

1. INTRODUCTION

This application note provides guidance for a smooth transition from W25Q40CL to W25Q40RL. The newly designed W25Q40RL ensures compatibility with its predecessors while delivering enhanced performance. The guide includes specific details highlighting differences in each section. For comprehensive information, please refer to the respective datasheets.

2. "WRITE STATUS REGISTER" COMMAND CHANGED

The new W25Q40RL didn't support the "Write Status Register 1 & 2" command anymore, but with 2 new "Write Status Register-1" and "Write Status Register-2" commands.

2.1 W25Q40RL does not support the "Write Status Register (01h)" command to simultaneously write Status Register-1 and Status Register-2.

2.2 Individual handling of Status Registers-1 and 2 is achieved through the "Write Status Register-1 (01h)" and "Write Status Register-2 (31h)" commands, as illustrated in the table 1.

Table 1. Status Register Write Command Comparison

Product	Command		State Register-1	State Register-2
W25Q40CL	Write Status Register	01h	V	V
W25Q40RL	Write Status Register-1	01h	V	-
	Write Status Register-2	31h	-	V

3. SPECIFICATION COMPARISON

Please refer to the comparison table of AC/DC parameters, major features.

Table 2. Features

Features	W25Q40CL	W25Q40RL
Technology	90nm	58nm
VCC	2.3 ~ 3.6V	2.3 ~ 3.6V
Temp.	-40°C to +85°C	-40°C to +105°C
Special Pins	/HOLD	/HOLD or /RESET
"Power Up" Address Mode	3-Byte	3-Byte
Page Program Size	256B	256B
Erase Granularity	Uniform 4/32/64KB	Uniform 4/32/64KB
UID / OTP	64-Bit Unique ID / 3x256Byte OTP	64-Bit Unique ID / 3x256Byte OTP

Table 3. AC parameters

AC PARAMETERS		W25Q40CL	W25Q40RL
		Typ. / Max	Typ. / Max
Fast Read Speed (2.7V~3.6V)	FR (MHz)	104	133
Fast Read Speed (2.3V~2.7V)	FR (MHz)	80	104
Normal Read Speed (2.7V~3.6V)	fR (MHz)	50	84
Normal Read Speed (2.7V~2.7V)	fR (MHz)	33	66
Page Program Time	tPP (ms)	0.4 / 0.8	0.25 / 2
4KB Sectors Erase Time	tSE (ms)	30 / 300	30 / 240
32KB Blocks Erase Time	tBE1 (ms)	120 / 800	80 / 800
64KB Blocks Erase Time	tBE2 (ms)	150 / 1000	120 / 1,200
Chip Erase Time	tCE (s)	1 / 4	0.8 / 5

Table 4. DC parameters

DC Parameters		W25Q40CL	W25Q40RL
		Typ. / Max	Typ. / Max
Standby Current	ICC1 (uA)	10 / 50	10 / 35
Power-down Current	ICC2 (uA)	1 / 5	0.1 / 5
Read Current	ICC3 (mA)	8 / 16 (104MHz)	11 / 20 (133MHz)
Page Program Current	ICC5 (mA)	10 / 15	8 / 15
Sector/Block Erase Current	ICC6 (mA)	10 / 15	8 / 15

Table 5. Features Comparison

Features Comparison	W25Q40CL	W25Q40RL
Features	Block protection	Block protection
	-	Hardware Reset
	Software Reset	Software Reset
	Program/Erase Suspend/Resume	Program/Erase Suspend/Resume
	-	QPI
	SFDP	SFDP
	Uniform 4/32/64KB	Uniform 4/32/64KB
	Deep Power Down	Deep Power Down
	Unique ID (64-Bit)	Unique ID (64-Bit)
	3x256-Byte OTP	3x256-Byte OTP
	-	Burst Read with Wrap

4. OPERATION GUIDE

4.1 Command Set Table Comparison

Table 6. Command Table

Command Table	W25Q40CL	W25Q40RL
---------------	----------	----------

Write Enable	06h	06h
Write Disable	04h	04h
Read JEDEC ID	9Fh	9Fh
Volatile SR Write Enable	50h	50h
Read Status Register-1	05h	05h
Write Status Register	01h	-
Write Status Register-1	-	01h
Read Status Register-2	35h	35h
Write Status Register-2	-	31h
Read Status Register-3	-	15h
Write Status Register-3	-	11h
Read Data	03h	03h
Fast Read	0Bh	0Bh
Burst Read with Wrap	-	0Ch
Fast Read Dual I/O	BBh	BBh
Fast Read Dual Output	3Bh	3Bh
Fast Read Quad I/O	EBh	EBh
Fast Read Quad Output	6Bh	6Bh
Enable QPI Mode	-	38h
Disable QPI Mode	-	FFh
Block (4KB) Erase	20h	20h
Block (32KB) Erase	52h	52h
Block (64KB) Erase	D8h	D8h
Chip Erase	60/C7h	60/C7h
Program/Erase Suspend	75h	75h
Program/Erase Resume	7Ah	7Ah
Page Program	02h	02h
Quad Page Program	32h	32h
Power Down	B9h	B9h
Release Power Down / Device ID	ABh	ABh
Read Manufacturer / Device ID	90h	90h
Read Manufacturer / Device ID Dual I/O	92h	92h
Read Manufacturer / Device ID Quad I/O	94h	94h
Erase Security Register	44h	44h
Program Security Register	42h	42h
Read Security Register	48h	48h
Read SFDP	5Ah	5Ah
Enable Reset	66h	66h
Reset	99h	99h
Set Read Parameters	-	C0h
Set Burst Length	77h	77h
Read Unique ID	4Bh	4Bh

Table 7. Manufacturer and Device Identification

Manufacturer and Device Identification	W25Q40CL-IG	W25Q40RL-JQ
Manufacturer ID Winbond Serial Flash (MF[7:0])	EFh	EFh
Device ID ABh, 90h, 92h, 94h (ID[7:0])	12h	12h
Device ID 9Fh (ID[15:0])	4013h	4013h (P/N -Q) 7013h (P/N -M)

4.2 Part Number Comparison

Table 8. Package Type

Package Type	W25Q40CL	W25Q40RL
SOP8 150mil (SN)	W25Q40CLSNIG	W25Q40RLSNJQ W25Q40RLSNJM
SOP8 208mil (SS)	W25Q40CLSSIG	W25Q40RLSSJQ W25Q40RLSSJM
USON8 2x3x0.4mm (XH)	W25Q40CLUXIG W25Q40CLUXIGG	W25Q40RLXHJQ W25Q40RLXHJQG W25Q40RLXHJM

4.3 Status Register Comparison

Table 9. Status Register Read*

Status Register	W25Q40CL-G									W25Q40RL-JQ								
	7	6	5	4	3	2	1	0	Default value	7	6	5	4	3	2	1	0	Default value
SR-1	SRP0	SEC	TB	BP2	BP1	BP0	WEL	BUSY	00h	SRP	SEC	TB	BP2	BP1	BP0	WEL	BUSY	00h
SR-2	SUS	CMP	LB3	LB2	LB1	-	QE	SRP1	00h	SUS	CMP	LB3	LB2	LB1	LB0	QE	SRL	06h
SR-3	-	-	-	-	-	-	-	-	-	-	DRV1	DRV0	-	-	-	-	-	40h

* Refer the datasheet for Status Register definition

- 4.3.1 The notation of SRP0 is changed to SRP. The feature is no change.
- 4.3.2 The notation of SRP1 is changed to SRL. The feature is no change.
- 4.3.3 The W25Q40RL introduces the LB0 bit in State Register-2, with a default value of 1 indicating that the SFDP Register is locked.
- 4.3.4 The W25Q40RL introduces "Write Status Register-3" command to adjust the Driver Strength.

4.3.5 The W25Q40RL-JQ fixes QE in State Register-2, with a default value of 1 indicating that the quad enable.

4.3.6 The default value of State Register-2 is 06h for the W25Q40RL-JQ and 00h for the W25Q40CL-IG.

Table 10. Status Register Write

Product	Write Status Register-1/2/3	Byte 1	Byte 2	Byte 3
		Command input	Data input	Data input
W25Q40CL	Write Status Register	01h	(S7-S0)	(S15-S8)
W25Q40RL	Write Status Register-1	01h	(S7-S0)	-
	Write Status Register-2	31h	(S15-S8)	-
	Write Status Register-3	11h	(S23-S16)	-

*State Register-1: S7-0

*State Register-2: S15-8

*State Register-3: S23-16

4.3.7 Status Registers-1 and 2 require individual writing using the commands "01h" and "31h," respectively.

5. REVISION HISTORY

Version	Date		Page	Description
1.0	12/18/2025			Initial release

Trademarks

Winbond, *SpiFlash* and *SpiStack* are trademarks of *Winbond Electronics Corporation*. All other marks are the property of their respective owner.

Important Notice

Winbond products are not designed, intended, authorized or warranted for use as components in systems or equipment intended for surgical implantation, atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, or for other applications intended to support or sustain life. Furthermore, *Winbond* products are not intended for applications wherein failure of *Winbond* products could result or lead to a situation wherein personal injury, death or severe property or environmental damage could occur. *Winbond* customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify *Winbond* for any damages resulting from such improper use or sales.

Information in this document is provided solely in connection with Winbond products. Winbond reserves the right to make changes, corrections, modifications or improvements to this document and the products and services described herein at any time, without notice.



Product / Process Change Notice

No.: Z200-PCN-DM202601-07-A

Date: January 21, 2026

Change Title : W25Q40RL "R-Series" (58nm) to replace W25Q40CL and W25X40CL "C-Series" (90nm) 4Mb 3.3V SpiFlash® Memories industrial products

Change Classification: Major Minor with customer special request Minor with customer notification
Change item : DataSheet Design Raw Material Wafer FAB Assembly Testing Packing Manufacture site Others

Affected Product(s) :

Please refer to Table 1 in details.

Description of Change(s)

The W25Q40RL 4Mb SpiFlash® Memories use Winbond's 58nm Flash technology. It is function-compatible with W25Q40CL and W25X40CL 90nm devices offering improved performance, features and availability. (Please refer the attachment II)

Reason for Change(s) :

Improve features and Command backward compatible (same Superset Instruction Set). (Please refer the attachment II)

Impact of Change(s) : (positive & negative)

Form : Change (The package size will be changed from USON8(2x3x0.6mm) to XSON8(2x3x0.4mm), and from VSOP8 150mil(4x5x1mm) to SOP8 150mil (4x5x1.75mm). Other sizes remain unchanged. Please refer to attachment I)

Fit : Change (The package size will be changed from USON8(2x3x0.6mm) to XSON8(2x3x0.4mm), and from VSOP8 150mil(4x5x1mm) to SOP8 150mil (4x5x1.75mm). Other sizes remain unchanged. Please refer to attachment I)

Function : No Concern (Please refer to attachment II)

Reliability : No Concern (Please refer to attachment III)

Hazardous Substances: No Change (Please refer to attachment IV)

Qualification Plan/ Results :

Based on the Winbond Reliability report, the new product meets our criteria and has no quality concern. (Please refer to attachment III)

Implementation Plan :

Please refer to attachment V for details.

Date Code: onward Lot No: onward Proposed first ship date: January 20, 2026

Originator: (QA)	H.Y. Huang	Approval: (QA Dept. Manager)	C.C. HE0	Approval: (QRA Director)	T.M. Kuo	Approval: (Quality Center Technology Executive)	W.P. CHANG
----------------------------	-------------------	---	-----------------	---------------------------------------	-----------------	--	-------------------

Contact for Questions & Concerns	Name: <u>Betty Huang</u> TEL: <u>886-3-5678168</u> (ext.76549) FAX: <u>886-3-5796124</u>
	Address : <u>No. 8,Keya 1st Rd., Daya Dist., Central Taiwan Science Park, Taichung City 42881,Taiwan</u>
	E-mail: <u>Hyhuang8@winbond.com</u>



Customer Comments:

Note: Please sign this notice, and return to Winbond contact within 30 days. If no response is received within 30 days, this Change Request will be assumed to meet your approval.

Major change: Approval Disapproval Conditional Approval : _____.

Minor with customer special request: Approval Disapproval Conditional Approval : _____.

Minor with customer notification: Recognition

Comment:

Date: _____

Dept. name: _____

Person in charge: _____



Table 1. The affected part no is listed below.

W25Q40CLSNIG	W25Q40CLSSIG	W25Q40CLUXIG	W25Q40CLUXIGG	W25X40CLSNIG
W25X40CLSSIG	W25X40CLSVIG	W25X40CLUXIG	W25X40CLUXIGG	W25X40CLZPIG
W25X41CLSNIG				