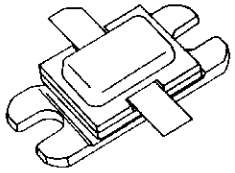
SGS-THOMSON MICROELECTRONICS

# AM1214-175

## RF & MICROWAVE TRANSISTORS L-BAND RADAR APPLICATIONS

- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- 3:1 VSWR CAPABILITY
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- $P_{OUT}$ = 160 W MIN. WITH 7.3 dB GAIN



**.400 x .500 2LFL (S038)**
hermetically sealed

| ORDER CODE | BRANDING |
|---|---|
| AM1214-175 | 1214-175 |

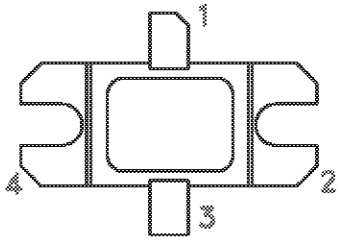
### DESCRIPTION

The AM1214-175 device is a high power Class C transistor specifically designed for L-Band radar pulsed output and driver applications.

This device is capable of operation over a wide range of pulse widths, duty cycles and temperatures and is capable of withstanding 3:1 output VSWR at rated RF conditions. Low RF thermal resistance and computerized automatic wire bonding techniques ensure high reliability and product consistency.

The AM1214-175 is supplied in the BIGPAC™ Hermetic Metal/Ceramic package with internal Input/Output matching structures.

### PIN CONNECTION




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

### ABSOLUTE MAXIMUM RATINGS ($T_{case}$ = 25°C)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $P_{DISS}$ | Power Dissipation* ($T_C \leq 100°C$) | 330 | W |
| $I_C$ | Device Current* | 14 | A |
| $V_{CC}$ | Collector-Supply Voltage* | 45 | V |
| $T_J$ | Junction Temperature (Pulsed RF Operation) | 250 | °C |
| $T_{STG}$ | Storage Temperature | – 65 to +200 | °C |

### THERMAL DATA

| | | | |
|---|---|---|---|
| $R_{TH(j-c)}$ | Junction-Case Thermal Resistance* | 0.45 | °C/W |

*Applies only to rated RF amplifier operation

## ELECTRICAL SPECIFICATIONS ($T_{case}$ = 25°C)

STATIC

| Symbol | Test Conditions | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $BV_{CBO}$ | $I_C$ = 60mA | $I_E$ = 0mA | 65 | — | — | V |
| $BV_{EBO}$ | $I_E$ = 10mA | $I_C$ = 0mA | 3.5 | — | — | V |
| $BV_{CES}$ | IC = 100mA | | 65 | — | — | V |
| $I_{CES}$ | $V_{CE}$ = 40V | | — | — | 25 | mA |
| $h_{FE}$ | $V_{CE}$ = 5V | $I_C$ = 5A | 15 | — | 150 | — |

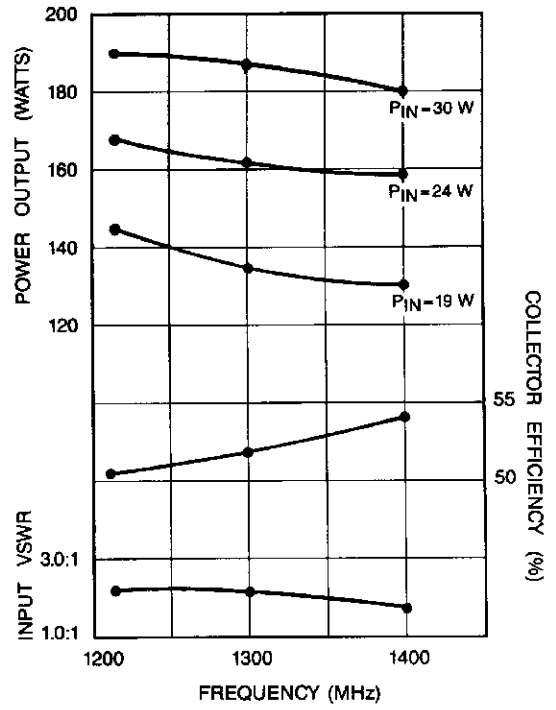
DYNAMIC

| Symbol | Test Conditions | | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $P_{OUT}$ | f = 1215 — 1400MHz | $P_{IN}$ = 30W | $V_{CC}$ = 40V | 160 | 180 | — | W |
| $\eta c$ | f = 1215 — 1400MHz | $P_{IN}$ = 30W | $V_{CC}$ = 40V | 45 | 50 | — | % |
| $G_P$ | f = 1215 — 1400MHz | $P_{IN}$ = 30W | $V_{CC}$ = 40V | 7.3 | 7.8 | — | dB |

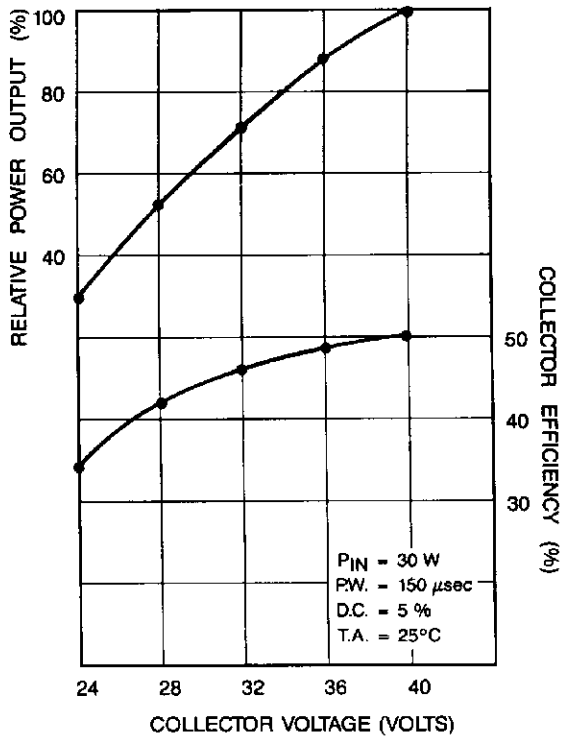
Note: Pulse Width = 150µS
Duty Cycle = 5%

## TYPICAL PERFORMANCE

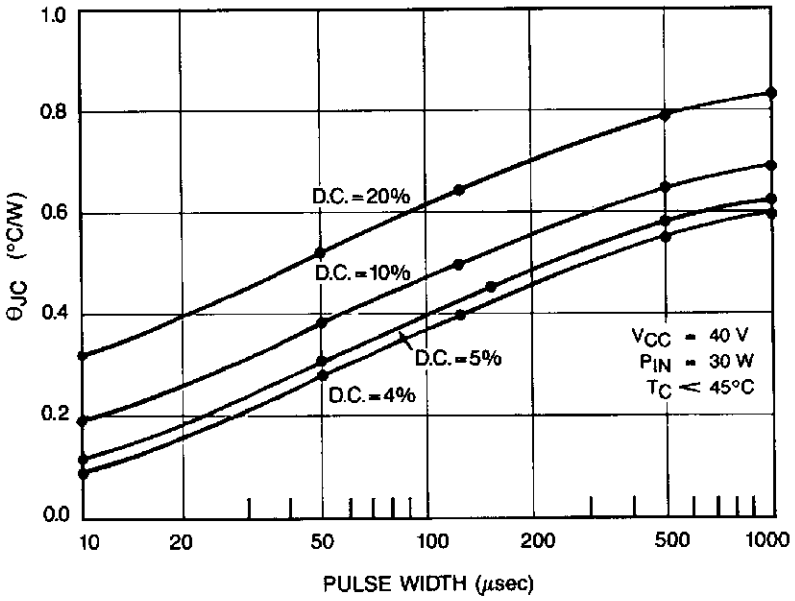
### TYPICAL BROADBAND POWER AMPLIFIER




### RELATIVE POWER OUTPUT AND COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE

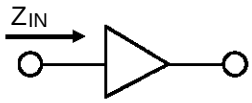



### MAXIMUM THERMAL RESISTANCE vs PULSE WIDTH & DUTY CYCLE

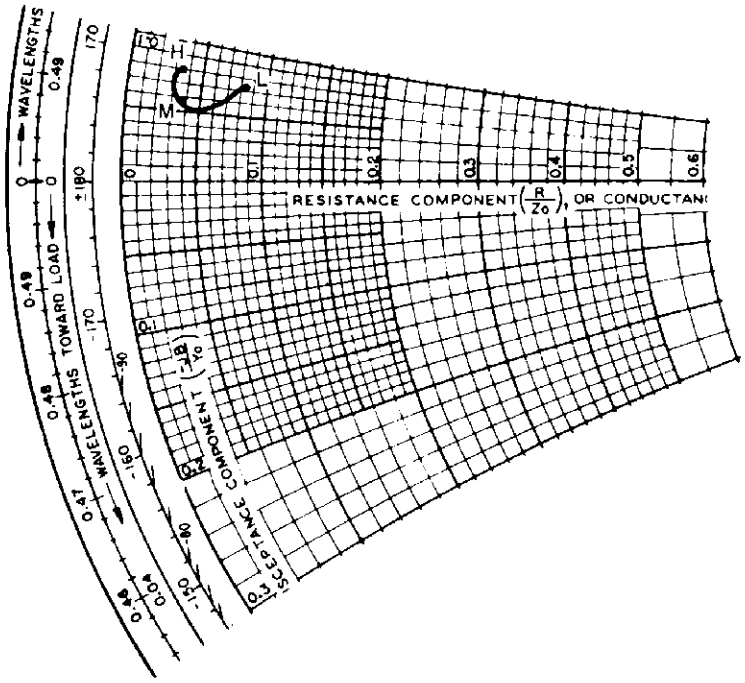


## IMPEDANCE DATA

### TYPICAL INPUT IMPEDANCE

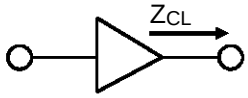



$P_{IN}$ = 30 W
$V_{CC}$ = 40 V
$Z_0$* = 50 ohms

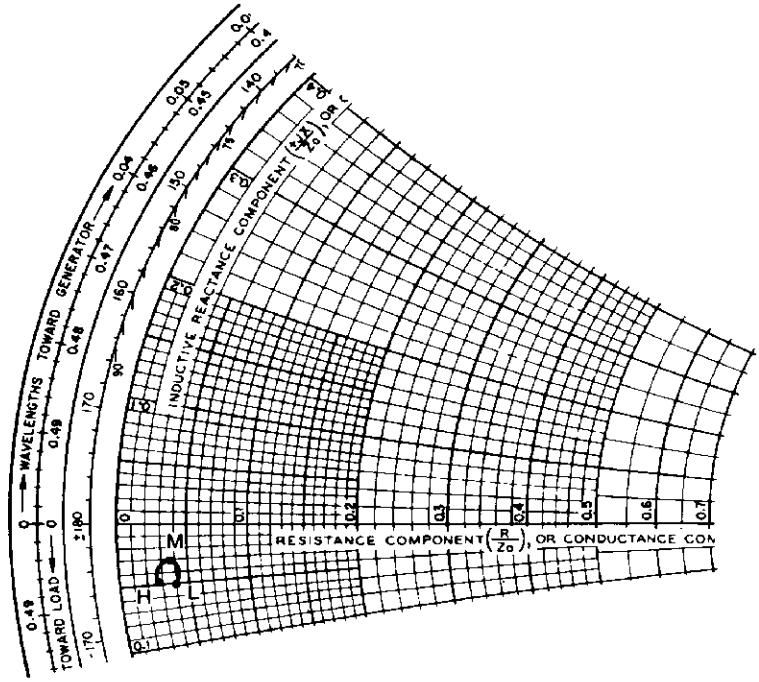



| FREQ. | $Z_{IN}$ (Ω) | $Z_{CL}$ (Ω) |
|---|---|---|
| L = 1215 MHz | 4.0 + j 3.5 | 2.0 – j 2.5 |
| M = 1300 MHz | 2.0 + j 3.0 | 2.0 – j 1.5 |
| H = 1400 MHz | 1.5 + j 4.0 | 1.5 – j 2.5 |

### TYPICAL COLLECTOR LOAD IMPEDANCE

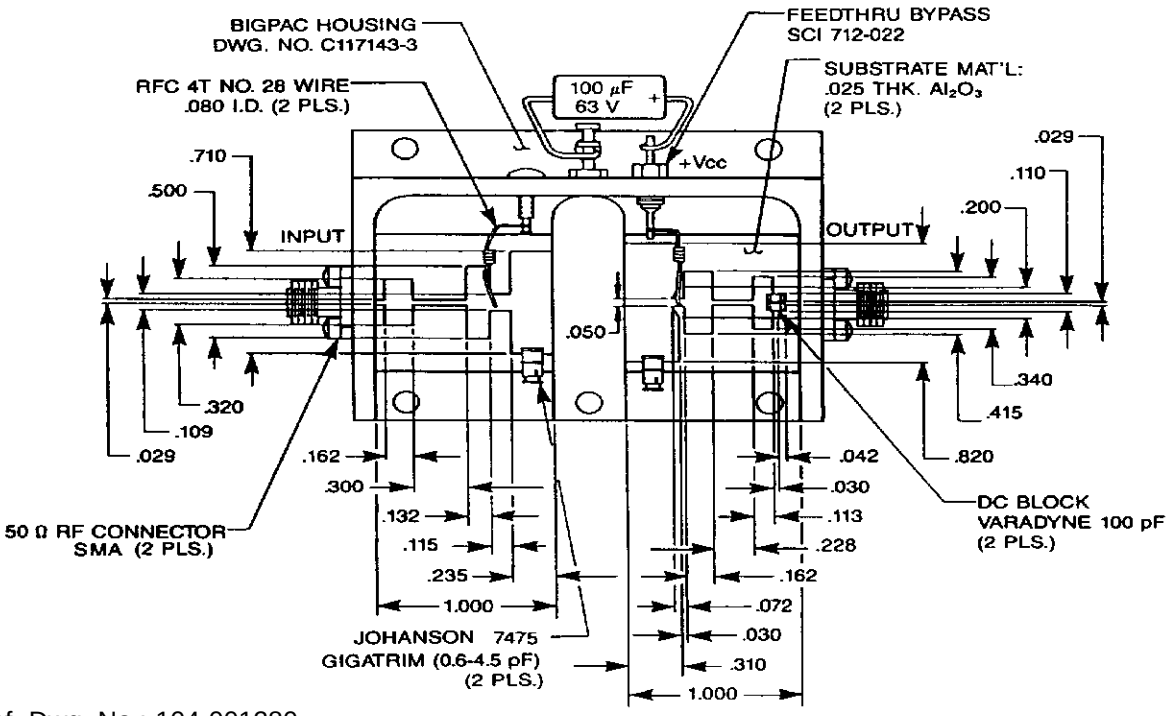



$P_{IN}$ = 30 W
$V_{CC}$ = 40 V
$Z_0$* = 50 ohms




*Normalized Impedance

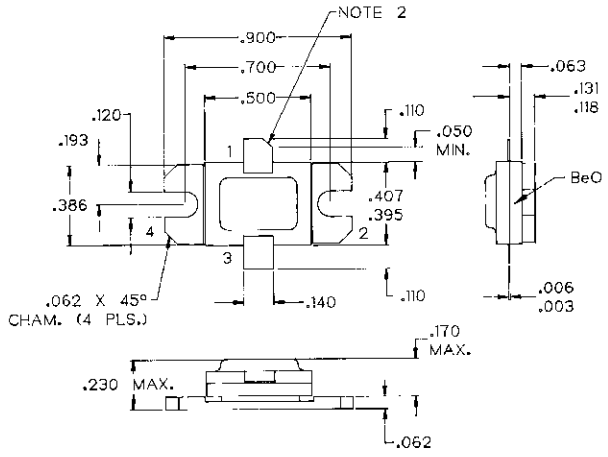
## TEST CIRCUIT




Ref. Dwg. No.: 104-001280

## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J135066F




NOTES:
1. ALL TOLERANCE ± .010 EXCEPT WHERE NOTED; DIMENSIONS IN INCHES.
2. COLLECTOR LEAD CHAMFER 45° NOM. X .040 NOM.