



Advanced Product / Process Change Notice

PCN No.: Z200-PCN-DM201306-01-A

Date : June 7, 2013

Change Title : W25Q16 “D-Series” to replace W25Q16 “B-Series” and “C-Series” 16Mb SpiFlash® Memories

Change Classification: Major Minor

Change item: Design Raw Material Wafer FAB Package Assembly Testing Others : _____.

Affected Product(s): 90nm 16Mb “B-Series” and “C-Series” SpiFlash memories:

W25Q16BVFCC1, W25Q16BVFCC2, W25Q16BVFCC3, W25Q16BVSFIG, W25Q16BVSNIG, W25Q16BVSS1D, W25Q16BVSSIG, W25Q16BVSSIP, W25Q16BVS01, W25Q16BVS02, W25Q16BVWC, W25Q16BVWCM1, W25Q16BVWCR1, W25Q16BVWCR2, W25Q16BVWI, W25Q16BVZPIG

W25Q16CVDAIG, W25Q16CVSCA1, W25Q16CVSCA2, W25Q16CVSCB1, W25Q16CVSCB2, W25Q16CVSFIG, W25Q16CVSFIQ, W25Q16CVSNIG, W25Q16CVSSIG, W25Q16CVSSIH, W25Q16CVSSIL, W25Q16CVSSIP, W25Q16CVSSIQ, W25Q16CVSTIG, W25Q16CVSTIM, W25Q16CVSVIG, W25Q16CVSY02, W25Q16CVSY03, W25Q16CVSY04, W25Q16CVSY05, W25Q16CVTBIG, W25Q16CVTBIP, W25Q16CVTCIG, W25Q16CVTCIP, W25Q16CVWC, W25Q16CVWI, W25Q16CVWIR1, W25Q16CVZPIG, W25Q16CVZPIM

Description of Change(s) :

The W25Q16DV 16 Mb SpiFlash Memory is a function-compatible superset of the W25Q16BV and W25Q16CV offering improved features and availability using the same well-proven 90nm process technology.

Reason for Change(s):

1) Improved Features (see below)

Features

a) Enhanced features over W25Q16BV include: Security Registers with OTP, Program/Erase Suspend/Resume, Burst Read with Wrap, Non-Volatile & Volatile Status Registers, Complement Array Protection, SFDP and Software Reset

b) Enhanced features over W25Q16CV include: Software Reset

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

Form: No Change

Fit: No Change

Function: No System Change*

Reliability: No concern (Attachment I W25Q16DV Reliability Report is attached as reference)

Hazardous Substances: No concern (see Appendix I)

* No system change is needed unless new features (QPI, Software Reset) will be used.

Qualification Plan/ Results :

Based on Winbond W25Q64FW Serial Flash Reliability report, the new product meets our criteria and no quality concern (refers to Attachment I in details).

Implementation Plan :

Please refer to Attachment for details

Date Code : _____ onward Lot No.: _____ onward Implemented date: (See Attachment) .



Originator:(QA Sec. Manager)	<i>YH Cheng</i>	Responsible: (QA Dept. Manager)	<i>Yu-Sung, Cheng</i>	Approval:(QRA Director)	<i>Yu-Sung, Cheng</i>
Contact for Questions & Concerns	Name: <u>Hannah Cheng</u> TEL: <u>886-3-5678168</u> (ext.6553) FAX: <u>886-3-5796124</u> Address : <u># 539, Sec. 2, Wenxing Rd., Jhubei City, Hsinchu County 302, Taiwan</u> E-mail: <u>yhcheng2@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.

Approval Disapproval Conditional Approval : _____.

Date: _____

Dept. name: _____

Person in charge: _____.



Table 1 The impact product list

Winbond Current PN (90nm B-Series)	Winbond Primary Replacement PN (90nm D-Series)
W25Q16BFVCC1	W25Q16DVFIG
W25Q16BFVCC2	W25Q16DVFIG
W25Q16BFVCC3	W25Q16DVFIG
W25Q16BVFIG	W25Q16DVFIG
W25Q16BVSNIG	W25Q16DVSNIG
W25Q16BVSS1D	W25Q16DVSS1D
W25Q16BVSSIG	W25Q16DVSSIG
W25Q16BVSSIP	W25Q16DVSSIP
W25Q16BVS01	W25Q16DVSSIG
W25Q16BVS02	W25Q16DVSSIG
W25Q16BVWC	W25Q16DVWC
W25Q16BVWCM1	W25Q16DVWC
W25Q16BVWCR1	W25Q16DVWC
W25Q16BVWCR2	W25Q16DVWC
W25Q16BVWI	W25Q16DVWI
W25Q16BVZPIG	W25Q16DVZPIG

Winbond Current PN (90nm C-Series)	Winbond Primary Replacement PN (90nm D-Series)
W25Q16CVDAIG	W25Q16DVDAIG
W25Q16CVSCA1	W25Q16DVSSIG
W25Q16CVSCA2	W25Q16DVSSIG
W25Q16CVSCB1	W25Q16DVSSIG
W25Q16CVSCB2	W25Q16DVSSIG
W25Q16CVSFIG	W25Q16DVFIG
W25Q16CVSFIQ	W25Q16DVFIG
W25Q16CVSNIG	W25Q16DVSNIG
W25Q16CVSSIG	W25Q16DVSSIG
W25Q16CVSSIH	W25Q16DVSSIH
W25Q16CVSSIL	W25Q16DVSSIL
W25Q16CVSSIP	W25Q16DVSSIP
W25Q16CVSSIQ	W25Q16DVSSIQ
W25Q16CVSTIG	W25Q16DVSTIG
W25Q16CVSTIM	W25Q16DVSTIM
W25Q16CVSVIG	W25Q16DVSVIG
W25Q16CVSY02	W25Q16DVSSIG
W25Q16CVSY03	W25Q16DVSSIG
W25Q16CVSY04	W25Q16DVSSIG
W25Q16CVSY05	W25Q16DVSSIG
W25Q16CVTBIG	W25Q16DVTBIG
W25Q16CVTBIP	W25Q16DVTBIP
W25Q16CVTCIG	W25Q16DVTCIG
W25Q16CVTCIP	W25Q16DVTCIP
W25Q16CVWC	W25Q16DVWC
W25Q16CVWI	W25Q16DVWI
W25Q16CVWIR1	W25Q16DVWI
W25Q16CVZPIG	W25Q16DVZPIG
W25Q16CVZPIM	W25Q16DVZPIM



Winbond Electronics Corporation

No.539, Sec.2 Wenxing Rd.
 Jhubei City, Hsinchu, Taiwan, R.O.C.

Product Obsolescence Notice

W25Q16B and W25Q16C SpiFlash Memories

Notification Date: June 5, 2013

Dear Valued Customer,

This letter is to notification of Winbond’s intention to terminate production of the W25Q16BV and W25Q16CV SpiFlash memory and replace it with the W25Q16DV. Current part numbers affected and corresponding replacement part numbers are listed below. Availability of W25Q16BV and W25Q16CV Automotive Grade products are not affected by this notice.

Winbond Current PN (90nm B-Series)	Winbond Primary Replacement PN (90nm D-Series)
W25Q16BVFCC1	W25Q16DVFIG
W25Q16BVFCC2	W25Q16DVFIG
W25Q16BVFCC3	W25Q16DVFIG
W25Q16BVFIG	W25Q16DVFIG
W25Q16BVSNIG	W25Q16DVSNIG
W25Q16BVSS1D	W25Q16DVSS1D
W25Q16BVSSIG	W25Q16DVSSIG
W25Q16BVSSIP	W25Q16DVSSIP
W25Q16BVS01	W25Q16DVSSIG
W25Q16BVS02	W25Q16DVSSIG
W25Q16BVWC	W25Q16DVWC
W25Q16BVWCM1	W25Q16DVWC
W25Q16BVWCR1	W25Q16DVWC
W25Q16BVWCR2	W25Q16DVWC
W25Q16BVWI	W25Q16DVWI
W25Q16BVZPIG	W25Q16DVZPIG

Winbond Current PN (90nm C-Series)	Winbond Primary Replacement PN (90nm D-Series)
W25Q16CVDAIG	W25Q16DVDAIG
W25Q16CVSCA1	W25Q16DVSSIG
W25Q16CVSCA2	W25Q16DVSSIG
W25Q16CVSCB1	W25Q16DVSSIG
W25Q16CVSCB2	W25Q16DVSSIG
W25Q16CVSFIG	W25Q16DVFIG
W25Q16CVSFIQ	W25Q16DVSFIQ
W25Q16CVSNIG	W25Q16DVSNIG
W25Q16CVSSIG	W25Q16DVSSIG
W25Q16CVSSIH	W25Q16DVSSIH
W25Q16CVSSIL	W25Q16DVSSIL
W25Q16CVSSIP	W25Q16DVSSIP
W25Q16CVSSIQ	W25Q16DVSSIQ
W25Q16CVSTIG	W25Q16DVTIG
W25Q16CVSTIM	W25Q16DVTIM
W25Q16CVSVIG	W25Q16DVSVIG
W25Q16CVSY02	W25Q16DVSSIG
W25Q16CVSY03	W25Q16DVSSIG
W25Q16CVSY04	W25Q16DVSSIG
W25Q16CVSY05	W25Q16DVSSIG
W25Q16CVTBIG	W25Q16DVTBIG
W25Q16CVTBIP	W25Q16DVTBIP
W25Q16CVTCIG	W25Q16DVTCIG
W25Q16CVTCIP	W25Q16DVTCIP
W25Q16CVWC	W25Q16DVWC
W25Q16CVWI	W25Q16DVWI
W25Q16CVWIR1	W25Q16DVWI
W25Q16CVZPIG	W25Q16DVZPIG
W25Q16CVZPIM	W25Q16DVZPIM



W25Q16DV Features

- a) Enhanced features over W25Q16BV include:
Security Registers with OTP, Program/Erase Suspend/Resume, Burst Read with Wrap, Non-Volatile & Volatile Status Registers, Complement Array Protection, SFDP and Software Reset
- b) Functional compatible with W25Q16BV and W25Q16CV:
Identical JEDEC Device ID, Superset Instruction Set

W25Q16DV Benefits

- a) Improved Features and Availability
- b) Smaller die size
- c) Faster Read performance

Please refer to the table below for the product last time order date and Winbond last shipment date. Winbond Electronics reserves the right to limit last time buy quantities based on capacity and material availability. Please notify Winbond as soon as possible if there are any concerns with this schedule.

Affected Part Number	Notification Date	Last Order Date	Last Ship Date	Replacement Part Number	Reliability Report	Mass Production
W25Q16BV	June 5th 2013	Dec. 5th 2013	June 5th 2014	W25Q16DV	May 20th 2013	May 20th 2013
W25Q16CV	June 5th 2013	Dec. 5th 2013	June 5th 2014	W25Q16DV	May 20th 2013	May 20th 2013

Jooweon (JW) Park

Vice President of Flash Marketing



RELIABILITY REPORT

W25Q16DV

PART NO. : W25Q16DV

FUNCTION : 16M FLASH MEMORY

PROCESS : 90nm CMOS (DPTM)

RA ENGINEER : WR. Chang

RA MANAGER : K.F. Chuang



~SUMMARY~

W25Q16DV for 8-SOP 150 mil passed the reliability items as follows:

⌘. High Temp. Operating Life test	: 0/231 pcs
⌘. Endurance Cycling with Data Retention	: 0/231 pcs
⌘. ESD-HBM	: 0/36 pcs
⌘. ESD-MM	: 0/36 pcs
⌘. ESD-CDM	: 0/9 pcs
⌘. Latch -Up Test	: 0/18 pcs

---CONTENTS---

I . PRODUCT DESCRIPTION

A. Introduction

B. Features

C. Function Block

II . LIFE TEST

A. Introduction

1. High Temp. Operating Life Test (HTOL)
2. Non-Volatile Memory Cycling Endurance (NVCE)

B. Test Results

1. High Temp. Operating Life Test (HTOL)
2. Non-Volatile Memory Cycling Endurance (NVCE)



III. ESD & LATCH-UP

A. Introduction

1. ESD
2. LATCH-UP

B. Test Results

1. ESD
2. LATCH-UP

I. PRODUCT DESCRIPTION

A. Introduction

The W25Q16DV (16M-bit) Serial Flash memory provides a storage solution for systems with limited space, pins and power. The 25Q series offers flexibility and performance well beyond ordinary Serial Flash devices. They are ideal for code shadowing to RAM, executing code directly from Dual/Quad SPI (XIP) and storing voice, text and data. The device operates on a single 2.7V to 3.6V power supply with current consumption as low as 4mA active and 1 μ A for power-down.

The W25Q16DV array is organized into 8,192 programmable pages of 256-bytes each. Up to 256 bytes can be programmed at a time. Pages can be erased in groups of 16 (4KB sector erase), groups of 128 (32KB block erase), groups of 256 (64KB block erase) or the entire chip (chip erase). The W25Q16DV has 512 erasable sectors and 32 erasable blocks respectively. The small 4KB sectors allow for greater flexibility in applications that require data and parameter storage.

The W25Q16DV supports the standard Serial Peripheral Interface (SPI), and a high performance Dual/Quad output as well as Dual/Quad I/O SPI: Serial Clock, Chip Select, Serial Data I/O0 (DI), I/O1 (DO), I/O2 (/WP), and I/O3 (/HOLD). SPI clock frequencies of up to 104MHz are supported allowing equivalent clock rates of 208MHz (104MHz x 2) for Dual I/O and 416MHz (104MHz x 4) for Quad I/O when using the Fast Read Dual/Quad I/O instructions. These transfer rates can outperform standard Asynchronous 8 and 16-bit Parallel Flash memories. The Continuous Read Mode allows for efficient memory access with as few as 8-clocks of instruction-overhead to read a 24-bit address, allowing true XIP (execute in place) operation.

A Hold pin, Write Protect pin and programmable write protection, with top or bottom array control, provide further control flexibility. Additionally, the device supports JEDEC standard manufacturer and device identification with a 64-bit Unique Serial Number.

B. Features

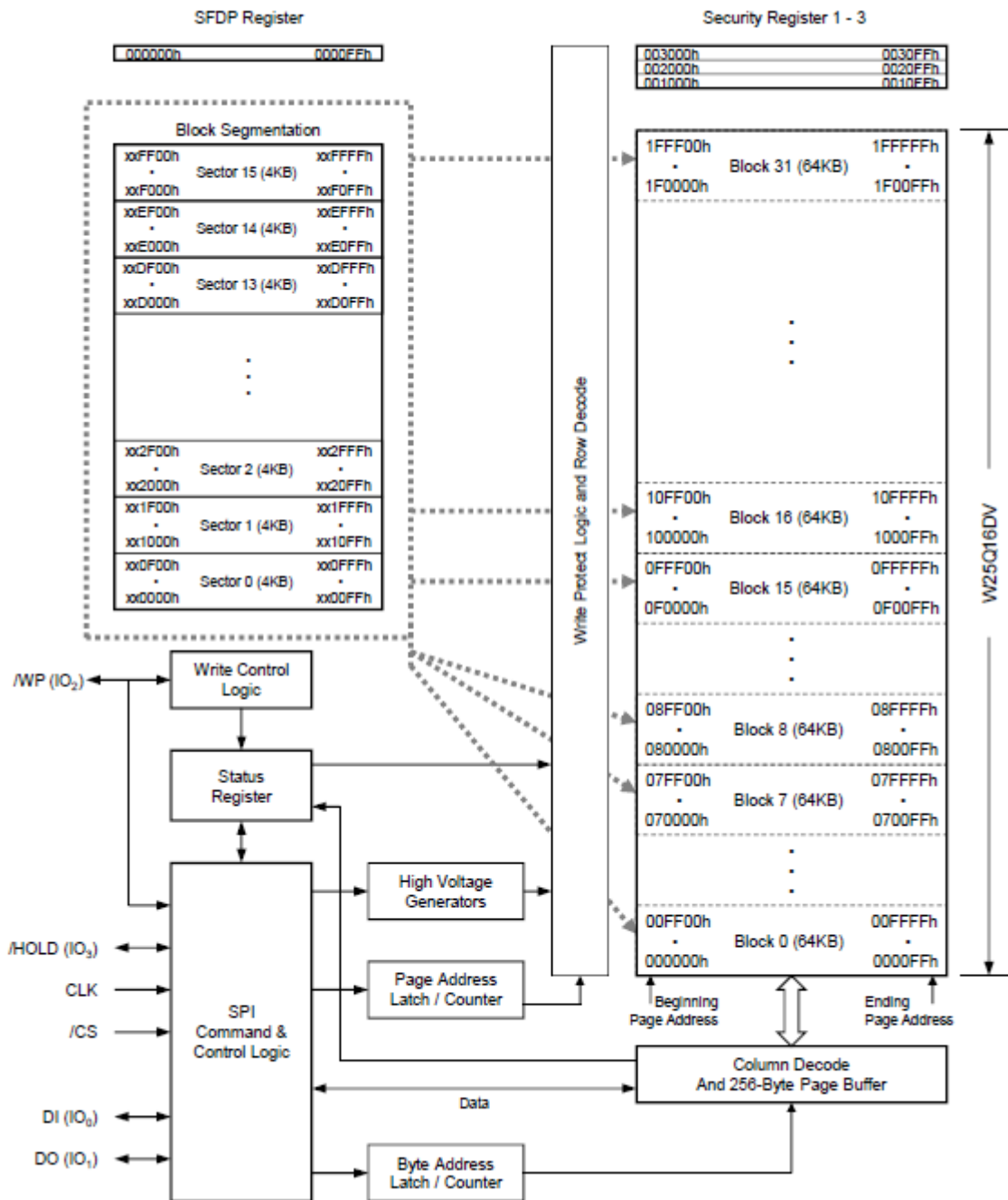
- Family of Serial Flash Memories
 - W25Q16DV: 16M-bit / 2M -byte (2,097,152)
 - Standard SPI: CLK,/CS,DI,DO,/WP,/Hold
 - Dual SPI: CLK,/CS,IO0,IO1,/WP,/Hold
 - Quad SPI: CLK,/CS,IO0,IO1,IO2,IO3
 - QPI: CLK, /CS,IO0,IO1,IO2,IO3
- Highest Performance Serial Flash
 - 104MHz Standard/Dual/Quad SPI clocks
 - 208/416MHz equivalent Dual/Quad SPI
 - 52MB/s continuous data transfer rate
 - More than 100,000 erase/program cycles
 - More than 20-year data retention
- Efficient “Continuous Read Mode”
 - Low Instruction overhead
 - Continuous Read with 8/16/32/64-Byte Wrap
 - As few as 8 clocks to address memory
 - Allows true XIP (execute in place) operation
 - Outperforms X16 Parallel Flash
- Low Power, Wide Temperature Range
 - Single 2.7 to 3.6V supply
 - 4mA active current, <1μA Power-down (typ.)
 - -40° C to +85°C operating range
- Flexible Architecture with 4KB sectors
 - Uniform Sector/Block Erase (4/32/64K-bytes)
 - Program one to 256 bytes
 - Erase/Program Suspend & Resume



- Advanced Security & Identification Features
 - Software and Hardware Write-Protect
 - Top or Bottom ,4KB complement array protection
 - Power Supply Lock-Down and OTP protection
 - 64-Bit Unique ID for each device
 - 3X 256-Byte Security Registers with OTP locks
 - Volatile & Non-volatile Status Register Bits
- Space Efficient Packaging
 - 8-pin SOIC/VSOP 150/208-mil
 - 8-pad WSON 6x5-mm
 - 16-pin SOIC 300-mil
 - 24-ball TFBGA 8x6-mm (6x4/5x5 ball array)
 - Contact Winbond for KGD and other options



C. Function Block



II. LIFE TEST

A. Introduction

1. High-Temperature Operating Life Test (HTOL)

1.1 SCOPE

HTOL test is performed to accelerate failure mechanisms which are thermally activated. This can be achieved by stressing the devices with bias at high temperature.

1.2 TEST CONDITION

Temp ambient = 125°C, Vdd = 3.6V, dynamic stressing, Td = 1000 hrs.
(JESD22-A108)

2. Non-Volatile Memory Cycling Endurance (NVCE)

2.1 SCOPE

Test product's capability to the number of Program and Erase.

2.2 TEST CONDITION

JEDEC-STD-JESD 47

Room Temp cycling test:

TD (Duration) = 1K, 10K, 100K cycles on 100:10:1 memory size.

Vcc = 3.6V

Pattern = 00, FF, CHKBD, CHKBD\



Low temp data retention (LTDR):

Dynamic operation life test at room temp.

TD (Duration) = 500 hrs

Vcc = 3.6V

Apply dynamic pattern.

85°C cycling test:

TD (Duration) = 1K, 10K, 100K cycles on 100:10:1 memory size.

Vcc = 3.6V

Pattern = 00, FF, CHKBD, CHKBD\

High temp data retention (HTDR):

Bake at 125°C

TD (Duration) = 10 hrs for 100K cycling,
100 hrs for 10K and 1K cycling.



B. Test Results

1. High-Temperature Operating Life Test (HTOL)

1.1 SUMMARY TABLE

RUN	Lot No	500 Hrs	1000 Hrs	Remark
#1	6207BA8AG	0/77	0/77	
#2	62129F6AC	0/77	0/77	
#3	622703000	0/77	0/77	

*Criteria : Acc/Rej = 0/1

1.2 FAILURE RATE CALCULATION

$$F.R.(T) = \frac{X^2(1-CL, 2N+2)}{2EDH}$$

WHERE X^2 : CHI-SQUARE Function CL: Confidence Level

N : No of Failures

EDH: Equivalent Device Hour

Test Item	Dev. Hours at Tj=126.32°C	Equiv. Dev. Hours at Tj=55°C	No. of Failure	Failure Rate at 55°C
HTOL	231000	212591118.41	0	4.31 FIT

Based on CL = 60% and Activation Energy = 1.08 eV

$$T_j = T_a + P_d \cdot \theta_{ja}$$

Where: Tj= junction temp, Ta=125°C (ambient temp)

Pd=15.48mW (power dissipated on the device)

θja=85.56°C/W (thermal resistance from junction to ambient)



2. Non-Volatile Memory Cycling Endurance (NVCE)

2.1 Room temp 1k~100k cycling with Data Retention

RUN	Lot No	RT cycling: 1K~100K	LTDR- 500 HRs	Remark
#1	6207BA8AG	0/38	0/38	
#2	62129F6AC	0/38	0/38	
#3	622703000	0/38	0/38	

*Criteria: Acc/Rej = 0/1.

2.2 85°C 1k~100k cycling with Data Retention

RUN	Lot No	85°C cycling: 1K~100K	HTDR- 10 HRs	HTDR- 100 HRs	Remark
#1	6207BA8AG	0/39	0/39	0/39	
#2	62129F6AC	0/39	0/39	0/39	
#3	622703000	0/39	0/39	0/39	

*Criteria: Acc/Rej = 0/1.



III. ESD AND LATCH-UP

A. Introduction

1. ESD

1.1 SCOPE

ESD test is to evaluate the immunity of device to electrostatic discharge.

1.2 TEST CONDITION

Human Body Model (HBM): JESD22-A114C.01

Machine Model (MM): EIA/JESD22-A115-A.

Charge Device Model (CDM): JESD22-C101-C.

2. Latch-Up

2.1 SCOPE

Latch-Up test is to evaluate the immunity of the devices to latch-up.

2.2 TEST CONDITION

JEDEC STD 78, Temp = 25 °C, VDD = Max. Operating Voltage

B. Test Results

1. ESD

1.1 Human Body Model

Run	LOT#	POSITIVE	NEGATIVE	Remark
#1	6207BA8AG	0/6	0/6	
#2	62129F6AC	0/6	0/6	
#3	622703000	0/6	0/6	

*Criteria: Acc/Rej = 0/1.

*| SPEC | : >2KV



1.2. Machine Model

Run	LOT#	POSITIVE	NEGATIVE	Remark
#1	6207BA8AG	0/6	0/6	
#2	62129F6AC	0/6	0/6	
#3	622703000	0/6	0/6	

*Criteria: Acc/Rej = 0/1.

*| SPEC | : >200 V

1.3. Charge Device Model

Run	LOT#	POSITIVE / NEGATIVE	Remark
#1	6207BA8AG	0/3	
#2	62129F6AC	0/3	
#3	622703000	0/3	

*Criteria: Acc/Rej = 0/1.

*| SPEC | : >1000V

2. Latch-Up

Run	LOT#	POSITIVE	NEGATIVE	Remark
#1	6207BA8AG	0/3	0/3	
#2	62129F6AC	0/3	0/3	
#3	622703000	0/3	0/3	

*Criteria: Acc/Rej = 0/1.

*| SPEC. | : I-Test > 200mA

Vsupply over voltage Test>1.5x max supply voltage

W25Q16DV



Headquarters Taiwan

Winbond Electronics Corp.

No. 8, Keya Rd. I, Central Taiwan Science Park,
Taichung County, 428, Taiwan, R.O.C.
Tel: 886-4-25218168

USA

Winbond Electronics Corporation America

2727 N. First Street,
San Jose, CA 95134, U.S.A.
Tel: 408-943-6666

Hong Kong

Winbond Electronics (H.K.) Ltd.

Unit 9-11, 22/F, Millennium City 2,
378 Kwun Tong Road, Kowloon,
Hong Kong, P.R. China
Tel: 852-27513126

Japan

Winbond Electronics Corporation Japan

NO.2 Ueno-Bldg.,7-18,3-chome,
Shinyokohama Kohoku-ku,
Yokohama, 222-0033, Japan
Tel: 81-45-478-1881



Hazardous Substances Check List

Raw material name: W25Q16DVZPIG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	4ppm	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	N.D.	PASS
Cr (Chromium, 鉻)	< 700ppm	1ppm	PASS
Br (Bromine, 溴)	< 900ppm	9ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	3ppm	PASS

Conclusion: Accept Reject

Engineer: 周雅英

Date: 2013/2/4



Hazardous Substances Check List

Raw material name: W25Q16DVUUG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	N.D.	PASS
Cr (Chromium, 鉻)	< 700ppm	N.D.	PASS
Br (Bromine, 溴)	< 900ppm	56ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	3ppm	PASS

Conclusion: Accept Reject

Engineer: 周雅英

Date: 2013/2/4

Hazardous Substances Check List

Raw material name: W25Q16DVTICP

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	5ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	2ppm	PASS
Br (Bromine, 溴)	< 900ppm	17ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	2ppm	PASS

Conclusion: Accept RejectEngineer: 周雅英Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVTCIG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	5ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	N.D.	PASS
Br (Bromine, 溴)	< 900ppm	23ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept Reject

Engineer: 周雅英

Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVTBIP

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	1ppm	PASS
Hg (Mercury, 汞)	< 200ppm	5ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	N.D.	PASS
Br (Bromine, 溴)	< 900ppm	N.D.	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	2ppm	PASS

Conclusion: Accept Reject

Engineer: 周雅英

Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVTBIG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	5ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	1ppm	PASS
Br (Bromine, 溴)	< 900ppm	10ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept Reject

Engineer: 周雅榮

Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVSVIG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	12ppm	PASS
Hg (Mercury, 汞)	< 200ppm	15ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	1ppm	PASS
Br (Bromine, 溴)	< 900ppm	N.D.	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept RejectEngineer: 周雅策Date: 2013/2/4

Hazardous Substances Check List

Raw material name: W25Q16DVSSIQ

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	2ppm	PASS
Hg (Mercury, 汞)	< 200ppm	1ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	N.D.	PASS
Br (Bromine, 溴)	< 900ppm	N.D.	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept Reject

Engineer: 周雅苑

Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVSSIG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	4ppm	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	4ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	5ppm	PASS
Br (Bromine, 溴)	< 900ppm	96ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	15ppm	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept Reject

Engineer: 周雅策

Date: 2013/1/18



Hazardous Substances Check List

Raw material name: W25Q16DVSNIG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	7ppm	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	N.D.	PASS
Cr (Chromium, 鉻)	< 700ppm	1ppm	PASS
Br (Bromine, 溴)	< 900ppm	73ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	20ppm	PASS

Conclusion: Accept Reject

Engineer: 周雅榮

Date: 2013/1/18



Hazardous Substances Check List

Raw material name: W25Q16DVSFIQ

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	N.D.	PASS
Cr (Chromium, 鉻)	< 700ppm	4ppm	PASS
Br (Bromine, 溴)	< 900ppm	8ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept Reject

Engineer: 周雅英

Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVFIG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	2ppm	PASS
Hg (Mercury, 汞)	< 200ppm	2ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	4ppm	PASS
Br (Bromine, 溴)	< 900ppm	25ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept Reject

Engineer: 周雅堯

Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVDAIQ

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	1ppm	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	N.D.	PASS
Cr (Chromium, 鉻)	< 700ppm	8ppm	PASS
Br (Bromine, 溴)	< 900ppm	11ppm	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept Reject

Engineer: 周雅策

Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVDAIG

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	N.D.	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	N.D.	PASS
Cr (Chromium, 鉻)	< 700ppm	N.D.	PASS
Br (Bromine, 溴)	< 900ppm	N.D.	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	26ppm	PASS

Conclusion: Accept RejectEngineer: 周雅榮Date: 2013/1/18

Hazardous Substances Check List

Raw material name: W25Q16DVZPIQ

Element	Specification	Measured Data	Result
Cd (Cadmium, 鎘)	< 20ppm	4ppm	PASS
Pb (Lead, 鉛)	Organic < 200ppm Inorganic < 700ppm	N.D.	PASS
Hg (Mercury, 汞)	< 200ppm	6ppm	PASS
Cr (Chromium, 鉻)	< 700ppm	1ppm	PASS
Br (Bromine, 溴)	< 900ppm	N.D.	PASS
Cl (Chlorine, 氯)	< 900ppm	N.D.	PASS
Sb (Antimony, 銻)	< 700ppm	N.D.	PASS

Conclusion: Accept RejectEngineer: 周雅英Date: 2013/1/18