Final Product/Process Change Notification

Document #:FPCN24557Z
Issue Date: 22 Apr 2022

Title of Change:	Dual source AR0135 for Assembly and Final Test at ASE (Advanced Semiconductor Engineering) Malaysia.
Proposed Changed Material First Ship Date:	29 Oct 2022 or earlier if approved by customer
Current Material Last Order Date:	N/A *Orders received after the Current Material Last Order Date expiration are to be considered as orders for new changed material as described in this PCN. Orders for current (unchanged) material after this date will be per mutual agreement and current material inventory availability*.
Current Material Last Delivery Date:	N/A *The Current Material Last Delivery Date may be subject to change based on build and depletion of the current (unchanged) material inventory*
Product Category:	Active components – Integrated circuits
Contact information:	Contact your local onsemi Sales Office or Mike.Webster@onsemi.com
PCN Samples Contact:	Contact your local onsemi Sales Office to place sample order. Sample requests are to be submitted no later than 45 days after publication of this change notification. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements.
Sample Availability Date:	20 Apr 2022
PPAP Availability Date:	13 Apr 2022
Additional Reliability Data:	Contact your local onsemi Sales Office or Amy.Wu@onsemi.com
Type of Notification:	This is a Final Product/Process Change Notification (FPCN) sent to customers. The change will be implemented at 'Proposed Change Material First Ship Date' in compliance to J-STD-46 or ZVEI, or earlier upon customer approval, or per our signed agreements. onsemi will consider this proposed change and it's conditions acceptable, unless an inquiry is made in writing within 45 days of delivery of this notice. To do so, contact PCN.Support@onsemi.com.

Change Category	
Category	**Type of Change**
Test Flow	Move of all or part of electrical wafer test and/or final test to a different location/site/subcontractor
Equipment	Production from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool) without change of process.
Process - Assembly	Move of all or part of assembly to a different location/site/subcontractor., Change of direct material supplier

Description and Purpose:

ASEM (Advanced Semiconductor Engineering Malaysia) is being qualified as an additional site for Assembly and Final test for AR0135 packages.

This is being done to add capacity and mitigate supply chain risks. The assembly equipment between the sites are equivalent and have been proven on other dual-sourced automotive products.

ASEM (Advanced Semiconductor Engineering Malaysia) will use a different substrate supplier than Kingpak but substrate design is exactly the same.

Product assembled at ASEM (Advanced Semiconductor Engineering Malaysia) will only final test at ASEM (turnkey).

Product at Kingpak will only final test at Kingpak (turnkey). There is no change in the test platform between the two sites.

There is no change to form, fit or function of the product.

	Before Change Description	After Change Description
Package Substrate Supplier	UMTC (@ KingPak)	UMTC (@ Kingpak) + SCC (@ ASEM)
Assembly Site	KingPak	Kingpak & ASEM (Advanced Semiconductor Engineering Malaysia)
Final Test Site	Kingpak	Kingpak - Turnkey & ASEM (Advanced Semiconductor Engineering Malaysia) – Turnkey

There is no product marking change as a result of this change.

Reason / Motivation for Change:	Capacity improvement
Anticipated impact on fit, form, function, reliability, product safety or manufacturability:	The device has been qualified and validated based on the same Product Specification. The device has successfully passed the qualification tests. Potential impacts can be identified, but due to testing performed by onsemi in relation to the PCN, associated risks are verified and excluded. No anticipated impacts.

Sites Affected:

onsemi Sites	External Foundry/Subcon Sites
None	ASEM, Malaysia

Marking of Parts/ Traceability of Change:	Lot history; Unique shipping label

Reliability Data Summary:

QV DEVICE NAME : AR0135AT2M00XUEA0-DPBR
RMS: n/a for ISG (external qual)
PACKAGE : iBGA 9x9

Test	Specification	Condition	Interval	Results
HTOL	JESD22-A108	Ta= 105 °C Tj, 100 % max rated Vcc	1008 hrs	0/231
ELFR	AEC Q100-008	Ta= 125 °C	24 hrs	0/2400
PC	J-STD-020 JESD-A113	MSL 3 @ 260 °C		Pass
HTSL	JESD22-A103	Ta= 150 °C	500 hrs	0/45
TC	JESD22-A104	Ta= -55 °C to +125 °C	1000 cyc	0/231
HAST	JESD22-A110	130°C, 85% RH, with bias	264 hrs	0/231
uHAST	JESD22-A118	130°C, 85% RH, unbiased	264 hrs	0/231
WBS	AEC Q100-001 AEC Q003	CPK >1.67		Pass
WBP	MIL-STD883 Method 2011 AEC Q003	CPK >1.67, 0 Fails after TC (test #A4)		Pass
HBM	AEC Q100-002	0 Fails; 2KV HBM		Pass
CDM	AEC Q100-011	0 Fails: 750V for corner pins, 500V all other pins		Pass
LU	AEC Q100-004	0 Fails		Pass
ED	AEC Q100-009 AEC Q003	Elect. Distribution: (Test @ C/ R/ H)		Pass
FG	AEC-Q100- 007	Fault Grading		Pass

NOTE: AEC-1pager is attached.

To view attachments:
1. Download pdf copy of the PCN to your computer
2. Open the downloaded pdf copy of the PCN
3. Click on the paper clip icon available on the menu provided in the left/bottom portion of the screen to reveal the Attachment field
4. Then click on the attached file.

Electrical Characteristics Summary:

K22B test data at Ta=room temp		LSL (RT)	USL (RT)	Units	KYEC		ASEM		Accuracy%	Temp Condition of specification
Quantity	Mode				Stdev	Mean	Stdev	Mean		
D6_PIX_BRT	Dark	0	20	Pixels	1.3	2.03	1.19	1.6	21.31	Tj=60
D6_PIX_VBR	Dark	0	13	Pixels	0.76	0.8	0.74	0.73	8.33	Tj=60
Bright Pixel	Midlight	0	50	Pixels	0.18	0.03	0.18	0.03	0	Tj=60
Very Bright Pixel	Midlight	0	40	Pixels	0	0	0	0	n/a	Tj=60
Dark Pixel	Midlight	0	50	Pixels	0.41	0.2	0.58	0.27	33.33	Tj=60
Very Dark Pixel	Midlight	0	40	Pixels	0	0	0	0	n/a	Tj=60
Cluster	Midlight	0	0	Clusters	0	0	0	0	n/a	Tj=60
Ia_OPER_VAA	Short	23.2	34.4	mA	0.9	25.89	0.82	25.9	0.04	Tj=60
Ip_OPER_VAA_PIX	Short	4.65	7.05	mA	0.17	5.45	0.16	5.47	0.37	Tj=60
Id_OPER_VDD	Short	52.2	60.3	mA	0.26	44.08	0.28	44.32	0.54	Tj=60
IL_OPER_VDD_PLL	Short	6.15	7.35	mA	0.05	6.18	0.06	6.18	0	Tj=60
Mh_PVAL_MEAN	Midlight	1750	2350	code	36.6	2134.6	30.14	2114.71	0.93	Tj=60
Dh_PVAL_MEAN	Dark	155	185	code	1.63	169.3	1.34	170.61	0.77	Tj=60

Electrical characteristics are not impacted.

List of Affected Parts:

Note: *Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the* ***PCN Customized Portal****.*

Current Part Number	New Part Number	Qualification Vehicle
AR0135AT2M00XUEA0-DPBR	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M00XUEA0-DPBR1	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M25XUEA0-TRBR	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M25XUEA0-TPBR	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M25XUEA0-DRBR	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M25XUEA0-DPBR1	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M25XUEA0-DPBR	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M00XUEA0-TPBR	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M00XUEA0-DRBR1	NA	AR0135AT2M00XUEA0-DPBR
AR0135AT2M00XUEA0-DRBR	NA	AR0135AT2M00XUEA0-DPBR