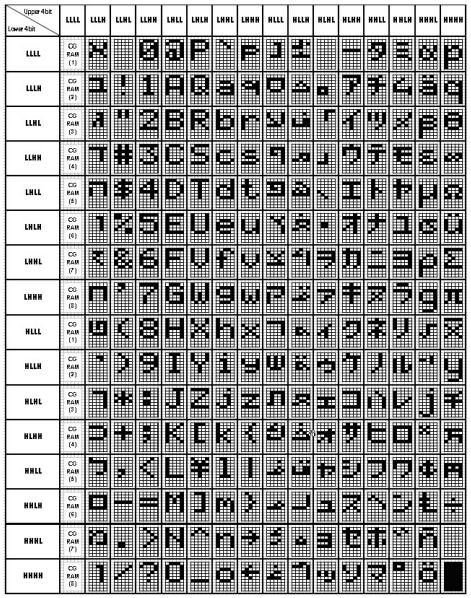
WS0010 IC Revision Comparison

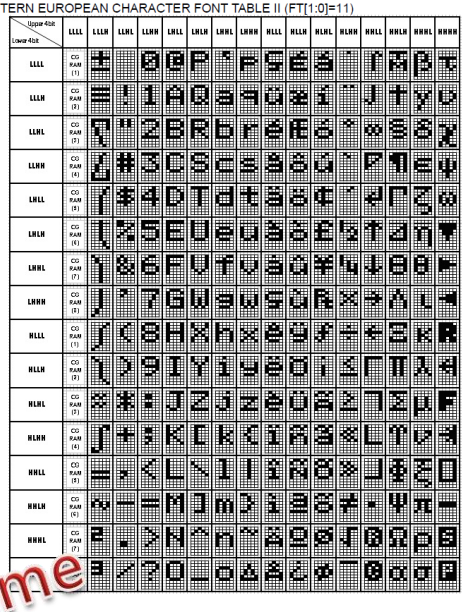
Character Generator ROM (CGROM)

WINSTAR

ENGLISH_JAPANESE CHARACTER FONT TABLE(default FT[1:0]= 00)

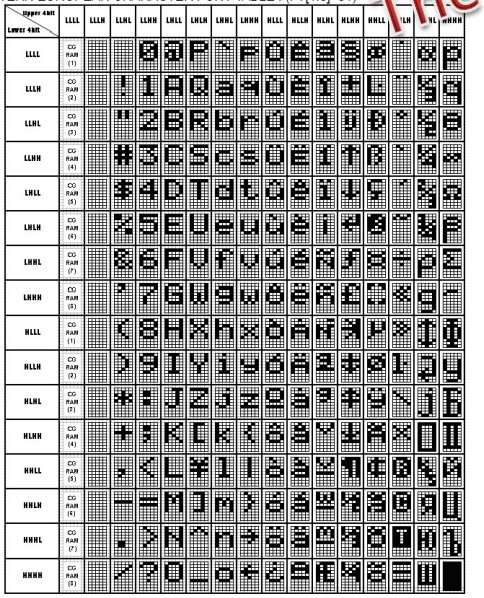


WESTERN EUROPEAN CHARACTER FONT TABLE II (FT[1:0]=11)

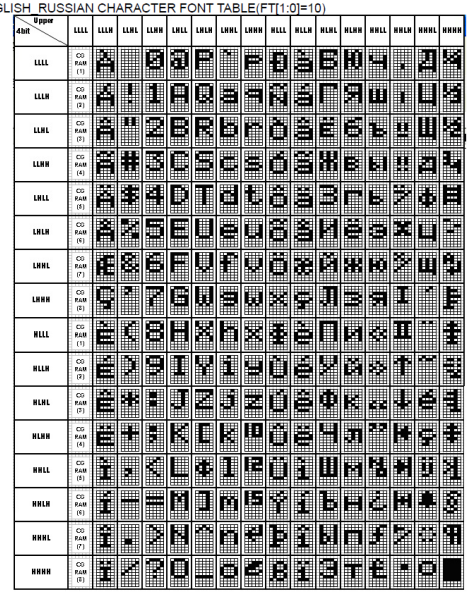


The same

WESTERN EUROPEAN CHARACTER FONT TABLE I (FT[1:0]=01)



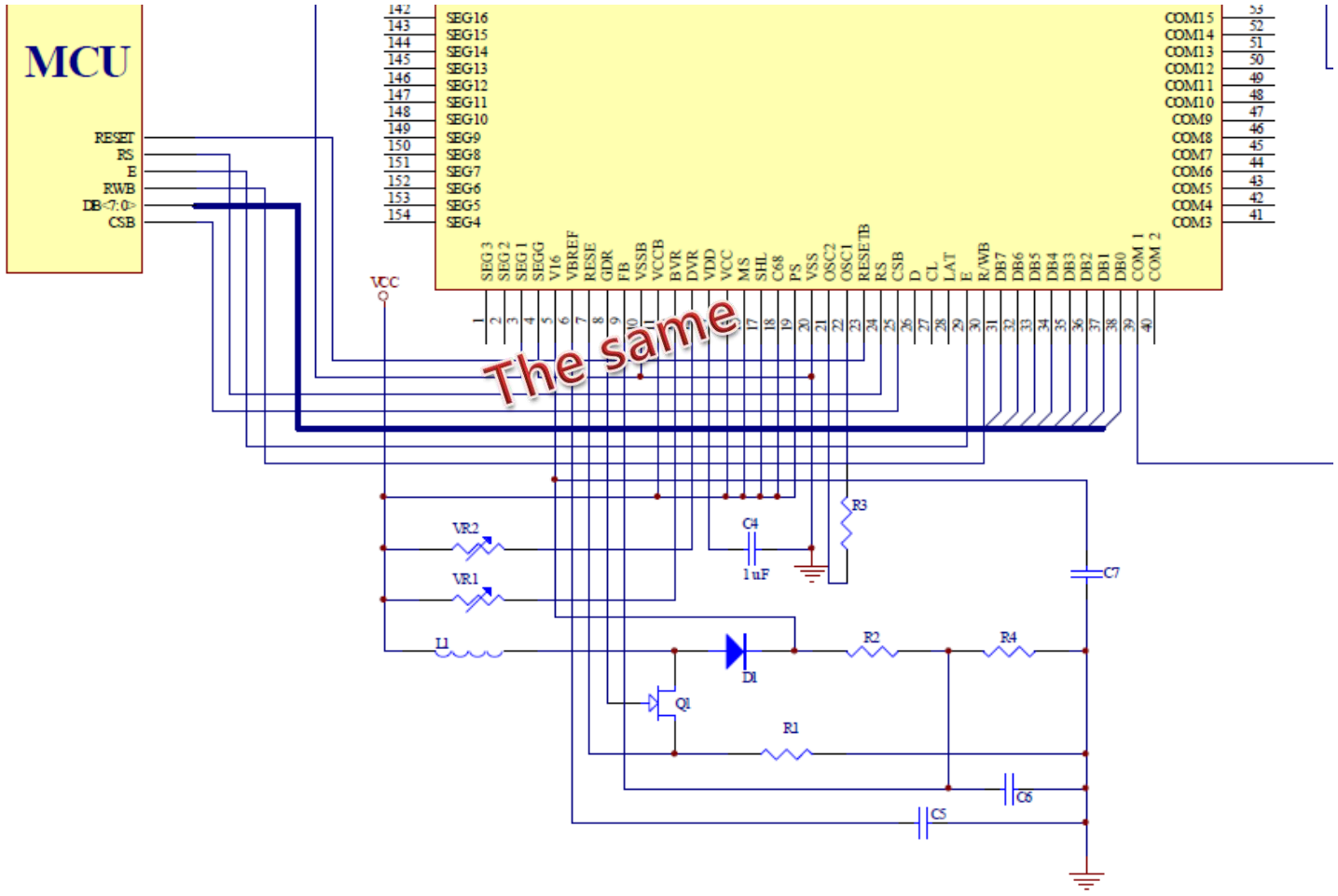
ENGLISH_RUSSIAN CHARACTER FONT TABLE(FT[1:0]=10)



Instructions

Instruction	Code										Description	Max. Execution Time when fsp or fosc = 250KHz
	RS	R/WB	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0		
Clear Display	0	0	0	0	0	0	0	0	0	1	Clears entire display.	6.2ms
Return Home	0	0	0	0	0	0	0	0	1	0	Sets DDRAM Address 0 into the Address Counter. Returns shifted display to original position. DDRAM contents remain unchanged. (DB0 is test pin. User should set DB0=0 all the time)	0
Entry Mode Set	0	0	0	0	0	0	0	1	I/D	S	Sets cursor move direction and specifies display shift. (These operations are performed during data write and read.)	0
Display ON/OFF Control	0	0	0	0	0	0	1	D	C	B	Sets entire Display (D) ON/OFF. Sets Cursor (C) ON/OFF. Sets Blinking (B) of Cursor Position Character.	0
Cursor/ Display Shift/ Mode/ Pwr	0	0	0	0	0	1	S/C	R/L	0	0	Moves cursor & shifts display without changing DDRAM contents.	0
							G/C	PWR	1	1	Sets Graphic/Character Mode Sets internal power on/off	
Function Set	0	0	0	0	1	DL	N	F	FT1	FT0	Sets interface data length (DL). Sets number of display lines (N). Sets Character Font (F). Sets Font Table (FT) *Forbids to set FT=01 or 11 when IST0010 be operated in 4-bit interface.	0
Set CGRAM Address	0	0	0	1	ACG	ACG	ACG	ACG	ACG	ACG	Sets CGRAM Address. CGRAM data is sent and received after this setting.	0
Set DDRAM Address	0	0	1	ADD	ADD	ADD	ADD	ADD	ADD	ADD	Sets DDRAM Address. The DDRAM data Is sent and received after this setting.	0
Read Busy Flag & Address	0	1	BF	AC	AC	AC	AC	AC	AC	AC	Reads Busy Flag (BF) indicating that internal operation is being performed. Reads Address Counter contents.	0
Write data into the CGRAM or DDRAM	1	0	Write Data								Writes data into the CGRAM or DDRAM	0
Read Data from the CGRAM or DDRAM	1	1	Read Data								Read data from the CGRAM or DDRAM	0

Application Circuit



Electrical & Optical Characteristics

WINSTAR

Integrated Solutions Technology — *IST0010-TX*

ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Rating	Unit
Supply voltage range	VCC/VCCB	- 0.3 to +6.5	V
	V16	-0.3 to +19.0	V
Input voltage range	VIN	-0.3 to VCC + 0.3	V
Operating temperature range	TOPR	-30 to +80	℃
Storage temperature range	TSTR	-55 to +125	℃

NOTES:
1. VCC/VCCB and V16 are based on VSS/VSSB = 0V
2. If supply voltage exceeds its absolute maximum range, this LSI may be damaged permanently. It is desirable to use this LSI under electrical characteristic conditions during general operation. Otherwise, this LSI may malfunction or reduced LSI reliability may result.

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The same

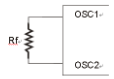
Integrated Solutions Technology — *IST0010-TX*

DC CHARACTERISTICS

(GND = 0V, VCC = 2.7 to 5.5V, Ta = -30 to +80℃)

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Pin used
Operating Voltage		VCC		2.7	-	5.5	V	VCC
Operating Voltage		V16		-	-	16	V	V16
Input voltage	High	VIH		0.8 VCC	-	VCC	V	*1
	Low	VIL		-	-	0.2 VCC		
Output voltage	High	VOH	IOH = -0.5mA	0.8 VCC	-	VCC	V	*2
	Low	VOL	IOL = 0.5mA	-	-	0.2 VCC		
Input leakage current		IIL\IIH	VIN = VCC or GND	-1	-	1	μA	*1
Oscillator frequency		fosc	Rf=60K (*4)	400	-	800	KHz	OS1,OSC2
			Rf=75K (*4)	370	-	780		
High level segment output current		ISEGOH	VSEGOH=14V	-30	-	-300	μA	SEG1~100
High level segment output current tolerance		ITOL	VSEGOH=14V	-	-	±6	%	SEG1~100
Low level common sink current		ICOMOL	VCOMOL=0.4V	15	-	-	mA	COM1~16
DC-DC converter output voltage		V16	-	-	-	16	V	V16
Standby current		Istd	(*3)	-	-	30	uA	VCC
Operating current		IVcc	VCC=3.3V, fosc=530kHz No loading External V16	-	-	330	uA	VCC

[Notes]
*1: MS,LAT,CL,D,SHL,CSB,DB7~DB0,RESETB,RS,R_WB,E,PS,C86
*2: LAT,CL,D, DB7~DB0
*3: When MS,PS and C68 = "H"(VCC),OSC=OFF,VCC=3.3V
*4: When VCC=2.7V & VCC=5.5V



Integrated Solutions Technology — *IST0010*

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Operating Voltage		VCC		2.7	-	5.5	V	VCC
Operating Voltage		V16		-	-	16	V	V16
Input voltage	High	VIH		0.8 VCC	-	VCC	V	*1
	Low	VIL		-	-	0.2 VCC		
Output voltage	High	VOH	IOH = -0.5mA	0.8 VCC	-	VCC	V	*2
	Low	VOL	IOL = 0.5mA	-	-	0.2 VCC		
Input leakage current		IIL\IIH	VIN = VCC or GND	-1	-	1	μA	*1
Oscillator frequency		fosc	Rf=60K (*4)	400	-	800	KHz	OS1,OSC2
			Rf=75K (*4)	370	-	780		
High level segment output current		ISEGOH	VSEGOH=14V	-30	-	-300	μA	SEG1~100
High level segment output current tolerance		ITOL	VSEGOH=14V	-	-	±6	%	SEG1~100
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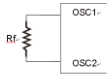

Update Data List

Series	New module testing value	New module Spec
WEH00802A	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEH001202A	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEH001601B	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEH001602A/C/D/E	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEH001602H	IDD –7 ~–13mA keep the same brightness	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEH002002A	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEH002004A/B	IDD +7 ~+13mA brightness + 10 cd/m2	(IDD) Typ increases 10 mA; Max = 1.5 x Typ; Min cancel (Brightness) Typ increases 10 cd/m2
WEH004002A	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEG005016A	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEG007616A	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEG010016A/C/D/E	IDD +7 ~+13mA brightness + 10 cd/m2	(IDD) Typ increases 10 mA ; Max = 1.5 x Typ; Min cancel (Brightness) Typ increases 10 cd/m2
WEG010016J	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEG010016F	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEG010032A/B	In spec	(IDD) Typ keep the same; Max = 1.5 x TYP; Min cancel
WEG020016A	IDD +7 ~+13mA brightness + 10 cd/m2	(IDD) Typ increases 10 mA; Max = 1.5 x Typ; Min cancel (Brightness) Typ increases 10 cd/m2

※ Lifetime remains the same as previous version.

Summary

- New IC is quite the same with the previous version.
  - CGROM …the same
  - Command table …the same
  - Application circuit …the same
  - Interface …the same
  - Input voltage …the same

- Since the driving capability of new IC is enhanced, the modules' IDD (operating current) & brightness also increase.
  Therefore, we will cancel the IDD Min. value & update the Max. value.
  As for the models listed below, the IDD Typ. values & Typ. brightness will be updated as well.
  - WEG010016A/C/D/E IDD Typ increases +10mA, brightness increases +10cd/m2
  - WEH002004A/B IDD Typ increases +10mA, brightness increases +10cd/m2
  - WEG020016A IDD Typ increases +10mA, brightness increases +10cd/m2
  - WEH001602H IDD Typ decreases –10mA, brightness kept the same

- Lifetime remains the same as the previous version.

- The part numbers and the datasheets will be updated accordingly.

THANK YOU FOR LISTENING

謝謝 Danke Dziękuję 감사합니다 Merci Благодарим Вас
Gracias ευχαριστω Dank u ありがとう Obrigado

WINSTAR
WWW.WINSTAR.COM.TW

5F, No.31, Keya Rd., Daya Dist.
Taichung City 428, Taiwan (R.O.C.)
TEL : 886-4-25689987
FAX : 886-4-25687763

Responsibility on Environmental Protection

Winstar considered that our responsibility on environmental protection; our manufacturing process completely follows RoHS, SVHC of EU REACH and WEEE standard since 2006, as well as our relative supplier was asked to be cooperated with same regulation.