



# 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	$T_j$	$150^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	$-55$ to $+150^\circ\text{C}$

### 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	$\mu\text{A}$	$V_{CE} = 35\text{V}$ $V_{BE} = 0$
Emitter Cutoff Current	$I_{EBO}$			1	$\mu\text{A}$	$V_{EB} = 5\text{V}$ $I_C = 0$
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

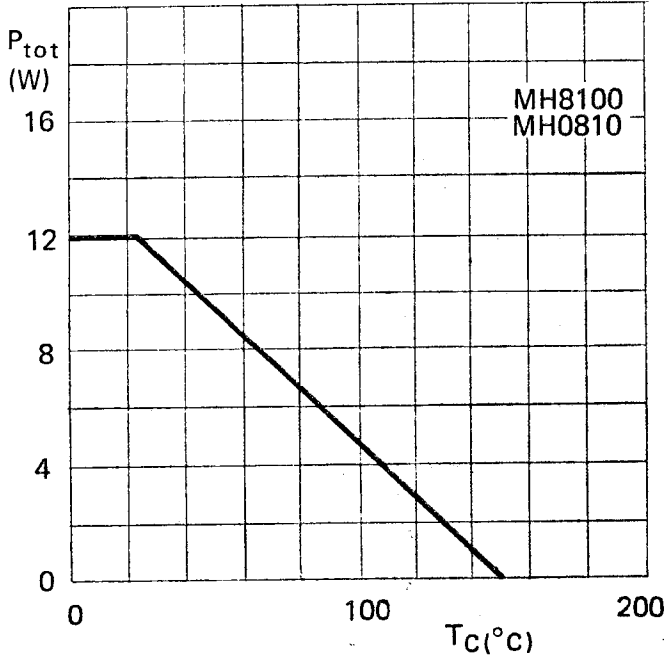
## MICRO ELECTRONICS LTD.

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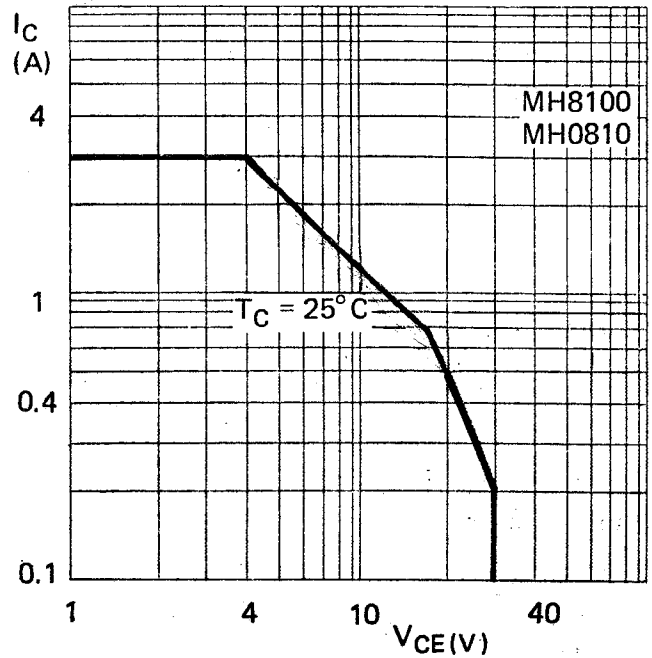
FAX: 3-410321

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

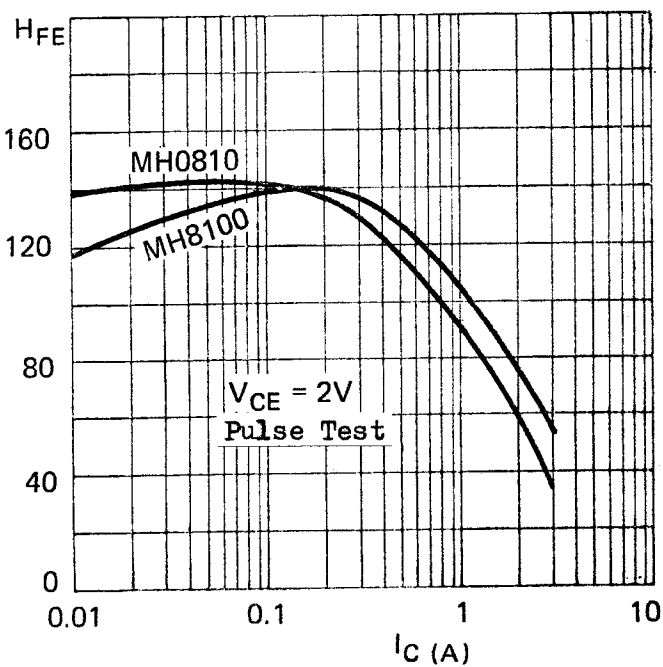
RATED POWER vs CASE TEMPERATURE



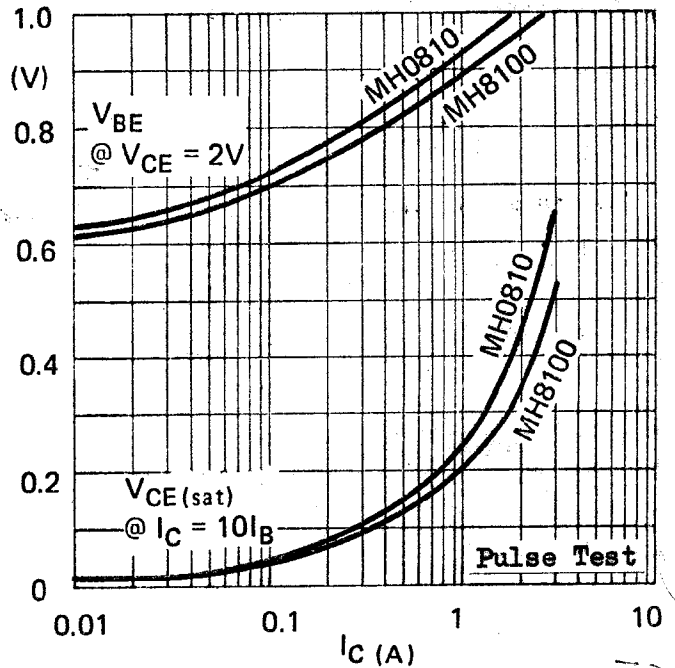
SAFE OPERATING AREA (D.C.)

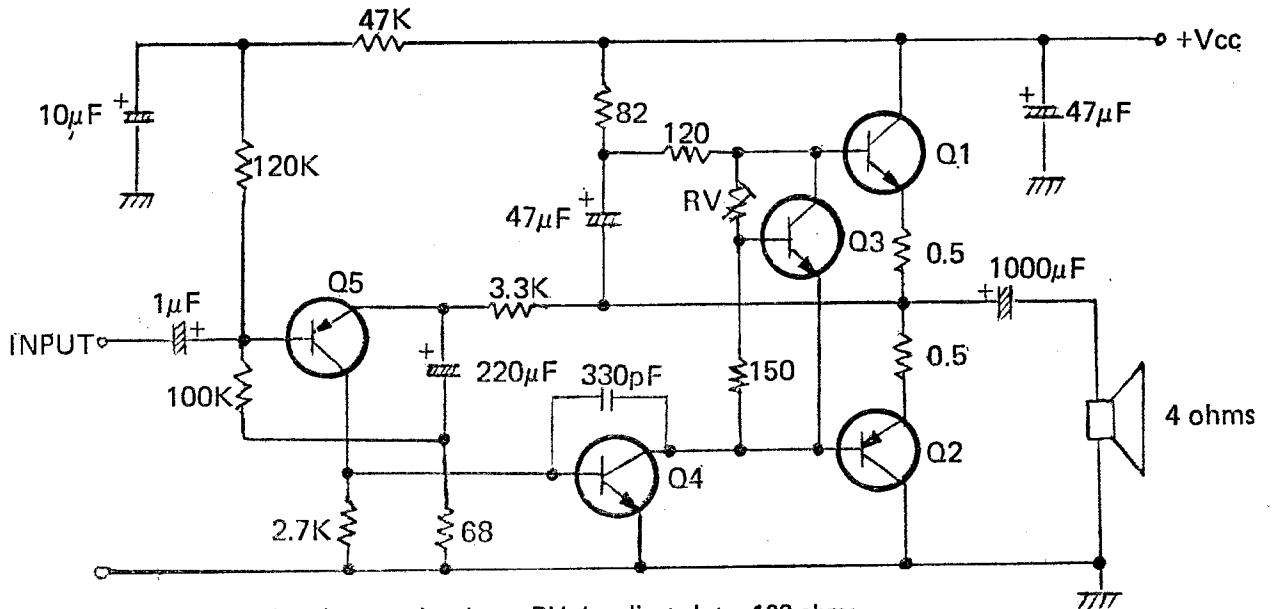


D.C. CURRENT GAIN vs COLLECTOR CURRENT



$V_{BE}$  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  $Q_1 = 5\text{mA}$ .

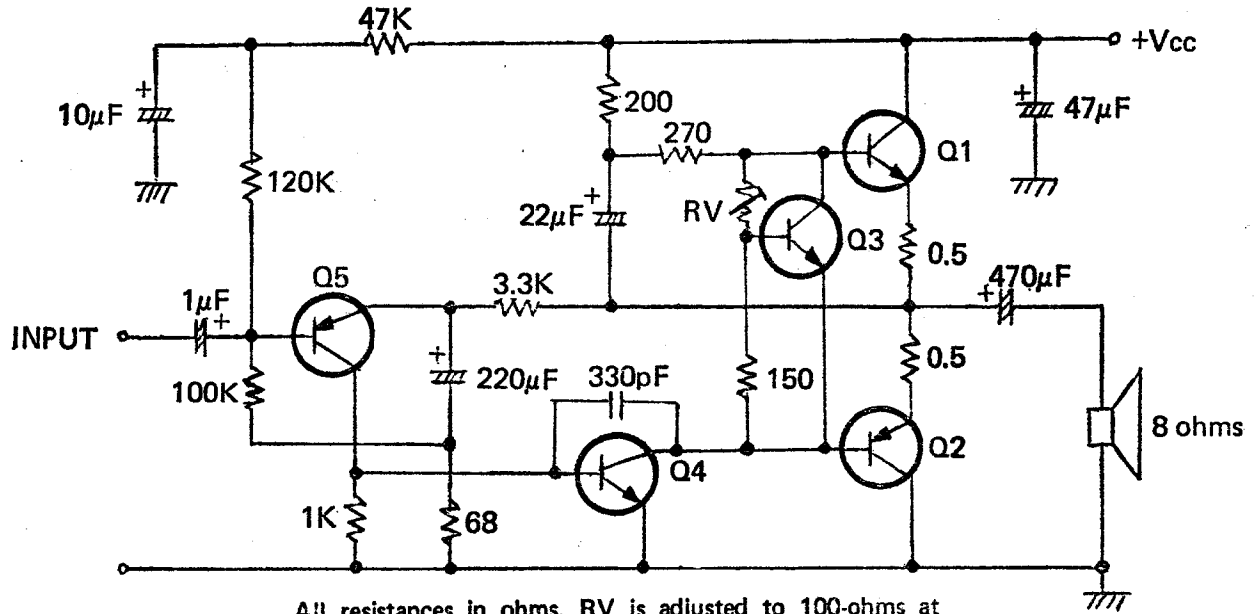
TRANSISTORS

$Q_1$	:	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 Q<sub>1</sub> = 5mA.

**TRANSISTORS**

- Q<sub>1</sub> : MH8100, H<sub>F</sub> GROUP B to C, mounted on heat sink.
- Q<sub>2</sub> : MH0810, H<sub>FE</sub> GROUP B to C, mounted on heat sink.
- Q<sub>3</sub> : BC238, H<sub>FE</sub> GROUP B.
- Q<sub>4</sub> : BC338, any H<sub>FE</sub> GROUP.
- Q<sub>5</sub> : BC308, H<sub>FE</sub> 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