high-frequency, high-output transistors for mobile radio equipment (flange screw fastening part cut package), care should be taken to the following points.

1. When mounting the device to the heat sink, silicon compound should be applied to the heat sink and device heat radiating fin and apply the device to the heat sink using a proper fastening tool.
2. If the device is soldered directly to heat sink, excessive thermal stress will result in deteriorating the reliability. Do not use this mounting method.
3. Care should be taken, if the device is applied to the heat sink, the force of soldering the leads to the printed circuit board results in continual mechanical stress, deteriorating the reliability and performance of the system.
4. Refer to Mitsubishi's DATABOOK or manuals for transistors, small-signal diodes and integrated circuit modules for mounting and handling of the device.