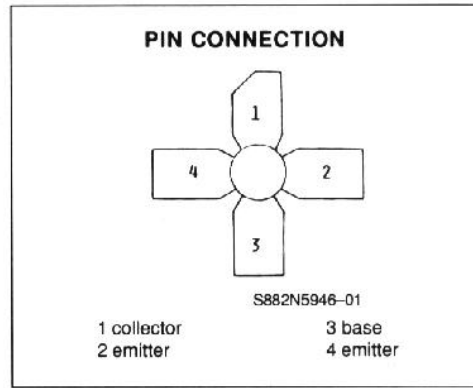
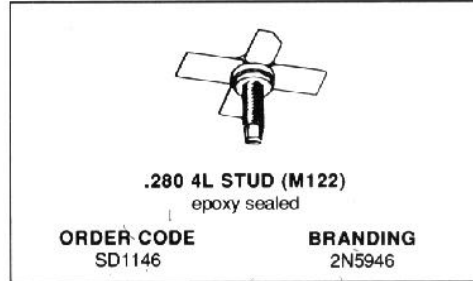


**RF & MICROWAVE TRANSISTORS**  
**450–512MHz CLASS C MOBILE APPLICATIONS**

- CLASS C TRANSISTOR
- FREQUENCY 470MHz
- VOLTAGE 12.5V
- POWER OUT 10.0W
- POWER GAIN 6.0dB
- EFFICIENCY 60%
- COMMON EMITTER



**DESCRIPTION**

The 2N5946 is a 12.5V epitaxial silicon NPN planar transistor designed primarily for UHF communications. This device utilizes improved metallization to achieve infinite VSWR at rated operating conditions.

**ABSOLUTE MAXIMUM RATINGS** ( $T_{case} = 25^{\circ}C$ )

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector - Base Voltage	36.0	V
$V_{CEO}$	Collector - Emitter Voltage	16.0	V
$V_{CES}$	Collector - Emitter Voltage	36.0	V
$V_{EBO}$	Emitter - Base Voltage	4.0	V
$I_C$	Collector Current	2.0	A
$P_{tot}$	Total Power Dissipation	37.5	W
$T_{stg}$	Storage Temperature	- 65 to + 150	$^{\circ}C$
$T_j$	Junction Temperature	+ 200	$^{\circ}C$

**THERMAL DATA**

$R_{th(j-c)}$	Junction-case Thermal Resistance	4.7	$^{\circ}C/W$
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## 2N5946

### ELECTRICAL CHARACTERISTICS ( $T_{cbsb} = 25^{\circ}\text{C}$ )

#### STATIC

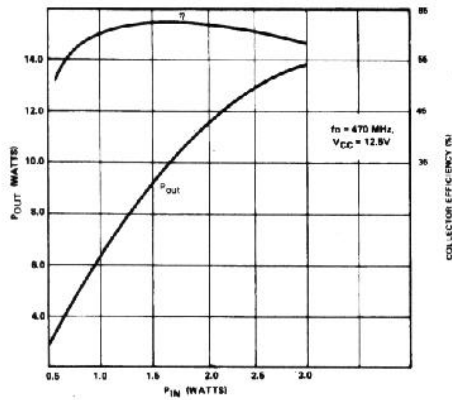
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{CES}$	$I_C = 200\text{mA}$ $V_{BE} = 0$	36.0			V
$BV_{CEO}$	$I_C = 200\text{mA}$ $I_B = 0$	16			V
$BV_{EBO}$	$I_E = 4\text{mA}$ $I_C = 0$	4			V
$I_{CBO}$	$V_{CB} = 15\text{V}$ $I_E = 0$			2	mA
$h_{FE}$	$V_{CE} = 5\text{V}$ $I_C = .5\text{A}$	20			

#### DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_O$	$f = 470\text{MHz}$ $V_{CE} = 12.5\text{V}$	10			W
$G_P$	$f = 470\text{MHz}$ $V_{CE} = 12.5\text{V}$	6			dB
$C_{OB}$	$V_{CB} = 12.5\text{V}$ $I_C = 0$			45	pF

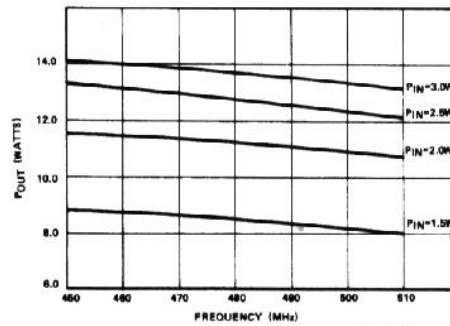
#### APPLICATION INFORMATION (typical curves)

**POWER OUTPUT VS POWER INPUT**



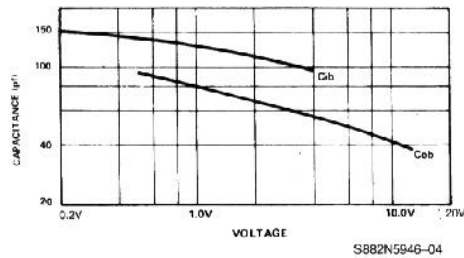
S882N5946-02

**POWER OUTPUT VS FREQUENCY**



S882N5946-03

## CAPACITANCE VS VOLTAGE



## IMPEDANCE INFORMATION

$$Z_{IN} = 1.6 + j2.2\Omega$$

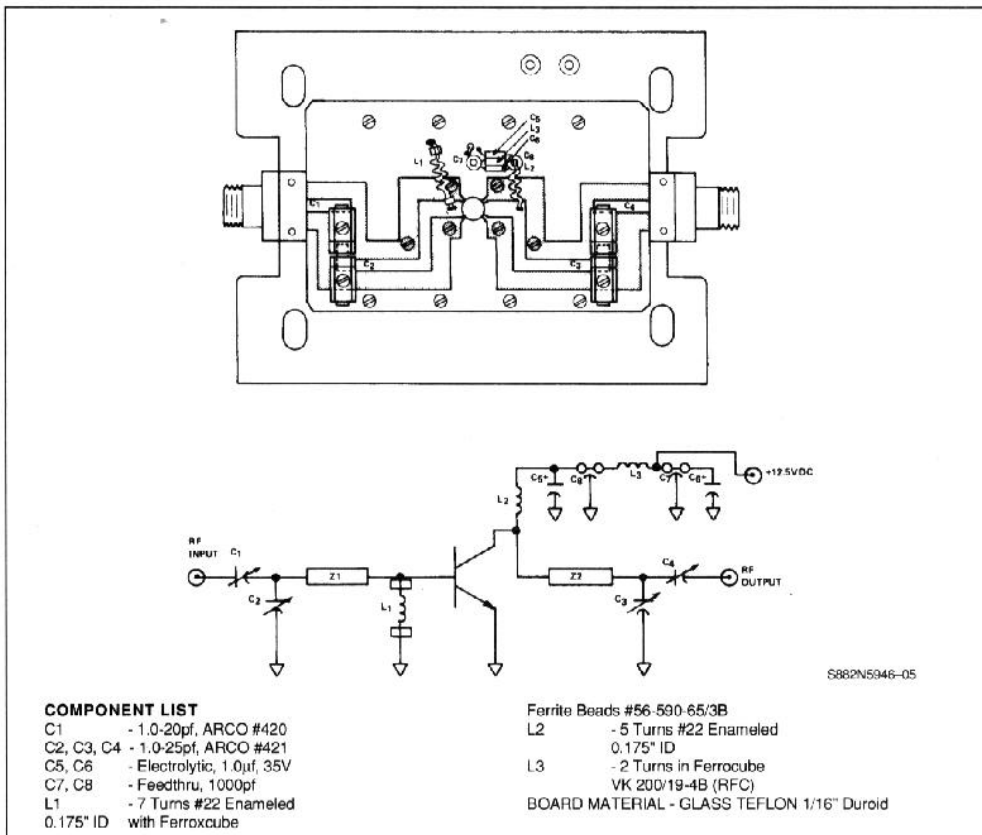
$$Z_{OUT} = 6.0 - j0.34\Omega$$

$$F = 470\text{MHz } 12\text{V}$$

$$V_{CE} = 12.5\text{V}$$

$$P_O = 10.0\text{W}$$

## 470MHz TEST CIRCUIT LAYOUT



## COMPONENT LIST

C1 - 1.0-20pf, ARCO #420  
 C2, C3, C4 - 1.0-25pf, ARCO #421  
 C5, C6 - Electrolytic, 1.0 $\mu$ f, 35V  
 C7, C8 - Feedthru, 1000pf  
 L1 - 7 Turns #22 Enameled  
 0.175" ID with Ferroxcube

## Ferrite Beads #56-590-65/3B

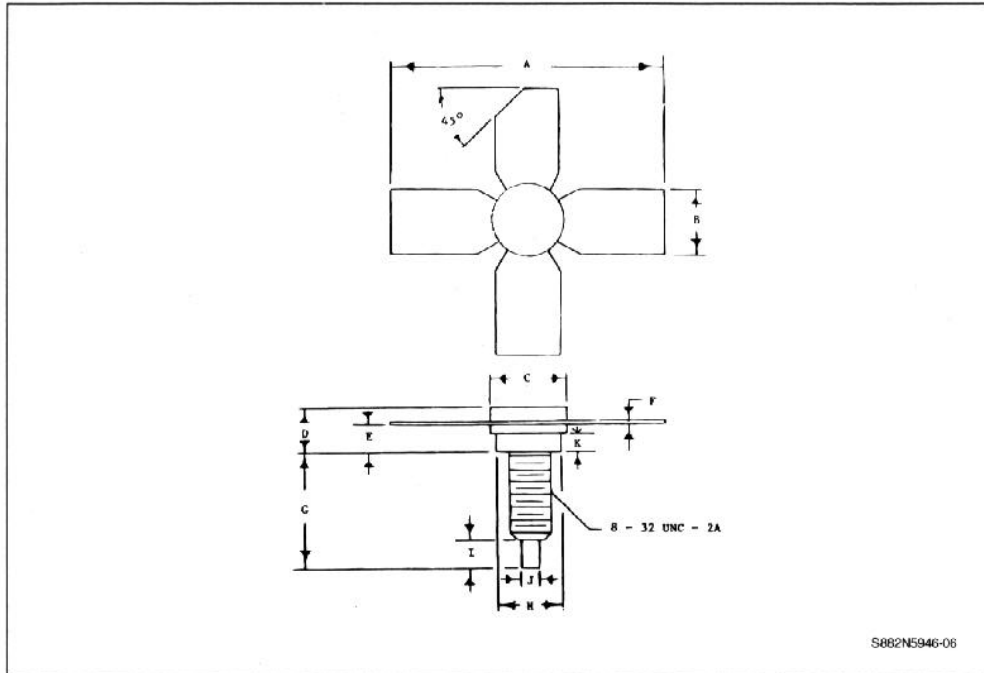
L2 - 5 Turns #22 Enameled  
 0.175" ID  
 L3 - 2 Turns in Ferroxcube  
 VK 200/19-4B (RFC)

BOARD MATERIAL - GLASS TEFLON 1/16" Duroid

**2N5946**

**PACKAGE MECHANICAL DATA**

.280 4LSTUD



	Minimum Inches	Maximum Inches
A		1.055
B	.220	.230
C	.275	.285
D	.178	.192
E	.110	.125
F	.004	.006

	Minimum Inches	Maximum Inches
G	.445	.465
H	.245	.255
I	.120	.140
J	.055	.065
K	.055	.065