MFC8020

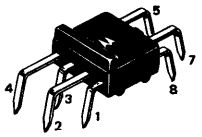
CLASS B AUDIO DRIVER

. . . designed as a preamplifier and driver circuit for complementary output transistors.

- Drives Up to 15-Watts Output (Four-Ohm Load)
- High Gain – 10 mV Input for Full Output
- High Input Impedance – 1 Meg Ohm Typ
- Output Biasing Diodes Included
- No Special h_{FE} Matching of Outputs Required

CLASS B AUDIO DRIVER

Silicon Monolithic Functional Circuit

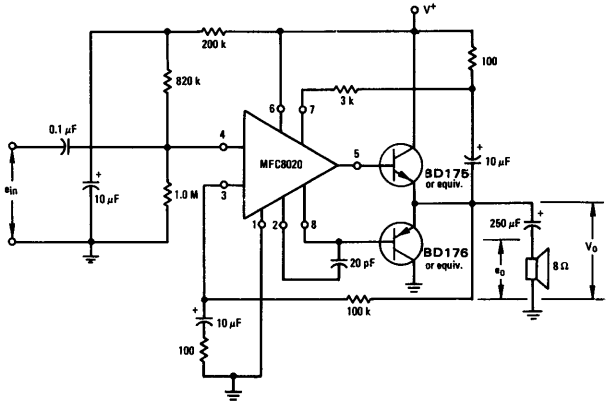


CASE 644A

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Power Supply Voltage	V^+	35	Vdc
Thermal Resistance Derate above T_A = +25°C	θ_{JA}	100 10	°C/Watt mW/°C
Operating Temperature	T_A	-10 to +75	°C

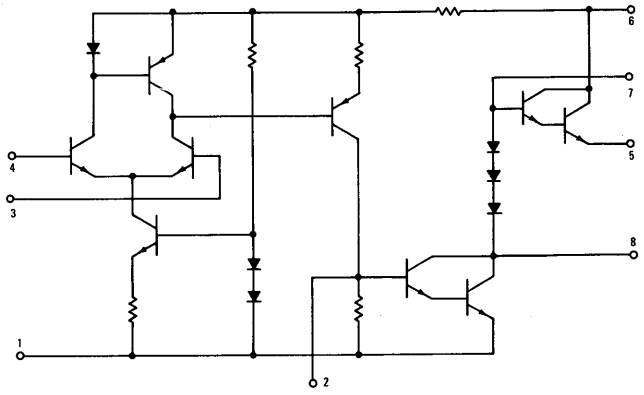
FIGURE 1 – TYPICAL APPLICATION AND TEST CIRCUIT (10-WATT AMPLIFIER)



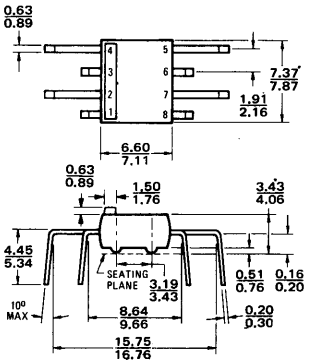
ELECTRICAL CHARACTERISTICS (T_A = +25°C unless otherwise noted) (See Figure 1)

Characteristic	Symbol	Min	Typ	Max	Unit
Drain Current (e_{in} = 0, V^+ = 32 Vdc)	I_D	–	10	30	mA
Sensitivity (f = 1.0 kHz, P_o = 10 W, e_o = 8.95 V[rms])	e_{in}	–	–	10	mV
Distortion @ 10 Watts Power Output (e_{in} adjusted to produce 10-Watts output, e_o = 8.95 V(rms), V^+ = 32 Vdc, f = 1.0 kHz)	THD	–	1.0	5.0	%
Quiescent Output Voltage (V^+ = 32 Vdc, e_{in} = 0)	V_o	15	16	17	Vdc

FIGURE 2 – CIRCUIT SCHEMATIC



OUTLINE DIMENSIONS
CASE 644A
PLASTIC PACKAGE



Dimensions in millimeters

MFC8030

Advance Information

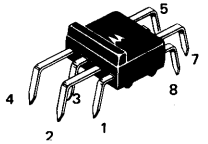
DIFFERENTIAL/CASCODE AMPLIFIER

. . . designed for applications requiring differential or cascode amplifiers.

- Extremely Flexible Amplifier
- Diode Available for Biasing
- Economical 8-Staggered Lead Package

DIFFERENTIAL/CASCODE AMPLIFIER

Silicon Monolithic Functional Circuit

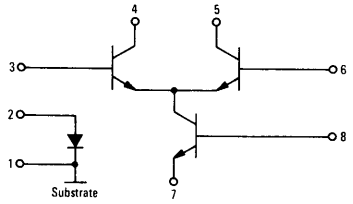


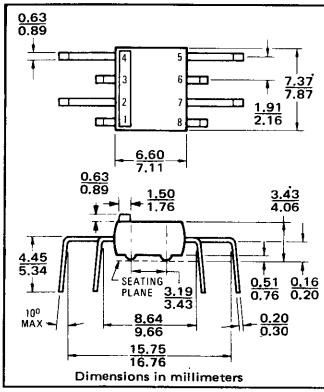
CASE 644A

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Power Supply Voltage	V^+	20	Vdc
Differential Input Voltage	V_{in}	±5.0	Vdc
Power Dissipation @ T_A = 25°C (Package Limitation)	P_D	1.0	Watt
Derate above 25°C	$1/\theta_{JA}$	10	mW/°C
Operating Temperature Range	T_A	0 to +75	°C

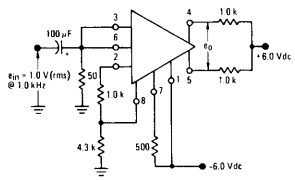
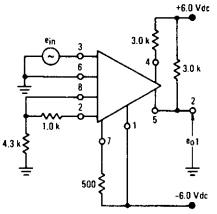
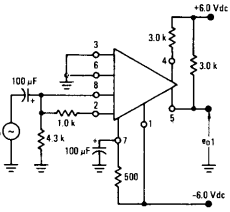
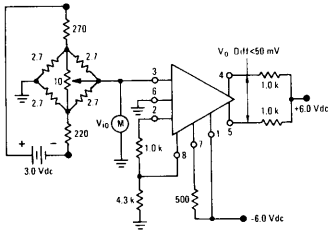
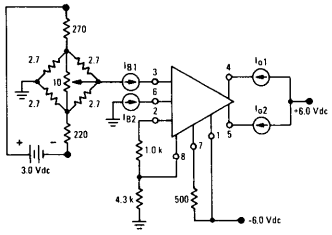
FIGURE 1 – CIRCUIT SCHEMATIC





Dimensions in millimeters

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Circuit	Characteristic	Symbol	Min	Typ	Max	Unit
	AC Common-Mode Rejection $e_{4-5} = e_o$ $CMR = 20 \log \frac{(e_{in})}{(e_o)}$	CMR_{AC}	–	35	–	dB
	Differential-Mode Voltage Gain A_V Diff = $20 \log \frac{(e_{o1})}{(e_{in})}$ (e_{in} = 1.0 kHz, 1.0 mV[rms]) (e_{in} = 10 MHz, 1.0 mV[rms]) (e_{in} = 50 MHz, 1.0 mV[rms])	$A_{V(dif)}$	– – –	32 26 10	– – –	dB
	Cascode-Mode Voltage Gain A_V Cascode = $20 \log \frac{(e_{o1})}{(e_{in})}$ (e_{in} = 1.0 kHz, 1.0 mV[rms]) (e_{in} = 10 MHz, 1.0 mV[rms]) (e_{in} = 50 MHz, 1.0 mV[rms])	$A_{V(cscd)}$	– – –	36 31.5 15	– – –	dB
	Input Offset Voltage	V_{IO}	–	5.0	10	mV
	DC Current Gain Match (I_{o1} = I_{o2})	$\frac{h_{FE1}}{h_{FE2}}$	0.8	–	1.1	–

MFC8070

Advance Information

ZERO VOLTAGE SWITCH

. . . designed for use in ac power switching applications with output drive capable of triggering triacs. Other operational features include:

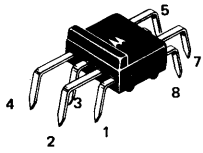
- A built-in voltage regulator that allows direct ac line operation
- A differential input with dual sensor inputs capable of testing the condition of two external sensors and controlling the gate pulse to a triac accordingly. Hysteresis or proportional control to this section may be added if desired.
- Sensor input "open and short" protection. This insures that the triac will never be turned "on" if either of the sensors are shorted or opened.
- A zero crossing detector that synchronizes the triac gate pulses with the zero crossing of the ac line voltage. This eliminates radio frequency interference (rfi) when used with resistive loads.

Typical Applications Include:

- Heater Controls
- Photo Controls
- Threshold Detector
- Lamp Driver
- Valve Control
- ON-OFF Power Controls
- Relay Driver
- Flasher Control

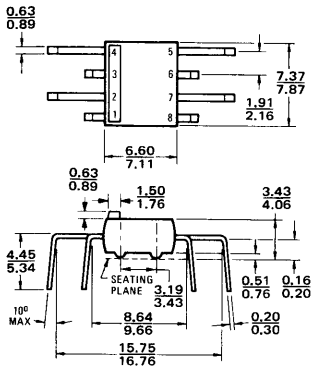
ZERO VOLTAGE SWITCH

Silicon Monolithic Functional Circuit



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Voltage	V_{5-8}	15	Vdc
DC Voltage	V_{4-8}	15	Vdc
DC Voltage	V_{7-8}	15	Vdc
Power Dissipation @ T_A = 25°C Derate above 25°C	P_D $1/\theta_{JA}$	1.0 10	Watt mW/°C
Operating Temperature Range	T_A	-10 to +75	°C
Storage Temperature Range	T_{stg}	-55 to + 150	°C

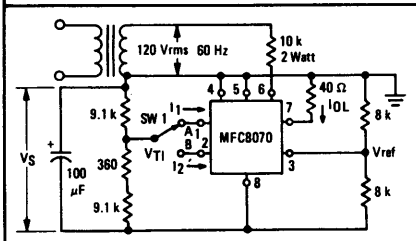


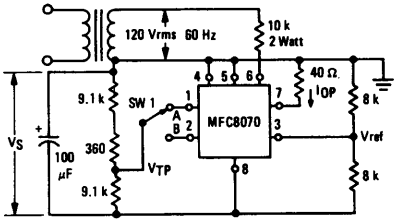
CASE 644A

Dimensions in millimeters

ELECTRICAL CHARACTERISTICS (T_A = 25° C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
V_S with Inhibit Output (Sw. 1: A or B)	V_{SI}	–	9.0	11	Vdc
Output Leakage (Sw. 1: A or B)	I_{OL}	–	5.0	100	μA
Input Current 1 (Sw. 1: A)	I_1	–	5.0	15	μA
Input Current 2 (Sw. 1: B)	I_2	–	5.0	15	μA
Inhibit Threshold (Sw. 1: A or B)	V_{TI}	V_{ref} +100 mV	V_{ref} +10 mV	–	Vdc
V_S with Pulse Output (Sw. 1: A or B)	V_{SP}	6.0	8.5	–	Vdc
Peak Output Current (Sw. 1: A or B)	I_{OP}	50	–	–	mA
Pulse Threshold (Sw. 1: A or B)	V_{TP}	–	V_{ref} -10 mV	V_{ref} -100 mV	Vdc
Output Pulse Width (Sw. 1: A or B) (See Figure 1)	τ_A, τ_B	–	70	–	μs
Input Short Protection (Sw. 1: A; Sw. 2: B)	I_{OS}	–	5.0	100	μA
Input Short Protection (Sw. 1: B; Sw. 2: A)	I_{OS}	–	5.0	100	μA





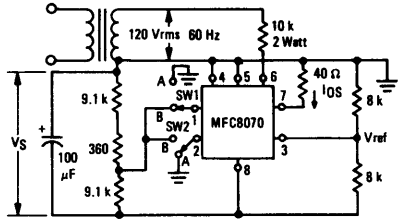


FIGURE 1 – OUTPUT PULSE DEFINITION

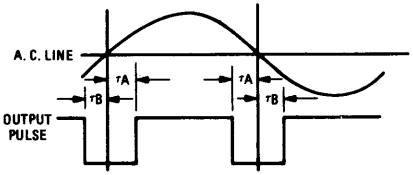


FIGURE 2 – CIRCUIT SCHEMATIC

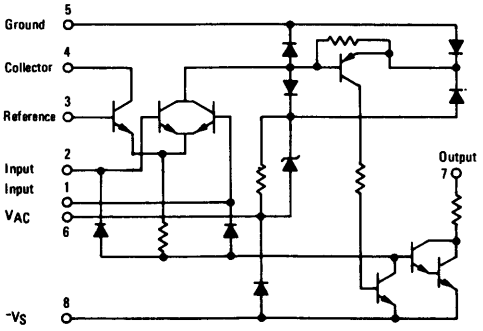


FIGURE 3 – CIRCUIT FOR MEASURING OUTPUT PULSE WIDTH versus SOURCE RESISTANCE

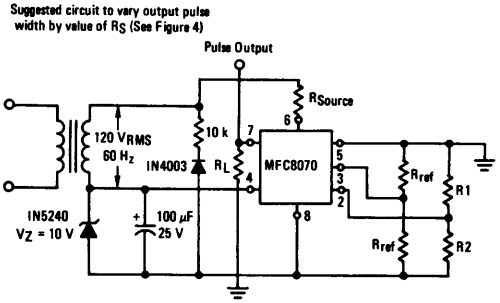
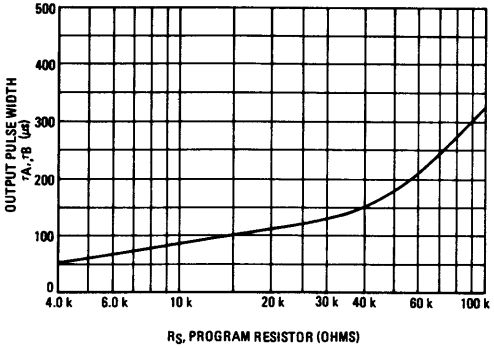
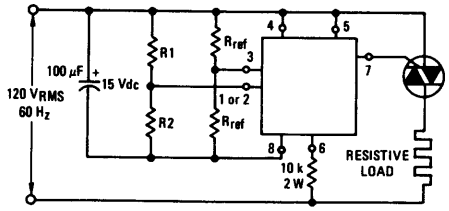


FIGURE 4 – OUTPUT PULSE WIDTH versus SOURCE RESISTANCE



TYPICAL ZERO VOLTAGE SWITCH APPLICATIONS FOR TRIAC CONTROL

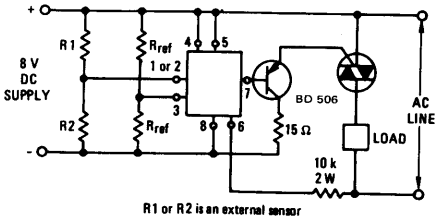
FIGURE 5 – TRIAC CONTROL CIRCUIT



R1 or R2 is an external sensor

Basic triac trigger circuit utilizing the zero crossing detector and the input comparator to control the gate of the triac.

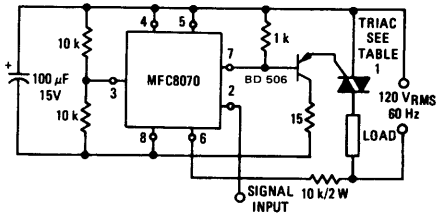
FIGURE 6 – TRIAC CONTROL CIRCUIT WITH CURRENT BOOST UTILIZING DC SUPPLY



R1 or R2 is an external sensor

Basic DC trigger application using the input comparator to control a PNP capable of furnishing gate drive of approximately 0.5 Amp.

FIGURE 7 – TRIAC CONTROL CIRCUIT WITH CURRENT BOOST UTILIZING AC SUPPLY

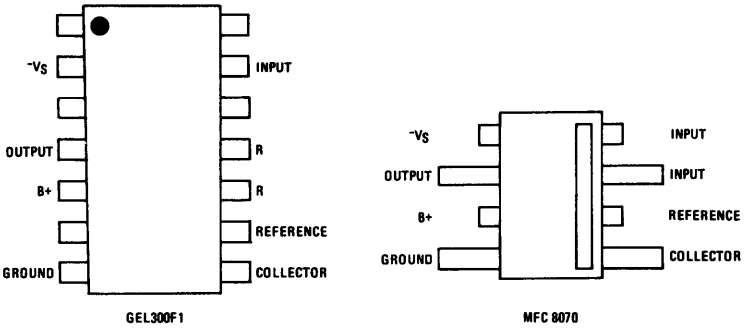


Zero crossing triac control circuit for gate current requirements greater than 50 mA.

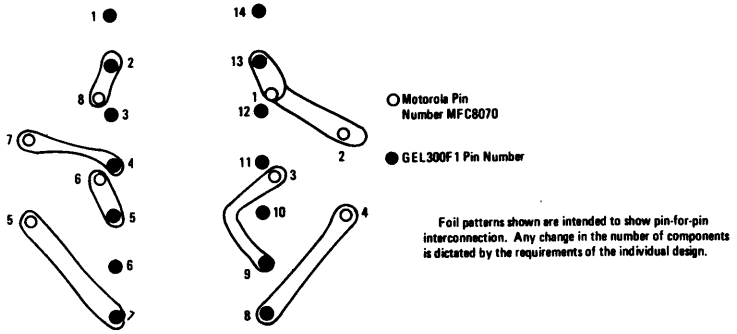
Recommended Motorola triacs for use in circuit.

Maximum Continuous (Current (Amp Rms)	Triac Family	Case No.
10	2N6154/2N6156 (MAC 10)	90 (Plastic)
10	2N6139/2N6144 (MAC 1, 2, 3)	85, 86, 87L
30	2N6157/2N6165 (MAC 35, 36)	174, 175

PIN COMPARISON OF MFC8070 AND GEL300F1 (PA424)



COMPATIBLE PRINTED CIRCUIT FOIL PATTERN FOR MFC8070 AND GEL300F1 (PA424)



Foil patterns shown are intended to show pin-for-pin interconnection. Any change in the number of components is dictated by the requirements of the individual design.