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 @ $T_C = 25^\circ C$ (1)</td>
<td>$P_D$</td>
<td>70</td>
<td>Watts</td>
</tr>
<tr>
<td></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>$R_{LJC}$</td>
<td>2.5</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

### ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ C$ unless otherwise noted.)

### OFF CHARACTERISTICS

<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 ($I_C = 50 \text{ mA}_{dc}, I_E = 0$)</td>
<td>$V_{BR(CEO)}$</td>
<td>35</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector–Base Breakdown Voltage ($I_C = 50 \text{ mA}_{dc}, I_E = 0$)</td>
<td>$V_{BR(CBO)}$</td>
<td>65</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Emitter–Base Breakdown Voltage ($I_E = 10 \text{ mA}_{dc}, I_C = 0$)</td>
<td>$V_{BR(EBO)}$</td>
<td>4.0</td>
<td>—</td>
<td>—</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector Cutoff Current ($V_{CE} = 28 \text{ V}<em>{dc}, V</em>{BE} = 0$)</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.

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

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>
<tbody>
<tr>
<td>DC Current Gain</td>
<td>h FE</td>
<td>10</td>
<td>35</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

DYNAMIC CHARACTERISTICS

| Output Capacitance | C cb  | —   | 60  | 80  | pF   |

FUNCTIONAL TESTS (SSB)

| Common–Emitter Amplifier Gain | G FE  | 22  | 25  | —   | dB   |
| Collector Efficiency | η      | 35  | —   | —   | %    |
| Intermodulation Distortion (2) | IMD(23) | —  | −35 | −30 | dB   |
| Load Mismatch | Ψ      | No Degradation in Output Power |

CLASS A PERFORMANCE

| Intermodulation Distortion (2) and Power Gain | G FE  | —  | 23.5 | —   | dB   |
| IMD(23) | —  | −40 | —   | —   | dB   |
| IMD(25) | —  | −55 | —   | —   | dB   |

NOTE:
1. To Mil–Std–1311 Version A, Test Method 2204B, Two Tone, Reference each Tone.
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The RF Line NPN Silicon Power Transistor
25W(PEP), 30MHz, 28V

Rev. V1

C1, C2 — ARCO 459, 190–790 pF
C3, C4 — ARCO 454, 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

L1 — 3 Tums #16 0.25" ID
L2 — 6 Tums #16 0.5" ID
L3 — 7 Tums #20 0.38" ID
L4 — 10 μH Molded Choke Delevan
RFC1 — Ferroxcube VK200/20-4B
RFC2 — 3-Ferroxcube 5653065-3B
RF — Input/Output Connectors UG53 A/jx
R1 — 10 Ω 1/2 Watt 10%

Adjust Bias (Base) for ICQ = 20 mA with No RF Applied

Figure 1. 30 MHz Linear Test Circuit
The RF Line NPN Silicon Power Transistor
25W(PEP), 30MHz, 28V

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

Figure 6. DC Safe Operating Area
The RF Line NPN Silicon Power Transistor
25W(PEP), 30MHz, 28V

Figure 7. Output Capacitance versus Frequency

Figure 8. Output Resistance versus Frequency

Figure 9. Series Equivalent Input Impedance
The RF Line NPN Silicon Power Transistor
25W(PEP), 30MHz, 28V

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Unless otherwise noted, tolerances are inches ±.005" [millimeters ±0.13mm]
The RF Line NPN Silicon Power Transistor
25W(PEP), 30MHz, 28V

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