

KA741/E/I

SINGLE OPERATIONAL AMPLIFIER

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The KA741 series are general purpose operational amplifiers which feature improved performance over industry standards like the KA709. It is intended for a wide range of analog applications. The high gain and wide range of operating voltage provide superior performance in integrator, summing amplifier, and general feedback applications.

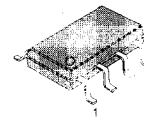
FEATURES

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

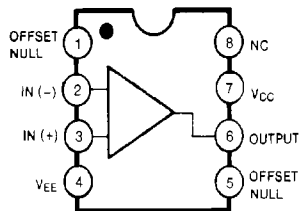
8 DIP



8 SOP



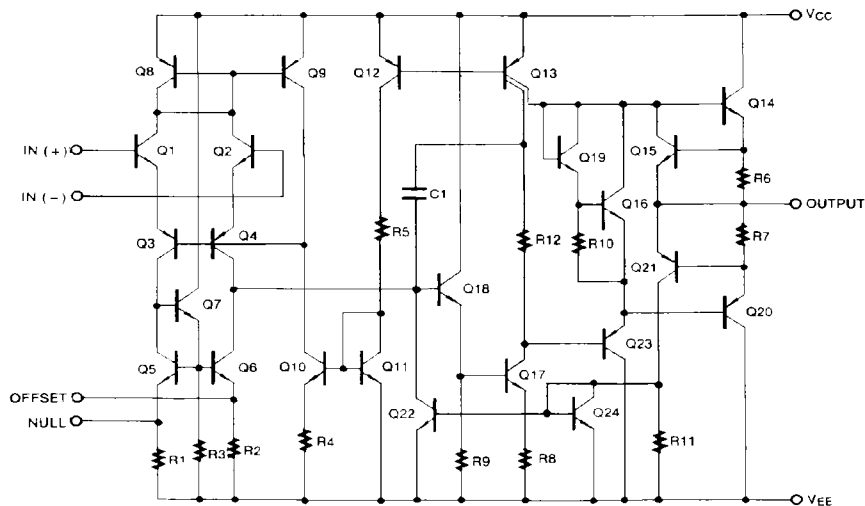
BLOCK DIAGRAM



ORDERING INFORMATION

Device	Package	Operating Temperature
KA741E KA741	8 DIP	0 ~ +70 °C
KA741ED KA741D	8 SOP	
KA741I KA741EI	8 DIP	-40 ~ +85 °C
KA7411ID KA741EID	8 SOP	

SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_A=25 °C)

Characteristic	Symbol	KA741	KA741E	KA741I	Unit
Supply Voltage	V _{CC}	± 18	± 22	± 18	V
Differential Input Voltage	V _{I(DIFF)}	± 30	± 30	± 30	V
Input Voltage	V _I	± 15	± 15	± 15	V
Output Short Circuit Duration		Indefinite	Indefinite	Indefinite	
Power Dissipation	P _D	500	500	500	mW
Operating Temperature Range	T _{OPR}	0 ~ + 70	0 ~ + 70	-40 ~ + 85	°C
Storage Temperature Range	T _{STG}	-65 ~ + 150	-65 ~ + 150	-65 ~ + 150	°C

ELECTRICAL CHARACTERISTICS

(V_{CC} = 15V, V_{EE} = - 15V. T_A = 25 °C, unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA741E			KA741/KA741I			Unit
			Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage	V _{IO}	R _S ≤ 10KΩ					2.0	6.0	mV
		R _S ≤ 50Ω		0.8	3.0				
Input Offset Voltage Adjustment Range	V _{IO(R)}	V _{CC} = ± 20V	± 10				± 15		mV
Input Offset Current	I _{IO}			3.0	30		20	200	nA
Input Bias Current	I _{BIAS}			30	80		80	500	nA
Input Resistance	R _I	V _{CC} = ± 20V	1.0	6.0		0.3	2.0		MΩ
Input Voltage Range	V _{I(R)}		± 12	± 13		± 12	± 13		V
Large Signal Voltage Gain	G _V	R _L ≥ 2KΩ	50			20	200		V/mV
Output Short Circuit Current	I _{SC}		10	25	35		25		mA
Output Voltage Swing	V _{O(P.P)}	V _{CC} = ± 20V	R _L ≥ 10KΩ	± 16					V
			R _L ≥ 10KΩ	± 15					
		V _{CC} = ± 15V	R _L ≥ 10KΩ			± 12	± 14		
			R _L ≥ 10KΩ			± 10	± 13		
Common Mode Rejection Ratio	CMRR	R _S ≤ 10KΩ, V _{CM} = ± 12V				70	90		dB
		R _S ≤ 50KΩ, V _{CM} = ± 12V	80	95					
Power Supply Rejection Ratio	PSRR	V _{CC} = ± 15V to V _{CC} = ± 15V	86	96					dB
		R _S ≤ 50Ω							
		V _{CC} = ± 15V to V _{CC} = ± 15V				77	96		

KA741/E/I

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ELECTRICAL CHARACTERISTICS (Continued)

Characteristic		Symbol	Test Conditions	KA741E			KA741/KA741I			Unit
				Min	Typ	Max	Min	Typ	Max	
Transient Response	Rise Time	t_R	Unity Gain		0.25	0.8		0.3		μs
	Overshoot	OS			6.0	20		10		%
Bandwidth		BW		0.43	1.5					MHz
Slew Rate		SR	Unity Gain	0.3	0.7			0.5		V/ μs
Supply Current		I_{CC}	$R_L = \infty$					1.5	2.8	mA
Power Consumption		P_C	$V_{CC} = \pm 20V$		80	150				mW
			$V_{CC} = \pm 15V$					50	85	

ELECTRICAL CHARACTERISTICS

($-40^\circ C \leq T_A \leq 85^\circ C$ for the KA741I, $0^\circ C \leq T_A \leq 70^\circ C$ for the KA741 and KA741E. $V_{CC} = \pm 15V$, unless otherwise specified)

Characteristic	Symbol	Test Conditions		KA741E			KA741/KA741I			Unit
				Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage	V _{IO}	R _S ≤ 50Ω				4.0				mV
		R _S ≤ 10KΩ							7.5	
Input Offset Voltage Drift	Δ V _{IO} /Δ T				15					μ V/°C
Input Offset Current	I _{IO}					70			300	nA
Input Offset Current Drift	Δ I _{IO} /Δ T					0.5				nA/°C
Input Bias Current	I _{BIAS}					0.21			0.8	μ A
Input Resistance	R _i	V _{CC} = ± 20V		0.5						MΩ
Input Voltage Range	V _{I(R)}			± 12	± 13		± 12	± 13		V
Output Voltage Swing	V _{O(P.P)}	V _{CC} =± 20V	R _S ≥ 10KΩ	± 16						V
			R _S ≥ 2KΩ	± 15						
		V _{CC} =± 15V	R _S ≥ 10KΩ				± 12	± 14		
			R _S ≥ 2KΩ				± 10	± 13		
Output Short Circuit Current	I _{SC}			10		40	10		40	mA
Common Mode Rejection Ratio	CMRR	R _S ≤ 10KΩ , V _{CM} =± 12V					70	90		dB
		R _S ≤ 50KΩ , V _{CM} =± 12V		80	95					
Power Supply Rejection Ratio	PSRR	V _{CC} =± 20V to ± 5V	R _S ≤ 50Ω	86	96					dB
			R _S ≤ 10KΩ				77	96		
Large Signal Voltage Gain	G _V	R _S ≥ 2KΩ	V _{CC} =± 20V, V _{O(P.P)} =± 15V	32						V/mV
			V _{CC} =± 15V, V _{O(P.P)} =± 10V				15			
			V _{CC} =± 15V, V _{O(P.P)} =± 2V	10						

TYPICAL PERFORMANCE CHARACTERISTICS

Fig. 7 OUTPUT RESISTANCE vs FREQUENCY

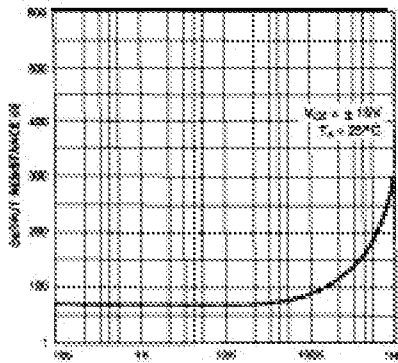


Fig. 8 INPUT RESISTANCE AND INPUT CAPACITANCE vs FREQUENCY

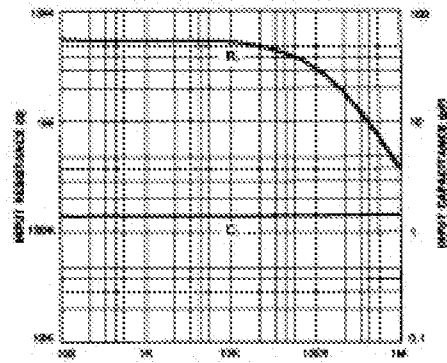


Fig. 9 INPUT BIAS CURRENT vs AMBIENT TEMPERATURE

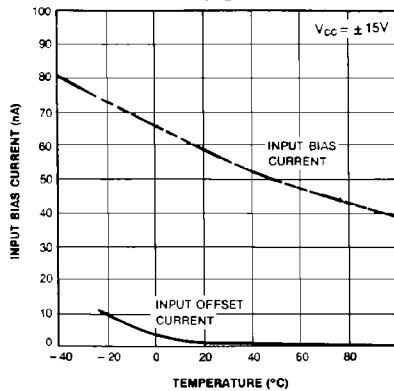


Fig. 10 POWER CONSUMPTION vs AMBIENT TEMPERATURE

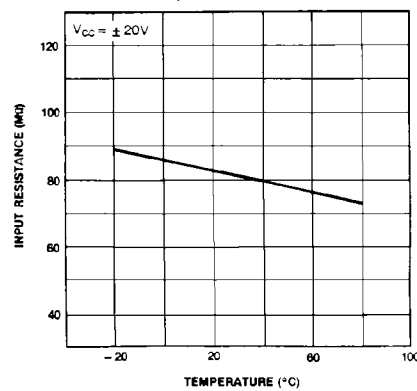


Fig. 11 INPUT OFFSET CURRENT vs AMBIENT TEMPERATURE

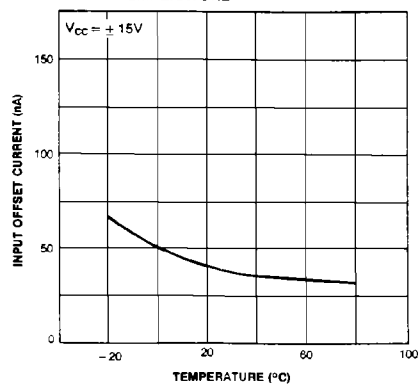


Fig. 12 INPUT RESISTANCE vs AMBIENT TEMPERATURE

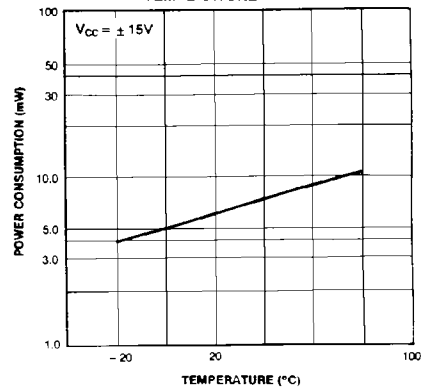


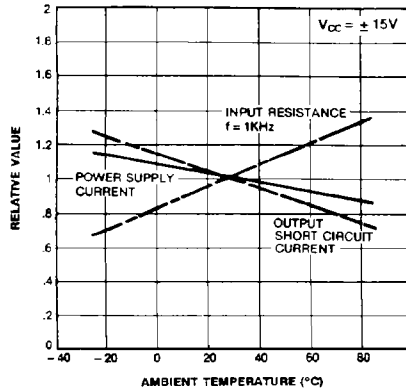
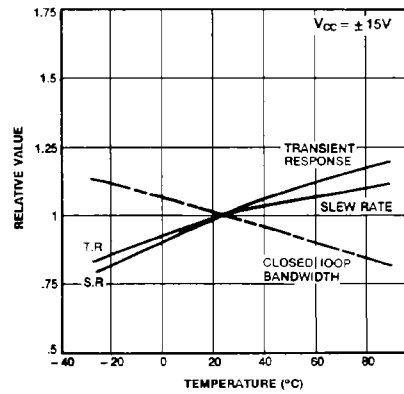
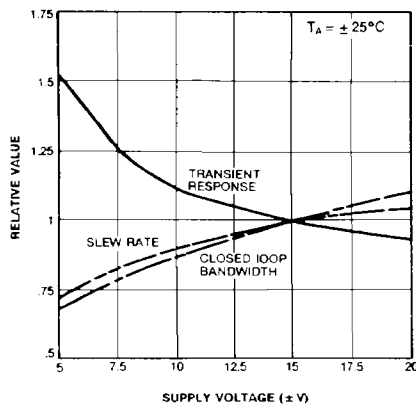
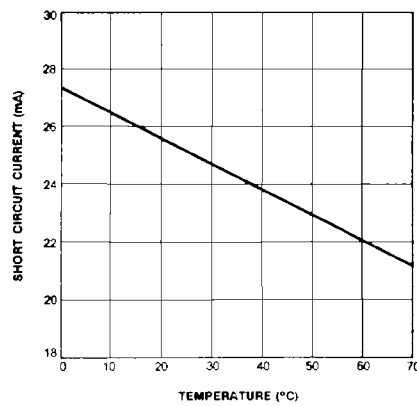
Fig. 13 NORMALIZED DC PARAMETERS
vs AMBIENT TEMPERATUREFig. 14 FREQUENCY CHARACTERISTICS
vs AMBIENT TEMPERATUREFig. 15 FREQUENCY CHARACTERISTICS
vs SUPPLY VOLTAGEFig. 16 OUTPUT SHORT CIRCUIT CURRENT
vs AMBIENT TEMPERATURE

Fig. 17 TRANSIENT RESPONSE

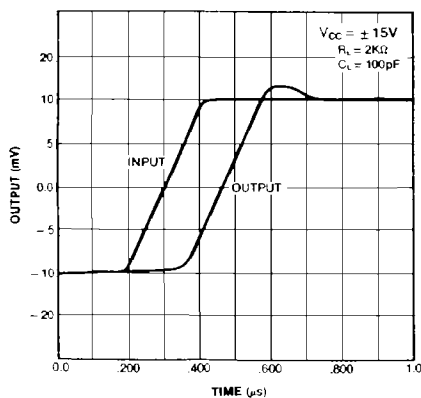
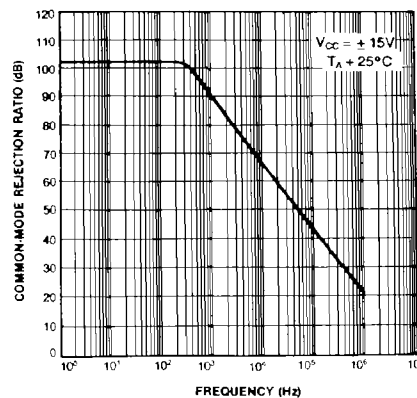
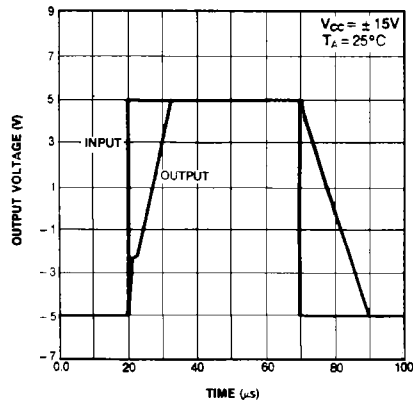
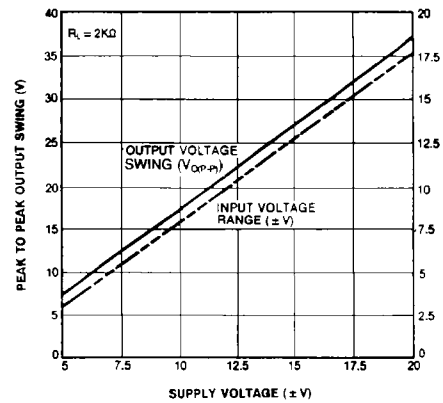
Fig. 18 COMMON-MODE REJECTION RATIO
vs FREQUENCY

Fig. 18 VOLTAGE FOLLOWER LARGE
SIGNAL PULSE RESPONSEFig. 19 OUTPUT SWING AND INPUT RANGE
vs SUPPLY VOLTAGE

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