DESCRIPTION
M67705H is thick film RF power module specifically designed for 470 ~ 512MHz, 5W FM portable sets.

FEATURES
- Wide band: 40MHz, f = 470 ~ 512MHz
- High total efficiency
  \( \eta_T \geq 40\% \) MIN
- High gain, High output
  \( G_p \geq 25\text{dB}, P_o \geq 7\text{W}, @V_{CC} = 9.6\text{V}, P_{in} = 20\text{mW} \)
- Small package: 45 x 12 x 6.3mm

APPLICATION
Output stage of 5W output UHF band portable radio sets.

OUTLINE DRAWING
Dimensions in mm

EQUIVALENT CIRCUIT
### ABSOLUTE MAXIMUM RATINGS (T_e = 25°C unless otherwise noted)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDD</td>
<td>DC Supply voltage</td>
<td></td>
<td>13</td>
<td>V</td>
</tr>
<tr>
<td>VBB</td>
<td>Base DC bias voltage</td>
<td></td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>ICC</td>
<td>Total current</td>
<td></td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>P_{in(max)}</td>
<td>Input power</td>
<td>Z_0 = Z_L = 50 Ohm</td>
<td>40</td>
<td>mW</td>
</tr>
<tr>
<td>P_{out(max)}</td>
<td>Output power</td>
<td>Z_0 = Z_L = 50 Ohm</td>
<td>10</td>
<td>W</td>
</tr>
<tr>
<td>T_{c(ov)}</td>
<td>Operation case temperature</td>
<td></td>
<td>−30 − −110</td>
<td>°C</td>
</tr>
<tr>
<td>T_{stg}</td>
<td>Storage temperature</td>
<td></td>
<td>−40 − −110</td>
<td>°C</td>
</tr>
</tbody>
</table>

### ELECTRICAL CHARACTERISTICS (T_e = 25°C unless otherwise noted)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test conditions</th>
<th>Limits</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_{out}</td>
<td>Output power</td>
<td>V_{CC} = 9.6V, V_{BB} = 5V, f = 400 – 430MHz, P_{in} = 20mW, Z_0 = 50 Ohm</td>
<td>Min: 7 W, Typ: 8 W, Max: 10 W</td>
<td>W</td>
</tr>
<tr>
<td>η_{T}</td>
<td>Total efficiency</td>
<td></td>
<td>Min: 70 %, Typ: 80 %, Max: 90 %</td>
<td>%</td>
</tr>
<tr>
<td>— 2nd harmonic</td>
<td></td>
<td></td>
<td>Min: −25 dB, Typ: −30 dB</td>
<td>dB</td>
</tr>
<tr>
<td>— 3rd harmonic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P_{in}</td>
<td>Input VSWR</td>
<td>V_{CC1} = V_{CC2} = 9.6V, V_{BB} = 5V, f = 400 – 430MHz, P_{out} = 7W, T_{case} = 20°C (all phase), Z_0 = 50 Ohm</td>
<td>Min: 1.5, Typ: 2.5, Max: 3.0</td>
<td></td>
</tr>
<tr>
<td>Ψ_{in}</td>
<td>Output VSWR</td>
<td></td>
<td>Min: 1.5</td>
<td></td>
</tr>
<tr>
<td>— Load VSWR tolerance</td>
<td>V_{CC1} = V_{CC2} = 9.6V, V_{BB} = 5V, f = 400 – 430MHz, P_{out} = 7W, T_{case} = 20°C (all phase), Z_0 = 50 Ohm</td>
<td>Min: 20 : 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TEST BLOCK DIAGRAM

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S.G. ATT 10dB + VARIATION
VECTOR VOLTOMETER
DIC -RATIONAL COUPLER
Z_0 = 50 Ohm

M67705H

SPECTRUM ANALYZER
ATT. 40x8 POWER METER

DIRECTIONAL COUPLER
DC POWER SUPPLY 1 (V_{DD})
DC POWER SUPPLY 2 (V_{BB})

SHORT TERMINATED VARIABLE COAXIAL

PIN:
① RF INPUT TERMINAL
② 1st STAGE DC SUPPLY TERMINAL
③ BASE DC BIAS TERMINAL
④ DRIVE AND FINAL DC SUPPLY TERMINAL
⑤ RF OUTPUT TERMINAL
⑥ PIN (GROUND)

C. 2200uF, 22uF IN PARALLELED BOARD MATERIAL 1.8mm-THICK EPOXY-GLASS
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2—278
OUTPUT POWER, TOTAL CURRENT, FIRST STAGE CURRENT VS. SUPPLY VOLTAGE CHARACTERISTICS

OUTPUT POWER, FINAL CURRENT VS. FIRST STAGE SUPPLY CHARACTERISTICS

OUTPUT POWER, FIRST STAGE CURRENT VS. FIRST STAGE SUPPLY VOLTAGE CHARACTERISTICS

OUTPUT POWER, FINAL STAGE CURRENT VS. FIRST STAGE SUPPLY VOLTAGE CHARACTERISTICS

SUPPLY VOLTAGE $V_{cc}$ (V)

SUPPLY VOLTAGE $V_{cc}$ (V)

SUPPLY VOLTAGE $V_{cc}$ (V)

SUPPLY VOLTAGE $V_{cc}$ (V)