SSM
SOLID STATE MICROWAVE
THOMSON-CSF COMPONENTS CORPORATION
Montgomeryville, PA 18936 ■ (215) 362-8500 ■ TWX 510-661-7299

SD1416

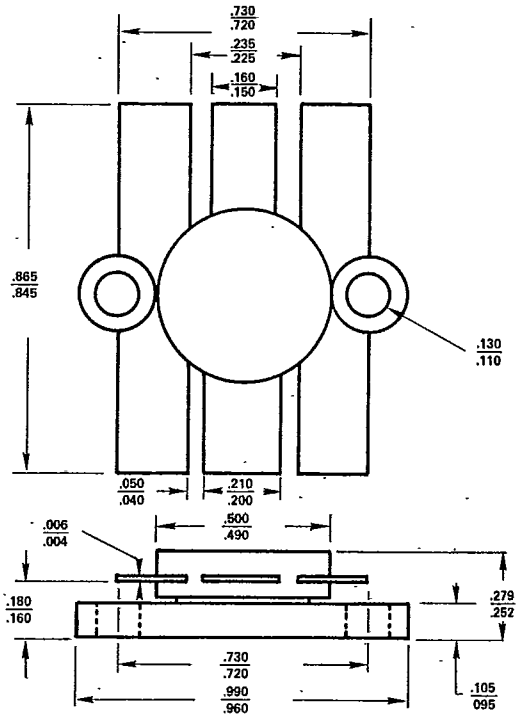
VHF COMMUNICATIONS TRANSISTOR

DESCRIPTION

SSM device type SD1416 is a 12.5 volt epitaxial silicon NPN planar transistor designed primarily for VHF communications. This device utilizes "Tuned Q" technology which incorporates a matching network on the input to provide both high gain and broadband operation.

FEATURES

- Designed for VHF military and commercial equipment
- 70.0 watts (min.) with greater than 6.7 dB gain
- Withstands infinite VSWR under operating conditions
- Input matched for wide bandwidth
- High gain



.500 6LFL

ABSOLUTE MAX. RATING

V_{CBO}	:	Collector-Base Voltage	36.0 V
V_{CEO}	:	Collector-Emitter Voltage	18.0 V
V_{EBO}	:	Emitter-Base Voltage	4.0 V
I_c	:	Collector Current (max.)	20.0 A
PT	:	Total Device Dissipation @25° Case	220 W
ϕ_{jc}	:	Thermal Resistance	.795°C/W
T_j	:	Junction Temperature	+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 = 50 mA, I_b = 0	18.0	–	–	V_{dc}
Collector-Emitter Breakdown Voltage*	BV_{CES}	I_c = 100 mA, V_{be} = 0	36.0	–	–	V_{dc}
Emitter-Base Breakdown Voltage	BV_{EBO}	I_e = 10 mA, I_c = 0	4.0	–	–	V_{dc}
Collector Cut Off Current	I_{CBO}	V_{cb} = 15 V, I_e = 0	–	–	5.0	mA
DC Current Gain	h_{FE}	V_{ce} = 5 V, I_c = 10A	20.0	–	–	–

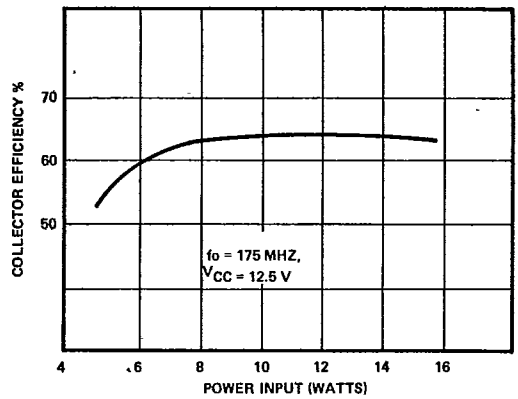
*Pulsed through 25 MH Inductor

RF CHARACTERISTICS: SMALL SIGNAL

Output Capacitance – F_o = 1.0 MHz	C_{ob}	V_{cb} = 12.5 V, I_c = 0	–	–	300.0	pF

RF CHARACTERISTICS: LARGE SIGNAL

Amplifier power out		P_o	175 MHz/12.5 V	70.0	–	–	watts
Amplifier power gain		P_g		6.7	–	–	dB
Impedance – Input	70.0 watts	Z_s	175 MHz/12.5 V	.58 + J .44			ohms
Impedance – Output		Z_{cl}		.72 + J .44			ohms

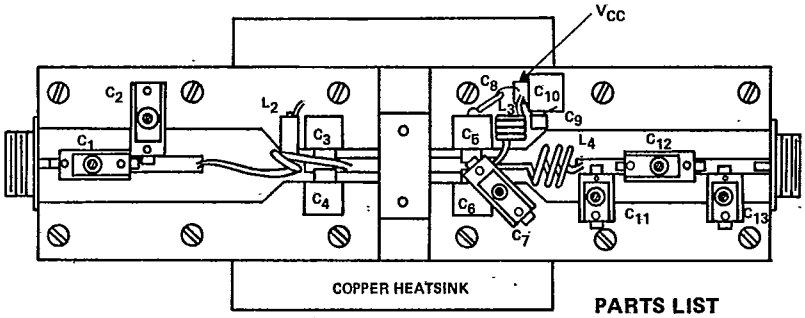


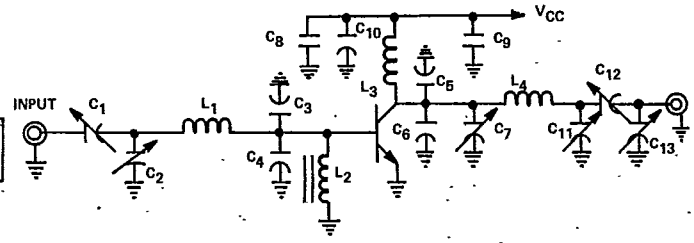
COLLECTOR EFFICIENCY VS. POWER INPUT

SD1416

IMPEDANCE VS. FREQUENCY

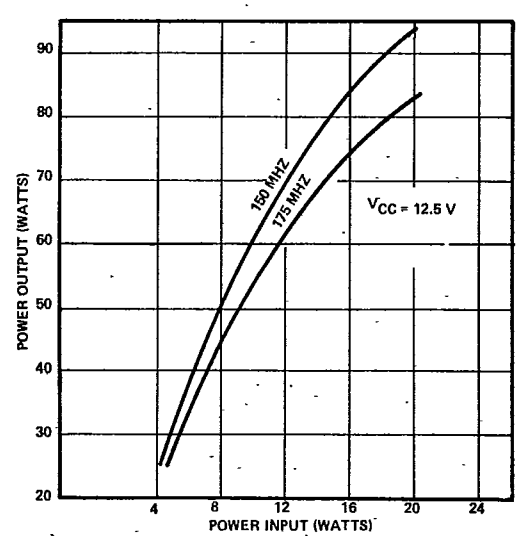
V_{cc}	P_{IN} (W)	f_o (MHz)	Z_{SOURCE}	Z_{LOAD}
12.5 V	15.0	175.	.58 + J .44 Ω	.72 + J .44 Ω
12.5 V	15.0	150.	.58 + J .44 Ω	.72 + J .87 Ω





PARTS LIST

C_1, C_7	ARCO 423 MICA CAP. – 7 pf → 100 pf
C_2, C_{12}	ARCO 422 MICA CAP. – 4 pf → 40 pf
C_3, C_4, C_5, C_6	UNELCO BOOK MICA CAP. – 100 pf @ 350 VDC
C_8	ERIE DISC. CAP. – .01 μf @ 200 VDC
C_9	ERIE MONOLITHIC CAP. – .22 μf @ 50 VDC
C_{10}	UNELCO BOOK MICA. – 1000 pf @ 350 VDC
C_{11}	ARCO 400 MICA CAP. – .1 pf → 7 pf
C_{13}	ARCO 404 MICA CAP. – 8 pf → 60 pf
L_1	IT #12 TCB .25" I.D.
L_2	FERROXCUBE VK200
L_3	4T #12 TCB CLOSE SPACED .25" ID
L_4	3T #12 TCB SPACED #10 .5" ID



POWER OUTPUT VS. POWER INPUT