MS652/MS652S

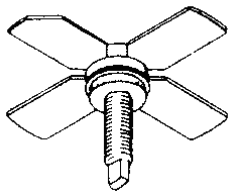
5.0 Watts, 12.5 Volts, Class C
UHF Applications

GENERAL DESCRIPTION

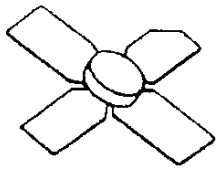
The **MS652/MS652S** is a common emitter and 12.5V Class C epitaxial silicon NPN planar transistor designed primarily for UHF communications. It withstands severe mismatch under normal operating conditions.

ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation @ 25°C		25 Watts
BV_{CBO}	Collector to Base Voltage	36 Volts
BV_{CEO}	Collector to Emitter Voltage	16 Volts
BV_{EBO}	Emitter to Base Voltage	4.0 Volts
I_C	Collector Current	2.0 Amps
Storage Temperature		-65 to +150 °C
Operating Junction Temperature		+200 °C



.280 4L STUD(M122), Epoxy sealed
MS652



.280 4LSL (M123), Epoxy sealed
MS652S

FUNCTIONAL CHARACTERISTICS @ 25°C

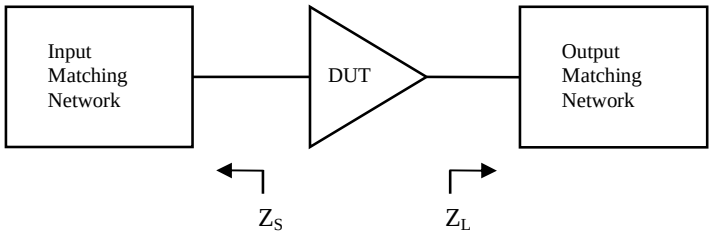
SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
P_{OUT}	Power Out	F = 512 MHz V_{CE} = 12.5V	5.0	-	-	W
P_{IN}	Power Input		-	-	0.5	W
G_P	Power Gain		10.0	-	-	dB
η	Efficiency	P_{OUT} = 5W	60	-	-	%

ELECTRICAL CHARACTERISTICS @ 25°C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
BV_{CES}	Collector to Emitter Breakdown	I_C = 25 mA, V_{BE} = 0	36	-	-	V
BV_{CEO}	Collector to Emitter Breakdown	I_C = 50 mA, I_B = 0	16	-	-	V
BV_{CBO}	Collector to Base Breakdown	I_C = 25 mA, I_E = 0	36	-	-	V
BV_{EBO}	Emitter to Base Breakdown	I_E = 5 mA, I_C = 0	4.0	-	-	V
I_{CES}	Collector to Emitter Leakage	V_{CE} = 15 V, V_{BE} = 0	-	-	1.0	mA
h_{FE}	DC – Current Gain	I_C = 200 mA, V_{CE} = 5 V	10	-	150	-
C_{OB}	Output Capacitance	F = 1MHz, V_{CB} = 15V	-	-	15	pF
θjc^1	Junction-Case Thermal Resistance		-	-	7	°C/W

NOTES: 1. At rated output power with MSC fixture.
Rev. A: May. 2010

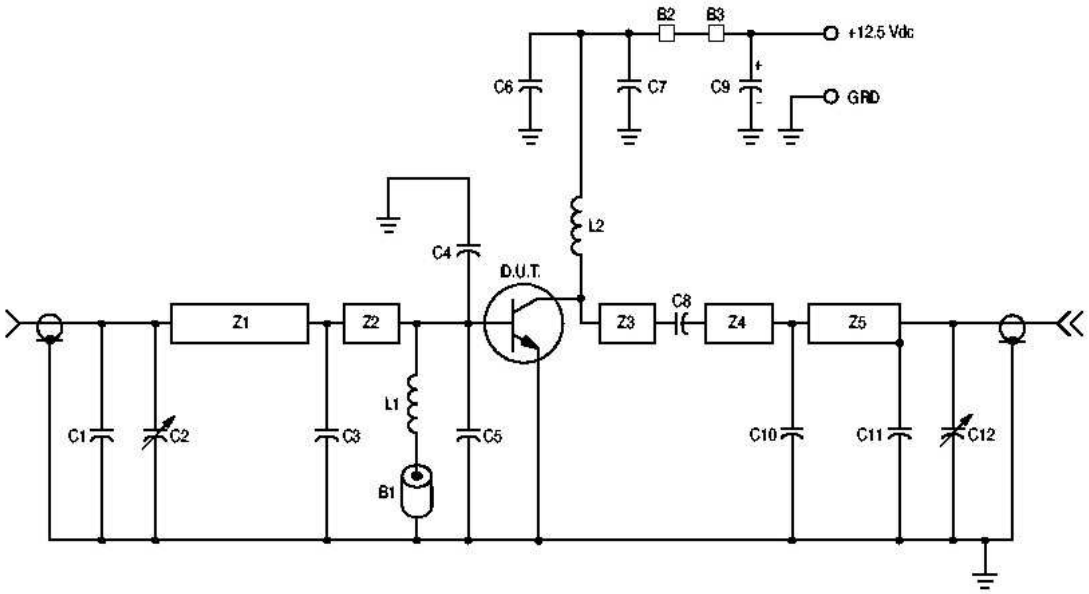
Typical Impedance Values



Frequency (MHz)	Z_S (Ω)	Z_L (Ω)
400	**1.2 – j0.6**	**6.5 + j6.5**
440	**1.2 – j0.9**	**7.2 + j6.0**
470	**1.2 – j1.2**	**7.7 + j5.3**
512	**1.2 – j1.5**	**8.3 + j4.5**

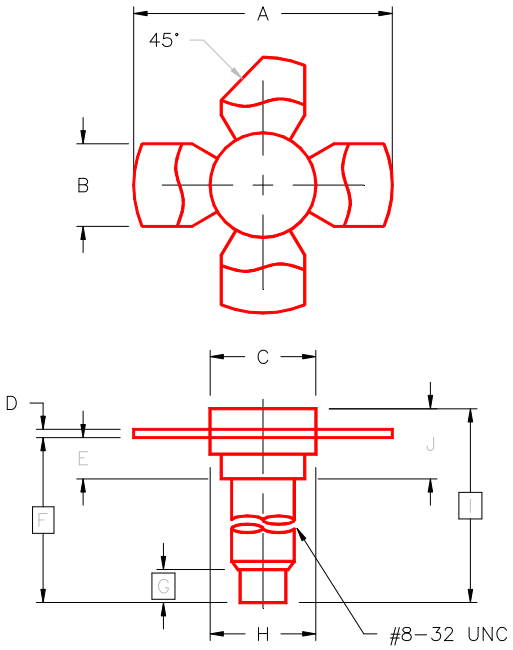
* V_{CC} = 12.5V, P_{OUT} = 5W

440 - 512 MHz Broadband Test Circuit



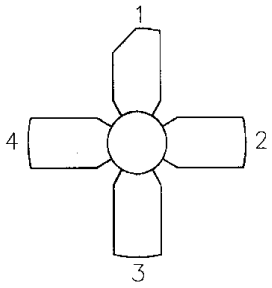
B1, B2, B3 — Ferrite Bead
C1 — 7.0 pF Unelco Mica
C2 — 1.0–6.0 pF Johanson Variable 5201
C3 — 15 pF Unelco Mica
C4 — 43 pF Mini–Underwood Mica
C5 — 56 pF Mini–Underwood Mica
C6 — 1000 pF Unelco Mica
C7 — 0.1 μF Ceramic
C8 — 68 pF Mini–Underwood Mica
C9 — 1.0 μF Electrolytic 25 V
C10, C11 — 5.0 pF Unelco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

PACKAGE STYLE M122



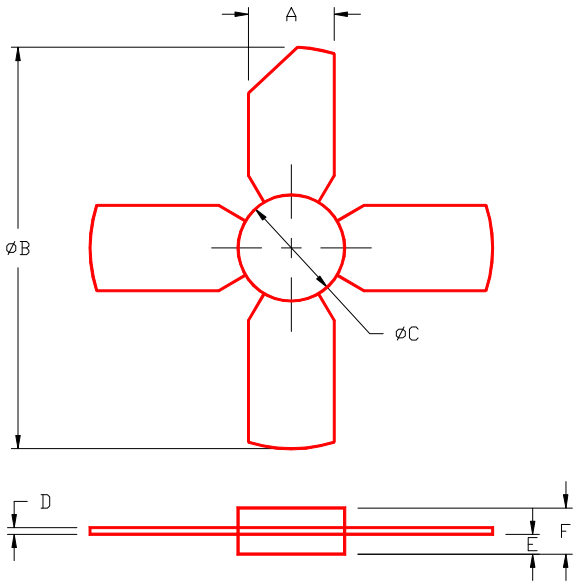
	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	1.010/25,65	1.055/26,80	I	.640/16,26	
B	.220/5,59	.230/5,84	J	.175/4,45	.217/5,51
C	.270/6,86	.285/7,24			
D	.003/0,08	.007/0,18			
E	.117/2,97	.137/3,48			
F	.572/14,53				
G	.130/3,30				
H	.275/6,99	.285/7,24			

PIN CONNECTION



1. Collector
2. Emitter
3. Base
4. Emitter

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			