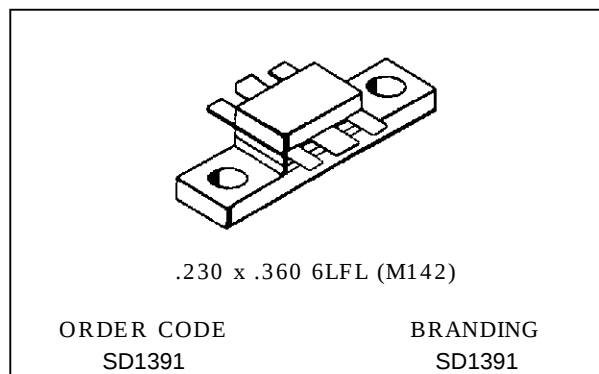


RF & MICROWAVE TRANSISTORS UHF BASE STATION APPLICATIONS

PRELIMINARY DATA

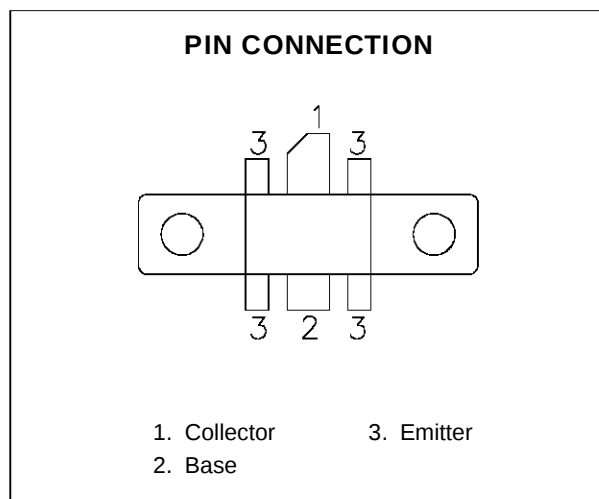
- 470 MHZ
- 24 VOLTS
- EFFICIENCY 50% MIN.
- $P_{OUT} = 15\text{ W}$ WITH 11.0 dB MIN. GAIN
- CLASS AB
- COMMON EMITTER



DESCRIPTION

The SD1391 is a gold metallized NPN planar transistor using diffused emitter ballast resistors for reliability and ruggedness.

The SD1391 is specifically designed as a low power, high gain driver and can be operated in Class A, B or C.



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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	48	V
V_{CEO}	Collector-Emitter Voltage	25	V
V_{EBO}	Emitter-Base Voltage	3.5	V
I_C	Collector Current	2.5	A
P_{DISS}	Power Dissipation (+25°C)	29	W
T_J	Junction Temperature	+200	°C
T_{STG}	Storage Temperature	- 65 to +150	°C

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance	6.0	°C/W
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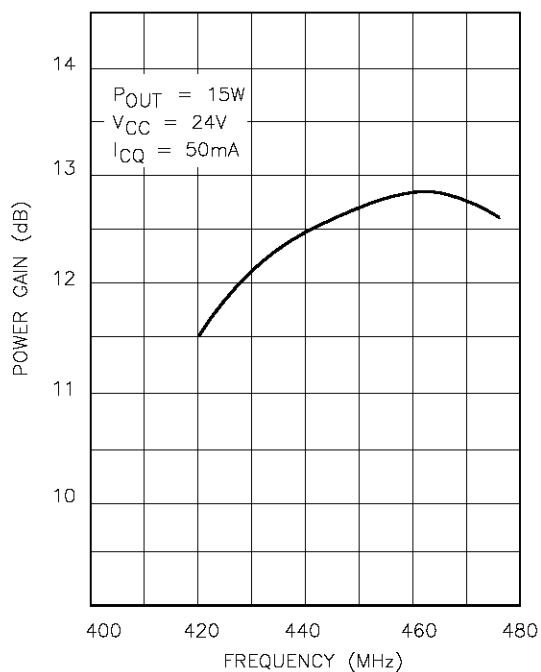
ELECTRICAL SPECIFICATIONS ($T_{\text{case}} = 25^{\circ}\text{C}$)**STATIC**

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 50 \text{ mA}$	$I_{\text{E}} = 0 \text{ mA}$	48	—	—	V
BV_{CEO}	$I_{\text{C}} = 20 \text{ mA}$	$I_{\text{B}} = 0 \text{ mA}$	25	—	—	V
BV_{EBO}	$I_{\text{E}} = 5 \text{ mA}$	$I_{\text{C}} = 0 \text{ mA}$	3.5	—	—	V
I_{CBO}	$V_{\text{CB}} = 24 \text{ V}$	$I_{\text{E}} = 0 \text{ mA}$	—	—	1.0	mA
h_{FE}	$V_{\text{CE}} = 10 \text{ V}$	$I_{\text{C}} = 0.1 \text{ A}$	10	—	100	—

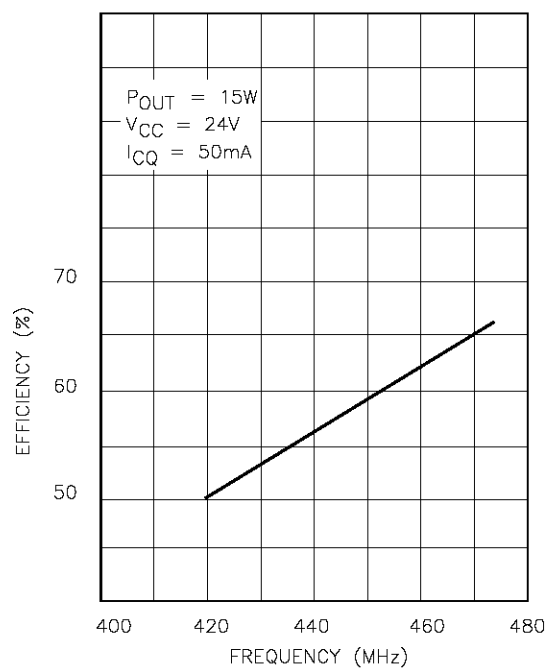
DYNAMIC

Symbol	Test Conditions				Value			Unit
					Min.	Typ.	Max.	
P_{OUT}	$f = 470 \text{ MHz}$	$P_{\text{IN}} = 6.3 \text{ W}$	$V_{\text{CC}} = 24 \text{ V}$	$I_{\text{CQ}} = 50 \text{ mA}$	15	—	—	W
η_{C}	$f = 470 \text{ MHz}$	$P_{\text{IN}} = 6.3 \text{ W}$	$V_{\text{CC}} = 24 \text{ V}$	$I_{\text{CQ}} = 50 \text{ mA}$	50	60		%
R_{TL}	$f = 470 \text{ MHz}$	$P_{\text{IN}} = 6.3 \text{ W}$	$V_{\text{CC}} = 24 \text{ V}$	$I_{\text{CQ}} = 50 \text{ mA}$	10	—		dB
C_{OB}	$f = 1 \text{ MHz}$	$V_{\text{CB}} = 24 \text{ V}$			—	—	24	pF

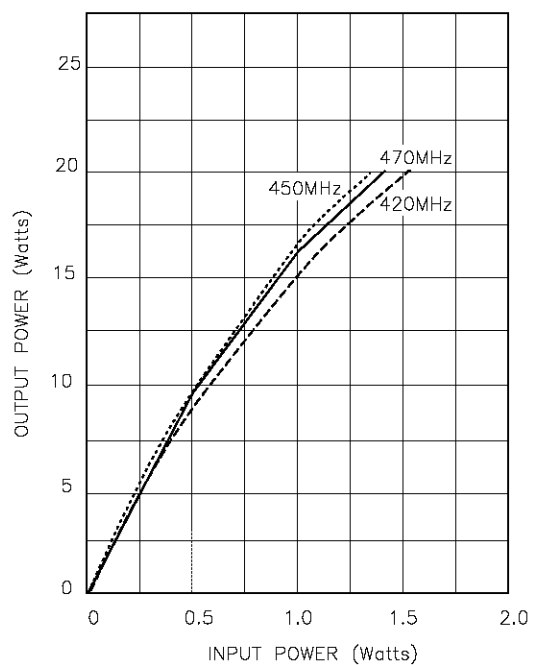
POWER GAIN vs FREQUENCY



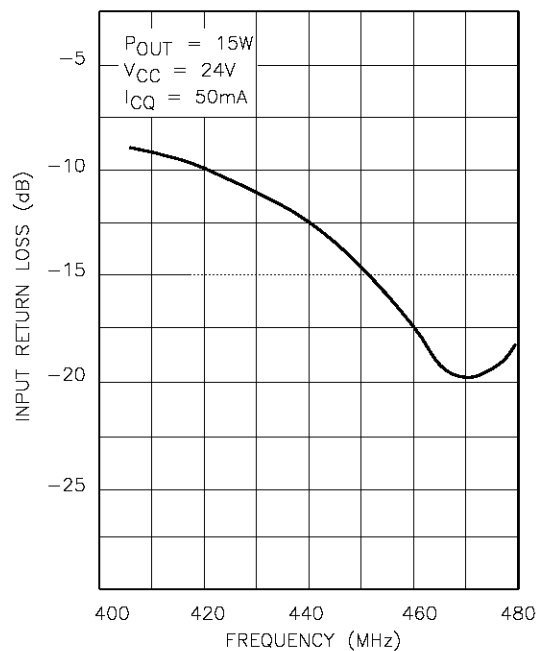
EFFICIENCY vs FREQUENCY



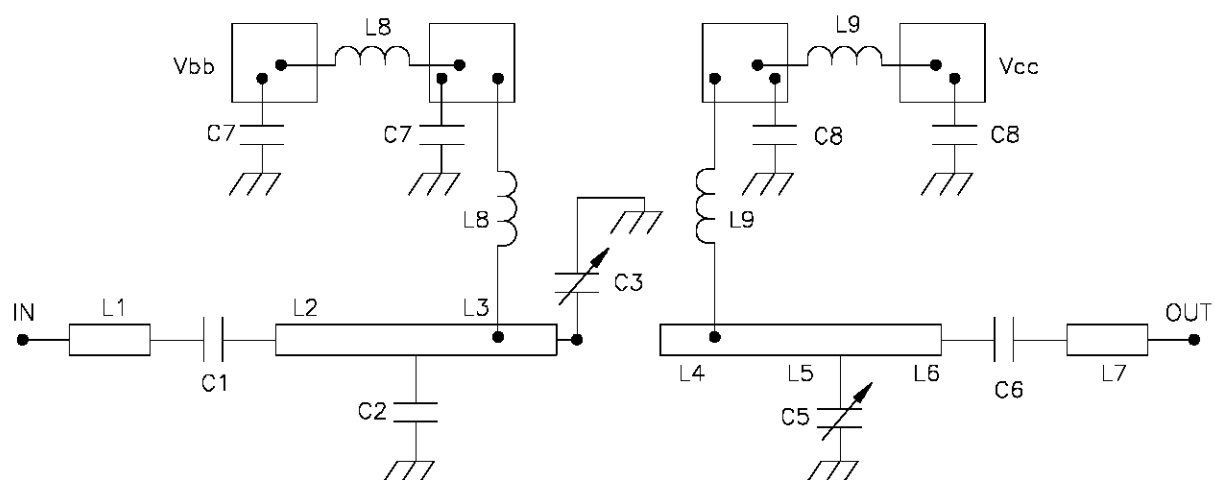
OUTPUT POWER vs INPUT POWER



INPUT RETURN LOSS vs FREQUENCY



TEST CIRCUIT



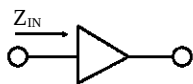
C1 : 2200pf Chip Capacitor
 C2 : 22pf Chip Capacitor + 2-10pf Trim Capacitor
 C3 : 2 x 33pf + 2-22pf Trim Capacitor
 C5 : 8.2pf + 2-10pf Trim Capacitor
 C6 : 330pf Chip Capacitor
 C7,C8 : 1nF + 10nF + 100nF + 10mF

L1 : 50 ohms microstrip line, L = 6mm
 L2 : 50 ohms microstrip line, L = 19mm
 L3 : 50 ohms microstrip line, L = 25mm
 L4 : 50 ohms microstrip line, L = 14mm
 L5 : 50 ohms microstrip line, L = 20mm
 L6 : 50 ohms microstrip line, L = 7.5mm
 L7 : 50 ohms microstrip line, L = 8.5mm
 L8,L9 : 5 Turns, ID = 33mm, 0.5mm Wire diameter

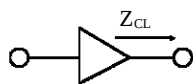
Board Material: Teflon H = 30mils, Er = 2.55

IMPEDANCE DATA

TYPICAL INPUT
IMPEDANCE



TYPICAL COLLECTOR LOAD
IMPEDANCE

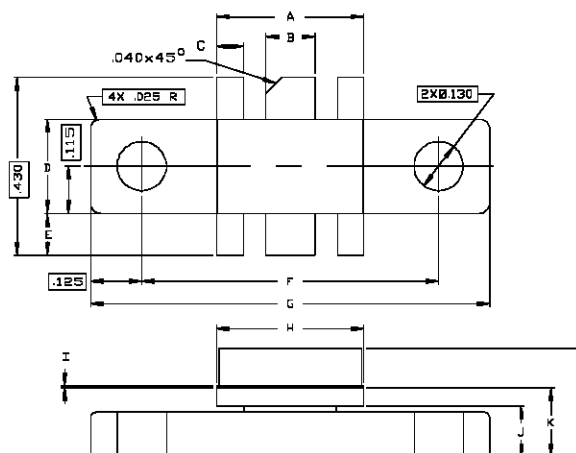


FREQ.	$Z_{IN}(\Omega)$	$Z_{CL}(\Omega)$
420 MHz	$4.0 + j 2.2$	$7.2 + j 1.0$
450 MHz	$5.4 + j 3.9$	$6.8 + j 3.0$
470 MHz	$4.9 + j 5.7$	$6.6 + j 4.3$

PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0142 rev. C

UDCS No. 1010968



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.355/9,02	.365/9,27	K	.160/4,06	.180/4,57
B	.115/2,92	.125/3,18	L	.230/5,84	.260/6,60
C	.075/1,91	.085/2,16			
D	.225/5,72	.235/5,97			
E	.090/2,29	.110/2,79			
F	.720/18,29	.730/18,54			
G	.970/24,64	.980/24,89			
H	.355/9,02	.365/9,27			
I	.004/0,10	.006/0,15			
J	.120/3,05	.130/3,30			

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