



## DOCUMENT CHANGE REQUEST

DCR number 507 Changes required for: General

Date: 2009/04/29

Date sent: 2009/04/29

Originator: S Jeffery - ESCC

Organisation: ESA/ESTEC

Status: IMPLEMENTED

Title: Matched Dual Transistors NPN, based on type 2N3350

Number: 5207/003

Issue: 2

Other documents affected:

Page:

See attached mark-up of 5207/003 (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 5207/003 (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:

5207003\_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:

A handwritten signature in black ink, appearing to read "R. S. Hart" with a long horizontal stroke extending to the right.

Date signed:

2009-04-29



Pages 1 to 15

## TRANSISTORS, MATCHED DUAL, PNP

BASED ON TYPE 2N3350

ESCC Detail Specification No. 5207/003

as applicable

Issue 2 3 - Draft A	February 2008-
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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
<del>187, 328</del>	Specification up issued to incorporate editorial and technical changes per DCRs.

447, tbd

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	$V_{CEO}$	-45	V	
Emitter-Base Voltage	$V_{EBO}$	-6	V	
Collector Current	$I_C$	30	mA	Continuous
Power Dissipation (One Section)				At $T_{amb} \leq +25^\circ C$ Note 1
For TO-77 and CCP	$P_{totO1}$	0.3	W	make symbols bigger
For CCP	<del><math>P_{totO2}</math></del>	<del>0.6 (Note 2)</del>	<del>W</del>	
For TO-77	$P_{totO1} \times 2$	0.6	W	
Power Dissipation (Both Sections)				At $T_{amb} \leq +25^\circ C$ Note 1
For TO-77 and CCP	$P_{totB1}$	0.6	W	make symbols bigger
For CCP	<del><math>P_{totB2}</math></del>	<del>1.2 (Note 2)</del>	<del>W</del>	
For TO-77	$P_{totB1} \times 2$	1.2	W	
Operating Temperature Range	$T_{op}$	-55 to +200	$^\circ C$	Note 2
Storage Temperature Range	$T_{stg}$	-65 to +200	$^\circ C$	Note 2
Soldering Temperature	$T_{sol}$		$^\circ C$	
For TO-77		+260		Note 3
For CCP		+245		Note 4

**NOTES:**

1. For  $T_{amb}$  or  $T_{case} > +25^\circ C$ , derate linearly to 0W at +200~~0~~  $^\circ C$ . Thermal Resistance, Junction-to-case
2. ~~When mounted on a 15 x 15 x 0.6mm ceramic substrate.~~
3. ~~For Variants with tin-lead plating or hot solder dip lead finish all testing performed at  $T_{amb} > +125^\circ C$  shall be carried out in a 100% inert atmosphere.~~
4. ~~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.~~
5. ~~Duration 5 seconds maximum and the same terminal shall not be resoldered until 3 minutes have elapsed.~~

only applies to TO-77 packaged Variants.

see attached

Thermal Resistance, Junction-to-Ambient	$R_{th(j-a)}$	583.3 291.7	$^{\circ}\text{C}/\text{W}$	For one section For both sections
Thermal Resistance, Junction-to-Case	$R_{th(j-c)}$	291.7 145.8	$^{\circ}\text{C}/\text{W}$	For one section For both sections Note 1

Characteristics	Symbols	MIL-STD-750 Test Method	Test Conditions	Limits		Units
				Min	Max	
Small-Signal Input Impedance	$h_{ie}$	3201	$I_C = -1\text{mA}$ $V_{CE} = -5\text{V}$ $f = 1\text{kHz}$ Note 2	3.7	20	k $\Omega$
Small-Signal Output Impedance	$h_{oe}$	3216	$I_C = -1\text{mA}$ $V_{CE} = -5\text{V}$ $f = 1\text{kHz}$ Note 2	-	100	$\mu\text{mho}$
Noise Figure	NF	3246	$I_C = -10\mu\text{A}$ $V_{CE} = -5\text{V}$ $R_S = 10\text{k}\Omega$ $BW = 15.7\text{kHz}$ Note 2	-	4	dB

**NOTES:**

1. Pulse measurement: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
2. For AC characteristics read and record measurements shall be performed on a sample of 32 components with 0 failures allowed. Alternatively a 100% inspection may be performed.

2.4.2 High and Low Temperatures Electrical Measurements

Characteristics	Symbols	MIL-STD-750 Test Method	Test Conditions Note 1	Limits		Units
				Min	Max	
Collector-Base Cut-off Current	$I_{CBO}$	3036	$T_{amb} = +150(+0-5)^{\circ}\text{C}$ $V_{CB} = -45\text{V}$ , Bias Condition D	-	-10	$\mu\text{A}$
Forward-Current Transfer Ratio 2	$h_{FE2}$	3076	$T_{amb} = -55(+5-0)^{\circ}\text{C}$ $I_C = -1\text{mA}$ $V_{CE} = -5\text{V}$	70	-	-
Forward-Current Transfer Ratio Comparison	$h_{FE1-1}/h_{FE1-2}$	3076	$T_{amb} = -55$ to $+125^{\circ}\text{C}$ $I_C = -10\mu\text{A}$ ; $V_{CE} = -5\text{V}$	0.9	1.1	-
Base-Emitter Voltage Differential Change	$ \Delta(V_{BE1} - V_{BE2})/\Delta T_{amb} _1$	3066	$T_{amb} = -55(+5-0)^{\circ}\text{C}$ to $+25\pm 3^{\circ}\text{C}$ $I_C = -10\mu\text{A}$ $V_{CE} = -5\text{V}$	-	800	$\mu\text{V}$
	$ \Delta(V_{BE1} - V_{BE2})/\Delta T_{amb} _2$	3066	$T_{amb} = +25\pm 3^{\circ}\text{C}$ to $+125(+5-0)^{\circ}\text{C}$ $I_C = -10\mu\text{A}$ $V_{CE} = -5\text{V}$	-	1000	

bigger symbols

**NOTES:**

1. Read and record measurements shall be performed on a sample of 5 components with 0 failures allowed. Alternatively a 100% inspection may be performed.

2.5 PARAMETER DRIFT VALUES

Unless otherwise specified, the measurements shall be performed at  $T_{amb} = +22 \pm 3^{\circ}\text{C}$ .



2.7 HIGH TEMPERATURE REVERSE BIAS BURN-IN CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Case Temperature	$T_{case}$	+150 (+0 -5)	°C
Collector-Base Voltage	$V_{CB}$	-60	V
Emitter-Base Voltage	$V_{EB}$	-6	V
Duration	t	72 minimum	hrs

2.8 POWER BURN-IN CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	$T_{amb}$	+25 <del>to</del> to +50	°C
Power Dissipation (Both Sections)	$P_{totB}$	As per Maximum Ratings $P_{totB1}$ <del>at the chosen</del> at the chosen $T_{amb}$	W
Collector-Base Voltage	$V_{CB}$	-30	V

2.9 OPERATING LIFE CONDITIONS

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

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

P      APPENDIX 'A'      S -  
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)