PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	ADG/20/12054
1.3 Title of PCN	New RJR 5FT80092 frame qualification
1.4 Product Category	Power RF
1.5 Issue date	2020-03-12

2. PCN Team	
2.1 Contact supplier	
2.1.1 Name	ROBERTSON HEATHER
2.1.2 Phone	+1 8475853058
2.1.3 Email	heather.robertson@st.com
2.2 Change responsibility	
2.2.1 Product Manager	Roberto CRISAFULLI
2.1.2 Marketing Manager	Gaetano PIGNATARO
2.1.3 Quality Manager	Vincenzo MILITANO

3. Change		
3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Materials	Any change on substrate (part number, supplier, plant, design or composition of any layer, etc..)	ST BOUSKOURA Morocco

4. Description of change		
	Old	New
4.1 Description	RJR frame 5FT86666	RJR frame 5FT80092
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	no impacts	

5. Reason / motivation for change	
5.1 Motivation	Replacement of the actual RJR Frame 5FT86666 with the new one 5FT80092 to secure supply chain.
5.2 Customer Benefit	MANUFACTURING FLEXIBILITY

6. Marking of parts / traceability of change	
6.1 Description	dedicated FG

7. Timing / schedule	
7.1 Date of qualification results	2020-03-06
7.2 Intended start of delivery	2020-06-06
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation			
8.1 Description	12054 New STAC780-4FB packages for DMOS products qualification (silicon test vehicle 4925).pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2020-03-12

9. Attachments (additional documentations)

12054 Public product.pdf
12054 New RJR 5FT80092 frame qualification.doc
12054 New STAC780-4FB packages for DMOS products qualification (silicon test vehicle 4925).pdf
12054 STAC780-4 vs STAC244.pdf

10. Affected parts		
10. 1 Current		10.2 New (if applicable)
10.1.1 Customer Part No	10.1.2 Supplier Part No	10.1.2 Supplier Part No
	STAC2942BW	
	STAC3932B	
	STAC4932B	

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RELIABILITY EVALUATION REPORT

New STAC780-4F/B packages for DMOS products qualification
(silicon test vehicle 4925)
Process Change

General Information	
Commercial Product	*: STAC3932F – STAC3932B*
Product Line	*:4925*
Product Description	*: RF DMOS*
Package	*:STAC780-4F / STAC780-4B*
Silicon Technology	*: DMOS*
Division	*: Power Transistor Division*

Traceability	
Diffusion Plant	*:CT6*
Assembly Plant	*: BOUSKOURA 2 - MOROCCO*

Reliability Assessment	
Passed	☒

Disclaimer: *this report is a summary of the qualification plan results performed in good faith by STMicroelectronics to evaluate the electronic devices conformance to its specific mission profile for Automotive Application. This report and its contents shall not be disclosed to a third party, except in full, without previous written agreement by STMicroelectronics or under the approval of the author (see below)*

REVISION HISTORY

Version	Date	Author	Changes description
1.0	05-March-2020	Michele PANZARELLA	

APPROVED BY:
CORRADO CAPPELLO
ADG Q&R DEPARTMENT - CATANIA
ST MICROELECTRONICS

TABLE OF CONTENTS

1. RELIABILITY EVALUATION OVERVIEW

1.1 Objective

To evaluate the new STAC780-4F/B packages for DMOS products.

1.2 Reliability Test Plan

Reliability tests performed on this device are in agreement with internal spec 0061692 and are listed in the Test Plan
For details on test conditions, generic data used and spec reference see test results summary at Par.3

1.2.1 TEST PLAN

TABLE 2

#	Stress	Abrv	Reference	Test Flag	Comments
1	Pre and Post-Stress Electrical Test	TEST	User specification or supplier's standard Specification	Y	
2	High Temperature Storage Life	HTSL	JESD22B-101	Y	
3	Temperature Cycling	TC	JESD22A-104	Y	
4	Mechanical Sequence	MS	JESD22-B103B	Y	

1.3 **CONCLUSION**

On the basis of the positive reliability assessment, the new STAC780-4F/B package for DMOS products can be considered qualifiable from reliability point of view.

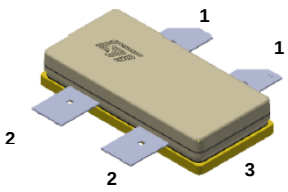
2. DEVICE/TEST VEHICLE CHARACTERISTICS

2.1 Generalities

The STAC3932B and the STAC3932F are N-channel MOS field-effect RF power transistor. It is intended for use in 100 V DC large signal applications up to 250 MHz.

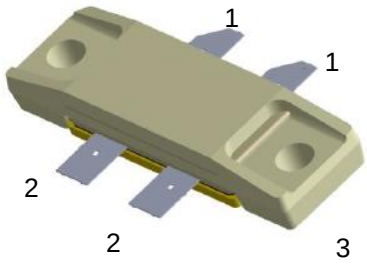
2.2 Pin connection

STAC780-4F (flangeless)



1.Drain
2.Gate
3.Source

STAC780-4B (bolt-down)



1.Drain
2.Gate
3.Source

2.5 Traceability

Wafer fab information	
Wafer fab manufacturing location	CT6
Wafer diameter (inches)	6”
Silicon process technology	DMOS
Die finishing front side (passivation)	SiN (nitride)
Die finishing back side	Au/As
Die area (Stepping die size)	6980 um x 1430 um
Metal levels/Materials	1 / AlCu

Assembly Information	
Assembly plant location	BOUSKOURA - MOROCCO
Package description	STAC780-4B/F
Frame	FRAME SW0800 4L 380x780 LCP STAC780-4PPF BASE THERMAL BeO 385x810 STAC244-KAI
Die attach material	AuSi eutectic
Wires bonding materials/diameters	WIRE Al-Si D1.5
Molding compound	LID LCP

Reliability Testing Information	
Reliability laboratory location	Catania
Electrical testing location (*)	Catania
Tester (*)	Tesec

3. TESTS RESULTS SUMMARY

3.1 Lot Information

Lot #	Line	PN	Packages	Note
1	4925	STAC3932F1	STAC780-4F	(flangeless)
2				
3		STAC3932B	STAC780-4B	(bolt-down)

3.2 Test results summary

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS		
						Lot 1	Lot 2	Lot3
TEST		User specification	All qualification parts tested per the requirements of the appropriate device specification.			80	80	80
External visual		JESD22 B-101	All devices submitted for testing			80	80	80
Parametric Verification		User specification	All parameters according to user specification at room temperature and the maximum specified operating temperature	135		80	80	80
Die Oriented Tests								
HTSL	N	JESD22 A-103	Tj = 175°C	135	168 H	0/45	0/45	0/45
					500 H	0/45	0/45	0/45
					1000 H	0/45	0/45	0/45
Package Oriented Tests								
TC	N	JESD22 A-104	TA=-65°C TO 150°C	75	100cy	0/25	0/25	0/25
					200cy	0/25	0/25	0/25
					500cy	0/25	0/25	0/25
MS	N	JESD22-B103B	VIBRATION a=20g; f=100/2000 Hz; 4' x 3 orient. x 4 cycles	30	After stress	0/10	0/10	0/10

Public Products List

Publict Products are off the shelf products. They are not dedicated to specific customers, they are available through ST Sales team, or Distributors, and visible on ST.com

PCN Title : New RJR 5FT80092 frame qualification

PCN Reference : ADG/20/12054

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

STAC4932B	STAC3932B	STAC4932F

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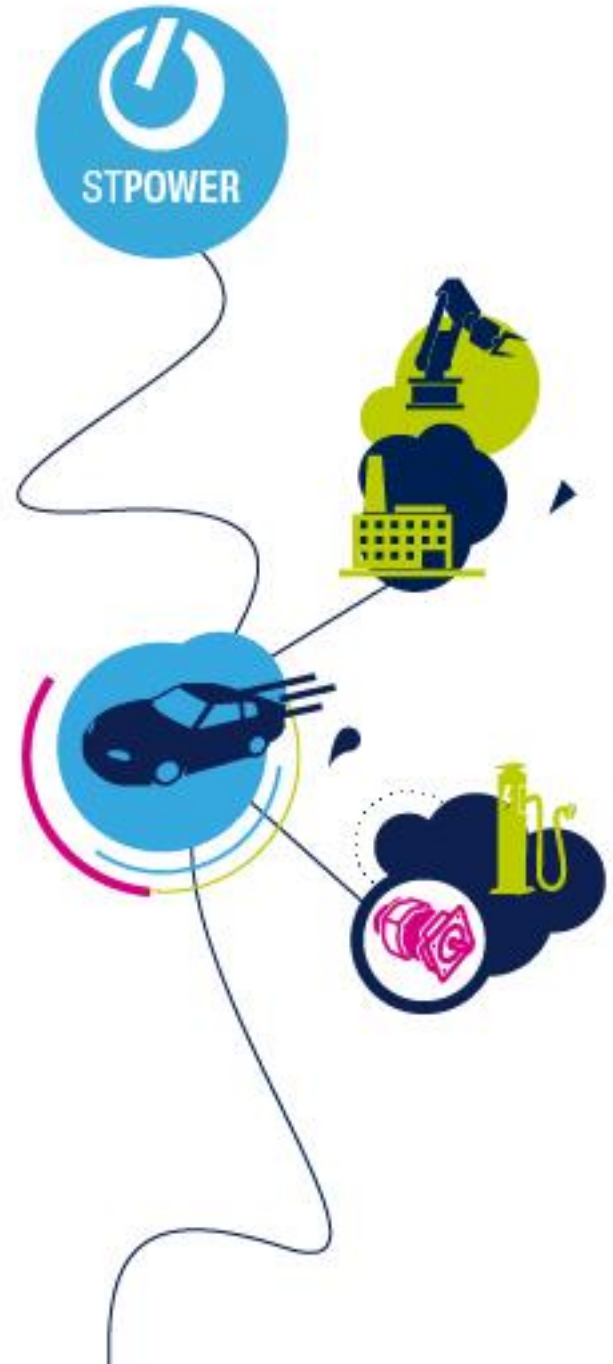
STAC780-4 vs STAC244

5FT80092 vs 5FT8666 lead frame

Gan & Power RF Marketing team

February 25th, 2020



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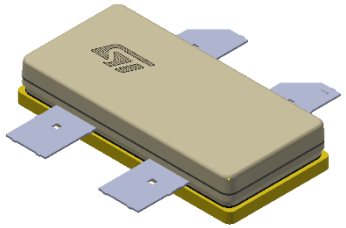
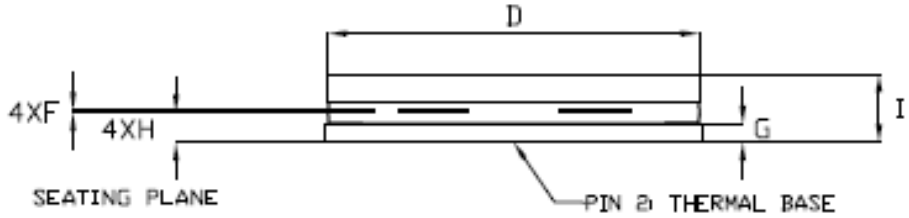
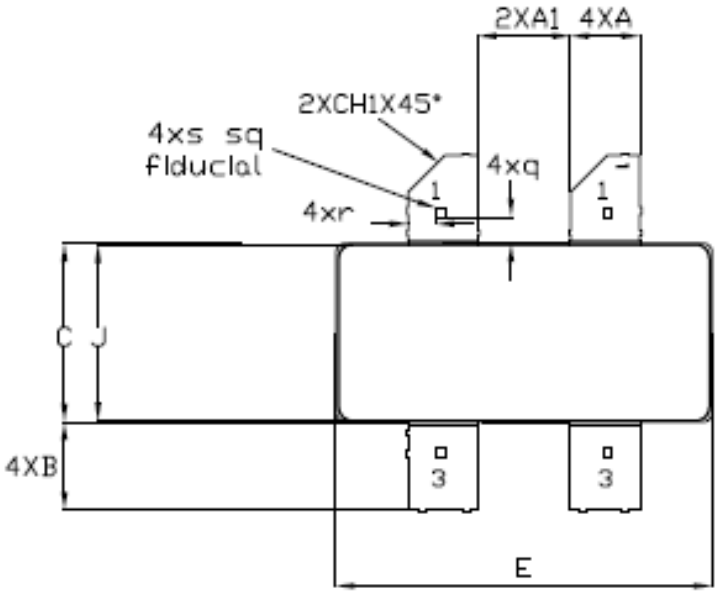


STAC780-4F

DIMENSIONS						
REF. DIM	DATA BOOK (mm)			DATA BOOK (inches)		
	NOM	MIN	MAX	NOM	MIN	MAX
A	-	3.76	3.86	-	0.148	0.152
A1		5.03	5.13		0.198	0.202
B	-	4.57	5.08	-	0.180	0.200
C	-	9.65	9.91	-	0.380	0.390
D	-	20.17	20.37	-	0.794	0.802
E	-	20.45	20.70	-	0.805	0.815
F	-	0.11	0.17	-	0.005	0.007
G	-	0.97	1.14	-	0.038	0.045
H	-	1.52	1.70	-	0.060	0.067
I	-	3.18	4.32	-	0.125	0.170
J	-	9.52	9.78	-	0.375	0.385
q	1.37	-	-	0.057	-	-
r	1.52	-	-	0.060	-	-
s	0.51	-	-	0.020	-	-
CH1	2.03	-	-	0.08	-	-





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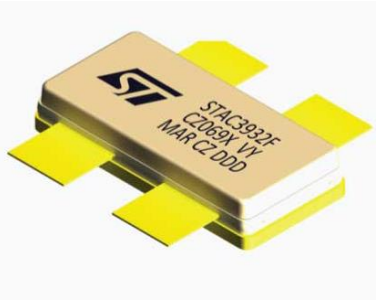
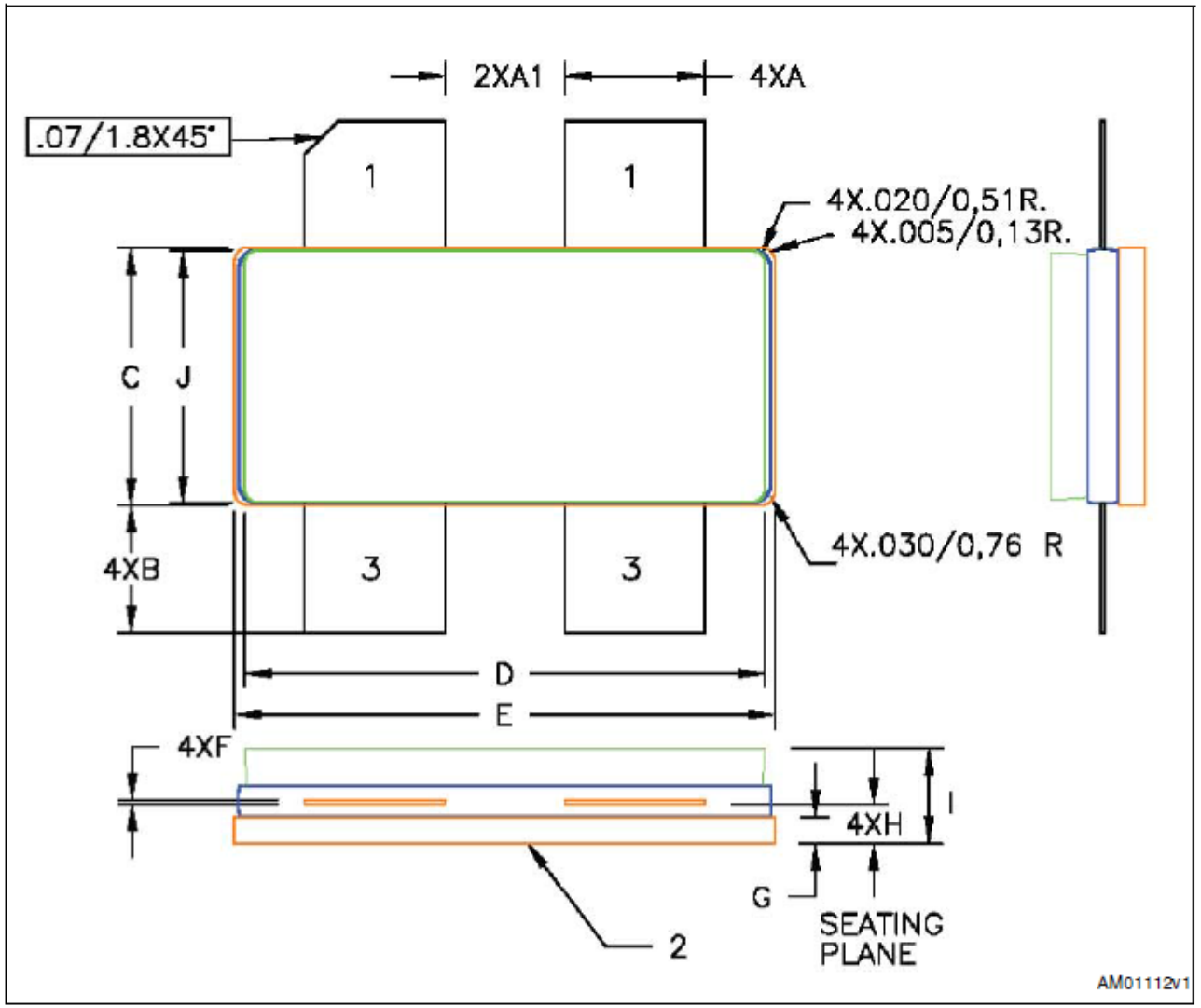


STAC244F

Dim.	mm.		Inch	
	Min	Max	Min	Max
A	5.10	5.59	200	220
A1	4.32	4.83	170	190
B	4.32	5.33	170	210
C	9.65	9.91	380	390
D	19.61	20.02	772	788
E	20.45	20.70	805	815
F	0.08	1.15	0.003	0.006
G	0.89	1.14	0.035	0.045
H	1.45	1.70	0.057	0.067
I	3.18	4.32	0.125	0.170
J	9.27	9.53	0.365	0.375



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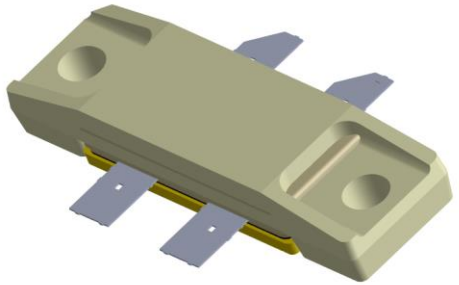
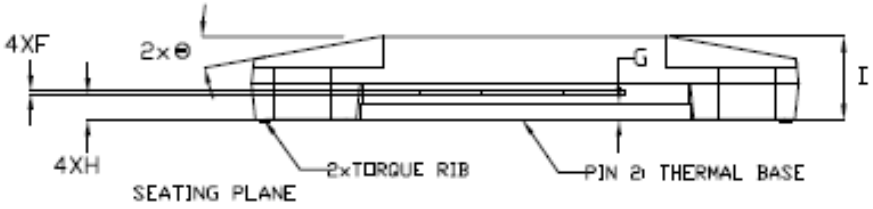
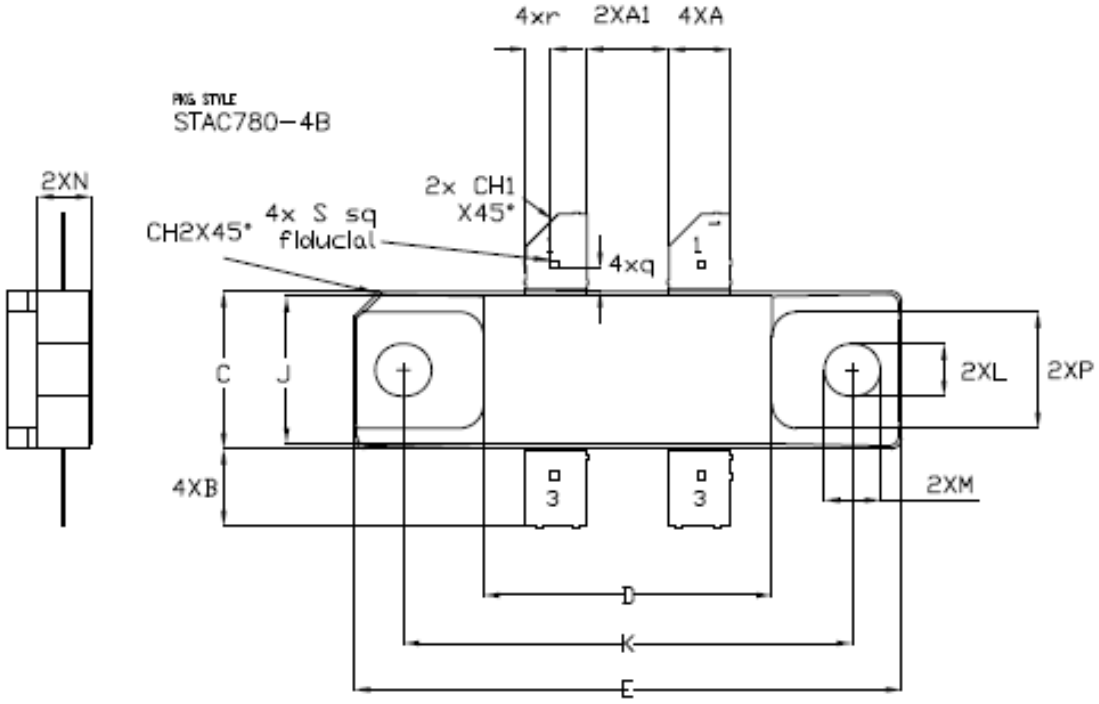
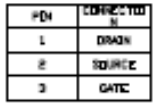
STAC780-4B





DIMENSIONS						
REF. DIM	DATA BOOK (mm)			DATA BOOK (inches)		
	NOM	MIN	MAX	NOM	MIN	MAX
A	-	3.76	3.86	-	0.148	0.152
A1	-	5.03	5.13	-	0.198	0.2020
B	-	4.57	5.08	-	0.180	0.200
C	-	9.65	9.91	-	0.380	0.390
D	-	17.78	18.08	-	0.700	0.712
E	-	33.88	34.19	-	1.334	1.346
F	-	0.11	0.17	-	0.005	0.007
G	-	0.97	1.14	-	0.038	0.045
H	-	1.52	1.70	-	0.060	0.067
I	-	4.83	5.33	-	0.190	0.210
J	-	9.52	9.78	-	0.375	0.385
K	-	27.69	28.19	-	1.090	1.110
L	3.25	3.20	3.30	0.128	0.126	0.130
M	3.51	3.43	3.58	0.138	0.135	0.141
N	3.38	3.30	3.45	0.133	0.130	0.136
p	7.21	7.14	7.29	0.284	0.281	0.287
q	1.37	-	-	0.057	-	-
r	1.52	-	-	0.060	-	-
s	0.51	-	-	0.020	-	-
Θ	10°	-	-	10°	-	-
CH1	2.03	-	-	0.08	-	-
CH2	1.52	-	-	0.060	-	-





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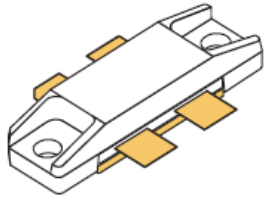
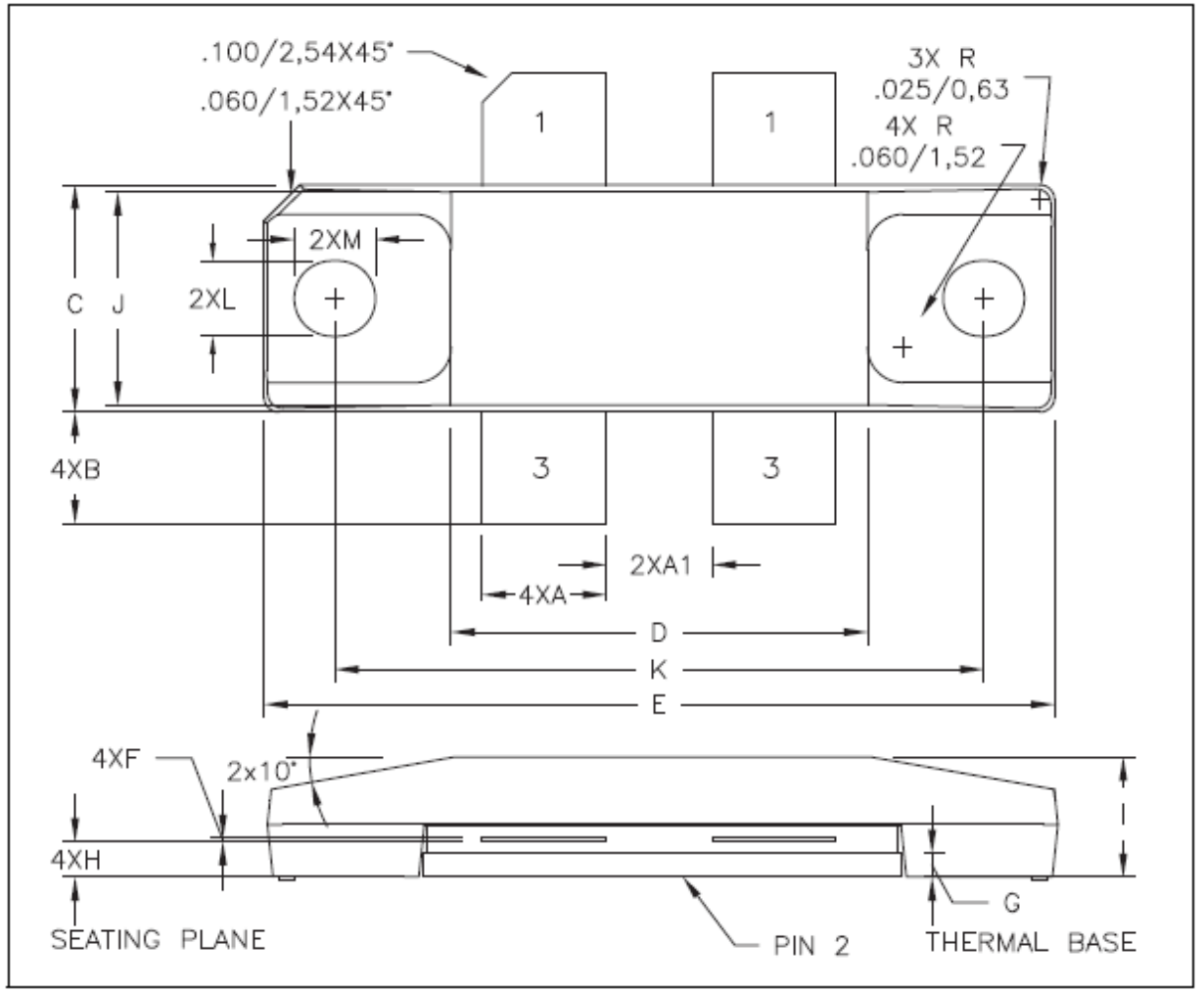
STAC244B



STAC244B
Air cavity

Dim.	mm		
	Min.	Typ.	Max.
A	5.08		5.59
A1	4.32		4.83
B	4.32		5.33
C	9.65		9.91
D	17.78		18.08
E	33.88		34.19
F	0.10		0.15
G		1.02	
H	1.45		1.70
I	4.83		5.33
J	9.27		9.52
K	27.69		28.19
L	3.12	3.23	3.33
M	3.35	3.45	3.56



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