

KA741

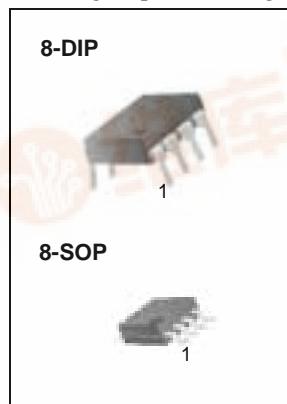
Single Operational Amplifier

Features

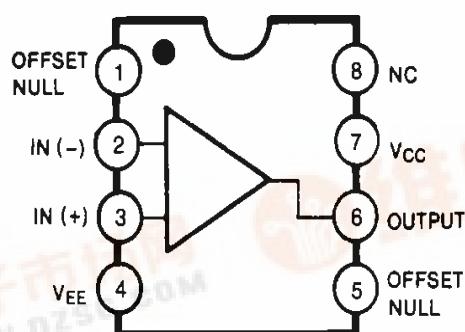
- Short circuit protection
- Excellent temperature stability
- Internal frequency compensation
- High Input voltage range
- Null of offset

Description

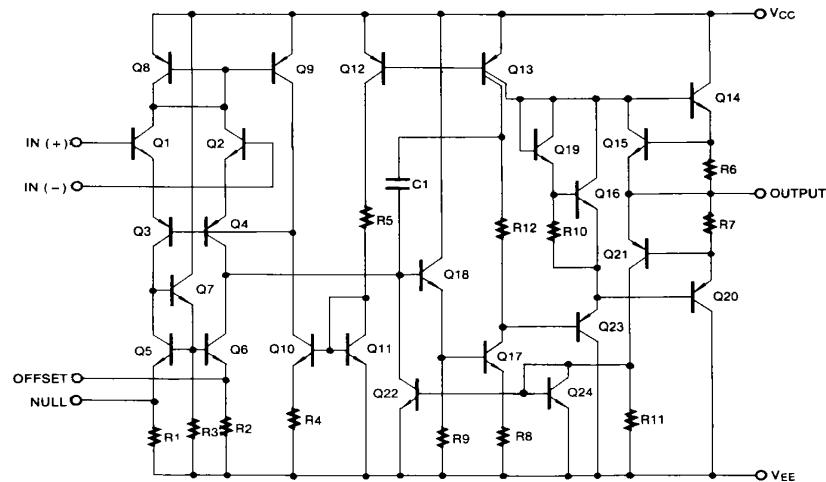
The KA741 series are general purpose operational amplifiers. It is intended for a wide range of analog applications. The high gain and wide range of operating voltage provide superior performance in intergrator, summing amplifier, and general feedback applications.



Internal Block Diagram



Schematic Diagram



Absolute Maximum Ratings (TA = 25°C)

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	±18	V
Differential Input Voltage	V _{I(DIFF)}	30	V
Input Voltage	V _I	±15	V
Output Short Circuit Duration	-	Indefinite	
Power Dissipation	P _D	500	mW
Operating Temperature Range KA741 KA741I	TOPR	0 ~ + 70 -40 ~ + 85	°C
Storage Temperature Range	T _{STG}	-65 ~ + 150	°C

Electrical Characteristics

(VCC = 15V, VEE = - 15V, TA = 25 °C, unless otherwise specified)

Parameter	Symbol	Conditions	KA741/KA741I			Unit	
			Min.	Typ.	Max.		
Input Offset Voltage	V _{IO}	R _S ≤10KΩ	-	2.0	6.0	mV	
		R _S ≤50Ω	-	-	-		
Input Offset Voltage Adjustment Range	V _{IO(R)}	V _{CC} = ±20V	-	±15	-	mV	
Input Offset Current	I _{IO}	-	-	20	200	nA	
Input Bias Current	I _{BIAS}	-	-	80	500	nA	
Input Resistance (Note1)	R _I	V _{CC} = ±20V	0.3	2.0	-	MΩ	
Input Voltage Range	V _{I(R)}	-	±12	±13	-	V	
Large Signal Voltage Gain	G _V	R _L ≥2KΩ	V _{CC} = ±20V, V _{O(P-P)} = ±15V	-	-	V/mV	
			V _{CC} = ±15V, V _{O(P-P)} = ±10V	20	200		
Output Short Circuit Current	I _{SC}	-	-	25	-	mA	
Output Voltage Swing	V _{O(P-P)}	V _{CC} = ±20V	R _L ≥10KΩ	-	-	V	
			R _L ≥2KΩ	-	-		
		V _{CC} = ±15V	R _L ≥10KΩ	±12	±14		
			R _L ≥2KΩ	±10	±13		
Common Mode Rejection Ratio	CMRR	R _S ≤10KΩ, V _{CM} = ±12V	70	90	-	dB	
		R _S ≤50Ω, V _{CM} = ±12V	-	-	-		
Power Supply Rejection Ratio	PSRR	V _{CC} = ±15V to V _{CC} = ±15V R _S ≤50Ω	-	-	-	dB	
		V _{CC} = ±15V to V _{CC} = ±15V R _S ≤10KΩ	77	96	-		
Transient Response	Rise Time	T _R	Unity Gain	-	0.3	-	μs
	Overshoot	OS		-	10	-	%
Bandwidth	BW	-	-	-	-	MHz	
Slew Rate	SR	Unity Gain	-	0.5	-	V/μs	
Supply Current	I _{CC}	R _L = ∞Ω	-	1.5	2.8	mA	
Power Consumption	P _C	V _{CC} = ±20V	-	-	-	mW	
		V _{CC} = ±15V	-	50	85		

Note:

1. Guaranteed by design.

Electrical Characteristics

($V_{CC} = \pm 15V$, unless otherwise specified)

The following specification apply over the range of $0^{\circ}C \leq T_A \leq +70^{\circ}C$ for the KA741; and the $-40^{\circ}C \leq T_A \leq +85^{\circ}C$ for the KA741I

Parameter	Symbol	Conditions	KA741/KA741I			Unit
			Min.	Typ.	Max.	
Input Offset Voltage	V_{IO}	$R_S \leq 50\Omega$	-	-	-	mV
		$R_S \leq 10K\Omega$	-	-	7.5	
Input Offset Voltage Drift	$\Delta V_{IO}/\Delta T$	-	-	-	-	$\mu V/{}^{\circ}C$
Input Offset Current	I_{IO}	-	-	-	300	nA
Input Offset Current Drift	$\Delta I_{IO}/\Delta T$	-	-	-	-	$nA/{}^{\circ}C$
Input Bias Current	I_{BIAS}	-	-	-	0.8	μA
Input Resistance (Note1)	R_I	$V_{CC} = \pm 20V$	-	-	-	$M\Omega$
Input Voltage Range	$V_{I(R)}$	-	± 12	± 13	-	V
Output Voltage Swing	$V_{O(P-P)}$	$V_{CC} = \pm 20V$	$R_S \geq 10K\Omega$	-	-	V
			$R_S \geq 2K\Omega$	-	-	
		$V_{CC} = \pm 15V$	$R_S \geq 10K\Omega$	± 12	± 14	
			$R_S \geq 2K\Omega$	± 10	± 13	
Output Short Circuit Current	I_{SC}	-	10	-	40	mA
Common Mode Rejection Ratio	CMRR	$R_S \leq 10K\Omega$, $V_{CM} = \pm 12V$	70	90	-	dB
		$R_S \leq 50\Omega$, $V_{CM} = \pm 12V$	-	-	-	
Power Supply Rejection Ratio	PSRR	$V_{CC} = \pm 20V$ to $\pm 5V$	$R_S \leq 50\Omega$	-	-	dB
			$R_S \leq 10K\Omega$	77	96	
Large Signal Voltage Gain	G_V	$R_S \geq 2K\Omega$	$V_{CC} = \pm 20V$, $V_{O(P-P)} = \pm 15V$	-	-	V/mV
			$V_{CC} = \pm 15V$, $V_{O(P-P)} = \pm 10V$	15	-	
			$V_{CC} = \pm 15V$, $V_{O(P-P)} = \pm 2V$	-	-	

Note :

1. Guaranteed by design.

Typical Performance Characteristics

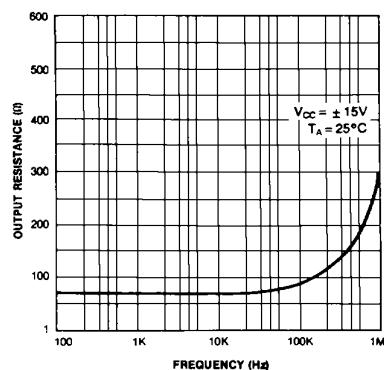


Figure 1. Output Resistance vs Frequency

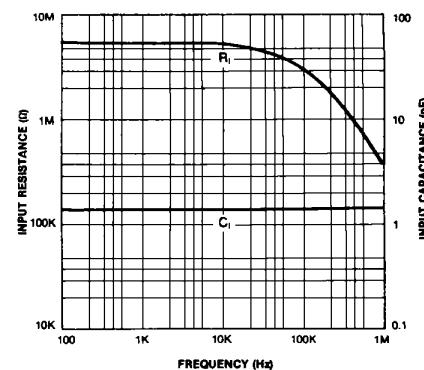


Figure 2. Input Resistance and Input Capacitance vs Frequency

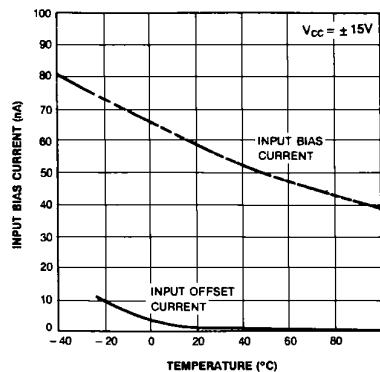


Figure 3. Input Bias Current vs Ambient Temperature

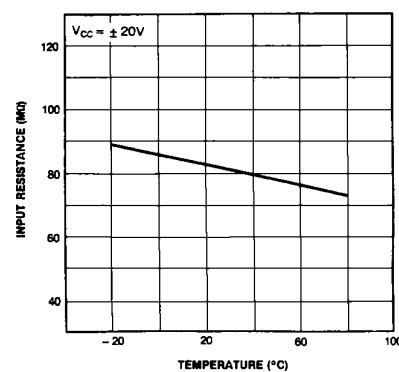


Figure 4. Power Consumption vs Ambient Temperature

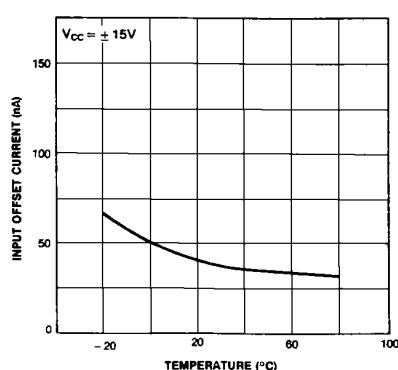


Figure 5. Input Offset Current vs Ambient Temperature

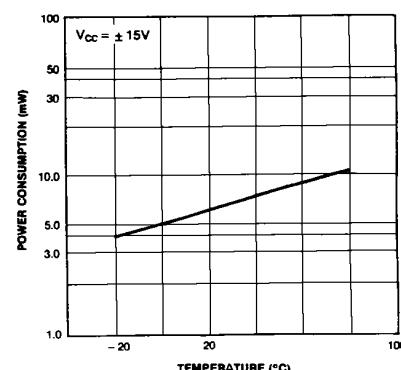


Figure 6. Input Resistance vs Ambient Temperature

Typical Performance Characteristics (continued)

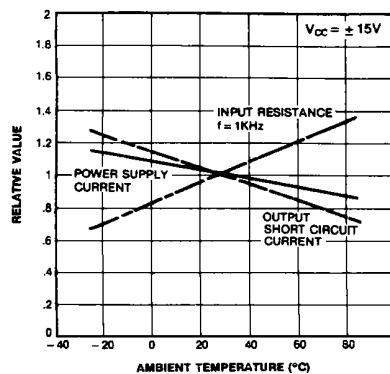


Figure 7. Normalized DC Parameters vs Ambient Temperature

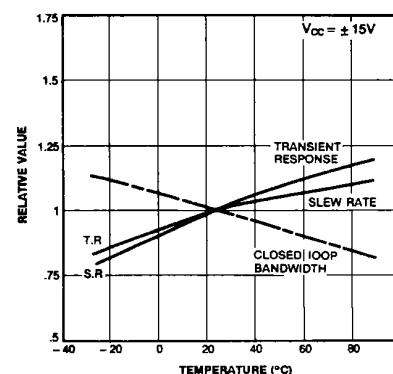


Figure 8. Frequency Characteristics vs Ambient Temperature

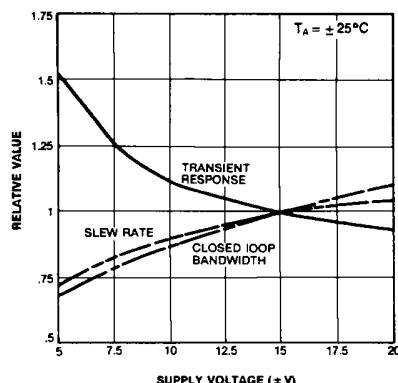


Figure 9. Frequency Characteristics vs Supply Voltage

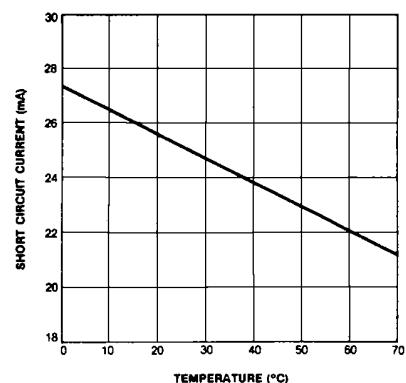


Figure 10. Output Short Circuit Current vs Ambient Temperature

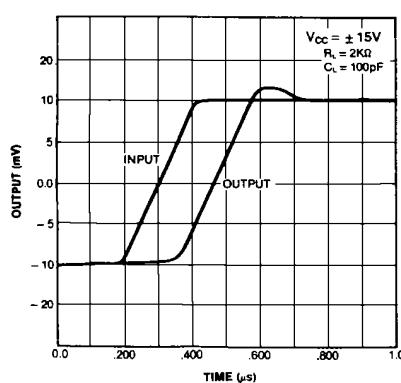


Figure 11. Transient Response

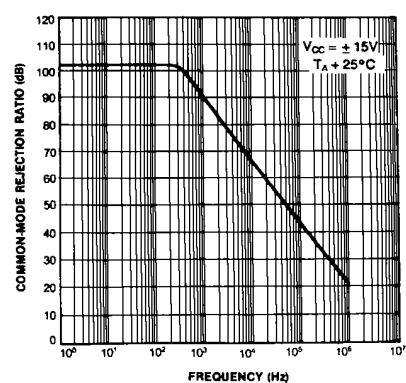


Figure 12. Common-Mode Rejection Ratio vs Frequency

Typical Performance Characteristics (continued)

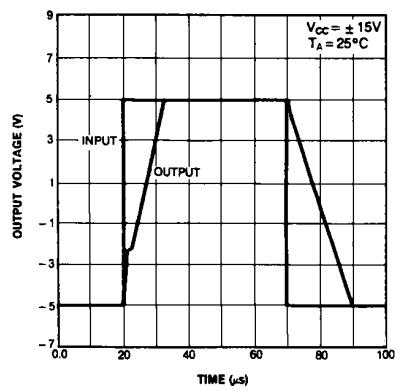


Figure 13. Voltage Follower Large Signal Pulse Response

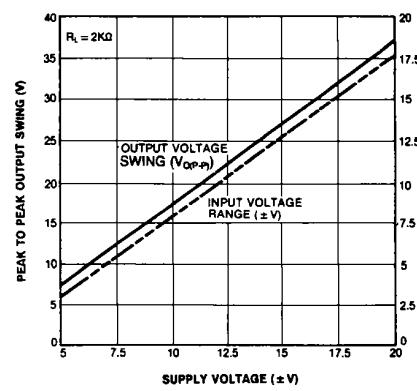
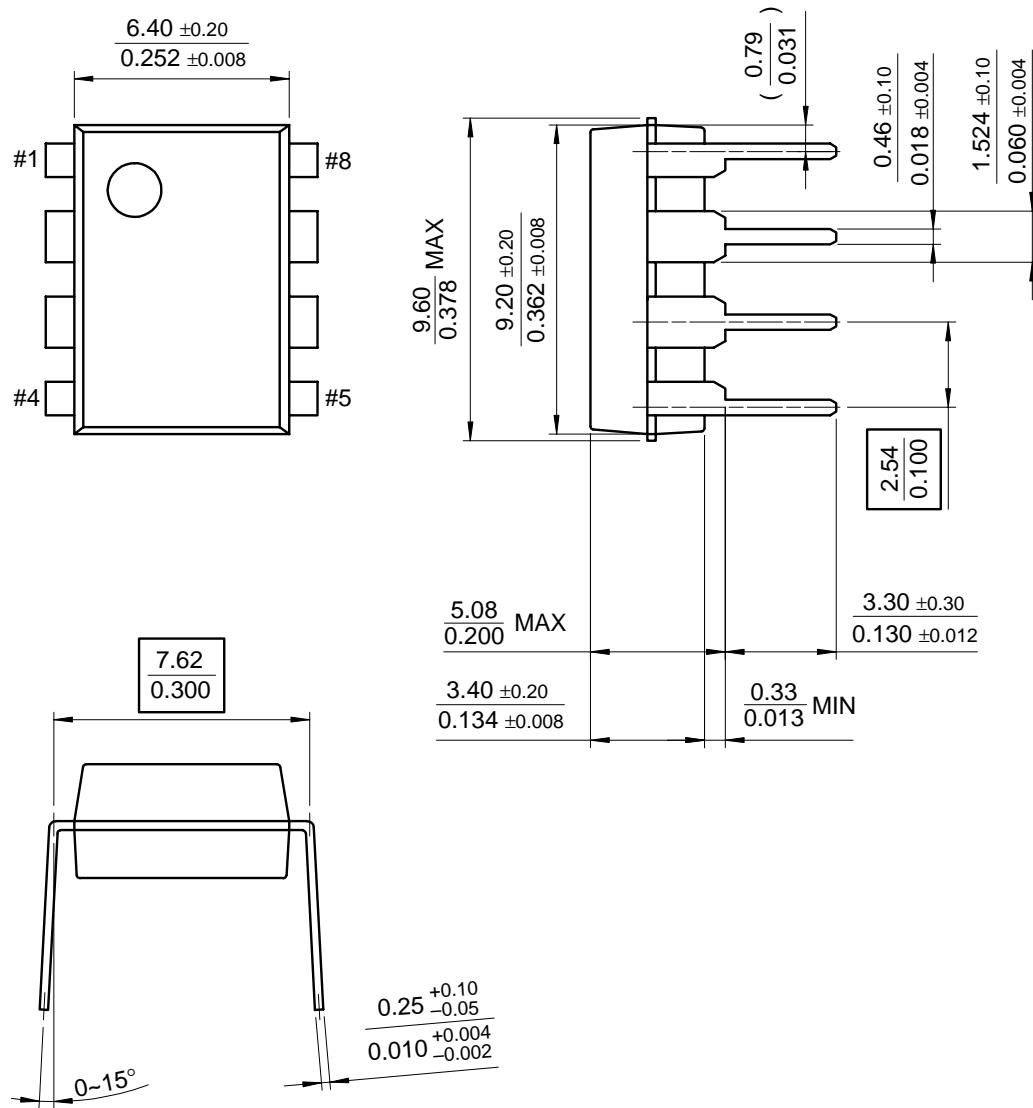


Figure 14. Output Swing and Input Range vs Supply Voltage

Mechanical Dimensions

Package

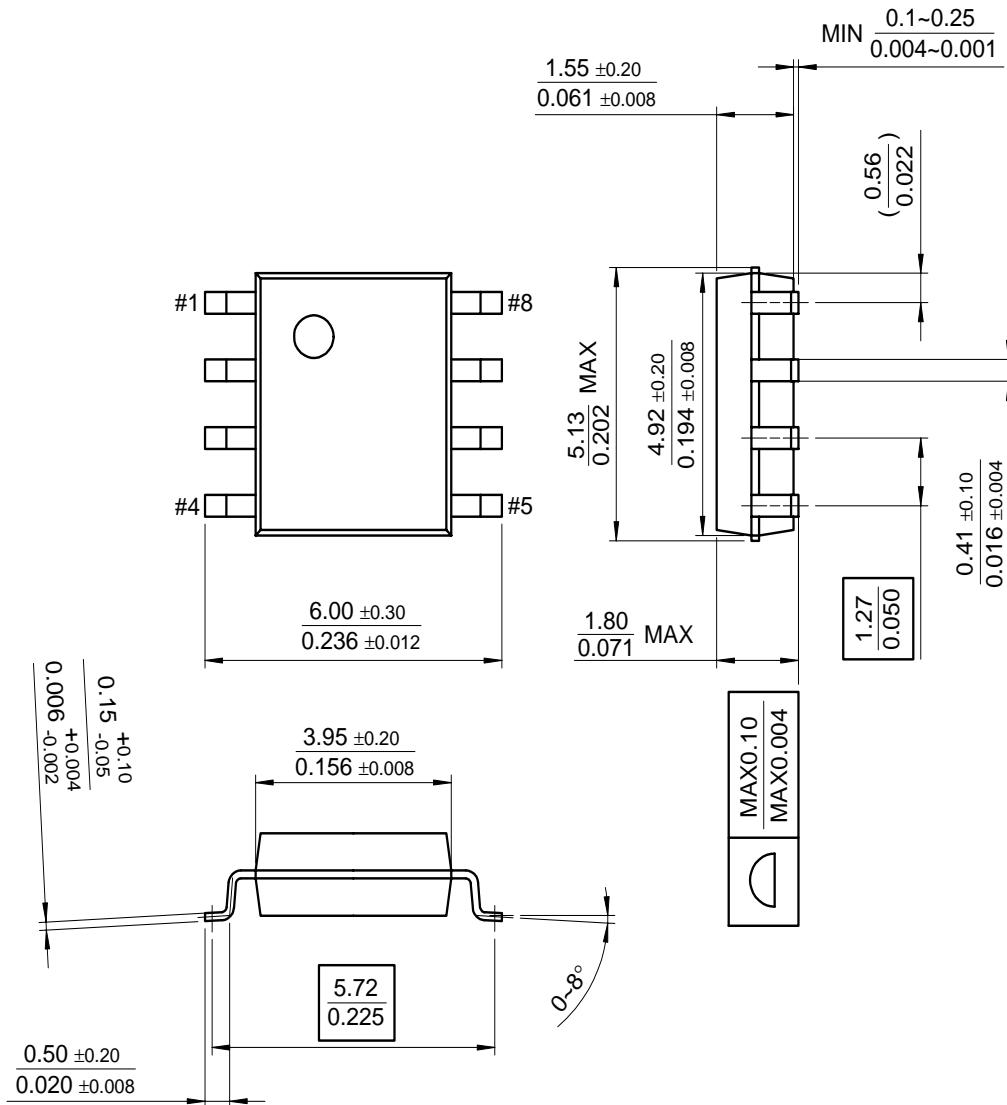
8-DIP



Mechanical Dimensions (Continued)

Package

8-SOP



Ordering Information

Product Number	Package	Operating Temperature
KA741	8-DIP	0 ~ + 70°C
KA741D	8-SOP	
KA741I	8-DIP	-40 ~ + 85°C

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