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_{CEO}</td>
<td>65</td>
<td>Vdc</td>
</tr>
<tr>
<td>Emitter–Base Voltage</td>
<td>V_{BEO}</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 — 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_{D}</td>
<td>70</td>
<td>Watts</td>
</tr>
<tr>
<td>Derate above 25°C</td>
<td></td>
<td>0.4</td>
<td>Watts</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 dc, I_{E} = 0)</td>
<td>V_{BR}/V_{CEO}</td>
<td>35</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector–Base Breakdown Voltage (I_{C} = 50 mA dc, I_{E} = 0)</td>
<td>V_{BR}/V_{CEO}</td>
<td>65</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Emitter–Base Breakdown Voltage (I_{E} = 10 mA dc, I_{C} = 0)</td>
<td>V_{BR}/V_{BEO}</td>
<td>4.0</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector Cutoff Current (V_{CE} = 20 V dc, V_{BE} = 0)</td>
<td>I_{CES}</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>mA dc</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_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>
</table>

**ON CHARACTERISTICS**

| DC Current Gain (I_C = 1.0 Adc, V_CE = 5.0 Vdc) | h_FE | 10  | 35  | —   | —   |

**DYNAMIC CHARACTERISTICS**

| Output Capacitance (V_CE = 30 Vdc, I_E = 0, f = 1.0 MHz) | C_oe | 60  | 80  | pF  |

**FUNCTIONAL TESTS (SSB)**

| Common–Emitter Amplifier Gain (V_CC = 28 Vdc, P_OUT = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_CQ = 25 mA) | G_FE | 22  | 25  | —   | dB  |
| Collector Efficiency (V_CC = 28 Vdc, P_OUT = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_CQ = 25 mA) | η    | 35  | —   | —   | %   |
| Intermodulation Distortion (2) (V_CC = 28 Vdc, P_OUT = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_CQ = 25 mA) | IMD(2) | —  | -35 | -30 | dB  |
| Load Mismatch (V_CC = 28 Vdc, P_OUT = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_CQ = 25 mA, VSWR 30.1 at All Phase Angles) | Ψ    | No Degradation in Output Power |

**CLASS A PERFORMANCE**

| Intermodulation Distortion (2) and Power Gain (V_CC = 28 Vdc, P_OUT = 8.0 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_CQ = 1.2 Adc) | G_FE | —   | 23.5 | —   | dB  |
| IMD(2) | — | -40 | —   | —   | dB  |
| IMD(3) | — | -55 | —   | —   | dB  |

**NOTE:**

2. To Mil–Std–1311 Version A, Test Method 2204B, Two Tone, Reference each Tone.
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MRF426

BIAS INPUT

RFC1

C8

C9

L3

L2

C3

C4

C5

RF OUTPUT

RF INPUT

L1

C1

C1 — ARCO 469, 190–790 pF
C3, C4 — ARCO 464, 25–280 pF
C5 — 120 pF Dipped Mica
C6, C7 — 100 µF, 15 Vdc
C8 — 680 pF F.T. Allen Bradley
C9 — 1.0 µF 35 V Tantalum
CR1 — 1N4997

Adjust Bias (Base) for ICQ = 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
MRF426

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Figure 6. DC Safe Operating Area
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Rev. V1

Figure 7. Output Capacitance versus Frequency

Figure 8. Output Resistance versus Frequency

Figure 9. Series Equivalent Input Impedance

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