New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

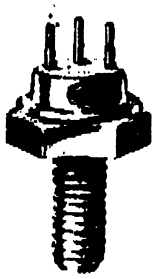
TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

RF POWER TRANSISTORS

2N5090

SILICON N-P-N "overlay" TRANSISTOR

High-Gain Type for Class-A, -B, or -C Operation in VHF/UHF Circuits



JEDEC TO-60

RCA-2N5090* is an epitaxial silicon n-p-n planar transistor employing an advanced version of the RCA-developed overlay emitter-electrode design. It is intended for rf amplifier, frequency-multiplier, and oscillator service in VHF and UHF communications equipment.

This overlay transistor features a structure with many isolated emitter sites connected in parallel by means of a diffused-grid structure and a deposited metal overlay. The overlay design provides a very high emitter periphery-to-emitter area ratio resulting in low output capacitance, high rf-current handling capability, and high power gain.

*Formerly RCA Dev. Type No. TA7146

- Maximum Safe-Area-of-Operation Curve
- 1.2 Watts (Min.) Output at 400 MHz (7.8-dB Gain)
- 1.6 Watts (Typ.) Output at 175 MHz (12-dB Gain)
- Hermetic Stud-Type Package
- All Electrodes Isolated from Stud

MAXIMUM RATINGS, *Absolute-Maximum Values:*

COLLECTOR-TO-BASE VOLTAGE ... V_{CBO}	55	V
COLLECTOR-TO-EMITTER VOLTAGE:		
With external base-to-emitter resistance, R_{BE} = 10 Ω ..... V_{CER}	55	V
With base open ..... V_{CEO}	30	V
EMITTER-TO-BASE VOLTAGE..... V_{EBO}	3.5	V
COLLECTOR CURRENT ..... I_C	0.4	A
TRANSISTOR DISSIPATION ..... P_T		
At case temperatures up to 75° C	5	W
At case temperatures above 75° C	Derate linearly at 0.04 W/°C	
TEMPERATURE RANGE:		
Storage & Operating (Junction)	−65 to +200	°C
LEAD TEMPERATURE (During soldering):		
At distances ≥ 1/32 in. (0.79 mm) from insulating wafer for 10 s max	230	°C

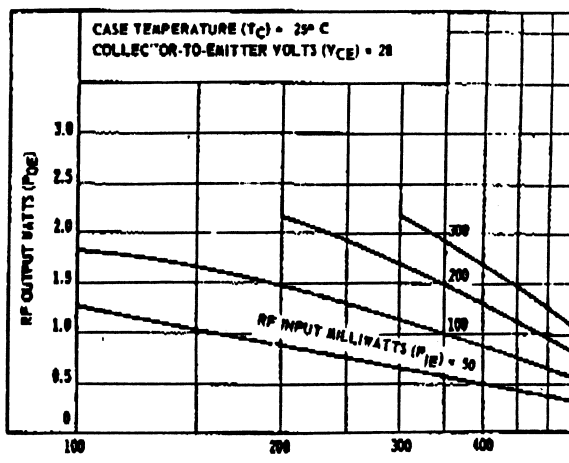


Fig. 1 - Typical Output Power vs. Frequency

Information furnished by RCA is believed to be accurate and reliable. However, no responsibility is assumed by RCA for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of RCA.

NJS

Quality Semi-Conductors

New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C) = 25° C

CHARACTERISTIC	SYMBOL	TEST CONDITIONS					LIMITS		UNITS
		DC COLLECTOR VOLTS		DC CURRENT mA					
		V_{CB}	V_{CE}	I_E	I_B	I_C	Min.	Max.	
Collector-Cutoff Current	I_{CEO}		28		0		-	20	μA
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$			0		0.1	55	-	V
Collector-to-Emitter Sustaining Voltage: With external base-to-emitter resistance (R_{BE}) = 10 Ω	$V_{CER(sus)}$					5	55[a]	-	V
With base open	$V_{CEO(sus)}$				0	5	30	-	V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$			0.1		0	3.5	-	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$				20	100	-	1.0	V
Collector-to-Base Capacitance (Measured at 1 MHz)	C_{obo}	30		0			-	3.5	pF
RF Power Output: As Class-C Amplifier, Unneutralized At 400 MHz *(See Fig. 2 & 3)*	P_{OE}		28 (V_{CC})				1.2[b]	-	W
Gain-Bandwidth Product	f_T		15			50	500	-	MHz

[a] Pulsed through an inductor (25 mH); duty factor = 0.05.

[b] For P_{IE} = 0.2 W; minimum efficiency = 45%.

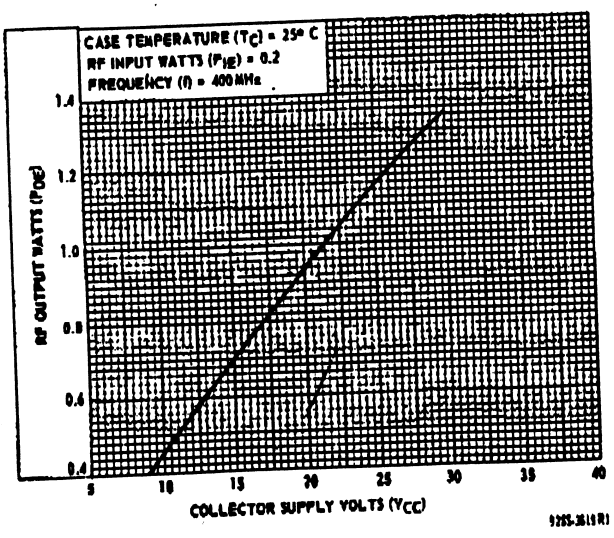
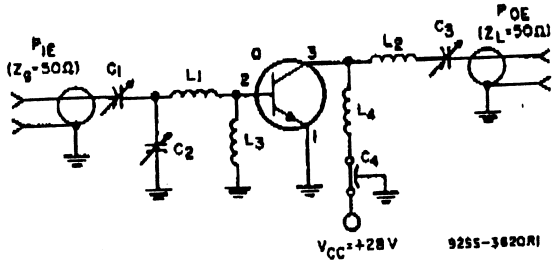


Fig. 2 - Typical Output Power vs. Collector Supply Voltage for Circuit Shown in Fig. 3



C_1: 0.9-7 pF, ARCO 400, or equivalent
C_2, C_3: 1.5-20 pF, ARCO 402, or equivalent
C_4: 1,000 pF, feed through type

L_1: 2 turns No. 18 wire, 1/4 in. ID, 1/8 in. long
L_2: 3 turns No. 16 wire, 1/4 in. ID, 3/8 in. long
L_3: 0.1 μH, rf choke
L_4: 2 turns No. 18 wire, 1/8 in. ID, 1/8 in. long
Q: 2N5090

Fig. 3 - 400-MHz RF Amplifier Test Circuit for Measurement of Output Power