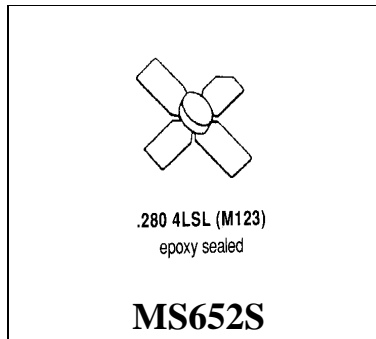
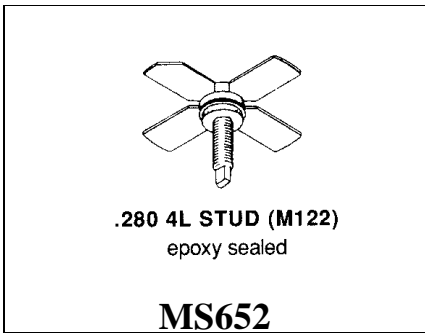


The MS652/MS652S is a 12.5 V Class C epitaxial silicon NPN planar transistor designed primarily for UHF communications. It withstands severe mismatch under normal operating conditions.

**KEY FEATURES**

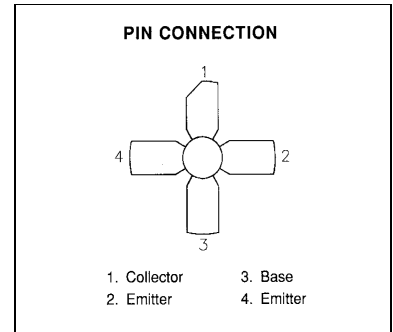
- ▮ 512 MHz
- ▮ 12.5 Volts
- ▮ Common Emitter
- ▮  $P_{OUT} = 5$  W Min.
- ▮  $G_p = 10.0$  dB Gain



**APPLICATIONS/BENEFITS**

- ▮ UHF Portable/Mobile Applications

<b>ABSOLUTE MAXIMUM RATINGS (<math>T_{CASE} = 25^{\circ}C</math>)</b>			
Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	36	V
$V_{CEO}$	Collector-Emitter Voltage	16	V
$V_{EBO}$	Emitter-Base Voltage	4.0	V
$I_C$	Device Current	2	A
$P_{DISS}$	Power Dissipation	25	W
$T_J$	Junction Temperature	+200	$^{\circ}C$
$T_{STG}$	Storage Temperature	-65 to +150	$^{\circ}C$



<b>THERMAL DATA</b>			
$R_{TH(j-c)}$	Junction-Case Thermal Resistance	7	$^{\circ}C/W$

**STATIC ELECTRICAL SPECIFICATIONS (TCASE = 25°C)**

Symbol	Test Conditions	MS652S			Units
		Min.	Typ.	Max.	
<b>BV<sub>CES</sub></b>	<b>I<sub>C</sub> = 25 mA      V<sub>BE</sub> = 0</b>	36			V
<b>BV<sub>CEO</sub></b>	<b>I<sub>C</sub> = 50 mA      I<sub>B</sub> = 0</b>	16			V
<b>BV<sub>CBO</sub></b>	<b>I<sub>C</sub> = 25 mA      I<sub>E</sub> = 0</b>	36			V
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 5 mA      I<sub>C</sub> = 0</b>	4.0			V
<b>I<sub>CES</sub></b>	<b>V<sub>CE</sub> = 15 V      V<sub>BE</sub> = 0</b>			1.0	mA
<b>h<sub>FE</sub></b>	<b>V<sub>CE</sub> = 5 V      I<sub>C</sub> = 200 mA</b>	10		150	

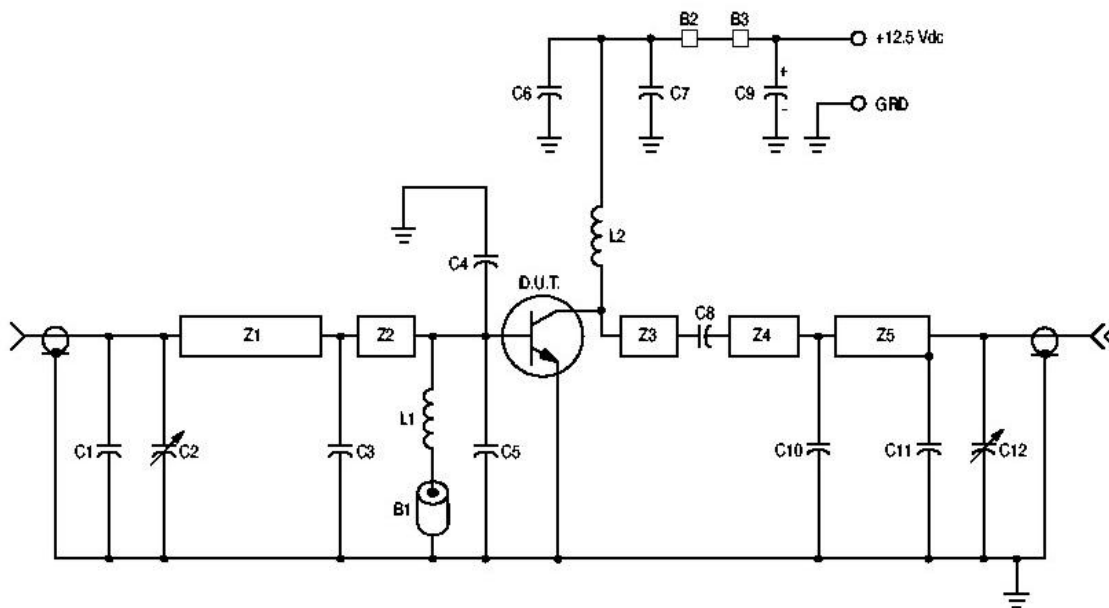
**DYNAMIC ELECTRICAL SPECIFICATIONS (TCASE = 25°C)**

Symbol	Test Conditions	MS652S			Units
		Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 512 MHz      V<sub>CC</sub> = 12.5 V</b>	5			W
<b>G<sub>p</sub></b>	<b>f = 512 MHz      V<sub>CC</sub> = 12.5 V</b>	10			dB
<b>η</b>	<b>f = 512 MHz      V<sub>CC</sub> = 12.5 V      P<sub>OUT</sub> = 5 W</b>	60			%
<b>C<sub>OB</sub></b>	<b>f = 1 MHz      V<sub>CB</sub> = 15 V</b>			15	pF

**LARGE SIGNAL IMPEDANCE DATA**

Frequency MHz			Units
	<b>Z<sub>IN</sub></b>	<b>Z<sub>CL</sub></b>	
400	1.2 + j0.6	6.5 + j6.5	Ω
440	1.2 + j0.9	7.2 + j6.0	Ω
470	1.2 + j1.2	7.7 + j5.3	Ω
512	1.2 + j1.5	8.3 + j4.5	Ω
Conditions      Vcc = 12.5V, Pout = 5W			

**TEST CIRCUIT**

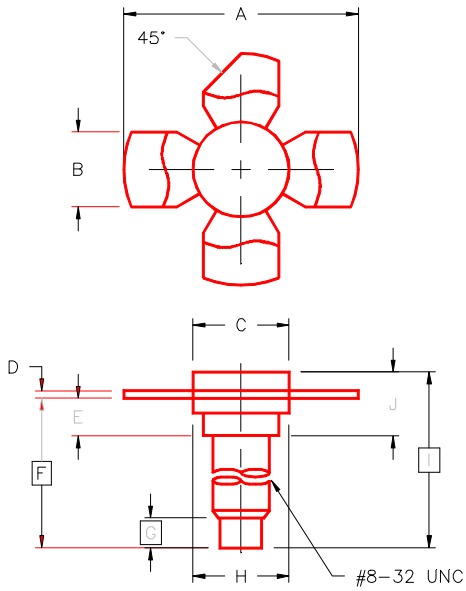


- |  |   |
|--|---|
| B1, B2, B3 — Ferrite Bead              | C8 — 68 pF Mini-Underwood Mica          |
| C1 — 7.0 pF Unelco Mica                | C9 — 1.0 $\mu$ F Electrolytic 25 V      |
| C2 — 1.0–6.0 pF Johanson Variable 5201 | C10, C11 — 5.0 pF Unelco Mica           |
| C3 — 15 pF Unelco Mica                 | C12 — 1.0–10 pF Johanson Variable 5501  |
| C4 — 43 pF Mini-Underwood Mica         | L1, L2 — 6 Turns, 20 AWG Wire 0.125" ID |
| C5 — 56 pF Mini-Underwood Mica         | Z1, Z2 — 25 Ohm $\mu$ Stripline         |
| C6 — 1000 pF Unelco Mica               | Z3, Z4, Z5 — 50 Ohm $\mu$ Stripline     |
| C7 — 0.1 $\mu$ F Ceramic               | Board — 0.032" Glass-Teflon             |

**Figure 1. 440–512 MHz Broadband Test Circuit**

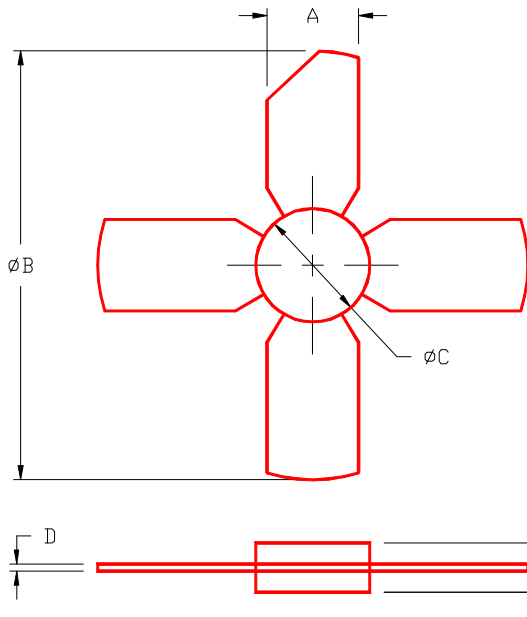
**PACKAGE OUTLINE**

**PACKAGE STYLE M122**



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	1.010/25,65	1.055/26,80	I	.640/16,26	
B	.220/5,59	.230/5,84	J	.175/4,45	.217/5,51
C	.270/6,86	.285/7,24			
D	.003/0,08	.007/0,18			
E	.117/2,97	.137/3,48			
F	.572/14,53				
G	.130/3,30				
H	.275/6,99	.285/7,24			

**PACKAGE STYLE M123**



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.220/5,59	.230/5,84			
B	-----	1.055/26,8			
C	.275/6,99	.285/7,24			
D	.004/0,10	.006/0,15			
E	.050/1,27	.060/1,52			
F	.118/3,00	.130/3,30			