Single Supply Dual Operational Amplifiers
KM358

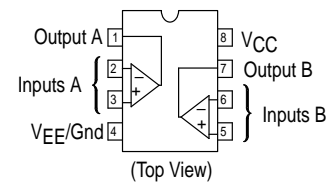■ Features

● Short Circuit Protected Outputs

● True Differential Input Stage

● Single Supply Operation: 3.0 V to 32 V

● Low Input Bias Currents

● Internally Compensated

● Common Mode Range Extends to Negative Supply
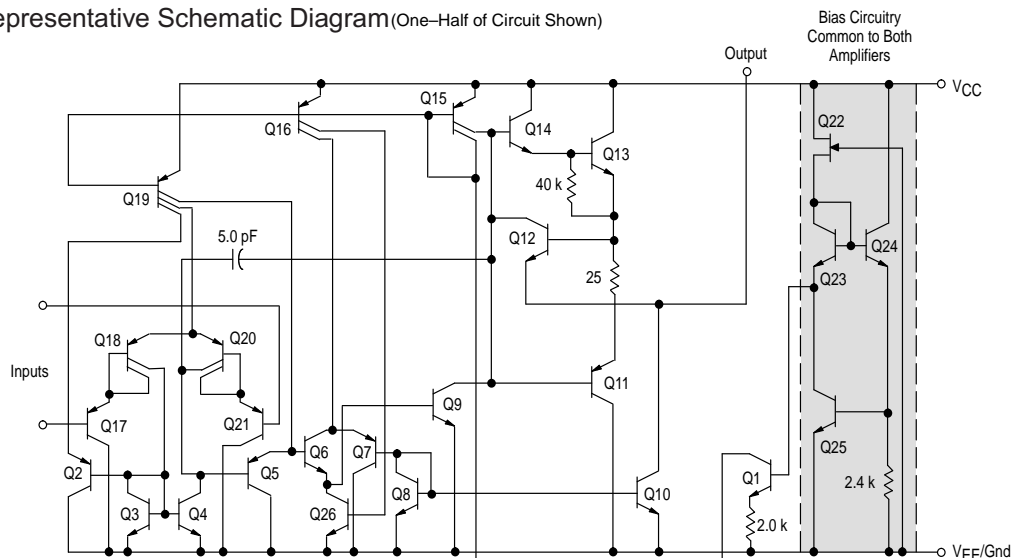
● Single and Split Supply Operation

SOP08

(Top View)

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Power Supply Voltages Single Supply	V_{CC}	32	Vdc
Split Supplies	V_{CC}, V_{EE}	±16	
Input Differential Voltage Range *1	V_{IDR}	±32	Vdc
Input Common Mode Voltage Range *2	V_{ICR}	-0.3 to 32	Vdc
Output Short Circuit Duration	t_{SC}	Continuous	
Junction Temperature	T_J	150	℃
Thermal Resistance, Junction-to-Air	$R_{\theta JA}$	238	℃/W
Storage Temperature Range	T_{stg}	-55 to +125	℃
Operating Ambient Temperature Range	T_A	0 to +70	℃

*1 Split Power Supplies.

*2 For supply voltages less than 32 V the absolute maximum input voltage is equal to the supply voltage.

■ Representative Schematic Diagram(One–Half of Circuit Shown)

KM358

■ Electrical Characteristics Ta = 25℃ (V$_{CC}$ = 5.0 V, V$_{EE}$ = Gnd, T$_A$ = 25℃, unless otherwise noted.)

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Input Offset Voltage	V$_{IO}$	V$_{CC}$ = 5.0 V to 30 V, V$_{IC}$ = 0 V to V$_{CC}$ -1.7V V$_O$ ≈ 1.4 V, R$_S$ = 0Ω T$_A$ = 25℃		2.0	7.0	mV
		T$_A$ = T$_{high}$ *5			9.0	
		T$_A$ = T$_{low}$ *5			9.0	
Average Temperature Coefficient of Input Offset Voltage	△V$_{IO}$/△T	T$_A$ = T$_{high}$ to T$_{low}$ *5		7.0		µV/℃
Input Offset Current	I$_{IO}$	T$_A$ = T$_{high}$ to T$_{low}$ *5		5.0	50	nA
					150	
Input Bias Current	I$_{IB}$	T$_A$ = T$_{high}$ to T$_{low}$ *5		-45	-250	
				-50	-500	
Average Temperature Coefficient of Input Offset Current	△V$_{IO}$/△T	T$_A$ = T$_{high}$ to T$_{low}$*5		10		pA/℃
Input Common Mode Voltage Range *6	V$_{ICR}$	V$_{CC}$ = 30 V	0		28.3	V
		V$_{CC}$ = 30 V, T$_A$ = T$_{high}$ to T$_{low}$	0		28	
Differential Input Voltage Range	V$_{IDR}$				V$_{CC}$	V
Large Signal Open Loop Voltage Gain	A$_{VOL}$	R$_L$ = 2.0 kΩ V$_{CC}$ = 15 V, For Large V$_O$ Swing,	25	100		V/mV
		T$_A$ = T$_{high}$ to T$_{low}$	15			
Channel Separation	C$_S$	1.0 kHz ≤ f ≤ 20 kHz, Input Referenced		-120		dB
Common Mode Rejection	C$_{MR}$	R$_S$ ≤ 10 KΩ	65	70		dB
Power Supply Rejection	P$_{SR}$		65	100		dB
Output Voltage-High Limit	V$_{OH}$	T$_A$ = T$_{high}$ to T$_{low}$ *5 V$_{CC}$ = 5.0 V, R$_L$ = 2.0KΩ T$_A$ = 25℃	3.3	3.5		V
		V$_{CC}$ = 30 V, R$_L$ = 2.0 KΩ	26			
		V$_{CC}$ = 30 V, R$_L$ = 10 KΩ	27	28		
Output Voltage-Low Limit	V$_{OL}$	V$_{CC}$ = 5.0 V, R$_L$ = 10 KΩ T$_A$ = Thigh to Tlow *5		5	20	mV
Output Source Current	I$_{O+}$	V$_{ID}$ = +1.0 V, V$_{CC}$ = 15 V	20	40		mA
Output Sink Current	I$_{O-}$	V$_{ID}$ = -1.0 V, V$_{CC}$ = 15 V	10	20		mA
		V$_{ID}$ = -1.0 V, V$_O$ = 200 mV	12	50		µA
Output Short Circuit to Ground *7	I$_{SC}$			40	60	mA
Power Supply Current (Total Device)	I$_{CC}$	T$_A$ = T$_{high}$ to T$_{low}$ *5 V$_{CC}$ = 30 V, V$_O$ = 0 V, R$_L$ = ∞		1.5	3.0	mA
		V$_{CC}$ = 5 V, V$_O$ = 0 V, R$_L$ = ∞		0.7	1.2	

*5 Tlow = 0℃, Thigh = +70℃

*6 The input common mode voltage or either input signal voltage should not be allowed to go negative by more than 0.3 V.

The upper end of the common mode voltage range is V$_{CC}$ -1.7 V.

*7 Short circuits from the output to VCC can cause excessive heating and eventual destruction.

Destructive dissipation can result from simultaneous shorts on all amplifiers.