

**DATA SHEET**

20 June 2003

No. 00012  
REV 1-03**MIK4558****DUAL WIDE BANDWIDTH OPERATIONAL AMPLIFIER**REPLACEMENT of:  
**LM4558**

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## GENERAL DESCRIPTION

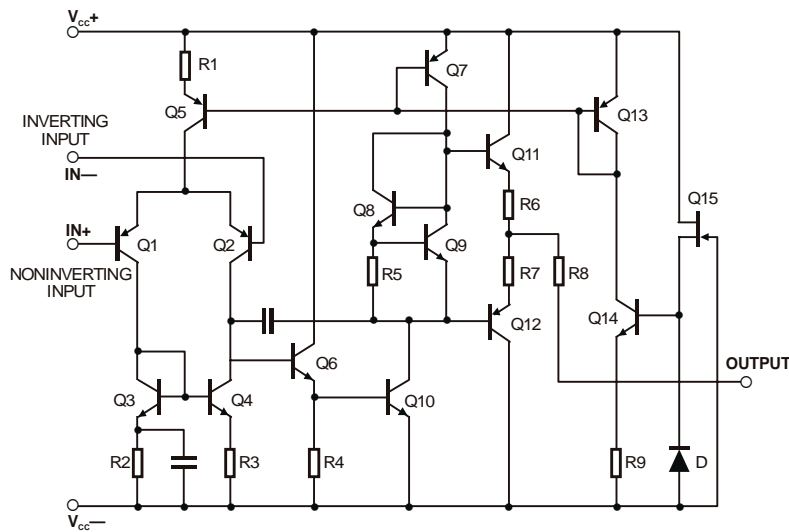
The MIK4558 device is dual general-purpose operational amplifier with each half electrically similar to the  $\mu$ A741 except that offset null capability is not provided. The high common-mode input voltage range and the absence of latch-up make this amplifier ideal for voltage-follower applications. The device is short-circuit protected and the internal frequency compensation ensures stability without external components. The MIK4558 is characterized for operation from 0 °C to 70 °C.

## FEATURES

- Continuous-Short-Circuit Protection
- Wide Common-Mode and Differential Voltage Ranges
- No Frequency Compensation Required
- Low Power Consumption
- No Latch-Up
- Unity-Gain Bandwidth ...3 MHz Typ
- Gain and Phase Match Between Amplifiers
- Low Noise ...8 nV/√Hz Typ at 1 kHz



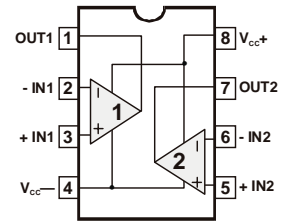
# SCHEMATIC DIAGRAM (1/2 MIK4558)



SOP-8  MIK4558CD

DIP-8  MIK4558CN

## PIN CONNECTION



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## ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	VALUE	UNIT
$V_{cc+}$	Supply Voltage – (Note 1)	22	V
$V_{cc-}$		-22	V
$V_{IN}$	Input Voltage – (Note 1, 3)	$\pm 15$	V
$V_{id}$	Differential Input Voltage – (Note 2)	$\pm 30$	V
	Duration of output short circuit to ground, one amplifier at a time (see Note 4)	Unlimited	
$T_{stg}$	Storage temperature range	-65 to 150	$^{\circ}C$

**NOTE:**  
Stresses above those listed under «Absolute Maximum Ratings» may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operation sections of the specifications is not implied.  
Exposure to Absolute Maximum Rating conditions for extended periods may affect device reliability.

Note 1: All voltage values, unless otherwise noted, are with respect to the midpoint between  $V_{cc+}$  and  $V_{cc-}$ .

Note 2: Differential voltages are at  $IN+$  with respect to  $IN-$ .

Note 3: The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15V, whichever is less.

Note 4: Temperature and/or supply voltages must be limited to ensure that the dissipation rating is not exceeded.

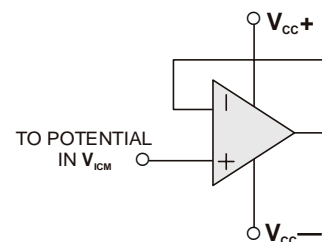
## RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN	MAX	UNIT
$V_{cc+}$	Supply voltage	5	15	V
$V_{cc-}$		-5	-15	
$T_A$	Operating free-air temperature	0	70	$^{\circ}C$

## OPERATION NOTES

### UNUSED CIRCUIT CONNECTIONS

If there are any circuits which are not being used, we recommend making connections as shown in right figure, with the non-inverted input pin connected to the potential within the in-phase input voltage range ( $V_{ICM}$ ).





## ELECTRICAL CHARACTERISTICS

at specified free-air temperature,  $V_{CC+} = 15V$ ,  $V_{CC-} = -15V$  (Wafer Form)

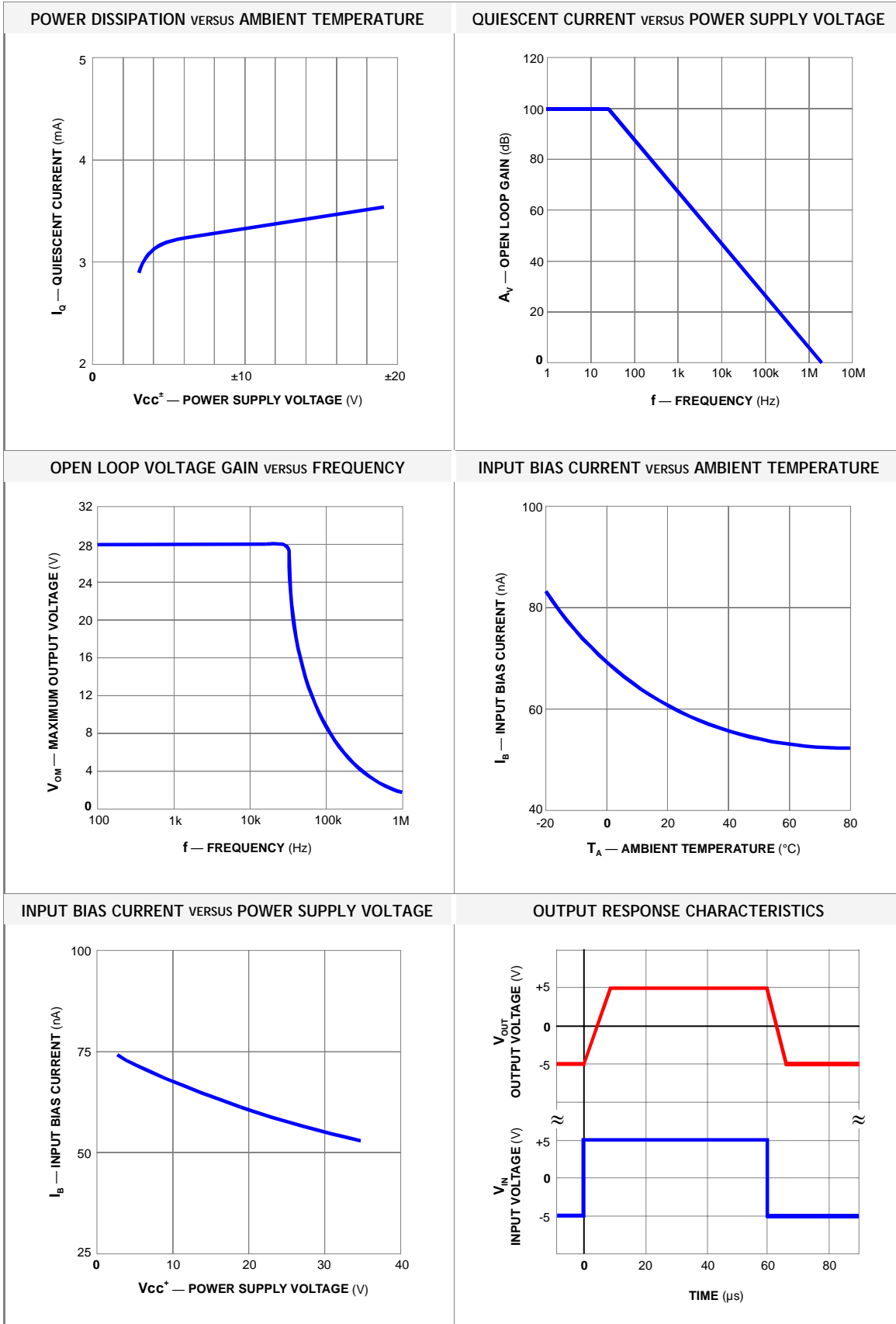
PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
$V_{IO}$	Input offset voltage	$V_o = 0$	25°C		0.5	5	mV
			Full range			6	
$I_{IO}$	Input offset current	$V_o = 0$	25°C		5	200	nA
			Full range			500	
$I_{IB}$	Input bias current	$V_o = 0$	25°C		140	500	nA
			Full range			1500	
$V_{ICR}$	Common-mode input voltage range		25°C	$\pm 12$	$\pm 14$		V
$V_{OM}$	Maximum output voltage swing	$R_L = 10\text{ k}\Omega$	25°C	$\pm 12$	$\pm 14$		V
		$R_L = 2\text{ k}\Omega$	25°C	$\pm 10$	$\pm 13$		
		$R_L \geq 2\text{ k}\Omega$	Full range	$\pm 10$			
$A_{VD}$	Large signal differential voltage amplification	$R_L \geq 2\text{ k}\Omega$ $V_o = \pm 10\text{ V}$	25°C	50	350		V/mV
			Full range	25			
$r_j$	Input resistance		25°C	0.3	5		M $\Omega$
<b>CMRR</b>	Common-mode rejection ratio		25°C	70	90		dB
$k_{SVS}$	Supply-voltage sensitivity ( $\Delta V_{IO} / \Delta V_{CC}$ )		25°C		30	150	$\mu\text{V/V}$
$I_{CC}$	Supply current (both amplifiers)	$V_o = 0$ , No load	25°C		2.5	5.6	mA
			$T_A(\text{min})$		3	6.6	
			$T_A(\text{max})$		2	5	
$V_{01}/V_{02}$	Crosstalk attenuation	Open loop	$R_S = 100\Omega$	25°C	85		
		$A_{VD} = 100$	$f = 1\text{ kHz}$		105		

All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified. Full range is 0°C to 70°C.  $T_A(\text{min}) = 0^\circ\text{C}$ .  $T_A(\text{max}) = 70^\circ\text{C}$ .



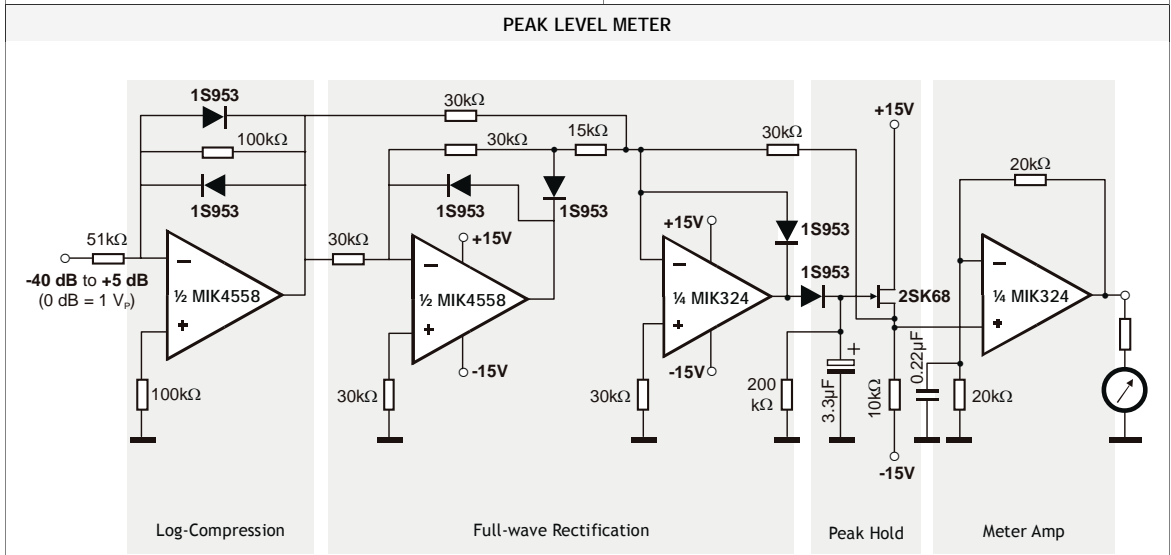
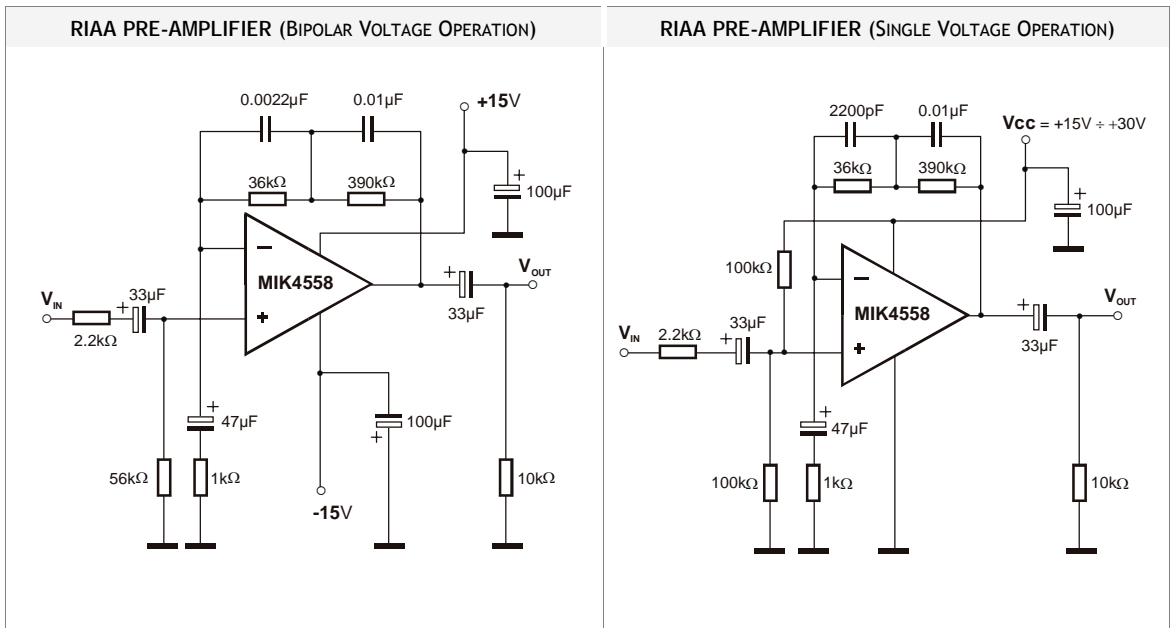
# TYPICAL CHARACTERISTICS

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## TYPICAL APPLICATIONS

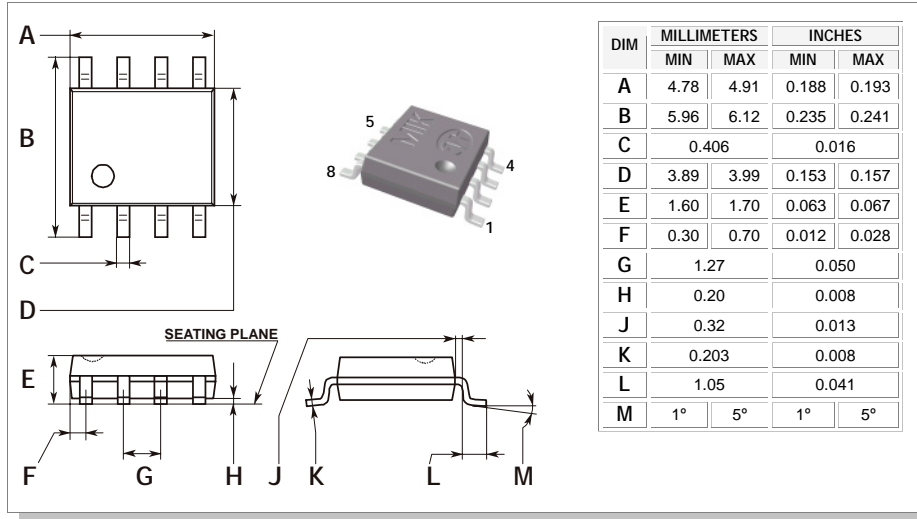


This circuit converts the peak voltage (about  $\pm 10\text{mV}$  to  $\pm 10\text{V}$  of the input signal to a DC voltage (about  $0.2\text{V}$  to  $1.3\text{V}$ ) and drives the meter. Since the output voltage is proportional to the logarithmic value of the peak voltage of the input signal, indication of a much wider dynamic range can be obtained compared to conventional linear indicating methods.

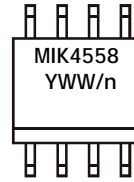


## PHYSICAL DIMENSIONS AND MARKING DIAGRAMS

### SOP-8 PACKAGE

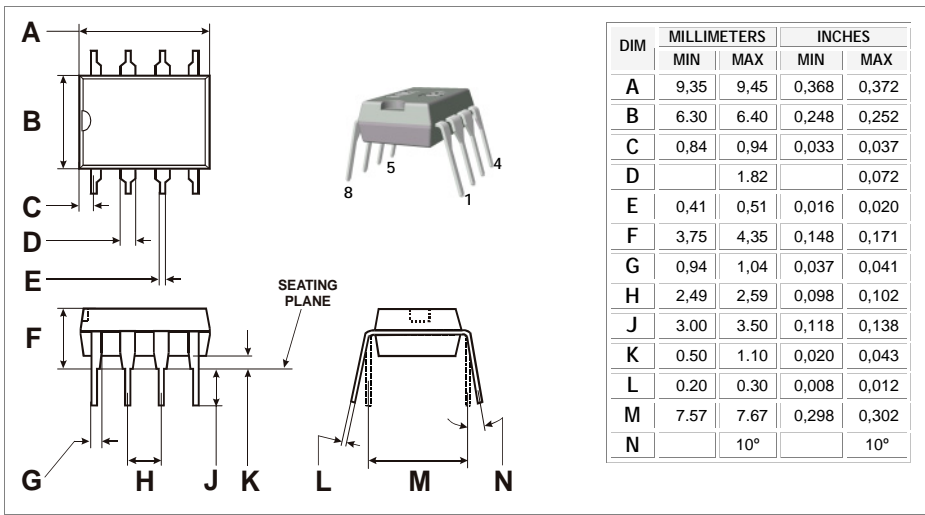


### SOP-8 MARKING DIAGRAM

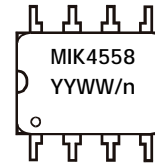


Y – Year  
WW – Work Week  
n – assembly location

### DIP-8 PACKAGE



### DIP-8 MARKING DIAGRAM



YY – Year  
WW – Work Week  
n – assembly location

## ORDERING INFORMATION

(THE FORM OF PACKING IS STIPULATED IN THE CONTRACT)

ORDERING NUMBER	OPERATING TEMPERATURE (°C)	PACKAGE	SHIPPING
MIK 4558CD	0 ÷ 70	SOP-8	100 Units/Tube
MIK 4558CN	0 ÷ 70	DIP-8	50 Units/Tube

The information presented in this Data sheet is believed to be accurate and reliable. Application circuits shown are typical examples illustrating the operation of the device. MIKRON can assume no responsibility for use of any application circuits.

In the interest of product improvement, MIKRON reserves the right to change specifications and data without notice.

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