



## Descriptions

The NJM5532M is a dual operational amplifier IC designed for improved tone control and is well suited for audio applications. Its noise-free, high gain bandwidth, high output current, and low distortion ratio make it suitable not only for acoustic electronic components of audio preamplifiers and active filters, but also for industrial measurement tools. It is also suitable for headphone amplifiers with high output currents, and can be applied to general purpose portable integrated power amplifiers to appropriately bias input low voltage sources in low voltage single supply applications.

## Feature

- Operating voltage( $\pm 2V \sim \pm 18V$ )
- Low input noise voltage (Typical value  $0.8\mu V_{rms}$ )
- Wide gain bandwidth product (Typical value  $15MHz$ )
- Low distortion (Typical value  $0.0005\%$ )
- Rate of conversion (Typical value  $5V/\mu s$ )
- Bipolar technique

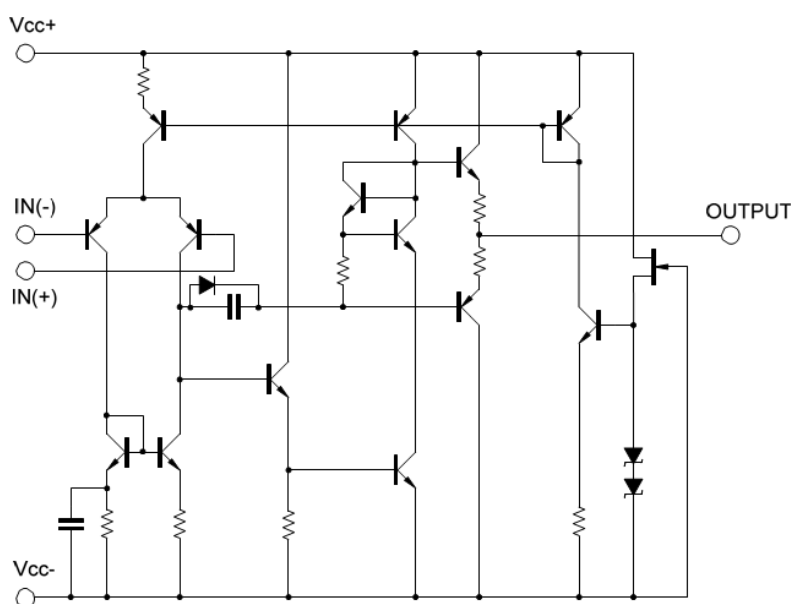
## Applications

- Audio Preamplifiers
- Active Filters
- Headphone Amplifiers
- Industrial Measurement Equipment

## Ordering Information

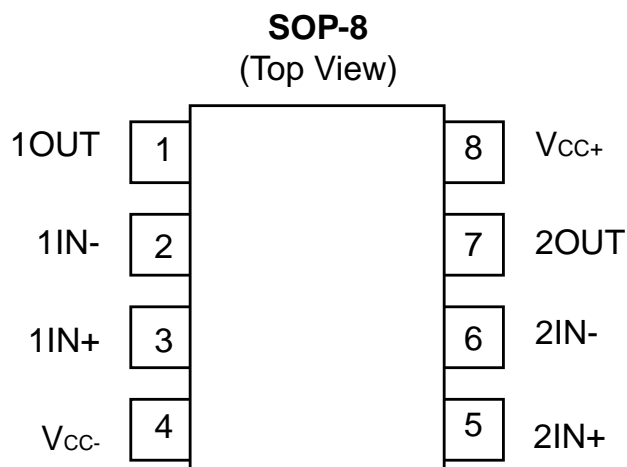
Product Model	Package Type	Packing	Packing Qty
NJM5532M	SOP-8	Tape	4000Pcs/Reel

## Internal Block Diagram (1/2)





## Pin Configurations



## Pin Description

Pin	Symbol	I/O	Pin Description
1	1OUT	O	Output
2	1IN-	I	Inverting input
3	1IN+	I	Noninverting input
4	V <sub>CC-</sub>	—	Negative supply
5	2IN+	I	Noninverting input
6	2IN-	I	Inverting input
7	2OUT	O	Output
8	V <sub>CC+</sub>	—	Positive supply



## Absolute Maximum Ratings

( $T_A=25^{\circ}\text{C}$ , not otherwise specified.)

Parameters	Symbol	Scope of scope	Unit of work
Supply voltage	$V_{CC+}/V_{CC-}$	$\pm 18$	V
Input voltage	$V_{in}$	$\pm 15$	V
Differential input voltage	$V_{I(DIFF)}$	$\pm 30$	V
Current of output	$I_{OUT}$	$\pm 50$	mA
Power consumption		440	mV
Temperature of junction	$T_J$	125	$^{\circ}\text{C}$
Operating temperature	$T_{OPR}$	$-40 \sim +85$	$^{\circ}\text{C}$
Temperature of storage	$T_{STG}$	$-40 \sim +125$	$^{\circ}\text{C}$

Note: Exceeding the limit parameters listed may lead to permanent damage inside the chip, and long-term operation under the limit conditions will affect the reliability of the chip.

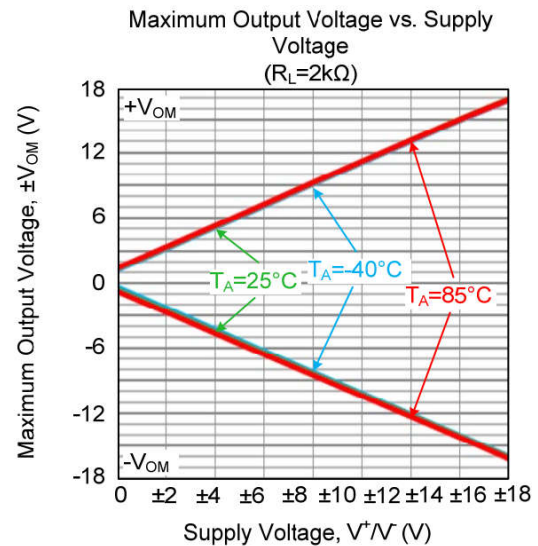
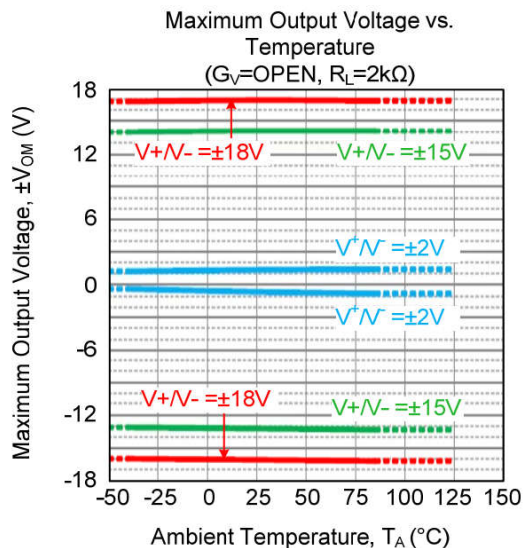
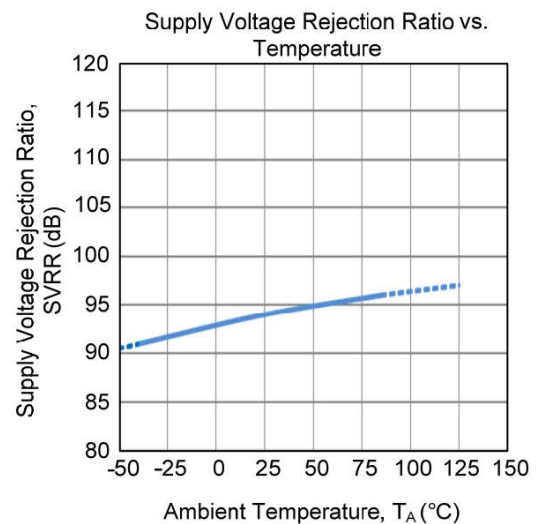
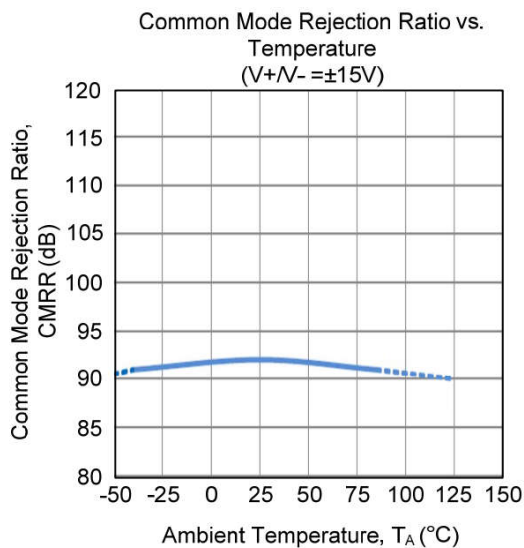
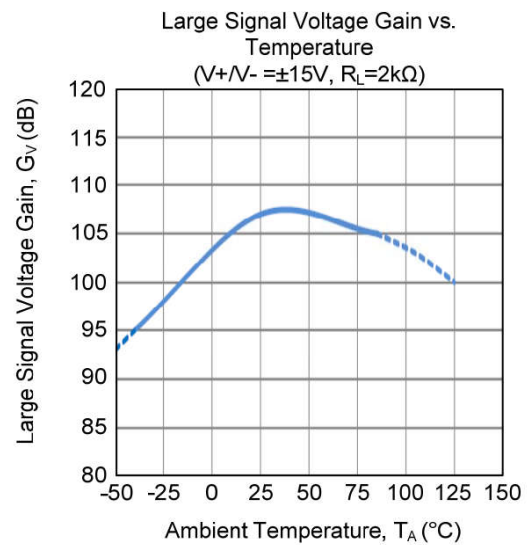
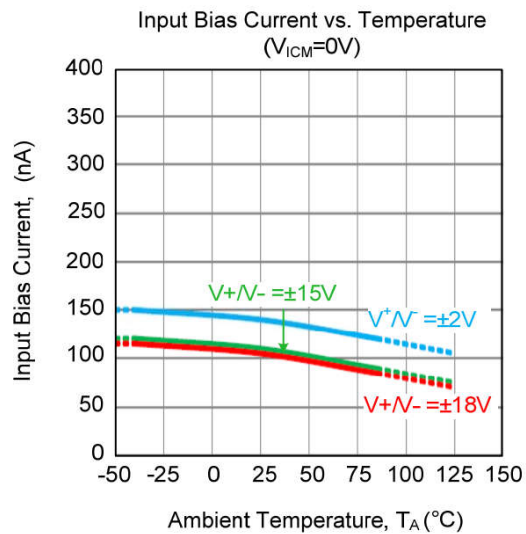
## DC Electrical Characteristics

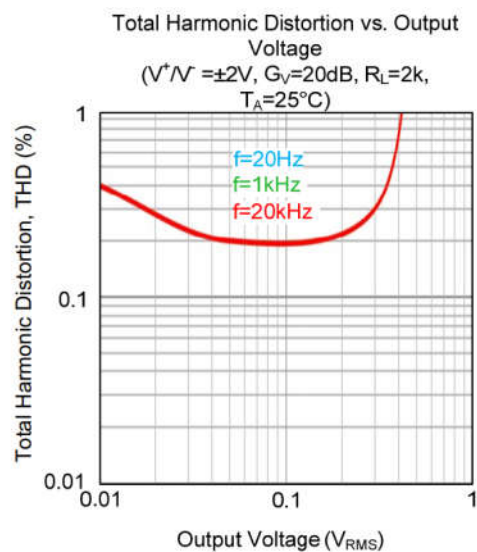
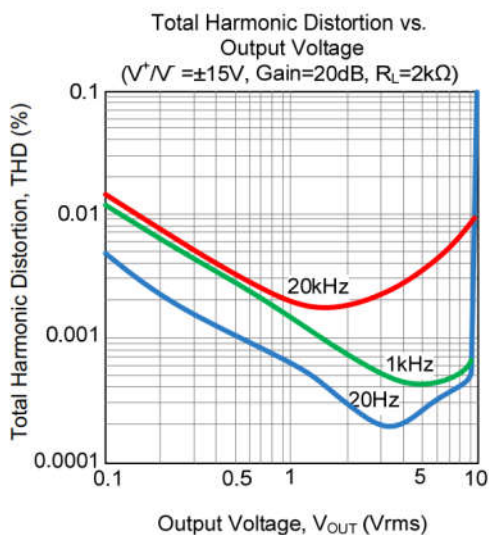
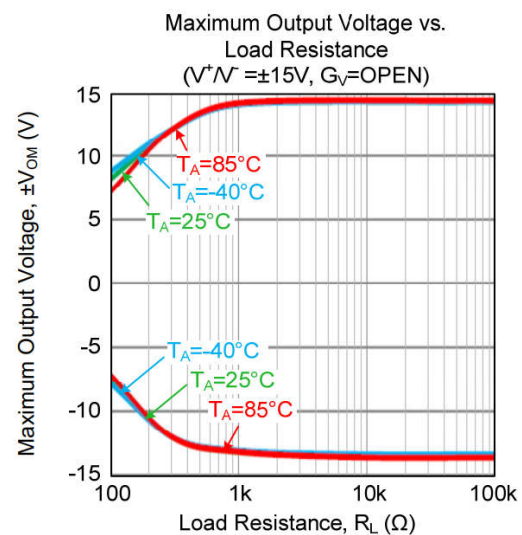
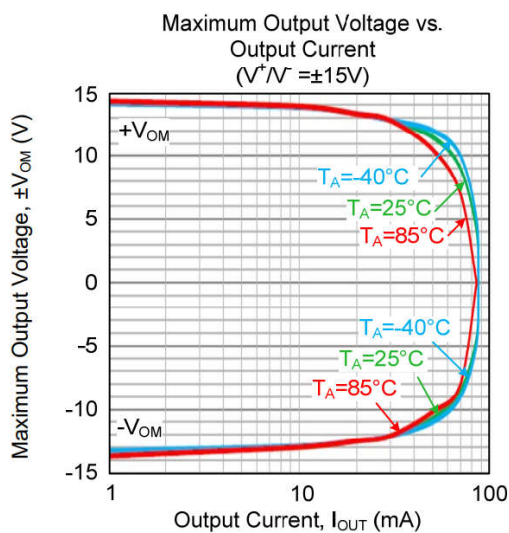
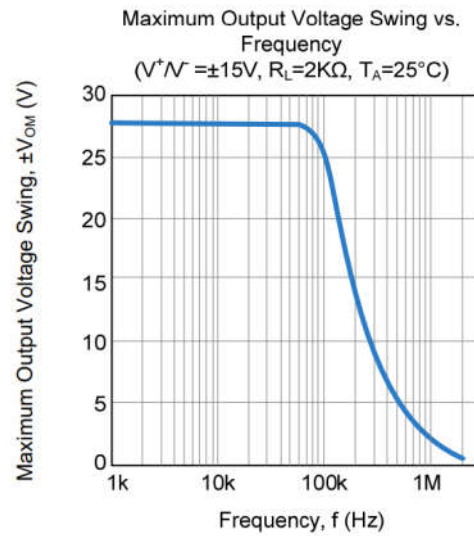
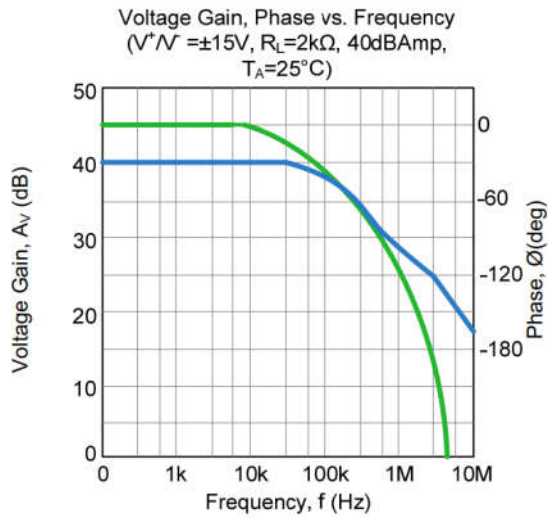
( $V_+ / V_- = \pm 15\text{V}$ ,  $T_A=25^{\circ}\text{C}$ , Unless otherwise stated.)

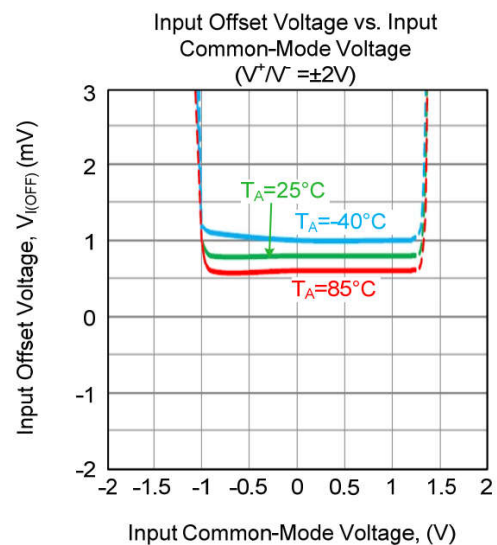
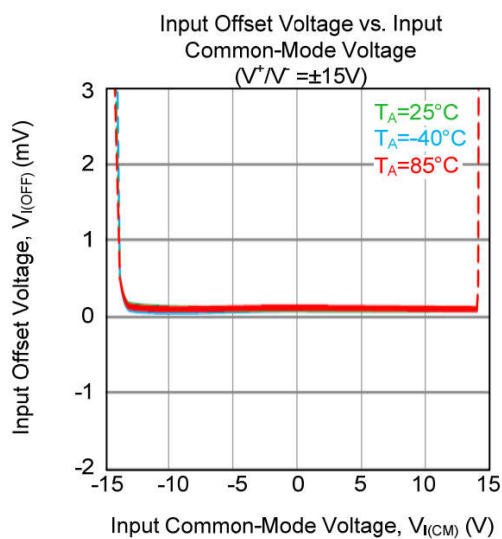
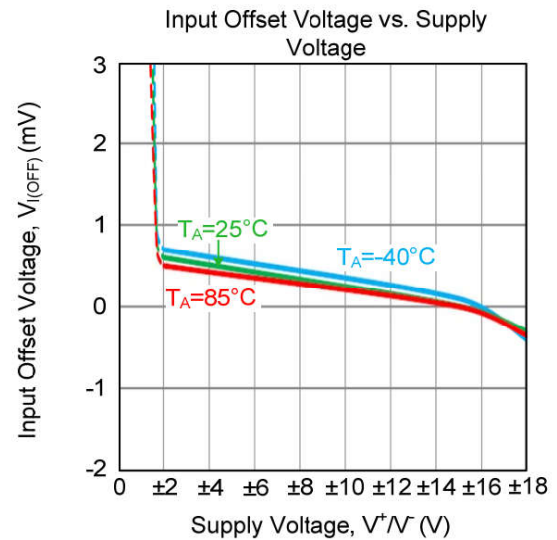
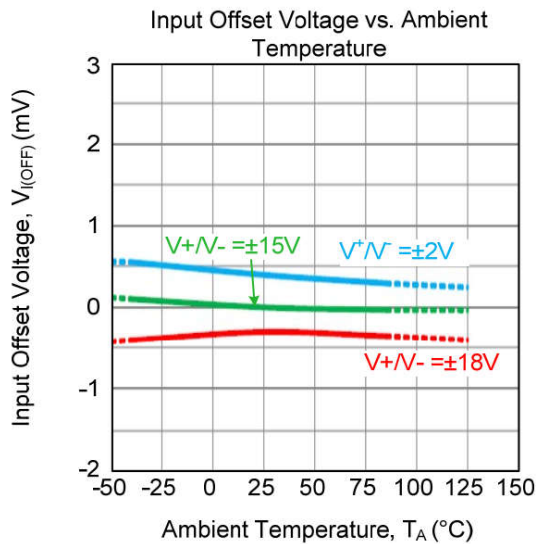
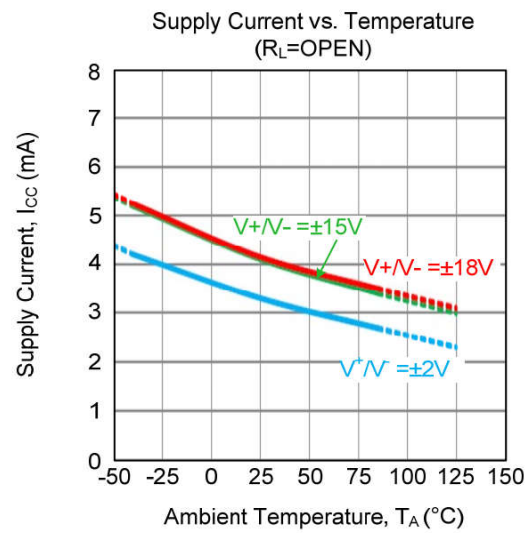
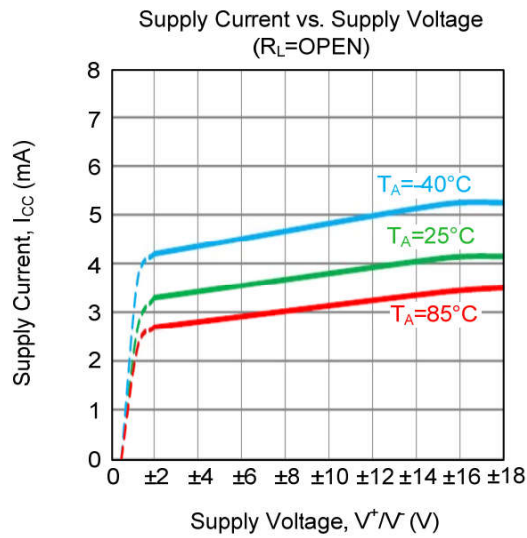
Parameters	Symbol	Condition of test	Min	Typ	Max	Unit
Input bias voltage	$V_{I(OFF)}$	$R_S \leq 10\text{k}\Omega$		0.5	3	mV
Input bias voltage	$I_{I(OFF)}$			5	200	nA
Input bias current	$I_{I(BIAS)}$			100	500	nA
Large signal voltage gain	$G_v$	$V_{OUT} = \pm 10\text{V}$ , $R_L \geq 2\text{k}\Omega$	90	110		dB
Output voltage swing	$V_{OM}$	$R_L \geq 2\text{k}\Omega$	$\pm 12$	$\pm 13.5$		V
Input the common mode voltage	$V_{I(CM)}$		$\pm 12$	$\pm 13.5$		V
Common mode inhibition ratio	CMRR	$R_S \leq 10\text{k}\Omega$	80	110		dB
Supply voltage rejection ratio	SVR	$R_S \leq 10\text{k}\Omega$	80	110		dB
Current of operation	$I_{CC}$			6	9	mA
Rate of conversion	SR	$R_L \geq 2\text{k}\Omega$		5		V/ $\mu\text{s}$
Gain bandwidth product	GB	$f = 10\text{kHz}$		15		MHz
Total harmonic distortion	THD	$G_v = 20\text{dB}$ , $V_{OUT} = 5\text{V}$ , $R_L = 2\text{k}\Omega$ , $f = 1\text{kHz}$		0.0005		%
Input noise voltage	eN	$R_{IAA} R_S = 2.2\text{ k}\Omega$ , 30kHz LPF		0.8		$\mu\text{Vrms}$



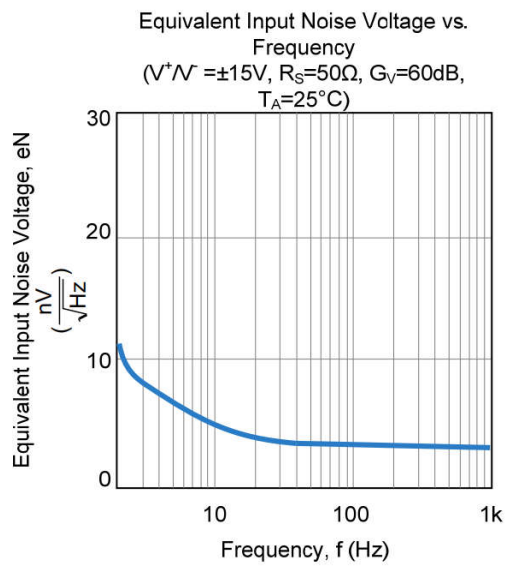
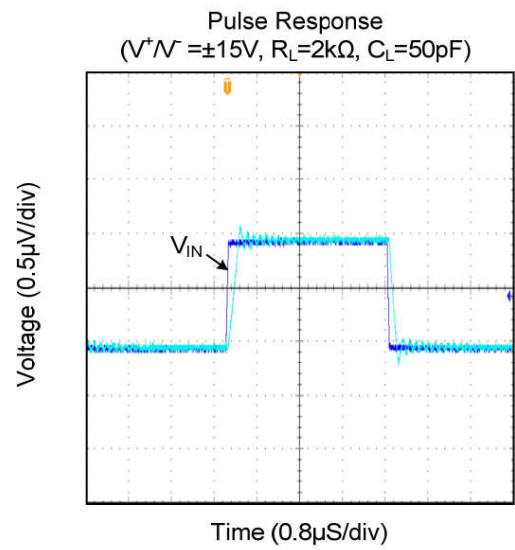
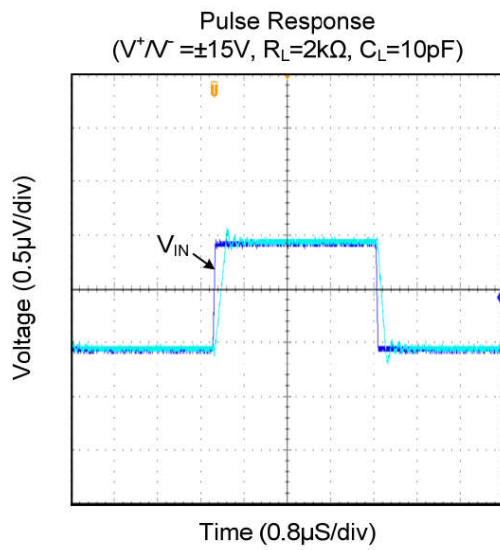
## Typical characteristics







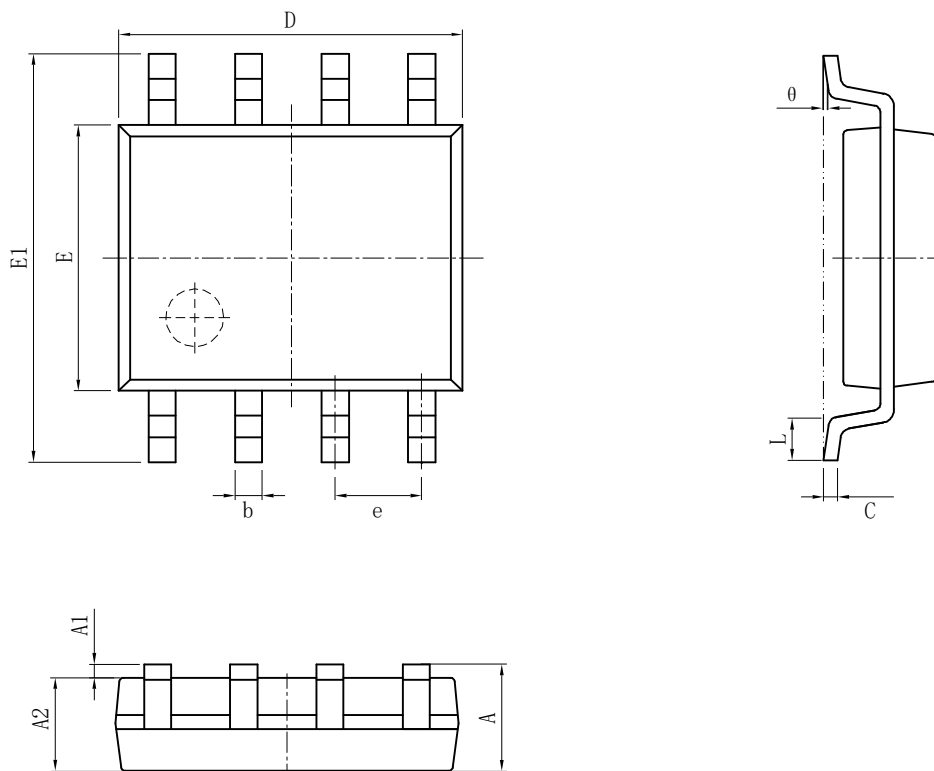






## Package Information

### SOP-8



Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	1.350	1.750	A	0.053	0.069
A1	0.100	0.250	A1	0.004	0.010
A2	1.350	1.550	A2	0.053	0.061
b	0.330	0.510	b	0.013	0.020
c	0.170	0.250	c	0.006	0.010
D	4.700	5.100	D	0.185	0.200
E	3.800	4.000	E	0.150	0.157
E1	5.800	6.200	E1	0.228	0.224
e	1.270(BSC)		e	0.050(BSC)	
L	0.400	1.270	L	0.016	0.050
$\theta$	0°	8°	$\theta$	0°	8°





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