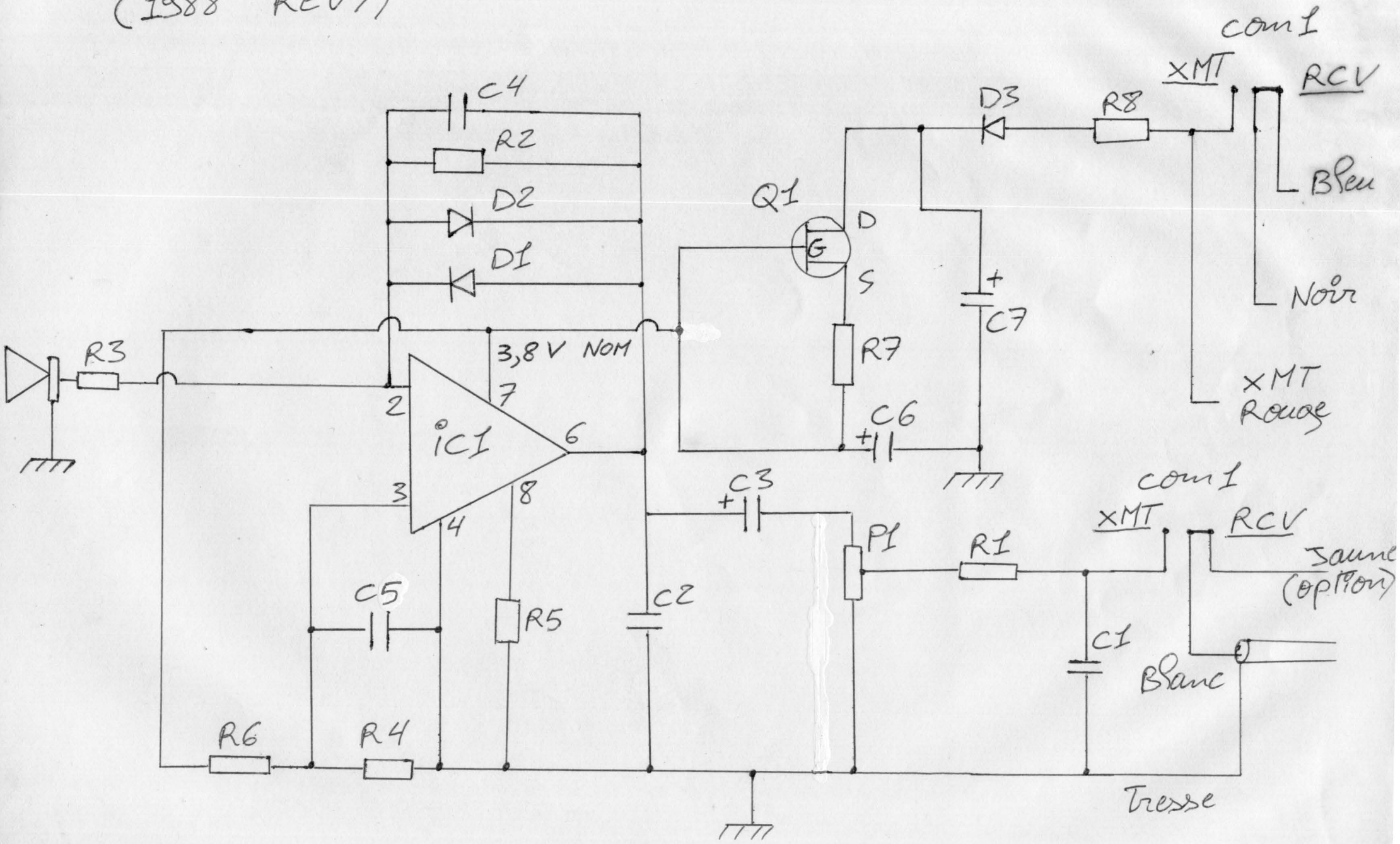
PAN K 40
(1988 REV7)



PAN K40 (1988 RV7)

Pastille = ASTATIC MC-564-I (céramique)

ICI = MC 3476 (PI-K8440) (Motorola)

Q1 = 2N5458 (Motorola)

D1 = 1N4148

D2 = 1N4148

D3 = IN (4003?)

C1 = céramique disque 102

C2 = céramique disque 102

C3 = chimique axial 2,2 µF-63V

C4 = céramique disque 102

C5 = céramique disque 104

C6 = chimique axial 10 µF-63V

C7 = chimique axial 470 µF-25V (condensateur d'alimentation du pré-ampli micro).

R1 = orange, blanc, rouge, or

R2 = rouge, jaune, jaune, or

R3 = marron, noir, jaune, or

R4 = jaune, violet, jaune, or

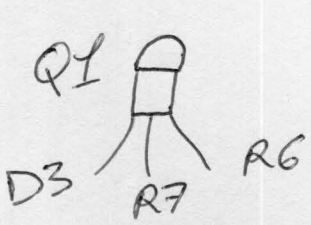
R5 = marron, noir, vert, or

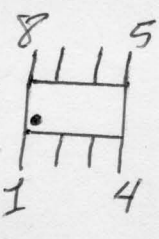
R6 = jaune, violet, jaune, or

R7 = bleu, rouge, orange, or

R8 = marron, noir, rouge, noir

P1 = 5 KΩ





Vue de dessus

Astatic Microphone Cartridges and Accessories

Replacement Microphone Cartridges


MC-151
MC-127


MC-451


MC-563


MC-320
MC-321


MC-564-1


MC-558
MC-559-2


MC-560

MC-151 Replacement for Astatic Models T-3, JT-30, JT-30F, JT-40, 200, 241, CX and CX-1.

MC-127 Replacement for Astatic Models T-3C, JT-30C, JT-30CF, JT-40C, CC, CC-1, VC and VC-1.

MC-451 Replacement for Astatic Models 10M5 and 11M5.

MC-563 Replacement for Astatic Models DN-50, DN-HZ, DN-500, DN-MZ and 10-DA.

MC-320 Replacement for Astatic Model D-104 (Crystal).

MC-321 Replacement for Astatic Model D-104C (Ceramic).

MC-558* Replacement for Astatic Model 332.

MC-559-2* Replacement for Astatic Model 331.

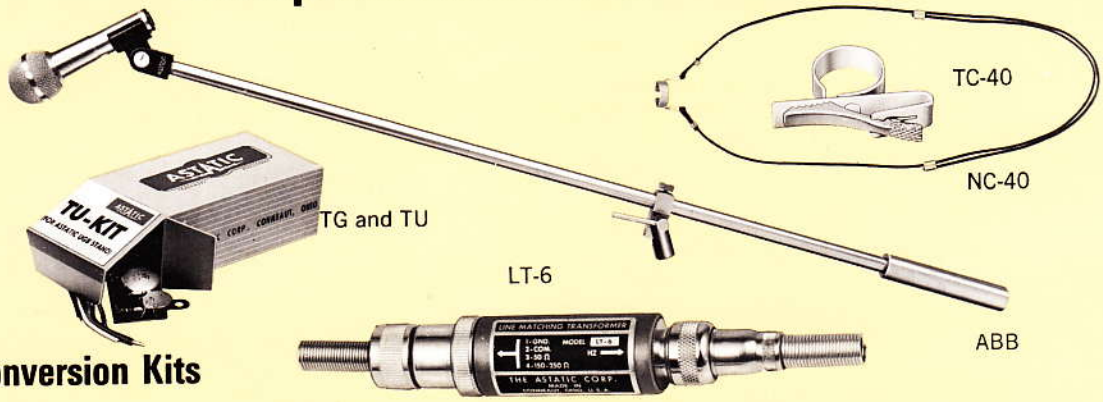
MC-560* Replacement for Astatic Models 335H and 335L.

MC-564-1 Replacement of Astatic Models 531, TMD-107, and TMD-107-E.

*Microphone without screw fastened caps should be returned to factory for repairs.

Microphone Accessories


SC-11
SC-12



TG and TU Conversion Kits

See page 16.

Switch Connectors

MODEL SC-11 SWITCH CONNECTOR (less cable): Bright chrome with standard receptacles to receive the interchangeable connector used on many Astatic microphones. Also have connection for standard concentric cable connector. Used with Astatic microphone Models T-3, DN-HZ, 10-C, 10-DA, and D-104.

MODEL SC-12 SWITCH CONNECTOR (less cable): Same as SC-11 except for use with Astatic microphone Model DN-50 and 77L.

Neck Cord and Tie Clip

MODEL NC-40 NECK CORD and **TC-40 TIE CLIP:** Made especially to convert Astatic 840 Series Microphone from hand held to lavalier use.

Transformer

MODEL LT-6 TRANSFORMER: Matches low impedance microphones to high impedance of amplifier. Permits use of long cable with minimum signal loss. Eliminates high frequency loss and objectionable hum pickup where long length of microphone cable is required. Completely shielded, sturdy construction, finished in opalescent gray. Furnished complete with •Amphenol 91-852 and 75-MCIF connectors. Input: 30-50 ohms or 150-250 ohms. Output: High impedance (EIA 40,000 ohms). Response: 20-20,000 Hz±1 db.

Baby Boom

MODEL ABB: Attaches to any adjustable microphone stand. All chrome, including counterweight.

(continued on page 18)

Order this document by MC3476/D

MOTOROLA

MC3476

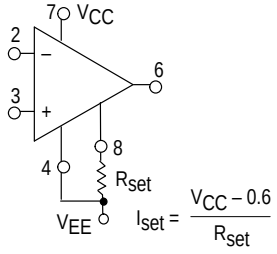
Low Cost Programmable Operational Amplifier

The MC3476 is a low cost selection of the popular industry standard MC1776 programmable operational amplifier. This extremely versatile operational amplifier features low power consumption and high input impedance. In addition, the quiescent currents within the device may be programmed by the choice of an external resistor value or current source applied to the I_{set} input. This allows the amplifier's characteristics to be optimized for input current and power consumption despite wide variations in operating power supply voltages.

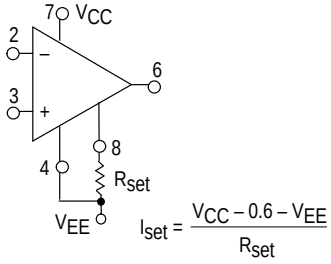
- ±6.0 V to ±18 V Operation
- Wide Programming Range
- Offset Null Capability
- No Frequency Compensation Required
- Low Input Bias Currents
- Short Circuit Protection

Resistive Programming
(See Figure 1)

R_{set} to Ground



R_{set} to Negative Supply
(Recommended for supply voltage less than ±6.0 V)

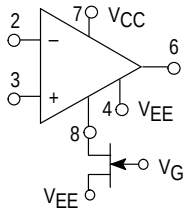


Typical R_{set} Values		
V_{CC}, V_{EE}	I_{set} = 1.5 µA	I_{set} = 15 µA
±6.0 V	3.6 MΩ	360 kΩ
±10 V	6.2 MΩ	620 kΩ
±12 V	7.5 MΩ	750 kΩ
±15 V	10 MΩ	1.0 MΩ

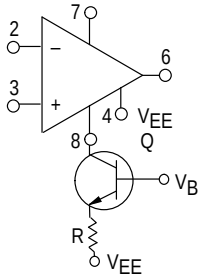
Typical R_{set} Values		
V_{CC}, V_{EE}	I_{set} = 1.5 µA	I_{set} = 15 µA
+1.5 V	1.6 MΩ	160 kΩ
+3.0 V	3.6 MΩ	360 kΩ
+6.0 V	7.5 MΩ	750 kΩ
+15 V	20 MΩ	2.0 MΩ

Active Programming

FET Current Source



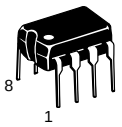
Bipolar Current Source



Pins not shown are not connected.

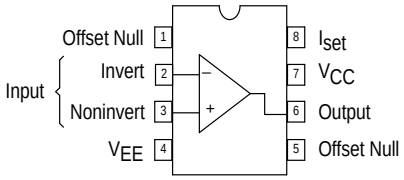
LOW COST PROGRAMMABLE OPERATIONAL AMPLIFIER

SEMICONDUCTOR TECHNICAL DATA



P1 SUFFIX
PLASTIC PACKAGE
CASE 626

PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

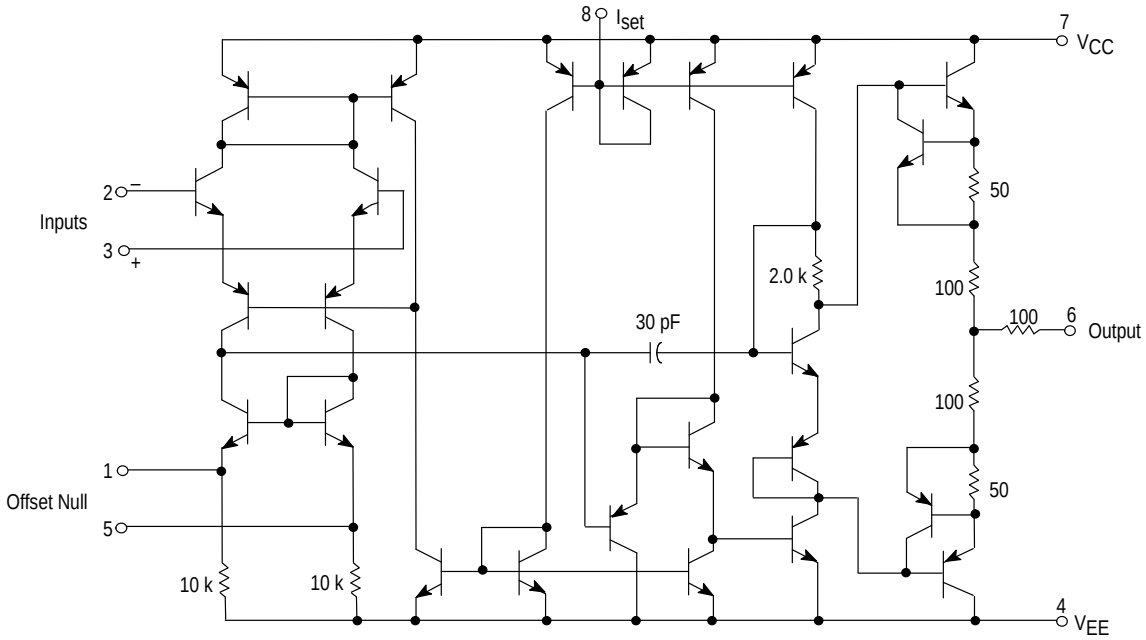
Device	Operating Temperature Range	Package
MC3476P1	T_A = 0° to +70°C	Plastic DIP

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

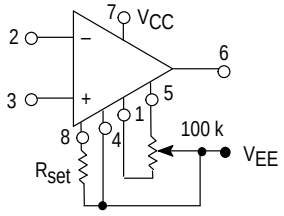
Rating	Symbol	Value	Unit
Power Supply Voltages	V_{CC}, V_{EE}	±18	Vdc
Input Differential Voltage Range	V_{IDR}	±30	Vdc
Input Common Mode Voltage Range	V_{ICR}	V_{CC}, V_{EE}	Vdc
Offset Null to V_{EE} Voltage	$V_{off} - V_{EE}$	±0.5	Vdc
Programming Current	I_{set}	200	μA
Programming Voltage (Voltage from I_{set} Terminal to Ground)	V_{set}	(V_{CC} – 0.6 V) to V_{CC}	Vdc
Output Short Circuit Duration (Note 1)	t_{SC}	Indefinite	sec
Operating Ambient Temperature Range	T_A	0 to +70	°C
Storage Temperature Range	T_{stg}	– 55 ot +125	°C
Junction Temperature	T_J	150	°C

NOTES: 1. Short circuit to ground with $I_{set} \leq 15$ μA. Rating applies up to ambient temperature of +70°C.

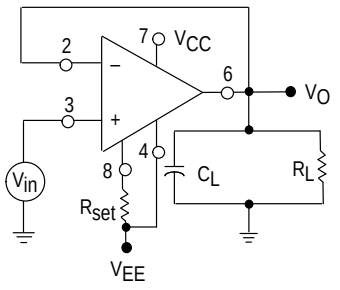
Representative Schematic Diagram



Voltage Offset Null Circuit



Transient Response Test Circuit



Pins not shown are not connected.

ELECTRICAL CHARACTERISTICS (V_{CC} = +15 V, V_{EE} = – 15 V, I_{set} = 15 μA, T_A = +25°C, unless otherwise noted).

Characteristic	Symbol	Min	Typ	Max	Unit
Input Offset voltage ($R_S \le 10$ kΩ)	V_{IO}				mV
T_A = +25°C		–	2.0	6.0	
0°C ≤ T_A ≤ +70°C		–	–	7.5	
Offset Voltage Adjustment Range	V_{IOR}	–	18	–	mV
Input Offset Current	I_{IO}				nA
T_A = +25°C		–	20	25	
T_A = +70°C		–	–	25	
T_A = 0°C		–	–	40	
Input Bias Current	I_{IB}				nA
T_A = +25°C		–	15	50	
T_A = +70°C		–	–	50	
T_A = 0°C		–	–	100	
Input Resistance	r_i	–	5.0	–	MΩ
Input Capacitance	C_i	–	2.0	–	pF
Input Common Mode Voltage Gain	V_{ICR}	±10	–	–	V
0°C ≤ T_A ≤ +70°C					
Large Signal Voltage Gain	A_{VOL}				V/V
$R_L \ge 10$ kΩ, V_O = ±10 V, T_A = +25°C		50 k	400 k	–	
$R_L \ge 10$ kΩ, V_O = ±10 V, 0°C ≤ T_A ≤ +70°C		25 k	–	–	
Output Voltage Range	V_{OR}				V
$R_L \ge 10$ kΩ, T_A = +25°C		±12	±13	–	
$R_L \ge 10$ kΩ, 0°C ≤ T_A ≤ +70°C		±12	–	–	
Output Resistance	r_o	–	1.0	–	kΩ
Output Short Circuit Current	I_{SC}	–	12	–	mA
Common Mode Rejection	CMR	70	90	–	dB
$R_S \le 10$ kΩ, 0°C ≤ T_A ≤ +70°C					
Supply Voltage Rejection Ratio	PSRR	–	25	200	μV/V
$R_S \le 10$ kΩ, 0°C ≤ T_A ≤ +70°C					
Supply Current	I_{CC}, I_{EE}				μA
T_A = +25°C		–	160	200	
0°C ≤ T_A ≤ +70°C		–	–	225	
Power Dissipation	P_D				mW
T_A = +25°C		–	4.8	6.0	
0°C ≤ T_A ≤ +70°C		–	–	6.75	
Transient Response (Unity Gain)					
V_{in} = 20 mV, $R_L \ge 10$ kΩ, C_L = 100 pF					
Rise Time	t_{TLH}	–	0.35	–	μs
Overshoot	os	–	10	–	%
Slew Rate ($R_L \ge 10$ kΩ)	SR	–	0.8	–	V/μs

Figure 1. Set Current versus Set Resistor

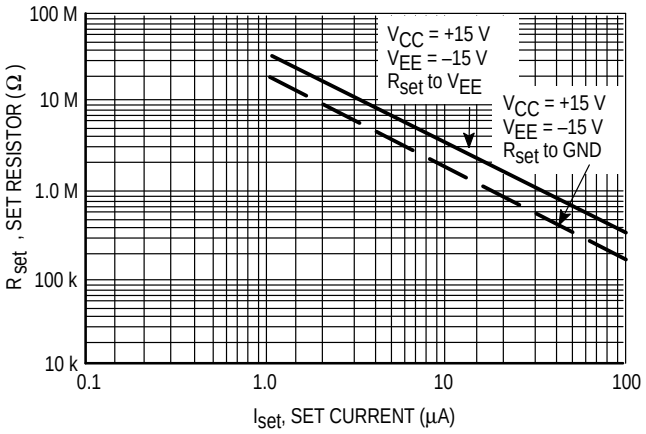


Figure 2. Positive Standby Supply Current versus Set Current

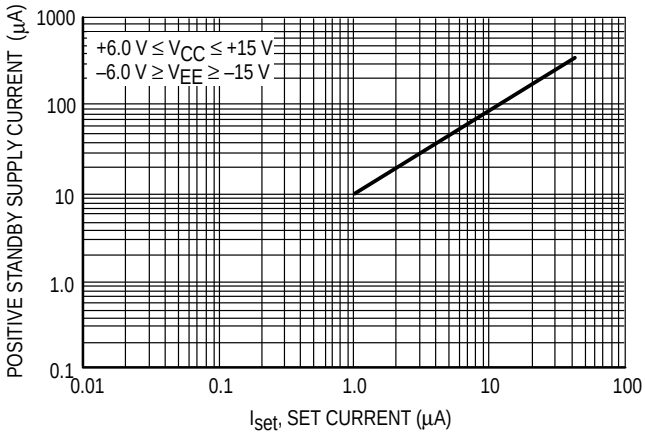


Figure 3. Open Loop versus Set Current

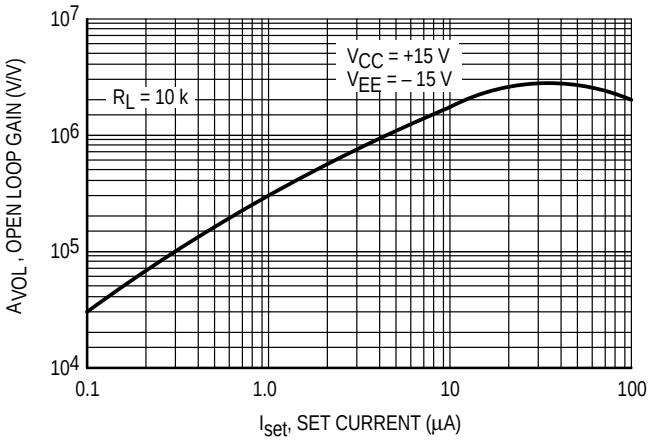


Figure 4. Input Bias Current versus Set Current

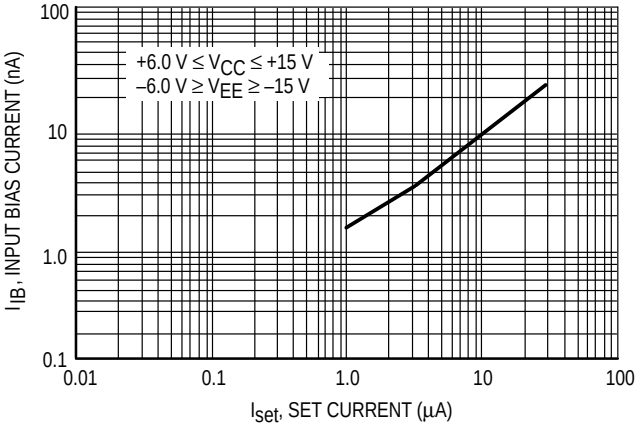


Figure 5. Slew Rate versus Set Current

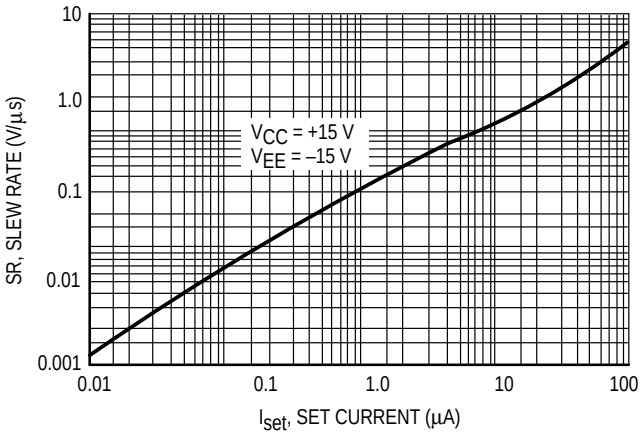


Figure 6. Gain Bandwidth Product versus Set Current

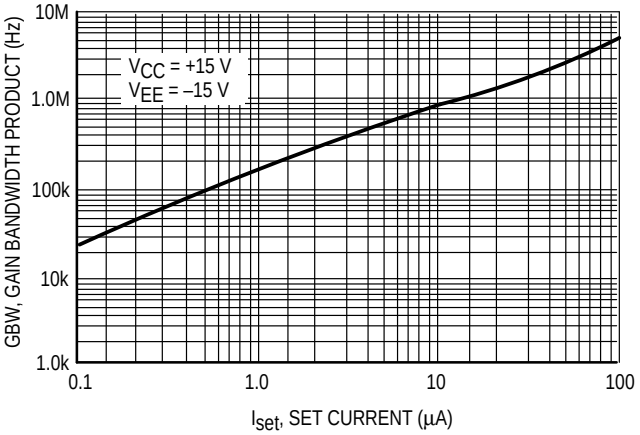


Figure 7. Output Voltage Swing versus Load Resistance

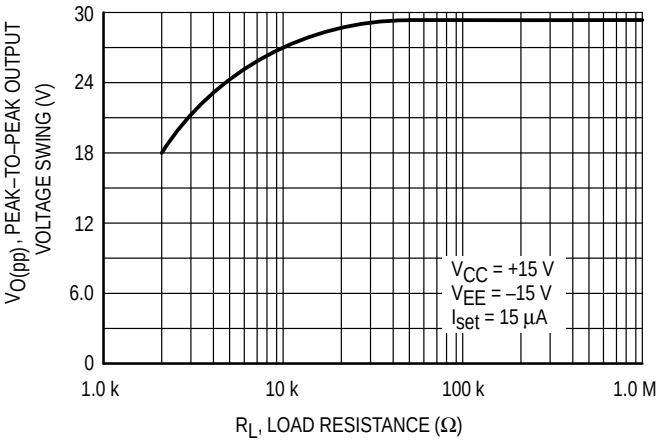
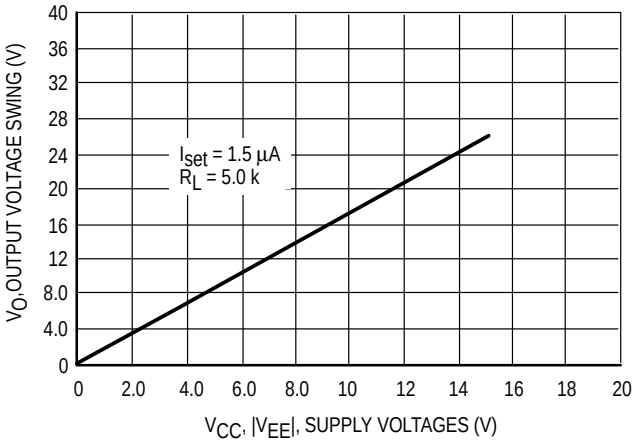
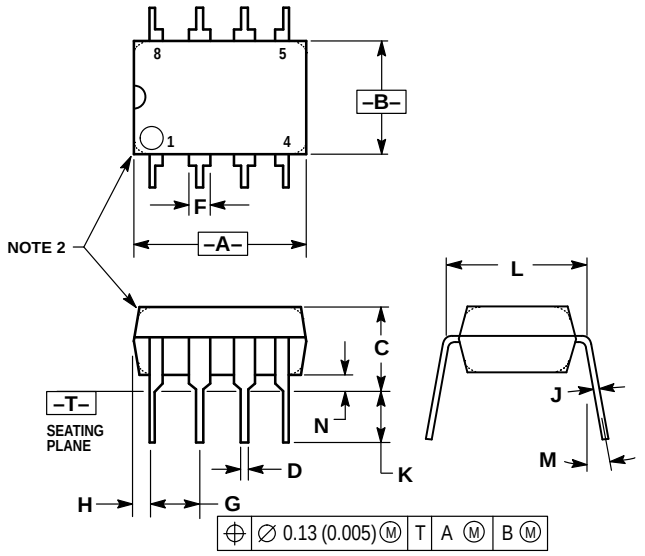


Figure 8. Output Voltage Swing versus Supply Voltage



OUTLINE DIMENSIONS

P1 SUFFIX
PLASTIC PACKAGE
CASE 626–05
ISSUE K



NOTES:
1. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
2. PACKAGE CONTOUR OPTIONAL (ROUND OR SQUARE CORNERS).
3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	9.40	10.16	0.370	0.400
B	6.10	6.60	0.240	0.260
C	3.94	4.45	0.155	0.175
D	0.38	0.51	0.015	0.020
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
H	0.76	1.27	0.030	0.050
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	—	10°	—	10°
N	0.76	1.01	0.030	0.040

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MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609
INTERNET: http://Design–NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, 6F Seibu–Butsuryu–Center,
3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 03–81–3521–8315

ASIA / PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298

2N5457, 2N5458

Preferred Device

JFETs - General Purpose

N- Channel - Depletion

N-Channel Junction Field Effect Transistors, depletion mode (Type A) designed for audio and switching applications.

- N-Channel for Higher Gain
- Drain and Source Interchangeable
- High AC Input Impedance
- High DC Input Resistance
- Low Transfer and Input Capacitance
- Low Cross-Modulation and Intermodulation Distortion
- Unibloc Plastic Encapsulated Package

ON Semiconductor®

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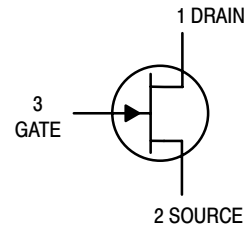
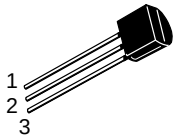
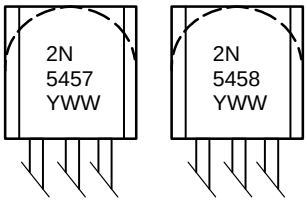




TO-92
CASE 29
STYLE 5

MARKING DIAGRAMS



Y = Year
WW = Work Week

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	25	Vdc
Drain- Gate Voltage	V_{DG}	25	Vdc
Reverse Gate- Source Voltage	V_{GSR}	-25	Vdc
Gate Current	I_G	10	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	 310 2.82	 mW mW/°C
Operating Junction Temperature	T_J	135	°C
Storage Temperature Range	T_{stg}	- 65 to +150	°C

ORDERING INFORMATION

Device	Package	Shipping
2N5457	TO-92	5000 Units/Box
2N5458	TO-92	5000 Units/Box

Preferred devices are recommended choices for future use and best overall value.

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Gate- Source Breakdown Voltage	(I_G = -10 μAdc, V_{DS} = 0)	$V_{(BR)GSS}$	-25	-	-	Vdc
Gate Reverse Current	(V_{GS} = -15 Vdc, V_{DS} = 0)	I_{GSS}	-	-	−1.0	nAdc
	(V_{GS} = -15 Vdc, V_{DS} = 0, T_A = 100°C)		-	-	-200	
Gate-Source Cutoff Voltage (V_{DS} = 15 Vdc, i_D = 10 nAdc)	2N5457	$V_{GS(off)}$	-0.5	-	-6.0	Vdc
	2N5458		-1.0	-	-7.0	
Gate-Source Voltage		V_{GS}	-			Vdc
(V_{DS} = 15 Vdc, i_D = 100 μAdc)	2N5457		-	-2.5	-	
(V_{DS} = 15 Vdc, i_D = 200 μAdc)	2N5458			-3.5	-	
ON CHARACTERISTICS						
Zero-Gate-V oltage Drain Current (Note 1)	2N5457	I_{DSS}	1.0	3.0	5.0	mAdc
(V_{DS} = 15 Vdc, V_{GS} = 0)	2N5458		2.0	6.0	9.0	
DYNAMIC CHARACTERISTICS						
Forward Transfer Admittance (Note 1)	2N5457	$\|Y_{fs}\|$	1000	3000	5000	μmhos
(V_{DS} = 15 Vdc, V_{GS} = 0, f = 1 kHz)	2N5458		1500	4000	5500	
Output Admittance Common Source (Note 1)	(V_{DS} = 15 Vdc, V_{GS} = 0, f = 1 kHz)	$\|Y_{os}\|$	-	10	50	μmhos
Input Capacitance	(V_{DS} = 15 Vdc, V_{GS} = 0, f = 1 kHz)	C_{iss}	-	4.5	7.0	pF
Reverse Transfer Capacitance	(V_{DS} = 15 Vdc, V_{GS} = 0, f = 1 kHz)	C_{rss}	-	1.5	3.0	pF

1. Pulse Width ≤ 630 ms, Duty Cycle ≤ 10%.

TYPICAL CHARACTERISTICS
For 2N5457 Only

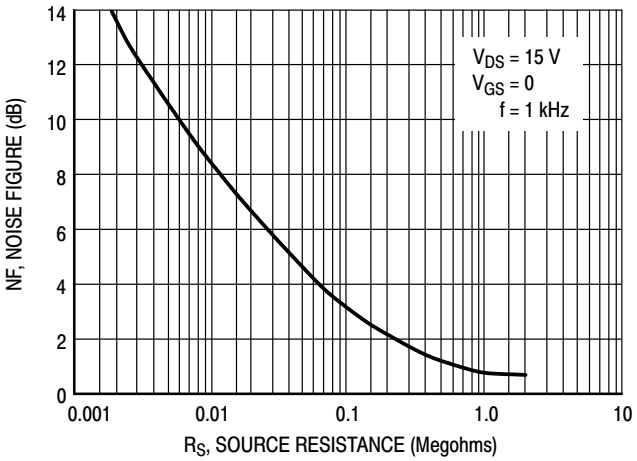


Figure 1. Noise Figure versus Source Resistance

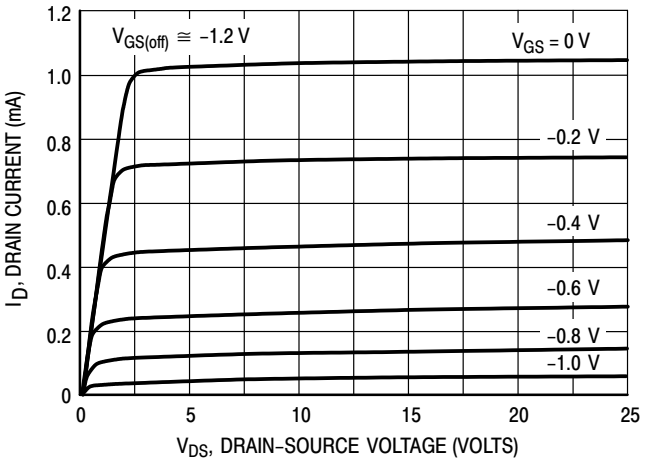


Figure 2. Typical Drain Characteristics

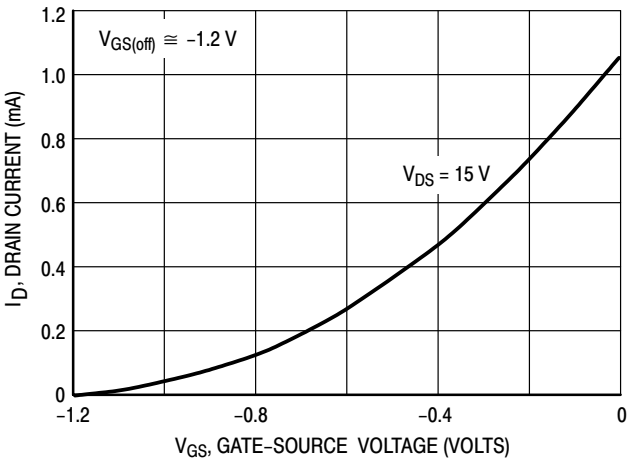


Figure 3. Common Source Transfer Characteristics

TYPICAL CHARACTERISTICS
For 2N5457 Only

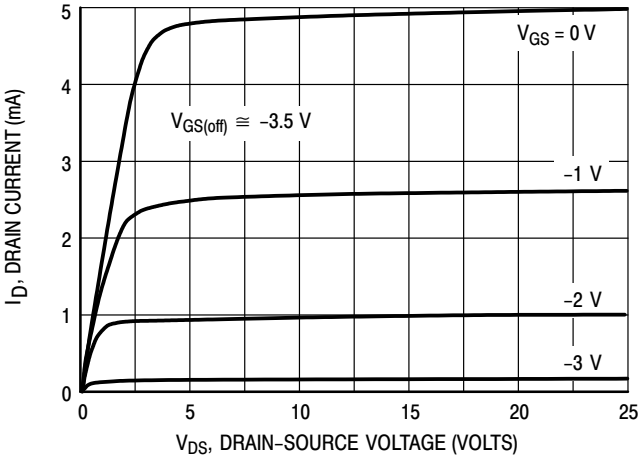


Figure 4. Typical Drain Characteristics

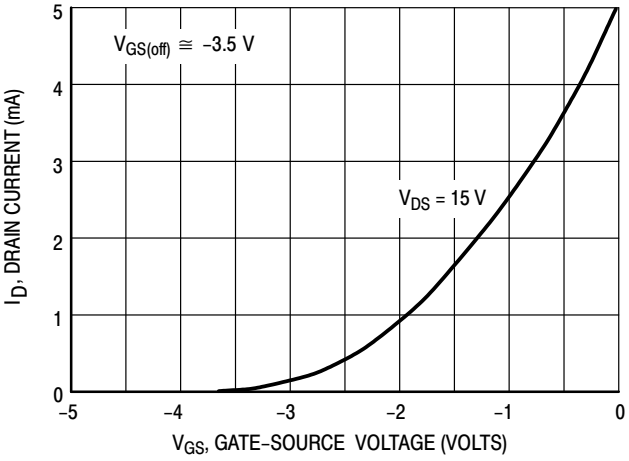


Figure 5. Common Source Transfer Characteristics

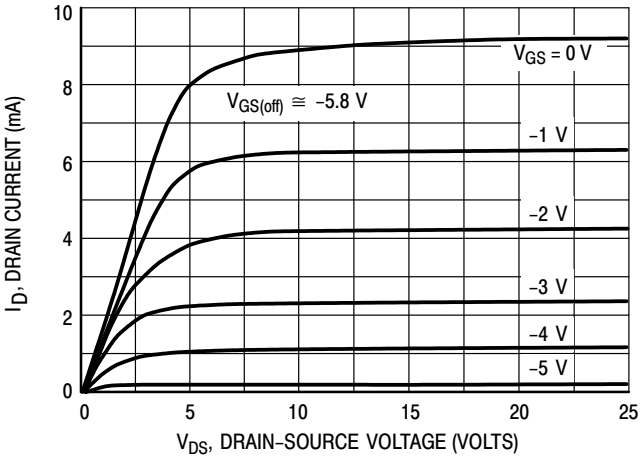


Figure 6. Typical Drain Characteristics

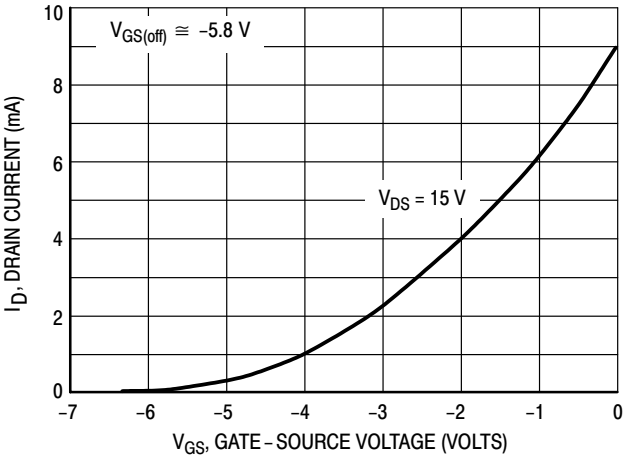
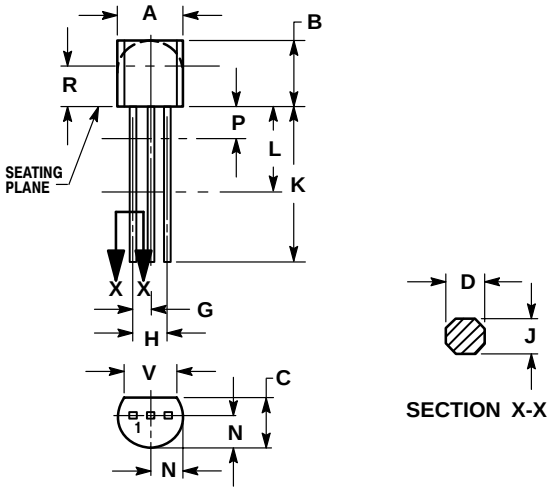


Figure 7. Common Source Transfer Characteristics

NOTE: Note: Graphical data is presented for dc conditions. Tabular data is given for pulsed conditions (Pulse Width = 630 ms, Duty Cycle = 10%). Under dc conditions, self heating in higher I_{DSS} units reduces I_{DSS}.

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-11
ISSUE AL



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

TYLE 5:
PIN 1. DRAIN
2. SOURCE
3. GATE

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