

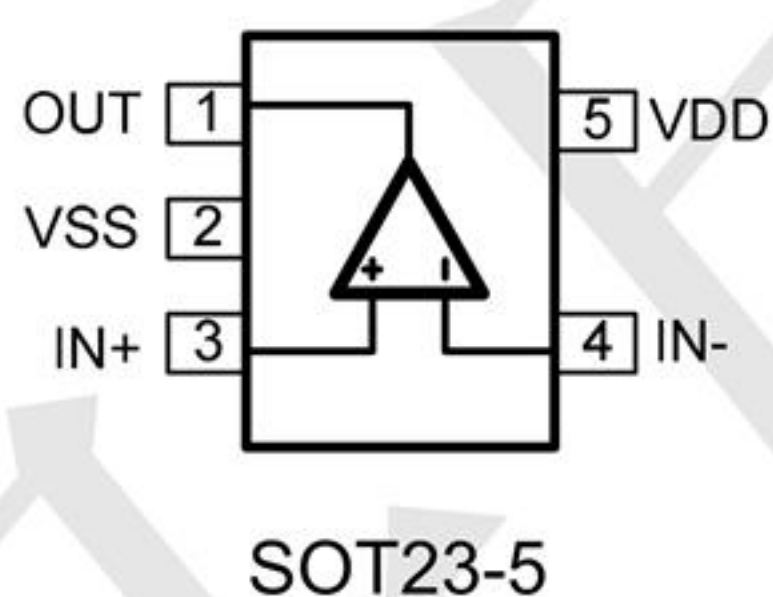
Features

- Quiescent Current: 700nA per Amplifier (Typ.)
- Low Offset Voltage: 3mV (Max.)
- Low Offset Drift: 2.5 μ V/°C, max
- Gain-Bandwidth: 14.5kHz (Typ.)
- Single-Supply
- Supply Voltage: 1.4V to 5.5V
- Rail-to-Rail Input / Output
- Low Input Bias Current: 1pA (Typ.)
- Operating Temperature: -40°C ~ +125°C
- Embedded RF Anti-EMI Filter
- Available in SOT-25 and SC70-5 packages

Applications

- Battery-Powered Instruments
- Portable Devices
- Medical Instruments
- Test Equipment
- Low-Power Sensor Signal Conditioning
- ASIC Input or Output Amplifier
- Sensor Interface
- Smoke Detectors
- Audio Output
- Piezoelectric Transducer Amplifier

Pin Assignments



Electrical Characteristics

Power Supply Voltage (V_{DD} to V_{SS})	-0.5V ~ +7.5V
Analog Input Voltage ($IN+$ or $IN-$)	$V_{SS}-0.5V \sim V_{DD}+0.5V$
PDB Input Voltage	$V_{SS}-0.5V \sim +7V$
Operating Temperature Range	-40°C ~ 125°C
Junction Temperature	+160°C
Storage Temperature Range	-55°C ~ 150°C
Lead Temperature (soldering, 10sec)	+260°C
Package Thermal Resistance ($T_A=+25^\circ\text{C}$)	
θ_{JA} , SOT-25	190°C/W
θ_{JA} , SC70-5	333°C/W
ESD Susceptibility	
HBM	6kV
MM	300V

Electrical Characteristics

At $V_S = +5V$, $R_L = 1M\Omega$ connected to $V_S/2$, and $V_{OUT} = V_S/2$, unless otherwise noted.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
INPUT CHARACTERISTICS						
Input Offset Voltage	V _{OS}	V _{CM} = V _S /2		0.4	3	mV
Input Bias Current	I _B		-	1	-	pA
Input Offset Current	I _{OS}		-	1	-	pA
Common-Mode Voltage Range	V _{CM}	V _S = 5.5V	-	-0.1 to +5.6	-	V
Common-Mode Rejection Ratio	CMRR	V _S = 5V, V _{CM} = -0.1V to 2.5V	66	78	-	dB
		V _S = 5V, V _{CM} = -0.1V to 5.1V	67	84	-	
Open-Loop Voltage Gain	A _{OL}	V _S =1.4V, R _L = 50kΩ, V _O = V _S -0.1V	75	86	-	dB
		V _S =5V, R _L = 50kΩ, V _O = V _S -0.1V	84	93	-	
Input Offset Voltage Drift	ΔV _{OS} /ΔT		-	2.5	-	μV/°C
OUTPUT CHARACTERISTICS						
Output Voltage Swing from Rail	V _{OH}	V _S =1.4V, R _L = 50kΩ	1.390	1.395	-	V
	V _{OL}		-	4.5	10	mV
	V _{OH}	V _S =5V, R _L = 50kΩ	4.990	4.997	-	V
	V _{OL}		-	3.5	10	mV
Output Current	I _{SOURCE}	R _L = 10Ω to V _S /2	-	20	-	mA
	I _{SINK}		-	20	-	
POWER SUPPLY						
Operating Voltage Range			-	1.4	-	V
			-	5.5	-	
Power Supply Rejection Ratio	PSRR	V _S = +1.4V to +5.5V, V _{CM} = +0.5V	77	80	-	dB
Quiescent Current / Amplifier	I _Q		-	700	-	nA
DYNAMIC PERFORMANCE (C _L = 100pF)						
Gain-Bandwidth Product	GBP		-	14.5	-	kHz
Slew Rate	SR		-	6	-	V/ms

		$R_L = 500\Omega$ to $V_{DD}/2$ $V_{OL}-V_{SS}$		80	260	
Output Short-Circuit Current	I_{SC}	Sinking or Sourcing	-	± 50	-	mA
PDB Logic Low	V_{IL}		-	-	0.8	V
PDB Logic High	V_{IH}		2	-	-	V
Turn-On Time	T_{ON}		-	2.2	-	μs
Turn-Off Time	T_{OFF}		-	0.8	-	μs
Output Leakage Current	I_{LEAK}	Shutdown Mode ($PDB = V_{SS}$), $V_{OUT} = V_{SS}$ to V_{DD}	-	± 0.001	± 1.0	μA
Input Capacitance	C_{IN}			10		pF
Gain Bandwidth Product	GBW	$A_v = +1V/V$	-	10	-	MHz
Slew Rate	SR	$A_v = +1V/V$	-	4.5	-	V/ μs
Full Power Bandwidth		$A_v = +1V/V$	-	0.4	-	MHz
Phase Margin	ϕ_m	$A_v = +1V/V$	-	55	-	deg
Gain Margin	G_m	$A_v = +1V/V$	-	12	-	dB
Settling Time	t_s	To 0.01%, $V_{OUT} = 2V$ step $A_v = +1V/V$	-	1	-	μs
Capacitive-Load Stability	C_{LOAD}	No sustained oscillations. $A_v = +1V/V$	-	200	-	pF
Peak-to-Peak Input Noise Voltage (Note 5)	$e_n(p-p)$	$f = 0.1Hz$ to $10Hz$	-	5	-	μV_{p-p}
Input Voltage Noise Density	e_n	$f = 10Hz$	-	60	-	nV/ $\sqrt{Hz}$
		$f = 1kHz$	-	30	-	
		$f = 30kHz$	-	15	-	
Input Current Noise Density	i_n	$f = 1kHz$				fA/ $\sqrt{Hz}$
Total Harmonic Distortion plus Noise	THD+N	$V_{OUT} = 2V_{p-p}$, $A_v = +1V/V$, $f = 1kHz$	-	0.0001	-	%
		$R_L = 10k\Omega$ to GND $f = 20kHz$	-	0.002	-	
		$V_{OUT} = 2V_{p-p}$, $A_v = +1V/V$, $f = 1kHz$	-	0.0002	-	
		$R_L = 1k\Omega$ to GND $f = 20kHz$	-	0.004	-	

Note 1: All devices are 100% production tested at $T_A = +25^\circ C$; all specifications over the automotive temperature range is guaranteed by design, not production tested.

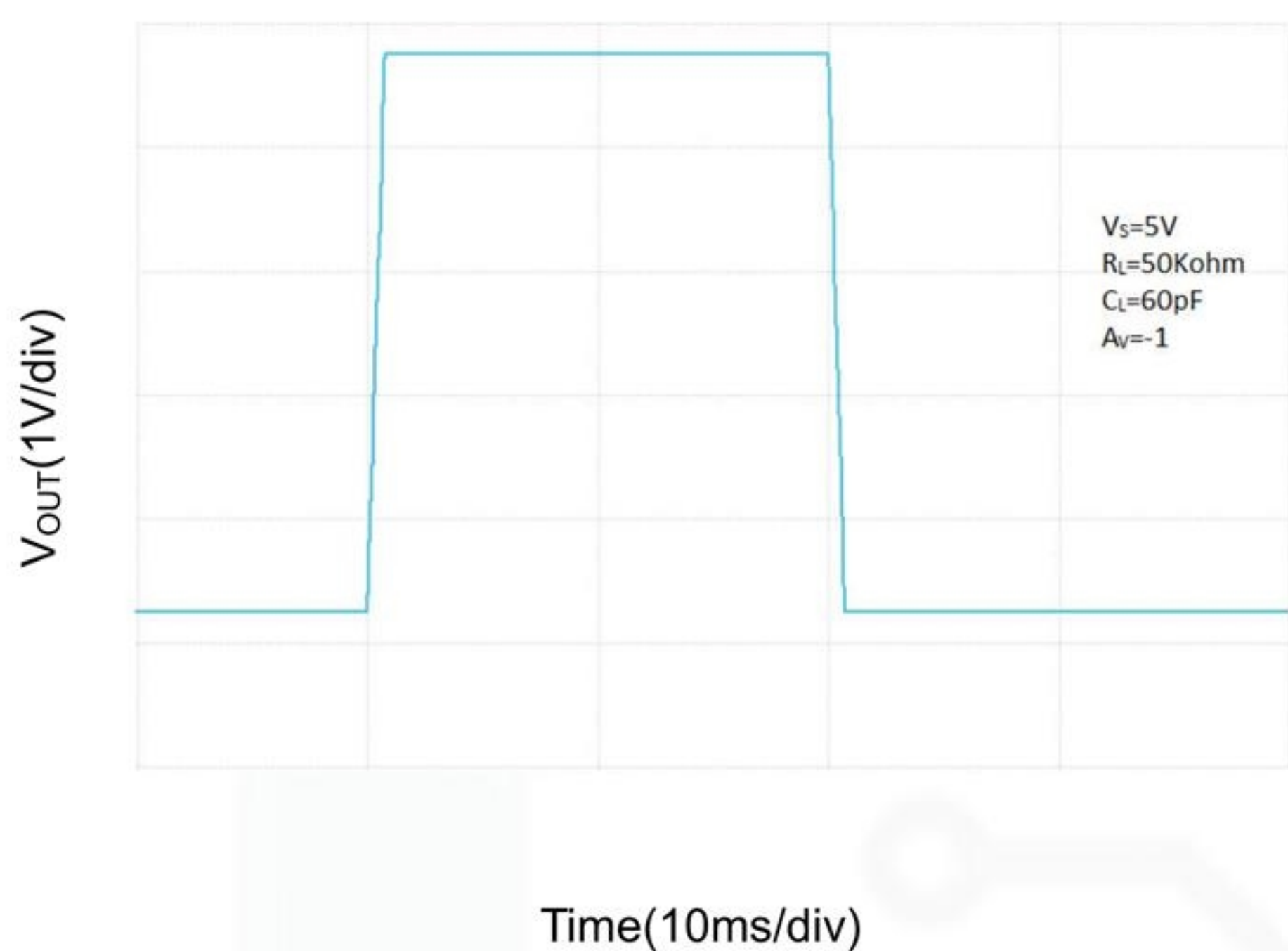
Note 2: Parameter is guaranteed by design.

Note 3: Peak-to-peak input noise voltage is defined as six times RMS value of input noise voltage.

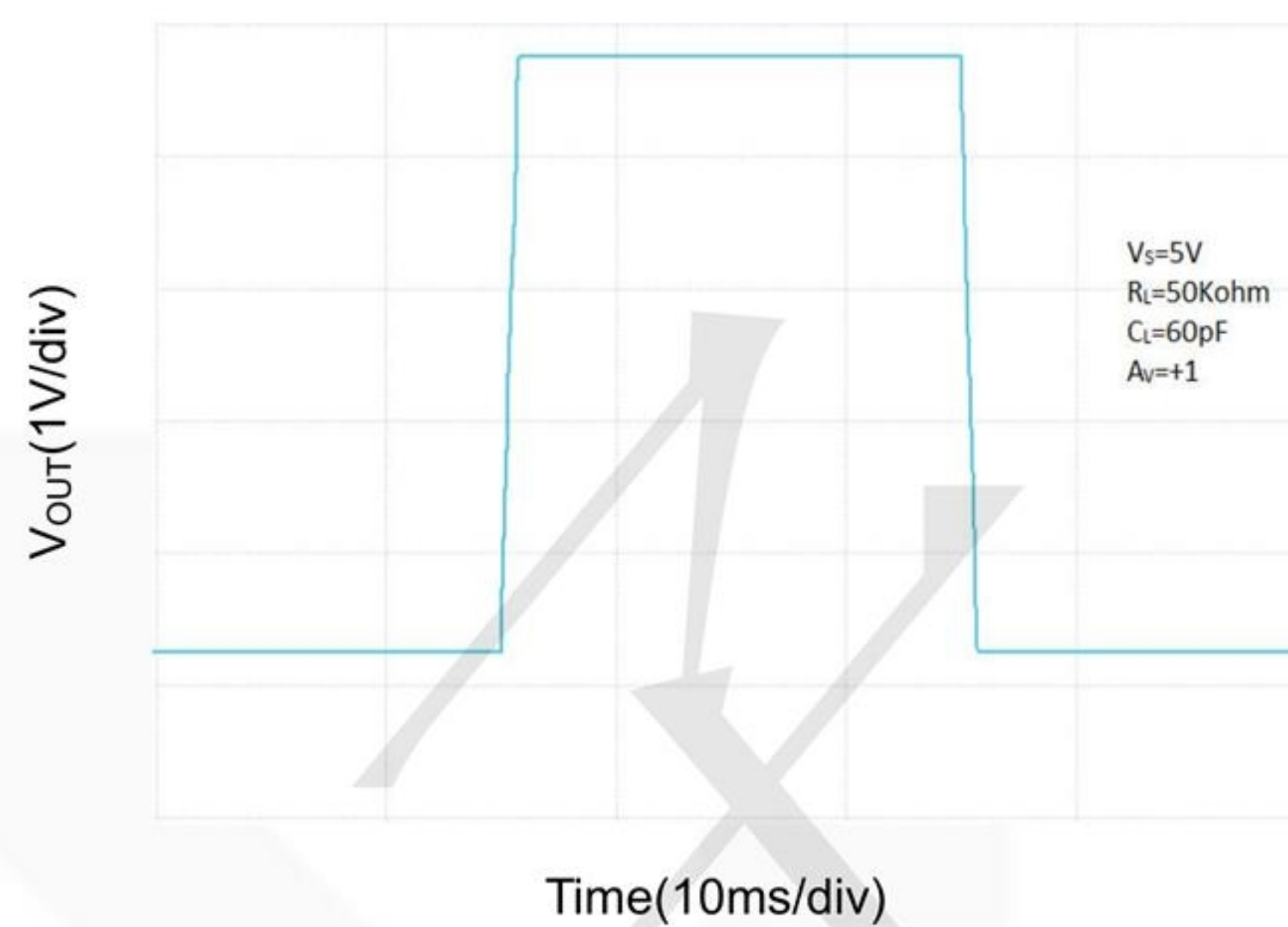
Typical Performance characteristics

At $T_A=+25^{\circ}\text{C}$, $V_S=+5\text{V}$, and $R_L=100\text{K}\Omega$ connected to $V_S/2$, unless otherwise noted.

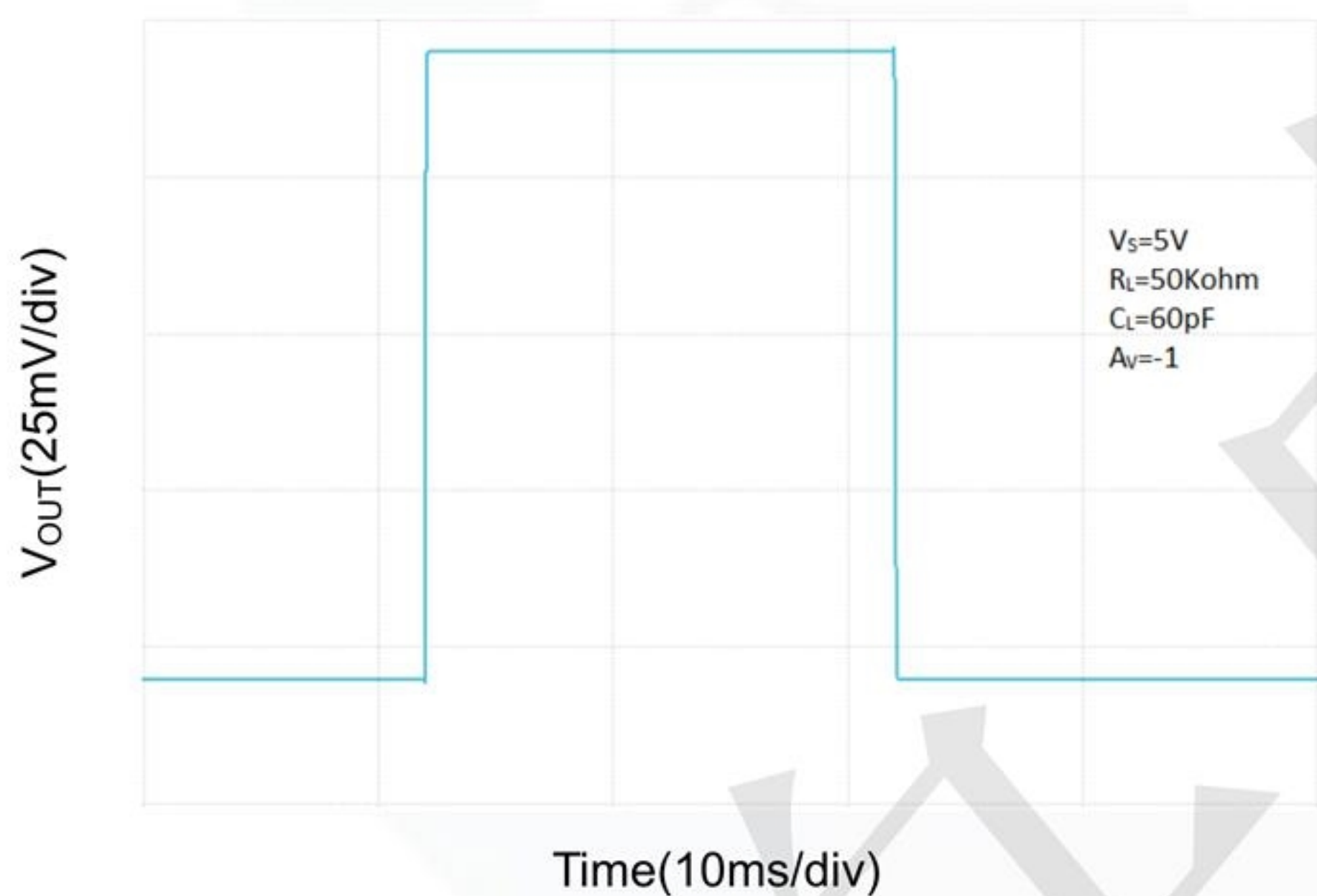
Large Signal Inverting Pulse Response



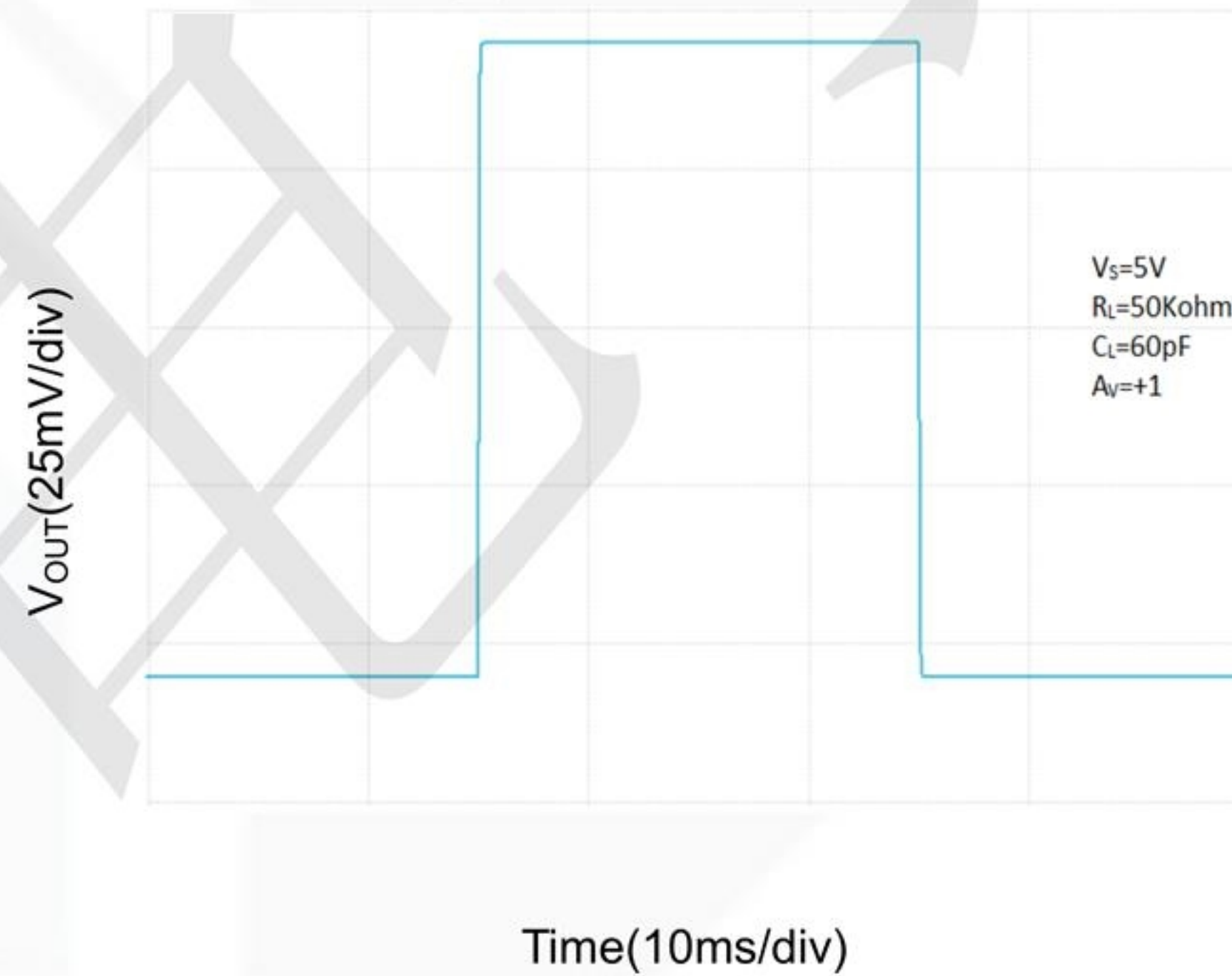
Large Signal Non-Inverting Pulse Response



Small Signal Inverting Pulse Response

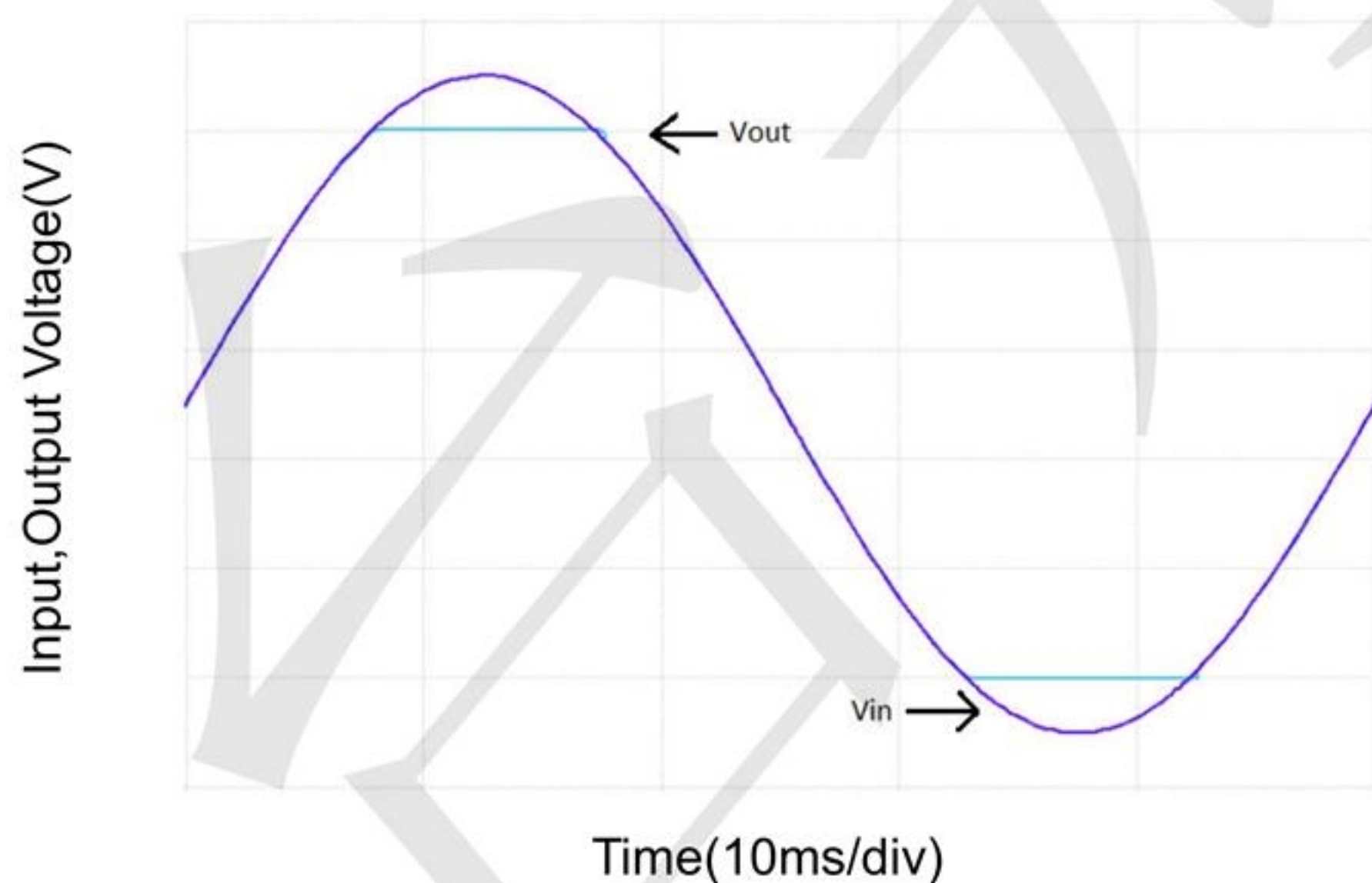


Small Signal Non-Inverting Pulse Response

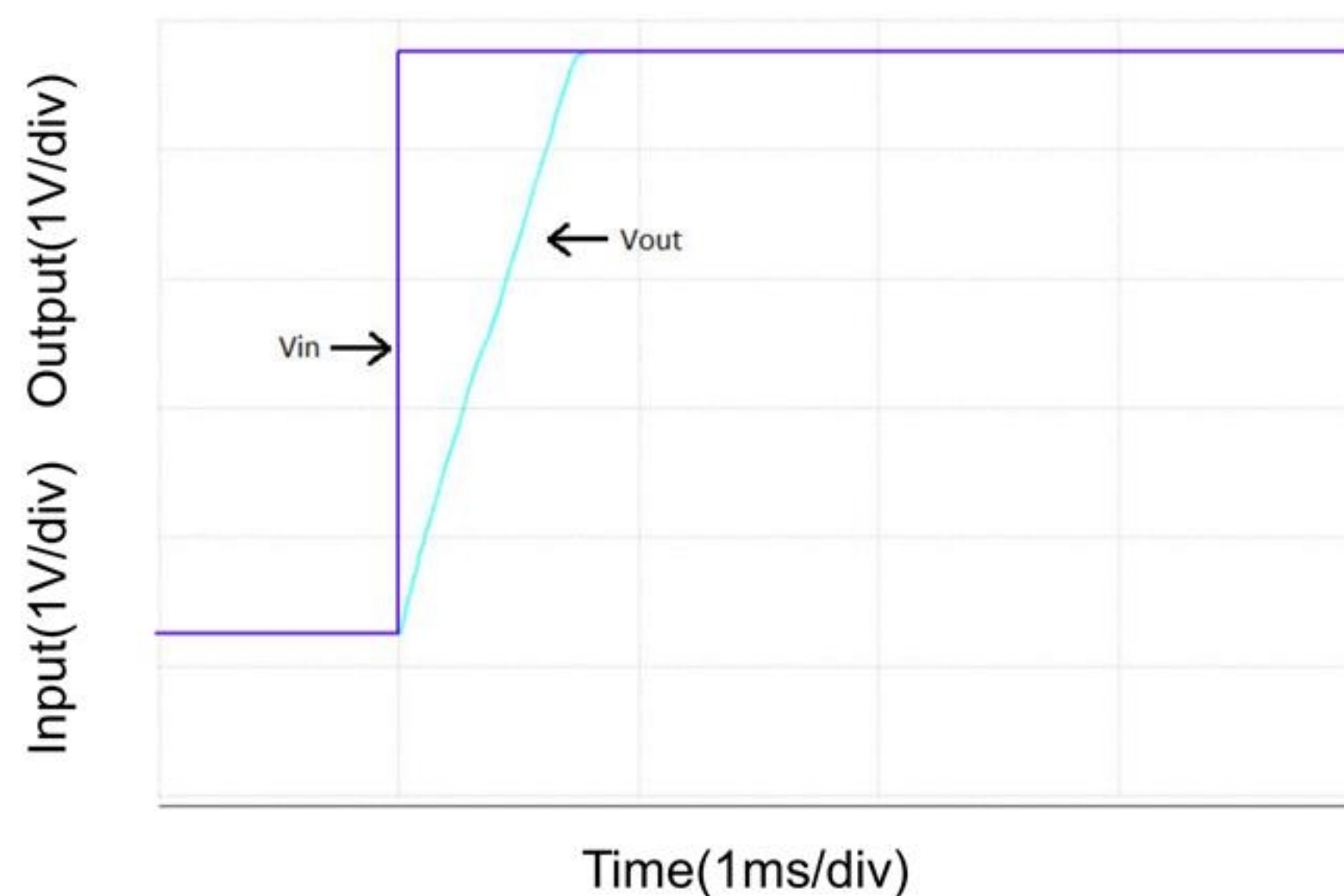


At $T_A=+25^{\circ}\text{C}$, $V_S=+5\text{V}$, and $R_L=100\text{K}\Omega$ connected to $V_S/2$, unless otherwise noted.

No Phase Reversal

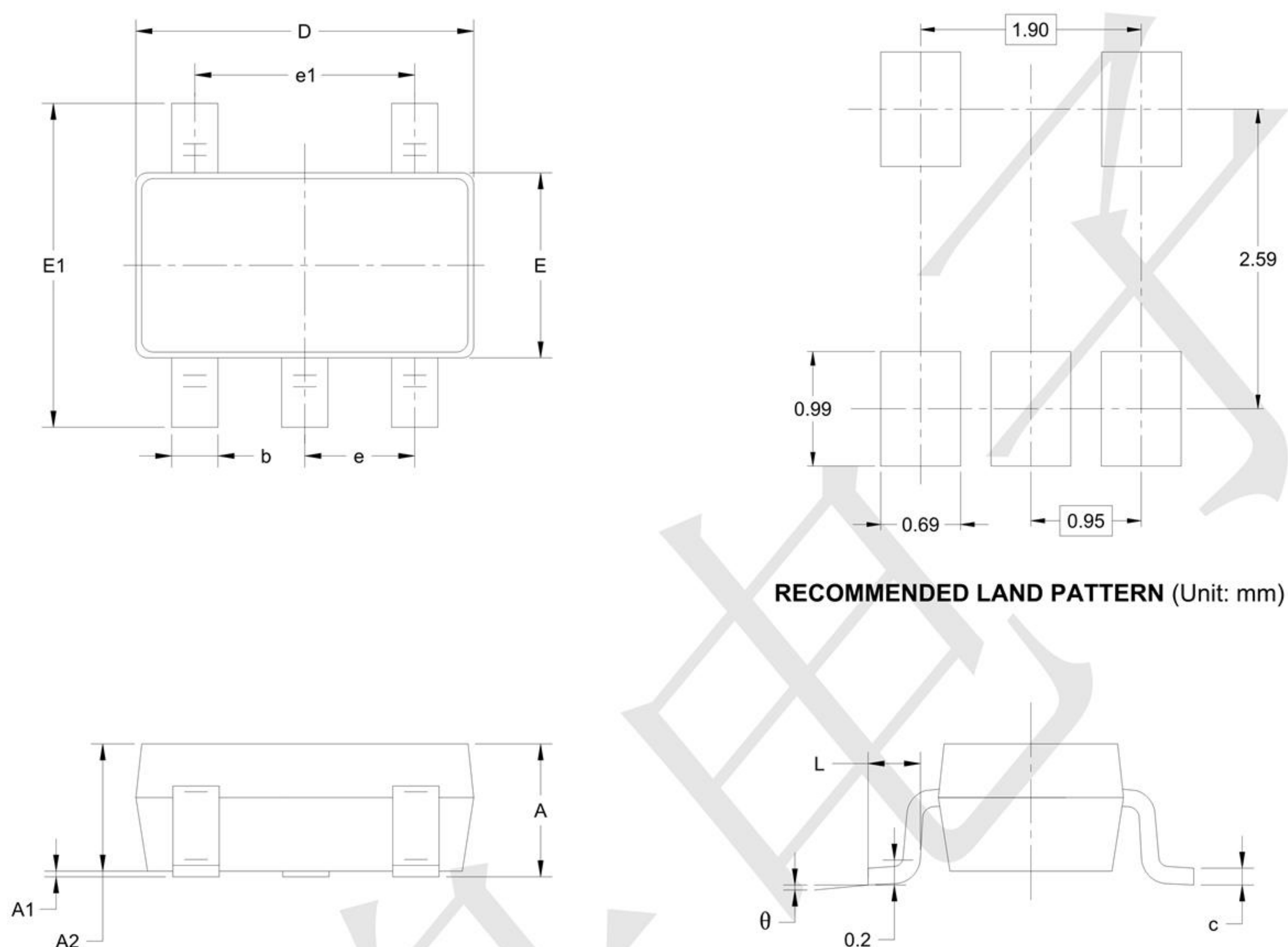


Output Settling Time



Package Information

SOT-23-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°