

WS0010 vs WS0010-TX driver comparison



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

The same



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

[illegible][illegible]

The same

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

[illegible]

RUSSIAN CHARACTER FONT TABLE (171-210)															
Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs
Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs	Abbr	Upprs
LLLL	CO PAR (1)	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О
LLLN	CO PAR (2)	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Э
LLNL	CO PAR (3)	Ю	Я	а	б	в	г	д	е	ж	з	и	й	к	л
LLNN	CO PAR (4)	м	н	о	п	р	с	т	у	ф	х	ц	ч	ш	щ
LLNL	CO PAR (5)	ъ	ы	э	ю	я	А	Б	В	Г	Д	Е	Ж	З	И
LLNN	CO PAR (6)	Й	К	Л	М	Н	О	П	Р	С	Т	У	Ф	Х	Ц
LLNL	CO PAR (7)	Ч	Ш	Щ	Ъ	Ы	Э	Ю	Я	а	б	в	г	д	е
LLNN	CO PAR (8)	ж	з	и	й	к	л	м	н	о	п	р	с	т	у
MLLL	CO PAR (1)	ф	х	ц	ч	ш	щ	ъ	ы	э	ю	я	А	Б	В
MLLN	CO PAR (2)	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П	Р
MLNL	CO PAR (3)	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Э	Ю	Я
MLNN	CO PAR (4)	а	б	в	г	д	е	ж	з	и	й	к	л	м	н
MLLL	CO PAR (5)	о	п	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы
MLLN	CO PAR (6)	э	ю	я	А	Б	В	Г	Д	Е	Ж	З	И	Й	К
MLNL	CO PAR (7)	Л	М	Н	О	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш
MLNN	CO PAR (8)	Щ	Ъ	Ы	Э	Ю	Я	а	б	в	г	д	е	ж	з
MLLL	CO PAR (9)	и	й	к	л	м	н	о	п	р	с	т	у	ф	х
MLLN	CO PAR (10)	ц	ч	ш	щ	ъ	ы	э	ю	я	А	Б	В	Г	Д
MLNL	CO PAR (11)	Е	Ж	З	И	Й	К	Л	М	Н	О	П	Р	С	Т
MLNN	CO PAR (12)	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Э	Ю	Я	а	б
MLLL	CO PAR (13)	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
MLLN	CO PAR (14)	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	э	ю
MLNL	CO PAR (15)	я	А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М
MLNN	CO PAR (16)	Н	О	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ
MLLL	CO PAR (17)	Ы	Э	Ю	Я	а	б	в	г	д	е	ж	з	и	й
MLNN	CO PAR (18)	к	л	м	н	о	п	р	с	т	у	ф	х	ц	ч



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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	V _{IN}	-0.3 to VCC + 0.3	V
Operating temperature range	T _{OPR}	-30 to +80	°C
Storage temperature range	T _{STR}	-55 to +125	°C

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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IST0010-TX

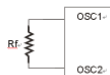
DC CHARACTERISTICS

(GND = 0V, VCC = 2.7 to 5.5V, T_a = -30 to +80°C)

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	V _{IH}	0.8 VCC	-	VCC	V	*1
	Low	V _{IL}	-	-	0.2 VCC	V	
Output voltage	High	V _{OH}	I _{OH} = -0.5mA	0.8 VCC	VCC	V	*2
	Low	V _{OL}	I _{OL} = 0.5mA	-	0.2 VCC	V	
Input leakage current	I _{IL} /I _{IH}	V _{IN} = VCC or GND	-1	-	1	μA	*1
Oscillator frequency	f _{osc}	R _F =60K (*4)	400	-	800	KHz	OS1, OSC2
		R _F =75K (*4)	370	-	780	KHz	
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	I _{std}	(*3)	-	-	30	uA	VCC
Operating current	I _{VCC}	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 C88 = "H"(VCC), OSC=OFF, VCC=3.3V
- *4: When VCC=2.7V & VCC=5.5V



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IST0010

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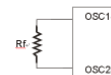
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- *4: When VCC=2.7V & VCC=5.5V





100%



50%



0%

- New IC's CGROMs is the same as old IC.
- New IC's functions are the same as old IC.
- New IC's characteristics is the same as old IC.
- New IC can switch with old IC, regarding the module spec still keep the same.

THANK YOU FOR LISTENING

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



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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.