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MOTOROLA

MC3467

Triple Wideband Preamplifier with Electronic Gain Control (EGC)

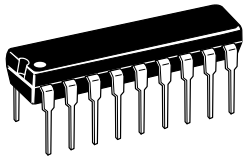
The MC3467 provides three independent preamplifiers with individual electronic gain control in a single 18–pin package. Each preamplifier has differential inputs and outputs allowing operation in completely balanced systems. The device is optimized for use in 9–track magnetic tape memory systems where low noise and low distortion are paramount objectives.

The electronic gain control allows each amplifier's gain to be set anywhere from essentially zero to a maximum of approximately 100 V/V.

- Wide Bandwidth – 15 MHz (Typical)
- Individual Electronic Gain Control
- Differential Input/Output

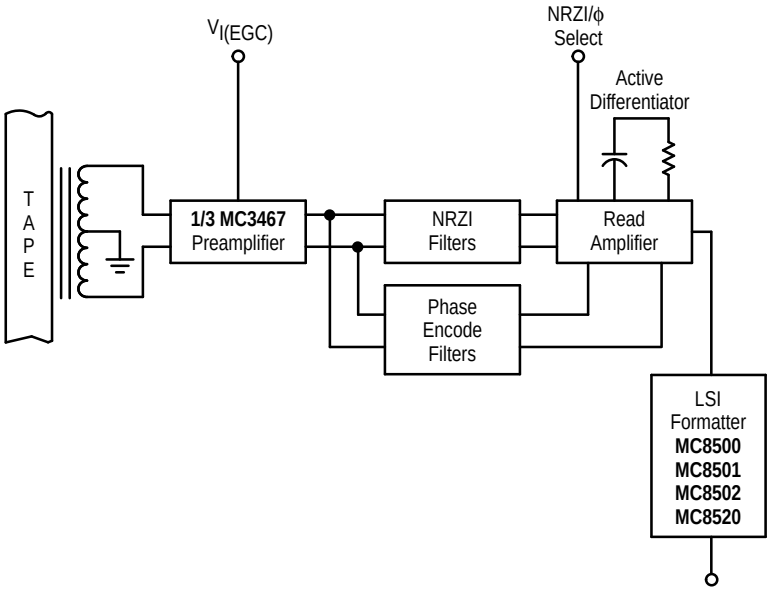
TRIPLE MAGNETIC TAPE MEMORY PREAMPLIFIER

SEMICONDUCTOR TECHNICAL DATA

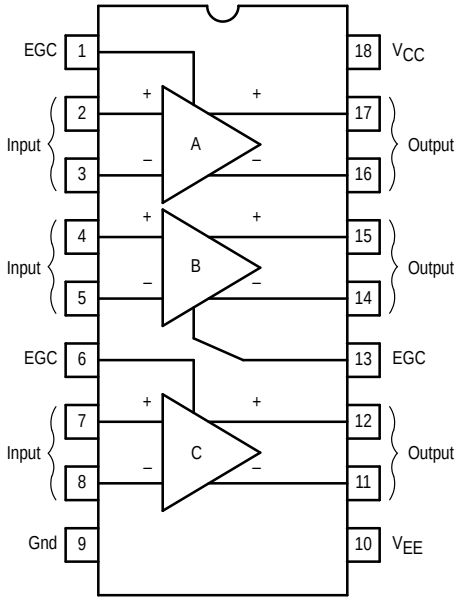


P SUFFIX
PLASTIC PACKAGE
CASE 707

Simplified Application
High Performance 9–Track Open Reel Tape System



PIN CONNECTIONS



ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC3467P	T_A = 0 to +70°C	Plastic DIP

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

Rating	Symbol	Value	Unit
Power Supply Voltages Positive Supply Voltage Negative Supply Voltage	 V_{CC} V_{EE}	 6.0 –9.0	V
EGC Voltages (Pins 1, 6 and 13)	$V_{I(EGC)}$	–5.0 to V_{CC}	V
Input Differential Voltage	V_{ID}	± 5.0	V
Input Common–Mode Voltage	V_{IC}	± 5.0	V
Amplifier Output Short Circuit Duration (to Ground)	t_{sc}	10	s
Operating Ambient Temperature Range	T_A	0 to +70	°C
Storage Temperature Range	T_{stg}	– 65 to +150	°C
Junction Temperature	T_J	+150	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 5.0 V, V_{EE} = –6.0 V, f =100 kHz, T_A = 0 to +70°C, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Power Supply Voltage Range Positive Supply Voltage Negative Supply Voltage Operating EGC Voltage	 V_{CCR} V_{EER} $V_{I(EGC)}$	 4.75 –5.5 0	 5.0 –6.0 –	 5.25 –7.0 V_{CC}	V
Differential Voltage Gain (Balanced) ($V_{I(EGC)}$ = 0, e_i = 25 mVpp) (See Figure 1)	A_{VD}	85	100	120	V/V
Differential Voltage Gain ($V_{I(EGC)}$ = V_{CC})	A_{VD}	–	0.5	2.0	V/V
Maximum Input Differential Voltage (Balanced) (T_A = 25°C)	V_{IDR}	0.2	–	–	V_{pp}
Output Voltage Swing (Balanced) (Figure 1) (e_i = 200 mVpp)	V_{OR}	6.0	8.0	–	V_{pp}
Input Common–Mode Range	V_{ICR}	± 1.5	± 2.0	–	V
Differential Output Offset Voltage (T_A = 25°C)	V_{OOD}	–	500	–	mV
Common–Mode Output Offset Voltage (T_A = 25°C)	V_{OOC}	–	500	–	mV
Common–Mode Rejection Ratio (Figure 2) $V_{I(EGC)}$ = 0, V_{CM} = 1.0 V_{pp} (f = 100 kHz) (f = 1.0 MHz)	CMRR	 60 40	 100 100	 – –	dB
Small–Signal Bandwidth (Figure 1) (–3.0 dB, e_i = 1.0 mVpp, T_A = 25°C)	BW	10	15	–	MHz
Input Bias Current	I_{IB}	–	5.0	15	μA
Output Sink Current (Figure 5)	I_{OS}	1.0	1.4	–	mA
Differential Noise Voltage Referred to Input (Figure 3) ($V_{I(EGC)}$ = 0, R_S = 50 Ω, BW = 10 Hz to 1.0 MHz, T_A = 25°C)	e_n	–	3.5	–	μV_{RMS}
Positive Power Supply Current (Figure 4)	I_{CC}	–	30	40	mA
Negative Power Supply Current (Figure 4)	I_{EE}	–	–30	–40	mA
Input Resistance (T_A = 25°C)	r_i	12	25	–	kΩ
Input Capacitance (T_A = 25°C)	C_i	–	2.0	–	pF
Output Resistance (Unbalanced) (T_A = 25°C)	r_o	–	30	–	Ohms

Figure 1. Differential Voltage Gain, Bandwidth and Output Voltage Swing Test Circuit

(Channel A under test, other channels tested similarly)

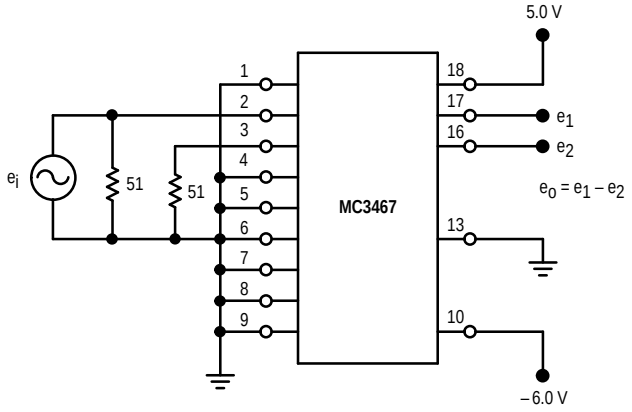


Figure 2. Common–Mode Rejection Ratio

(Channel A under test, other amplifiers tested similarly)

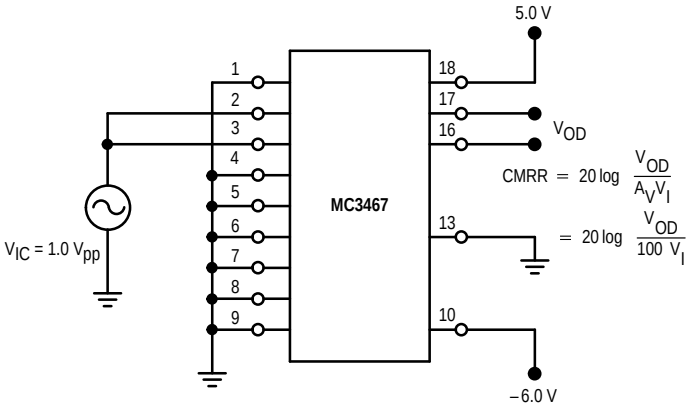
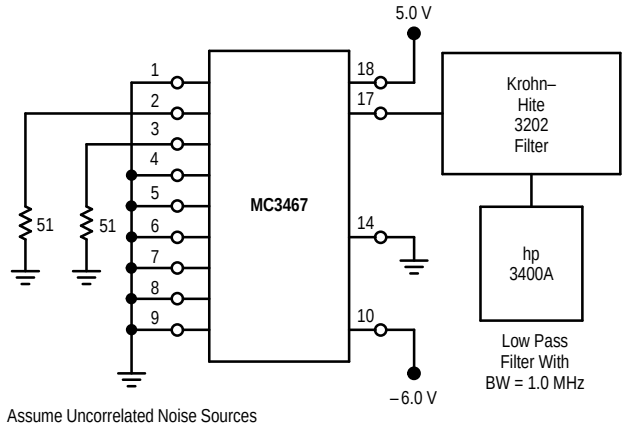


Figure 3. Differential Noise Voltage Referred to the Input



Assume Uncorrelated Noise Sources

e_n (Differential Noise at Input) $= e_o \sqrt{2/100}$

Figure 4. Power Supply Current Test Circuit

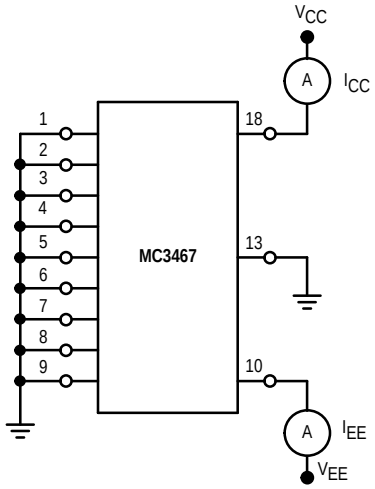


Figure 5. Output Sink Current Test Circuit

(Channel A under test, other channels tested similarly)

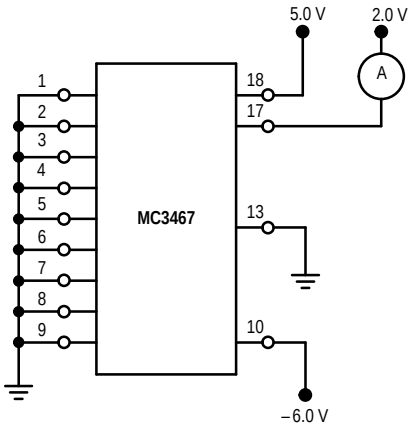
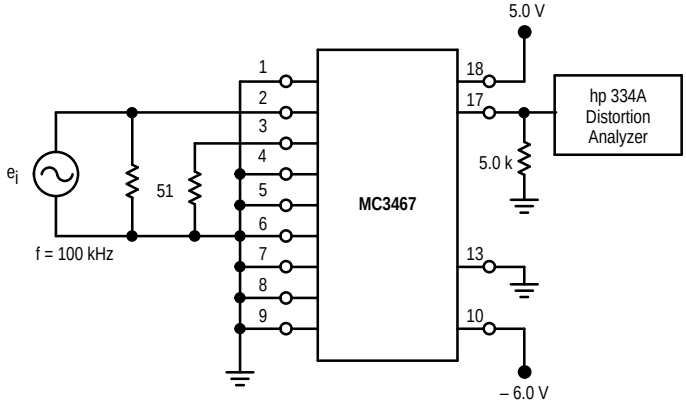


Figure 6. Total Harmonic Distortion Test Circuit

(Channel A under test, other channels tested similarly)



TYPICAL CHARACTERISTICS
(V_{CC} = 5.0 V, V_{EE} = –6.0V, T_A = 25° unless otherwise noted)

Figure 7. Total Harmonic Distortion (THD) versus Input Voltage

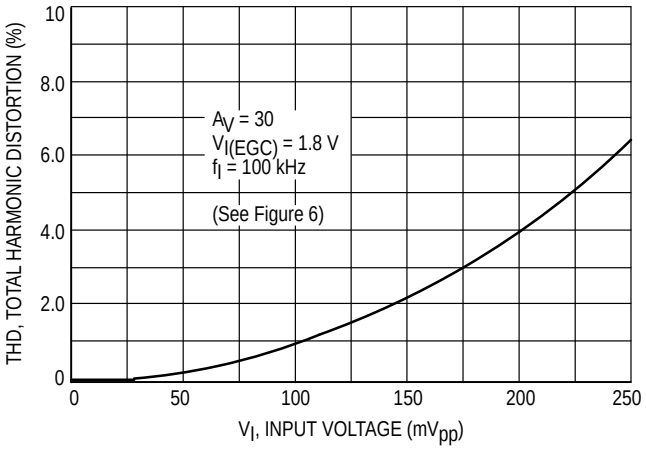


Figure 8. Normalized Voltage Gain versus Frequency

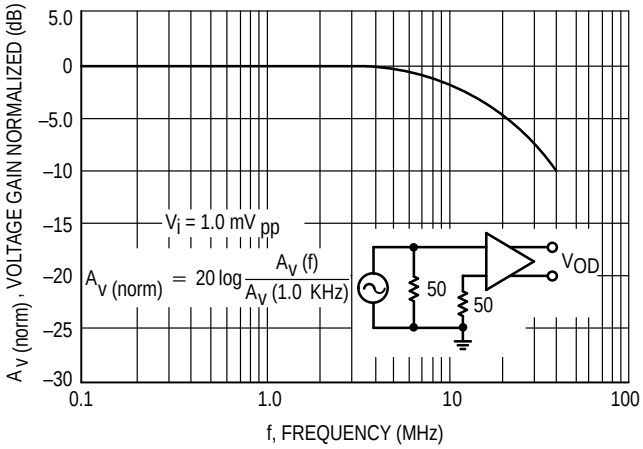


Figure 9. Normalized Voltage Gain versus Ambient Temperature

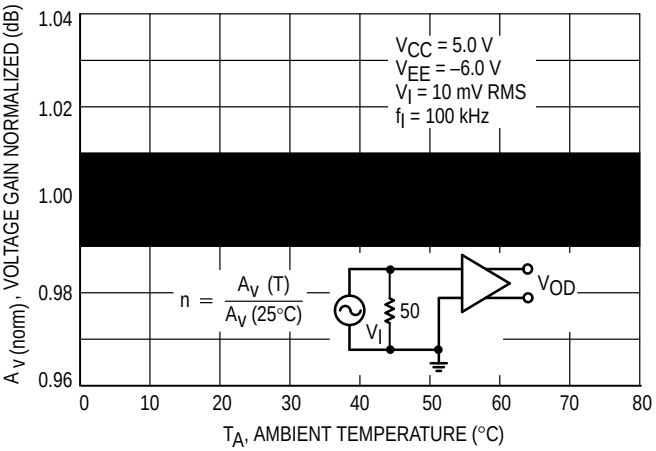


Figure 10. Normalized Positive Power Supply Current versus Positive Power Supply Voltage

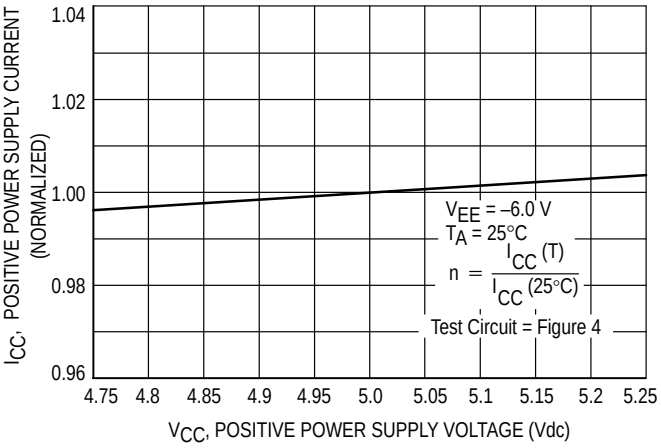


Figure 11. Normalized Negative Power Supply Current versus Negative Power Supply Voltage

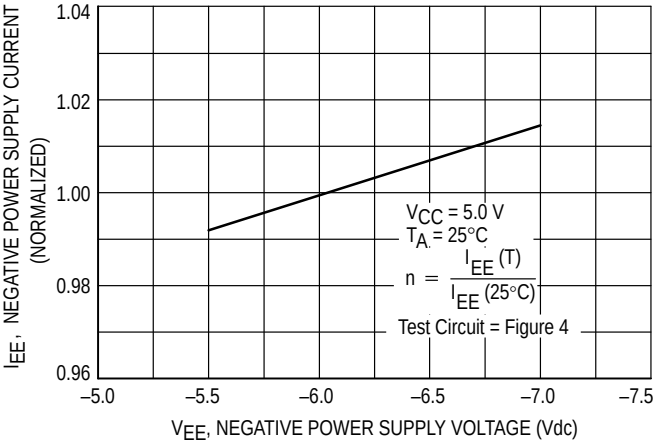


Figure 12. Normalized Power Supply Currents versus Ambient Temperature

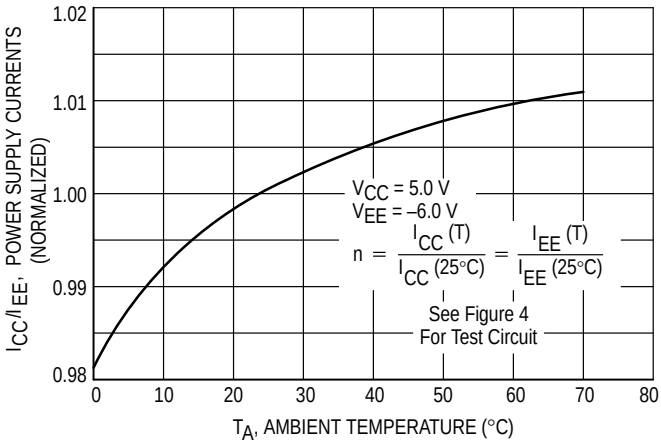


Figure 13. Differential Voltage Gain versus Electronic Gain Control Voltage ($V_{I(EGC)}$)

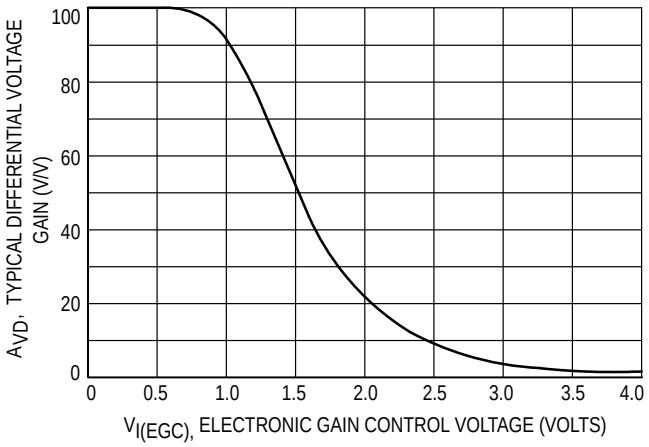


Figure 14. Common–Mode Rejection Ratio (CMRR) versus Frequency

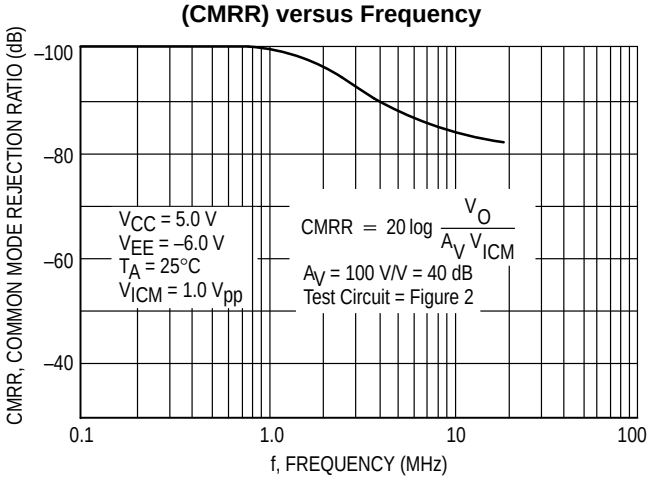


Figure 15. Phase Shift versus Frequency

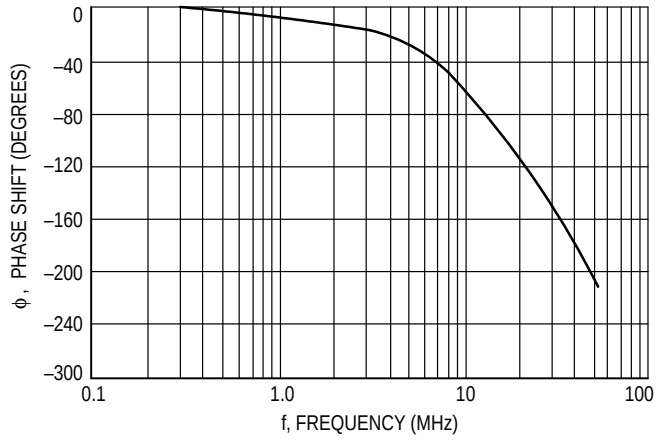
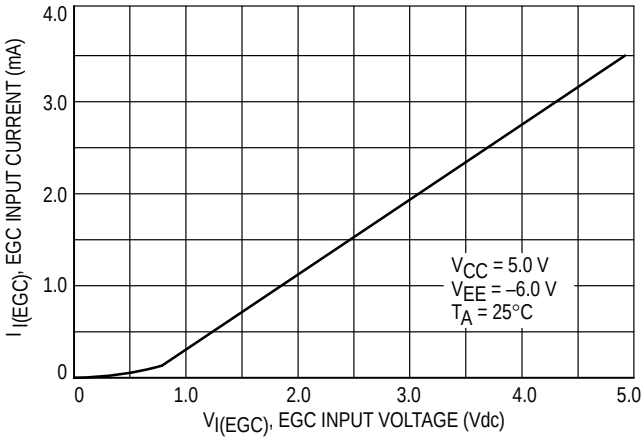
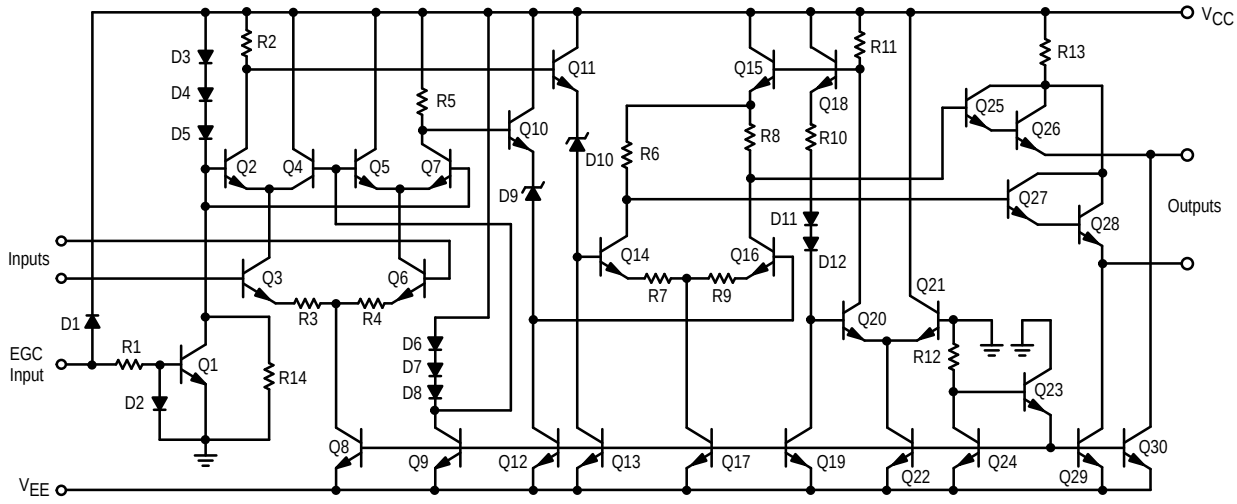


Figure 16. Typical EGC Input Current versus EGC Input Voltage



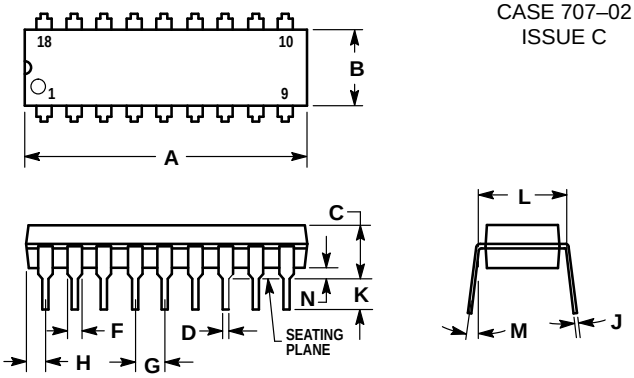
Representative Schematic Diagram

1/3 MC3467



OUTLINE DIMENSIONS

P SUFFIX
PLASTIC PACKAGE
CASE 707–02
ISSUE C



NOTES:
1. POSITIONAL TOLERANCE OF LEADS (D), SHALL BE WITHIN 0.25 (0.010) AT MAXIMUM MATERIAL CONDITION, IN RELATION TO SEATING PLANE AND EACH OTHER.
2. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
3. DIMENSION B DOES NOT INCLUDE MOLD FLASH.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	22.22	23.24	0.875	0.915
B	6.10	6.60	0.240	0.260
C	3.56	4.57	0.140	0.180
D	0.36	0.56	0.014	0.022
F	1.27	1.78	0.050	0.070
G	2.54 BSC		0.100 BSC	
H	1.02	1.52	0.040	0.060
J	0.20	0.30	0.008	0.012
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	0 °	15 °	0 °	15 °
N	0.51	1.02	0.020	0.040

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