ON Semiconductor

FINAL PRODUCT/PROCESS CHANGE NOTIFICATION #16669

Generic Copy

Issue Date: 23-Jun-2011

TITLE: Qualification of Serial I2C EEPROM devices CAT24C128 and CAT24C256 for fabrication at ON Semiconductor's Gresham, Oregon Wafer Fab

PROPOSED FIRST SHIP DATE: 01-Oct-2011

AFFECTED CHANGE CATEGORY(S): CAT24C128 and CAT24C256 (all Packages, all Temperatures)

FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:
Contact your local ON Semiconductor Sales Office or Denisa Stefan< denisa.stefan@onsemi.com >

SAMPLES: Samples available per "Affected Device List" table on Page 4.
Contact your local ON Semiconductor Sales Office.

ADDITIONAL RELIABILITY DATA: Available
Contact your local ON Semiconductor Sales Office or Tony Luciani <tony.luciani@onsemi.com>

NOTIFICATION TYPE:

Final Product/Process Change Notification (FPCN)

Final change notification sent to customers. FPCNs are issued at least 90 days prior to implementation of the change.

ON Semiconductor will consider this change approved unless specific conditions of acceptance are provided in writing within 30 days of receipt of this notice. To do so, contact <quality@onsemi.com>.

DESCRIPTION AND PURPOSE:

ON Semiconductor is pleased to announce that, as part of its ongoing effort to improve product availability, the Serial I^2C EEPROM devices CAT24C128 and CAT24C256 are now qualified for production in the 0.18 µm CMOS EE process at ON Semiconductor's 8-inch Wafer Fab in Gresham, Oregon, USA. The Gresham Wafer Fab is ISO9001:2008, ISO/TS16949:2009 and ISO14001:2004 certified. Wafers for these devices will also continue to be supplied by our foundry partner OKI Semiconductor, Japan from a 6-inch line running a 0.35 µm CMOS EE process.

This will provide increased die capacity to meet growing demand. In addition, the new devices will also be offered in smaller packages, enabling to support customers with space-efficient solutions.

This notification and acceptance thereof, allows for the use of either Gresham or OKI die in future shipments under the same OPN.

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RELIABILITY DATA SUMMARY: The qualification vehicle CAT24M01 Rev A was chosen as it has the largest array of the family. The additional products (CAT 24C512/256) have been qualified based upon similarity of the memory cell structure and technology.

QTP: 100006, CAT24C256 Rev. E, CAT24C128 Rev. C, Gresham ONC18EE

Product	Qual Lot Number	Assy Lot	Wfr Lot
CAT24M01	lot 1	EBR 031335	GAM28922.1_7
CAT24M01	lot 2	EBR 034455	GAM44932.4_1
CAT24M01	lot 3	EBR 035061	GAM42911.4_2
CAT24M01	lot 4	EBR 035556	GAM43923.4_8
CAT24M01	lot 5	N/A	GAM43923.4_7
CAT24C512	lot 6	EBR030681	GAM21908.2_4
CAT24C256	lot 7	EBR030137	GAM21907.2_w3
CAT24C128	lot 8	EBR033621	GAM33919_w18

		Package	Lot Number	Samples	168hrs	408hrs	1000hrs
HTOL **High Temp Op Life** (3x77)	408hrs, 150C release Per JA108 Tritemp test before and after	SOIC	lot 1	77	PASS	PASS	PASS
			lot 2	77	PASS	PASS	PASS
			lot 3	77	PASS	PASS	PASS
			lot 6	77	PASS	PASS	PASS
			lot 7	77	PASS	PASS	PASS
		Package	**Lot Number**	**Samples**	**24hrs**		
ELFR **Early Life Failure Rate**	Per AEC-Q100-008 HTOL conditions, 24hrs, 150C Room/Hot testing before and after	SOIC	lot 1	800	PASS		
			lot 2	800	PASS		
			lot 6	800	PASS		
			lot 7	800	PASS		
			lot 3	800	PASS		
		Package	**Lot Number**	**Samples**	**100k**	**200k**	**300k**	**400k**	**500k**
EDR Per JESD22-A103/ Q100-005 Room/Hot test before and after	**NVM Endurance** 1M Cycles	SOIC	lot 2	77	PASS	PASS	PASS	PASS	PASS
			lot 3	77	PASS	PASS	PASS	PASS	PASS
			lot 4	77	PASS	PASS	PASS	PASS	PASS
		Package	**Lot Number**	**Samples**	**600k**	**700k**	**800k**	**900k**	**1M**
		SOIC	lot 2	77	PASS	PASS	PASS	PASS	PASS
			lot 3	77	PASS	PASS	PASS	PASS	PASS
			lot 4	77	PASS	PASS	PASS	PASS	PASS
	Wafer Level Endurance	Wafer	**Lot Number**	**Samples**	**1 M**				
			lot 4	77	PASS				
EDR Per Q100-005 Room/Hot test before and after	**NVM Data Retention** Package Level 1000hrs, 150C Cycling Precon to 100k	**Data**	**Lot Number**	**Samples**	**168hrs**	**336hrs**	**500hrs**	**1000hrs**
		"00"	lot 2	77	PASS	PASS	PASS	PASS
			lot 3	77	PASS	PASS	PASS	PASS
		"FF"	lot 2	77	PASS	PASS	PASS	PASS
			lot 3	77	PASS	PASS	PASS	PASS
	Wafer Level Bake at 225C, 100hrs Endurance Preconditioning: 1M Cycles	**Data**	**Lot Number**	**Samples**	**100hrs**			
		"00"	lot 5	77	PASS			
		"FF"	lot 5	77	PASS			
		Package	**Lot Number**	**Samples**	**500V**	**1000V**	**1500V**	**2000V**
ESD AEC Q100-002 1 lot, 3 units per level	**Human Body Model**	SOIC	lot 4	5/level	PASS	PASS	PASS	PASS
			lot 6	5/level	PASS	PASS	PASS	PASS
			lot 7	5/level	PASS	PASS	PASS	PASS
			lot 8	5/level	PASS	PASS	PASS	PASS
		Package	**Lot Number**	**Samples**	**100V**	**150V**	**200V**	**300V**
ESD AEC Q100-003 1 lot, 3 units per level	**Machine Model**	SOIC	lot 4	5/level	PASS	PASS	PASS	PASS
			lot 6	5/level	PASS	PASS	PASS	FAIL
			lot 7	5/level	PASS	PASS	PASS	PASS
			lot 8	5/level	PASS	PASS	PASS	PASS
		Package	**Lot Number**	**Samples**	**100mA**			
LU (1 x 6)	**Latch Up** per AEC-Q100-004 Room / Hot testing after LU test	SOIC			25C	125C		
			lot 4	6	PASS	PASS		
			lot 6	6	PASS	PASS		
			lot 7	6	PASS	PASS		
			lot 8	6	PASS	PASS		
		Package	**Lot Number**	**Samples**	**Result**			
CHAR Characterization (3 x 30)	Per AEC-Q003	SOIC	lot 2	30	PASS			
			lot 3	30	PASS			
			lot 4	30	PASS			
			lot 6	30	PASS			
			lot 7	30	PASS			
			lot 8	30	PASS			

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ELECTRICAL CHARACTERISTIC SUMMARY:

The major features and electrical parameters of the CAT24C128 Rev C and CAT24C256 Rev E compared to the previous OKI product die revision are shown in the Table below.
The new Gresham die supports both Standard (100kHz) and Fast (400kHz) I^2C protocol for full VCC range of 1.8V to 5.5V and Fast-Plus (1MHz) protocol for VCC = 2.5V to 5.5V.

	CAT24C128	CAT24C128
	Gresham 0.18u /Rev C	**OKI 0.35u / Rev B**
Power Supply Current, Read Mode	1 mA	1 mA
Power Supply Current Write Mode	3 mA	3 mA
I/O Leakage Current (SCL, SDA) *	1 µA	1 µA
Clock Frequency / Vcc Range	400 KHz / 1.8V to 5.5V 1 MHz / 2.5V to 5.5V	400 KHz / 1.8V to 5.5V
Write Cycle Time	5 ms	5 ms
Page Write Buffer	64 Bytes	64 Bytes
	CAT24C256	CAT24C256
	Gresham 0.18u /Rev E	**OKI 0.35u / Rev D**
Power Supply Current, Read Mode	1 mA	1 mA
Power Supply Current Write Mode	3 mA	3 mA
I/O Leakage Current (SCL, SDA)*	1 µA	1 µA
Clock Frequency / Vcc Range	400 KHz / 1.8V to 5.5V 1 MHz / 2.5V to 5.5V	400 KHz / 1.8V to 5.5V 1 MHz / 2.5V to 5.5V
Write Cycle Time	5 ms	5 ms
Page Write Buffer	64 Bytes	64 Bytes

***Notes:**

- When not driven, the WP, A0, A1 and A2 pins are pulled down to GND internally.
- For improved noise immunity, the ***new Gresham die***, CAT24C128 Rev C and CAT24C256 Rev E feature a relatively strong internal pull-down when VIN <VIH both for the **WP** pin and Address (**A0, A1, A2)** pins. Therefore the external driver (or the pull-up resistor) must be able to overcome the pull-down current to drive the pin “High”. As soon as the input is in the “High” state, the strong pull-down reverts to a weak current source.
- For the OKI die, the variable Input characteristic is valid for the WP pin only. The Address pins have a weak internal pull-down for full Input voltage range.

For detailed description of the new CAT24C128 and CAT24C256 devices, including package availability and Ordering information please consult the latest data sheet.

A detailed characterization report for each product is available upon request.

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CHANGED PART IDENTIFICATION:

While both Gresham and OKI die will be offered under the same OPN, a new package marking will be used for Gresham die, with OKI die marking continuing unchanged. The Gresham die marking reflects the integration of former CSI (Catalyst) into ON Semiconductor, and provides for easier identification of device and die revision, especially for smaller packages with less room for marking.

Die origin will also be identified on the packaging box label by the 2-digit wafer fabrication country code of CS: US for Gresham and CS: Japan for OKI.

The top package marking format for the new Gresham die versus current marking for the OKI die is shown in the Appendix.

List of Affected General Parts:

Part Number (OPN)	Samples Availability	Comments
CAT24C128LI-G	Now	
CAT24C128WI-G	Now	
CAT24C128WI-GT3	Now	
CAT24C128YI-G	Now	
CAT24C128YI-GT3	Now	
CAT24C128ZI-GT3	Now	
CAT24C128HU3IGT3	Now	NOT Recommended for new designs
CAT24C128HU4IGT3	Now	New OPN/ New Package
CAT24C128LE-G	7/20/2011	
CAT24C128WE-G	Now	
CAT24C128WE-GT3	Now	
CAT24C128YE-G	Now	
CAT24C128YE-GT3	Now	
CAT24C256LI	N/A	NOT Recommended for new designs
CAT24C256LI-G	Now	
CAT24C256WI-G	Now	
CAT24C256WI-GT3	Now	
CAT24C256XI	Now	
CAT24C256XI-T2	Now	
CAT24C256YI-G	Now	
CAT24C256YI-GT3	Now	
CAT24C256ZD2IGT2	N/A	NOT Recommended for new designs
CAT24C256HU4IGT3	Now	New OPN/ New Package
CAT24C256ZI-GT3	Now	New OPN/ New Package
CAT24C256LE-G	7/20/2011	
CAT24C256WE-G	Now	
CAT24C256WE-GT3	Now	
CAT24C256XE	7/30/2011	
CAT24C256XE-T2	7/30/2011	
CAT24C256XA-T2	N/A	NOT Recommended for new designs
CAT24C256YE-G	Now	
CAT24C256YE-GT3	Now	

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List of Affected Customer Specific Parts:

CAT24C128WIGT-QQ
CAT24C128WIGT-CP
CAJ24C128WIGT3PC
CAT24C256XIT-QQ

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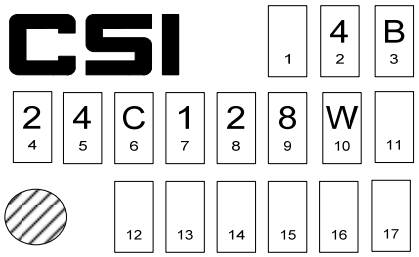
Appendix – PART IDENTIFICATION

Package Marking – Gresham die versus actual OKI die

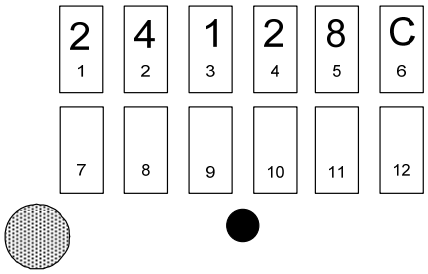
1) SOIC -150mil 8pin (W), SOIC – 208mil 8pin (X)

Current OKI die CAT24C128 Rev B



1: Assembly location code
2: Leadfinish (NiPdAu)
3: Product Revision
4-10: Device name
11: Temperature range
12: Production Year
13: Production Month
14-17: Assembly lot number

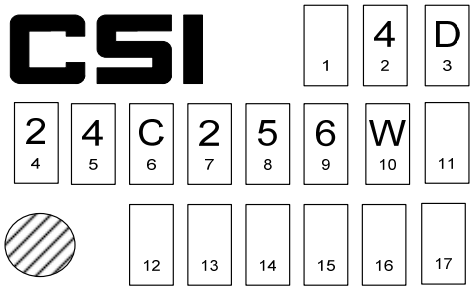
New Gresham die CAT24C128 Rev C



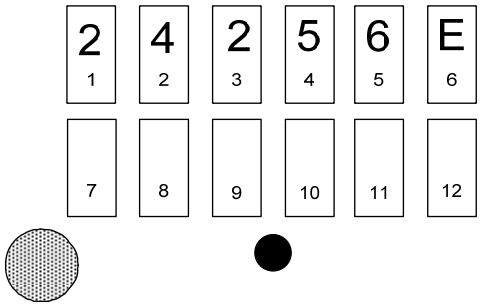
FRONT SIDE MARK:

1-5: Device name(5 char)
6: Production Revision
7: Assembly location
8: Production Year
9: Production Month
10-12: Assembly Lot Number

Current OKI die CAT24C256WI-G Rev D

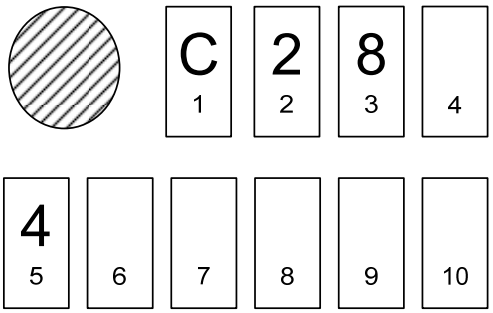


New Gresham die CAT24C256WI-G Rev E



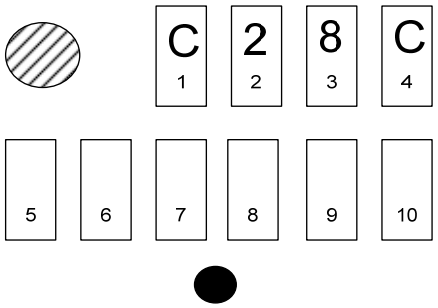
2) TSSOP- 8pin (Y)

Current OKI die CAT24C128YI-G



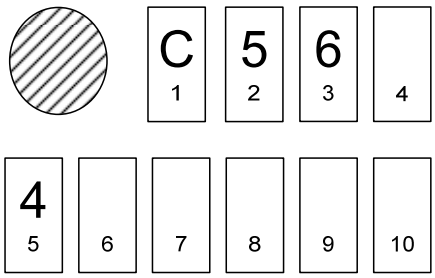
1-3: Device name
4: Assembly location code
5: Leadfinish (NiPdAu)
6: Production Year
7: Production Month
8-10: Assembly lot number

New Gresham die CAT24C128YI-G Rev C

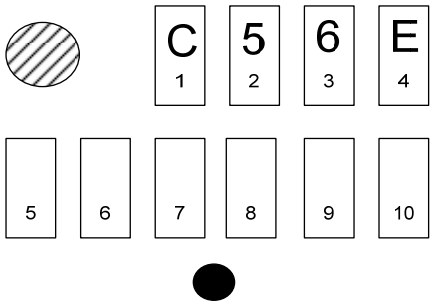


1-3: Device name
4: Product Revision
5: Assembly location code
6: Production Year
7: Production Month
8-10: Assembly lot number
● :Pb-free microdot

Current OKI die CAT24C256YI-G

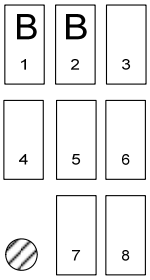


New Gresham die CAT24C256YI-G Rev E



3) UDFN 2x3mm (HU3, HU4)

Current OKI die CAT24C128HU3I-G



1-2: Device code

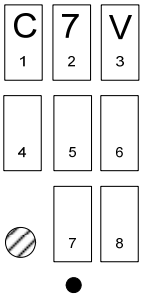
3: Assembly location code

4-6: Assembly lot number

7: Production Year

8: Production Month

New Gresham die CAT24C128HU3I-GT3



1-2: Device code

3: Product rev&package code

4: Assembly location code

5-6: Assembly lot number

7: Production Year

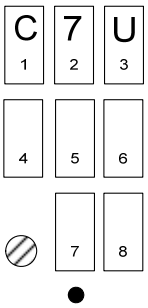
8: Production Month

● :Pb-free microdot

Current OKI die CAT24C128HU4I-G

NOT EXISTING

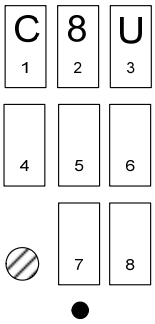
New Gresham die CAT24C128HU4I-G



Current OKI die CAT24C256HU4I-G

NOT EXISTING

New Gresham die CAT24C256HU4I-G



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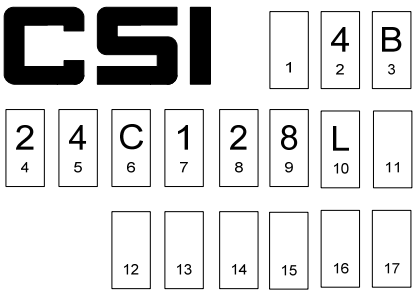
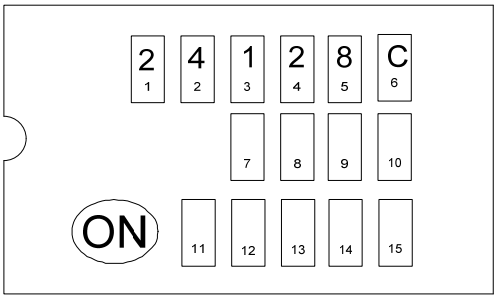
4) PDIP 8LD (L)

Current OKI die CAT24C128LI-G



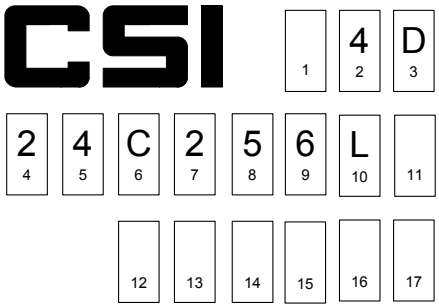
1: Assembly location code
2: Leadfinish (NiPdAu)
3: Product Revision
4-10: Device name
11: Temperature range
12: Production Year
13: Production Month
14-17: Assembly lot number

New Gresham die CAT24C128LI-G Rev C

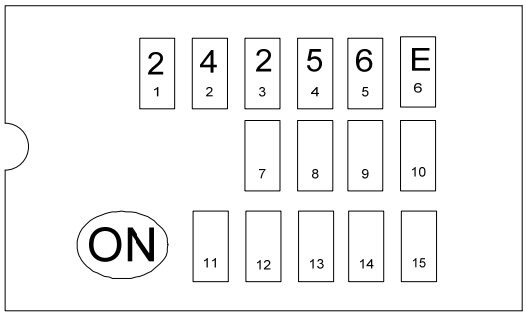


1-5: Device name
6: Product Revision
7: Assembly location code
8-10: Assembly lot number
11-12: Production Year
13-14: Production Week
15: Pb-free designator

Current OKI die CAT24C256LI-G



New Gresham die CAT24C256LI-G Rev E



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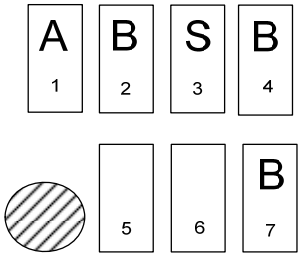
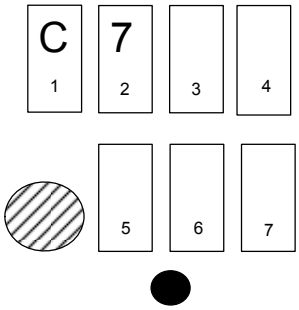
5) MSOP 8L (Z)

Current OKI die CAT24C128ZI-G



1-4: Device code
5: Production Year
6: Production Month
7: Product Revision

New Gresham die CAT24C128ZI-G Rev C



1-2: Device code
3: Production Year
4: Production Month
5: Assembly location code
6-7: Assembly lot number
●:Pb-free microdot

Current OKI die CAT24C256ZI-G

NOT EXISTING

New Gresham die CAT24C256ZI-G Rev E