Features

- Guaranteed performance @1.215GHz, 28Vdc
- Output power: 5.0W CW
- Minimum gain = 8.5dB, 10.3dB (Typ.)
- RF performance curves for 28 Vdc and 36 Vdc operation
- 100% tested for load mismatch at all phase angles with 10:1 VSWR
- Hermetically sealed industry standard package
- Silicon nitride passivated
- Gold metallized, emitter ballasted for long life and resistance to metal migration
- Internal input matching for broadband operation

Description and Applications

Designed for CW and long-pulsed common base amplifier applications, such as JTIDS and Mode S, in the 0.96 to 1.215 GHz frequency range with high overall duty cycles.

Maximum Ratings

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector–Emitter Voltage</td>
<td>V_CES</td>
<td>55</td>
</tr>
<tr>
<td>Collector–Base Voltage</td>
<td>V_CBO</td>
<td>55</td>
</tr>
<tr>
<td>Emitter–Base Voltage</td>
<td>V_EBO</td>
<td>3.5</td>
</tr>
<tr>
<td>Collector Current — Continuous (1)</td>
<td>I_C</td>
<td>1.25</td>
</tr>
<tr>
<td>Total Device Dissipation @ T_A = 25°C (1)</td>
<td>P0</td>
<td>25</td>
</tr>
<tr>
<td>Derate above 25°C</td>
<td></td>
<td>143</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>T_stg</td>
<td>–65 to +200</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>T_J</td>
<td>200</td>
</tr>
</tbody>
</table>

**THERMAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Resistance, Junction to Case (2)</td>
<td>R_{JJC}</td>
<td>7.0</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

NOTES:

1. These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as RF amplifiers.
2. Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques.
Microwave Power Silicon Bipolar Transistor

5.0 W, 960–1215 MHz, 28V

ELECTRICAL CHARACTERISTICS \((T_C = 25^\circ C \text{ unless otherwise noted.})\)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector–Emitter Breakdown Voltage ((I_C = 25 \text{ mA}, V_{BE} = 0))</td>
<td>(V_{BR,CE})</td>
<td>55</td>
<td></td>
<td></td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector–Base Breakdown Voltage ((I_C = 25 \text{ mA}, I_E = 0))</td>
<td>(V_{BR,CE})</td>
<td>55</td>
<td></td>
<td></td>
<td>Vdc</td>
</tr>
<tr>
<td>Emitter–Base Breakdown Voltage ((I_E = 0.5 \text{ mA}, I_C = 0))</td>
<td>(V_{BR,EC})</td>
<td>3.5</td>
<td></td>
<td></td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector Cutoff Current ((V_{CB} = 28 \text{ V}, I_E = 0))</td>
<td>(I_{CEO})</td>
<td>—</td>
<td></td>
<td>1.0</td>
<td>mA dc</td>
</tr>
</tbody>
</table>

ON CHARACTERISTICS

DC Current Gain \((I_C = 500 \text{ mA}, V_{CE} = 5.0 \text{ Vdc})\)

\(h_{FE}\) | 20  | —  | 100 | —   |

DYNAMIC CHARACTERISTICS

Output Capacitance \((V_{CB} = 28 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz})\)

\(C_{BO}\) | —   | 7.0 | 10  | pF  |

FUNCTIONAL TESTS

Common–Base Amplifier Power Gain
\((V_{CC} = 28 \text{ Vdc}, P_{out} = 5.0 \text{ W}, f = 1215 \text{ MHz})\)

\(G_{PB}\) | 8.5  | 10.3 | —  | dB  |

Collector Efficiency
\((V_{CC} = 28 \text{ Vdc}, P_{out} = 5.0 \text{ W}, f = 1215 \text{ MHz})\)

\(\eta\)  | 45  | 55  | —  | %   |

Load Mismatch
\((V_{CC} = 28 \text{ Vdc}, P_{out} = 5.0 \text{ W}, f = 1215 \text{ MHz}, VSWR = 10:1 \text{ All Phase Angles})\)

\(\psi\)  | No Degradation in Output Power |

For further information and support please visit: https://www.macom.com/support
Figure 1. Test Circuit

Figure 2. Output Power versus Input Power

Figure 3. Output Power versus Input Power
Microwave Power Silicon Bipolar Transistor
5.0 W, 960–1215 MHz, 28V

Figure 4. Series Equivalent Input/Output Impedances
Microwave Power Silicon Bipolar Transistor
5.0 W, 960–1215 MHz, 28V

PACKAGE DIMENSIONS

CASE 336E-02
ISSUE B