



# SOLID STATE MICROWAVE

THOMSON-CSF COMPONENTS CORPORATION

Montgomeryville, PA 18936 ■ (215) 362-8500 ■ TWX 510-661-7299

2N5589

2N5590

2N5591

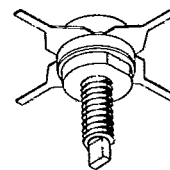
## 3 W/10 W/24 W, 12.5 V VHF POWER TRANSISTOR

### DESCRIPTION:

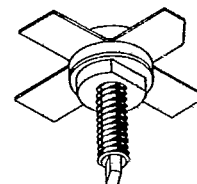
These SSM devices are epitaxial silicon NPN-planar transistors designed primarily for VHF mobile and marine transmitters. These devices utilize ballasted emitter resistors and improved metalization systems to achieve extreme ruggedness under severe operating conditions.

### FEATURES:

- Designed for VHF mobile and marine transmitters
- Withstand severe mismatch under operating conditions
- Low inductance stripline package
- All leads electrically isolated from stud



MT-71



TO-72

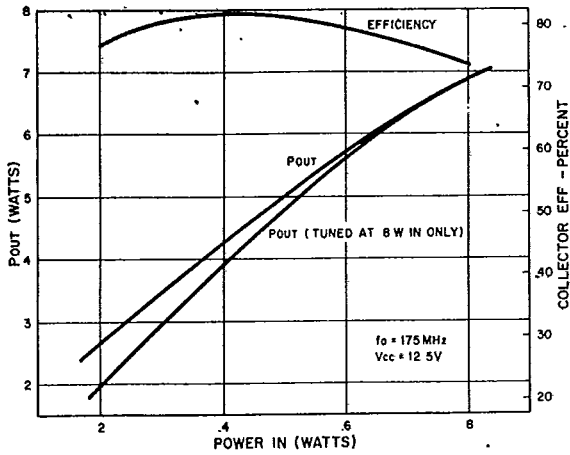
### ABSOLUTE MAX. RATINGS (+25°C except where noted)

Symbol	Characteristic	2N5589	2N5590	2N5591
V <sub>CB0</sub>	Collector to Base Voltage	36.0V	36.0V	36.0V
V <sub>CEO</sub>	Collector to Emitter Voltage	18.0V	18.0V	18.0V
V <sub>EBO</sub>	Emitter to Base Voltage	4.0V	4.0V	4.0V
I <sub>C</sub> (max)	Continuous Collector Current	0.6A	2.0A	4.0A
P <sub>D</sub>	Total Dissipation at 25°C Stud	15.0W	30.0W	70.0W
ϕ <sub>JC</sub>	Thermal Resistance (Junction to Stud)	11.7°C/W	5.8°C/W	2.5°C/W
T <sub>J</sub>	Junction Temperature	-65°C to 200°C	-65°C to 200°C	-65°C to 200°C
T <sub>stg</sub>	Storage Temperature	-65°C to 200°C	-65°C to 200°C	-65°C to 200°C
Pkg	Package Type	MT 71	MT 72	MT 72

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

Symbol	Characteristic	Test Conditions	2N5589		2N5590		2N5591	
			Min.	Max.	Min.	Max.	Min.	Max.
BV <sub>CEO</sub>	Collector to Emitter Breakdown Voltage	I <sub>C</sub> = 200mA, I <sub>B</sub> = 0 Pulsed through 25mH	18.V	-	18.V	-	18.V	-
BV <sub>CES</sub>	Collector to Emitter Breakdown Voltage	I <sub>C</sub> = 200mA, I <sub>B</sub> = 0 Pulsed through 25mH	36.V	-	36.V	-	36.V	-
BV <sub>EBO</sub>	Emitter to Base Breakdown Voltage	I <sub>E</sub> = 1mA, I <sub>C</sub> = 0	4.V	-				
		I <sub>E</sub> = 25mA, I <sub>C</sub> = 0			4.V	-		
		I <sub>E</sub> = 5.0mA, I <sub>C</sub> = 0					4.V	-
I <sub>CBO</sub>	Collector Cutoff Current	V <sub>CB</sub> = 15.0V, I <sub>E</sub> = 0	-	1.0mA	-	1.0mA	-	1.0mA
h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> = 5V, I <sub>C</sub> = 100mA	5.	-				
		V <sub>CE</sub> = 5V, I <sub>C</sub> = 250mA			5.	-		
		V <sub>CE</sub> = 5V, I <sub>C</sub> = 500mA					5.	-
f <sub>T</sub>	Gain-Bandwidth Product	V <sub>CE</sub> = 13.6V, I <sub>C</sub> = 100mA	200.mHz	-	200.mHz	-		
		V <sub>CE</sub> = 13.6V, I <sub>C</sub> = 150mA					200.mHz	-
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> = 12.5V, I <sub>C</sub> = 0 f <sub>o</sub> = 1.0MHz	-	30. pF	-	70. pF	-	120. pF
P <sub>out</sub>	Power Output Class C	f <sub>o</sub> = 175mHz, V <sub>CE</sub> = 13.6V	3.0W	-	10.W	-	25.W	-
P <sub>g</sub>	Power Gain Class C	f <sub>o</sub> = 175mHz, V <sub>CE</sub> = 13.6V	8.2dB	-	5.2 dB	-	4.4 dB	-
η	Collector Efficiency Class C	f <sub>o</sub> = 175mHz, V <sub>CE</sub> = 13.6V	50.%	-	50.%	-	50.%	-



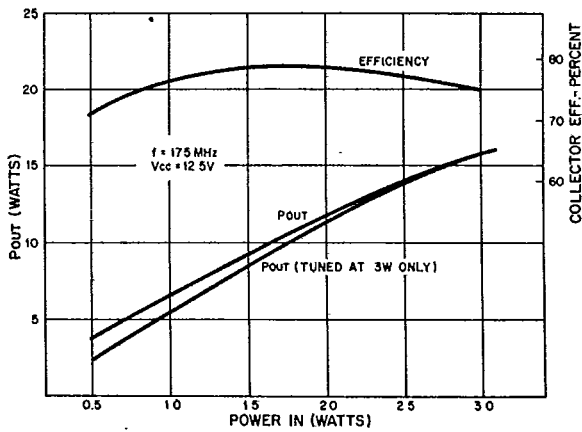


Power Output vs. Power Input

2N5589

f = 175 MHz, Vcc = 12.5V			
PIN WATTS	POUT WATTS	INPUT OHMS	OUTPUT OHMS
0.2	2.6	2.9 + J 0.5	15.0 + J 16.8
0.4	4.2	3.5 + J 0.2	14.2 + J 10.4
0.6	5.7	3.7 - J 0.1	13.0 + J 7.3
0.8	7.1	4.0 - J 0.3	12.3 + J 5.8

Network Impedance at Transistor Terminals

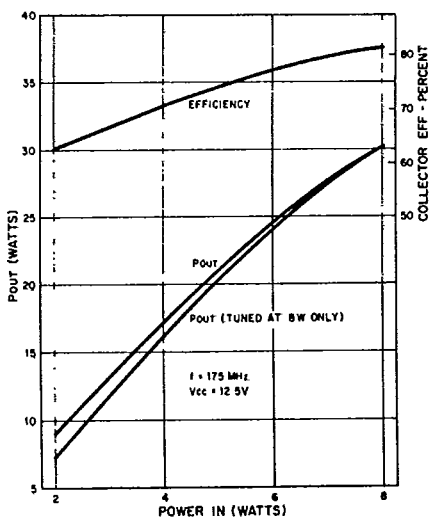


Power Output vs. Power Input

2N5590

f = 175 MHz, Vcc = 12.5V			
PIN WATTS	POUT WATTS	INPUT OHMS	OUTPUT OHMS
0.5	3.8	1.4 + J 2.0	9.0 + J 8.9
1.0	6.6	1.5 + J 2.4	10.0 + J 5.1
2.0	11.8	1.6 + J 2.5	8.6 + J 1.3
3.0	15.8	1.8 + J 2.6	6.9 - J 0

Network Impedance at Transistor Terminals



Power Output vs. Power Input

2N5591

f = 175 MHz, Vcc = 12.5V			
PIN WATTS	POUT WATTS	INPUT OHMS	OUTPUT OHMS
2.0	10.0	.99 - J 1.2	4.5 + J 4.3
4.0	17.0	1.1 - J 1.3	4.3 + J 2.7
6.0	24.6	1.3 - J 1.5	4.0 + J 2.01
8.0	30.2	1.3 - J 1.5	3.9 + J 1.7

Network Impedance at Transistor Terminals