



GLOBAL ETS

NEXT GENERATION COMPONENT TESTING & AUTHENTICATION

Laboratory Analysis Report

Report Number: 1000-33725

Date: 2022-02-19

Customer Internal P/N: NOT AVAILABLE

Manufacturer: TEXAS INSTRUMENTS

Manufacturer Part Number: TPS3823-50DBVR

Quantity: 1,000

Date Code: 2141+5

Lot Code: NOT AVAILABLE

Part Description: PROCESSOR SUPERVISOR 4.55V 1 ACTIVE LOW/PUSH-PULL AUTOMOTIVE 5-PIN SOT-23 T/R



GB/T19001-2016/ISO9001:2015

Global ETS China

86-0755-829-11501

808 Room T1 Tower HYPark

FuAn Road PingHu Street

LongGang District

Shenzhen

China

www.gets-china.com



Analysis Report - 1000-33725

Part Number:	TPS3823-50DBVR	Customer P/N:	NOT AVAILABLE
Manufacturer:	TEXAS INSTRUMENTS	Devices Received:	1,000
Date Code:	2141+5	Lot Code:	NOT AVAILABLE

1.0.0 Summary Of Inspection Results Freedom D Testing Protocol

	Test-Process Operation	Quantity Inspected	Pass	Fail	N/A	Comments / Observations
1.1.0	Documentation and Packaging - All Devices (SAE AS6081, 4.2.6.4.1) (Non-destructive)					
1.1.1	Condition Observed	1,000	1,000	0		Total 1000pcs was received in tape format.
1.2.0	External Visual Inspection - 10 Devices (SAE AS6081 and MIL-STD-883, Method 2009.9) (Non-destructive)					
1.2.1	Condition Observed	10	10	0		No anomalies were found. Devices passed visual inspection.
1.3.0	Package Inspection - 1 Device (SAE AS6081 and MIL-STD-883, Method 2009.9) (Non-destructive)					
1.3.1	Dimensions	1	1	0		Processor Supervisor 4.55V 1 Active Low/Push-Pull Automotive 5-Pin SOT-23 T/R
1.4.0	Re-Marking Testing - Permanency - 1 Device					
1.4.1	Permanency (Non-destructive) (SAE AS6081 4.2.6.4.3A)	1	1	0		Marking permanency test was performed on 1 device. No marking was removed during this process. The device passed permanency testing.
1.5.0	Re-Surfacing Testing - Dynasolve 750 - 1 Device					
1.5.1	Heat Solvent (Destructive) Dynasolve 750	1	1	0		Heated Solvent Testing was performed on 1 device using Dynosolve 750 solution. Material was soften during this process however no evidence of a secondary coating was observed. Device passed Heated Solvent testing.
1.6.0	Delid/Decapsulation Internal Analysis - 1 Device (AS6081 4.2.6.4.6) or (MIL-STD-883, Method 2014) (Destructive)					
1.6.1	Die Verification	1	1	0		Internal inspection was performed on 1 device. Device revealed Texas Instruments logo with 1997 copyright. Die marking 94741WM50B was also found.
1.7.0	X-Ray Inspection - 10 Devices (SAE AS6081 4.2.6.4.4 and MIL-STD-883, Method 2012.7)(Non-destructive)					
1.7.1	Die Construction	10	10	0		10 samples were X-ray. Die construction and size are all the same. No anomalies were found.
1.8.0	XRF Inspection - 1 Device (SAE AS6081 4.2.6.4.5)(Non-destructive)					
1.8.1	RoHS Compliant	1	1	0		XRF were performed on 1 sample. No restricted elements were detected. Devices meet EU RoHS Directive 2011/65/EU Annex. Devices confirmed to be RoHS compliant.
1.9.0	Electrical Test - 10 Devices (MIL-STD-883 and Manufacturer Specification)					
1.9.1	DC Function Test TA = 25C	10	0	10		TPS3823-50DBVR: Processor Supervisor 4.55V 1 Active Low/Push-Pull Automotive 5-Pin SOT-23 T/R Tested 10 samples,failed 10 samples for VIT- <4.49v min (range = 4.49v min,4.55v typ,4.64v max)
Equipment Used		DIGITAL OSCILLOSCOPE Asset Tag: 3 Calibration Due Date: 2023-02-09 Cert: HK0918441 POWER SUPPLY Asset Tag: 13 Calibration Due Date: 2023-02-09 Cert: HK0918447 MULTIMETER Asset Tag: 14 Calibration Due Date: 2023-02-09 Cert: HK0918448				

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2.0.0 Documentation and Packaging (SAE AS6081, 4.2.6.4.1) (Non-destructive)

Results Summary

Total 1000pcs was received in tape format.

	Criteria	Acceptable	Suspect	Not Acceptable	N/A	Comments / Observations
2.1.0	Incoming Conditions					
2.1.1	ESD Protection	X				
2.1.2	Poor Syntax or Alterations				X	
2.1.3	Correct MSL Packaging	X				Moisture Sensitivity Level (MSL) 1 (Unlimited)
2.1.4	Quantity Match Document	X				1000pcs
2.1.5	Box Damaged				X	
2.1.6	Type of Package	X				Tape format

Images For Documentation and Packaging .

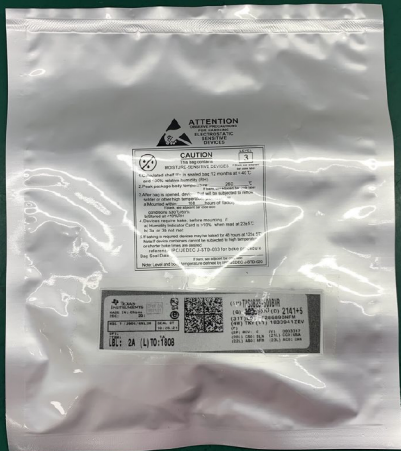


Figure 1. RECEIVED

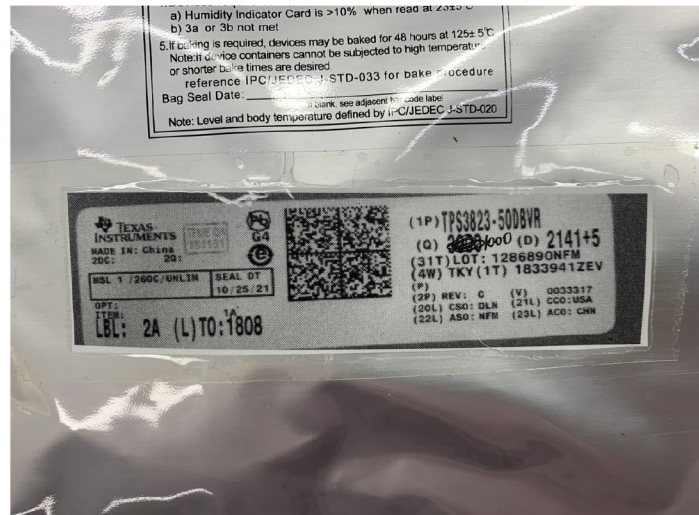


Figure 2. LABEL

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Manufacturer:	TEXAS INSTRUMENTS	Devices Received:	1,000
Date Code:	2141+5	Lot Code:	NOT AVAILABLE

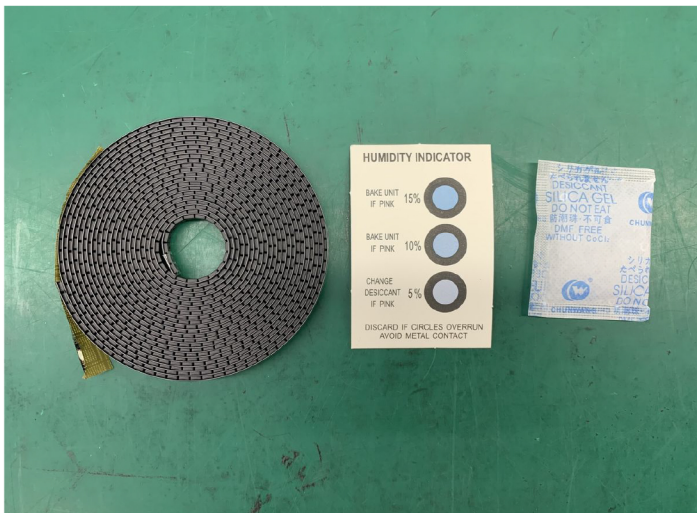


Figure 3. RECEIVED 1

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Analysis Report - 1000-33725

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Customer P/N: NOT AVAILABLE

Manufacturer: TEXAS INSTRUMENTS

Devices Received: 1,000

Date Code: 2141+5

Lot Code: NOT AVAILABLE

3.0.0 External Visual Inspection (SAE AS6081 and MIL-STD-883, Method 2009.9) (Non-destructive)

	Criteria	Acceptable	Suspect	Not Acceptable	N/A	Comments / Observations
3.1.0	External Conditions					
3.1.1	Markings - Top	X				
3.1.2	Pin 1 Cavity - Top	X				
3.1.3	Construction Quality	X				Devices are in new condition
3.2.0	Lead / BGA Conditions					
3.2.1	Lead Alignment	X				Acceptable
3.2.2	Lead Formation / Scratches	X				Acceptable
3.2.3	Lead Missing Pins	X				None were observed
3.2.4	Lead Plating Composition	X				Acceptable
3.2.5	Lead Excessive or Uneven Plating	X				Acceptable
3.2.6	Lead Discoloration, Dirt or Residue	X				Acceptable
3.2.7	Lead Oxidation	X				Acceptable

Images For External Visual Inspection.



Figure 4. TOP

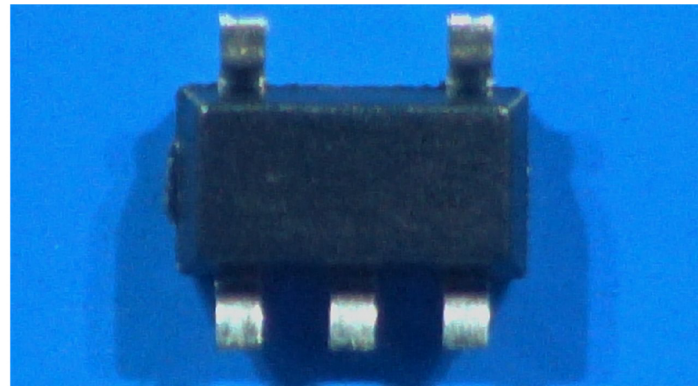


Figure 5. BOTTOM

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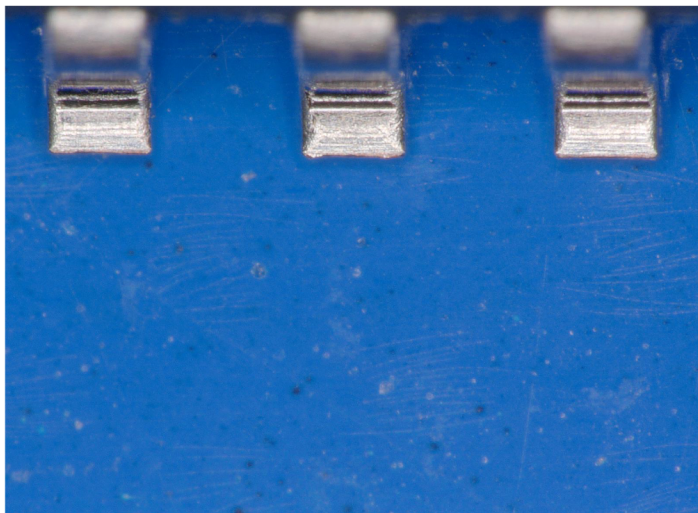


Figure 6. TOP LEADS

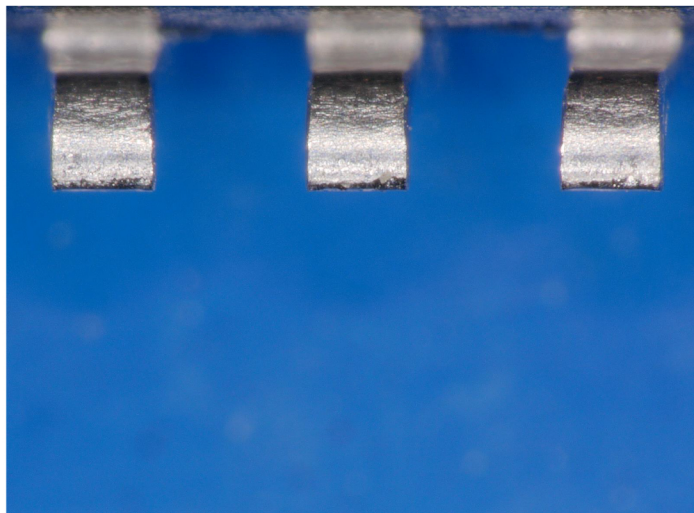


Figure 7. BOTTOM LEADS

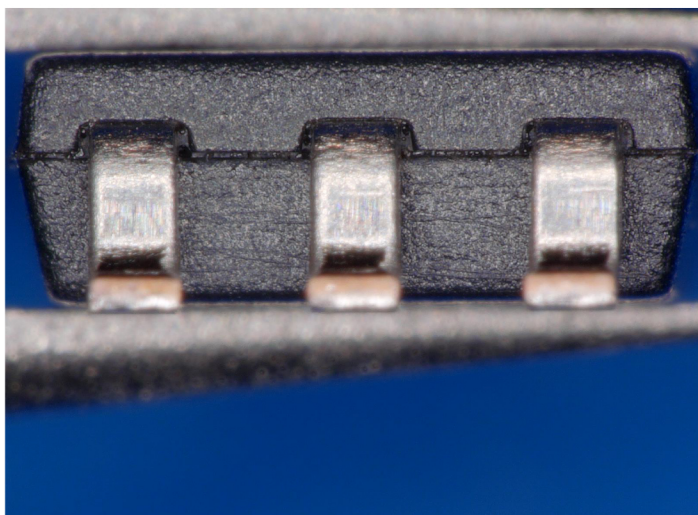


Figure 8. SIDE



Figure 9. LEADS END

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Devices Received: 1,000

Date Code: 2141+5

Lot Code: NOT AVAILABLE

4.0.0 Device Package

Results Summary

Length = 3.00mm (2.75mm min - 3.05mm max) Pass

Width = 2.80 mm (2.6mm min -3.0 mm max) - Pass

Thickness = 1.12mm (0.9mm min -1.45 mm max) - Pass

	Criteria	Acceptable	Suspect	Not Acceptable	N/A	Comments / Observations
4.1.0	Package Dimensions					
4.1.1	Dimensions	X				

Images For Device Package.



Figure 10. LENGTH



Figure 11. WIDTH



Figure 12. THICKNESS

Images For Device Package. (Continued From Previous Page)

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Devices Received: 1,000

Date Code: 2141+5

Lot Code: NOT AVAILABLE

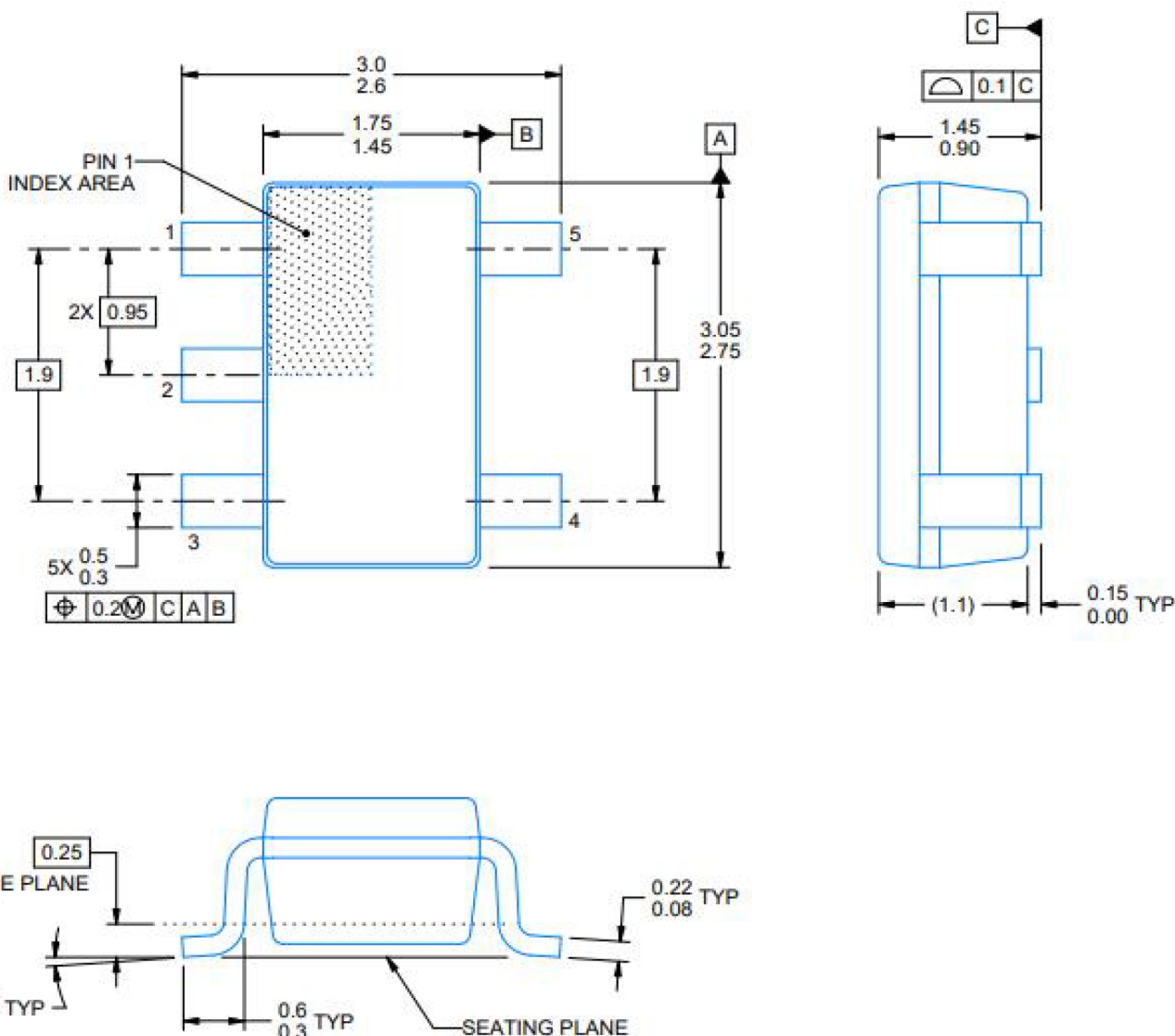


Figure 13. DIMENSION

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5.0.0 Remarking and Resurfacing (SAE AS6081 and JESD22-B107C)

	Criteria	Acceptable	Suspect	Not Acceptable	N/A	Comments / Observations
5.1.0	Re-Surfacing / Re-Marking Testing					
5.1.1	Solvent Test for Re-marking - Permanency (Non-destructive)	X				Marking permanency test was performed on 1 device. No marking was removed during this process. The device passed permanency testing.
5.1.2	Solvent Test for Re-Surfacing - Heat Solvent (Destructive) Dynasolve 750	X				Heated Solvent Testing was performed on 1 device using Dynasolve 750 solution. No secondary coating was removed during this process. The device passed Heated Solvent testing.

Images For Remarking and Resurfacing .



Figure 14. HCT

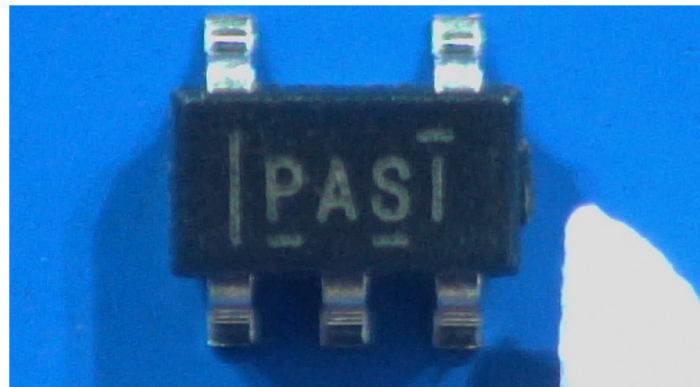


Figure 15. PERMANENCY

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6.0.0 Delid/Decapsulation Internal Analysis (AS6081 4.2.6.4.6) or (MIL-STD-883, Method 2014) (Destructive)

Results Summary

Internal inspection was performed on 1 device. Device revealed Texas Instruments logo with 1997 copyright. Die marking 94741WM50B was also found.

	Criteria	Acceptable	Suspect	Not Acceptable	N/A	Comments / Observations
6.1.0	Internal Visual Inspection					
6.1.1	Die Topography	X				
6.1.2	Die Markings	X				

Images For Delid/Decapsulation Internal Analysis.

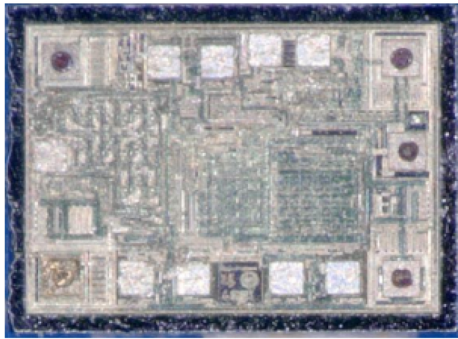


Figure 16. DIE

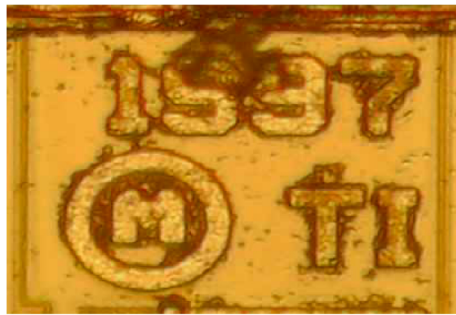


Figure 17. DIE LOGO

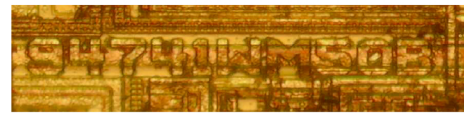


Figure 18. DIE MARKING

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Lot Code: NOT AVAILABLE

7.0.0 X-Ray Analysis (SAE AS6081 4.2.6.4.4 and MIL-STD-883, Method 2012.7)(Non-destructive)

Results Summary

10 samples were X-ray. Die construction and size are all the same. No anomalies were found.

	Criteria	Acceptable	Suspect	Not Acceptable	N/A	Comments / Observations
7.1.0	X-Ray Analysis					
7.1.1	Die Construction	X				
7.1.2	Wire Bond Layout/Quality	X				
7.1.3	Lead Conditions	X				

Images For X-Ray Analysis.

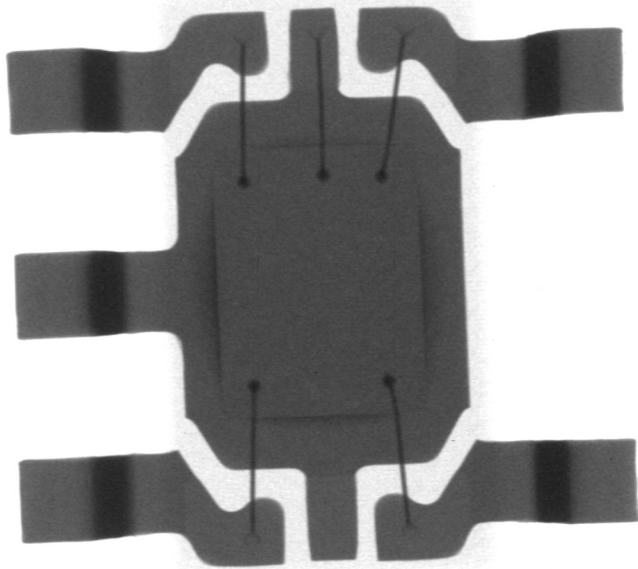


Figure 19. XRAY VIEW 1

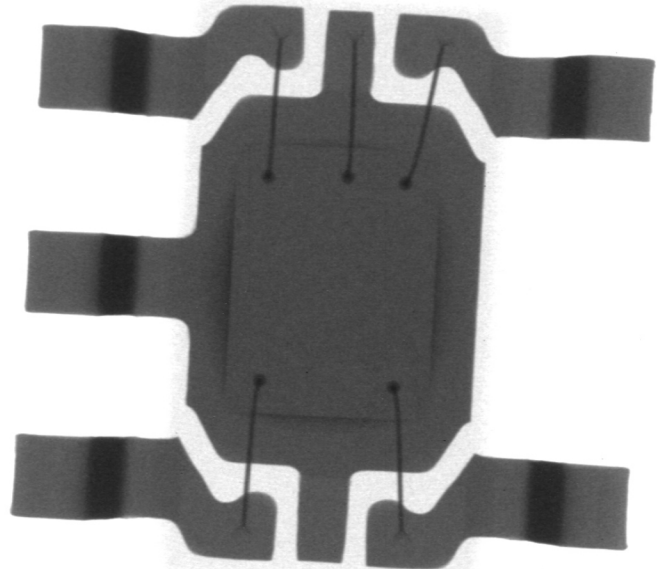


Figure 20. XRAY VIEW 2

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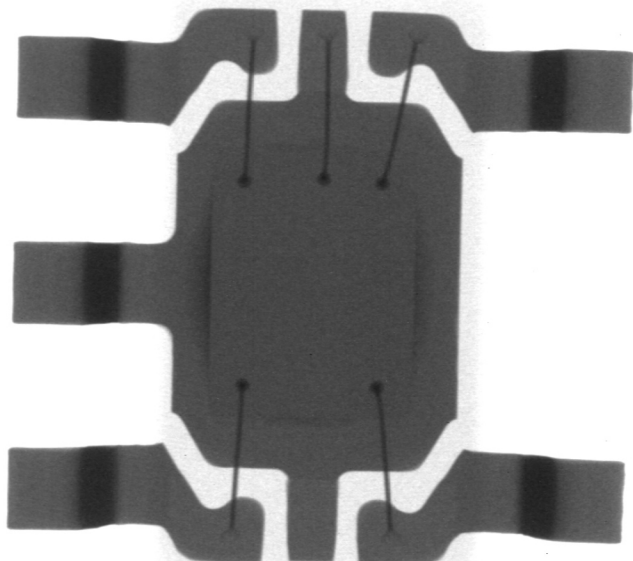


Figure 21. XRAY VIEW 3

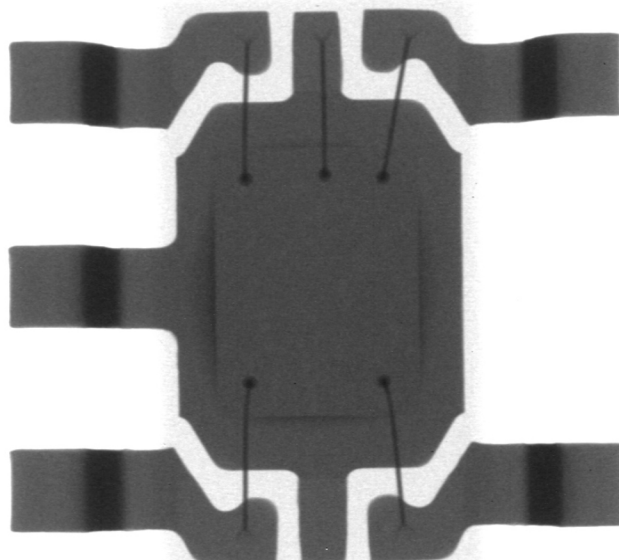


Figure 22. XRAY VIEW 4

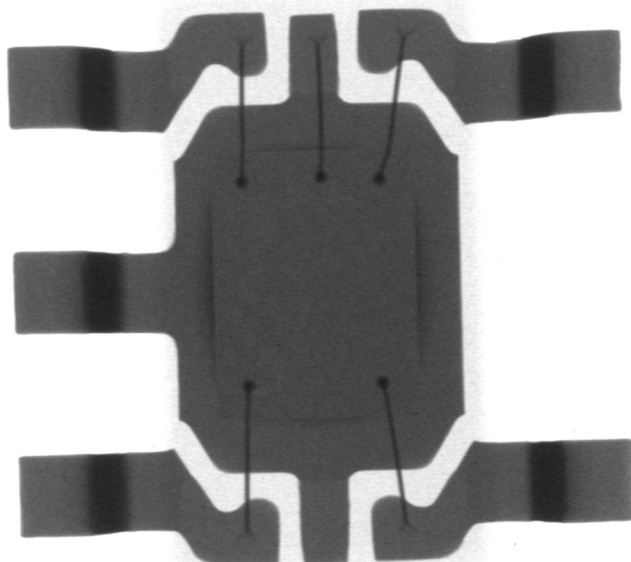


Figure 23. XRAY VIEW 5

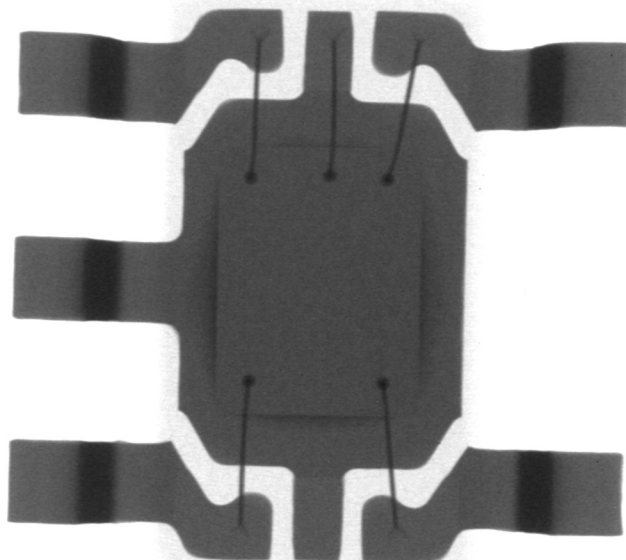


Figure 24. XRAY VIEW 6

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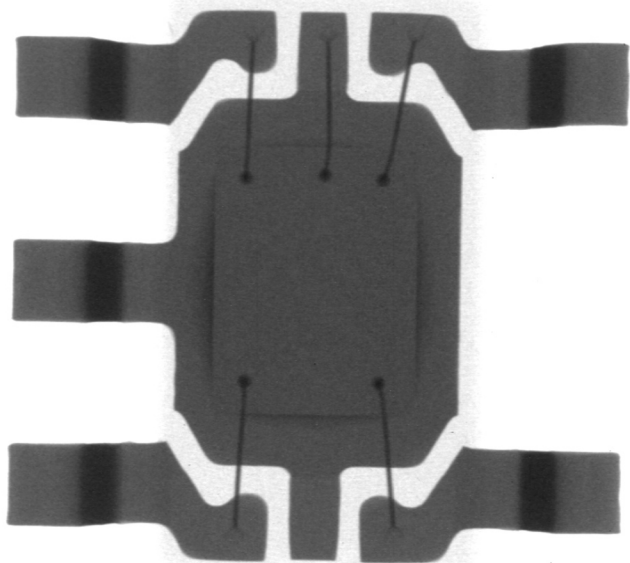


Figure 25. XRAY VIEW 7

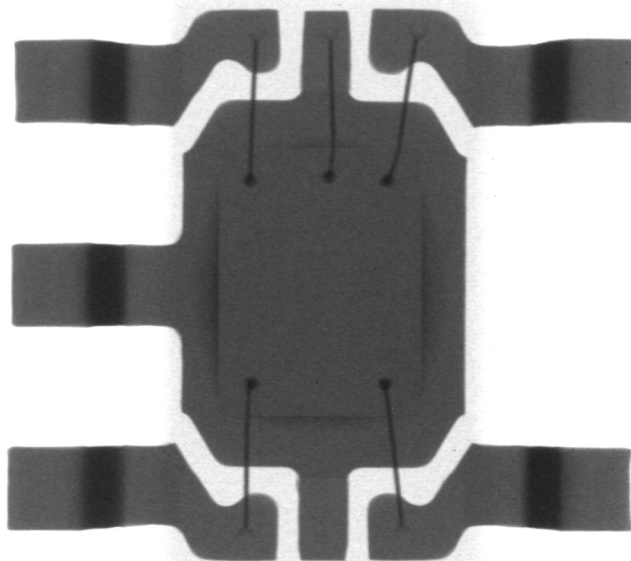
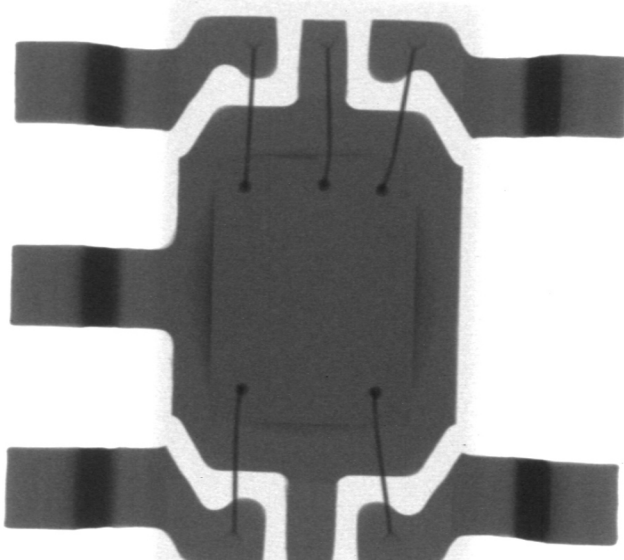
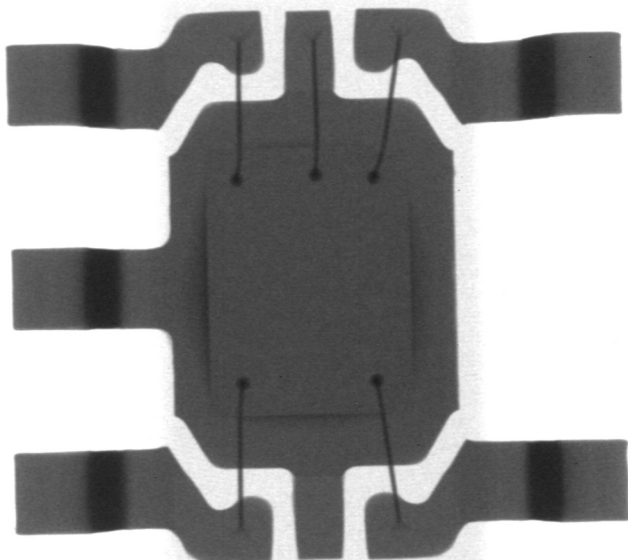


Figure 26. XRAY VIEW 8



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Figure 27. XRAY VIEW 9

Figure 28. XRAY VIEW 10



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Manufacturer: TEXAS INSTRUMENTS

Devices Received: 1,000

Date Code: 2141+5

Lot Code: NOT AVAILABLE

8.0.0 XRF Analysis (SAE AS6081 4.2.6.4.5)(Non-destructive)

Results Summary

XRF were performed on 1 sample. No restricted elements were detected. Devices meet EU RoHS Directive 2011/65/EU Annex. Devices confirmed to be RoHS compliant.

	Criteria	Acceptable	Suspect	Not Acceptable	N/A	Comments / Observations
8.1.0	XRF Analysis					
8.1.1	RoHS Compliance	X				

Images For XRF Analysis.

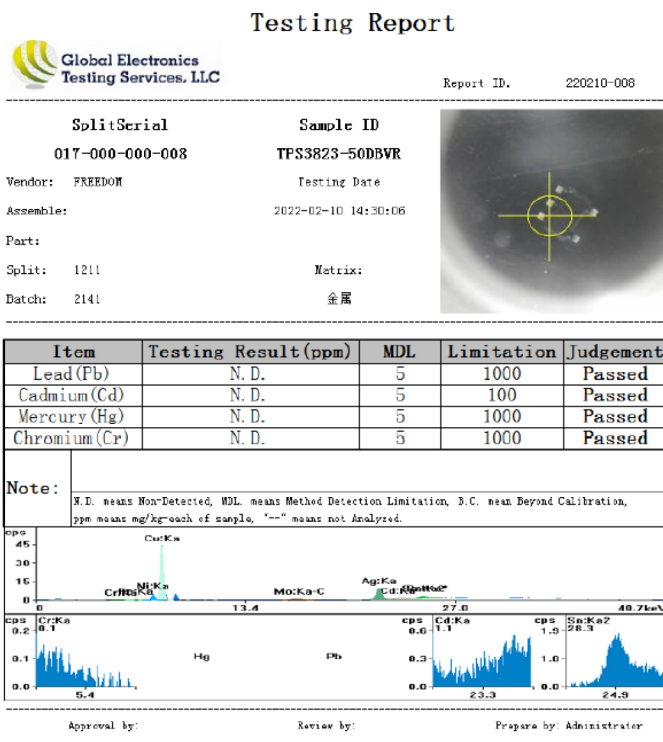


Figure 29. XRF 1

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9.0.0	Electrical Test (MIL-STD-883 and Manufacturer Specification)
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Results Summary TPS3823-50DBVR: Processor Supervisor 4.55V 1 Active Low/Push-Pull Automotive 5-Pin SOT-23 T/R Tested 10 samples,failed 10 samples for VIT- <4.49v min (range = 4.49v min,4.55v typ,4.64v max)
--

	Test-Process Operation	Quantity Inspected	Pass	Fail	N/A	Comments / Observations
9.1.0	Electrical Test (MIL-STD-883 and Manufacturer Specification)					
9.1.1	DC Function Test TA = 25C	10	0	10		
Equipment Used		DIGITAL OSCILLOSCOPE Asset Tag: 3 Calibration Due Date: 2023-02-09 Cert: HK0918441 POWER SUPPLY Asset Tag: 13 Calibration Due Date: 2023-02-09 Cert: HK0918447 MULTIMETER Asset Tag: 14 Calibration Due Date: 2023-02-09 Cert: HK0918448				

Images For Electrical Test.

TPS3820, TPS3823, TPS3823A, TPS3828: DBV PACKAGE

5-Pin SOT-23

Top View

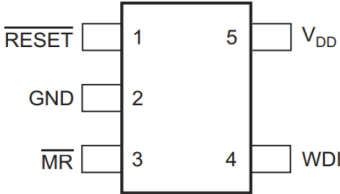


Figure 30. DEVICE PIN OUT

7.5 Electrical Characteristics

over operating junction temperature range -40°C to 85°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
V _{OH} High-level output voltage	RESET TPS382x-50 V _{DD} = V _{IT-} + 0.2 V I _{OH} = -120 μA	V _{DD} - 1.5 V			V
V _{OL} Low-level output voltage	RESET TPS382x-50 V _{DD} = V _{IT-} - 0.2 V I _{OL} = 3 mA		0.4		V
V _{IT-} Negative-going input threshold voltage ⁽²⁾	TPS382x-50 T _A = 0°C to 85°C	4.49	4.55	4.64	V
	TPS382x-25	2.20	2.25	2.30	
	TPS382x-50 T _A = -40°C to 85°C	4.46	4.55	4.64	
V _{hys} Hysteresis at V _{DD} input	TPS382x-25		30		mV
	TPS382x-30				
	TPS382x-33				
	TPS382x-50		50		
I _{IQ(AV)} Average high-level input current	WDI WDI = V _{DD} , time average (DC = 88%)		120		μA
I _{IQ(AV)} Average low-level input current	WDI WDI = 0.3 V, V _{DD} = 5.5 V time average (DC = 12%)	-15			μA
I _{ih} High-level input current	MR MR = V _{DD}		140	190	μA
	MR MR = V _{DD} + 0.7, V _{DD} = 5.5 V		-40	-60	μA
I _{il} Low-level input current	WDI WDI = 0.3 V, V _{DD} = 5.5 V		140	190	μA
	MR MR = 0.3 V, V _{DD} = 5.5 V		-110	-160	μA

Figure 31. ELECTRICAL CHARACTERISTICS

VIT- = 4.49v min, 4.55v typ, 4.64v max

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Approved by: PETER YAN	Global Electronics Testing Services LongGang District, Shenzhen China 86-0755-82911501	Page: Page 16 Of 18

Part Number: TPS3823-50DBVR
Manufacturer: TEXAS INSTRUMENTS
Date Code: 2141+5

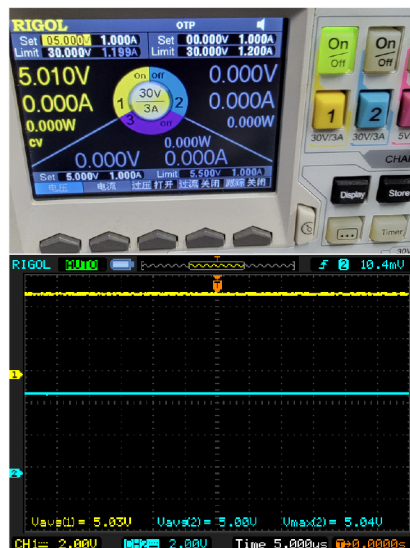
Customer P/N: NOT AVAILABLE
Devices Received: 1,000
Lot Code: NOT AVAILABLE

Table 1. Function Table

INPUTS		OUTPUTS	
MR ⁽¹⁾	V _{DD} > V _{IT}	RESET	RESET ⁽²⁾
L	0	L	H
L	1	L	H
H	0	L	H
H	1	H	L

(1) TPS3820/3/5/8
(2) TPS3824/5

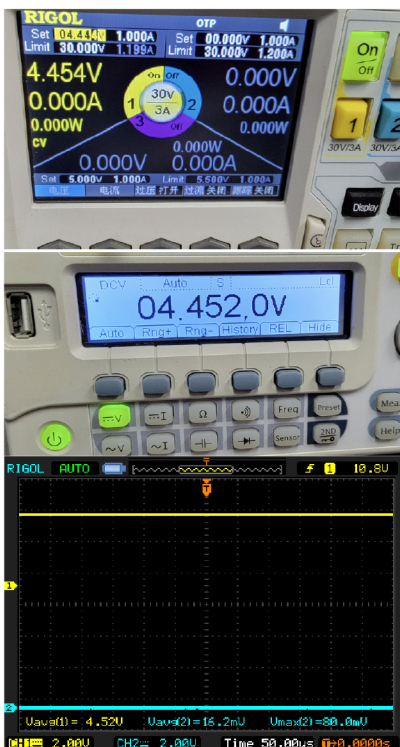
Figure 32. FUNCTION TABLE



Power supply
V_{cc} = 5(v)

Oscilloscope
Ch1=V_{cc} = 5v
Ch2=/Reset_vout = 5v

Figure 33. RESET_VOUT = 5V (HIGH LOGIC) AT VCC = 5V



Power supply
V_{cc} = 4.454(V)

Voltmeter
V_{CC} = 4.452(v) observed

Oscilloscope
Ch1=V_{cc}
Ch2=/Reset_vout = 0v

Figure 34. RESET_VOUT = 0V (LOW LOGIC) AT VCC = 4.452V

P/N: TPS3823-50DBVR

From datasheet

V_{in} = 0V Min to 5.5V Max.

Negative-going VIT- = 4.49v min, 4.55v typ, 4.64v max

Qty.	(v)	(v)
/Reset_vout	VCC input (VIT-)	
1	0	4.452
2	0	4.371
3	0	4.421
4	0	4.457
5	0	4.356
6	0	4.292
7	0	4.393
8	0	4.347
9	0	4.416
10	0	4.453
Average	0	4.389444444
PASS	0	
FAIL	10(pcs)	

Figure 35. TEST DATA

Prepared by:

JAY XU

Approved by:

PETER YAN

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Analysis Report - 1000-33725

Part Number:	TPS3823-50DBVR	Customer P/N:	NOT AVAILABLE
Manufacturer:	TEXAS INSTRUMENTS	Devices Received:	1,000
Date Code:	2141+5	Lot Code:	NOT AVAILABLE

VIT- = 4.452v observed
VIT- range = 4.49v min, 4.55v typ, 4.64v max
Failed!

VIT- Average = 4.389v observed
VIT- range = 4.49v min, 4.55v typ, 4.64v max
10 samples failed!

Prepared by:

JAY XU

Approved by:

PETER YAN

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