



## SD1274-01

### RF POWER BIPOLAR TRANSISTORS VHF MOBILE APPLICATIONS

#### FEATURES SUMMARY

- 160 MHz
- 13.6 VOLTS
- COMMON EMITTER
- $P_{OUT} = 30\text{ W MIN. WITH } 10\text{ dB GAIN}$

#### DESCRIPTION

The SD1274-01 is a 13.6 V Class C epitaxial silicon NPN planar transistor designed primarily for VHF communications. The SD1274-01 utilizes an emitter ballasted die geometry to withstand severe load mismatch conditions.

Figure 1. Package

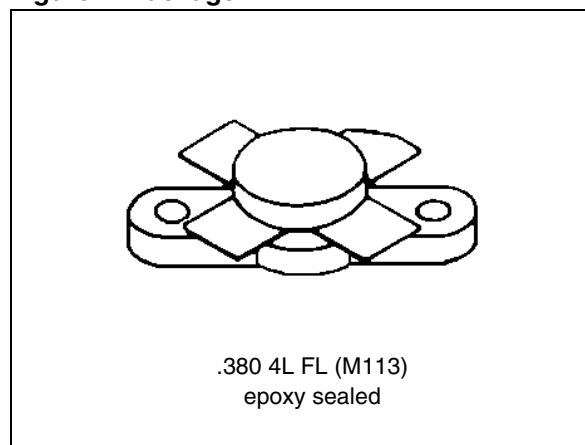


Figure 2. Pin Connection

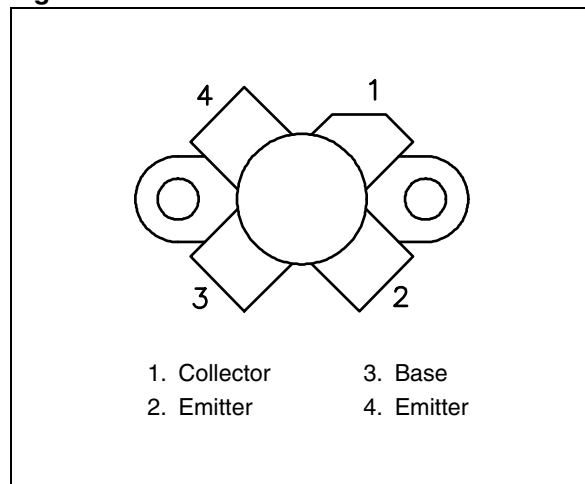


Table 1. Order Codes

| Order Codes | Marking   | Package | Packaging     |
|-------------|-----------|---------|---------------|
| SD1274-01   | SD1274-01 | M113    | PLASTIC TRAYS |

**Table 2. Absolute Maximum Ratings ( $T_{\text{case}} = 25^{\circ}\text{C}$ )**

| Symbol            | Parameter                 | Value        | Unit               |
|-------------------|---------------------------|--------------|--------------------|
| $V_{\text{CBO}}$  | Collector-Base Voltage    | 36           | V                  |
| $V_{\text{CEO}}$  | Collector-Emitter Voltage | 16           | V                  |
| $V_{\text{CES}}$  | Collector-Emitter Voltage | 36           | V                  |
| $V_{\text{EBO}}$  | Emitter-Base Voltage      | 4.0          | V                  |
| $I_{\text{C}}$    | Device Current            | 8.0          | A                  |
| $P_{\text{DISS}}$ | Power Dissipation         | 70           | W                  |
| $T_{\text{J}}$    | Junction Temperature      | +200         | $^{\circ}\text{C}$ |
| $T_{\text{STG}}$  | Storage Temperature       | - 65 to +150 | $^{\circ}\text{C}$ |

**Table 3. Thermal Data**

| Symbol               | Parameter                        | Value | Unit                 |
|----------------------|----------------------------------|-------|----------------------|
| $R_{\text{TH(j-c)}}$ | Junction-Case Thermal Resistance | 1.2   | $^{\circ}\text{C/W}$ |

**ELECTRICAL SPECIFICATIONS ( $T_{\text{CASE}} = 25^{\circ}\text{C}$ )****Table 4. Static**

| Symbol            | Test Conditions                                                 | Value |      |      | Unit |
|-------------------|-----------------------------------------------------------------|-------|------|------|------|
|                   |                                                                 | Min.  | Typ. | Max. |      |
| $BV_{\text{CES}}$ | $I_{\text{C}} = 15 \text{ mA}$ ; $V_{\text{BE}} = 0 \text{ mA}$ | 36    | —    | —    | V    |
| $BV_{\text{CEO}}$ | $I_{\text{C}} = 50 \text{ mA}$ ; $I_{\text{B}} = 0 \text{ mA}$  | 16    | —    | —    | V    |
| $BV_{\text{EBO}}$ | $I_{\text{E}} = 5 \text{ mA}$ ; $I_{\text{C}} = 0 \text{ mA}$   | 4.0   | —    | —    | V    |
| $I_{\text{CBO}}$  | $V_{\text{CB}} = 15 \text{ V}$ ; $I_{\text{E}} = 0 \text{ mA}$  | —     | —    | 5    | mA   |
| $h_{\text{FE}}$   | $V_{\text{CE}} = 5 \text{ V}$ ; $I_{\text{C}} = 250 \text{ mA}$ | 20    | —    | —    | —    |

**Table 5. Dynamic**

| Symbol           | Test Conditions                                                                            | Value |      |      | Unit |
|------------------|--------------------------------------------------------------------------------------------|-------|------|------|------|
|                  |                                                                                            | Min.  | Typ. | Max. |      |
| $P_{\text{OUT}}$ | $f = 160 \text{ MHz}$ ; $P_{\text{IN}} = 3.0 \text{ W}$ ; $V_{\text{CE}} = 13.6 \text{ V}$ | 30    | —    | —    | W    |
| $G_{\text{P}}$   | $f = 160 \text{ MHz}$ ; $P_{\text{IN}} = 3.0 \text{ W}$ ; $V_{\text{CE}} = 13.6 \text{ V}$ | 10    | —    | —    | dB   |
| $C_{\text{OB}}$  | $f = 1 \text{ MHz}$ ; $V_{\text{CB}} = 15 \text{ V}$                                       | —     | 95   | —    | pF   |

## TYPICAL PERFORMANCE

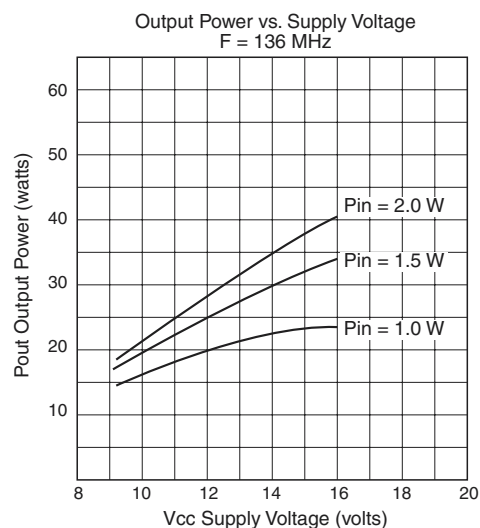
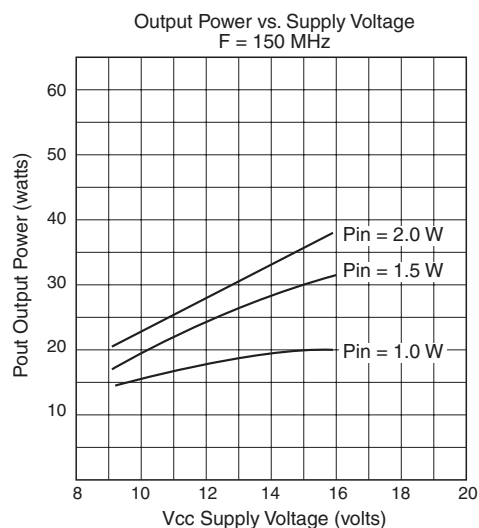
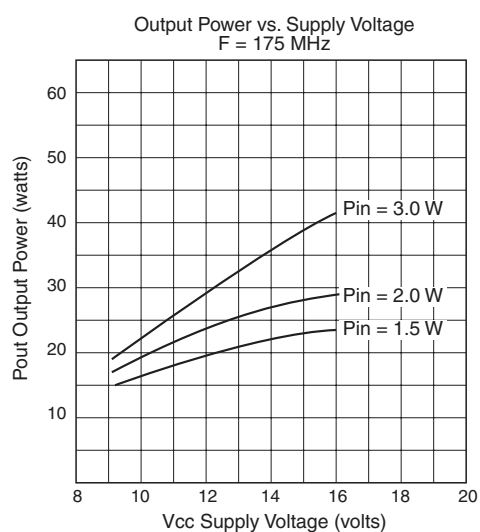
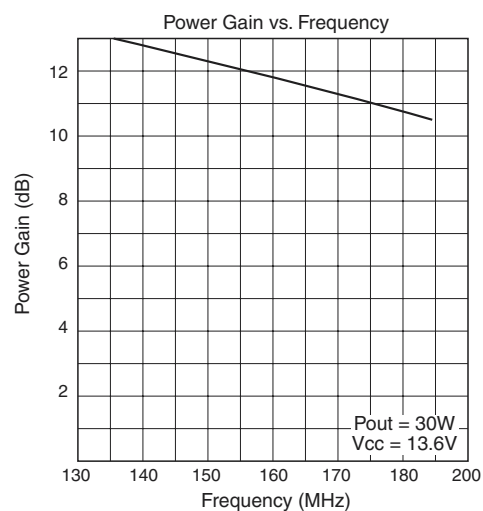
**Figure 3. Power Output vs Supply Voltage (136 MHz)****Figure 4. Power Output vs Supply Voltage (150 MHz)****Figure 5. Power Output vs Supply Voltage (175 MHz)****Figure 6. Power Gain vs Frequency**

Figure 7. Power Output vs Power Input

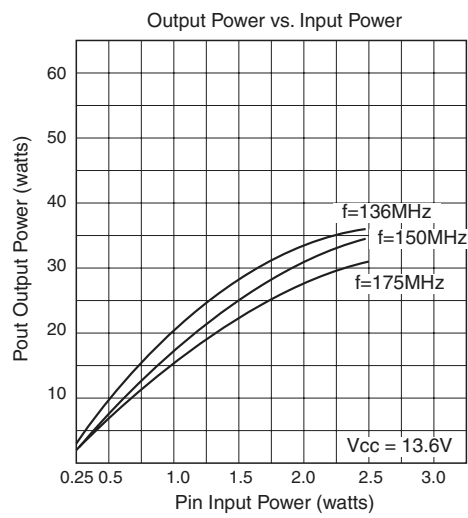


Table 6. Impedance Data <sup>(1)</sup>

| FREQ.   | $Z_{IN} (\Omega)$ | $Z_{CL} (\Omega)$ |
|---------|-------------------|-------------------|
| 175 MHz | $1.0 + j 0.4$     | $2.3 + j 0.1$     |

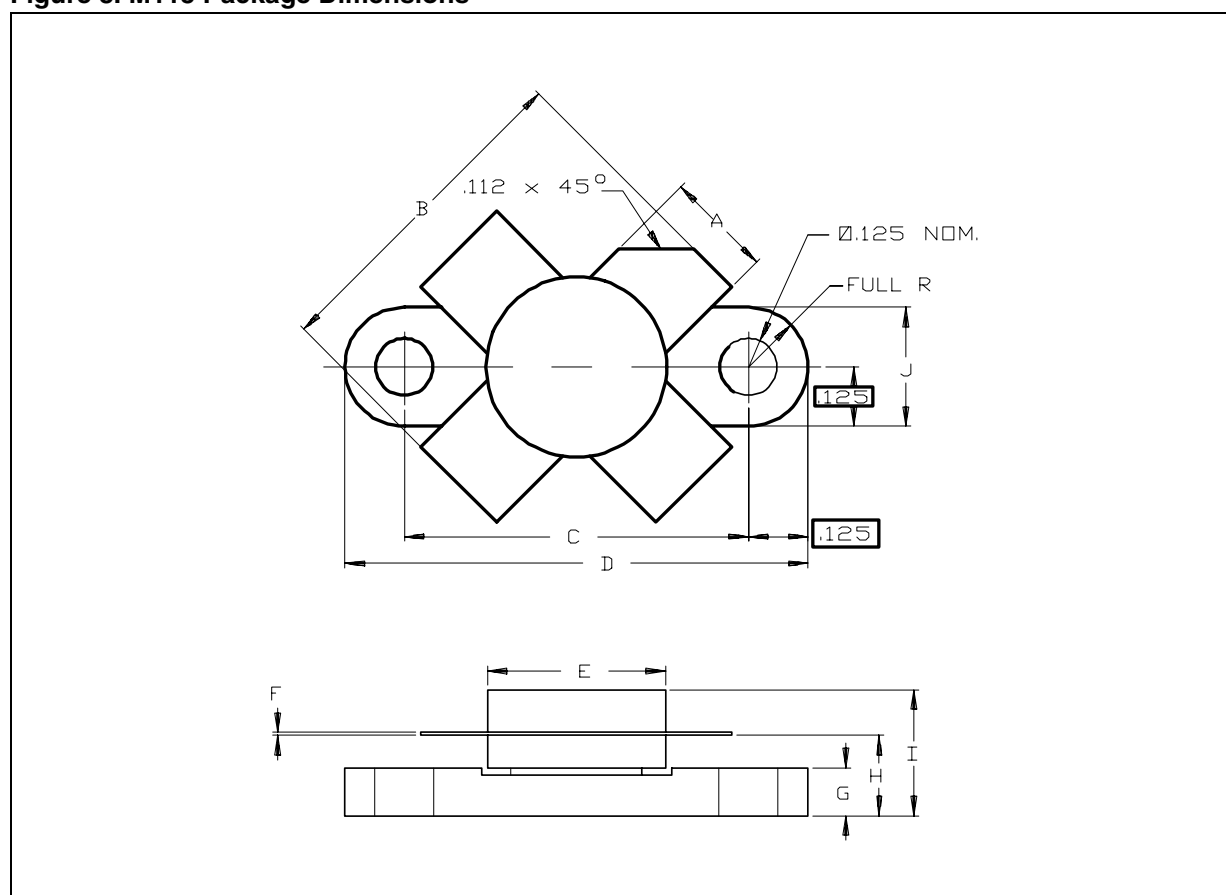
Note: 1.  $P_{IN} = 3.0 \text{ W}$ ;  $V_{CE} = 12.5 \text{ V}$

## PACKAGE MECHANICAL

Table 7. M113 Mechanical Data

| Symbol | millimeters |     |       | inches |     |       |
|--------|-------------|-----|-------|--------|-----|-------|
|        | Min         | Typ | Max   | Min    | Typ | Max   |
| A      | 5.59        |     | 5.84  | 0.220  |     | 0.230 |
| B      | 19.94       |     |       | 0.785  |     |       |
| C      | 18.29       |     | 18.54 | 0.720  |     | 0.730 |
| D      | 24.64       |     | 24.89 | 0.970  |     | 0.980 |
| E      |             |     | 9.78  |        |     | 0.385 |
| F      | 0.10        |     | 0.15  | 0.004  |     | 0.006 |
| G      | 2.16        |     | 2.67  | 0.085  |     | 0.105 |
| H      | 4.06        |     | 4.57  | 0.160  |     | 0.180 |
| I      |             |     | 7.11  |        |     | 0.280 |
| J      | 6.10        |     | 6.48  | 0.240  |     | 0.255 |

Figure 8. M113 Package Dimensions



Note: Drawing is not to scale.

**REVISION HISTORY**

**Table 8. Revision History**

| <b>Date</b> | <b>Revision</b> | <b>Description of Changes</b>         |
|-------------|-----------------|---------------------------------------|
| June-1993   | 1               | First Issue                           |
| 24-May-2004 | 2               | Stylesheet update. No content change. |

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