DOCUMENT CHANGE REQUEST

DCR number 504	Changes required for: General	Originator: S Jeffery - ESCC
Date: 2009/04/28	Date sent: 2009/04/28	Organisation: ESA/ESTEC
Status: IMPLEMENTED		

Title:	Transistors High Power NPN, based on type BUX77		
Number:	5203/016	Issue:	2

Other documents affected:

Page:

See attached mark-up of 5203/016 (Issue 3 â.. 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 5203/016 (Issue 3 â.. 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:
5203016_Issue_3_-_Draft_A.pdf, null
Modifications:
Page 6: original Note 2 to Maximum Ratings, add ", and any handling,"between "testing" and "performed".
Approval signature:
Date signed:
2009-04-28

Pages 1 to 16

TRANSISTORS, HIGH POWER, NPN

BASED ON TYPE BUX77

ESCC Detail Specification No. 5203/016

as applicable

Issue ~~2~~ 3 - Draft A	~~February 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, 324~~ 447, tbd	Specification up issued to incorporate editorial and technical changes per DCR~~.~~s.

Characteristics	Symbols	Maximum Ratings	Unit	Remarks
Collector-Base Voltage	V_{CBO}	100	V	Over T_{op}
Collector-Emitter Voltage	V_{CEO}	80	V	Over T_{op} Note ~~4~~ 3
Emitter-Base Voltage	V_{EBO}	6	V	Over T_{op}
Collector Current	I_C	5	A	Continuous Note ~~4~~ 3
Base Current	I_B	800	mA	Continuous
Power Dissipation For TO-66 For TO-257	P_{tot}	 40 35	W	At $T_{case} \leq +25^\circ C$ ~~Note 1~~
Operating Temperature Range	T_{op}	-65 to +200	°C	Note ~~2~~ 1
Storage Temperature Range	T_{stg}	-65 to +200	°C	Note ~~2~~ 1
Soldering Temperature	T_{sol}	+260	°C	Note~~s 3~~ 2
Thermal Resistance, Junction-to-Case For TO-66 For TO-257	$R_{th(j-c)}$	 4.4 5	°C/W	

NOTES:

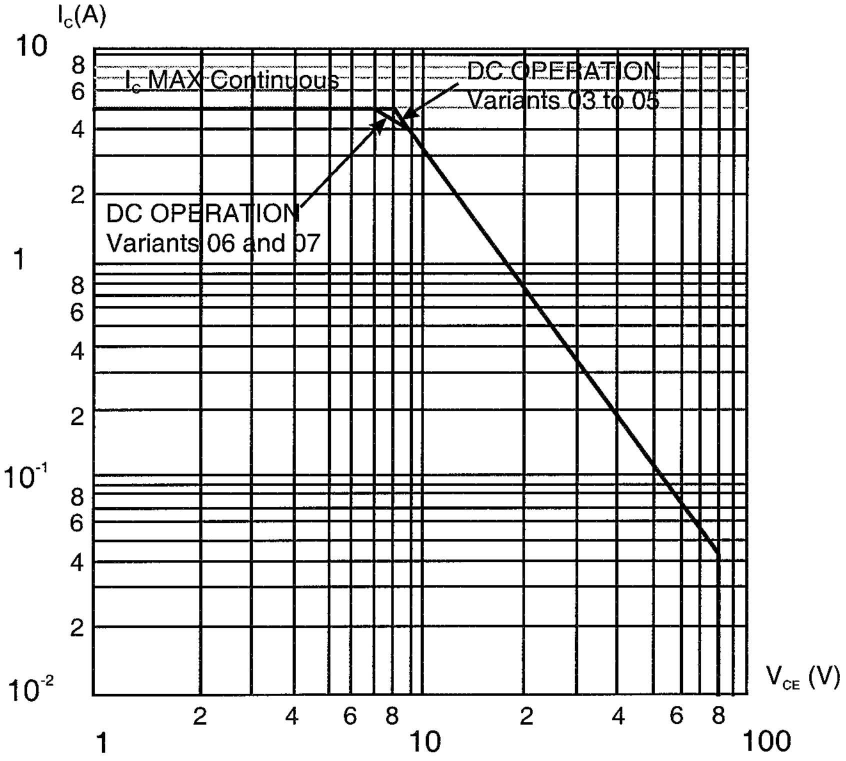
~~1. For T_{case} > +25°C, derate linearly to 0W at +200°C.~~

1. ~~2.~~ 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.
2. ~~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.

3. Safe Operation Area applies as follows:

Maximum Safe Operating Area Graph



1.6 HANDLING PRECAUTIONS

The TO-257 package contains Beryllium Oxide (BeO) and therefore it must not be ground, machined, sandblasted or subjected to any mechanical operation which will produce dust. The case must not be subjected to any chemical process (e.g. etching) which will produce fumes.

1.7 PHYSICAL DIMENSIONS AND TERMINAL IDENTIFICATION

Consolidated Notes are given following the case drawings and dimensions.

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. Pulsed measurement: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.

2.6 PARAMETER DRIFT VALUES

Unless otherwise specified, the measurements shall be performed at T_{amb}=+22 ±3°C.
The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.
The drift values (Δ) shall not be exceeded for each characteristic specified. The corresponding absolute limit values for each characteristic shall not be exceeded.

Characteristics	Symbols	Limits			Units
		Drift Value Δ	Absolute		
			Min	Max	
Emitter-Base Cut-off Current	I_{EBO}	±100	-	500	nA
Forward-Current Transfer Ratio 2	h_{FE2}	±25%	50	200	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	±100	-	1000	mV

2.7 INTERMEDIATE AND END-POINT ELECTRICAL MEASUREMENTS

Unless otherwise specified, the measurements shall be performed at T_{amb}=+22 ±3°C.
The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.
The limit values for each characteristic shall not be exceeded.

Characteristics	Symbols	Limits		Units
		Min	Max	
Collector-Emitter Cut-off Current	I_{CEO}	-	10	µA
Forward-Current Transfer Ratio 2	h_{FE2}	50	200	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	1	V

2.8 POWER BURN-IN CONDITIONS

Characteristics	Symbols	Conditions	Units
Case Temperature	T_{case}	+100 (+0 -5) (1)	°C
Power Dissipation	P_{tot}	As per Maximum Ratings. Derate P_{tot} ~~derated~~ at the specified T_{case} using the specified $R_{th}(j-c)$.	W
Collector-Emitter Voltage	V_{CE}	10	V

NOTES:

1. No heat sink nor forced air directly on the device shall be permitted.

APPENDIX 'A'

AGREED DEVIATIONS FOR STMICROELECTRONICS (F)

ITEMS AFFECTED	DESCRIPTION OF DEVIATIONS
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)