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MC1458
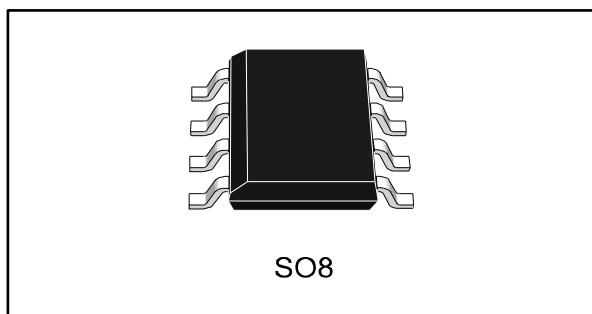
High-performance, dual operational amplifier

SO8

Features

- Low power consumption
- Large input voltage range
- No latch-up
- High gain
- Short-circuit protection
- No frequency compensation required

Applications

- Summing amplifier
- Voltage follower
- Integrator
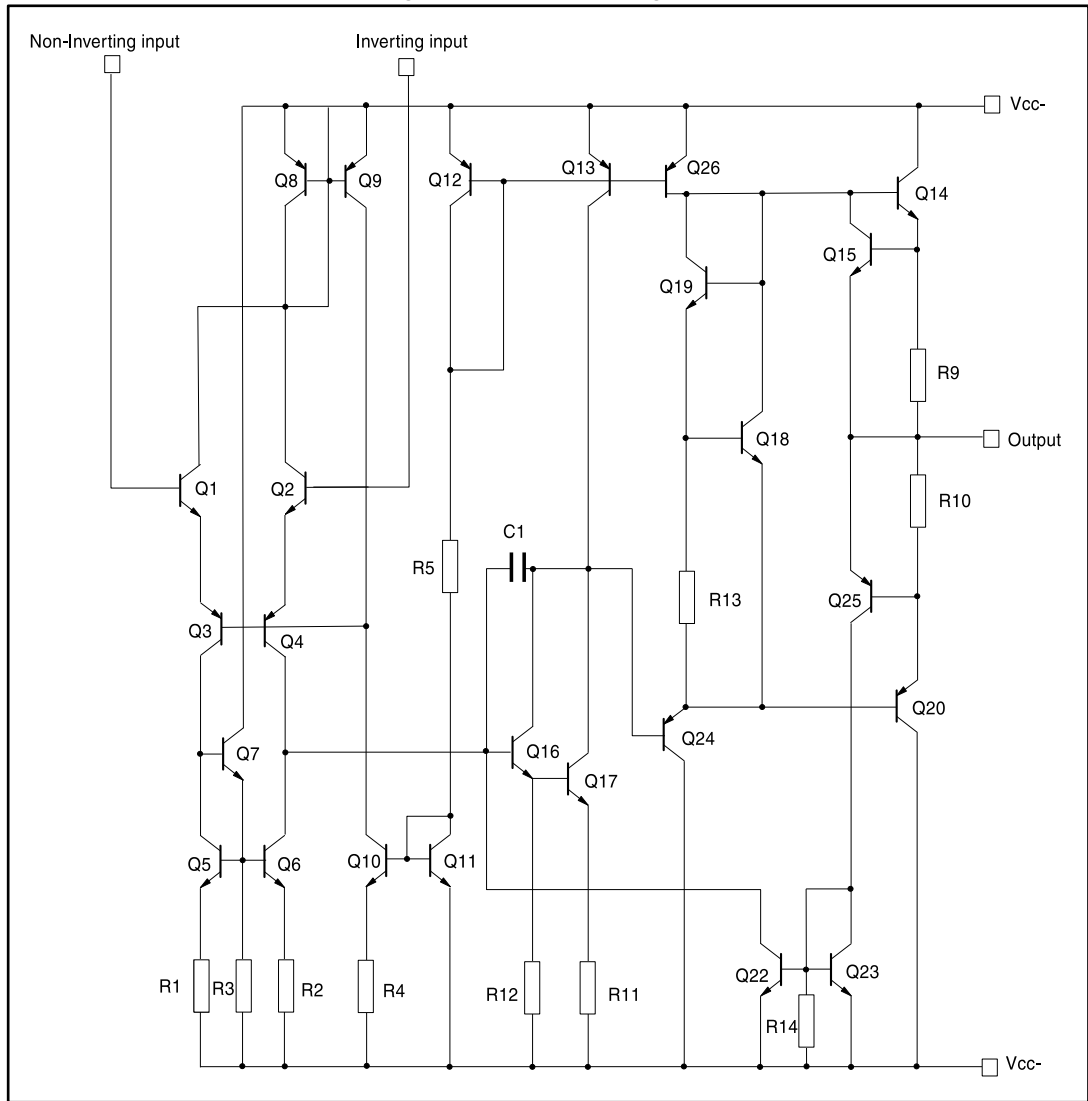- Active filtering
- Function generator

Description

The MC1458 is a high-performance, monolithic, dual operational amplifier intended for a wide range of analog applications. The high gain and wide range of operating voltages provide superior performance in integrator, summing amplifiers, and general feedback applications.

Contents

1   Schematic diagram

Figure 1: Schematic diagram

2 Package pin connections

Figure 2: Pin connections (top view)

Output 1	1		8	$V_{CC}+$
Inverting input 1	2	−	7	Output 2
Non-inverting input 1	3	+	6	Inverting input 2
$V_{CC}-$	4		5	Non-inverting input 2
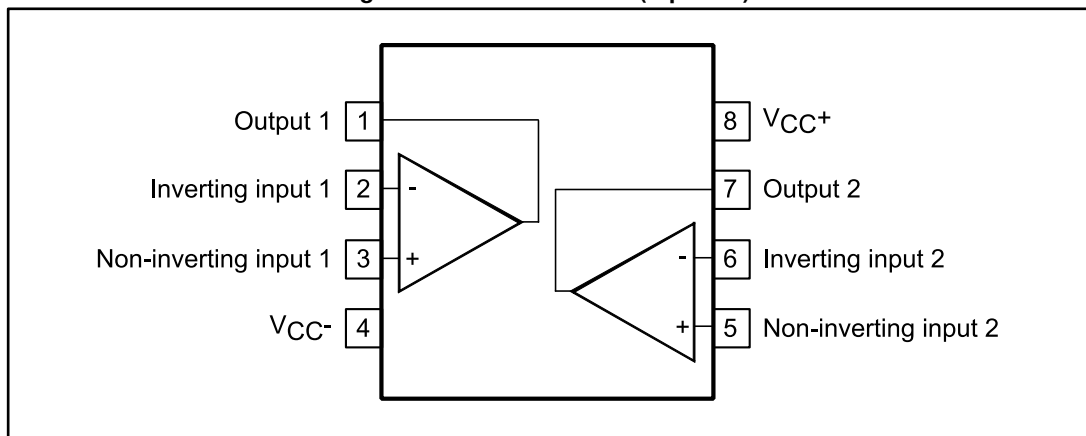
3   Absolute maximum ratings

Table 1: Absolute maximum ratings

Symbol	Parameter	MC1458DT	MC1458IDT	Unit
V_{CC}	Supply voltage	±22		V
V_i	Input voltage	±15		
V_{id}	Differential input voltage	±30		
	Output short-circuit duration	Infinite		
P_{tot}	Power dissipation	300		mW
T_{oper}	Operating free-air temperature range	0 to 70	-40 to 105	°C
T_{stg}	Storage temperature range	-65 to 150		

4 Electrical characteristics

Table 2: Electrical characteristics for VCC = ±15 V, Tamb = 25 °C (unless otherwise specified)

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_{io}	Input offset voltage, $R_s \leq 10$ kΩ	T_{amb} = 25 °C		1	5	mV
		$T_{min} \leq T_{amb} \leq T_{max}$			6	
I_{io}	Input offset current	T_{amb} = 25 °C		2	200	nA
		$T_{min} \leq T_{amb} \leq T_{max}$			300	
I_{ib}	Input bias current	T_{amb} = 25 °C		30	500	
		$T_{min} \leq T_{amb} \leq T_{max}$			800	
A_{vd}	Large signal voltage gain, V_o = ±10 V, R_L = 2 kΩ	T_{amb} = 25 °C	50	200		V/mV
		$T_{min} \leq T_{amb} \leq T_{max}$	25			
SVR	Supply voltage rejection ratio, $R_s \leq 10$ kΩ	T_{amb} = 25 °C	77	90		dB
		$T_{min} \leq T_{amb} \leq T_{max}$	77			
I_{CC}	Supply current, all amp, no load	T_{amb} = 25 °C		2.3	5	mA
		$T_{min} \leq T_{amb} \leq T_{max}$			6	
V_{icm}	Input common-mode voltage range	T_{amb} = 25 °C	±12			V
		$T_{min} \leq T_{amb} \leq T_{max}$	±12			
CMR	Common-mode rejection ratio, $R_s \leq 10$ kΩ	T_{amb} = 25 °C	70	90		dB
		$T_{min} \leq T_{amb} \leq T_{max}$	70			
I_{os}	Output short-circuit source	T_{amb} = 25 °C	10	20	35	mA
±V_{opp}	Output voltage swing	T_{amb} = 25 °C, $R_L \leq 10$ kΩ	12	14		V
		T_{amb} = 25 °C, $R_L \leq 2$ kΩ	10	13		
		$T_{min} \leq T_{amb} \leq T_{max}$, $R_L \leq 10$ kΩ	12			
		$T_{min} \leq T_{amb} \leq T_{max}$, $R_L \leq 2$ kΩ	10			
SR	Slew rate	V_I = ±10 V, R_L = 2 kΩ, C_L = 100 pF, unity gain	0.2	0.8		V/μs
t_r	Rise time	V_I = ±20 mV, R_L = 2 kΩ, C_L = 100 pF, unity gain		0.3		μs
K_{OV}	Overshoot	V_I = ±20 mV, R_L = 2 kΩ, C_L = 100 pF, unity gain		5		%
R_I	Input resistance		0.3	2		MΩ
Z_{ic}	Common-mode input impedance			200		
C_I	Input capacitance			1.4		pF
R_O	Output resistance			75		Ω
FPB	Full power bandwidth	R_L = 2 kΩ, $V_O \geq$ ±10 V, A_{VD} = 1, THD ≤ 5 %		14		kHz
B	Unity gain bandwidth	V_I = 10 mV, R_L = 2 kΩ, C_L = 100 pF		1		MHz
GBP	Gain bandwidth product	V_I = 10 mV, R_L = 2 kΩ, C_L = 100 pF, f = 100 kHz	0.4	1		
THD	Total harmonic distortion	f = 1 kHz, A_v = 20 dB, R_L = 2 kΩ, C_L = 100 pF, V_O = 2 V_{pp}		0.02		%

Symbol	Parameter		Min.	Typ.	Max.	Unit
e_n	Equivalent input noise voltage	$f = 1$ kHz, $R_s = 100\ \Omega$		45		nV/$\sqrt{\text{Hz}}$
ϕm	Phase margin			65		Degrees
Am	Gain margin			11		dB
V_{o1}/V_{o2}	Channel separation			120		

5 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: **www.st.com**. ECOPACK® is an ST trademark.

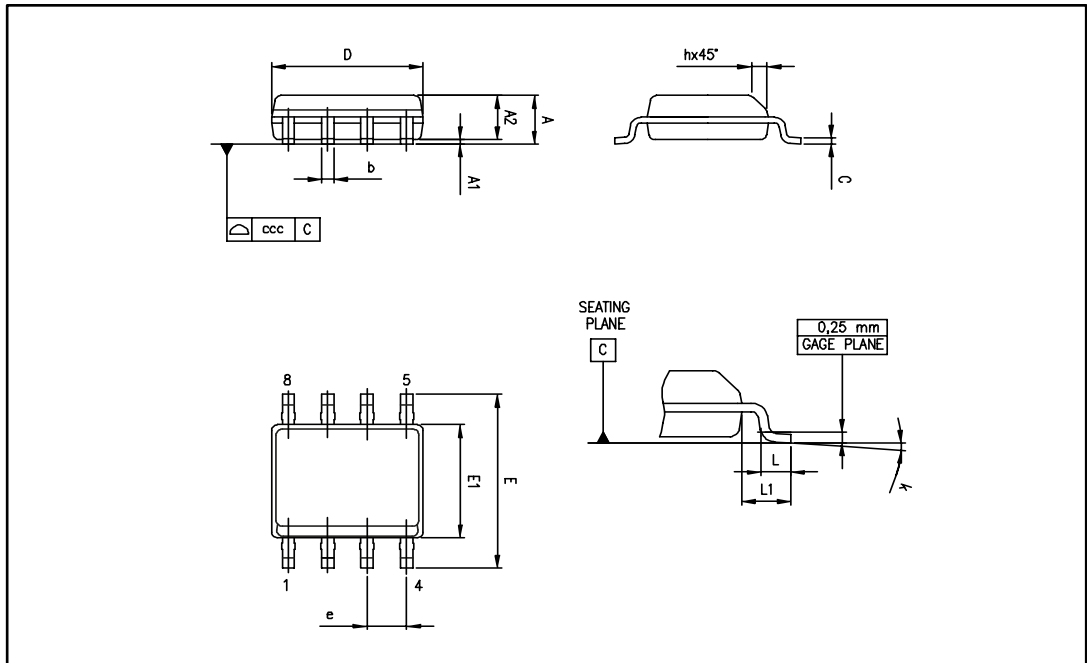## 5.1   SO8 package information

Figure 3: SO8 package outline

Table 3: SO8 mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max
A			1.75			0.069
A1	0.10		0.25	0.004		0.010
A2	1.25			0.049		
b	0.28		0.48	0.011		0.019
c	0.17		0.23	0.007		0.010
D	4.80	4.90	5.00	0.189	0.193	0.197
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e		1.27			0.050	
h	0.25		0.50	0.010		0.020
L	0.40		1.27	0.016		0.050
L1		1.04			0.040	
k	0°		8°	0°		8°
ccc			0.10			0.004

6   Ordering information

Table 4: Order codes

Order code	Temperature range	Package	Packaging	Marking
MC1458DT	0 °C to 70 °C	SO8	Tape and reel	1458
MC1458IDT	-40 °C to 105 °C			1458I

7 Revision history

Table 5: Document revision history

Date	Revision	Changes
21-Sep-2016	4	Moved part number MC1558 to a separate datasheet. Removed DIP8 package Deleted "Device summary table", created *Table 4: "Order codes"* in its place, and added the latter to *Section 6: "Ordering information"*. Updated *Section 5.1: "SO8 package information"* Updated document layout

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