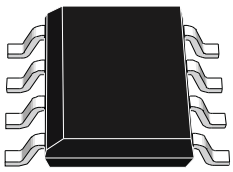
MC1458

High-performance, dual operational amplifier

Datasheet - production data



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

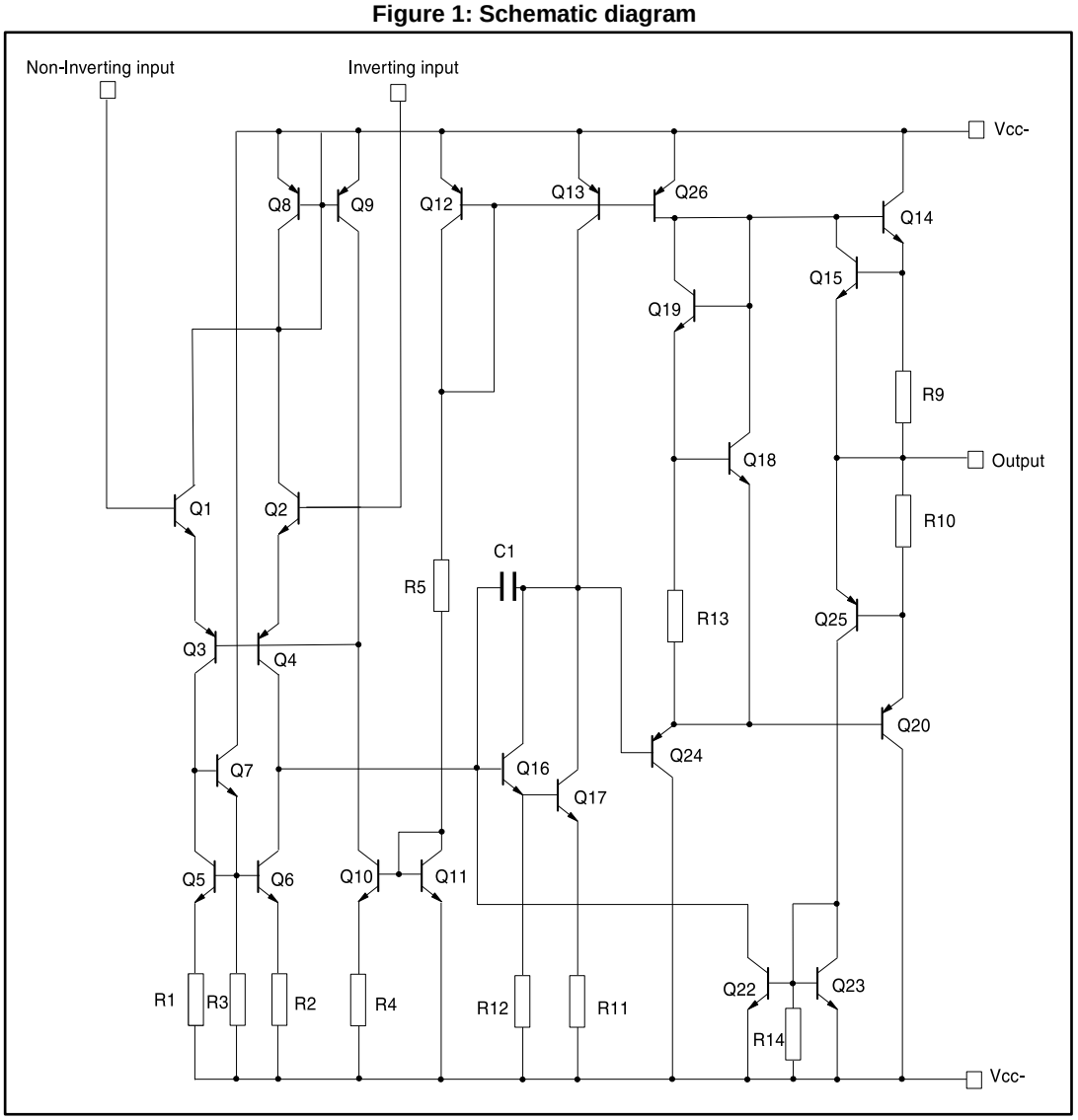
Description

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

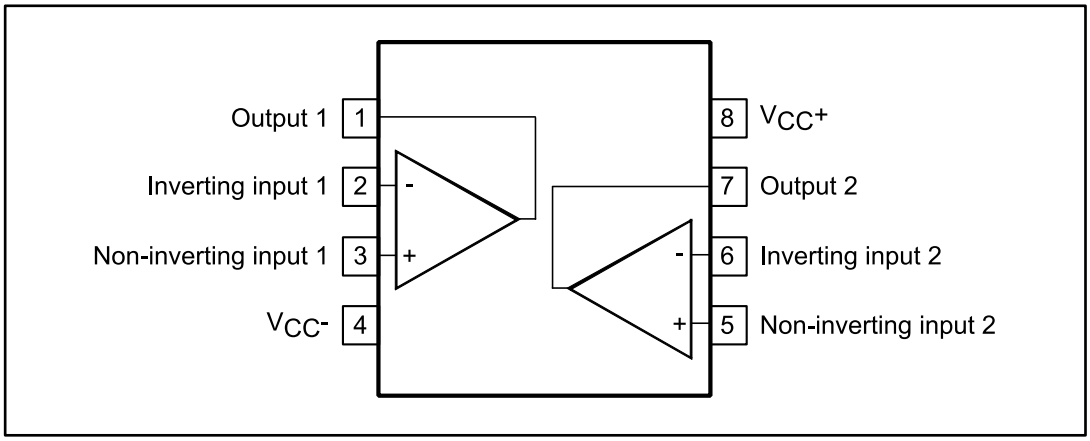
1 Schematic diagram

Figure 1: Schematic diagram



2 Package pin connections

Figure 2: Pin connections (top view)



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, $R_s \le 10\ k\Omega$	T_{amb} = 25 °C		1	5	mV
		$T_{min} \le T_{amb} \le T_{max}$			6	
I_{io}	Input offset current	T_{amb} = 25 °C		2	200	nA
		$T_{min} \le T_{amb} \le T_{max}$			300	
I_{ib}	Input bias current	T_{amb} = 25 °C		30	500	
		$T_{min} \le T_{amb} \le T_{max}$			800	
A_{vd}	Large signal voltage gain, V_o = ±10 V, R_L = 2 kΩ	T_{amb} = 25 °C	50	200		V/mV
		$T_{min} \le T_{amb} \le T_{max}$	25			
SVR	Supply voltage rejection ratio, $R_s \le 10\ k\Omega$	T_{amb} = 25 °C	77	90		dB
		$T_{min} \le T_{amb} \le T_{max}$	77			
I_{CC}	Supply current, all amp, no load	T_{amb} = 25 °C		2.3	5	mA
		$T_{min} \le T_{amb} \le T_{max}$			6	
V_{icm}	Input common-mode voltage range	T_{amb} = 25 °C	±12			V
		$T_{min} \le T_{amb} \le T_{max}$	±12			
CMR	Common-mode rejection ratio, $R_s \le 10\ k\Omega$	T_{amb} = 25 °C	70	90		dB
		$T_{min} \le T_{amb} \le T_{max}$	70			
I_{os}	Output short-circuit source	T_{amb} = 25 °C	10	20	35	mA
$\pm V_{opp}$	Output voltage swing	T_{amb} = 25 °C, $R_L \le 10\ k\Omega$	12	14		V
		T_{amb} = 25 °C, $R_L \le 2\ k\Omega$	10	13		
		$T_{min} \le T_{amb} \le T_{max}$, $R_L \le 10\ k\Omega$	12			
		$T_{min} \le T_{amb} \le T_{max}$, $R_L \le 2\ k\Omega$	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, $V_O \ge$ ±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 Ω		45		nV/√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

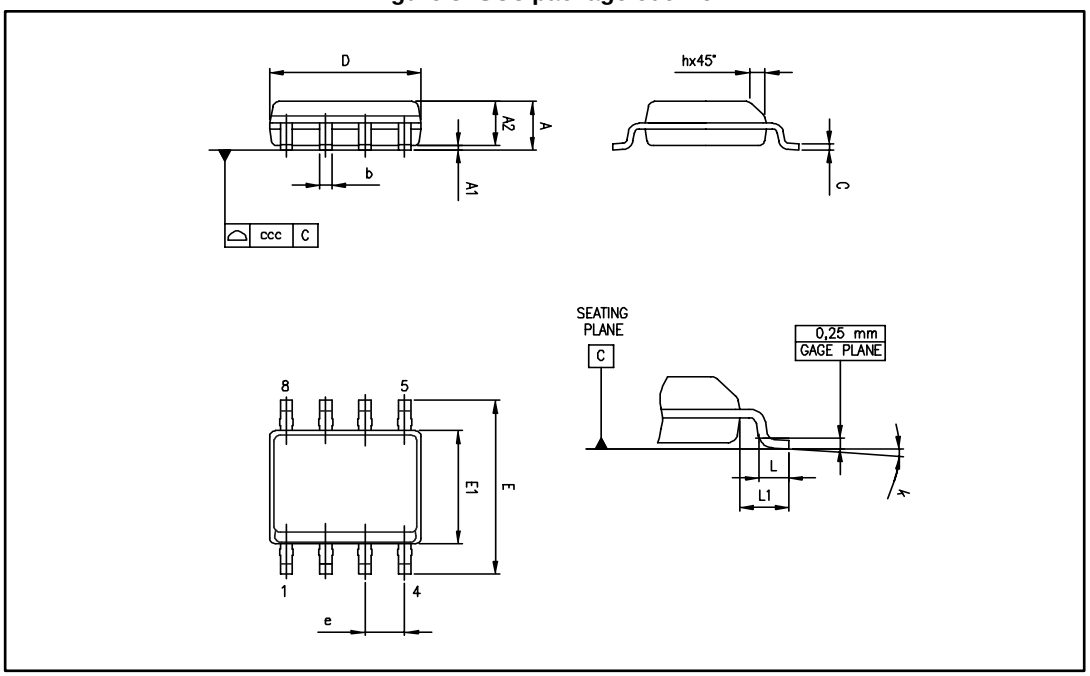


Table 3: SO8 mechanical data

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

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.