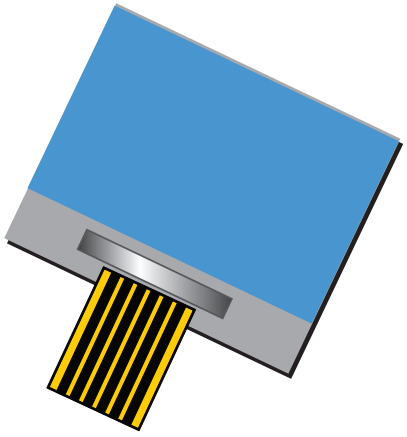

NXP LCD display driver solutions for COG technology

Chip-On-Glass technology for a simpler, and less expensive LCD display solution

NXP's LCD driver solutions for the proven COG technology, which makes it possible to mount the LCD driver directly on the display glass, yields an LCD display that is smaller, less complex, and cheaper to produce.

Chip-On-Glass (COG) technology is a design methodology for LCD displays that offers several advantages over conventional Surface Mount Device (SMD) technology.

With SMD technology, the LCD driver IC and the physical display module are mounted on the Printed Circuit Board (PCB) used by the microcontroller. This approach requires a more complex implementation and a larger, more crowded PCB design.

With COG technology, the LCD driver is mounted directly on the glass of the display module. This approach reduces the number of tracks and layers on the PCB, so the board is smaller and less complex, and eliminates the IC package used in the SMD technology. The overall result is a reduction in system cost, especially in applications that require a large number of LCD segments. COG makes it possible to build the LCD display in a modular fashion, so manufacturing is also simpler and less expensive.

NXP leadership in COG

NXP has more than 10 years of experience designing display drivers for COG and has partnered with Tianma Micro-electronics Company for COG manufacturing energy meter displays.

NXP's COG portfolio includes LCD segment drivers, from 160 to 640 segments, for industrial and automotive applications. The versions for automotive applications are AEC-Q100 compliant, and meet the demanding requirements of the harsh automotive environment. All NXP's COG products are supported by application notes and user manuals.

Special options for smart meters

NXP offers two LCD drivers for COG technology that are optimized for use in metering applications. The PCE85133U is a 320 (4 x 80) segment driver available as a bare die with gold bumps (4.16 x 1.07 x 0.38 mm), and the PCE85176LU is a 160 (4 x 40) segment driver also available as a bare die with gold bumps (2.26 x 2.01 x 0.38 mm). Both drivers can be ordered as samples, and are available in demonstrators that use a COG display module for a single-phase electric energy meter.

COG white paper on request

For more details about NXP's innovative COG display technology, please request our white paper, describing both formats, COG and SMD, and includes a case study of COG cost structures.

Parametric comparison of LCD segment drivers for COG technology

Product	Max number of elements	Number of elements in static drive mode	Number of elements in MUX 1:2	Number of elements in MUX 1:3	Number of elements in MUX 1:4	AEC Q100 compliant	I²C-bus speed mode	V_{DD} [min] (V)	V_{DD} [max] (V)	I_{DD} [typ] (µA)	V_{LCD} [min] (V)	V_{LCD} [max] (V)	T_{amb} [min] (°C)	T_{amb} [max] (°C)	f_{fr} (Hz) typ
PCF8576DU	160	40	80	120	160	N	Fast	1.8	5.5	2.7	2.5	6.5	-40	85	77
PCA8576DU**	160	40	80	120	160	Y	Fast	1.8	5.5	18	2.5	6.5	-40	85	77
PCE85176LU*	160	40	80	120	160	N	Fast	1.8	5.5	2.7	2.5	6.5	-40	85	82
PCF85133U	320	80	160	240	320	N	Fast	1.8	5.5	16	2.5	6.5	-40	85	SEL***
PCA85133U**	320	80	160	240	320	Y	Fast	1.8	5.5	16	2.5	8	-40	95	SEL***
PCE85133U*	320	80	160	240	320	N	Fast	1.8	5.5	16	2.5	6.5	-40	85	SEL***
PCF85132U	640	160	320	480	640	N	Fast	1.8	5.5	-	1.8	8	-40	85	SEL***
PCA85132U**	640	160	320	480	640	Y	Fast	1.8	5.5	-	1.8	8	-40	95	SEL***
PCA85232U**	640	160	320	480	640	Y	Fast	1.8	5.5	-	1.8	8	-40	95	SEL***

* COG display drivers optimized for electric energy meters - ** AEC-Q100 compliant for automotive applications - *** Selectable frame frequency

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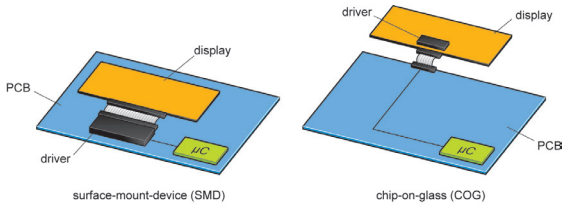
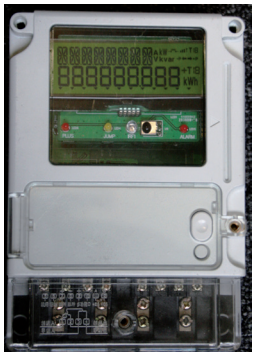
The COG format is simpler to design and costs less to produce



Sample application: energy meter demonstrator



Display detail: PCE85133 LCD driver (320 segments)

TIANMA

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