

1.1MHz Rail-To-Rail I/O CMOS Operational Amplifier

■ Description

The LN8541、LN8542、LN8544 (single channel, dual channel, four channel) are rail-to-rail input and output voltage feedback amplifier offering low cost. It has a wide input common-mode voltage range and output voltage swing, and takes the minimum operating supply voltage down to 2.1V and the maximum recommended supply voltage is 5.5V. All are specified over the extended -40°C to $+125^{\circ}\text{C}$ temperature range.

The series of LN854X provides 1.1MHz bandwidth at a low current consumption of $42\mu\text{A}$ per amplifier. Very low input bias currents of 0.5pA , enable LN8541 to be used for integrators, photodiode amplifiers, and piezoelectric sensors. Rail-to-rail inputs and outputs are useful to designers buffering ASIC in single-supply systems.

Applications for these amplifiers include safety monitoring, portable equipment, battery and power supply control, and signal conditioning and interfacing for transducers in very low power systems.

■ Applications

- ASIC input or output amplifiers
- Audio Output
- Handheld devices
- Mobile phones
- Notebook
- PCMCIA card
- Battery-powered devices

■ Package

- SOP-8
- SOT-23-5

■ Ordering Information

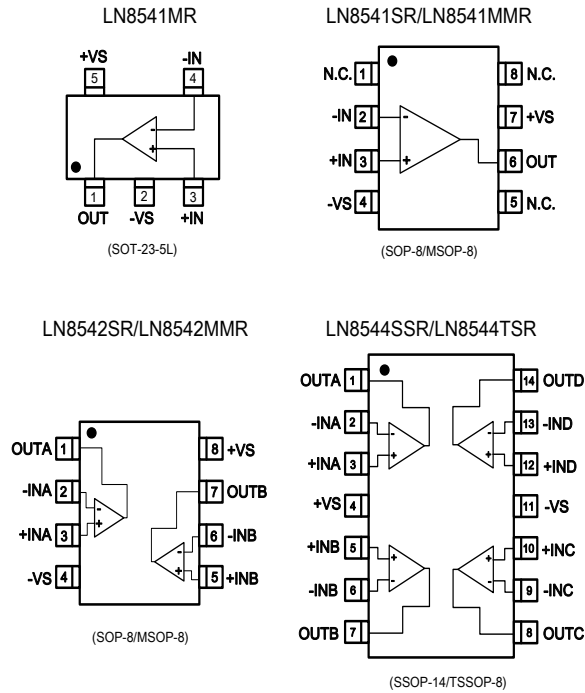
LN854①②③

Designator	Symbol	Description
①	—	Product name
	1	LN8541
	2	LN8542
	4	LN8544
②	—	Package
	M	SOT-23-5
	S	SOP-8
	MM	MSOP-8
	SS	SSOP-14
	TS	TSSOP-14
③	—	Embossed Tape
	R	Standard Feed
	L	Reverse Feed

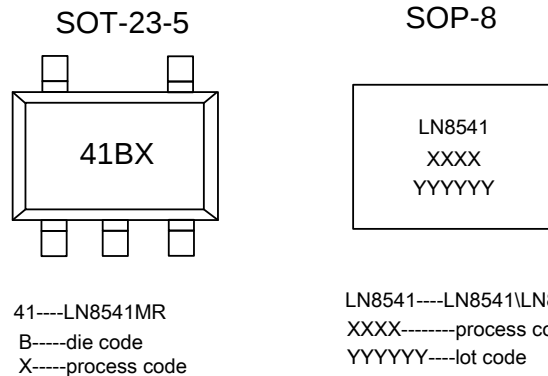
■ Features

- Low cost
- Rail-to-Rail input / output
- Unity-gain stable
- Slew rate: $0.52 (\text{V}/\mu\text{s})$
- Minimum power supply rejection ratio: 72dB
- Minimum common mode rejection ratio: 76dB
- Offset voltage: typically 0.8mV , 3.5mV maximum
- Gain bandwidth product: 1.1MHz
- Very low input bias current: 0.5pA
- Operating voltage range: 2.1V to 5.5V
- Input voltage range: 0.1V to $+5.6\text{V}$ ($V_S = 5.5\text{V}$)
- Quiescent current: $42\mu\text{A}$ (single)

Pin Configuration



Marking Rule



Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating	Unit
Supply voltage	V_{DD}	7.5	V
Common-mode input voltage	V_{CM}	$(-VS)-0.5$ to $(+VS)+0.5$	V
Storage temperature	Tstg	-55—150	°C
Junction temperature	—	150	°C
ESD susceptibility	HBM	4000	V
	MM	400	V

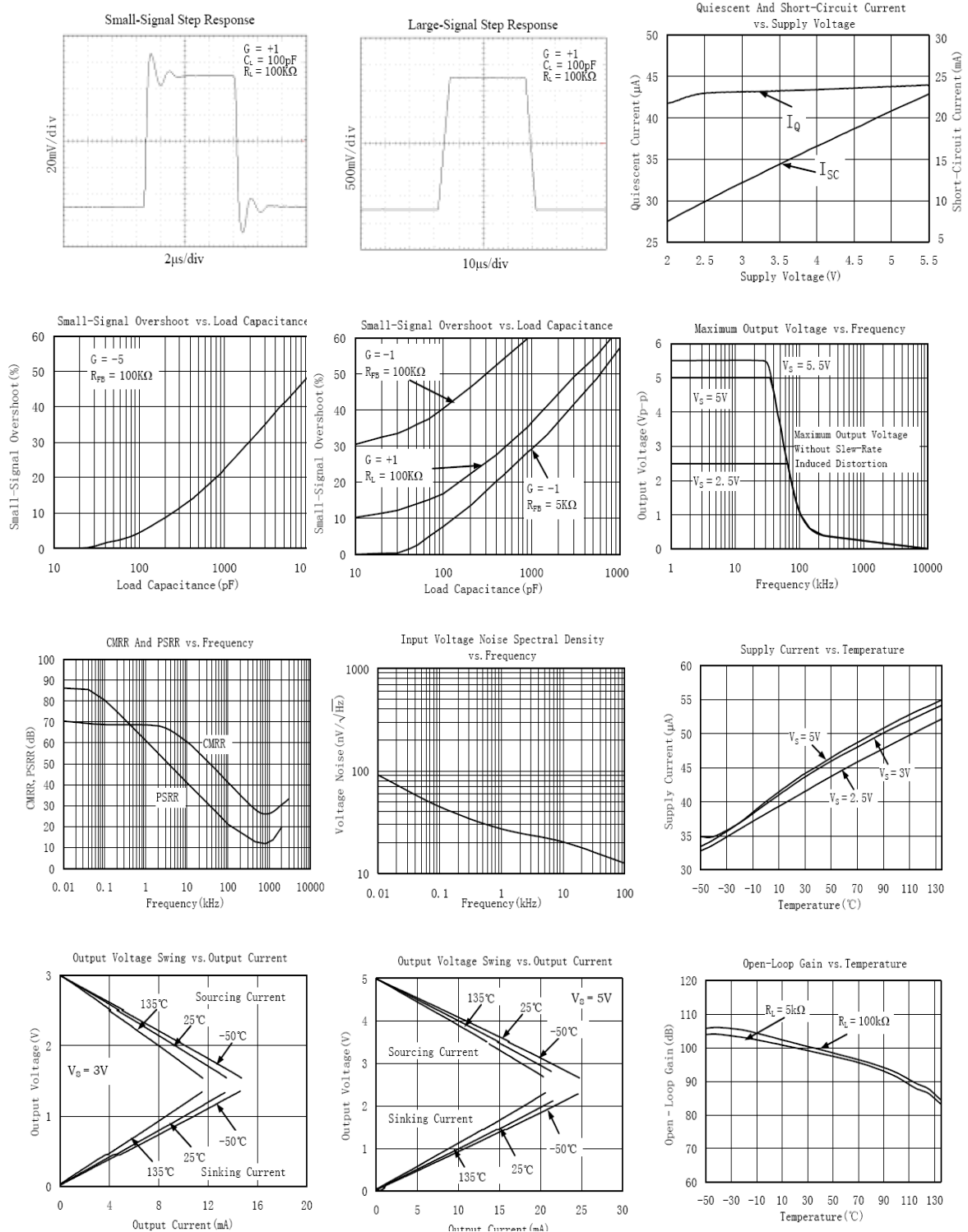
Electrical Specifications

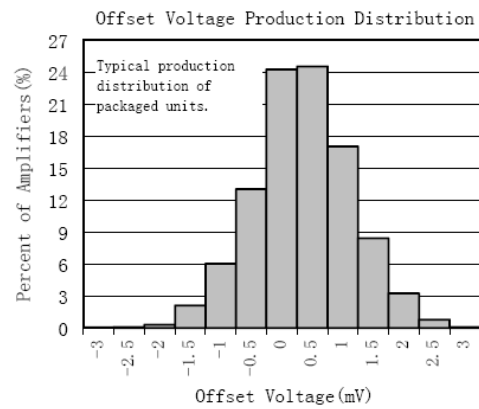
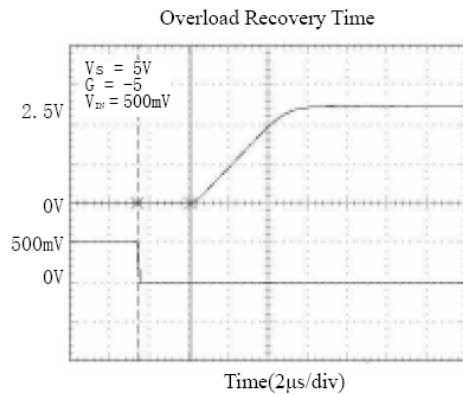
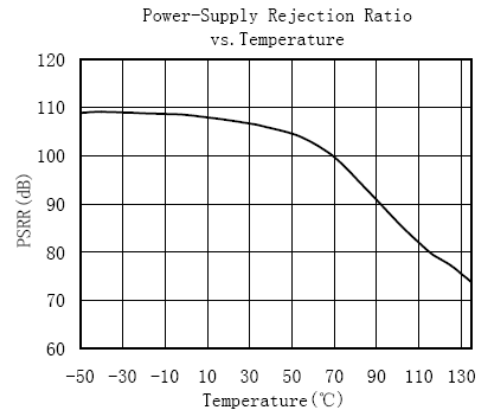
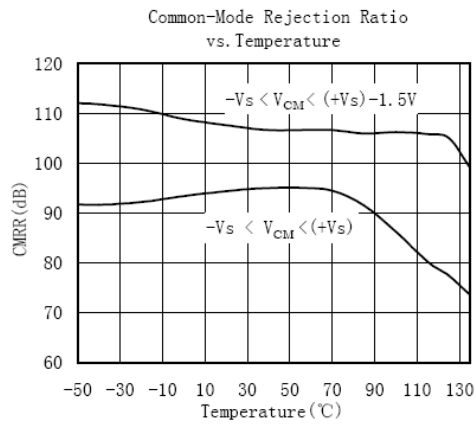
(The following parameters for the single channel parameters. Two channel and four channel can refer to it. $V_S=+5V$

$R_L=100K\Omega$ $V_{OUT}=V_S/2$)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
V_{OS}	Input offset voltage			± 0.8	± 5.4	mV
I_B	Input bias current			0.5		pA
I_{OS}	Input offset current			0.5		pA
V_{CM}	Common-Mode voltage range	$V_S=5.5V$	-0.1		5.6	V
CMRR	Common-Mode rejection ratio	$V_S=5.5V$, $V_{CM}=-0.1V-4V$	72	88		dB
		$V_S=5.5V$, $V_{CM}=-0.1V-5.6V$	57	78		dB
A_{OL}	Open-Loop voltage gain	$R_L=5K$, $V_O=0.1V-4.9V$	78	90		dB
		$R_L=100K$, $V_O=0.035V-4.965V$	82	94		dB
$\Delta V_{OS}/\Delta T$	Input offset voltage drift			2.7		$\mu V/^\circ C$
V_{SW}	Output voltage swing from rail	$R_L=100K$		0.008		V
I_{OUT}	Output current		18	23		mA
VDD	Operating voltage range		2.1		5.5	
PSRR	Power supply rejection ratio	$V_S=+2.5V$ to $+5.5V$, $V_{CM}=(-V_S)+0.5V$	70	92		
I_Q	Quiescent current	$I_{OUT}=0$		42	60	μA
GBP	Gain-bandwidth product	$CL=100pF$		1.1		MHz
SR	Slew rate			0.052		V/ μs

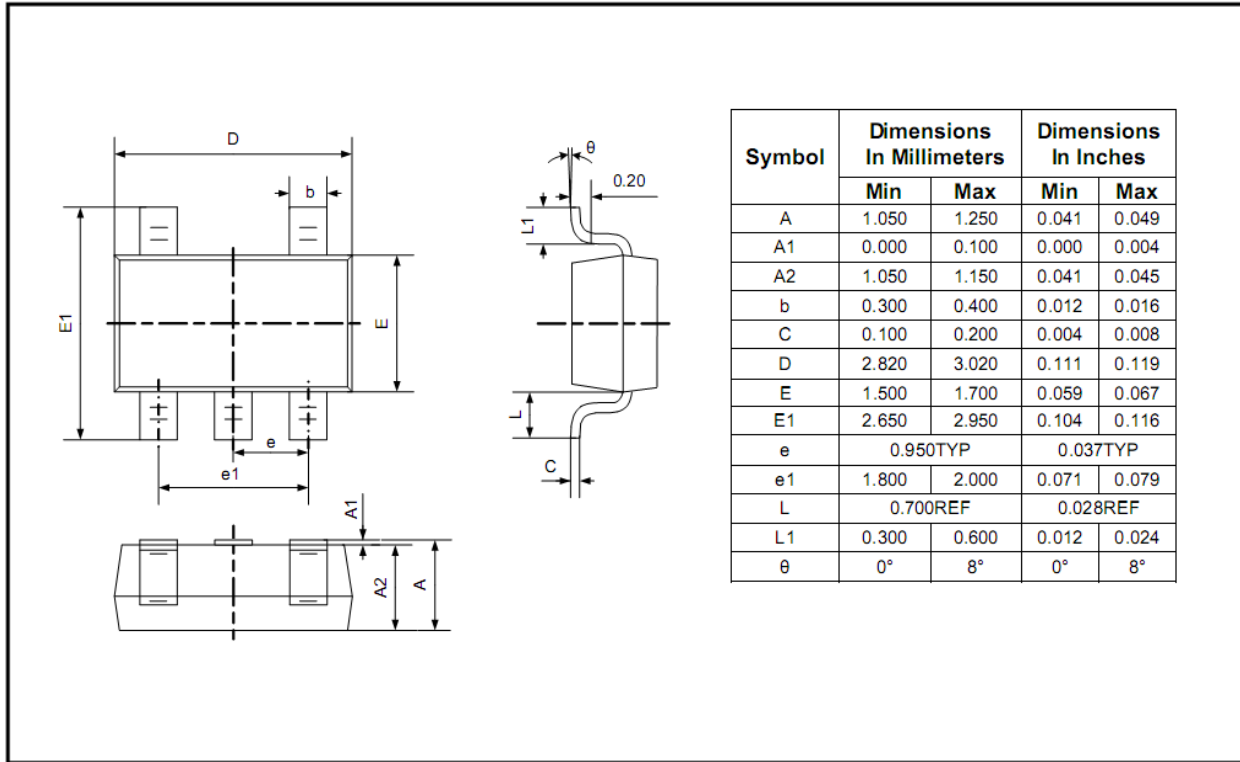
Typical Operating Characteristics



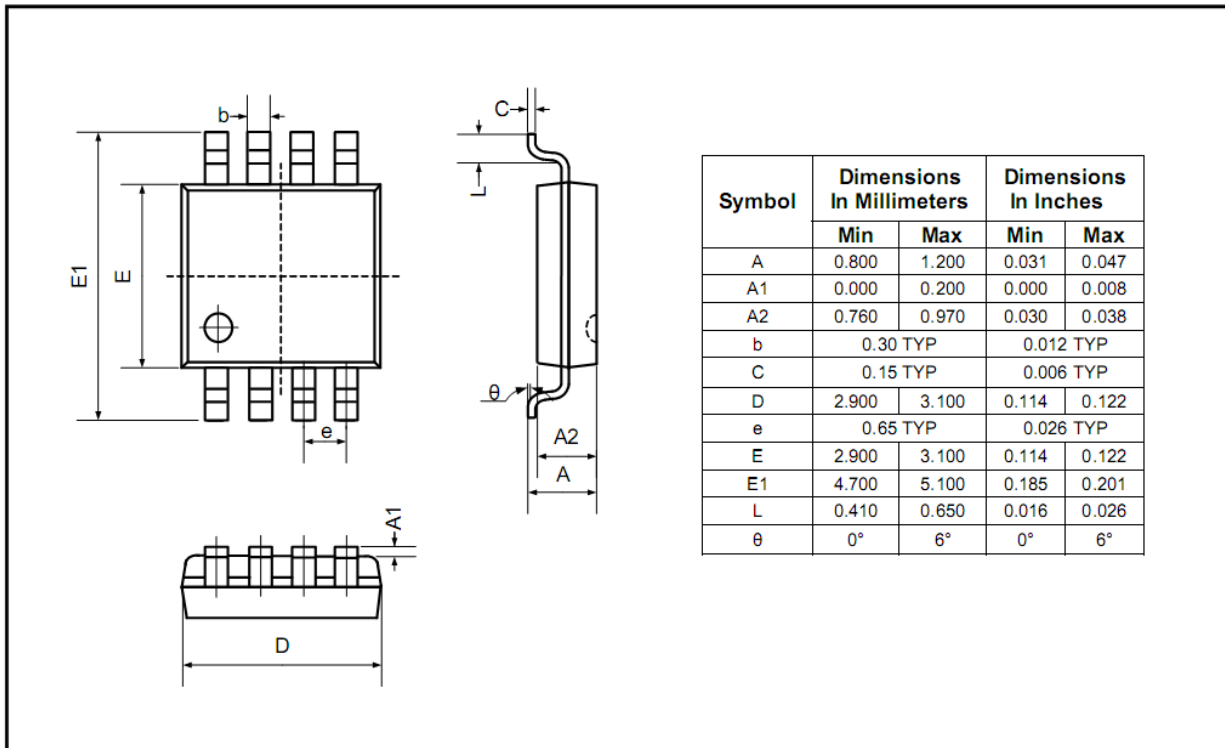


Package Information

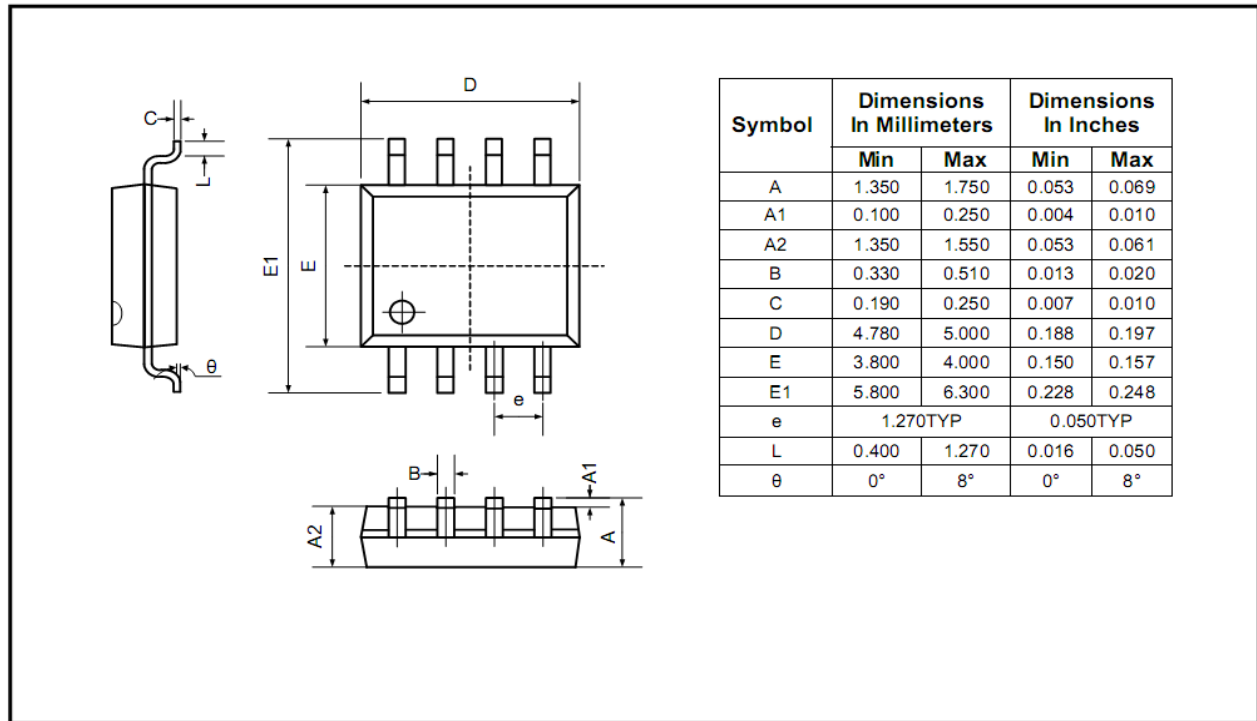
SOT-23-5



MSOP8



● SOP8



● MOP14

