SONY

CXD2475TQ

Reference Voltage and Driver IC for LCD

Description

The CXD2475TQ is suitable IC for applying reference voltage for gamma correction which is necessary for TFT liquid crystal display. This IC has a built-in 9 channels of rail-to-rail buffer circuit which enables 2-input switch and a common driver circuit.

Features

- Built-in 9 channels of rail-to-rail buffer circuit
- Built-in common driver circuit
- Current consumption: 3.6mA (typ.)
- Package: 48pin TQFP

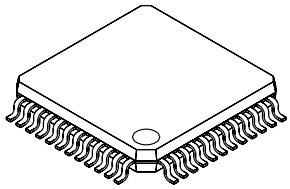
Structure

Bi-CMOS IC

Applications

Small liquid crystal monitor

48 pin TQFP (Plastic)



Absolute Maximum Ratings (Ta = 25°C)

• Supply voltage	V_{CC} *1	7.0	V
	V_{VG} *2	7.0	V
	V_{VC} *3	≤ V_{CC} + 0.2	V
	V_{VG} *4	≥ GND – 0.2	V
• Operating temperature			
	Topr	–25 to +85	°C
• Storage temperature			
	Tstg	–55 to +150	°C
• Allowable power dissipation (Ta ≤ 25°C)			
	Pd	1.72	W
• Reduced ratio (Ta < 25°C)		13.8	mW/°C

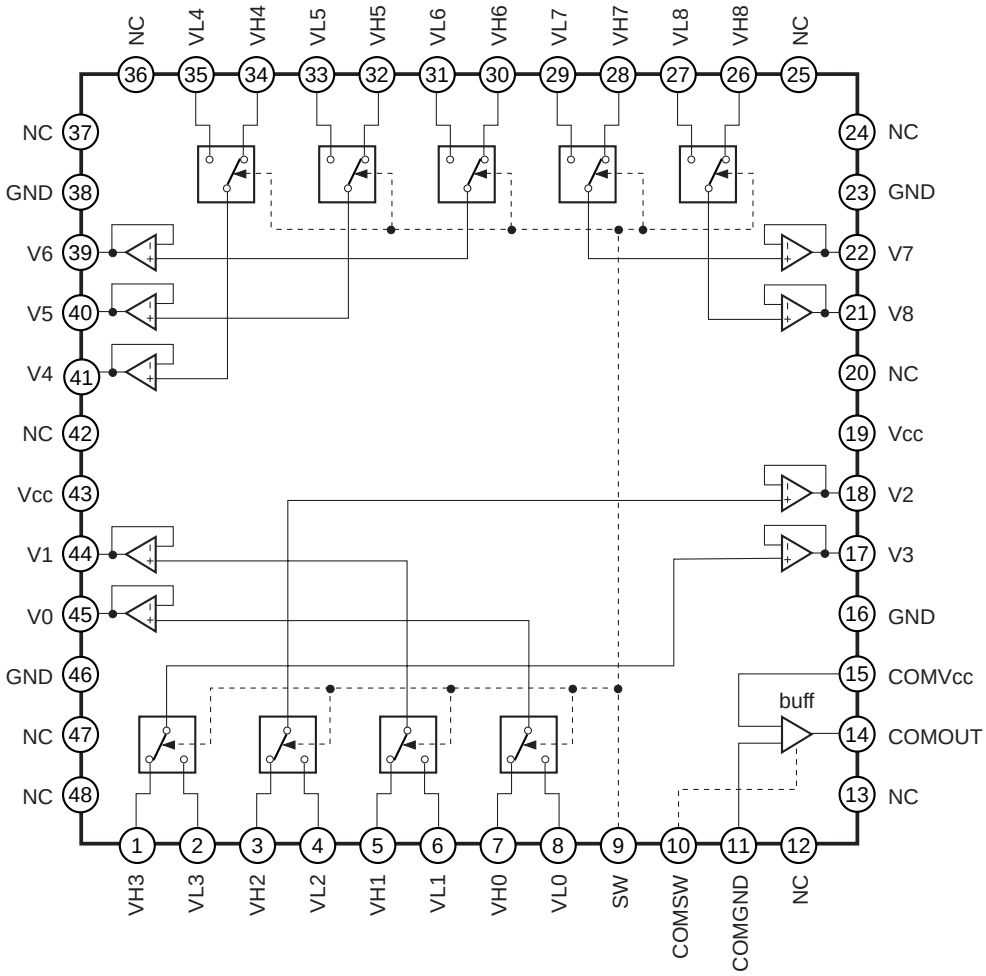
Operating Conditions

• Supply voltage	V_{CC} *1	4.5 to 5.0 to 5.5	V
	V_{VG} *2	4.0 to V_{CC}	V
	V_{VC} *3	4.0 to V_{CC}	V
	V_{VG} *4	0 to 1.0	V

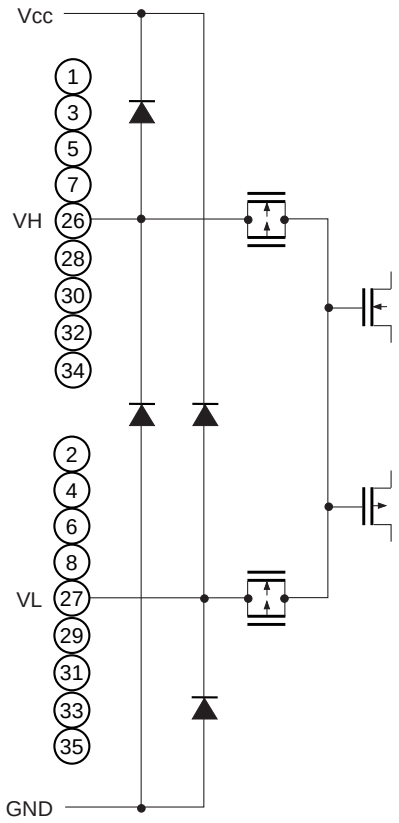
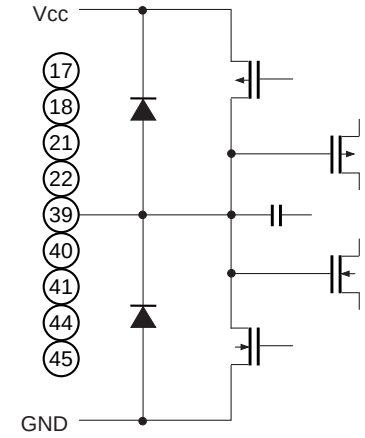
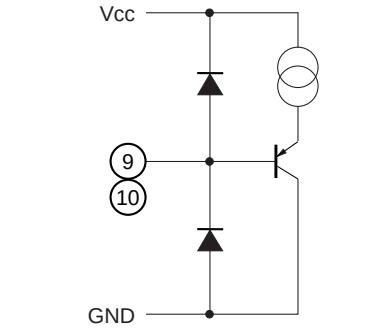
*1 Applied to Vcc – GND.
*2 Applied to COMVcc – COMGND
*3 Applied to COMVcc – GND
*4 Applied to COMGND – GND

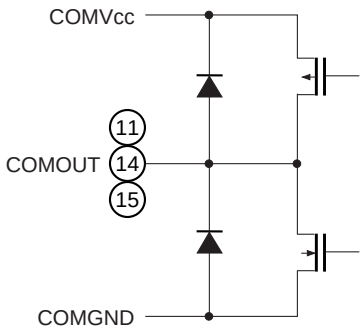
E99617-PS

Block Diagram



Pin Description

Pin No.	Symbol	Pin voltage	Equivalent circuit	Description
1	VH3	0.2 to 4.8V		DC input when SW is high.
2	VL3			DC input when SW is low.
3	VH2			DC input when SW is high.
4	VL2			DC input when SW is low.
5	VH1			DC input when SW is high.
6	VL1			DC input when SW is low.
7	VH0			DC input when SW is high.
8	VL0			DC input when SW is low.
26	VH8			DC input when SW is high.
27	VL8			DC input when SW is low.
28	VH7			DC input when SW is high.
29	VL7			DC input when SW is low.
30	VH6			DC input when SW is high.
31	VL6			DC input when SW is low.
32	VH5			DC input when SW is high.
33	VL5			DC input when SW is low.
34	VH4			DC input when SW is high.
35	VL4			DC input when SW is low.
17	V3	0.2 to 4.8V		V3 output.
18	V2			V2 output.
21	V8			V8 output.
22	V7			V7 output.
39	V6			V6 output.
40	V5			V5 output.
41	V4			V4 output.
44	V1			V1 output.
45	V0			V0 output.
9	SW			Input switch. VL is output for low; VH for high.
10	COMSW			COM output switch. COMVcc level is output for low; COMGND level for high.

Pin No.	Symbol	Pin voltage	Equivalent circuit	Description
11	COMGND	0 to 1.0V		COM output ground.
14	COMOUT			COM output.
15	COMVcc	4.0 to Vcc		COM power supply.
19	Vcc	5.0V		5V power supply.
43	Vcc	5.0V		5V power supply.
16	GND			GND.
23	GND			GND.
38	GND			GND.
46	GND			GND.
12	NC			No connected.
13	NC			No connected.
20	NC			No connected.
24	NC			No connected.
25	NC			No connected.
36	NC			No connected.
37	NC			No connected.
42	NC			No connected.
47	NC			No connected.
48	NC			No connected.

Note)

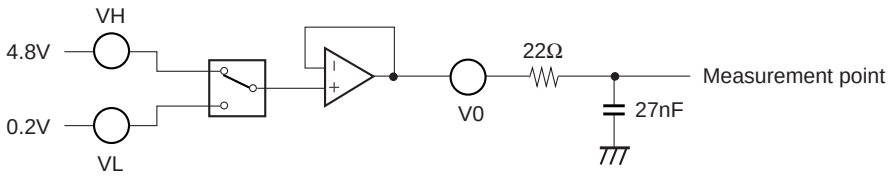
- GND
  Make sure that Pins 16, 23, 38 and 46 are connected to GND potential, and do not release them.
- Decoupling capacitor
  Locate decoupling capacitor connected between power supply and GND as near IC pin as possible.
- Design VH and VL input pins not to have capacity.

Electrical Characteristics (Ta = 25°C, Vcc = COMVcc = 5V, COMGND = 0V)

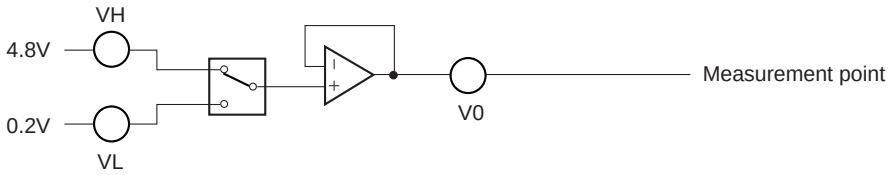
No.	Item	Symbol	Condition	Min.	Typ.	Max.	Unit
1	Current consumption (Vcc + COMVcc)	ICC	Input voltage = 2.5V	—	3.6	6.0	mA
2	VH, VL input current high	IIH	Input voltage = 4.8V	–0.1	—	0.1	µA
3	VH, VL input current low	IIL	Input voltage = 0.2V	–0.1	—	0.1	µA
4	SW, COMSW input current high	IISH	Input voltage = 5V	–0.1	—	0.1	µA
5	SW, COMSW input current low	IISL	Input voltage = 0V	–0.4	—	0.1	µA
6	VREF voltage gain	AV	Input voltage = 0.2 to 4.8V	0.985	—	—	V/V
7	VREF output voltage high	VOH	I_{SOURCE} = 10mA	Vcc – 0.2	—	—	V
8	VREF output voltage low	VOL	I_{SINK} = 10mA	—	—	0.2	V
9	COMOUT output voltage high	VCOH	I_{SOURCE} = 10mA	COMVcc – 0.1	—	—	V
10	COMOUT output voltage low	VCOL	I_{SINK} = 10mA	—	—	COMGND + 0.1	V
11	VREF offset voltage	VOFF		—	—	20	mV
12	VREF load regulation	ΔVO	Input voltage = 0.2 to 4.8V I_{SOURCE} = 10mA I_{SINK} = 10mA	—	±5	±10	mV
13	SW, COMSW input voltage high	VIH		2	—	—	V
14	SW, COMSW input voltage low	VIL		—	—	0.8	V
15	VREF transient time (1)	ttvLH1 ttvHL1	Measurement circuit 1	—	5	8	µs
16	VREF transient time (2)	ttvLH2 ttvHL2	Measurement circuit 2	—	3.5	6	µs
17	VREF propagation delay time (1)	tpvLH1 tpvHL1	Measurement circuit 1	—	3.5	6	µs
18	VREF propagation delay time (2)	tpvLH2 tpvHL2	Measurement circuit 2	—	2.5	5	µs
19	VREF propagation delay time difference (1)	Δtpv1	tpvLH1 – tpvHL1	—	—	±1.6	µs
20	VREF propagation delay time difference (2)	Δtpv2	tpvLH2 – tpvHL2	—	—	±0.8	µs
21	COM transient time	ttcLH ttcHL	Measurement circuit 3	—	3	5	µs
22	COM propagation delay time	tpcLH tpcHL	Measurement circuit 3	—	1.6	3	µs
23	COM propagation delay time difference	Δtpc	tpcLH – tpcHL	—	—	±1	µs

Measurement Circuits

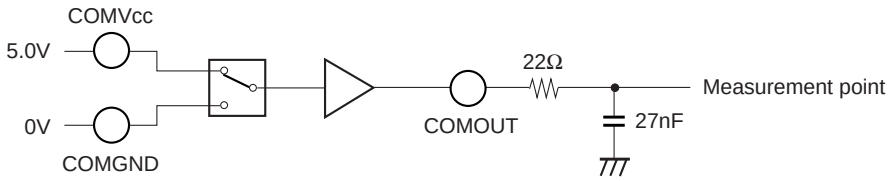
Measurement circuit 1

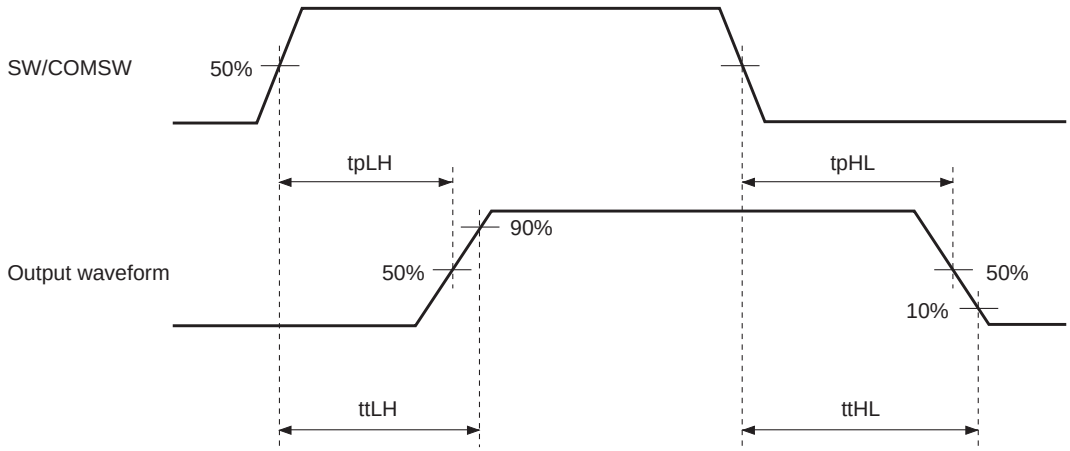


Measurement circuit 2

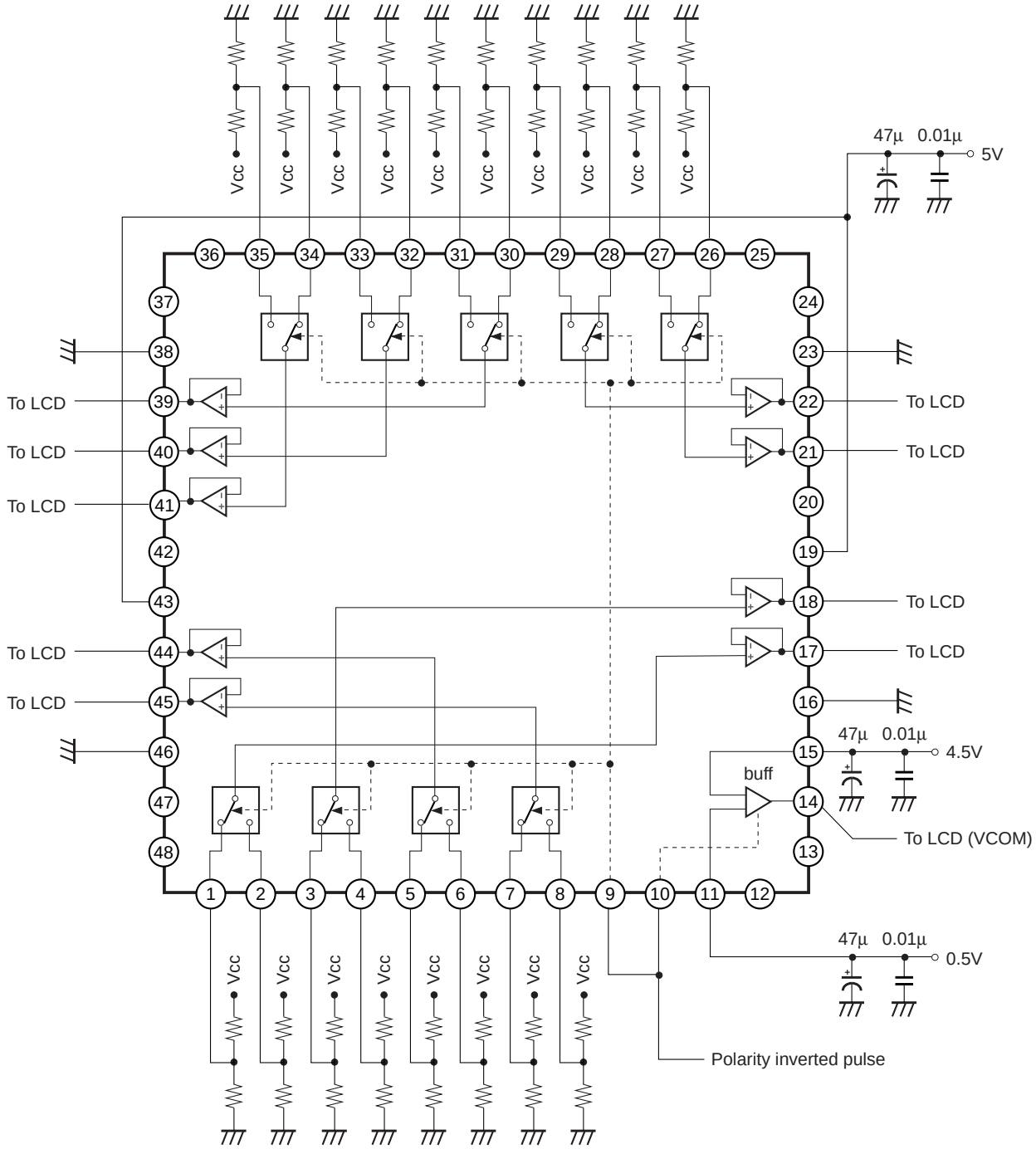


Measurement circuit 3





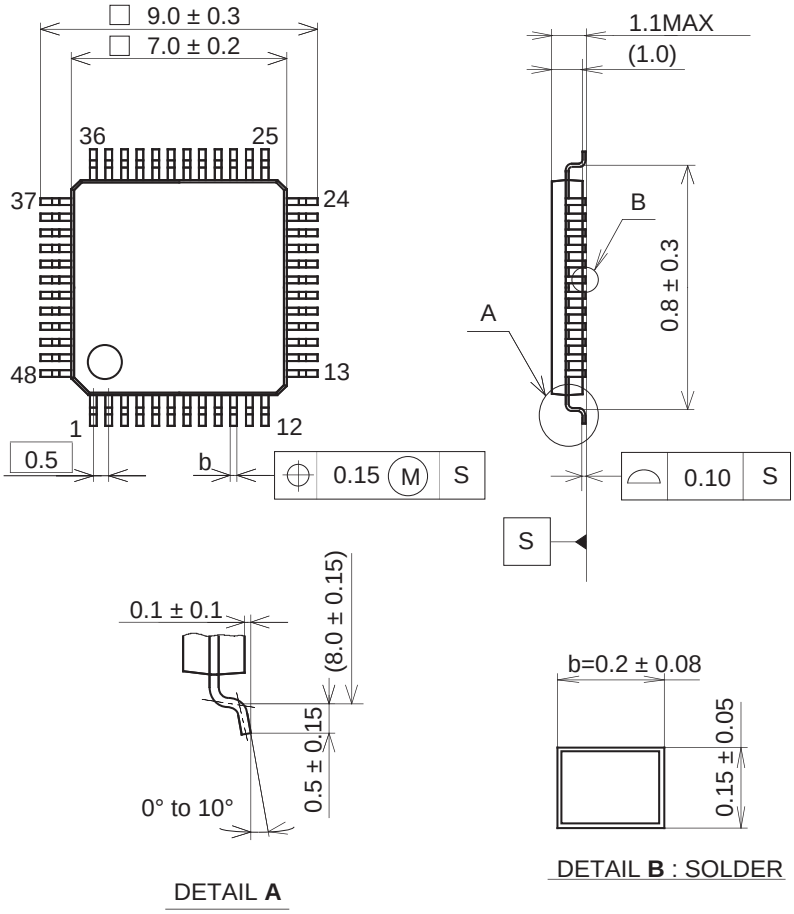
Application Circuit



Application circuits shown are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits or for any infringement of third party patent and other right due to same.

Package Outline Unit: mm

48PIN TQFP (PLASTIC)



DETAIL **A**

DETAIL **B** : SOLDER

SONY CODE	TQFP-48P-L111
EIAJ CODE	P-TQFP48-7x7-0.5
JEDEC CODE	————

PACKAGE STRUCTURE

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	42 ALLOY
PACKAGE WEIGHT	0.14g