SL358
Dual Operational Amplifier

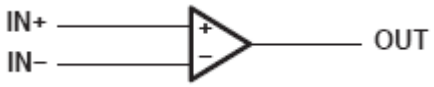
DESCRIPTION

The SL358 consists of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. Application areas include transducer amplifiers, dc gain blocks and all the conventional op amp circuits.

FEATURES

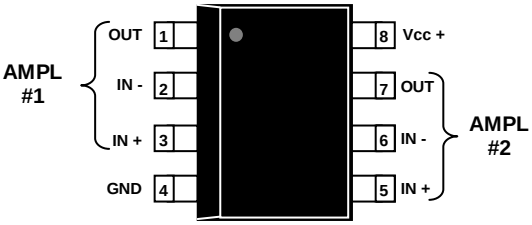
- Wide range of supply voltages
- Low supply current drain independent of supply voltage
- Low input biasing current
- Low input offset voltage and offset current
- Input common-mode voltage range includes ground
- Differential input voltage range equal to the power supply voltage
- DC voltage gain 100 V/ mV Typ
- Internally frequency compensation

SYMBOL (each amplifier)

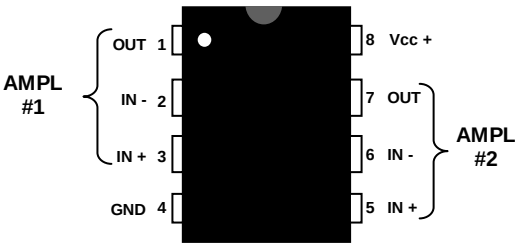


PIN CONFIGURATION – Top View

8L SOIC



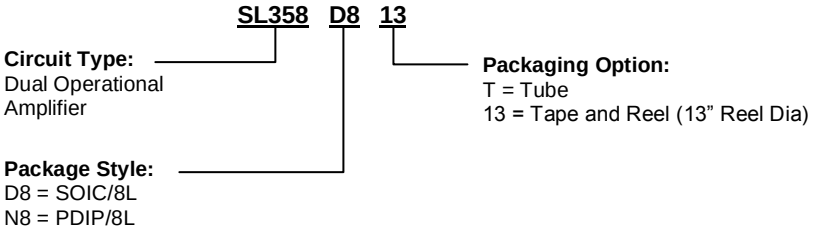
8L PDIP



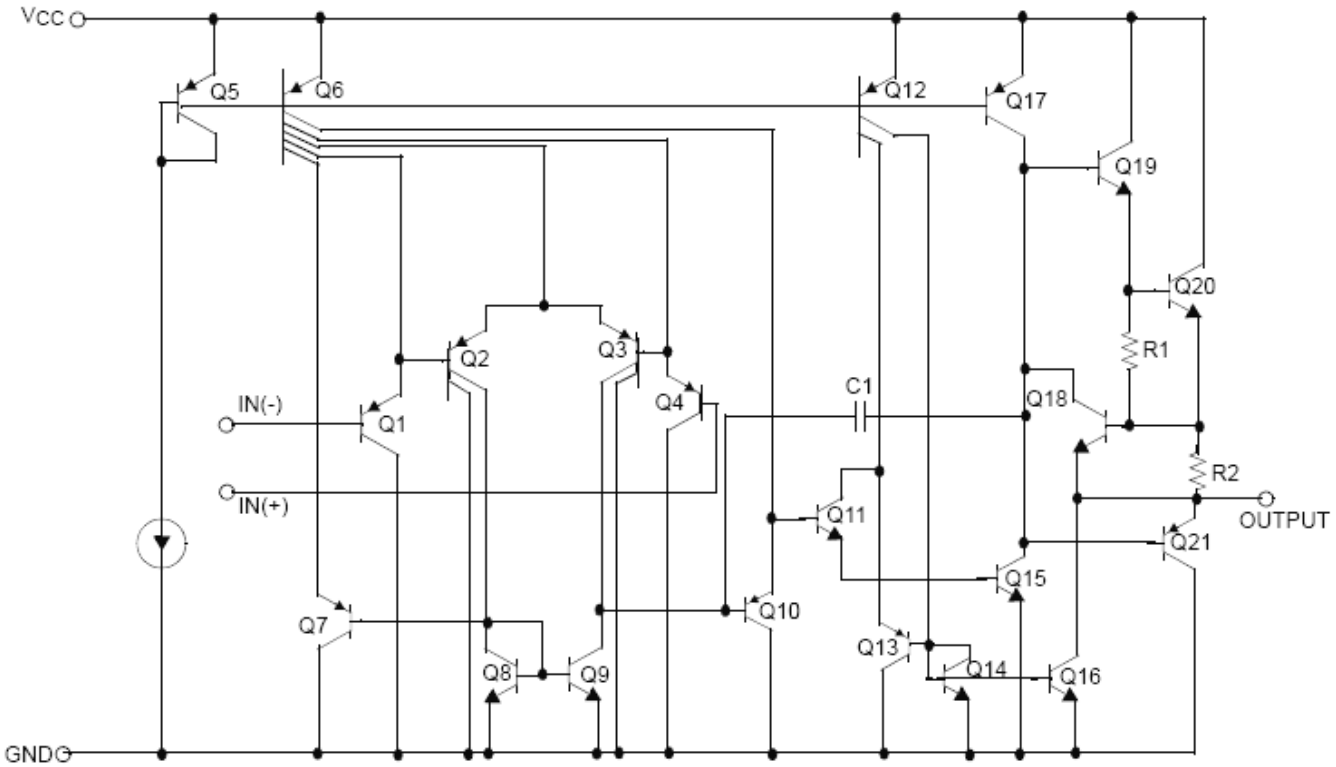
PACKAGE TOP MARKING:
(For both 8L SOIC/PDIP)

Line 1: Device
Line 2: Lot No. Code
F – Foundry Code (C)
YMXXX – 5 Character Lot No.
S – Split Code
Line 3: Date Code
G – Assembly Vendor Code
YY – Year
WW – Workweek

ORDERING INFORMATION



SCHEMATIC DIAGRAM
(each amplifier only)



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	SL358	Unit
Supply Voltage	V_{CC}	±16 or 32	V
Differential Input Voltage	V_I(DIFF)	32	V
Input Voltage	V_I	-0.3 to +32	V
Output Short Circuit to GND V_{CC}≤15V, T_A = 25°C(One Amp)	-	Continuous	-
Operating Temperature Range	T_{OPR}	0 ~ +70	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

ELECTRICAL CHARACTERISTICS

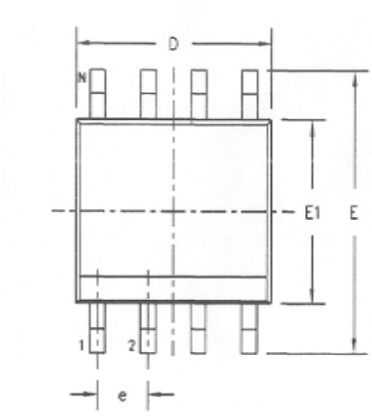
at specified free-air temperature, V_{CC} = 5V (unless otherwise noted)

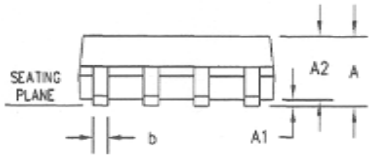
PARAMETER	TEST CONDITIONS*		SL358			UNIT
			MIN	TYP	MAX	
V_{IO} Input offset voltage	V_{CC} = 5 V to MAX, V_{IC} = V_{ICR} min, Vo=1.4 V	25 °C		3	7	mV
		Full range			9	
αV_{IO} Average temperature coefficient of input offset voltage		Full range		7		µV/°C
I_{IO} Input offset current	Vo=1.4 V	25 °C		2	50	nA
		Full range			150	
αIIO Average temperature coefficient of input offset current		Full range		10		pA/°C
I_{IB} Input bias current	Vo=1.4 V	25 °C		-20	-250	nA
		Full range			-500	
V_{ICR} Common-mode input voltage range	Vcc = 5 V to MAX	25° C	0 to Vcc-1.5			V
		Full range	0 to Vcc - 2			
V_{OH} High-level output voltage	R_L ≥2 KΩ (NOTE 1)	25 °C	Vcc-1.5			V
	Vcc = MAX, RL=2 kΩ	Full range	26			
	Vcc = MAX, R_L ≥ 10 kΩ	Full range	27	28		
V_{OL} Low-level output voltage	R_L ≥ 10 kΩ	Full range		5	20	mV
A_{VD} Large-signal differential voltage amplification	Vcc = 15 V, Vo=1V to 11 V, R_L ≥ 2 kΩ	25 °C	25	100		V/mV
		Full range	15			
CMRR Common-mode rejection ratio	Vcc = 5 V to MAX, V_{IC} = V_{ICR} min	25 °C	65	80		dB
k_{SVR} Supply voltage rejection ratio ($\Delta Vcc/\Delta V_{IO}$)	Vcc = 5 V to MAX	25 °C	65	100		dB
Vo1 /Vo2 Crosstalk attenuation	f=1 kHz to 20 kHz	25 °C		120		dB
Io Output current	Vcc = 15 V, V_{ID}=1 V,V_O= 0	25 °C	-20	-30		mA
		Full range	-10			
	Vcc = 15 V, V_{ID} = - 1 V, Vo = 15 V	25 °C	10	20		
		Full range	5			
	V_{ID} = -1 V, Vo =200 mV	25 °C	12	30		µA
I_{OS} Short-circuit output current	Vcc at 5 V, GND at -5 V,Vo=0	25 °C		±40	±60	mA
I_{CC} Supply current (two amplifiers)	Vo - 2.5 V, No load	Full range		0.7	1.2	mA
	Vcc = MAX, Vo = 0.5Vcc, No load	Full range		1	2	

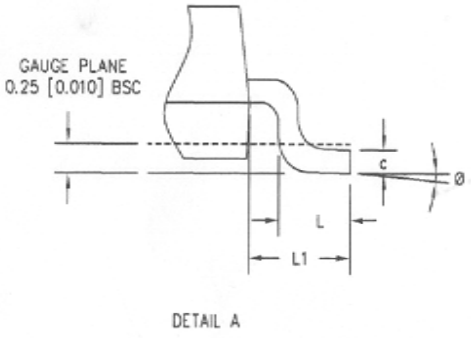
- All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified. “MAX” V_{CC} for testing purposes is 30 V. Full range is 0 °C to 70 °C.

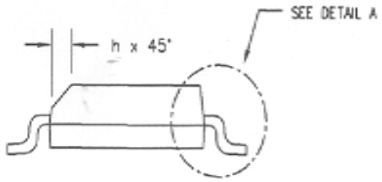
8L-SOIC PACKAGE DIMENSION

8-Lead SOIC Plastic
Surface Mounted Package
SLI Package Code: D8







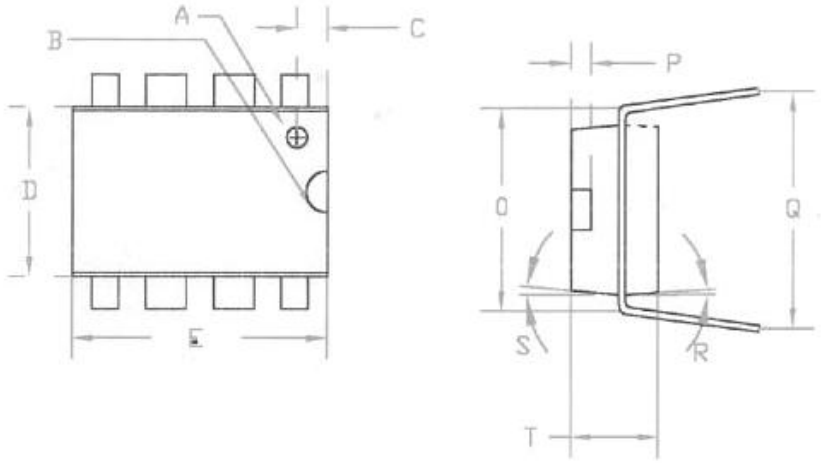


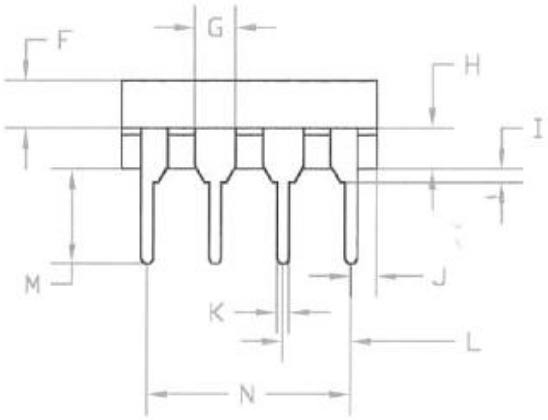
	DIMENSION IN INCHES			DIMENSION IN MM		
SYM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.059	0.062	0.065	1.50	1.57	1.65
A1	0.004	0.008	0.010	0.10	0.20	0.25
A2	0.051	0.054	0.057	1.30	1.37	1.45
b	0.013	0.016	0.020	0.33	0.41	0.51
c	0.007	0.008	0.010	0.18	0.20	0.25
D	0.191	0.193	0.195	4.85	4.90	4.95
E1	0.151	0.153	0.155	3.84	3.89	3.94
E	0.228	0.234	0.240	5.79	5.94	6.10
e	0.050			1.27		
L	0.020	0.024	0.032	0.51	0.61	0.81
L1	0.039	0.041	0.043	0.99	1.04	1.09
Ø	0*	-	B*	0*	-	B*
h	0.011	0.015	0.019	0.28	0.38	0.48

NOTES:
1. **DIMENSION D DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. DIMENSION E1 DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSIONS.**
2. **COPLANARITY APPLIES TO THE TERMINALS. COPLANARITY SHALL NOT EXCEED 0.003" [0.08 mm].**
3. **BASED FROM JEDEC NS-012 VARIATION AA.**

8L-PDIP PACKAGE DIMENSION

8-Lead PDIP Plastic
SLI Package Code: N8

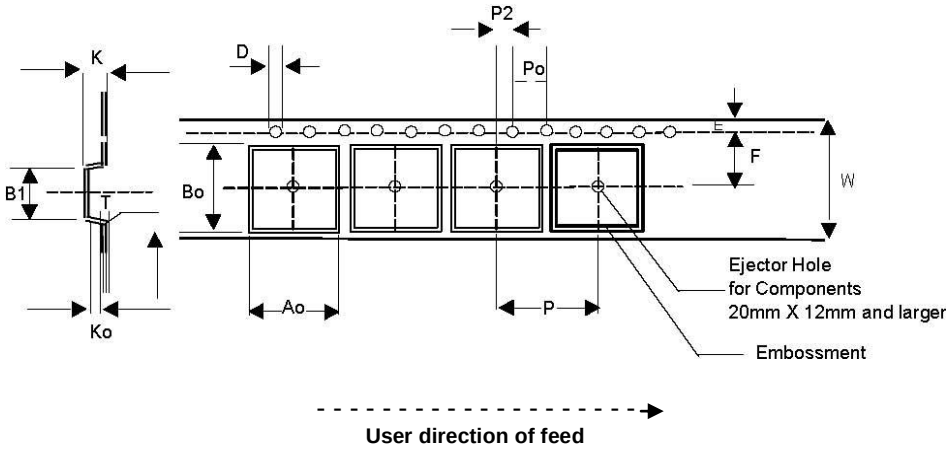




SYMBOL	INCHES			
	MIN	MAX	NOMINAL	TOLERANCE
A			Ø0.031X	0PT0.015
B			r 0.030	
C			0.045	
D			0.250	
E			0.370	±0.005
F			0.060	
G			0.060	
H			0.060	±0.002
I			0.020	
J			0.0375	
K	0.16	0.022	0.019	±0.003
L			0.100	
M	0.145	0.155	0.150	±0.005
N			0.300	
O			0.300	
P			0.030	
Q	0.320	0.380	0.350	±0.03
R			3°	
S			5°	
T			0.130	

PACKAGE MECHANICAL DRAWING

Surface Mountable Tape & Reel Specifications in mm (inch)
(SOIC)

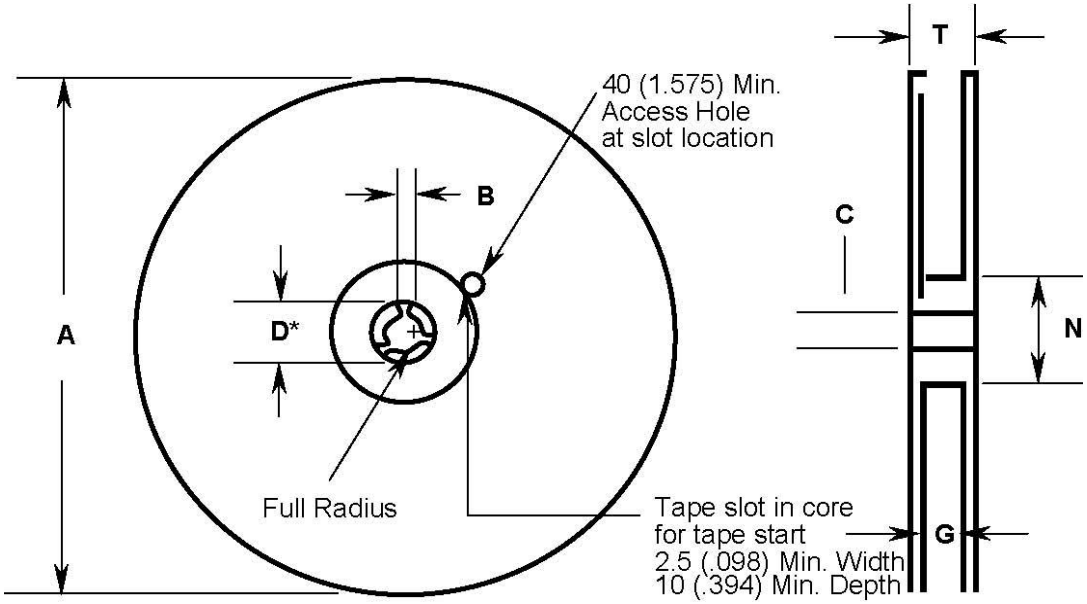


Tape Size (W)	D	E	P0	T (Max)	A0, B0, K0	T1 (Max)	Constant
8, 12, 16, 24mm	1.55±0.05 (.061±.002)	1.75±0.10 (.069±.004)	4.0±0.10 (.157±.004)	0.400 (.016)	See Note	0.100 (.004)	Dimensions

Tape Size (W)	B1 Max.	D1 Min.	F	K Max.	P2	
8 mm	4.2 (.165)	1.0 (.039)	3.5±0.05 (.138±.002)	2.4 (.094)	2.0±.05	
12 mm	8.2 (.323)	1.5 (.059)	5.5±0.05 (.217±.002)	4.5 (.177)	.079±.002	Variable Dimensions

Per Package Requirement					
Components		Tape Width (W) mm	Cavity Pitch (P) mm	Devices per Reel	
				7” Reel	13” Reel
SOIC	8L	12	8	-	2500

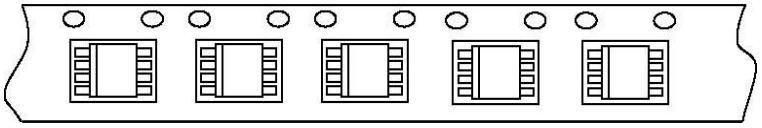
Note: Ao Bo Ko are determined by component size. The clearance between the component and the cavity must be within 0.05 [.002] min. to 0.50 [.020] max. for 8mm tape, 0.05 [.002] min to 0.65 [.026] max for 12mm tape.



REEL DIMENSIONS							
Tape Size	A Max.	B Min.	C	D* Min.	N Min.	G	T Max.
8mm	330 (12.992)	1.5 (.059)	13.0±0.20 (.152±.008)	20.2 (.795)	50 (1.973)	8.4±1.5 0.0 (.331±.059) 0.0	14.4 (.567)
12mm	330 (12.992)	1.5 (.059)	13.0±0.20 (.152±.008)	20.2 (.795)	50 (1.973)	12.4±2.0 0.0 (.488±.078) 0.0	14.4 (.567)

MECHANICAL POLARIZATION

SOIC-8L DEVICE



User direction of feed - →