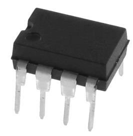
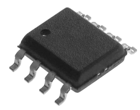
LM741 Operational Amplifier

General Description

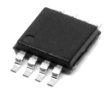
The LM741 series are general purpose operational amplifies which feature improved performance over industry standards like the LM709.They are e direct, plug-in replacements for the 709C, LM201, MC1439 and 748 in most applications. The amplifiers offer many features which make their applica tion nearly foolproof: overload protection on the input and output, no latch-up when the common mode range is ex ceeded, as well as freedom from oscillations.



DIP-8



SOP-8



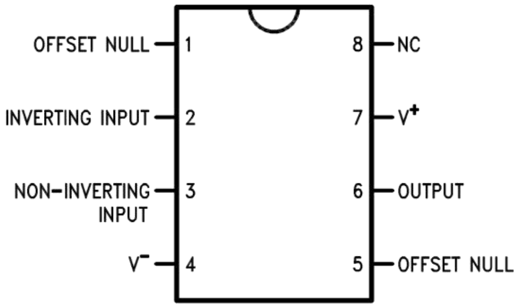
MSOP-8

Ordering Information

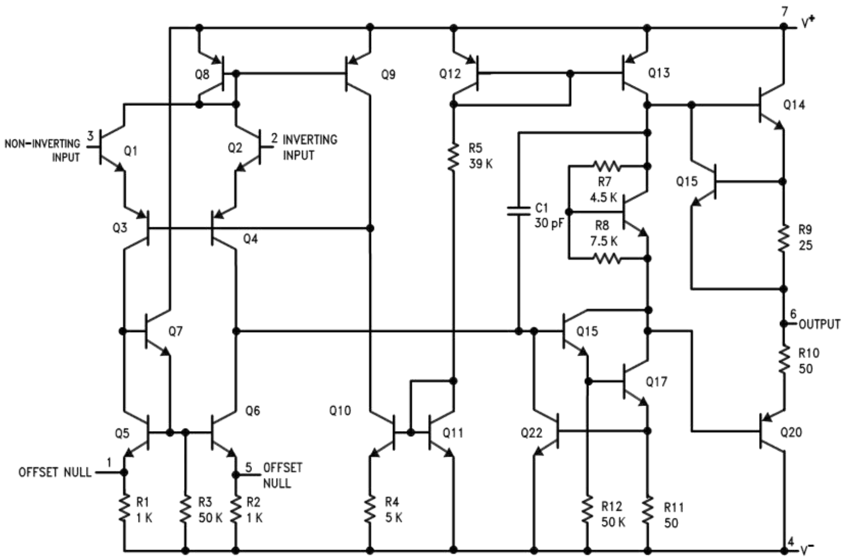
DEVICE	Package Type	MARKING	Packing	Packing Qty
LM741PG	DIP-8	LM741	TUBE	2000pcs/Box
LM741APG	DIP-8	LM741A	TUBE	2000pcs/Box
LM741DRG	SOP-8	LM741	REEL	2500pcs/Reel
LM741DRG4	SOP-8	LM741	REEL	4000pcs/Reel
LM741ADRG	SOP-8	LM741A	REEL	2500pcs/Reel
LM741ADRG4	SOP-8	LM741A	REEL	4000pcs/Reel
LM741DGKRG	MSOP-8	LM741	REEL	3000pcs/Reel
LM741ADGKRG	MSOP-8	741A	REEL	3000pcs/Reel

Connection Diagram

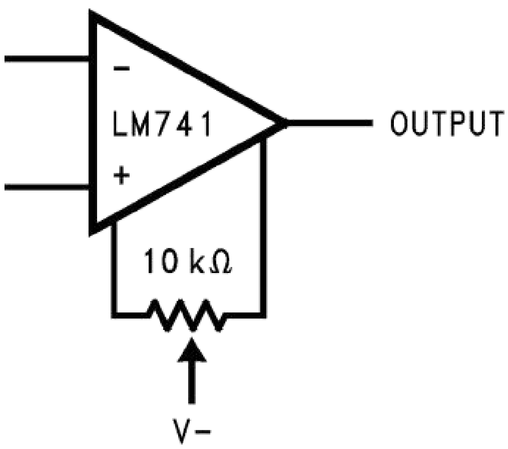
DIP-8/SOP-8/MSOP-8



Schematic Diagram



Offset Nulling Circuit



Absolute Maximum Ratings (1)

CONDITION		LIMITS
Supply Voltage		±22V
Power Dissipation(Note2）		500mW
Differential Input Voltage		±30V
Input Voltage(Note3)		±15V
Output Sort Circuit Duration		Continuous
Operating Temperature Range		0˚C to +70˚C
Junction Temperature	LM741A	150˚C
	LM741	100˚C
Soldering Information (10 seconds)		245˚C
Storage Temperature Range		-65˚C to +150˚C
ESD Tolerance(Note7)		400V

Electrical Characteristics

Parameter	Conditions	LM741A			LM741			Units
		Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage	T_A=25°C R_S≤10KΩ R_S≤50Ω		 0.8	 3.0		 2.0	 6.0	 mW mW
	T_{AMIN}≤T_A≤T_{AMAX} R_S≤50Ω R_S≤10KΩ			 4.0			 7.5	 mW mW
Average Input Offset Voltage Drift				15				µv/°C
Input Offset Voltage Adjustment Range	T_A=25°C,V_S=±20V	±10				±15		mW
Input Offset Current	T_A=25°C T_{AMIN}≤T_A≤T_{AMAX}		3.0	30 70		20	200 300	nA nA
Average Input Offset Current Drift				0.5				nA/°C
Input Bias Current	T_A=25°C T_{AMIN}≤T_A≤T_{AMAX}		30	80 0.210		80	500 0.8	nA µA
Input Resistance	T_A=25°C,V_S=±20V	1.0	6.0		0.3	2.0		MΩ
	T_{AMIN}≤T_A≤T_{AMAX}, V_S=±20V	0.5						MΩ
Input Voltage Range	T_A=25°C				±12	±13		V
	T_{AMIN}≤T_A≤T_{AMAX}							V
Large Signal Voltage Gain	T_A=25°C,R_L≥2KΩ V_S=±20V,V_O=±15V V_S=±15V,V_O=±10V	 50			 20	 200		 V/mW V/mW
	T_{AMIN}≤T_A≤T_{AMAX} R_L≥2KΩ V_S=±20V,V_O=±15V V_S=±15V,V_O=±10V V_S=±5V,V_O=±2V	 32 10			 15			 V/mW V/mW V/mW
Output Voltage Swing	V_S=±20V R_L≥10KΩ R_L≥2KΩ	 ±16 ±15						 V V
	V_S=±15V R_L≥10KΩ R_L≥2KΩ				 ±12 ±10	 ±14 ±13		 V V
Output Short Circuit Current	T_A=25°C T_{AMIN}≤T_A≤T_{AMAX}	10 10	25	35 40		25		mA mA

Common-Mode Rejection Ratio	$T_{AMIN} \leq T_A \leq T_{AMAX}$ $R_S \leq 10K\Omega, V_{CM} = \pm 12V$ $R_S \leq 50\Omega, V_{CM} = \pm 12V$	 80	 95	0.5	 70	 90		 dB dB
Supply Voltage Rejection Ratio	$T_{AMIN} \leq T_A \leq T_{AMAX}$ $V_S = \pm 20V to V_S = \pm 5V$ $R_S \leq 50\Omega$ $R_S \leq 10K\Omega$	 86	 96		 77	 96		 dB dB
Transient Response Rise Time Overshoot	$T_A = 25^{\circ}C$,Unity Gain		 0.25 6.0	 0.8 20		 0.3 5		μs
Bandwidth(Note5)	$T_A = 25^{\circ}C$	0.437	1.5					MHz
Slew Rate	$T_A = 25^{\circ}C$,Unity Gain	0.3	0.7			0.5		V/μs
Supply Current	$T_A = 25^{\circ}C$					1.7	2.8	mA
Power Consumption	$T_A = 25^{\circ}C$ $V_S = \pm 20V$ $V_S = \pm 15V$		 80	 150		 50	 85	 mw mw

Note1:"Absolute Maximum Ratings"indicate limits beyond which damage to the device may occur.Operating Ratings indicate conditions for which the device is functional,but do not guarantee specific performance limits.

Note 2: For operation at elevated temperatures, these devices must be derated based on thermal resistance, and T_j max. (listed under "Absolute Maximum Ratings"). $T_j = T_A + (\theta_{jA} P_D)$.

Thermal Resistance	**DIP(N)**	**SOP-8(M)**
θ_{jA}(Junction to Ambient)	100˚C/W	195˚C/W
θ_{jC}(Junction to Case)	N/A	N/A

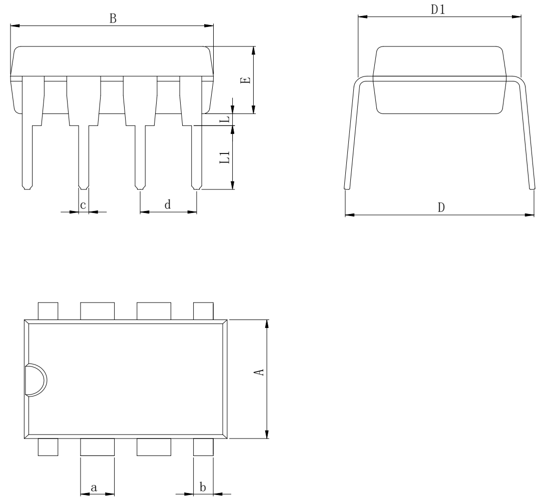
Note 3: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

Note 4: Calculated value from: BW (MHz) = 0.35/Rise Time(μs).

Note 5: Human body model, 1.5 kΩ in series with 100 pF.

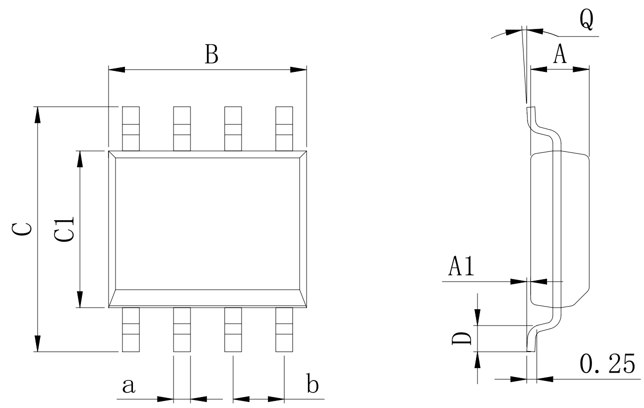
Physical Dimensions

DIP-8



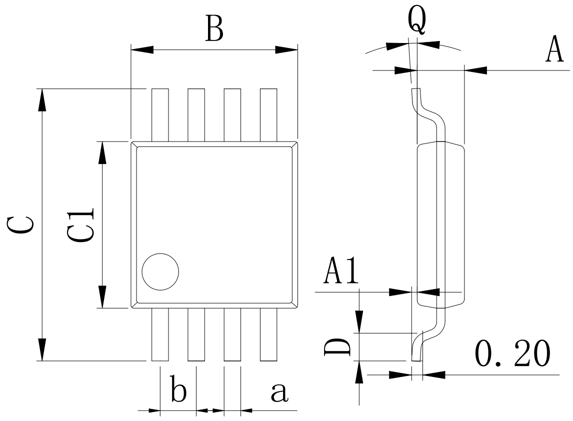
Dimensions In Millimeters(DIP-8)											
Symbol:	A	B	D	D1	E	L	L1	a	b	c	d
Min:	6.10	9.00	8.10	7.42	3.10	0.50	3.00	1.50	0.85	0.40	2.54 BSC
Max:	6.68	9.50	10.9	7.82	3.55	0.70	3.60	1.55	0.90	0.50	

SOP-8



Dimensions In Millimeters(SOP-8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	4.90	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	5.10	6.20	4.00	0.80	8°	0.45	

MSOP-8



Dimensions In Millimeters(MSOP-8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.80	0.05	2.90	4.75	2.90	0.35	0°	0.25	0.65 BSC
Max:	0.90	0.20	3.10	5.05	3.10	0.75	8°	0.35	

Revision History

REVISION NUMBER	DATE	REVISION	PAGE
V1.0	2021-7	New	1-9
V1.1	2023-9	Update encapsulation type、Add annotation for Maximum Ratings.	1、3

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