DOCUMENT CHANGE REQUEST

DCR number 506	Changes required for: General	Originator: S Jeffery - ESCC
Date: 2009/04/29	Date sent: 2009/04/29	Organisation: ESA/ESTEC
Status: IMPLEMENTED		

Title:	Matched Dual Transistors NPN, based on types 2N2919/2N2920 and 2N2920A		
Number:	5207/002	Issue:	2

Other documents affected:

Page:

See attached mark-up of 5207/002 (Issue 3 - Draft A). Note that this mark-up also includes the change of DCR 447 (DCR 447 was approved 16th December 2008); it is proposed that once this DCR has been approved, DCR 447 is introduced concurrently.

Paragraph:

See attached mark-up of 5207/002 (Issue 3 - Draft A). Note that this mark-up also includes the change of DCR 447 (DCR 447 was approved 16th December 2008); it is proposed that once this DCR has been approved, DCR 447 is introduced concurrently.

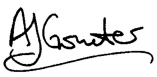
Original wording:

Proposed wording:

To introduce a number of editorial and technical changes (see the attached mark-up) which are required to make this detail spec clear, complete and consistent with the standard format and content of specifications for similar Part Types.

Justification:

Improve the appearance, content and clarity of the spec..

Attachments:
5207002_Issue_3_-_Draft_A.pdf, null
Modifications:
Page 6: original Note 3 to Maximum Ratings, add ", and any handling,"between "testing" and "performed".
Approval signature:

Date signed:
2009-04-29

Pages 1 to 16

TRANSISTORS, MATCHED DUAL, NPN

BASED ON TYPE 2N2919, 2N2920 and 2N2920A

ESCC Detail Specification No. 5207/002

as applicable

Issue ~~2~~ 3 – Draft A	~~October 2008~~

Document Custodian: European Space Agency - see https://escies.org

as applicable

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DOCUMENTATION CHANGE NOTICE

(Refer to https://escies.org for ESCC DCR content)

DCR No.	CHANGE DESCRIPTION
~~187, 334~~ 447, tbd	Specification up issued to incorporate editorial and technical changes per DCRs.

Variant Number	Based on Type	Case	Lead/Terminal Material and/or Finish	Weight max g
11	2N2920	CCP	2	0.2
12	2N2920A	CCP	2	0.2
13	2N2919	CCP	4	0.2
14	2N2920	CCP	4	0.2
15	2N2920A	CCP	4	0.2

The lead/terminal material and/or finish shall be in accordance with the requirements of ESCC Basic Specification No. 23500.

1.5 MAXIMUM RATINGS

The maximum ratings shall not be exceeded at any time during use or storage.
Maximum ratings shall only be exceeded during testing to the extent specified in this specification and when stipulated in Test Methods and Procedures of the ESCC Generic Specification.

Characteristics	Symbols	Maximum Ratings	Unit	Remarks
Collector-Base Voltage	V_{CBO}	60	V	Over entire operating temperature range
Collector-Emitter Voltage	V_{CEO}	60	V	
Emitter-Base Voltage	V_{EBO}	6	V	
Collector Current	I_C	30	mA	Continuous
Power Dissipation (One Section)				At $T_{amb} \leq +25^oC$ ~~Note 1~~
For TO-77 and CCP	P_{totO1}	0.3	W	
~~For CCP~~	~~P_{totO2}~~	~~0.6 (Note 2)~~	~~W~~	
For TO-77	P_{totO} 2	0.75	W	At $T_{case} \leq +25^oC$ ~~Note 1~~
Power Dissipation (Both Sections)				At $T_{amb} \leq +25^oC$ ~~Note 1~~
For TO-77 and CCP	P_{totB1}	0.5	W	
~~For CCP~~	~~P_{totB2}~~	~~1 (Note 2)~~	~~W~~	
For TO-77	P_{totB} 2	1.25	W	At $T_{case} \leq +25^oC$ ~~Note 1~~
Operating Temperature Range	T_{op}	-55 to +200	°C	Note ~~3~~ 2
Storage Temperature Range	T_{stg}	-65 to +200	°C	Note ~~3~~ 2
Soldering Temperature For TO-77 For CCP	T_{sol}	 +260 +245	°C	 Note ~~4~~ 3 Note ~~5~~ 4

see attached →

NOTES:

1. ~~For T_{amb} or $T_{case} > +25^oC$, derate linearly to 0W at $+200^oC$.~~ Thermal Resistance, Junction-to-Case
2. ~~When mounted on a 15 x 15 x 0.6mm ceramic substrate.~~
2. ~~3.~~ For Variants with tin-lead plating or hot solder dip lead finish all testing performed at $T_{amb} > +125^oC$

only applies to TO-77 packaged Variants.

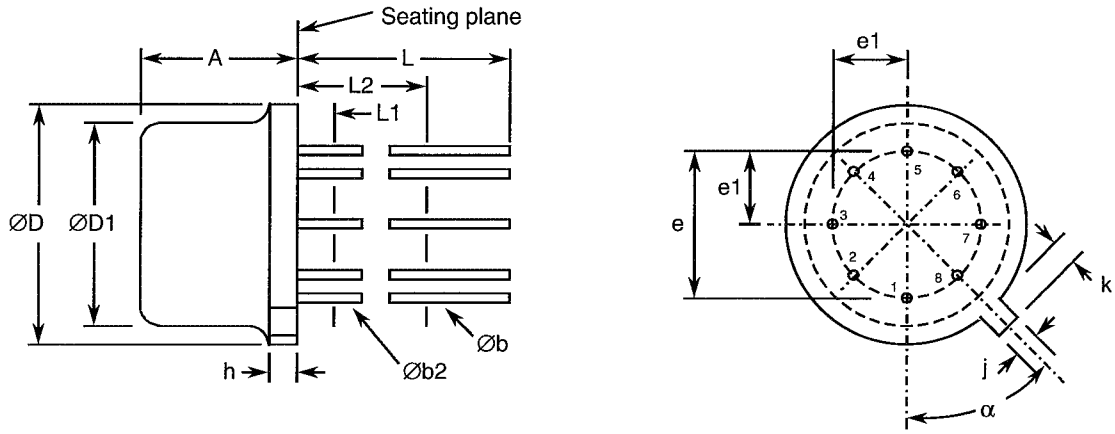
shall be carried out in a 100% inert atmosphere.

3. Duration 10 seconds maximum at a distance of not less than 1.5mm from the device body and the same lead shall not be resoldered until 3 minutes have elapsed.

4. Duration 5 seconds maximum and the same terminal shall not be resoldered until 3 minutes have elapsed.

1.6 PHYSICAL DIMENSIONS AND TERMINAL IDENTIFICATION

1.6.1 Metal Can Package (TO-77) - 6 lead



Symbols	Dimensions mm		Notes
	Min	Max	
A	6.1	6.6	
Øb	0.406	0.533	2, 3
Øb2	0.406	0.483	2, 3
ØD	8.51	9.4	
ØD1	7.75	8.51	
e	5.08 BSC		4
e1	2.54 BSC		4
h	-	1.02	
j	0.711	0.864	
k	0.737	1.14	5
L	12.7	-	2
L1	-	1.27	3
L2	6.35	-	3
α	45° BSC		1, 4, 6

Thermal Resistance, Junction-to-Ambient	$R_{th(j-a)}$	583.3 350	°C/W	For one section For both sections
Thermal Resistance, Junction-to-Case	$R_{th(j-c)}$	233.3 140	°C/W	For one section For both sections Note 1

Characteristics	Symbols	Limits		Units
		Min	Max	
Collector-Base Cut-off Current	I_{CBO}	-	2	nA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	350	mV
Forward-Current Transfer Ratio 2 Variants 04, 07, 10, 13 Variants 02, 03, 05, 06, 08, 09, 11, 12, 14, 15	h_{FE2}	 100 225	 - -	-
Forward-Current Transfer Ratio Comparison	h_{FE2-1}/ h_{FE2-2}	0.85	1.18	-
Base-Emitter Voltage Differential 2 Variants 02, 04, 05, 07, 08, 10, 11, 13, 14 Variants 03, 06, 09, 12, 15	$\lvert V_{BE1}-V_{BE2}\rvert 2$	 - -	 3 1.5	mV
Base-Emitter Voltage Differential Change 1 (Note 1) Variants 02, 04, 05, 07, 08, 10, 11, 13, 14 Variants 03, 06, 09, 12, 15	$\lvert\Delta(V_{BE1}-V_{BE2})\Delta T_{amb}\rvert 1$	 - -	 0.96 0.48	mV
Base-Emitter Voltage Differential Change 2 (Note 1) Variants 02, 04, 05, 07, 08, 10, 11, 13, 14 Variants 03, 06, 09, 12, 15	$\lvert\Delta(V_{BE1}-V_{BE2})\Delta T_{amb}\rvert 2$	 - -	 1.2 0.6	mV

NOTES:

1. To be measured after Operating Life test only.

2.7 POWER BURN-IN CONDITIONS

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Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	T_{amb}	+25 ~~to~~ to +50	°C
Power Dissipation (Both Sections)	P_{totB}	As per Maximum Ratings or P_{totB1} ~~derated~~ at the chosen T_{amb}	W
Collector-Base Voltage	V_{CB}	40	V

2.8 OPERATING LIFE CONDITIONS

The conditions shall be as specified for Power Burn-in.

using the specified $R_{th(j-a)}$.

P S-

APPENDIX 'A'

AGREED DEVIATIONS FOR STMICROELECTRONICS (F)

ITEMS AFFECTED	DESCRIPTION OF DEVIATIONS
Deviations from Production Control-Chart F2	Special In-process Control Internal Visual Inspection. For CCP packages the criteria specified for voids in the fillet and minimum die mounting material around the visible die perimeter for die mounting defects may be omitted providing that a radiographic inspection to verify the die-attach process is performed on a sample basis in accordance with STMicroelectronics procedure 0076637.
Deviations from Room Temperature Electrical Measurements	All AC characteristics (Room Temperature Electrical Measurement Note 2) may be considered guaranteed but not tested if successful pilot lot testing has been performed on the wafer lot which includes AC characteristic measurements per the Detail Specification. A summary of the pilot lot testing shall be provided if required by the Purchase Order.
Deviations from High and Low Temperatures Electrical Measurements	All characteristics specified may be considered guaranteed but not tested if successful pilot lot testing has been performed on the wafer lot which includes characteristic measurements at high and low temperatures per the Detail Specification. A summary of the pilot lot testing shall be provided if required by the Purchase Order.
Deviations from Screening Tests – Chart F3	Solderability is not applicable unless specifically stipulated in the Purchase Order.

(Approved DCR 447 refers)