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NEC Electronics Inc.

μPC356
J-FET INPUT OPERATIONAL AMPLIFIER

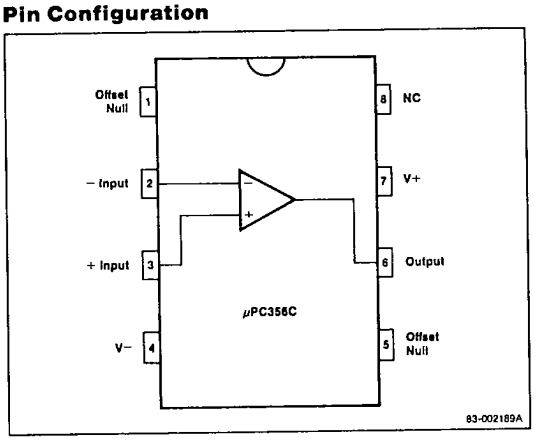
Description

The μPC356 is a J-FET input operational amplifier with matched P-channel ion implanted J-FETs. In addition to the obvious advantages of J-FET inputs, the μPC356 is designed for high slew rate, wide bandwidth, and extremely fast settling time.

Features

- ☐ Low input offset voltage: 5 mV max (trimming technique used)
- ☐ Offset adjust does not degrade drift or CMRR
- ☐ The NPN sink output stage allows use of large capacitive loads (10,000 pF) without a stability problem
- ☐ Internal compensation and large differential input voltage capability
- ☐ LF356 equivalent

Pin Configuration



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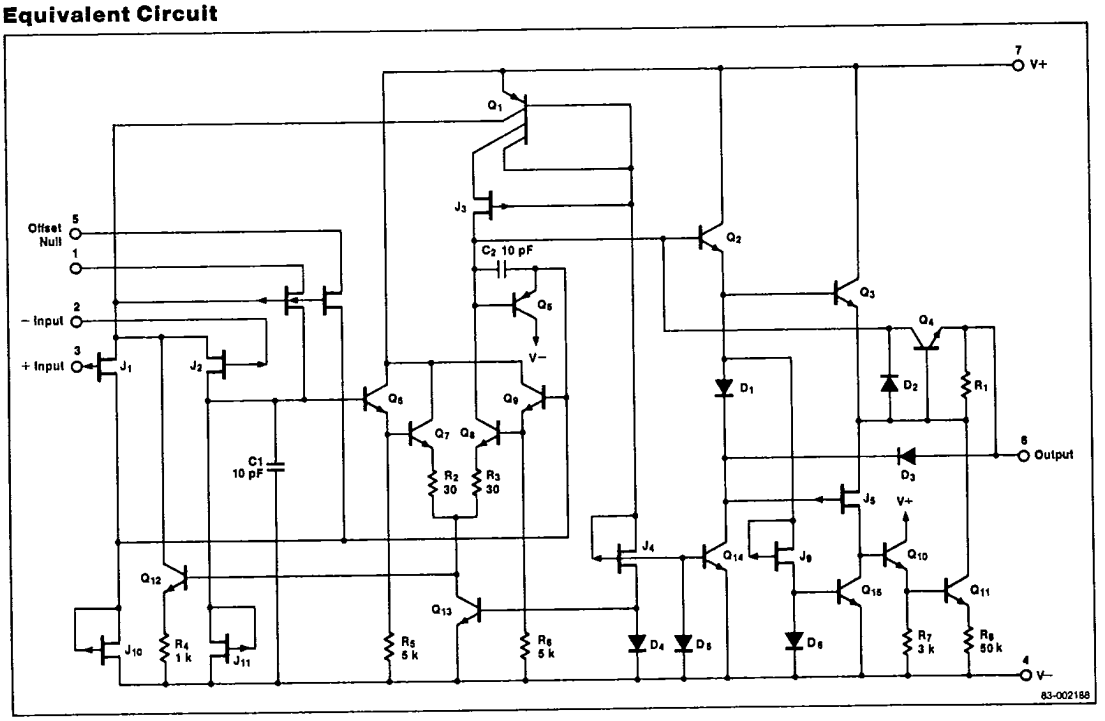
Equivalent Circuit



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Ordering Information

Part Number	Package	Operating Temperature Range
μPC356C	Plastic DIP	0°C to +70°C

Electrical Characteristics

$T_A = 25°C$, $V\pm = \pm 15$ V

Parameter	Symbol	Limits Min.	Typ.	Max.	Unit	Test Conditions
Input Offset Voltage	V_{IO}		2	5	mV	$R_S \leq 50\ \Omega$
Input Offset Current	I_{IO}		3	50	pA	
Input Bias Current	I_b		30	200	pA	
Large Signal Voltage Gain	A_{VOL}	88	106		dB	$R_L \geq 2$ kΩ, $V_O = \pm 10$ V
Supply Current	I_{CC}		5	10	mA	
Common Mode Rejection Ratio	CMRR	80	100		dB	
Supply Voltage Rejection Ratio	SVRR	80	100		dB	
Output Voltage Swing	V_{OM}	±12	±13		V	$R_1 \geq 10$ kΩ
		±10	±12		V	$R_1 \geq 2$ kΩ
Common Mode Voltage	V_{ICM}	±10	+15.1 −12		V	
Slew Rate	SR		12		V/μs	Rise
			20		V/μs	Fall
Input Noise Voltage	en		20		nV/√Hz	f = 1 kHz, $R_1 = 100\ \Omega$
Gain Bandwidth Products	GBW		5		MHz	
Over Operating Temperature Range						
Input Offset Voltage	V_{IO}			7	mV	$R_S \leq 50\ \Omega$, $T_A = T_{OPT}$
Offset Voltage Drift	$\Delta V_{IO}/\Delta T$		5		μV/°C	$T_A = T_{OPT}$
Input Bias Current	I_b			8	nA	$T_A = T_{OPT}$
Input Offset Current	I_{IO}			2	nA	$T_A = T_{OPT}$

Absolute Maximum Ratings

$T_A = 25°C$

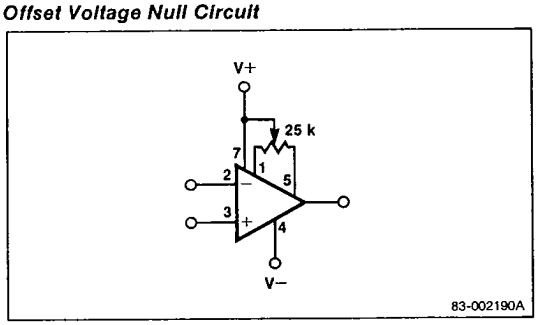
Voltage Between V^+ and V^-	36 V
Power Dissipation	350 mW
Differential Input Voltage	±30 V
Input Voltage (Note 1)	±15 V
Output Short Circuit Duration	Indefinite
Operating Temperature Range	0 to +70°C
Storage Temperature Range	−55 to +125°C

Note 1. For supply voltages less than ±15 V, the absolute maximum input voltage is equal to the supply voltage.

Comment: Stress above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Typical Application

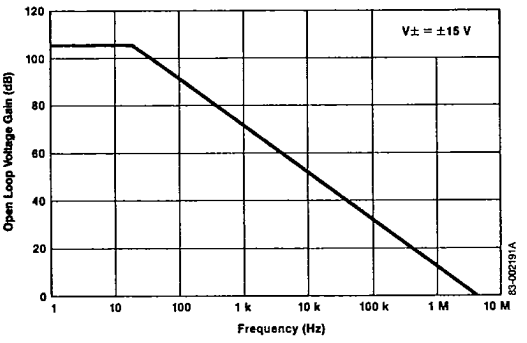
Offset Voltage Null Circuit



Operating Characteristics

$T_A = 25°C$

Open Loop Frequency Response



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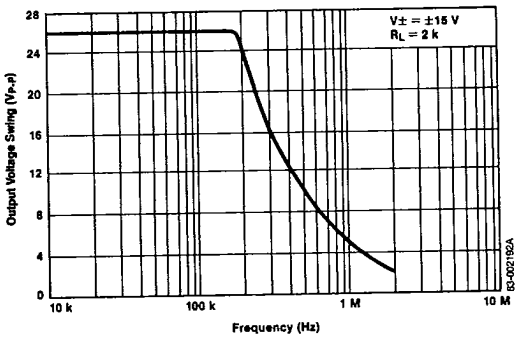
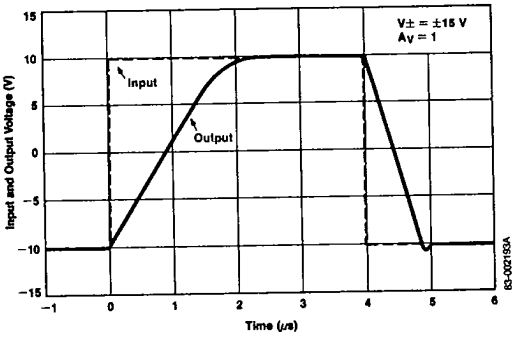
Operating Characteristics (Cont.)

$T_A = 25°C$

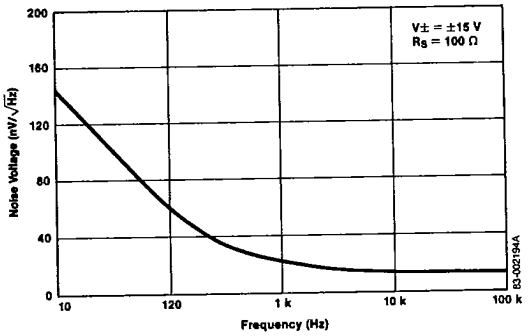
Undistorted Output Voltage Swing



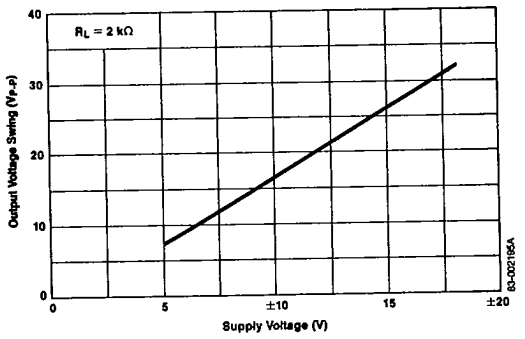
Voltage Follower Pulse Response



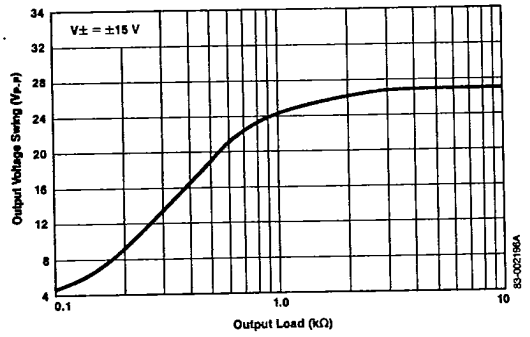
Input Equivalent Noise



Voltage Swing



Voltage Swing



Input Bias Current