

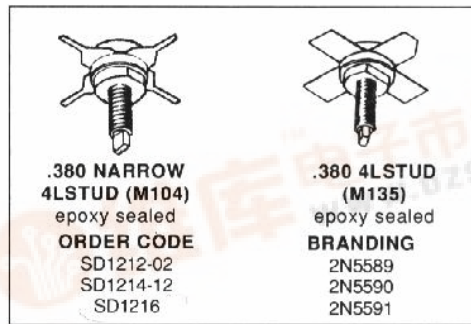
**RF Products**  
**Microsemi**  
Progress Powered by Technology

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Tel: (215) 631-9840

**2N5589**  
**2N5590/2N5591**

**RF & MICROWAVE TRANSISTORS**  
**130...230MHz FM MOBILE APPLICATIONS**

- FREQUENCY 175MHz
- VOLTAGE 13.6V
- POWER OUT 8 TO 25W
- HIGH POWER GAIN
- HIGH EFFICIENCY
- CLASS C TRANSISTORS
- COMMON EMITTER

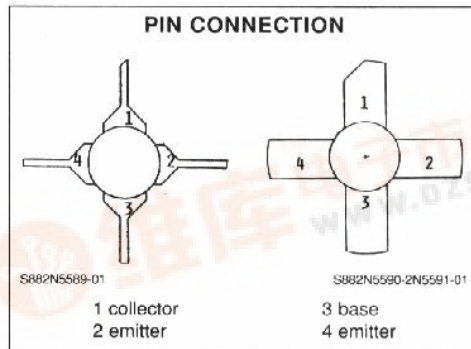


**DESCRIPTION**

The devices are epitaxial silicon NPN-planar transistors designed primarily for VHF mobile and marine transmitters.

These devices utilize ballasted emitter resistors and improved metallization systems to achieve extreme ruggedness under severe operating conditions.

device	package
2N5589	.380 NARROW 4LSTUD
2N5590	.380 4LSTUD
2N5591	.380 4LSTUD



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

Symbol	Parameter	2N5589	2N5590	2N5591	Unit
$V_{CBO}$	Collector to Base Voltage	36.0	36.0	36.0	V
$V_{CEO}$	Collector to Emitter Voltage	18.0	18.0	18.0	V
$V_{EB0}$	Emitter to Base Voltage	4.0	4.0	4.0	V
$I_{C(max)}$	Continuous Collector Current	0.6	2.0	4.0	A
$P_D$	Total Dissipation at 25°C Stud	15.0	30.0	70.0	W
$T_j$	Junction Temperature	200	200	200	°C
$T_{stg}$	Storage Temperature	- 65 to 150	- 65 to 150	- 65 to 150	°C

		2N5589	2N5590	2N5591	
$R_{th(j-c)}$	Junction-case Thermal Resistance	11.7	5.8	2.5	°C/W



## 2N5589/2N5590/2N5591

### ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$ )

#### STATIC

Symbol	Test Conditions	2N5589			2N5590			2N5591			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$BV_{CES}$	$I_C = 200mA$ $V_{BE} = 0$	36			36			36			V
$BV_{CFO}$	$I_C = 200mA$ $I_B = 0$	18			18			18			V
$BV_{EBO}$	$I_E = 2.5mA$ $I_C = 0$	4	( $I_E = 1mA$ )		4			4	( $I_E = 5mA$ )		V
$I_{CBO}$	$V_{CB} = 15V$ $I_E = 0$			1			1			1	mA
$h_{FE}$	$V_{CE} = 5V$ $I_C = 0.25A$	5	( $I_C = 0.1A$ )		5			5	( $I_C = 0.5A$ )		

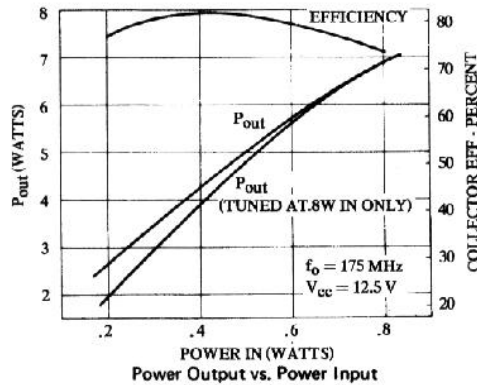
#### DYNAMIC

Symbol	Test Conditions	2N5589			2N5590			2N5591			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$P_O$	$F = 175MHz$ $V_{CE} = 13.6V$ Class C	3.0			10			25			W
$G_p$	$F = 175MHz$ $V_{CE} = 13.6V$ Class C	8.2			5.2			4.4			dB
$\eta_C$	$F = 175MHz$ $V_{CB} = 13.6V$ Class C	50			50			50			%
$C_{OB}$	$V_{CB} = 15V$ $I_C = 0$ $F = 1MHz$			30			70			120	pF

#### APPLICATION INFORMATION (typical curves)

#### IMPEDANCE DATA (typical)

#### 2N5589



S882N5589-02

#### 2N5589

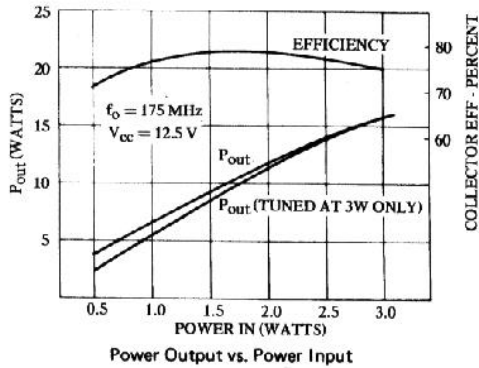
$f = 175MHz, V_{CC} = 12.5V$			
$P_{IN}$ WATTS	$P_{OUT}$ WATTS	Input OHMS	OUTPUT OHMS
0.2	2.6	$2.9 + j0.5$	$15.0 + j16.8$
0.4	4.2	$3.5 + j0.2$	$14.2 + j10.4$
0.6	5.7	$3.7 + j0.1$	$13.0 + j7.3$
0.8	7.1	$4.0 + j0.3$	$12.3 + j5.8$

Network Impedance at Transistor Terminals

**APPLICATION INFORMATION** (typical curves) (continued)

**IMPEDANCE DATA** (typical) (continued)

**2N5590**



**2N5590**

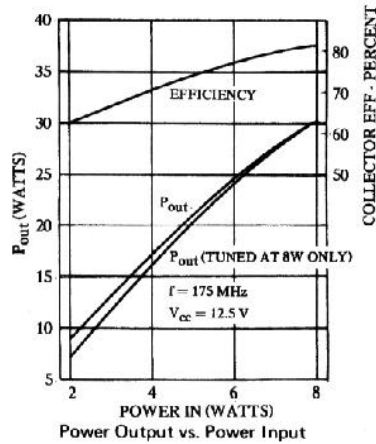
$f = 175\text{MHz}, V_{CC} = 12.5\text{V}$

P <sub>IN</sub> WATTS	P <sub>OUT</sub> WATTS	Input OHMS	OUTPUT OHMS
0.5	3.8	1.4 + J2.0	9.0 + J8.9
1.0	6.6	1.5 + J2.4	10.0 + J5.1
2.0	11.8	1.6 + J2.5	8.6 + J1.3
3.0	15.8	1.8 + J2.6	6.9 + J0

Network Impedance at Transistor Terminals

**2N5591**

S882N5590-02



**2N5591**

$f = 175\text{MHz}, V_{CC} = 12.5\text{V}$

P <sub>IN</sub> WATTS	P <sub>OUT</sub> WATTS	Input OHMS	OUTPUT OHMS
2.0	10.0	.99 + J1.2	4.5 + J4.3
4.0	17.0	1.1 + J1.3	4.3 + J2.7
6.0	24.6	1.3 + J1.5	4.0 + J2.01
8.0	30.2	1.3 + J1.5	3.9 + J1.7

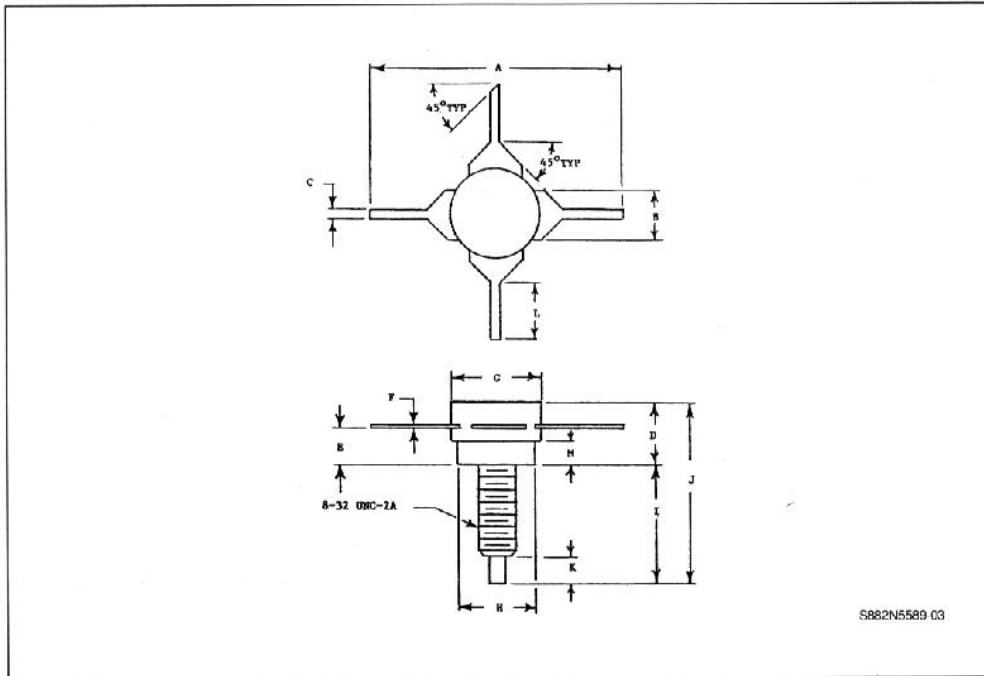
Network Impedance at Transistor Terminals

S882N5591-02

**2N5589/2N5590/2N5591**

**PACKAGE MECHANICAL DATA**

.380 NARROW 4LSTUD



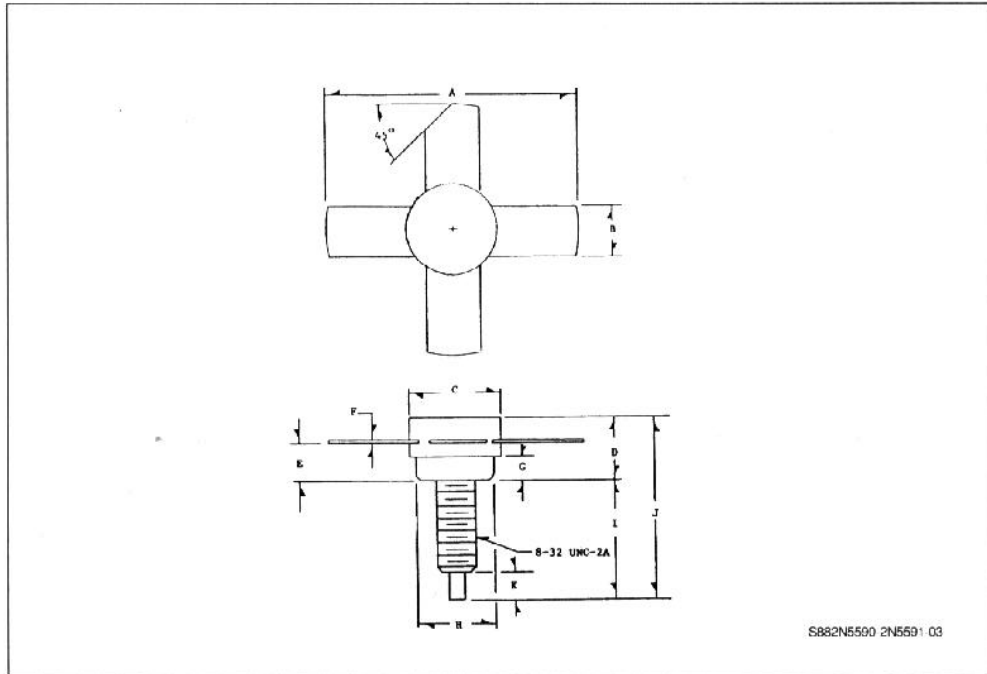
S882N5589 03

	Minimum Inches	Maximum Inches
A	1.000	
B	.220	.230
C	.025	.035
D		.275
E	.155	.175
F	.004	.007
G	.370	.380

	Minimum Inches	Maximum Inches
H	.320	.330
I	.450	.490
J		.750
K	.100	.130
L	.220	
M	.090	.100

PACKAGE MECHANICAL DATA (continued)

.380 4LSTUD



	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130