SOLID STATE MICROWAVE

THOMSON-CSF COMPONENTS CORPORATION
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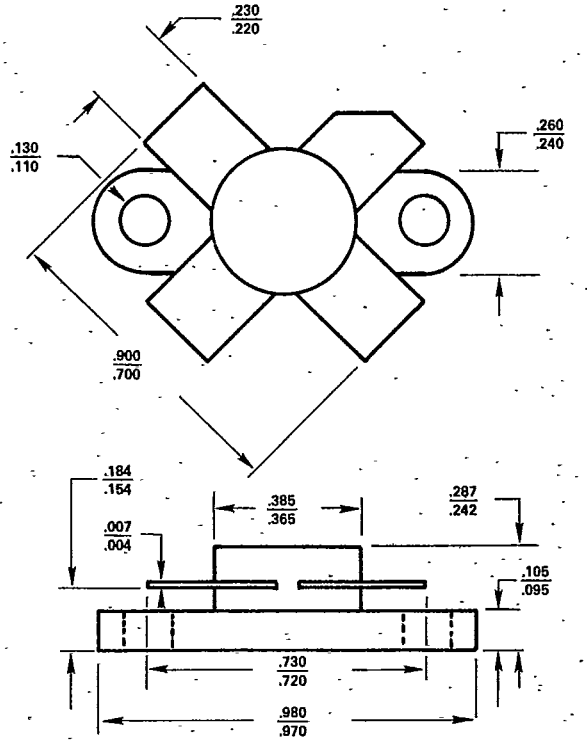
SD1013-3

VHF COMMUNICATIONS TRANSISTOR

DESCRIPTION

The SD1013-3 is an epitaxial silicon NPN planar transistor designed primarily for 12.5 volt AM class C rf amplifiers functional in the aviation band 118-136 MHz and for 28V FM class C rf amplifiers utilized in ground station transmitters.



.380 4LFL

FEATURES

- Designed for VHF 12.5V AM and 28V FM transmitters.
- 10 watts (minimum) with greater than 10 db gain at 28 volts.
- Withstands infinite VSWR under operating conditions.
- Low inductance stripline package.
- All leads electrically isolated from flange.

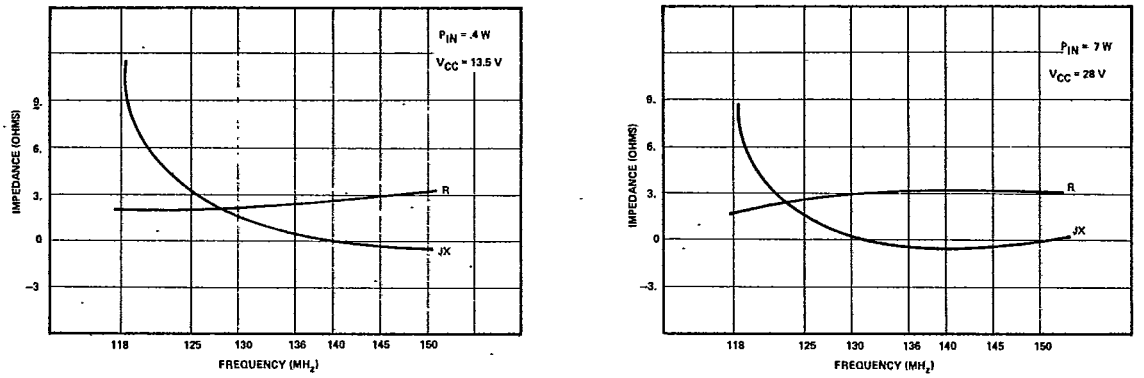
ABSOLUTE MAX. RATINGS (+25°C except where noted)

V_{CBO}	:	Collector-Base Voltage	65.0 V
V_{CEO}	:	Collector-Emitter Voltage	35.0 V
V_{EBO}	:	Emitter-Base Voltage	4.0 V
I_c (max)	:	Collector Current	1.0 A
PT.	:	Total Device Dissipation at +25°C	13 Watts
ϕ_j	:	Thermal Resistance	13.5 C/W
T_j	:	Junction Temperature (operating)	+200°C
T_s	:	Storage Temperature	–65°C to +200°C

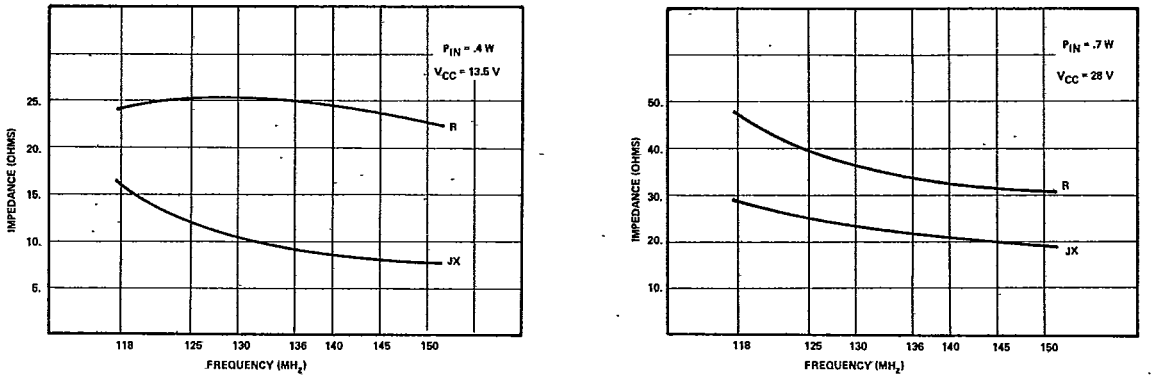
ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector-Emitter Breakdown Voltage*	BV_{CEO}	I_c = 200 mA, I_b = 0	35.0	–	–	V_{dc}
Collector-Emitter Breakdown Voltage*	BV_{CES}	I_c = 200 mA, V_{be} = 0	65.0	–	–	V_{dc}
Emitter-Base Breakdown Voltage	BV_{EBO}	I_e = 10.0 mA, I_c = 0	4.0	–	–	V_{dc}
Collector Cut-Off Current	I_{CBO}	V_{cb} = 30V, I_e = 0	–	–	1.0	mA
DC Current Gain	h_{FE}	V_{ce} = 5V, I_c = 200mA	5.0	–	–	–
*Pulsed through 25mH Inductor						
RF CHARACTERISTICS: SMALL SIGNAL						
Gain Bandwidth Product (100 MHz)	f(t)	V_{ce} = 10.0 V, I_c = 200 mA	250.0	–	–	MHz
Output Capacitance	C_{ob}	V_{cb} = 30.0 V, I_e = 0, f_o = 1.0 MHz	–	–	15.0	pF
Input Capacitance	C_{ib}	V_{eb} = 0.5 V, I_c = 0, f_o = 1.0 MHz	–	50	–	pF
RF CHARACTERISTICS: LARGE SIGNAL	–	150 MHz Operation:	13.5 V	28 V		
Amplifier power out	P_o	minimum	3.0	10.0		watts
Amplifier power gain	P_g	minimum	10.0	10.0		dB
Impedances-Input	Z_s	f_o = 150 MHz, V_{ce} = 28 V	(3.1 – J 0.1)	Typ.		ohms
Impedance-Output (Pin = .7 W)	Z_{cl}	f_o = 150 MHz, V_{ce} = 28 V	(31 + J 18.5)	Typ.		ohms

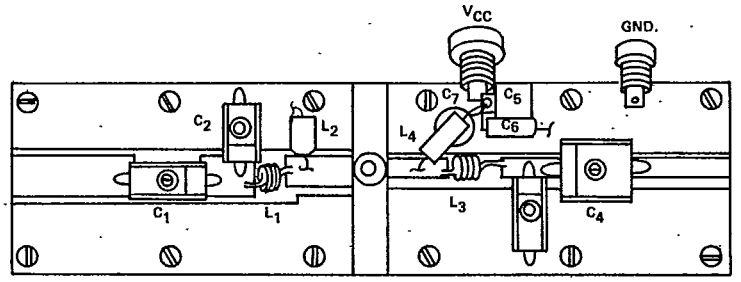
SD - - - 10133 - 1X

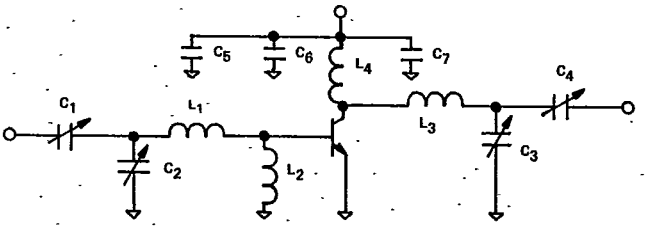


SERIES SOURCE IMPEDANCE VS FREQUENCY (13.5V, 28V)



SERIES COLLECTOR LOAD IMPEDANCE VS FREQUENCY (13.5V, 28V)

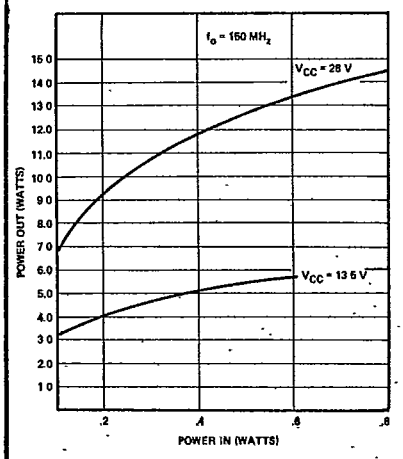




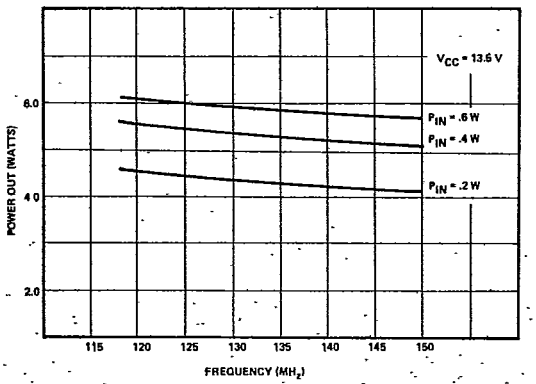
COMPONENT LIST

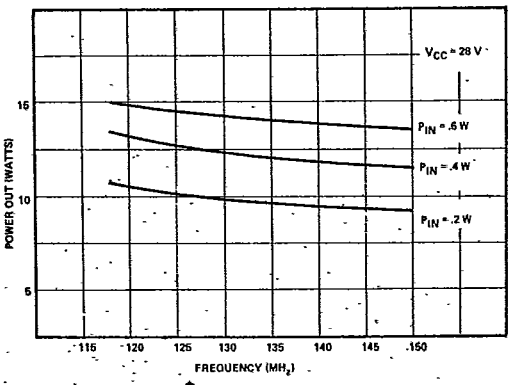
C_1, C_2	ARCO 422	C_7	.01 pf CERAMIC DISC.
C_3	ARCO 421	L_1	3T #22, 1/8 ID
C_4	ARCO 464	L_2	RFC FERROXCUBE
C_5	1000 pf UNELCO	L_3	3T #18, 1/4 ID
C_6	10 μf ELECTROLYTIC 35V	L_4	.47 μh MOLDED CHOKE

TEST CIRCUIT



POWER OUT VS POWER IN





POWER OUT VS FREQUENCY (13.5V, 28V)