CubicMOS General Purpose Low Voltage Rail-to-Rail Output OP

CMV358L
CMV358LM

The CMV358L is CMOS low-voltage (2.0V to 7.0V) and low power consumption versions of the dual operational amplifiers.

The CMV358L are the most cost-effective solutions for applications where low-voltage operation, space saving, and low price are needed. They offer specifications that meet or exceed those of the familiar LM358 devices.

This devices have rail-to-rail output-swing capability,and the input common-mode voltage range includes ground.They all exhibit excellent speed-to-power ratios, achieving 1.5MHz of bandwidth at 2V/μs slew rate with low supply current.The CMV358L package saves space on printed circuit boards and enables the design of small portable electronic devices.

Features

1. Low power consumption(<200uA).
2. Low supply voltage(2.0V).
3. Ultra high input impedance(>10GΩ).
4. Large output Voltage swing(rail-to-rail).
5. Low cross distortion.
6. Low distortion, high slew rate(2V/uS).
7. Excellent power supply ripple rejection.

Block diagram

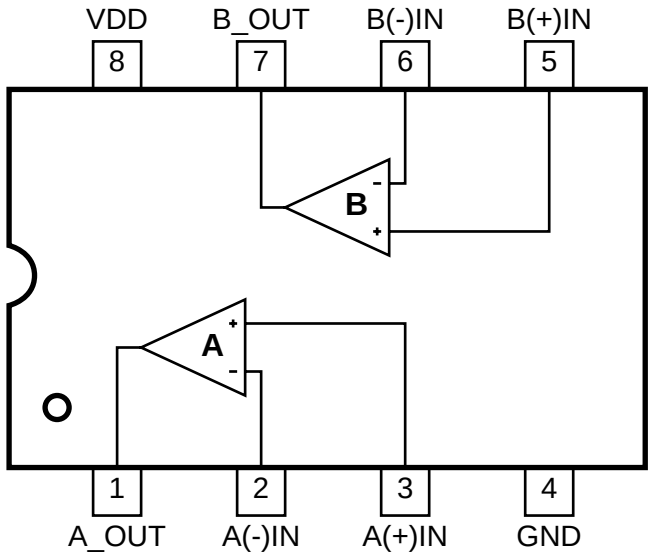


Fig. 1

Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	Vmax	9	V
Power dissipation	Pd	350*	mW
Operating temperature	Topr	-40 ~ +85	°C
Storage temperature	Tstg	-55 ~ +125	°C

Recommanded operating conditions (Ta=25°C)

Parameters	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	Vcc	2.0	--	7.0	V

Electrical characteristics (unless otherwise noted, Ta=25°C, V_{DD}=5.0V, R_L=1KΩ,V_{IN}=0dBV, f=1KHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input offset voltage	V_{IO}		1	3	mV	
Supply current	I_{DD}		180	300	uA	V_{IN}=0V
Common-mode rejection ratio	CMRR	50	70		dB	V_{CM}=0~4.0V
Supply-voltage rejection ratio	K_{SVR}	50	60		dB	V_{DD}=2.0~7.0V
Open loop gain	G_{AV}	80	86		dB	
Common-mode input voltage range	V_{ICR}	0~ V_{DD}-0.9	-0.4~ V_{DD}-0.7		V	25°C
Output swing	V_{OHI}	V_{DD}-120	V_{DD}-60			R_L=1KΩ to 2.5V
	V_{OLO}		50	100	mV	
Output short current	I_{SOURCE}	20	70		mA	V_O=0V
	I_{SINK}	20	80		mA	V_O=5V
Slew rate	SR	1	2		V/uS	
Unity-gain bandwidth	UG	1	1.5		MHz	C_L=100pF
Equivalent input noise voltage	V_N		50		nV/√Hz	F=1KHz

Electrical actual test result (1/3)

	Supply Current (uA)	Offset Voltage (mV)	Output Short Current (mA)	CMRR
1	192.4	0.59	69.5	67.36
2	191.5	0.684	71.6	74
3	192.8	0.341	72.2	85.17
4	194.2	0.916	72.1	70.88
5	189.4	1.856	71.1	67.22
6	183.2	0.219	70.8	68.96
7	201.8	1.065	73.2	71.55
8	203.4	0.825	71.7	72.59
9	191.8	0.682	71.2	68.59
10	171.4	1.719	70.4	67.8
11	192.4	0.578	70.9	70.97
12	190.9	0.335	71.9	69.98
13	189.9	1.439	71.2	68.33
14	160.9	0.946	69.8	71.41
15	164.2	0.296	71	69.03
16	181.3	2.431	68.9	61.87
17	190.5	0.032	69.9	66.26
18	192.7	2.399	69.4	69.94
19	178.7	0.286	69.4	71.14
20	177.4	0.928	69.5	75.85
21	186.3	2.448	71.6	67.3
22	190.5	1.083	69.5	75.26
23	186.3	0.422	69.9	71.1
24	190.5	1.932	69.5	70.97
25	186.3	0.254	70.3	68.11
26	197.9	0.616	69.6	72.59
27	207.3	0.429	69.4	71.64
28	174.4	0.172	69.7	76.73
29	161.4	0.315	69.1	78.3
30	208.1	0.382	70.2	72.03
31	189.4	1.032	69.5	75.12
32	179.4	1.802	10	68.62
33	183.9	0.208	70.2	68.93
34	206.8	0.2422	69.6	73.41
35	188.9	0.241	70.3	76.24

Electrical actual test result (2/3)

	Supply Current (uA)	Offset Voltage (mV)	Output Short Current (mA)	CMRR
36	198.9	1.685	70.4	65.46
37	245.3	2.455	70.4	80.21
38	182	1.583	69.9	76.4
39	199.7	0.005	70	69.91
40	181.3	0.132	69.6	83.73
41	193.6	2.448	69.5	72.43
42	192.3	2.448	69.8	69.28
43	183.4	0.505	69.5	66.99
44	178.6	0.487	71.5	71.46
45	195.9	1.872	69.3	73.24
46	211.3	2.369	70.5	76.65
47	167.2	2.455	69.2	70.97
48	195.6	0.879	68.8	75.85
49	175.3	1.141	69.1	77.34
50	188.4	0.965	68.5	70.46
51	187.9	1.372	69.7	72.13
52	190.4	0.985	69.9	83.92
53	167.1	1.638	69.2	69.06
54	166.9	0.167	69.8	79.04
55	201.1	1.161	71.6	71.55
56	191.6	0.659	69.8	67.74
57	192.3	0.994	69.7	90.97
58	193.9	1.934	71.1	62.28
59	208.8	1.979	70.9	66.83
60	205.9	0.165	69.36	68.39
61	176.4	0.482	69.8	78.61
62	168.1	0.206	69.7	69.53
63	171.1	0.679	69.9	68.14
64	167.6	1.732	69.8	74.45
65	164.3	1.421	68.2	71.32
66	171.3	1.276	69.3	73.29
67	179.8	0.048	69	71.64
68	259.5	1.496	69.2	77.62
69	178.7	0.819	69.6	84.95
70	178.3	0.209	68.9	78.2

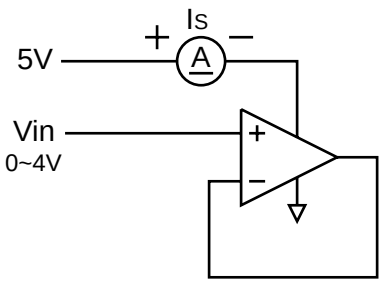
Electrical actual test result (3/3)

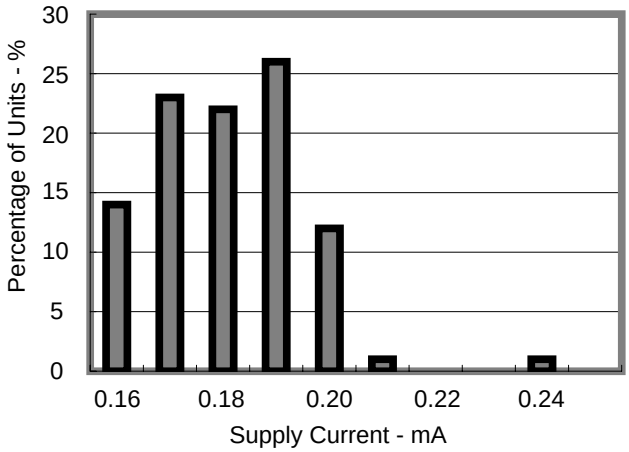
	Supply Current (uA)	Offset Voltage (mV)	Output Short Current (mA)	CMRR
71	203.3	0.015	69.1	78
72	195.9	1.416	70.1	73.02
73	172.9	0.661	68.8	69.98
74	187.9	0.171	68.1	68.62
75	202.3	0.197	69.4	71.37
76	187.6	0.558	69.2	71.28
77	192.2	2.445	70.3	72.38
78	182.5	1.863	69.5	74.71
79	173.5	1.418	70.5	70.46
80	174.3	1.976	68.3	69.13
81	167.9	1.453	70.1	71.69
82	185.1	0.942	69.6	72.74
83	174.9	2.445	69	71.41
84	173.9	1.936	70.5	72.96
85	178.3	0.929	69.9	71.14
86	209.6	2.456	70.1	76.4
87	179.4	2.054	69.2	69.21
88	191.1	0.296	70	71.37
89	192.6	2.453	68.4	67.71
90	183.2	2.445	69.7	73.82
91	178.7	1.484	68.9	71.88
92	181	0.667	68.6	60.7
93	207.8	2.457	67.3	70.3
94	173.6	2.152	66.8	73.24
95	168.4	0.498	69.8	73.13
96	166.9	0.117	69.4	78.71
97	168.4	1.648	69.7	70.75
98	182.5	0.098	68.5	76.73
99	161.7	2.455	69.2	75.33
100	179.6	0.188	68.2	70.75

Measurement procedure

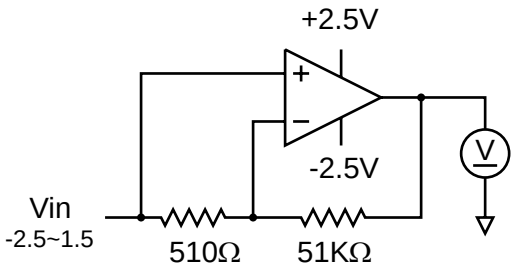
All chips from CubicMOS have passed the following test procedures.

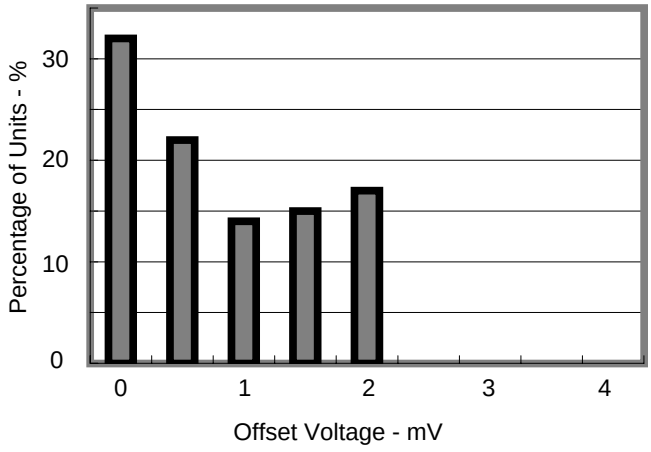
(1) Supply current measurement (I_{DD})





(2) Input offset voltage measurement (V_{IO})

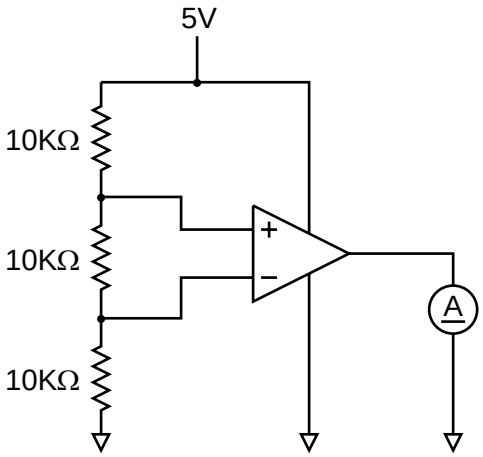


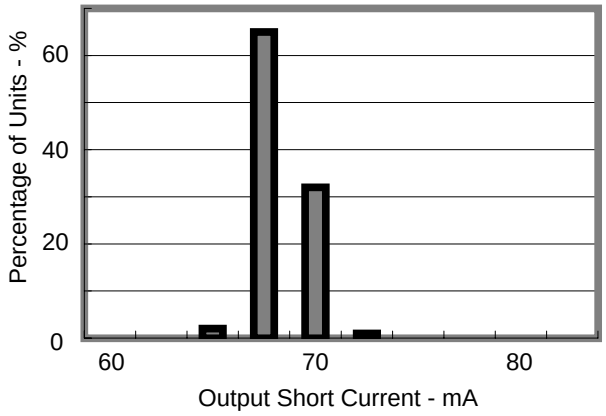


Measurement procedure

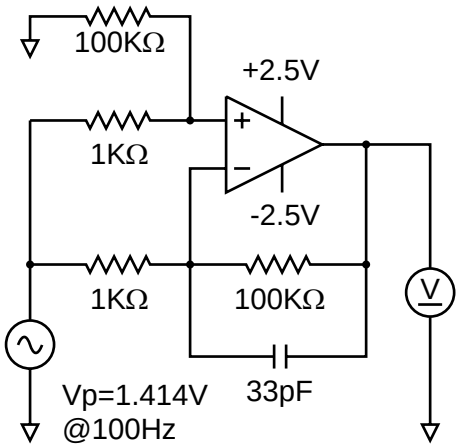
All chips from CubicMOS have passed the following test procedures.

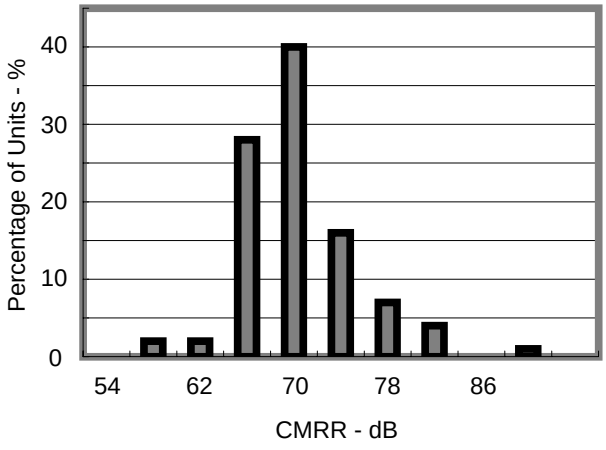
(3) Output short current measurement (I_{SOURCE})



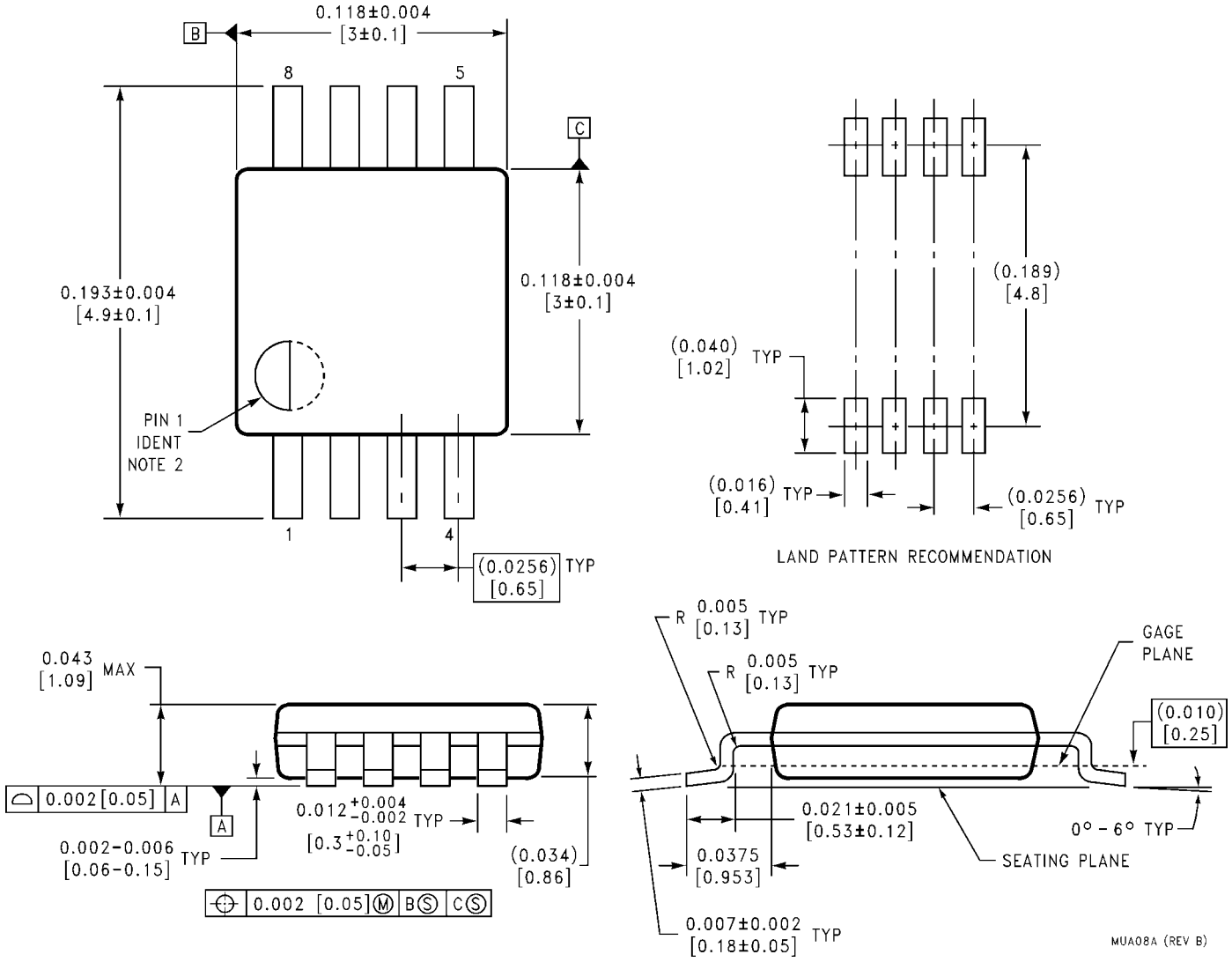


(4) CMRR measurement



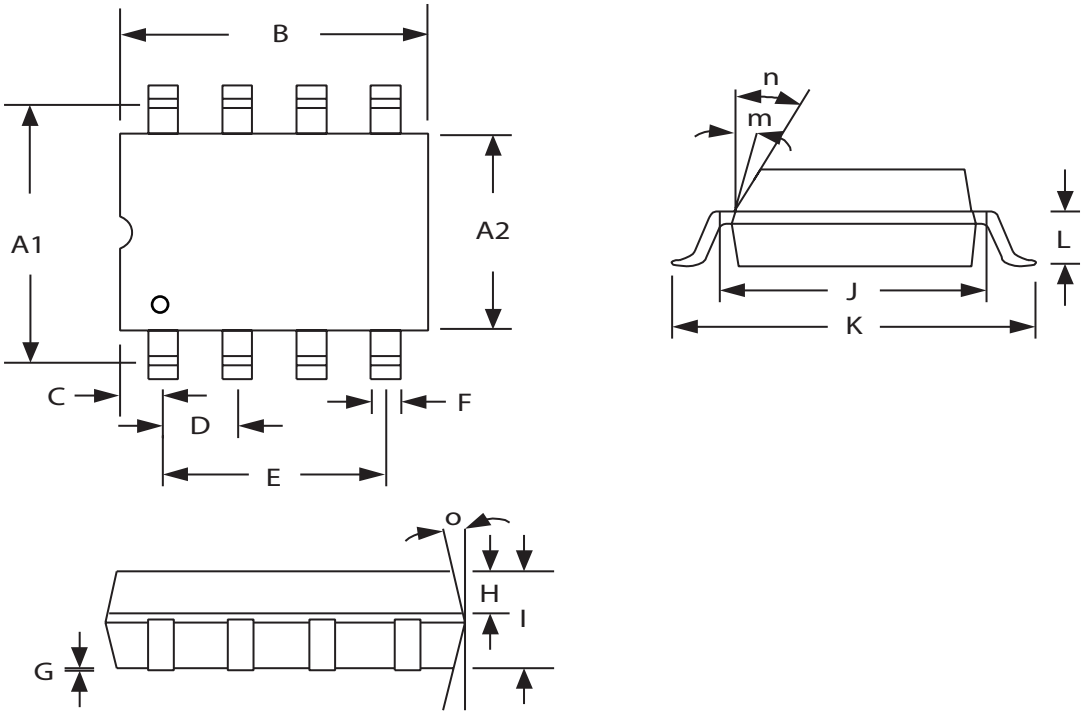


Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



CMV358LM Mini SOP8 Package

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



DIM	Millimeters		Inches	
	Min.	Max.	Mn.	Max.
A1	4.80	5.00	0.190	0.200
A2	3.80	4.00	0.149	0.157
B	4.80	5.00	0.189	0.196
C	0.558		0.022	
D	1.2BSC		0.050BSC	
E	3.810		0.150	
F	0.33	0.51	0.013	0.069
G	0.152	0.202	0.006	0.008
H	0.406		0.016	
I	1.35	1.75	0.053	0.069
J	4.496	4.623	0.177	0.182
K	5.994	6.197	0.236	0.244
L	0.939		0.037	
m	7°		7°	
n	45°		45°	
o	8°		8°	

CMV358L SOP8 Package