



DOCUMENT CHANGE REQUEST

DCR number 505 Changes required for: General

Date: 2009/04/28

Date sent: 2009/04/28

Originator: S Jeffery - ESCC

Organisation: ESA/ESTEC

Status: IMPLEMENTED

Title: Transistors High Power PNP, based on type BUX78

Number: 5204/006

Issue: 2

Other documents affected:

Page:

See attached mark-up of 5204/006 (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 5204/006 (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:

5204006_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:

A handwritten signature in black ink, appearing to read "A. G. Suter". The signature is written in a cursive style with a prominent initial "A" and a long, sweeping underline.

Date signed:

2009-04-28

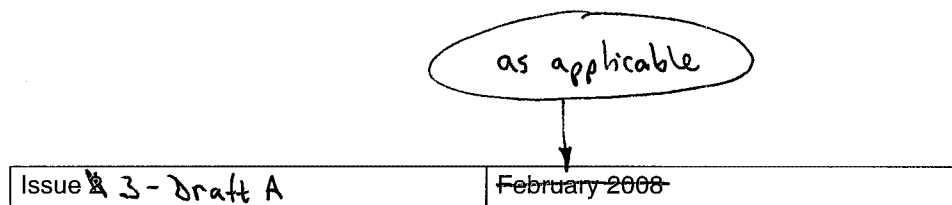


Pages 1 to 16

TRANSISTORS, HIGH POWER, PNP

BASED ON TYPE BUX78

ESCC Detail Specification No. 5204/006



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 |
|--------------------|--|
| 187-335 | Specification up issued to incorporate editorial and technical changes per DCRs. |

447, tbd

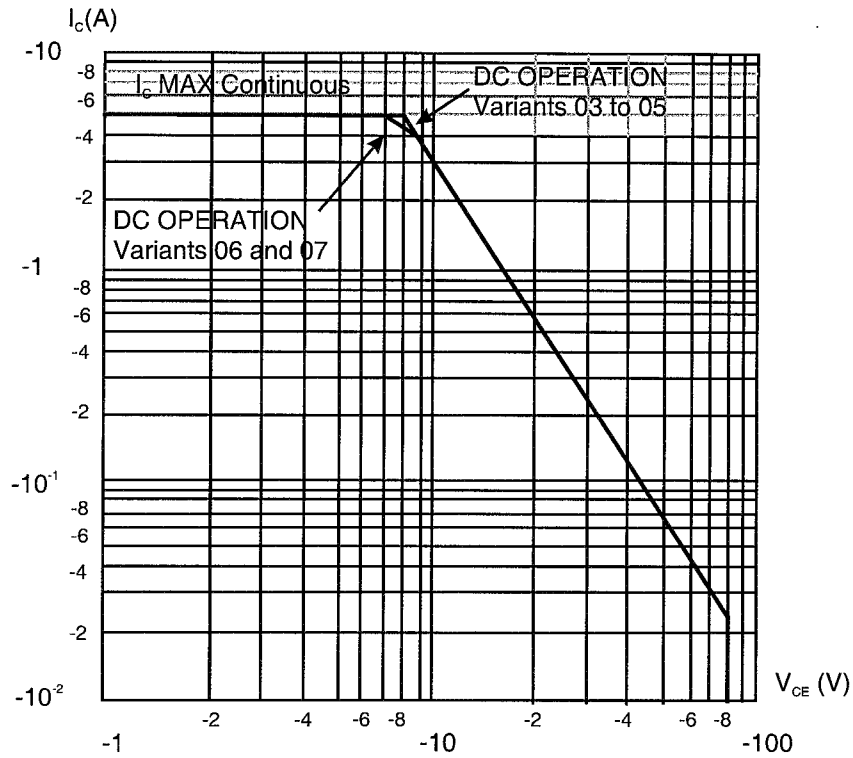
| Characteristics | Symbols | Maximum Ratings | Unit | Remarks |
|--------------------------------------|---------------|-----------------|---------------|--|
| Collector-Base Voltage | V_{CBO} | -100 | V | Over T_{op} |
| Collector-Emitter Voltage | V_{CEO} | -80 | V | Over T_{op} Note 2 3 |
| Emitter-Base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

NOTES:

- ~~1.~~ For $T_{case} > +25^{\circ}C$, derate linearly to 0W at +200 $^{\circ}C$.
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. ~~2~~ Duration 10 seconds maximum at a distance of not less than 1.5mm from the device body and the

3. # same lead shall not be resoldered until 3 minutes have elapsed.
 Safe Operating 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.

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} | $\pm 25\%$ | 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 $T_{amb} = +22 \pm 3^\circ C$.

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 HIGH TEMPERATURE REVERSE BIAS BURN-IN CONDITIONS

| Characteristics | Symbols | Conditions | Units |
|------------------------|-----------|-------------|------------|
| Ambient Temperature | T_{amb} | +150(+0 -5) | $^\circ C$ |
| Emitter-Base Voltage | V_{EB} | -4.5 | V |
| Collector-Base Voltage | V_{CB} | -80 | V |
| Duration | t | 48 minimum | hours |

NOTES:

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

2.9 POWER BURN-IN CONDITIONS

| Characteristics | Symbols | Conditions | Units |
|-------------------|------------|--|------------|
| Case Temperature | T_{case} | +100(+0-5) | $^\circ C$ |
| Power Dissipation | P_{tot} | As per Maximum Ratings P_{tot} derated at the specified T_{case} | W |

Derate

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



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 3) 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)