

THOMSON-CSF COMPONENTS CORPORATION

Montgomeryville, PA 18936 ■ (215) 362-8500 ■ TWX 510-661-7299

## 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

## 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
$\phi_{jc}$	: 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*	$BV_{CEO}$	$I_C = 50 \text{ mA}, I_b = 0$	18.0	—	—	$V_{dc}$
Collector-Emitter Breakdown Voltage*	$BV_{CES}$	$I_C = 100 \text{ mA}, V_{be} = 0$	36.0	—	—	$V_{dc}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_e = 10 \text{ mA}, I_C = 0$	4.0	—	—	$V_{dc}$
Collector Cut Off Current	$I_{CBO}$	$V_{cb} = 15 \text{ V}, I_e = 0$	—	—	5.0	mA
DC Current Gain	$h_{FE}$	$V_{ce} = 5 \text{ V}, I_C = 10 \text{ A}$	20.0	—	—	—

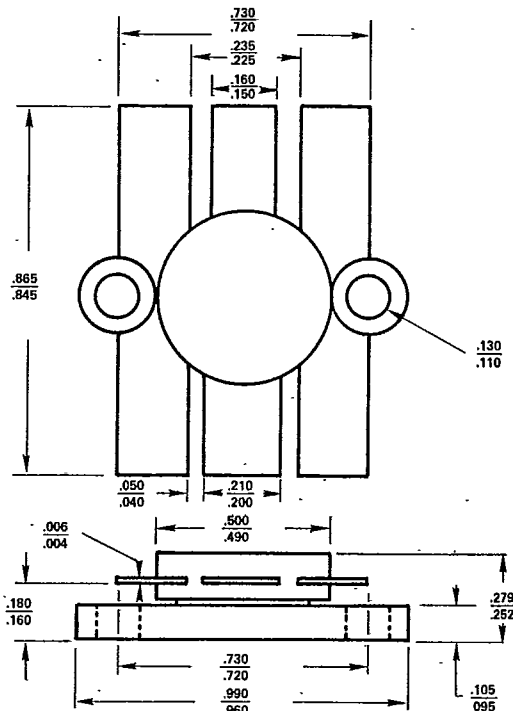
\*Pulsed through 25 MH Inductor

## RF CHARACTERISTICS: SMALL SIGNAL

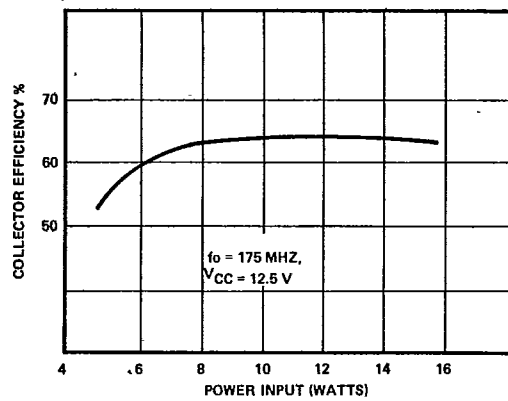
Output Capacitance — $F_o = 1.0 \text{ MHz}$	$C_{ob}$	$V_{cb} = 12.5 \text{ V}, I_C = 0$	—	—	300.0	pF
--	----------	------------------------------------	---	---	-------	----

## 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	$Z_s$	175 MHz/12.5 V	.58 + J .44			ohms
Impedance — Output	$Z_{cl}$		.72 + J .44			ohms



.500 6LFL

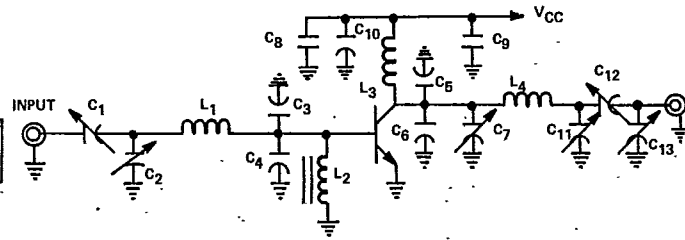
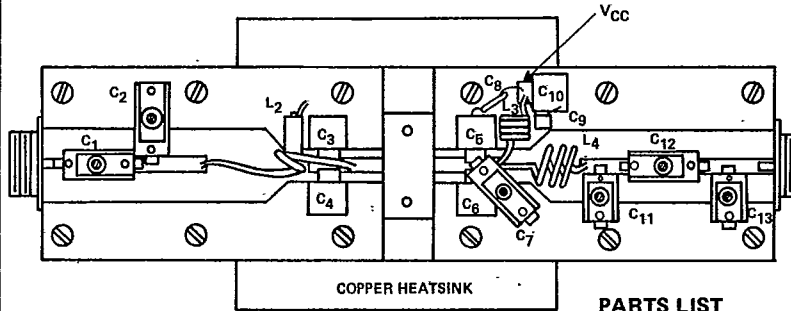


COLLECTOR EFFICIENCY VS. POWER INPUT

SD1416

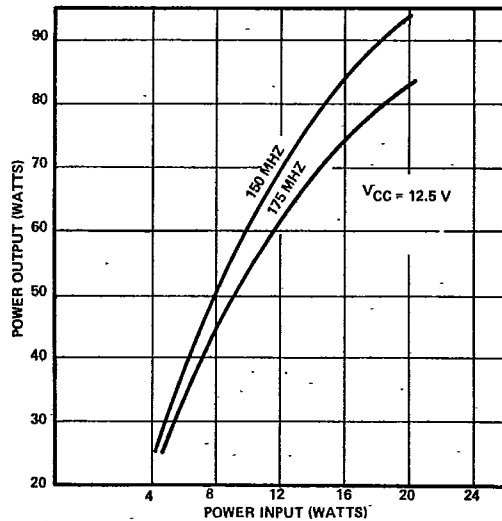
IMPEDANCE VS. FREQUENCY

V <sub>CC</sub>	P <sub>IN</sub> (W)	f <sub>o</sub> (MHz)	Z <sub>SOURCE</sub>	Z <sub>LOAD</sub>
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 <sub>1</sub> , C <sub>7</sub>                                   | ARCO 423 MICA CAP. - 7 pf → 100 pf       | C <sub>11</sub> | ARCO 400 MICA CAP. - .1 pf → 7 pf |
| C <sub>2</sub> , C <sub>12</sub>                                  | ARCO 422 MICA CAP. - 4 pf → 40 pf        | C <sub>13</sub> | ARCO 404 MICA CAP. - 8 pf → 60 pf |
| C <sub>3</sub> , C <sub>4</sub> , C <sub>5</sub> , C <sub>6</sub> | UNELCO BOOK MICA CAP. - 100 pf @ 350 VDC | L <sub>1</sub>  | IT #12 TCB .25" I.D.              |
| C <sub>8</sub>  | ERIE DISC. CAP. - .01 μf @ 200 VDC       | L <sub>2</sub>  | FERROXCUBE VK200                  |
| C <sub>9</sub>  | ERIE MONOLITHIC CAP. - .22 μf @ 50 VDC   | L <sub>3</sub>  | 4T #12 TCB CLOSE SPACED .25" ID.  |
| C <sub>10</sub>   | UNELCO BOOK MICA. - 1000 pf @ 350 VDC    | L <sub>4</sub>  | 3T #12 TCB SPACED #10 .5" ID      |



POWER OUTPUT VS. POWER INPUT