



# Final Product/Process Change Notification

Document #: FPCN24557ZB

Issue Date: 12 Jan 2023

<b>Title of Change:</b>	Dual source AR0144 for Assembly and Final Test at ASE (Advanced Semiconductor Engineering) Malaysia.
<b>Proposed Changed Material First Ship Date:</b>	01 Sep 2023 or earlier if approved by customer
<b>Current Material Last Order Date:</b>	N/A <i>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.</i>
<b>Current Material Last Delivery Date:</b>	N/A <i>The Current Material Last Delivery Date may be subject to change based on build and depletion of the current (unchanged) material inventory</i>
<b>Product Category:</b>	Active components – Integrated circuits
<b>Contact information:</b>	Contact your local onsemi Sales Office or <a href="mailto:Mike.Webster@onsemi.com">Mike.Webster@onsemi.com</a>
<b>PCN Samples Contact:</b>	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.
<b>Sample Availability Date:</b>	20 Mar 2023
<b>PPAP Availability Date:</b>	27 Feb 2023
<b>Additional Reliability Data:</b>	Contact your local onsemi Sales Office or <a href="mailto:Amy.Wu@onsemi.com">Amy.Wu@onsemi.com</a>
<b>Type of Notification:</b>	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 <a href="mailto:PCN.Support@onsemi.com">PCN.Support@onsemi.com</a> .
<b>Change Category</b>	
<b>Category</b>	<b>Type of Change</b>
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
<b>Description and Purpose:</b>	
<p>ASEM (Advanced Semiconductor Engineering Malaysia) is being qualified and added as an additional site for Assembly and Final test for AR0144 packages.</p> <p>This is being done to add capacity and mitigate supply chain risks.</p> <p>The assembly equipment between the sites are equivalent and have been proven on other dual-sourced automotive products.</p> <p>ASEM will use a different substrate supplier than Kingpak but substrate design is exactly the same.</p> <p>Product assembled at Tong Hsing (Kingpak) and ASEM can final test at any of the qualified Final Test sites.</p> <p>There is no change in the test platform, program or limits between the two sites.</p>	

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

	From	To
Assembly Site	Tong Hsing	Tong Hsing & ASE Malaysia
Final Test Site	Tong Hsing, KYEC	Tong Hsing, KYEC & ASE Malaysia
Package Substrate	Supplier = Eastern	Supplier = Eastern (at Tong Hsing) Supplier = SCC (at ASEM)

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

<b>Reason / Motivation for Change:</b>	Capacity improvement
<b>Anticipated impact on fit, form, function, reliability, product safety or manufacturability:</b>	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.

<b>Sites Affected:</b>	
<b>onsemi Sites</b>	<b>External Foundry/Subcon Sites</b>
None	ASEM, Malaysia

<b>Marking of Parts/ Traceability of Change:</b>	Lot history; Unique shipping label
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**Reliability Data Summary:**  
**QV DEVICE NAME :** AR0144AT  
**RMS:** n/a for ISG (external qual)  
**PACKAGE :** iBGA

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

**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.



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## Electrical Characteristics Summary:

AR0144 test data at Ta=room temp		LSL (RT)	USL (RT)	Units	Upper Specification	Tong Hsing			ASEM			Accuracy%	Temp Condition of specification
Quantity	Mode					Stdev	Mean	CPK	Stdev	Mean	CPK		
D6_PIX_BRT	Dark	0	80	Pixels	80	1.697	1.867	n/a	1.800	2.000	n/a	7.143	Tj=60
M6_PIX_BRT	Midlight	0	79	Pixels	79	0.461	0.167	n/a	0.434	0.133	n/a	20.000	Tj=60
M7_PIX_DRK	Midlight	0	79	Pixels	79	0.610	0.200	n/a	0.484	0.200	n/a	0.000	Tj=60
M3_CLUS_BRT	Midlight	0	9	Clusters	9	0.000	0.000	n/a	0.000	0.000	n/a	0.000	Tj=60
M4_CLUS_DRK	Midlight	0	9	Clusters	9	0.000	0.000	n/a	0.000	0.000	n/a	0.000	Tj=60
la_OPER_VAA	Short	45	72	mA	72	1.527	59.467	2.735	1.581	59.547	2.625	0.135	Tj=60
lp_OPER_VAA_PIX	Short	1	50	mA	50	0.196	9.199	13.974	0.200	9.202	13.661	0.031	Tj=60
ld_OPER_VDD	Short	90	120	mA	120	1.404	107.696	2.922	1.220	110.376	2.630	2.488	Tj=60
li_OPER_VDD_PLL	Short	1	50	mA	50	0.063	6.838	30.889	0.086	6.892	22.948	0.788	Tj=60
Mh_PVAL_MEAN	Midlight	1800	2600	code	2600	41.660	2147.635	2.782	38.395	2187.172	3.361	1.841	Tj=60
Dh_PVAL_MEAN	Dark	150	180	code	180	2.104	166.729	2.103	0.907	166.772	4.863	0.026	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
AR0144ATSM20XUEA0-SP-TPBR	NA	AR0144ATSM20XUEA0-DRBR
AR0144ATSM20XUEA0-TRBR	NA	AR0144ATSM20XUEA0-DRBR
AR0144ATSM20XUEA0-TPBR	NA	AR0144ATSM20XUEA0-DRBR
AR0144ATSM20XUEA0-DPBR	NA	AR0144ATSM20XUEA0-DRBR
AR0144ATSM20XUEA0-DRBR	NA	AR0144ATSM20XUEA0-DRBR

**Appendix A: Changed Products**

**PCN#: FPCN24557ZB**  
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DIKG: DIGI-KEY

Product	Customer Part Number	Qualification Vehicle	New Part Number	Replacement Supplier
AR0144ATSM20XUEA0-DPBR		AR0144ATSM20XUEA0-DRBR	NA	
AR0144ATSM20XUEA0-DRBR		AR0144ATSM20XUEA0-DRBR	NA	