DESCRIPTION

The TLV263x single supply operational amplifiers provide rail-to-rail output with an input range that includes ground. The TLV263x takes the minimum operating supply voltage down to 2.7 V over the extended industrial temperature range (−40°C to 125°C) while adding the rail-to-rail output swing feature. The TLV263x also provides a 9 MHz gain-bandwidth product from only 730 µA of supply current. The maximum recommended supply voltage is 5.5 V, which, when coupled with a 2.7-V minimum, allows the devices to be operated from lithium ion cells.

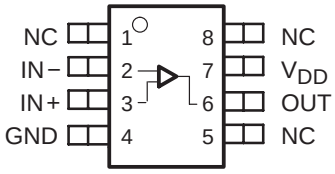
The combination of wide bandwidth, low noise, and low distortion makes it ideal for high speed and high resolution data converter applications. The ground input range allows it to directly interface to ground rail referred systems.

FEATURES

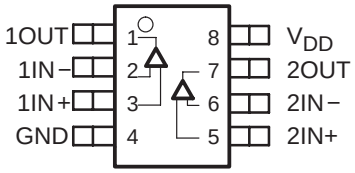
- Rail-To-Rail Output
- V_{ICR} Includes Ground
- Gain-Bandwidth Product . . . 9 MHz
- Supply Current . . . 730 µA/Channel
- Single, Duals, and Quad Versions
- Ultralow Power Down Mode
  $I_{DD(SHDN)}$ = 4 µA/Channel
- Specified Temperature Range
  −40°C to 125°C . . . Industrial Grade
- Supply Voltage Range . . . 2.7 V to 5.5 V

TLV263x PACKAGE PINOUTS

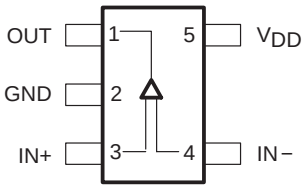
TLV2631
SOP-8



TLV2632
SOP-8

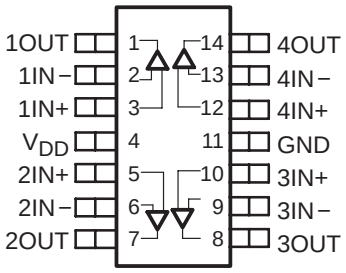


TLV2631
SOT23-5



NC − No internal connection

TLV2634
TSSOP-14/SOP-14



Recommended operating conditions

		MIN	MAX	UNIT
Supply voltage, V_{DD}	Single supply	2.7	5.5	V
	Split supply	±1.35	±2.75	
Common-mode input voltage range, V_{ICR}		GND	V_{DD}−1	V
Operating free-air temperature, T_A	I-suffix	−40	125	°C
	V_{IL}		0.4	
	V_{IH}	2		

‡ Relative to GND.

Electrical characteristics at specified free-air temperature, V_{DD} = 2.7 V, 5 V (unless otherwise noted) dc performance

PARAMETER		TEST CONDITIONS		T_A	MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	V_{IC} = VDD/2, V = V /2		25°C		250	3500	µV
				Full range			4500	
			TLV2634	25°C		250	4200	µV
				Full range			5200	
α_{VIO}	Temperature coefficient of input offset voltage			25°C		3		µV/°C
CMRR	Common-mode rejection ratio	VIC = GND to VDD−1 V	VDD = 2.7 V	25°C	76	100		dB
				Full range	67			
			VDD = 5 V	25°C	77	100		
				Full range	74			
A_{VD}	Large-signal differential voltage amplification	R_L = 2 kΩ, $V_{O(PP)}$ = V_{DD}−1 V		25°C	90	100		dB
				Full range	82			

Electrical characteristics at specified free-air temperature, V_{DD} = 2.7 V, 5 V (unless otherwise noted) (continued)
input characteristics

PARAMETER		TEST CONDITIONS	T_A†	MIN	TYP	MAX	UNIT
I_{IO}	Input offset current	$V_{IC} = V_{DD}/2$, $V_O = V_{DD}/2$	25°C		1	50	pA
			Full range			100	
I_{IB}	Input bias current		25°C		1	50	
			Full range			200	
$r_{i(d)}$	Differential input resistance		25°C		1000		GΩ
$C_{i(c)}$	Common-mode input capacitance	f = 1 kHz	25°C		12		pF

† Full range is −40°C to 125°C for the I-suffix.

Output characteristics

PARAMETER		TEST CONDITIONS		T_A†	MIN	TYP	MAX	UNIT
V_{OH}	High-level output voltage	$V_{IC} = V_{DD}/2$, I_{OH} = −1 mA	V_{DD} = 2.7 V	25°C	2.6	2.67		V
				Full range	2.55			
			V_{DD} = 5 V	25°C	4.92	4.98		
				Full range	4.9			
		$V_{IC} = V_{DD}/2$, I_{OH} = −10 mA	V_{DD} = 2.7 V	25°C	2.25	2.43		
				Full range	2.15			
			V_{DD} = 5 V	25°C	4.7	4.8		
				Full range	4.65			
V_{OL}	Low-level output voltage	$V_{IC} = V_{DD}/2$, I_{OL} = 1 mA	V_{DD} = 2.7 V	25°C		0.03	0.1	mV
				Full range			0.15	
			V_{DD} = 5 V	25°C		0.025	0.08	
				Full range			0.1	
		$V_{IC} = V_{DD}/2$, I_{OL} = 10 mA	V_{DD} = 2.7 V	25°C		0.26	0.45	
				Full range			0.47	
			V_{DD} = 5 V	25°C		0.2	0.3	
				Full range			0.35	
I_O	Output current	V_{DD} = 2.7 V, V_O = 0.5 V from rail	Sourcing	25°C		14		mA
			Sinking			19		
		V_{DD} = 5 V, V_O = 0.5 V from rail	Sourcing			28		
			Sinking			28		
I_{OS}	Short-circuit output current	Sourcing	V_{DD} = 2.7 V	25°C		50		mA
			V_{DD} = 5 V			95		
		Sinking	V_{DD} = 2.7 V			50		
			V_{DD} = 5 V			95		

† Full range is −40°C to 125°C for the I-suffix.

Power supply

PARAMETER		TEST CONDITIONS		T_A†	MIN	TYP	MAX	UNIT
I_{DD}	Supply current (per channel)	$V_O = V_{DD}/2$,	$\overline{SHDN} = V_{DD}$	25°C		730	1000	µA
				Full range			1350	
PSRR	Supply voltage rejection ratio (ΔV_{DD} /ΔV_{IO})	V_{DD} = 2.7 V to 5.5 V, $V_{IC} = V_{DD}/2$	No load	25°C	70	90		dB
				Full range	65			

† Full range is −40°C to 125°C for the I-suffix.

Electrical characteristics at specified free-air temperature, V_{DD} = 2.7 V, 5 V (unless otherwise noted) (continued)

Dynamic performance

PARAMETER		TEST CONDITIONS		T_A†	MIN	TYP	MAX	UNIT
GBWP	Gain-bandwidth product	R_L = 2 kΩ, C_L = 10 pF, f = 10 kHz		25°C		9		MHz
SR+	Positive slew rate at unity gain	R_L = 2 kΩ, C_L = 50 pF	V_{DD} = 2.7 V, $V_{O(PP)}$ = 1.7 V			6		V/µs
			V_{DD} = 5 V, $V_{O(PP)}$ = 3.5 V			6		
SR−	Negative slew rate at unity gain	R_L = 2 kΩ, C_L = 50 pF	V_{DD} = 2.7 V, $V_{O(PP)}$ = 1.7 V			10		V/µs
			V_{DD} = 5 V, $V_{O(PP)}$ = 3.5 V			9.5		V/µs
ϕ_m	Phase margin	R_L = 2 kΩ,	C_L = 10 pF			50		°
	Gain margin					20		dB

† Full range is −40°C to 125°C for the I-suffix.

Noise/distortion performance

PARAMETER		TEST CONDITIONS		T_A	MIN	TYP	MAX	UNIT
THD + N	Total harmonic distortion plus noise	$V_{O(PP)}$ = V_{DD}/2, R_L = 2 kΩ, f = 10 kHz	A_V = 1	25°C		0.003%		
			A_V = 10			0.02%		
			A_V = 100			0.095%		
V_n	Equivalent input noise voltage	f = 1 kHz				50		nV/√Hz
		f = 10 kHz				30		
I_n	Equivalent input noise current	f = 1 kHz				0.9		fA/√Hz

Shutdown characteristics

PARAMETER		TEST CONDITIONS		T_A†	MIN	TYP	MAX	UNIT
$I_{DD(SHDN)}$	Supply current, per channel in shutdown mode (TLV2630, TLV2633, TLV2635)	$\overline{SHDN}$ = 0.4 V		25°C		4	17	µA
				Full range			19	
$t_{(on)}$	Amplifier turnon time‡	R_L = 2 kΩ, C_L = 10 pF	V_{DD} = 2.7 V	25°C		4.5		µs
			V_{DD} = 5 V			1.5		
$t_{(off)}$	Amplifier turnoff time‡					200		ns

† Full range is −40°C to 125°C for the I-suffix.

‡ Disable time and enable time are defined as the interval between application of the logic signal to $\overline{SHDN}$ and the point at which the supply current has reached half its final value.

TYPICAL CHARACTERISTICS

INPUT OFFSET VOLTAGE
vs
COMMON-MODE INPUT VOLTAGE

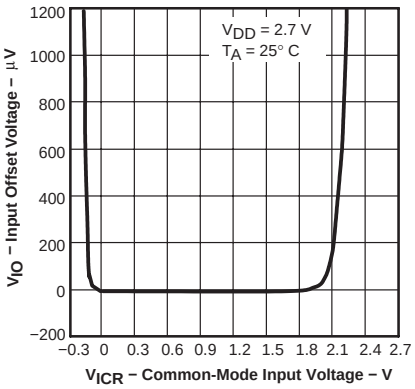


Figure 1

INPUT OFFSET VOLTAGE
vs
COMMON-MODE INPUT VOLTAGE

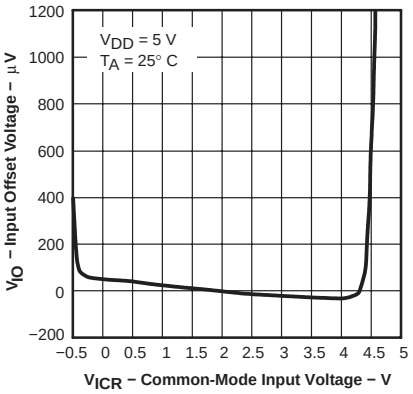


Figure 2

HIGH-LEVEL OUTPUT VOLTAGE
vs
HIGH-LEVEL OUTPUT CURRENT

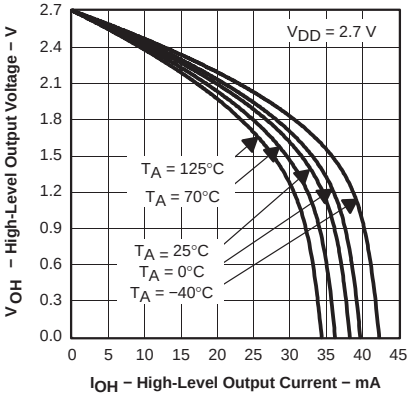


Figure 4

COMMON-MODE REJECTION RATIO
vs
FREQUENCY

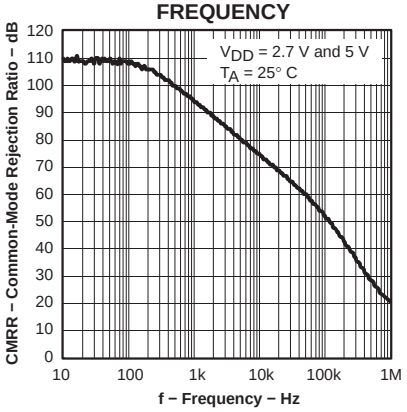


Figure 3

LOW-LEVEL OUTPUT VOLTAGE
vs
LOW-LEVEL OUTPUT CURRENT

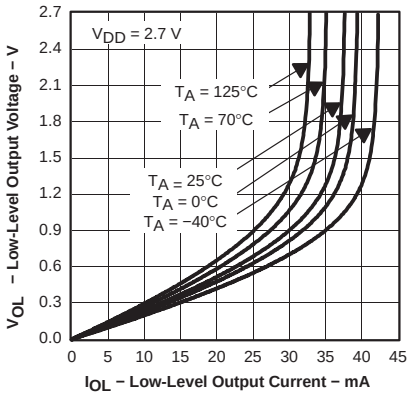


Figure 5

HIGH-LEVEL OUTPUT VOLTAGE
vs
HIGH-LEVEL OUTPUT CURRENT

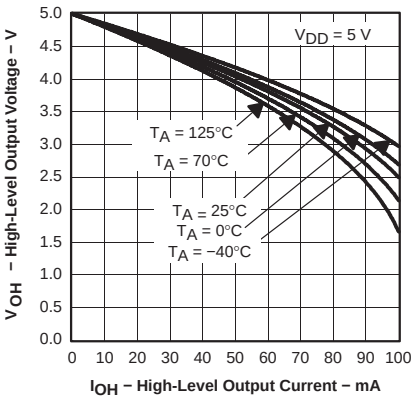


Figure 6

LOW-LEVEL OUTPUT VOLTAGE
vs
LOW-LEVEL OUTPUT CURRENT

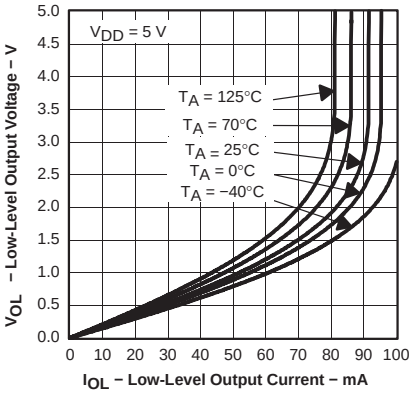


Figure 7

SUPPLY CURRENT
vs
SUPPLY VOLTAGE

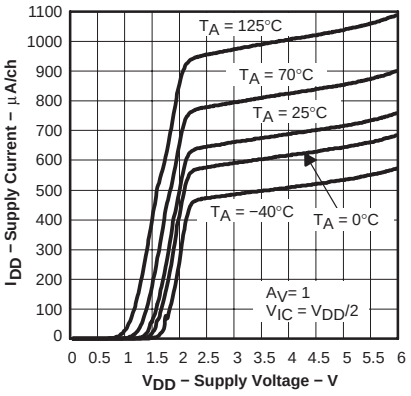


Figure 8

SUPPLY CURRENT
vs
FREE-AIR TEMPERATURE

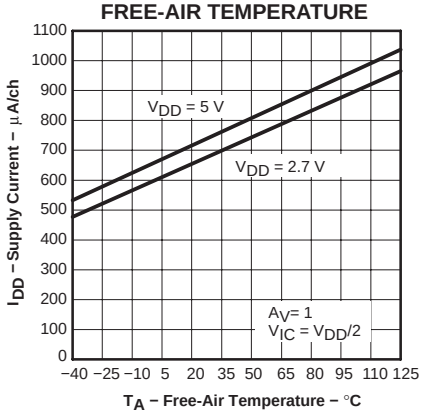


Figure 9

POWER SUPPLY REJECTION RATIO
vs
FREQUENCY

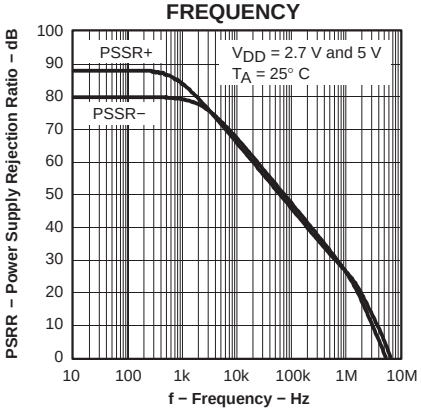


Figure 10

DIFFERENTIAL VOLTAGE AMPLIFICATION AND PHASE
vs
FREQUENCY

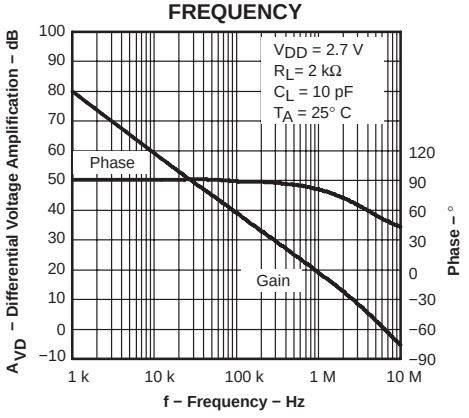


Figure 11

GAIN-BANDWIDTH PRODUCT
vs
SUPPLY VOLTAGE

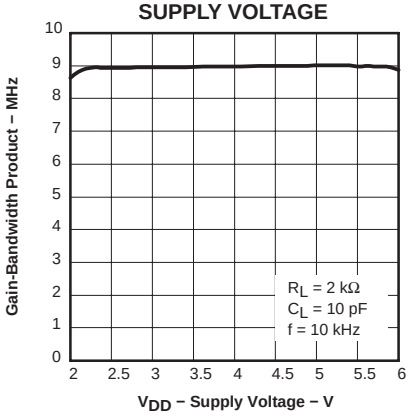


Figure 12

TYPICAL CHARACTERISTICS

GAIN-BANDWIDTH PRODUCT vs FREE-AIR TEMPERATURE

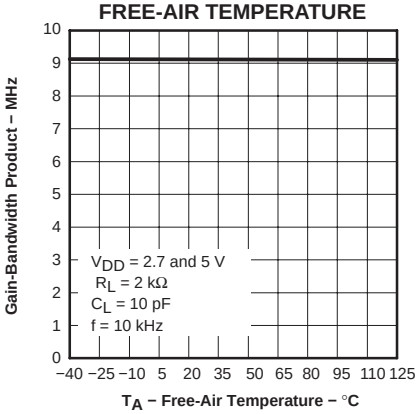


Figure 13

SLEW RATE vs SUPPLY VOLTAGE

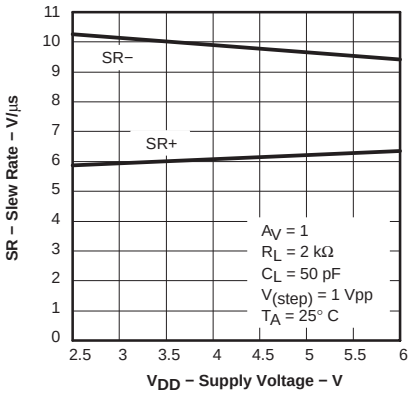


Figure 14

SLEW RATE vs FREE-AIR TEMPERATURE

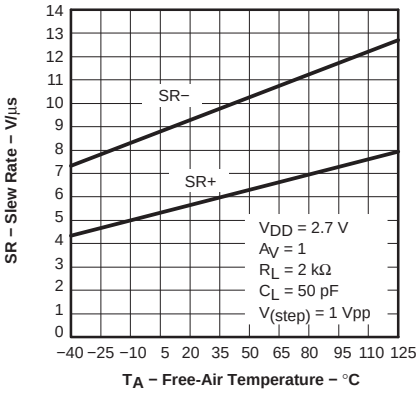


Figure 15

SLEW RATE vs FREE-AIR TEMPERATURE

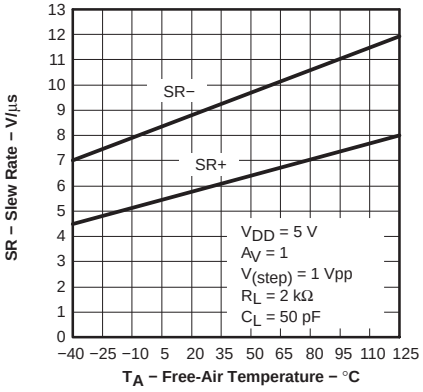


Figure 16

PHASE MARGIN vs LOAD CAPACITANCE

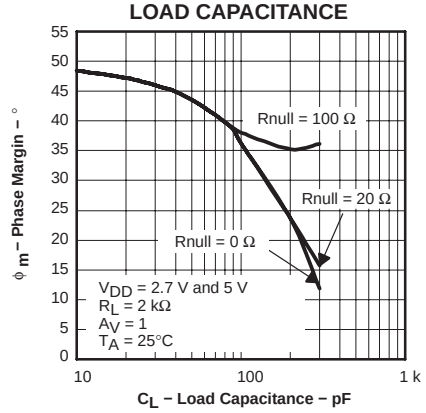


Figure 17

EQUIVALENT INPUT NOISE VOLTAGE vs FREQUENCY

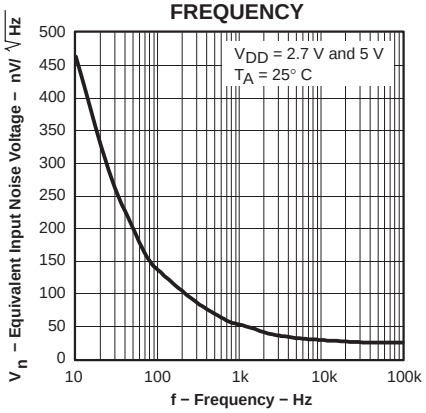


Figure 18

TYPICAL CHARACTERISTICS

CROSSTALK vs FREQUENCY

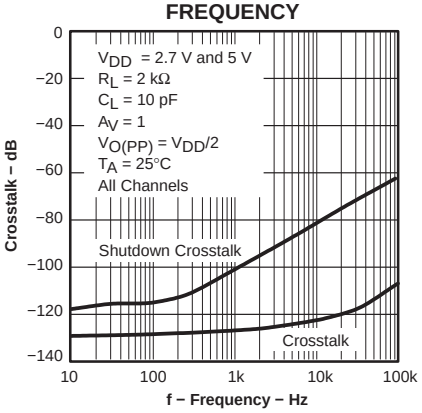


Figure 19

VOLTAGE-FOLLOWER LARGE-SIGNAL PULSE RESPONSE

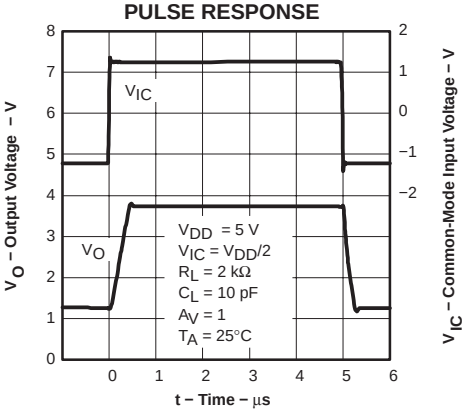


Figure 20

VOLTAGE-FOLLOWER SMALL-SIGNAL PULSE RESPONSE

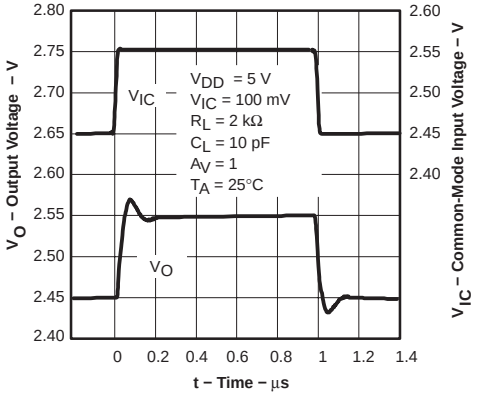


Figure 21

SHUTDOWN SUPPLY CURRENT vs FREE-AIR TEMPERATURE

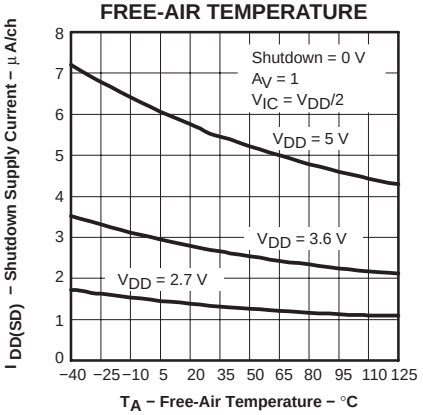


Figure 22

SHUTDOWN SUPPLY CURRENT vs SUPPLY VOLTAGE

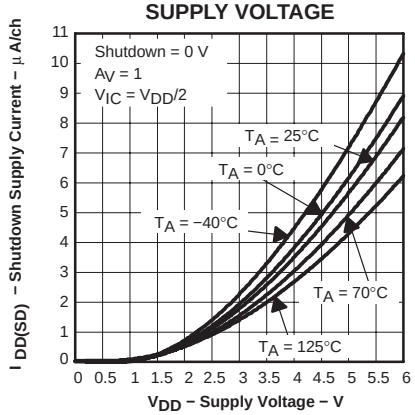


Figure 23

TYPICAL CHARACTERISTICS

SHUTDOWN SUPPLY CURRENT / OUTPUT VOLTAGE vs TIME

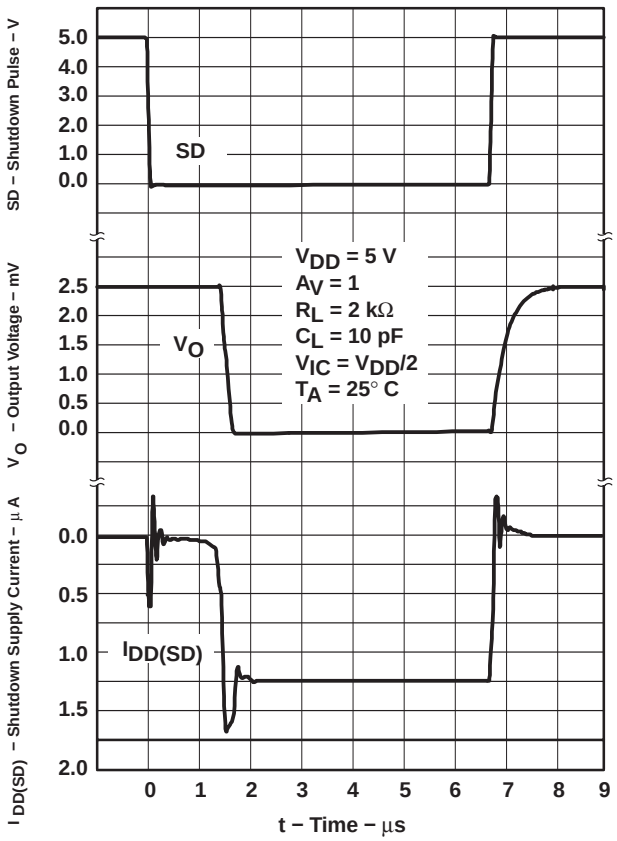
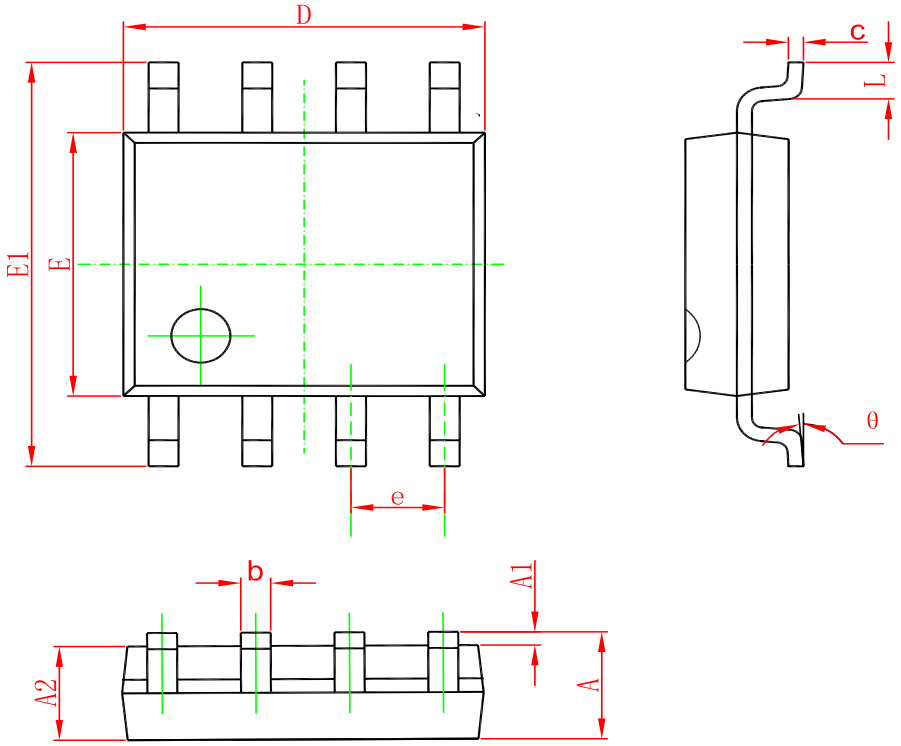


Figure 24

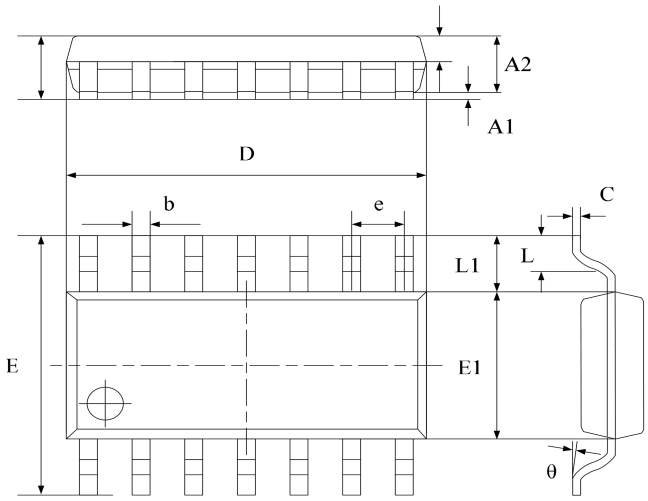
Package Dimension

SOP-8



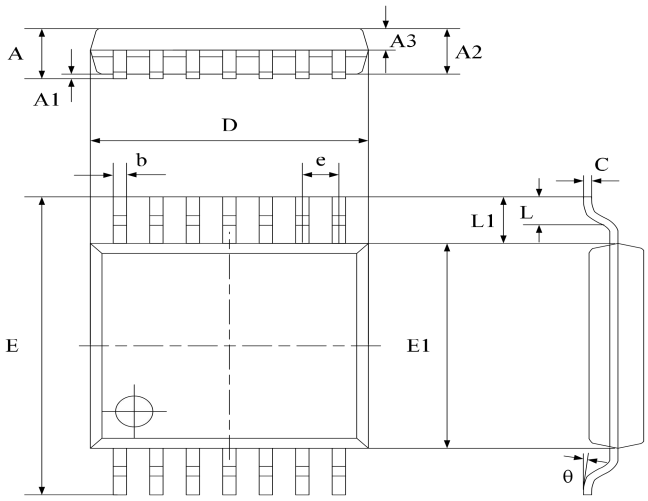
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

SOP-14



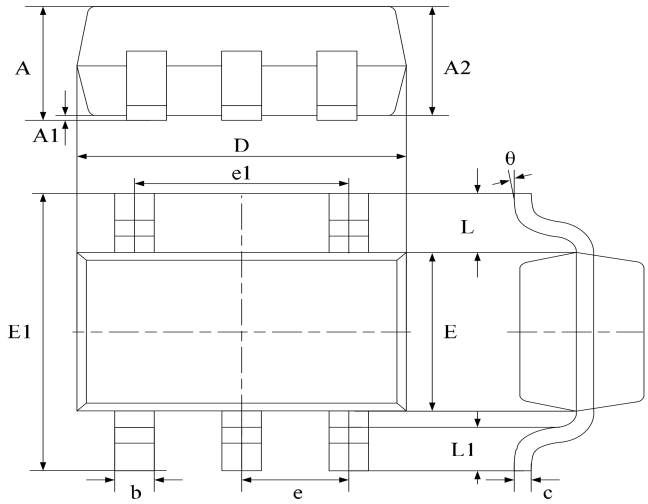
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.450	1.850	0.059	0.076
A1	0.100	0.300	0.004	0.012
A2	1.350	1.550	0.055	0.063
A3	0.550	0.750	0.022	0.031
b	0.406typ.		0.017typ.	
C	0.203typ.		0.008typ.	
D	8.630	8.830	0.352	0.360
E	5.840	6.240	0.238	0.255
E1	3.850	4.050	0.157	0.165
e	1.270 typ.		0.050 typ.	
L1	1.040 ref.		0.041 ref.	
L	0.350	0.750	0.014	0.031
θ	2°	8°	2°	8°

TSSOP-14



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	-	1.200	-	0.0472
A1	0.050	0.150	0.002	0.006
A2	0.900	1.050	0.037	0.043
A3	0.390	0.490	0.016	0.020
b	0.200	0.290	0.008	0.012
C	0.130	0.180	0.005	0.007
D	4.860	5.060	0.198	0.207
E	6.200	6.600	0.253	0.269
E1	4.300	4.500	0.176	0.184
e	0.650 typ.		0.0256 typ.	
L1	1.000 ref.		0.0393 ref.	
L	0.450	0.750	0.018	0.031
θ	0°	8°	0°	8°

SOT23-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.040	1.350	0.042	0.055
A1	0.040	0.150	0.002	0.006
A2	1.000	1.200	0.041	0.049
b	0.380	0.480	0.015	0.020
c	0.110	0.210	0.004	0.009
D	2.720	3.120	0.111	0.127
E	1.400	1.800	0.057	0.073
E1	2.600	3.000	0.106	0.122
e	0.950 typ.		0.037 typ.	
e1	1.900 typ.		0.078 typ.	
L	0.700 ref.		0.028 ref.	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Ordering information

Order code	Package	Baseqty	Deliverymode	Marking
UMW TLV2631IDBVT	SOT23-5	3000	Tape and reel	VAZI U
UMW TLV2631IDBVR	SOT23-5	3000	Tape and reel	VAZI U
UMW TLV2631ID	SOP-8	2500	Tape and reel	TLV2631
UMW TLV2632IDR	SOP-8	2500	Tape and reel	2632I
UMW TLV2634ID	SOP-14	2500	Tape and reel	2634I
UMW TLV2634IPW	TSSOP-14	4000	Tape and reel	2634I
UMW TLV2634IPWR	TSSOP-14	4000	Tape and reel	2634I

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Operational Amplifiers - Op Amps ***category:***

Click to view products by Youtai ***manufacturer:***

Other Similar products are found below :

430227FB LT1678IS8 NCV33202DMR2G NJM324E M38510/13101BPA NTE925 AZV358MTR-G1 AP4310AUMTR-AG1 AZV358MMTR-G1 SCY33178DR2G NCV20034DR2G NTE778S NTE871 NTE937 NJU7057RB1-TE2 SCY6358ADR2G NJM2904CRB1-TE1 UPC4570G2-E1-A UPC4741G2-E1-A UPC4574GR-9LG-E1-A NJM8532RB1-TE1 EL2250CS EL5100IS EL5104IS EL5127CY EL5127CYZ EL5133IW EL5152IS EL5156IS EL5162IS EL5202IY EL5203IY EL5204IY EL5210CS EL5210CYZ EL5211IYE EL5220CY EL5223CLZ EL5223CR EL5224ILZ EL5227CLZ EL5227CRZ EL5244CS EL5246CS EL5246CSZ EL5250IY EL5251IS EL5257IS EL5260IY EL5261IS