



# TJM4558

## WIDE BANDWIDTH DUAL BIPOLAR OPERATIONAL AMPLIFIERS

- INTERNALLY COMPENSATED
- SHORT-CIRCUIT PROTECTION
- GAIN AND PHASE MATCH BETWEEN AMPLIFIER
- LOW POWER CONSUMPTION
- PIN TO PIN COMPATIBLE WITH MC1458/LM358
- GAIN BANDWIDTH PRODUCT (at 100kHz) 5.5MHz

### DESCRIPTION

The TJM4558 is a high performance monolithic dual operational amplifier.

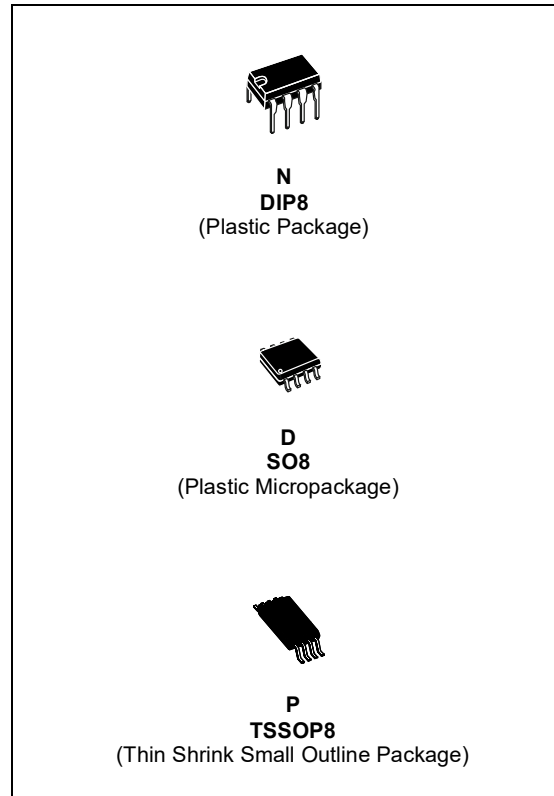
The circuit combines all the outstanding features of the MC1458 and, in addition possesses three times the unity gain bandwidth of the industry standard.

### ORDER CODE

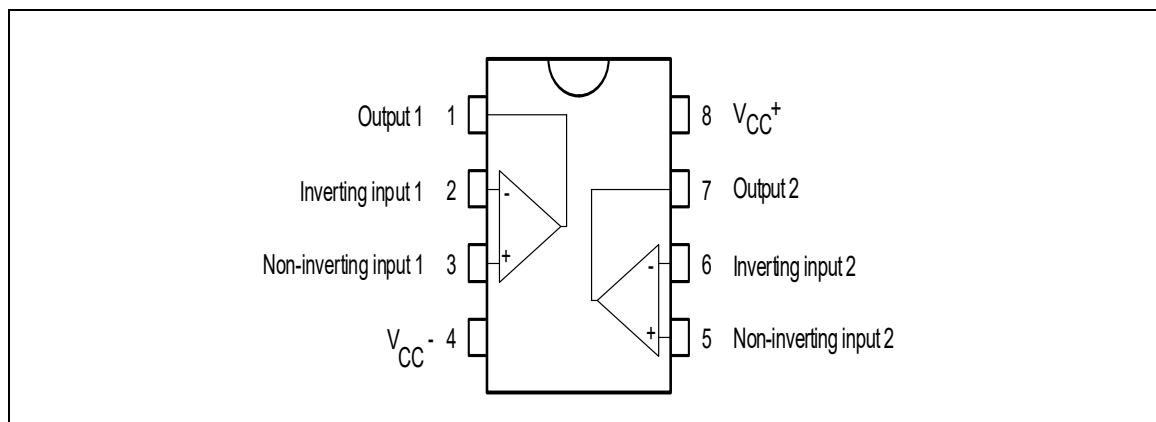
Part Number	Temperature Range	Package		
		N	D	P
TJM4558C	0°C, +70°C	•	•	•
TJM4558I	-40°C, +105°C	•	•	•

**Example :** TJM4558CN

**N** = Dual in Line Package (DIP)  
**D** = Small Outline Package (SO) - also available in Tape & Reel (DT)  
**P** = Thin Shrink Small Outline Package (TSSOP) - only available in Tape & Reel (PT)

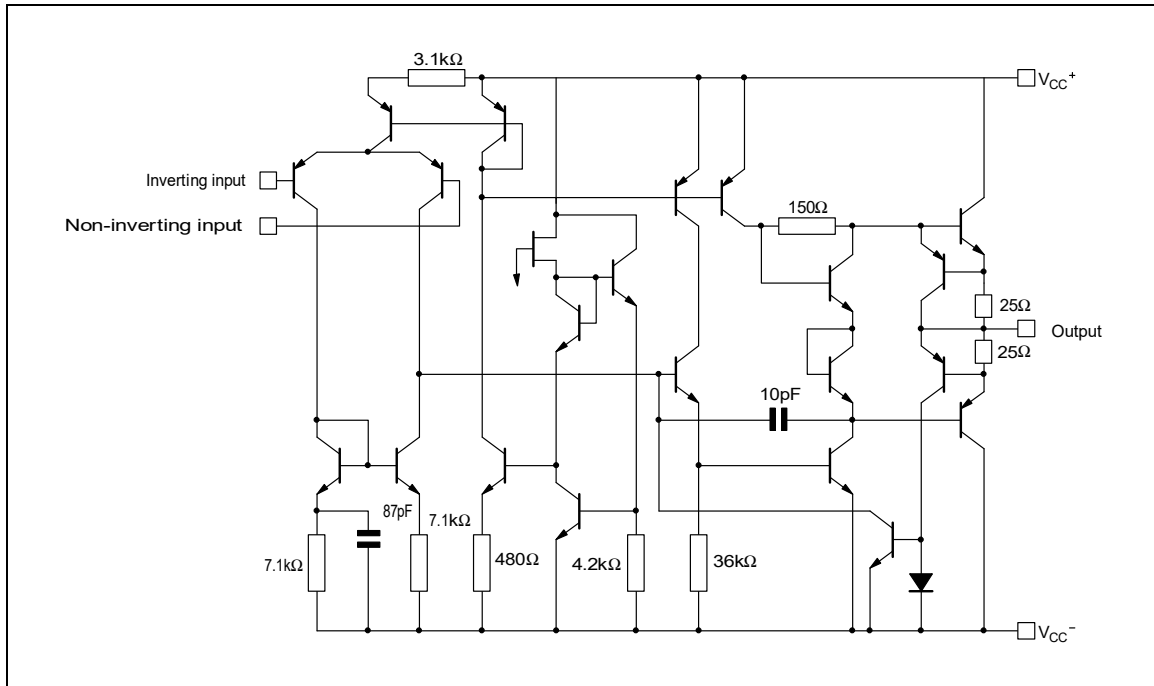


### PIN CONNECTIONS (top view)



# TJM4558

## SCHEMATIC DIAGRAM (1/2 TJM4558)



## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	TJM4558I	TJM4558C	Unit
$V_{CC}$	Supply Voltage	±22		V
$V_i$	Input Voltage	±15		V
$V_{id}$	Differential Input Voltage	±30		V
$P_{tot}$	Power Dissipation	680		mW
	Output Short Circuit Duration	Infinite		
$T_{oper}$	Operating Free-Air Temperature Range	-40 to +105	0 to +70	°C
$T_{stg}$	Storage Temperature	-65 to +150		°C

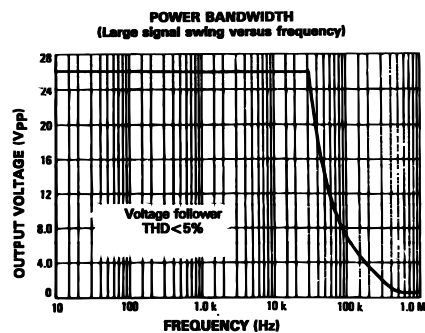
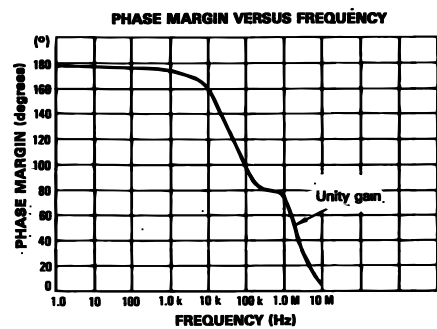
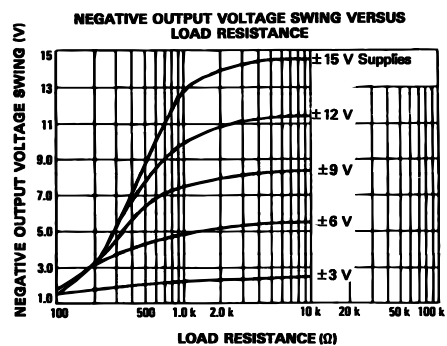
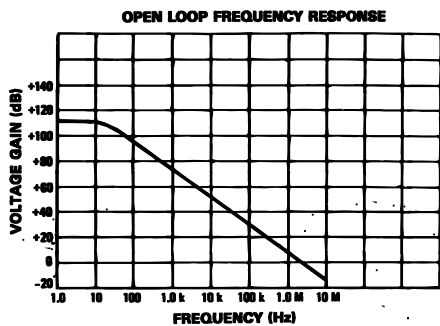
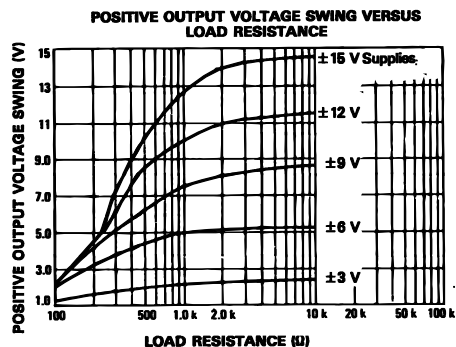
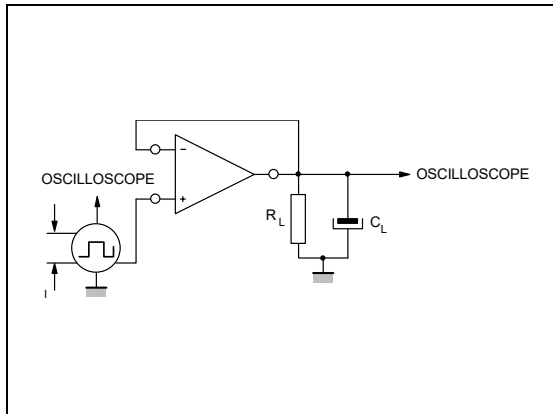
## ELECTRICAL CHARACTERISTICS

$V_{CC} = \pm 15V$ ,  $T_{amb} = 25^\circ C$  (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{io}$	Input Offset Voltage ( $R_s \leq 10k\Omega$ ) $T_{amb} = +25^\circ C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		1	5 6	mV
$I_{io}$	Input Offset Current $T_{amb} = +25^\circ C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		20 40	100	nA
$I_{ib}$	Input Bias Current $T_{amb} = +25^\circ C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		50 100	400	nA
$A_{vd}$	Large Signal Voltage Gain ( $R_L = 2k\Omega$ , $V_o = \pm 10V$ ) $T_{amb} = +25^\circ C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	50 25	200		V/mV

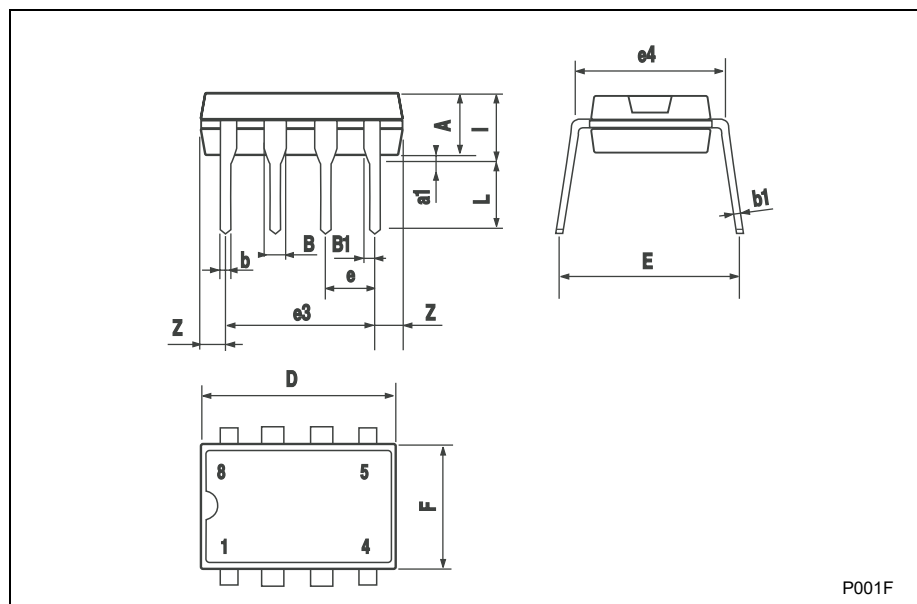
Symbol	Parameter	Min.	Typ.	Max.	Unit
SVR	Supply Voltage Rejection Ratio ( $R_s \leq 10k\Omega$ ) $T_{amb} = +25^\circ\text{C}$ $T_{min.} \leq T_{amb} \leq T_{max.}$		90 77		dB
$I_{CC}$	Supply Current, all amplifiers, no load $T_{amb} = +25^\circ\text{C}$ $T_{min.} \leq T_{amb} \leq T_{max.}$		2.3 4	4.5	mA
$V_{icm}$	Input Common Mode Voltage Range $T_{amb} = +25^\circ\text{C}$ $T_{min.} \leq T_{amb} \leq T_{max.}$	$\pm 12$ $\pm 12$			V
CMR	Common-mode Rejection Ratio ( $R_s \leq 10k\Omega$ ) $T_{amb} = +25^\circ\text{C}$ $T_{min.} \leq T_{amb} \leq T_{max.}$		90 70		dB
$I_{os}$	Output Short Circuit Current	10	20		mA
$V_o$	Output Voltage Swing $T_{amb} = +25^\circ\text{C}$ $T_{min.} \leq T_{amb} \leq T_{max.}$	$R_L = 10k\Omega$ $R_L = 2k\Omega$ $R_L = 10k\Omega$ $R_L = 2k\Omega$	$\pm 12$ $\pm 10$ $\pm 12$ $\pm 10$	$\pm 14$ $\pm 13$	V
SR	Slew Rate ( $V_i = \pm 10$ , $R_L = 2k\Omega$ , $C_L = 100\text{pF}$ , $T_{amb} = 25^\circ\text{C}$ , unity gain)		2.2		V/ $\mu\text{s}$
$t_r$	Rise Time ( $V_i = \pm 20\text{mV}$ , $R_L = 2k\Omega$ , $C_L = 100\text{pF}$ , $T_{amb} = 25^\circ\text{C}$ , unity gain)		0.3		$\mu\text{s}$
$K_{OV}$	Overshoot ( $V_i = \pm 20\text{mV}$ , $R_L = 2k\Omega$ , $C_L = 100\text{pF}$ , $T_{amb} = 25^\circ\text{C}$ , unity gain)		15		%
$R_i$	Input Resistance	0.3	2		M $\Omega$
$C_i$	Input Capacitance		1.4		pF
$R_o$	Output Resistance		75		$\Omega$
B	Unity Gain Bandwidth		2.8		MHz
GBP	Gain Bandwidth Product ( $V_i = 10\text{mV}$ , $R_L = 2k\Omega$ , $C_L = 100\text{pF}$ , $f = 100\text{kHz}$ , $T_{amb} = 25^\circ\text{C}$ )		5.5		MHz
THD	Total Harmonic Distortion ( $f = 1\text{kHz}$ , $A_v = 20\text{dB}$ , $R_L = 2k\Omega$ , $V_o = 2V_{pp}$ , $C_L = 100\text{pF}$ , $T_{amb} = 25^\circ\text{C}$ )		0.008		%
$e_n$	Equivalent Input Noise Voltage ( $R_S = 100\Omega$ , $f = 1\text{kHz}$ )		12		$\frac{\text{nV}}{\sqrt{\text{Hz}}}$
$V_{O1}/V_{O2}$	Channel Separation		120		dB

TRANSIENT RESPONSE TEST CIRCUIT



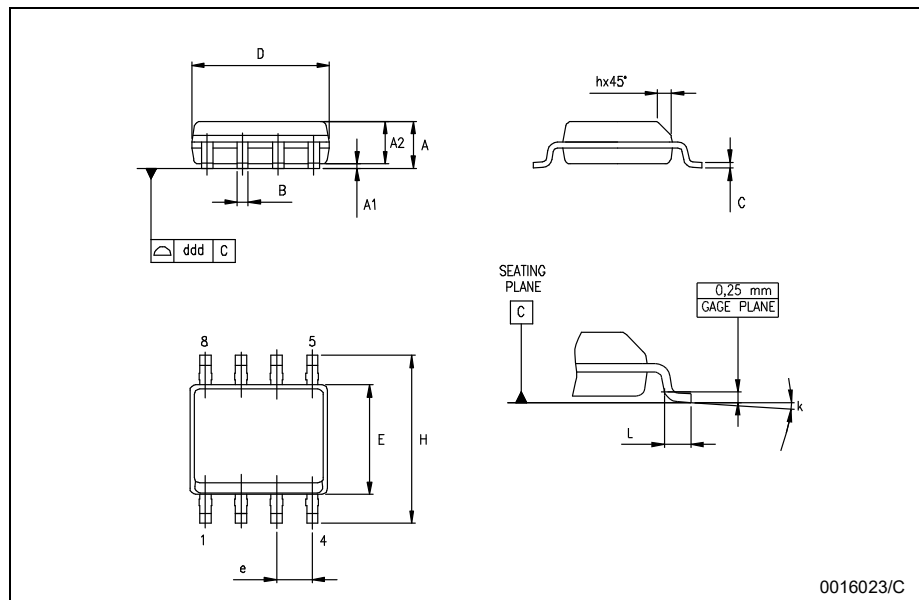
## PACKAGE MECHANICAL DATA

Plastic DIP-8 MECHANICAL DATA						
DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.3			0.130	
a1	0.7			0.028		
B	1.39		1.65	0.055		0.065
B1	0.91		1.04	0.036		0.041
b		0.5			0.020	
b1	0.38		0.5	0.015		0.020
D			9.8			0.386
E		8.8			0.346	
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			7.1			0.280
I			4.8			0.189
L		3.3			0.130	
Z	0.44		1.6	0.017		0.063



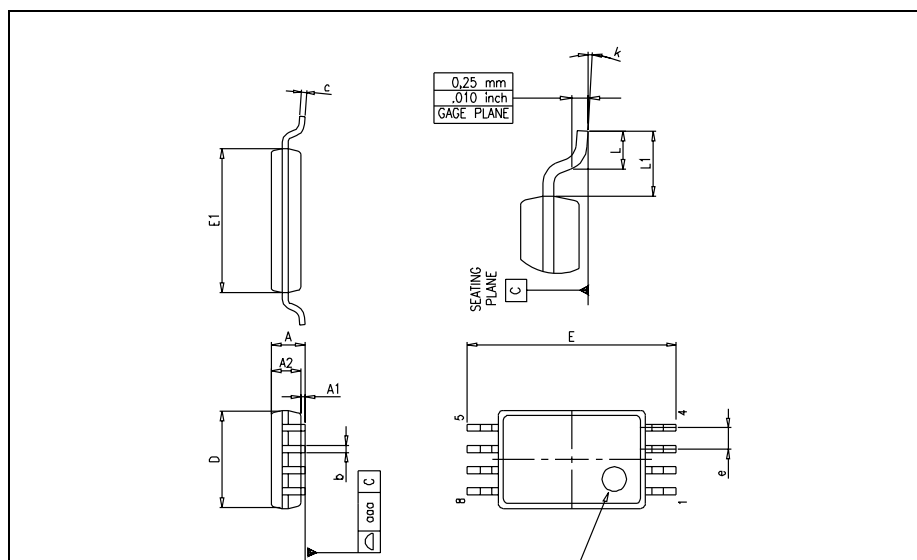
## PACKAGE MECHANICAL DATA

SO-8 MECHANICAL DATA						
DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.35		1.75	0.053		0.069
A1	0.10		0.25	0.04		0.010
A2	1.10		1.65	0.043		0.065
B	0.33		0.51	0.013		0.020
C	0.19		0.25	0.007		0.010
D	4.80		5.00	0.189		0.197
E	3.80		4.00	0.150		0.157
e		1.27			0.050	
H	5.80		6.20	0.228		0.244
h	0.25		0.50	0.010		0.020
L	0.40		1.27	0.016		0.050
k	8° (max.)					
ddd			0.1			0.04



## PACKAGE MECHANICAL DATA

TSSOP8 MECHANICAL DATA						
DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.2			0.047
A1	0.05		0.15	0.002		0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
b	0.19		0.30	0.007		0.012
c	0.09		0.20	0.004		0.008
D	2.90	3.00	3.10	0.114	0.118	0.122
E	6.20	6.40	6.60	0.244	0.252	0.260
E1	4.30	4.40	4.50	0.169	0.173	0.177
e		0.65			0.0256	
K	0°		8°	0°		8°
L	0.45	0.60	0.75	0.018	0.024	0.030
L1		1			0.039	



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