The RF Line NPN Silicon Power Transistor
25W(PEP), 30MHz, 28V

Designed for high gain driver and output linear amplifier stages in 1.5 to 30 MHz HF/SSB equipment.

- Specified 28 V, 30 MHz characteristics —
  - Output power = 25 W (PEP)
  - Minimum gain = 22 dB
  - Efficiency = 35%
- Intermodulation distortion @ 25 W (PEP) —IMD = −30 dB (max)
- 100% tested for load mismatch at all phase angles with 30:1 VSWR
- Class A and AB characterization
- BLX 13 equivalent

MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Rating</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector–Emitter Voltage</td>
<td>V_CEO</td>
<td>35</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector–Base Voltage</td>
<td>V_CBO</td>
<td>65</td>
<td>Vdc</td>
</tr>
<tr>
<td>Emitter–Base Voltage</td>
<td>V_EBO</td>
<td>4.0</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector Current — Continuous</td>
<td>I_C</td>
<td>3.0</td>
<td>Adc</td>
</tr>
<tr>
<td>Withstand Current — 5 s</td>
<td></td>
<td>6.0</td>
<td>Adc</td>
</tr>
<tr>
<td>Total Device Dissipation @ T_C = 25°C (1)</td>
<td>P_O</td>
<td>70</td>
<td>Watts</td>
</tr>
<tr>
<td>Derate above 25°C</td>
<td></td>
<td>0.4</td>
<td>W/C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>T_stg</td>
<td>−65 to +150</td>
<td>°C</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</td>
<td>R_{JUC}</td>
<td>2.5</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

ELECTRICAL CHARACTERISTICS (T_C = 25°C 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 = 50 mA, I_E = 0)</td>
<td>V_{(BR)CE0}</td>
<td>35</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector–Base Breakdown Voltage (I_C = 50 mA, I_E = 0)</td>
<td>V_{(BR)CB0}</td>
<td>65</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Emitter–Base Breakdown Voltage (I_E = 10 mA, I_C = 0)</td>
<td>V_{(BR)EB0}</td>
<td>4.0</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector Cutoff Current (V_CE = 28 Vdc, V_BE = 0)</td>
<td>I_{CES}</td>
<td>—</td>
<td>10</td>
<td>mA</td>
<td></td>
</tr>
</tbody>
</table>

NOTE:
1. This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier.
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ELECTRICAL CHARACTERISTICS — continued (T_J = 25°C 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>
</table>

ON CHARACTERISTICS

DC Current Gain
(lc = 1.0 A, V_CE = 5.0 V)

| h_FE                        | 10   | 35  |  |  | |

DYNAMIC CHARACTERISTICS

Output Capacitance
(V_CE = 30 V, I_E = 0, f = 1.0 MHz)

| C_OC | 60  | 80  | pF |

FUNCTIONAL TESTS (SSB)

Common–Emitter Amplifier Gain
(V_CC = 28 V, P_OUT = 25 W (PEP), f1 = 30 MHz,

| G_FE | 22  | 25  |  | dB |

Collector Efficiency
(V_CC = 28 V, P_OUT = 25 W (PEP), f1 = 30 MHz,

| η    | 35  |  |  | % |

Intermodulation Distortion (2)
(V_CC = 28 V, P_OUT = 25 W (PEP), f1 = 30 MHz,

| IMD(25) | —  | −35 | −30 | dB |

Load Mismatch
(V_CC = 28 V, P_OUT = 25 W (PEP), f1 = 30 MHz,

| Ψ    | No Degradation in Output Power |

CLASS A PERFORMANCE

Intermodulation Distortion (2) and Power Gain
(V_CC = 28 V, P_OUT = 80 W (PEP), f1 = 30 MHz,

| G_FE | 23.5 |  |  | dB |

IMD(25)

| IMD(25) | —  | −40 | — |

IMD(25)

| IMD(25) | —  | −55 | — |

NOTE:
2. To Mil-Std-1311 Version A, Test Method 2204B, Two Tone, Reference each Tone.
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Adjust Bias (Base) for ICBO = 20 mA with No RF Applied

Figure 1. 30 MHz Linear Test Circuit
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Figure 2. Output Power versus Input Power

Figure 3. Output Power versus Supply Voltage

Figure 4. Power Gain versus Frequency

Figure 5. Intermodulation Distortion versus Output Power
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Rev. V1

Figure 6. DC Safe Operating Area
The RF Line NPN Silicon Power Transistor
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Figure 7. Output Capacitance versus Frequency

Figure 8. Output Resistance versus Frequency

Figure 9. Series Equivalent Input Impedance
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Rev. V1

MACOM

Unless otherwise noted, tolerances are inches ±0.005" [millimeters ±0.13mm]
MRF426

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