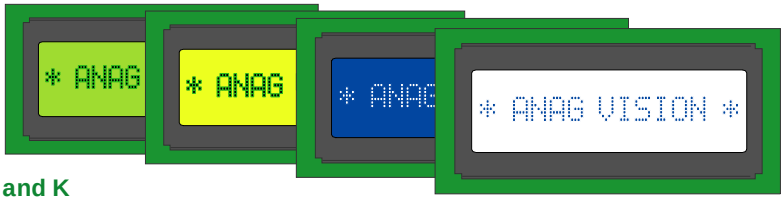
ANAG VISION AV1610

16x1 Character

- 5x7 dots with cursor
- 1/16 duty
- +5V single supply
- Built in Controller (KS0066 or Equivalent)
- B/L driven by pin1 and 2 or 15 and 16 or A and K



Pin Assignment

No.	Symbol	Function
1	V ss	Gnd, 0V
2	V dd	+5V
3	V ee	LCD Drive
4	RS	Function Select
5	R/W	Read/Write
6	E	Enable Signal
7-14	DB0-DB7	Data Bus Line
15	A*	4.2V for LED
16	K	Power Supply for LED 0V

Absolute Maximum Rating

Item	Symbol	Standard Value			Unit
		min.	typ.	max.	
V-Module	Vdd-Vss	-0.3	- - -	7.0	V
V-Input	VI	-0.3	- - -	Vdd	V

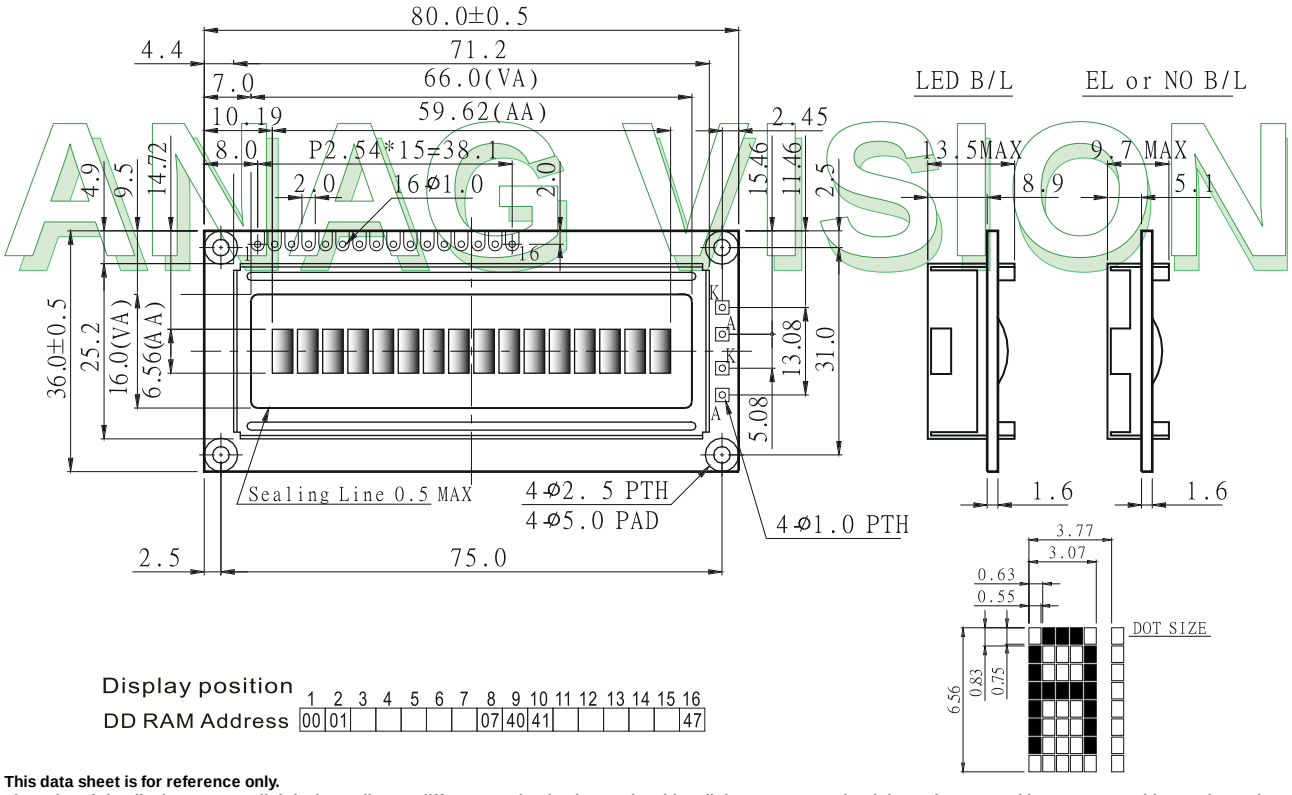
Vss=0V, Vdd=5.0V

Mechanical Data

Item	Standard Value	Unit
Module Size	80.0 x 36.0	mm
Viewing Area	66.0 x 16.0	mm
Dot Size	0.55 x 0.75	mm
Character Size	3.07 x 6.56	mm

Electronical Characteristics

Item	Symbol	Condit.	Standard Value			Unit
			min.	typ.	max.	
Input Voltage	Vdd	Vdd=+5V	4.7	5.0	5.3	V
Supply Curent	Idd	Vdd=+5V	- - -	1.2	3.0	mA
Recommended LC Driving Voltage for Standard Temp. Modules	Vdd-V0	0 °C	4.5	4.8	5.1	V
		25 °C	4.1	4.4	4.7	
		50 °C	3.8	4.2	4.4	
LED Forward Voltage	Vf	25 °C	- - -	4.2	- - -	V
LED Forward Current	If	25 °C	- - -	130	195	mA
LED weiß Current *	ILED	3.5 V	30	40	50	mA



This data sheet is for reference only.
The color of the disply may vary slightly depending on different production lots and ambient light. We reserve the right to changes and improvments without prior notice.

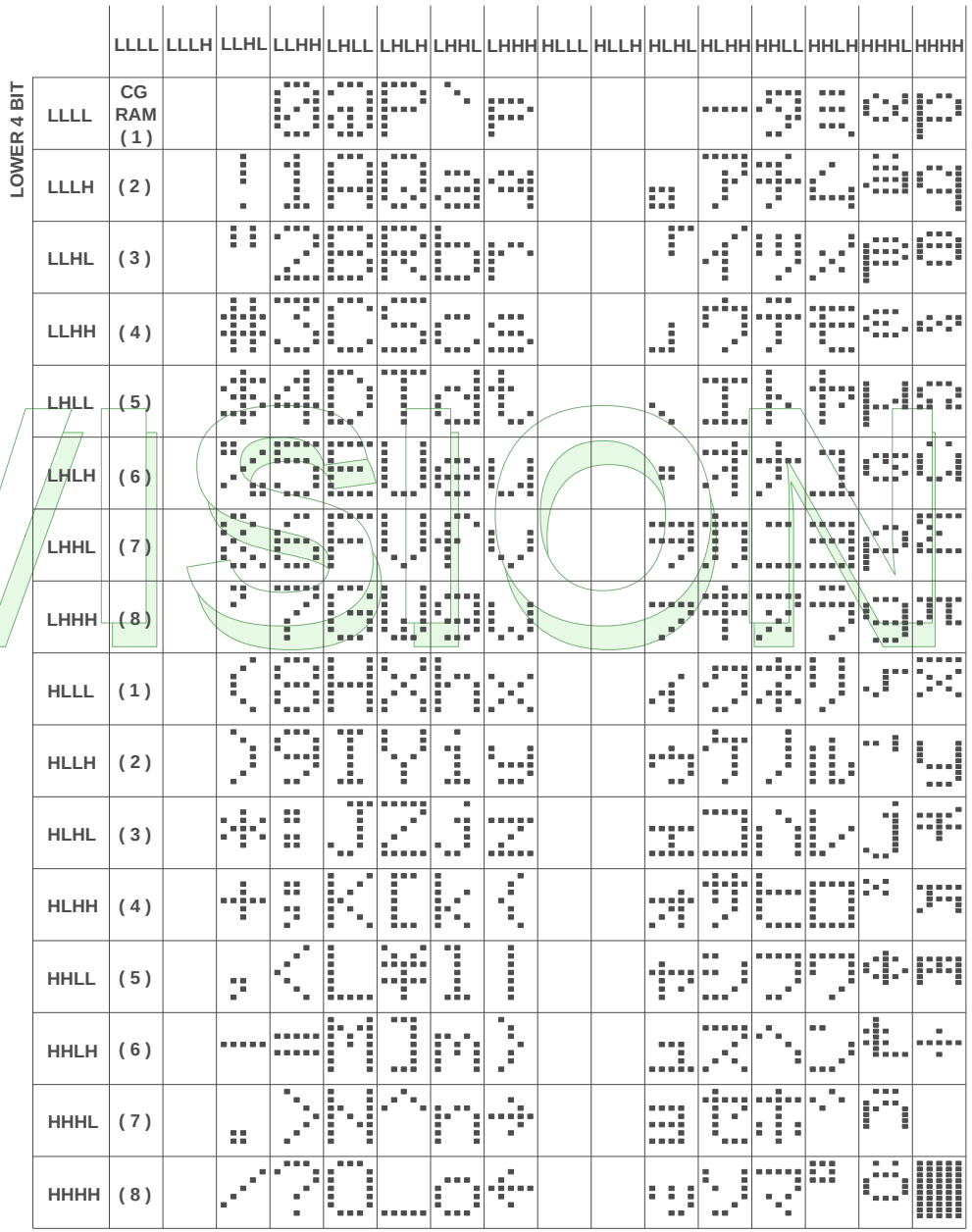
Verfügbar STN:	gelb-grün reflectiv positiv	gelb-grün LED positiv LED gelb	blau negativ LED weiß	grau positv LED weiß
CONRAD Best.-Nr:	183261	184071	181648	181662

CHARACTER MODULE COMMANDS

COMMANDS/CODES/DISCRIPTION

COMMAND	CODE										DESCRIPTION	EXECUTING TIME (FOSC = 270KHZ)
	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0		
CLEAR DISPLAY	0	0	0	0	0	0	0	0	0	1	CLEAR THE DISPLAY AND RETURN THE CURSOR TO THE HOME POSITION (ADDRESS 0)	82μS - 1.64MS
RETURN HOME	0	0	0	0	0	0	0	0	1	*	RETURN THE CURSOR TO THE HOME POSITION (ADDRESS 0); ALSO RETURN A SHIFTED DISPLAY TO THE HOME POSITION. DDRAM CONTENTS REMAIN UNCHANGED.	40μS - 1.64MS
ENTRY MODE SET	0	0	0	0	0	0	0	1	I/D	S	SET THE CURSOR`S MOVE DIRECTION AND ENABLE/DISABLE THE DISPLAY	40μS
DISPLAY ON/OFF CONTROL	0	0	0	0	0	0	1	D	C	B	TURN THE DISPLAY ON/OFF(D), OR THE CURSOR ON/OFF(C), AND BLINK OF THE CHARACTER AT THE CURSOR POSITION(B).	40μS
CURSOR & DISPLAY SHIFT	0	0	0	0	0	1	S/C	R/L	*	*	MOVE THE CURSOR AND SHIFT THE DISPLAY WITHOUT CHANGING DD RAM CONTENTS.	40μS
FUNCTION SET	0	0	0	0	1	DL	N	F	*	*	SET THE DATA WIDTH(DL), THE NUMBER OF LINES IN DISPLAY(L), AND THE CHARACTER FONT(F).	40μS
SET CG RAM ADDRESS	0	0	0	1	ACG						SET THE CG RAM ADDRESS. CG RAM DATA CAN BE READ OR ALTERED AFTER MAKING THIS SETTING.	40μS
SET DD RAM ADDRESS	0	0	1	ADD							SET DD RAM ADDRESS. DATA MAY BE WRITTEN OR READ AFTER MAKING THIS SETTING	40μS
READ BUSY FLAG & ADDRESS	0	1	BF	AC							READ THE BUSY FLAG(BF) INDICATING THAT AN INTERNAL OPERATION IS BEING PERFORMED AND READ THE ADDRESS COUNTER CONTENTS.	1μS
WRITE DATA TO CG RAM OR DD RAM	1	0	WRITE DATA								WRITE DATA INTO DD RAM OR CG RAM.	43μS
READ DATA FROM CG OR DD RAM	1	1	READ DATA								READ DATA FROM DD RAM OR CG RAM.	43μS
	I/D=1: INCREMENT I/D=0 DECREMENT S=1: ACCOMPANIES DISPLAY SHIFT S/C=1: DISPLAY SHIFT S/C=0 CURSOR MOVE R/L=1 SHIFT TO THE RIGHT R/L=0: SHIFT TO THE LEFT DL=1: 8 BITS DL=0: 4 BITS N=1: 5X10 DOTS N=0: 5X7 DOTS BF=1: BUSY BF=0: CAN ACCEPT DATA " * ": DON`T CARE FOSC: 27KHZ										DD RAM: DISPLAY DATA RAM CG RAM: CHARACTER GENERATOR RAM ACG: CG RAM ADDRESS ADD: DD RAM ADDRESS CORRESPONDS TO CURSOR ADDRESS AC: ADDRESS COUNTER USED FOR BOTH DD AND CG RAM ADDRESS.	EXECUTION TIME CHANGES WITH CHANGE IN INTERNAL OSCILLATION FREQUENCY (FOSC). EXAMPLE: WHEN FOSC = 270KHZ 40μS X $\frac{250}{270}$ = 37μS

FONT TABLE CHARACTER TYPES (STD. ENGL./JAP.)



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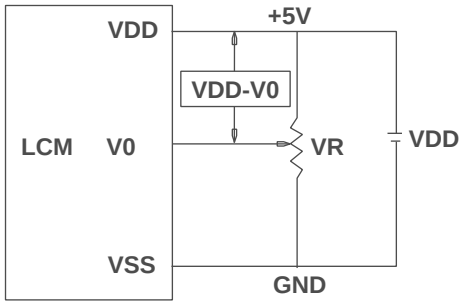
INSTRUCTIONS AND FONT TABLE ENGL./JAPANESE FOR STANDARD CHARACTER MODULES.

TOOΣE IYNI

POWER SUPPLY / INTERFACE TO MCU / INFOMATION ON CHARACTER IC AND LED BACKLIGHT

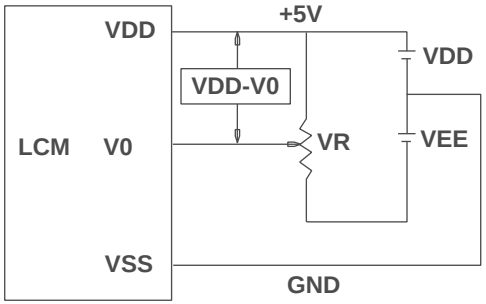
POWER SUPPLY FOR LCD MODULE

1.SINGLE SUPPLY VOLTAGE TYPES (INTERNAL N.V.)



VDD-V0: LCD DRIVING VOLTAGE
R: 10K - 20K

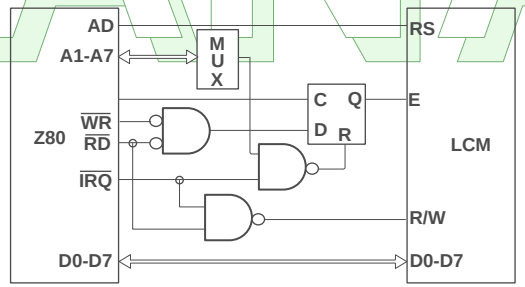
2. DUAL SUPPLY VOLTAGE TYPES



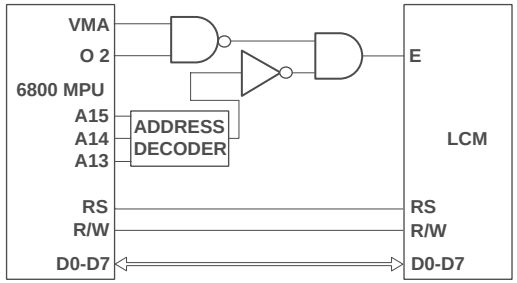
VDD-V0: LCD DRIVING VOLTAGE
R: 10K - 20K

INTERFACE TO MCU

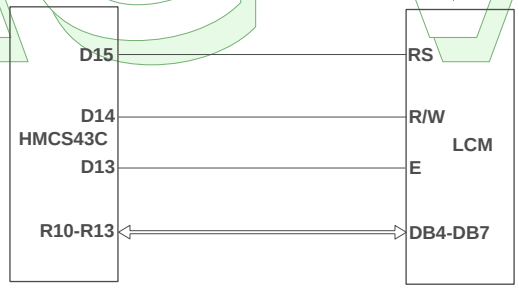
1. INTERFACE TO Z-80 MPU



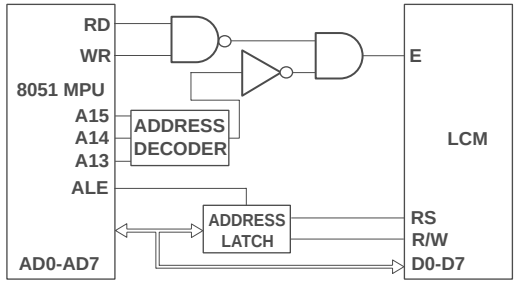
2. INTERFACE TO 6800 MCU



3. INTERFACE TO 4-BIT MPU (HMCS43C)

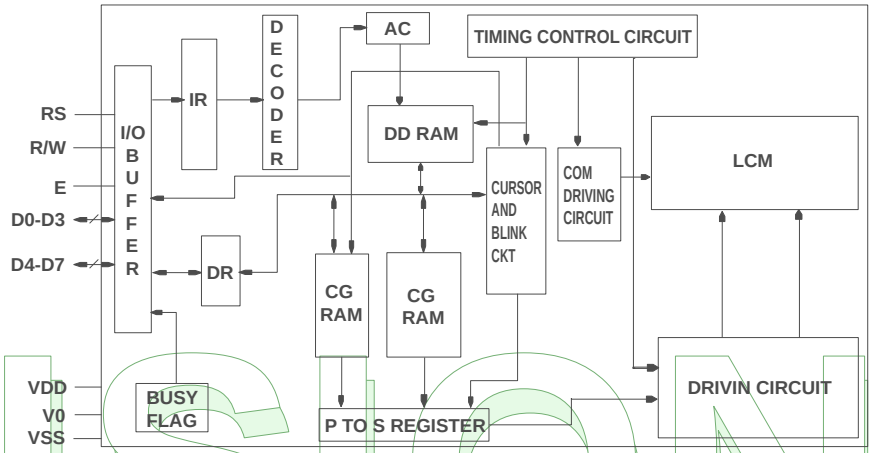


4. INTERFACE TO 8051 MCU



CHARACTER BLOCK DIAGRAM AND LED BACKLIGHT

CHARACTER BLOCK IC DIAGRAM



- DATA REGISTER (DR) IS REGULARLY USED FOR TEMPORARY STORAGE OF DATA READ/WRITE FROM/INTO DD RAM AND CG RAM.
- INSTRUCTION REGISTER (IR) IS USED FOR STORING INSTRUCTION CODES AND ADDRESS INFORMATION OF THE DISPLAY DATA (DD) RAM AND CHARACTER GENERATOR (CG) RAM.
- BUSY FLAG (BF) IS "1" WHEN THE LCM IS IN INTERNAL OPERATION AND CANNOT ACCEPT THE NEXT INSTRUCTION OR DATA.
- CHARACTER GENERATOR (CG) ROM GENERATES CHARACTER PATTERNS FROM 8-BIT CODE. THE CG ROM PROVIDES 192 CHARACTER PATTERNS.
- CHARACTER GENERATOR (CG) RAM ALLOWES THE USER TO DESIGN AND REWRITE CHARACTER PATTERNS ACCORDING THE PROGRAM.
- ADDRESS COUNTER (AC) IS USED TO GIVE THE ADDRESS INFORMATION OF THE DD RAM AND CG RAM.
- DISPLAY DATA (DD) RAM IS USED TO STORE THE DISPLAY DATA EXPRESSED BY 8-BIT CHARACTER CODE. THE CAPACITY IS 80 X 8 BITS AND 80 CHARACTERS CAN BE STORED.
- CURSOR AND BLINK CONTROL GENERATES THE CURSOR AND BLINK.

USAGE OF LED BACKLIGHT

THERE ARE THREE POSSIBILITIES TO USE LED BACKLIGHT IN ANAG VISION CHARACTER MODULES.

- DRIVING THE LED THROUGH A CURRENT LIMITING RESISTANCE (RA) WHICH IS ALREADY INCLUDED IN THE LCM, BY EXTERNAL 5V TO J1 AND J2 BETWEEN PIN 1 AND PIN 2.
- PROVIDING 5V BY PIN 15 AND 16 OF THE INTERFACE TO DRIVE THE LED, J15 AND J16 MUST BE SHORTENED AND RA = 3~7 OHMS IN THIS CASE.
- PROVIDING 4.2V BY DIRECT CONNECTION TO THE LED THROUGH A CURRENT LIMITING RESISTANCE.

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INITIALIZATION PROCEDURE

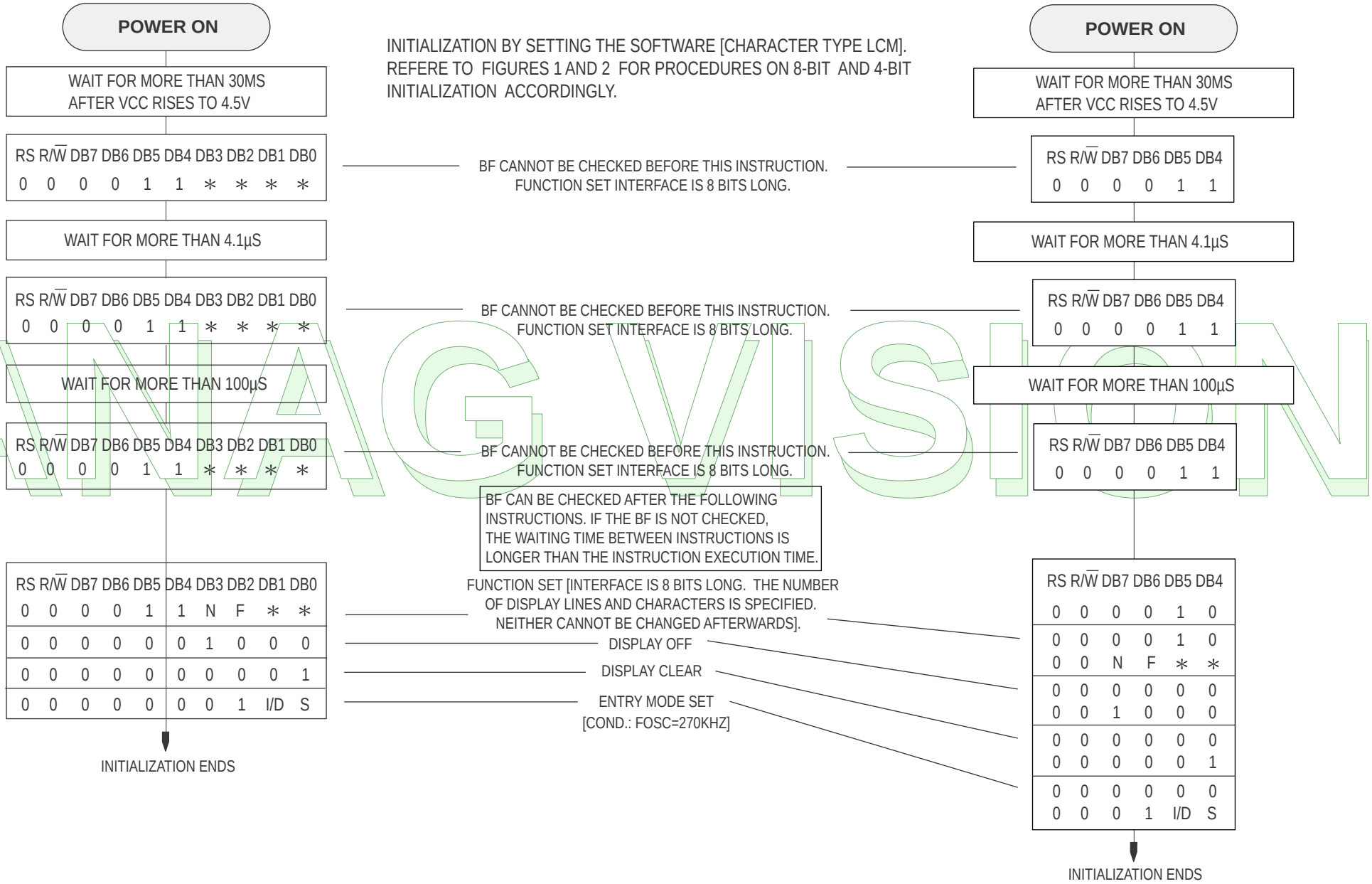

FIGURE1: 8-BIT INTERFACE

FIGURE2: 4-BIT INTERFACE

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