



MH 8100

MH 0810

COMPLEMENTARY EPITAXIAL TRANSISTORS FOR 3-5W AF OUTPUT

MICRO ELECTRONICS

The MH8100 (NPN), MH0810 (PNP) are complementary silicon planar epitaxial transistors designed for the output stages of 3-5 watt audio amplifiers. They are also suitable for switches up to 3A collector current.

CASE
TO-220B



BCE

ABSOLUTE MAXIMUM RATINGS:

For p-n-p devices, voltage and current values are negative.

| | | |
|---|-----------|---------------|
| Collector-Emitter Voltage ($V_{BE} = 0$) | V_{CES} | 35V |
| Collector-Emitter Voltage (Base Open) | V_{CEO} | 30V |
| Emitter-Base Voltage | V_{EBQ} | 5V |
| Collector Current | I_C | 3A |
| Collector Peak Current ($t \leq 10\text{ms}$) | I_{CM} | 5A |
| Total Power Dissipation ($T_C \leq 25^\circ\text{C}$) | P_{tot} | 12W |
| Junction Temperature | T_j | 150°C |
| Storage Temperature Range | T_{stg} | -55 to +150°C |

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT | TEST CONDITIONS |
|--------------------------------------|---------------|-----|-----|-----|---------------|---|
| Collector-Emitter Breakdown Voltage | LV_{CEO} | 30 | | | V | $I_C = 50\text{mA}$ $I_B = 0$ |
| Collector Cutoff Current | I_{CES} | | | 1 | μA | $V_{CE} = 35\text{V}$ $V_{BE} = 0$ |
| Emitter Cutoff Current | I_{EBO} | | | 1 | μA | $V_{EB} = 5\text{V}$ $I_C = 0$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | | 0.8 | V | $I_C = 2\text{A}$ $I_B = 0.2\text{A}$ |
| Base-Emitter Voltage | V_{BE} | | | 1 | V | $I_C = 0.5\text{A}$ $V_{CE} = 2\text{V}$ |
| D.C. Current Gain | $*H_{FE1}$ | 40 | | 240 | | $I_C = 0.5\text{A}$ $V_{CE} = 2\text{V}$ |
| | H_{FE2} | 30 | | | | $I_C = 0.01\text{A}$ $V_{CE} = 2\text{V}$ |
| Current Gain-Bandwidth Product | f_T | 30 | 100 | | MHz | $I_C = 0.2\text{A}$ $V_{CE} = 4\text{V}$ |

* H_{FE1} is classified as follows.

Group A : 40-80

Group B : 70-140

Group C : 120-240

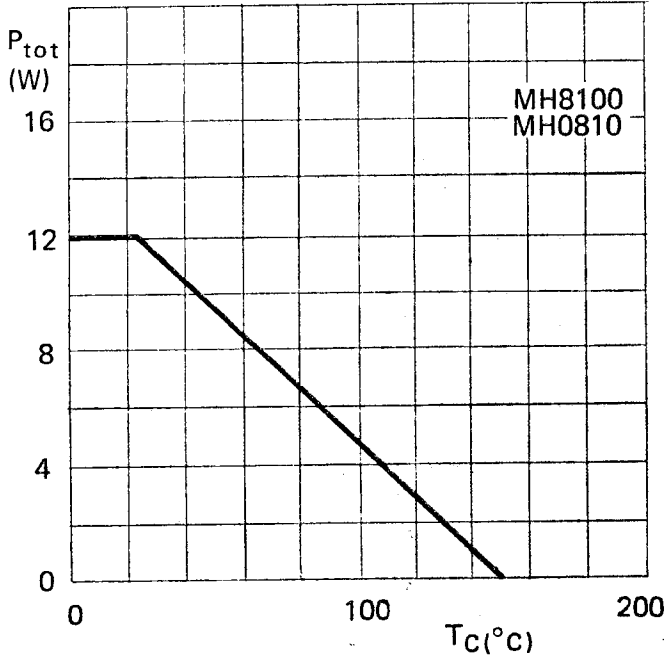
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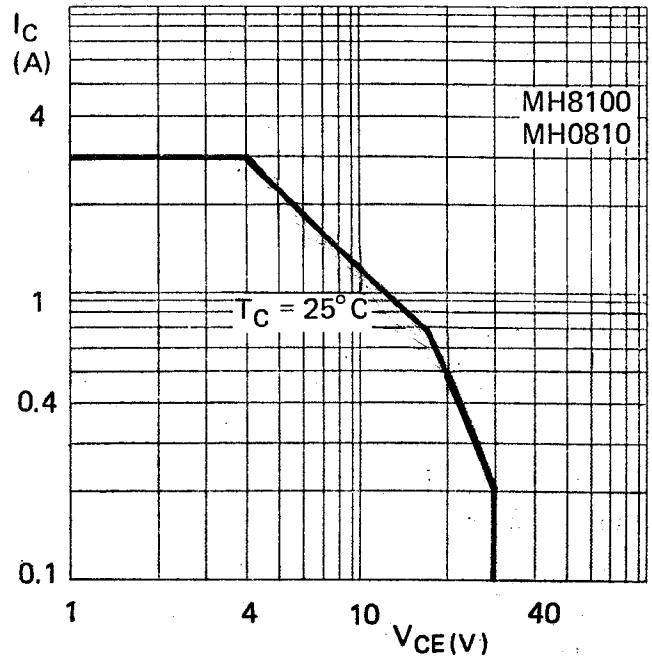
FAX: 3-410321

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE SPECIFIED)

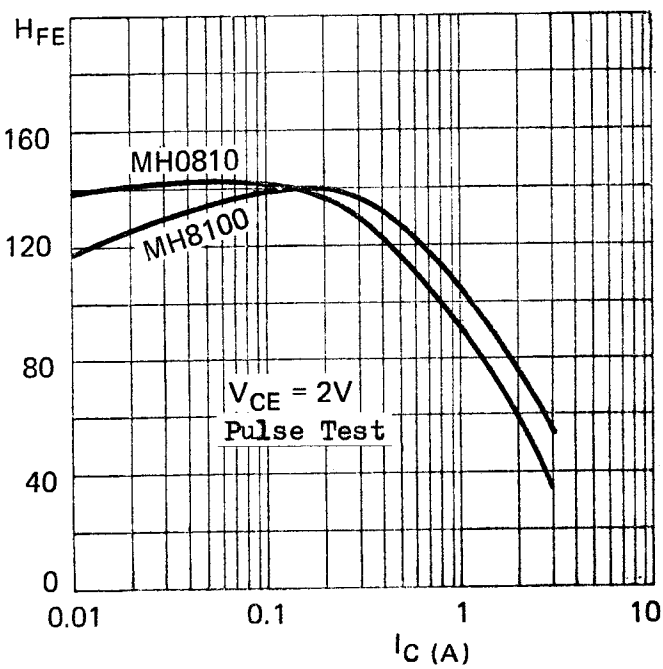
RATED POWER vs CASE TEMPERATURE



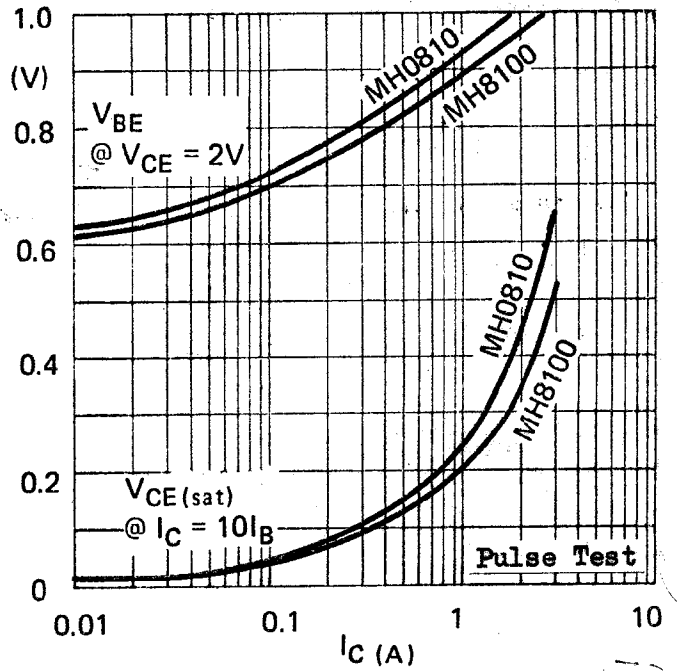
SAFE OPERATING AREA (D.C.)

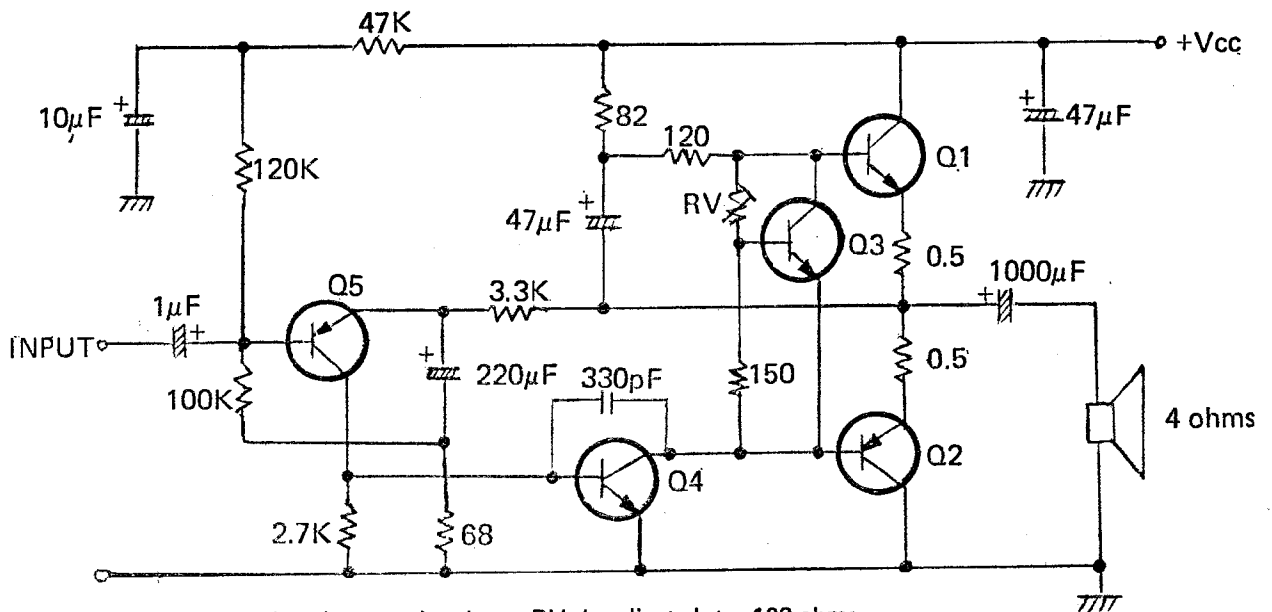


D.C. CURRENT GAIN vs COLLECTOR CURRENT



V_{BE} AND $V_{CE(sat)}$ vs COLLECTOR CURRENT



APPLICATION 1: 3W OTL AUDIO AMPLIFIER

All resistances in ohms. RV is adjusted to 100-ohms at which quiescent collector current of Q₁ = 5mA.

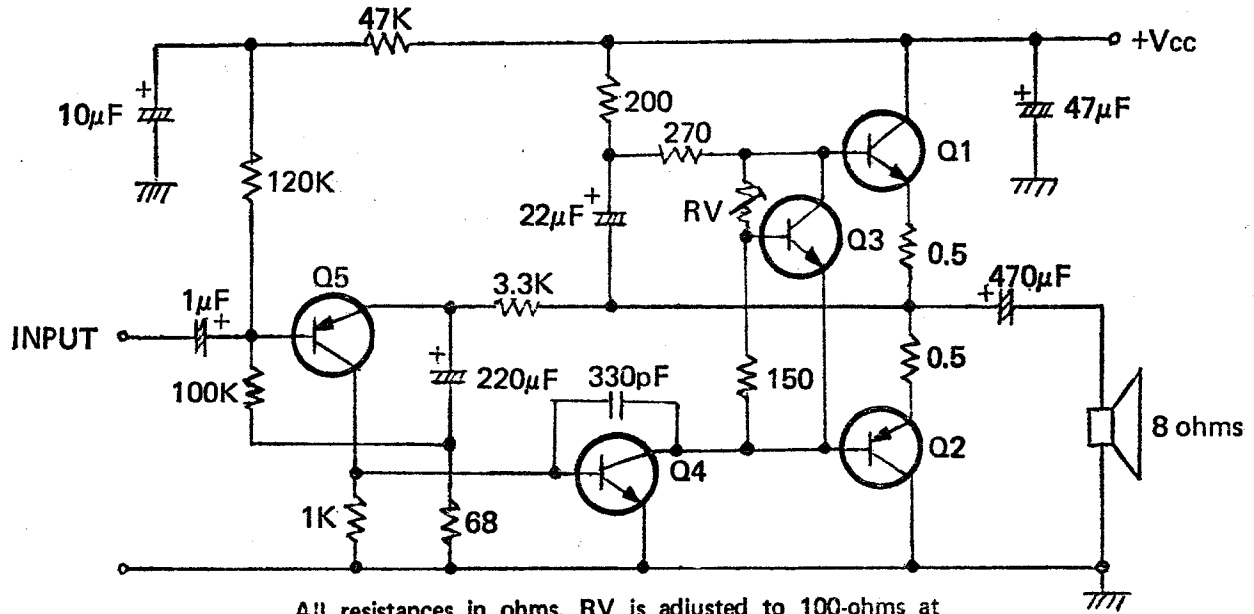
TRANSISTORS

| | | |
|----------------|---|---|
| Q ₁ | : | MH8100, H _{FE} GROUP B to C, mounted on heat sink. |
| Q ₂ | : | MH0810, H _{FE} GROUP B to C, mounted on heat sink. |
| Q ₃ | : | BC238, H _{FE} GROUP B. |
| Q ₄ | : | BC338, any H _{FE} GROUP. |
| Q ₅ | : | BC308, H _{FE} GROUP B to C. |

CIRCUIT PERFORMANCE

| | | |
|---------------------------|---|---------------------------------------|
| Supply Voltage | : | 13.2V (16V @ no signal) |
| Max Undistorted Output | : | 3W @ 1KHz |
| Input Sensitivity | : | 84mV @ 3W output |
| Input Impedance | : | 90K ohms @ 1KHz |
| Frequency Response | : | 37Hz to 55KHz, -3dB |
| Total Harmonic Distortion | : | less than 1% @ 2W output, 1KHz |
| Current Drain | : | 42mA @ no signal 440mA @ 3W output |

APPLICATION 2: 5W OTL AUDIO AMPLIFIER



All resistances in ohms. RV is adjusted to 100-ohms at which quiescent collector current of Q₁ = 5mA.

TRANSISTORS

- Q₁ : MH8100, H_F GROUP B to C, mounted on heat sink.
- Q₂ : MH0810, H_{FE} GROUP B to C, mounted on heat sink.
- Q₃ : BC238, H_{FE} GROUP B.
- Q₄ : BC338, any H_{FE} GROUP.
- Q₅ : BC308, H_{FE} GROUP B to C.

CIRCUIT PERFORMANCE

- Supply Voltage : 22V (25V @ no signal)
- Max Undistorted Output : 5.5W @ 1KHz
- Input Sensitivity : 140mV @ 5W
- Input Impedance : 105K ohms @ 1KHz
- Frequency Response : 33Hz to 65KHz, -3dB
- Total Harmonic Distortion : less than 2% @ 5W output, 1KHz
- Current Drain : 32mA @ no signal
390mA @ 5W output