



SPEC. NO.

TQ3C-8EAC0-E1AAYM91-00

DATE

December 22, 1999

For Reference Only

SPEC

TYPE: KCB104VG2CA-A43

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KYOCERA CORPORATION
KAGOSHIMA HAYATO PLANT

This specification is subject to change without notice. Consult Kyocera before ordering.

Original Issue Date December 22, 1999	Designed by: Engineering Dept.			Confirmed by: QA Dept.	
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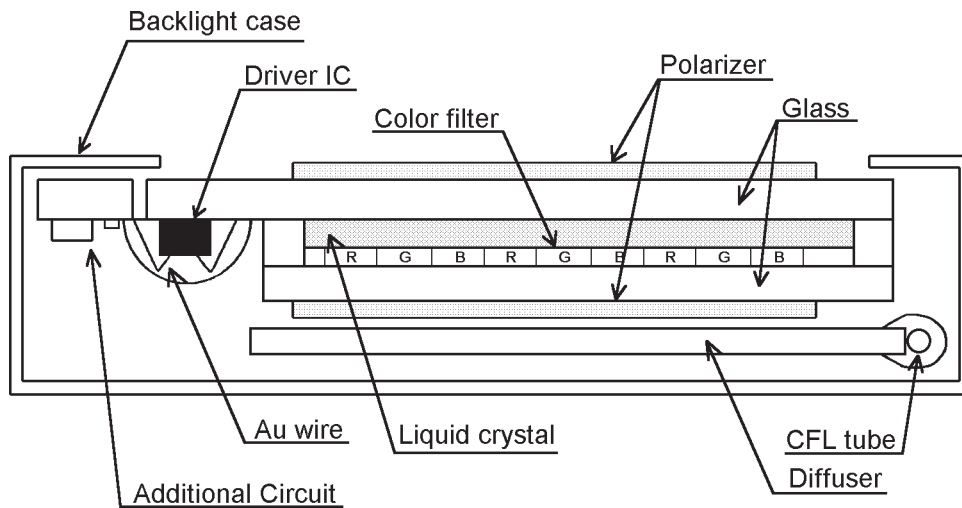
1. Application

This data sheet defines the specification for a (640 x 3) x 480 dot, STN color, dot matrix type Liquid Crystal Display with CFL backlight.

2. Construction and Outline

(640 x 3) x 480 dots. COB type LCD with CFL backlight.

Backlight system: Side-edge type CFL (2 tubes)
 Inverter: Optional
 Recommended Inverter: KCI-13 (Minebea Electronics)
 Polarizer: Anti-Glare treatment
 Additional Circuit: Bias voltage circuit, Randomizing circuit
 DC/DC Converter



3. Mechanical Specifications

ITEM	SPECIFICATION	
Outline dimensions	264.0 (W) x 183.0 (H) x 8.5 (D)	mm
Effective viewing area	215.07 (W) x 162.27(H)	mm
Dot number	(640 x 3) (W) x 480 (H)	Dots
Dot size	0.09 (W) x 0.31 (H)	mm
Dot pitch	0.11 (W) x 0.33 (H)	mm
Display color *1	White *2	-
Base color *1	Black *2	-
Weight	540	g

*1 Due to the characteristics of the LC material, the colors vary with environmental temperature.

*2 Negative-type display

Display data "H": R, G, B Dots ON: White

Display data "L": R, G, B, Dots OFF: Black

4. Absolute Maximum Ratings

4.1 Electrical absolute maximum ratings

Temp. = 25°C

ITEM	SYMBOL	MIN.	MAX.	UNIT
Supply voltage for logic	VDD	0	6.0	V
Supply voltage for LCD driving	VCONT	0	VDD	V
Input signal voltage	Vin	0	VDD+0.3	V

4.2 Environmental absolute maximum ratings

ITEM	SYMBOL	MIN.	MAX.	UNIT
Operating temperature *6	Top	0	50	°C
Storage temperature *1	Tsto	-20	60	°C
Operating humidity *2	Hop	10	85	%RH
Storage humidity *2	Hsto	10	*3	%RH
Vibration	-*4	*4	-	
Shock	-	*5	*5	-

*1 Temp. = -20°C < 24 Hr.; Temp. = 60°C < 24 Hr.

No vibration and shock

*2 Non-condensing

*3 Temp. ≤ 40°C, 85% RH Max.

Temp. > 40°C, Absolute Humidity shall be less than 85% RH at 40°C.

*4

Frequency	10 ~ 55 Hz	Converted to acceleration value: (0.03 ~ 0.91G)
Vibration width	0.15 mm	
Interval	10 - 55 - 10 Hz 1 minute	

2 hours in each direction; X, Y, & Z (6 hours total) - EIAJ ED-2531

*5 Acceleration: 50G

Pulse width: 11 msec.

3 times in each direction: ±X, ±Y, & ±Z

EIAJ ED-2531

6. Optical Characteristics

Temp. = 25°C

Measuring spot = $\phi 12\text{mm}$

ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Response time	Rise	Tr	$\theta = \phi = 0^\circ$	-	160	260	ms
	Down	Tf	$\theta = \phi = 0^\circ$	-	80	180	ms
Viewing angle range		θ	$\text{CR} \geq 2, \phi = 0^\circ$	-20	-	35	deg.
		ϕ	$\text{CR} \geq 2, \theta = 0^\circ$	-45	-	45	deg.
Contrast ratio		CR	$\theta = \phi = 0^\circ$	15.0	30.0	-	-
Chromaticity coordinates	Red	x	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
		y	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
	Green	x	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
		y	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
	Blue	x	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
		y	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
	White	x	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
		y	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
	Black	x	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-
		y	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	-

Optimum contrast is obtained by adjusting the LCD driving voltage (V_{op}) while at the viewing angle of $\theta = \phi = 0^\circ$.

6.1 Contrast ratio is defined as:
$$\text{CR} = \frac{\text{Brightness all pixels "White"}}{\text{Brightness all pixels "Black"}}$$

6.2 Definition of viewing angle

