AK2929

Zero Drift operational amplifiers

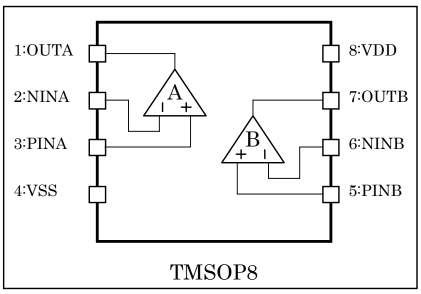
Feature

AK2929 is the dual channel CMOS operational amplifires which is available to output with very low input offset voltage (+/- 1.0μV) and near zero input offset dirft.
It's operated with very small current consumptions, 700μA typ./ch (VDD:3.2V +/- 5%), which is available to operate full swing signals in output.
AK2929 is appropriated to Sensor Pre Amp. applications.

☐ Low Voltage, Single Supply Operation : 2.7V - 5.5V
☐ Very Low Input Offset Voltage : +/- 1.0μV typ.
☐ Near Zero Dirft over time and temperature : +/- 2.0nV/°C typ.
☐ Full Swing Outputs to 10kΩ Load
☐ Power Supply Current : 700μA typ./ch (VDD: 3.2V +/- 5%, No Load)
☐ Gain Bandwidth : 2MHz typ.
☐ Package : TMSOP8

Part Name	Channel Number	Package
AK2929T 2		TMSOP8

Pin Location



(AK2929T)

Pin Function Descriptions

Pin number	Name	I/O note)	Function
1	OUTA	AO	Amplifier A Output
2	NINA	AI	Amplifier A Inverted Input
3	PINA	AI	Amplifier A No Inverted Input
4	VSS	PWR	Power Supply Ground
5 PINB		AI	Amplifier B No Inverted Input
6	NINB	AI	Amplifier B Inverted Input
7	OUTB	AO	Amplifier B Output
8	VDD	PWR	Positive Power Supply

Note)
PWR : Power Supply
AI : Analog Input
AO : Analog Output

Absolute Maximum Ratings

VSS=0V ; Note

Parameter	Symbol	Min	Max	Units
Supply Voltage	VDD	-0.3	6.5	V
Input Voltage	V_{TD}	-0.3	VDD + 0.3	V
Input Current	I_{IN} -1	0	+10	mA
Storage Temperature Range	T_{stg} -5	5	150	°C

Note : All voltage with respect to ground

WARNING :
Operational at or beyond these limits may result in permanent damage to the device. Normal operation is not guaranteed at these extremes.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Operationg Temperature Range	T_a	-40		85	°C	
Supply Voltage	VDD	2.7 5	.5		V	
Power Supply Current	Idd1		0.7	1.1	mA/ch.	VDD=3.2V +/- 5%, No Load

*We asuumes no responsibility for the usage beyond the conditions in this datasheet.

Electrical Characteristics

☐ DC Characteristics

VDD:5V, Ta:-40 to 85°C, unless otherwise noted

Parameter	Min.	Typ.	Max.	Units	Conditions
Input Voltage Offset		+/- 1	+/- 10	μV	
Input Voltage Offset Drift		+/- 2	+/- 100	nV/°C	
Input Bias Current		+/- 20		pA	
Input Common Mode Range		0.0 – VDD-0.2	V		
Output Voltage Swing		0.03 – VDD-0.03	V		RL ≥10kΩ connected to VDD/2
Common Mode Rejection Ratio	90	130		dB	
Power Supply Rejection Ratio	100	130		dB	
Large Signal Voltage Gain	100	130		dB	RL ≥10kΩ connected to VDD/2
Short Circuit Current		+/- 40		mA	
Output Current		+/- 20		mA	

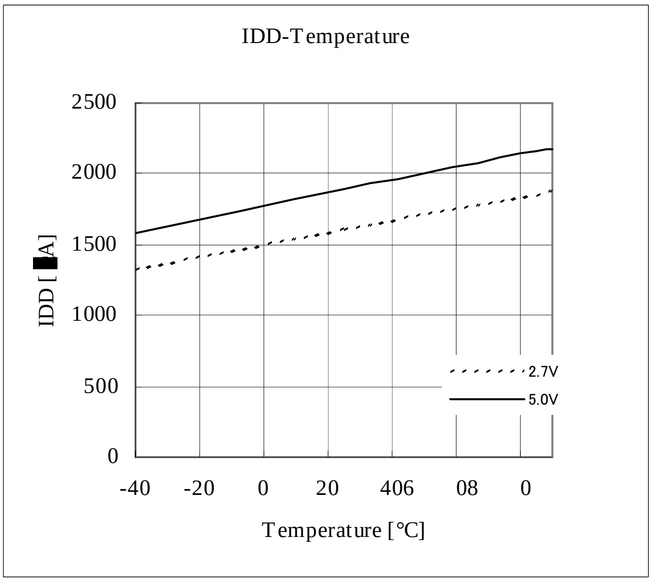
☐ AC Characteristics

VDD:5V, Ta:-40 to 85°C, unless otherwise noted

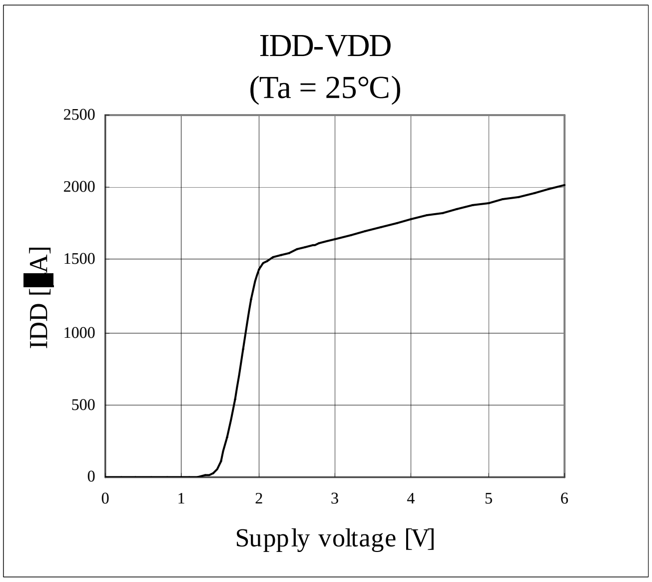
Parameter		Min.	Typ.	Max.	Units	Conditions
Gain Bandwidth			2		MHz	Av:1V/V
Slew Rate			1		V/μs	Av:1V/V
Input Voltage Noise			25		nVrms /√Hz	f:1kHz
	0.1 – 10Hz 0.5				μVpp	
0.1	– 1Hz		0.2		μVpp	
Overload Recovery Time			0.05		msec	Av:1V/V
Input Capacitance	Differential		1.5		pF	
	Common Mode		12		PF	
Maximum Capacitance Loads				150	pF	

Typical Operating Characteristics

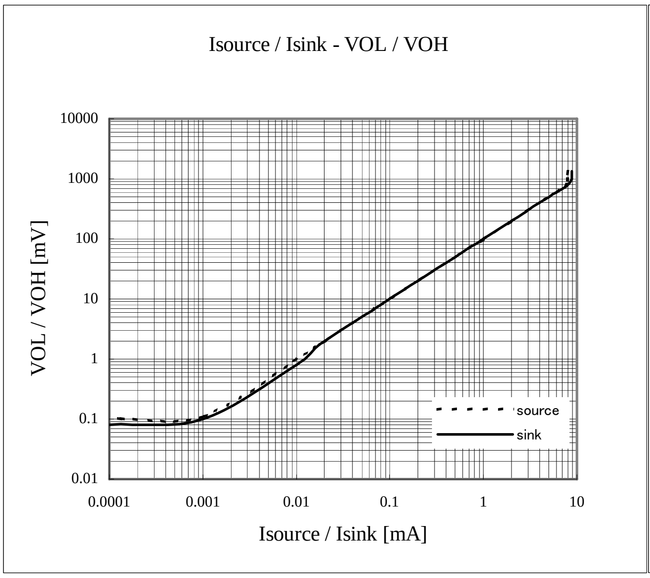
☐ Supply Current vs. Temperature
(Vin:1/2VDD)



☐ Supply Current vs. Supply Voltage
(Vin:1/2VDD)



☐ Output voltage vs. Load current
(VDD=2.7V, Ta=25°C)



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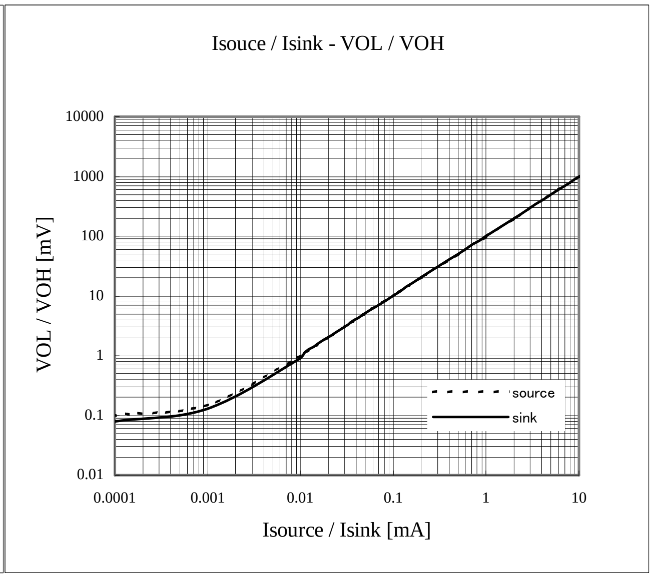
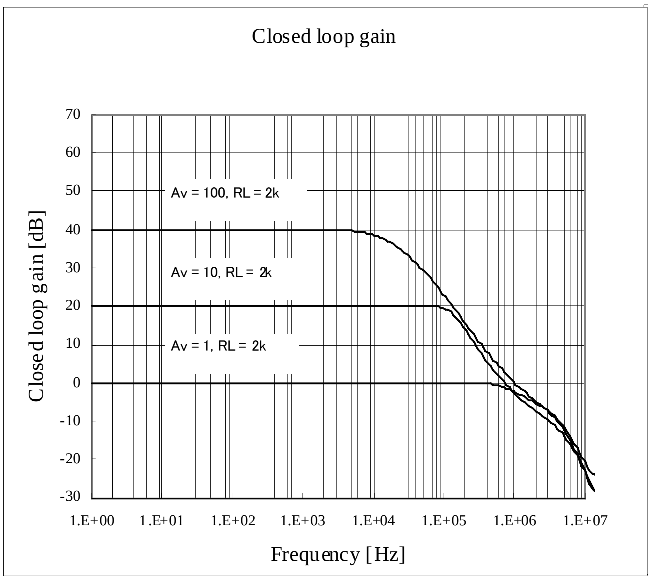


☐ Closed loop gain vs. Frequency
(VDD=2.7V, Ta=25°C)



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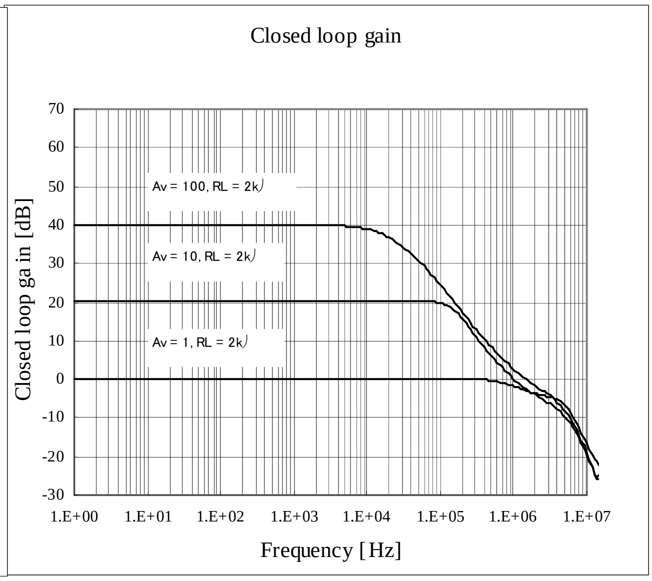
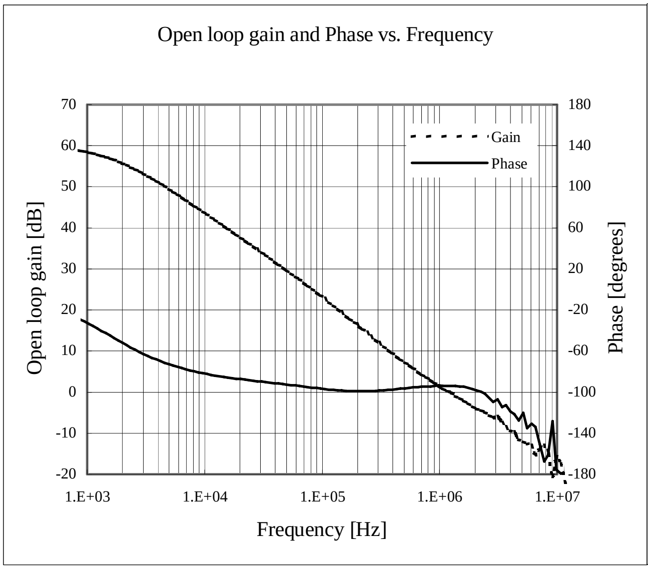


☐ Open loop gain and Phase vs. Frequency
(VDD=2.7V, Ta=25°C)



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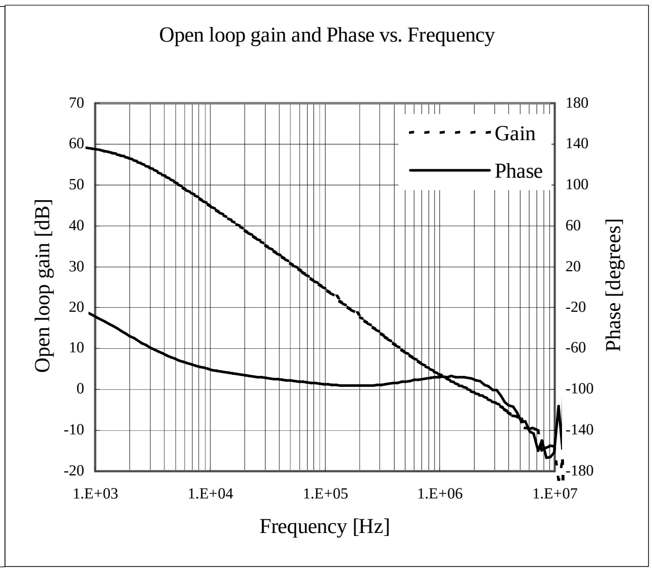
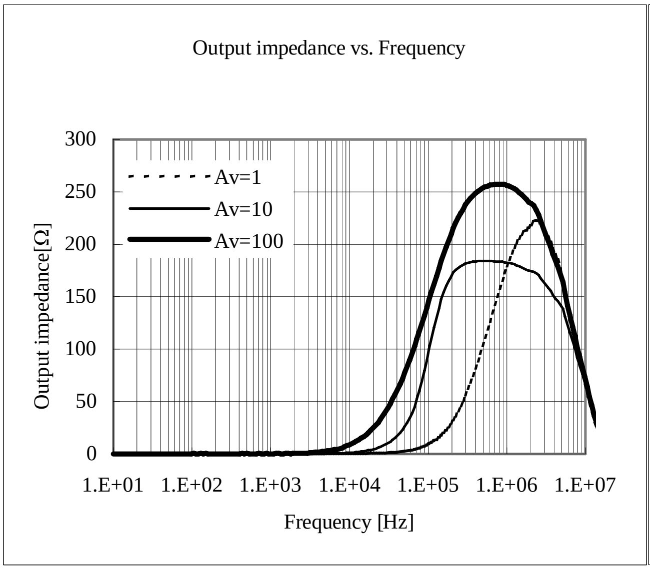
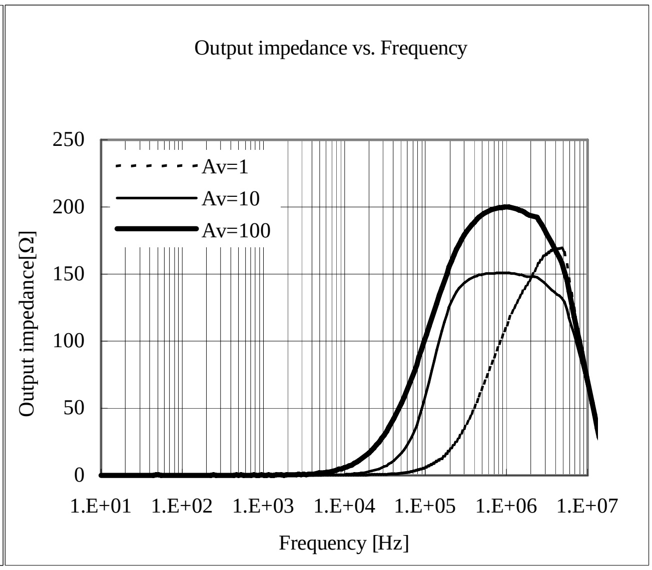
(VDD=5V, Ta=25°C)



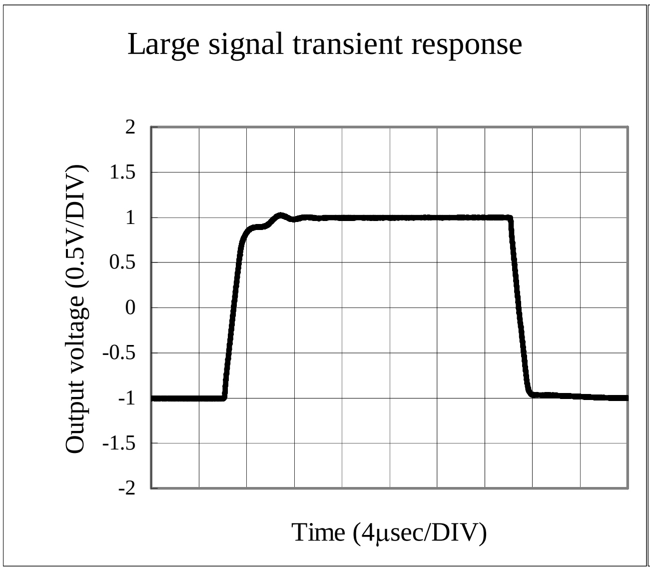
☐ Output impedance vs. Frequency
(VDD=2.7V, Ta=25°C)



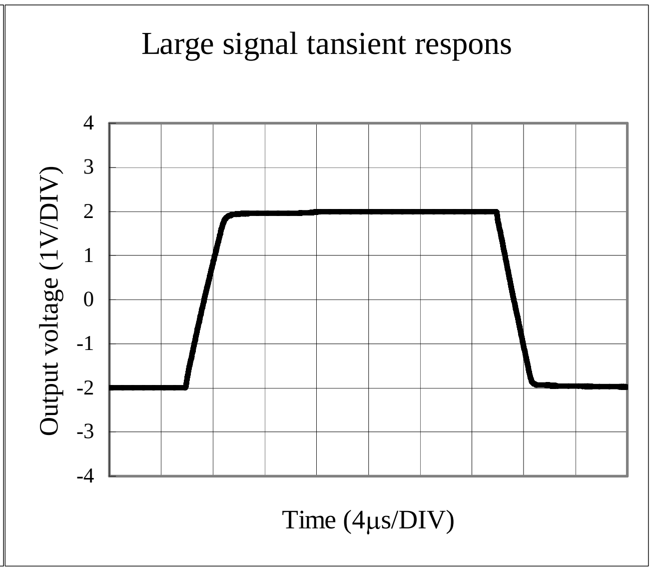
☐ Output impedance vs. Frequency
(VDD=5V, Ta=25°C)



☐ Large signal transient response
(VDD/VSS = +1.35V/- 1.35V,
Ta = 25°C, CL = 150pF)



☐ Large signal transient response
(VDD/VSS = +2.5V/-2.5V
Ta = 25°C, CL = 150pF)



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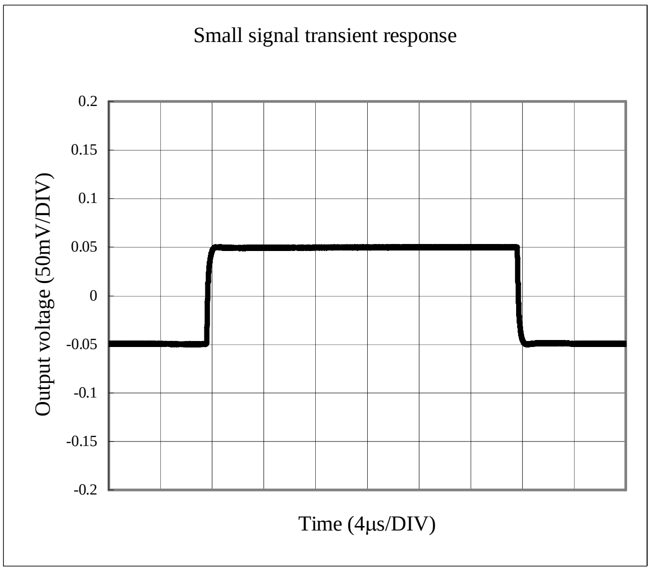

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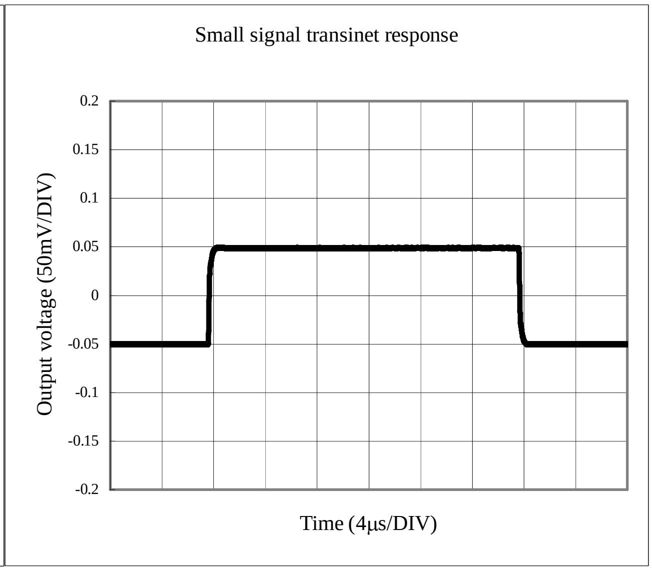
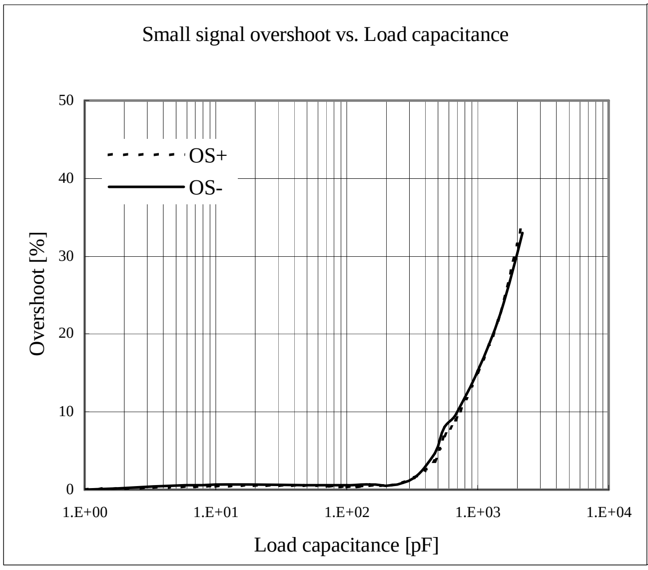


☐ Small signal overshoot vs. Load Capacitance
(VDD=2.7V, Ta=25°C)



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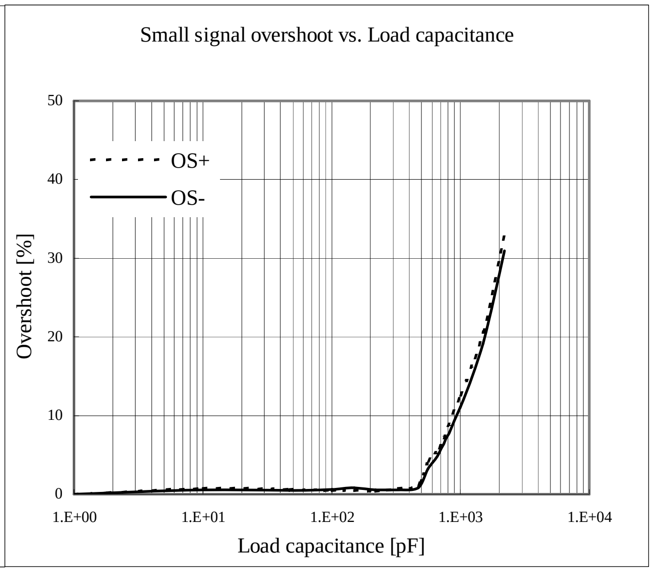
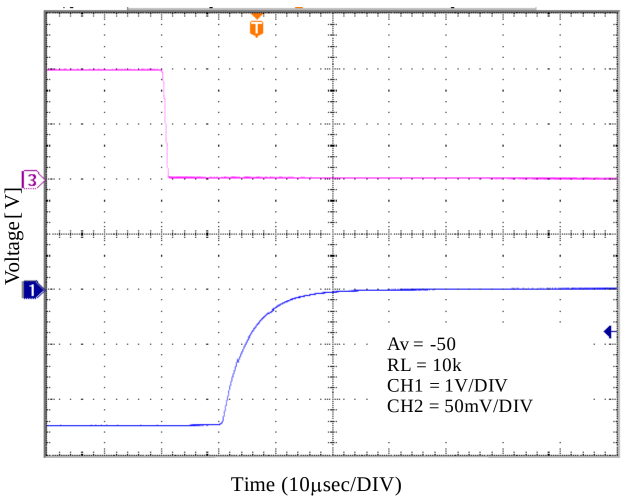


☐ Positive overvoltage recovery
(VDD/VSS = +2.5V/-2.5V, Ta = 25°C)

Positive overvoltage recovery



☐ Negative overvoltage recovery
(VDD/VSS = +2.5V/-2.5V, Ta = 25°C)

Negative overvoltage recovery