



ASP-0955
55 Watt, 900 MHz
Silicon Power Transistor

Features

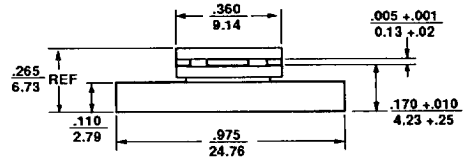
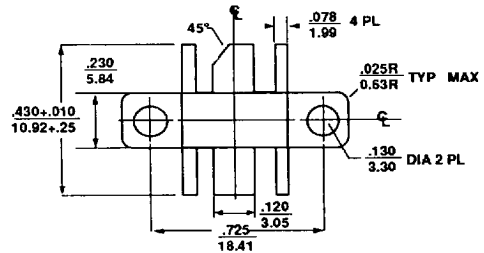
- **Power Out: 55 Watts**
- **Common Base Class C Power Transistor**
- **Frequency: 800-960 MHz**
- **Voltage: 25 V**
- **Efficiency: 50% Min.**
- **Load Mismatch Tolerance: 4.3:1**

Description

The ASP-0955 is a large signal, Class C common base, NPN silicon bipolar power transistor, housed in a BeO flange package for excellent thermal transfer. This device is designed for use as a 55 W driver or output amplifier for base station applications in cellular telephone systems operating in the 830 to 960 MHz frequency range.

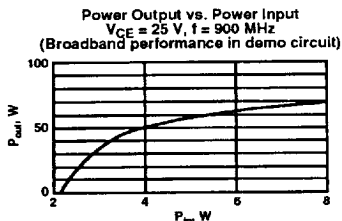
Excellent device uniformity, performance and reliability are produced by the use of ion-implantation, self-alignment techniques, and gold metalization in the fabrication of these devices. Emitter ballasting ensures a rugged device capable of withstanding severe load mismatches.

Power Flange

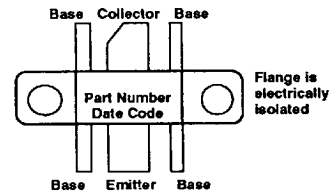


Dimensions are in mm

Tolerances: in .xxx = ±.005 mm .xx = ±.13



Marking and Lead Configuration



Electrical Specifications, $T_A = 25^\circ\text{C}$

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.
P_{out}	Output Power ¹ $V_{CE} = 25 \text{ V}$, $P_{in} = 7 \text{ W}$, $f = 900 \text{ MHz}$	Watts	55	58	
G_p	Power Gain ¹ $V_{CE} = 25 \text{ V}$, $P_{in} = 7 \text{ W}$, $f = 900 \text{ MHz}$	dB	8.9	9.2	
η_c	Collector Efficiency ¹ $V_{CE} = 25 \text{ V}$, $P_{in} = 7 \text{ W}$, $f = 900 \text{ MHz}$	%	50	55	
	Load Mismatch Tolerance $V_{CE} = 25 \text{ V}$, rated P_{out} , $f = 900 \text{ MHz}$	-	4.3:1		
BV_{CEO}	Collector-Emitter Voltage $V_{EB} = \text{open}$, $I_C = 50 \text{ mA}$	V	24	28	
BV_{CES}	Collector-Emitter Voltage $V_{EB} = 0 \text{ V}$, $I_C = 100 \text{ mA}$	V	50	55	
BV_{EBO}	Emitter-Base Voltage $V_{CB} = \text{open}$, $I_E = 15 \text{ mA}$	V	3.5	4.5	
h_{FE}	Forward Current Transfer Ratio $V_{CE} = 5 \text{ V}$, $I_C = 3 \text{ A}$	-	20	60	120
I_{CES}	Collector Leakage Current $V_{CE} = 26 \text{ V}$	mA		1	15
C_{OB}	Collector-Base Capacitance $f = 1 \text{ MHz}$, $V_{CB} = 25 \text{ V}$, $I_E = 0 \text{ mA}$	pF		62	

Notes: 1 Tuned narrow band test.

ASP-0955

55 Watt, 900 MHz Class C Power Transistor

Absolute Maximum Ratings

Parameter	Symbol	Absolute Maximum ¹
Emitter-Base Voltage	V_{EB0}	4.0 V
Collector-Emitter Voltage	V_{CES}	50 V
Collector Current	I_C	8.0 A
Power Dissipation ^{2,3}	P_T	115 W
Junction Temperature	T_J	200°C
Storage Temperature	T_{STG}	-65 to 150°C

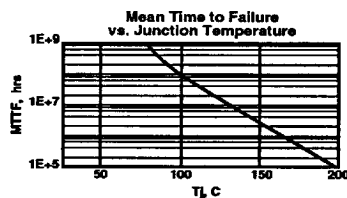
Thermal Resistance²: $\theta_{JC} = 1.2^\circ\text{C/W}$

Notes:

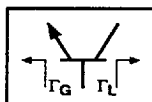
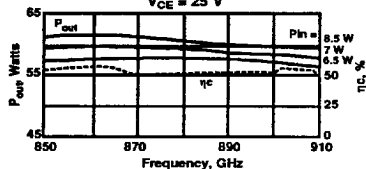
- Operation of this device above any one of these parameters may cause permanent damage.
- $T_{case} = 25^\circ\text{C}$
- Derate at .83 W/°C for $T_{case} > 62^\circ\text{C}$

Typical Performance, $T_A = 25^\circ\text{C}$

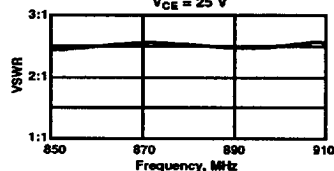
(Unless otherwise noted.)



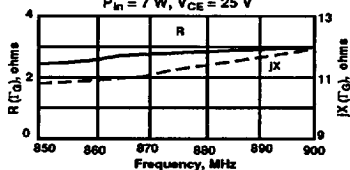
Typical Broadband Performance
Output Power and Collector Efficiency
vs. Frequency and Input Power
 $V_{CE} = 25\text{ V}$



Typical Broadband Performance
Input VSWR vs. Frequency
 $V_{CE} = 25\text{ V}$

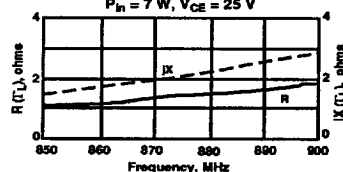


Typical Generator Impedance
vs. Frequency
 $P_{in} = 7\text{ W}$, $V_{CE} = 25\text{ V}$

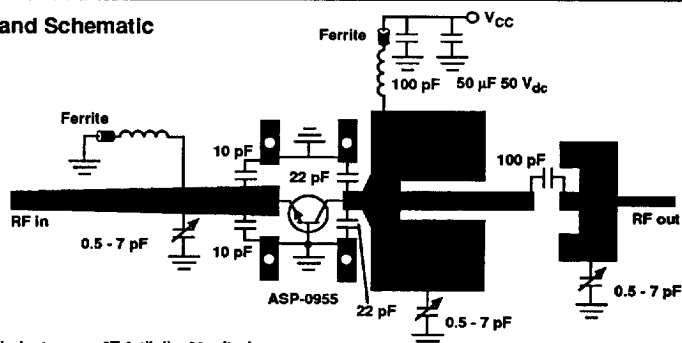


Freq. MHz	Γ_G		Γ_L	
	R	jX	R	jX
850	2.5	10.8	1.3	1.6
860	2.6	11.0	1.4	1.8
870	2.8	11.2	1.5	2.0
880	2.9	11.5	1.6	2.3
890	3.0	11.7	1.8	2.6
900	3.1	12.0	2.0	2.9

Typical Load Impedance
vs. Frequency
 $P_{in} = 7\text{ W}$, $V_{CE} = 25\text{ V}$



Test Circuit Layout and Schematic 850-900 MHz



(not to scale)

Inductors are 3T 0.1" dia. 30 mil wire