DOCUMENT CHANGE REQUEST

DCR number 1039	Changes required for: General	Originator: Steve Jeffery
Date: 2016/11/14	Date sent: 2016/09/16	Organisation: ESCC Executive
Status: IMPLEMENTED		

Title:	Diodes Microwave Silicon PIN Ultra-Fast Switching, based on types DH50071 to DH50077		
Number:	5513/037	Issue:	4

Other documents affected:

Page:

Total reformat/re-write of ESCC Detail Specification 5513/037 issue 4 as part of the ongoing conversion of legacy ESA/SCC specifications to the ESCC format, as well as reflecting changes resulting from the conversion of ESCC Generic Specification No. 5010.

The layout, format and general content of 5513/037 issue 5 is based on other converted ESCC Detail Specifications (see attached for proposed 5513/037 issue 5).

The technical content of ESCC 5513/037 issue 5 remains closely based on the original ESCC 5513/037 issue 4 except as detailed herein.

Paragraph:

All.

Original wording:

See ESCC 5513/037 issue 4.

Proposed wording:

Total reformat of this Detail Specification (from the range of various ESCC Detail Specifications, 5xxx/xxx, for microwave discrete semiconductors under Generic Specification No. 5010) as part of the ongoing conversion to the ESCC format.

See below for summary of changes, also see attached proposed 5513/037 issue 5.

Note: known support for active procurement against all these specifications includes the following Manufacturers:
• Cobham Microwave.

Summary of changes to the current format, layout and content of each specification is as follows:
1) General
Rewording and restructure of various sections and paragraphs of the specification, plus other editorial changes including deletion of any redundant paragraphs and information, based on the layout and editorial content of other Detail Specifications already converted to ESCC format.

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Specific amendments include:
2) Para 3: remove CT = Total Capacitance (redundant information).

3) Table 1(a) (= Component Type Variants):
'Figure' column 3 is replaced by new 'Package Type / Description'.
'Forward Series Resistance' & 'Minority Carrier Lifetime' columns 5 & 6 are deleted (the specific parameter limits are included in Room Temperature Electrical Measurements table).
'Body-Lid and Lead Material and Finish' Column 7 is replaced by 'Lead/Terminal Material and Finish' as applied to the anode & cathode terminals (from Para 4.4.2) and associated note added.
Weight is added to Table 1(a) (from Para 4.3.2).
Note 1 is deleted (requirements are moved to be in Table 2 (= Room Temperature Electrical Measurements).

4) Table 1(b): 'Junction Temperature' rating is added (for consistency purposes).

5) Table 1(b) Note 1 & Figure 1:
Figure 1 is replaced by the equivalent text description (Notes 1 & 2 in Maximum Ratings).
The reference to Tamb in Note 1 & in Figure 1 is corrected to be Tcase.

6) Figures 2(a) to 2(h):
All figures are redrawn including terminal identification details plus Package Type / Description (for homogeneity of these packages across the range of similar microwave discrete semiconductors covered by detail specifications 5xxx/xxx).
Some of the physical dimension symbols of Figure 2(g) are combined (as their dimensions are identical).

7) Figure 3:
The 3 Notes are deleted as they are effectively replaced by a new note to each figure 2.

8) Para 4.2:
Para. 5.2 SEM deviation, which is considered to be specific to Cobham, is moved to Appendix A.

Para. 6.3 Pre-Burn-in deviation is deleted as a pre-Burn-in is considered unnecessary for these devices. This change is supported and justified by Cobham.

Deviation for Die Shear is deleted; specific details regarding the Die Shear test are included in the Die Shear Para.

Minority Carrier Lifetime test requirement is moved to be a new note to Table 2 (= Room Temperature Electrical Measurements)

Special Testing deviation is deleted (redundant information).
New deviation "Mechanical Shock: Shall not be performed." is added (this is in-line with the deviations to 5512/016 etc.).

9) Para 4.3.2: Weight is moved to Table 1(a) (= Component Type Variants).

10) Para 4.3.3: Variants where terminal strength test shall not be performed are specified.

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11) Para 4.3.4: Bond Strength requirements are moved to Cobham Appendix A as a deviation to the Generic spec 5010.

12) Para 4.3.5: Para. is rewritten to clarify the requirements/test method.

13) Para 4.3.6: HT Stabilisation Bake is deleted (as the latest Generic Spec 5010 already covers this requirement).

14) Para 4.4.1: Reference to the metal base and lid is added, plus the sentence “The lid shall be welded or preform soldered” is deleted (clarification and removal of irrelevant information).

15) Para 4.4.2: Requirements as applicable to the materials & finish requirements for the anode & cathode terminals are extracted from this Para and moved to Table 1(a) (= Component Type Variants).
Requirements applicable to only ‘body’ & ‘lid’ (i.e. those with leads) are effectively deleted (removal of irrelevant information).

16) Para 4.5.1:
‘Cathode’ Identification bullet is renamed ‘Terminal identification, as specified in Physical Dimensions and Terminal Identification.’ Related Para. (4.5.2) is redundant and is therefore deleted.
‘The ESCC qualified components symbol’ bullet is added.

17) Para 4.5.3:
Testing Level (‘B’ or ‘C’) is deleted.

18) Para. 4.6.3, 4.7, 4.7.4, 4.9, 4.10 & Figure 5(b): are deleted.

19) Table 2 Forward Series Resistance and Minority Carrier Lifetime:
Notes 2 and 4 are deleted; the test limits are included for all Variants.

20) Table 2 Minority Carrier Lifetime (& Note 3), & Figure 4(a):
Test method reference to MIL-STD-750 Method ‘4031’ is added to Table 2 to replace Figure 4(a) which is deleted.
Sampling requirements (from Para 4.2.1(a)) are clarified in new Note 7: 0 failures are allowed otherwise a 100% inspection shall be performed.

21) Table 3: New Note 1 added to clarify sampling per the Generic spec 5010 applies to High and Low Temperatures Electrical Measurements.

22) Table 4:
Absolute limits from Table 2 are added (for clarification purposes).
“= delta 3” is deleted from Note 1 (redundant information).

23) Figure 5(a):
Figure is deleted.
Note 1 is moved to be new note in Table 5(a) (= Burn-in 1 Conditions).

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24) Appendix A for Cobham:
Para 4.2.2 & 4.2.3: Deviations to the test position of Radiographic Inspection is deleted (as the latest Generic Spec 5010 already covers this requirement).

Deviations to Bond Strength are moved from the main body of the spec into the appendix.

A deviation requested by Cobham Microwave regarding the performance of Radiographic Inspection is added.

A deviation requested by Cobham Microwave is added such that Internal Visual Inspection, Bond Strength and Die Shear during the De-encapsulation Subgroups in Charts F4A and F4B may be replaced by die solder integrity and wire integrity tests (specifically Thermal Impedance per MIL-STD-750 Test Method 3101 and Forward Voltage per MIL-STD-750 Test Method 4011).

In addition to the formatting and technical changes summarised above, various changes are also proposed to introduce seven new Naked Die Components (as requested by manufacturer Cobham Microwave):

25) Front sheet based on types: the Naked Die Component Types are added, i.e. “and EH50071 to EH50077”.

26) A new table of Component Type Variants – Naked Die Components is added for EH50071, EH50072, EH50073, EH50074, EH50075, EH50076 and EH50077 (Variant Numbers 57, 58, 59, 60, 61, 62 and 63), which includes Junction Capacitance values, Total Capacitance values and explanatory notes (Notes 2 and 3).

27) The Naked Die Component Type Variant Numbers are added to:
• Maximum Ratings table, Thermal Resistance characteristics (a new note, related to this rating as applicable to Naked Die Components, is also added).
• Note 3 of Maximum Ratings includes the packaged component Type Variant numbers (Soldering Temperature rating is not applicable to Naked Die Components)
• Terminal Strength Para.
• Room Temperature Electrical Measurements table
• Notes 3 & 4 of Room Temperature Electrical Measurements
• Note 3 of Parameter Drift Values
• Note 1 of Intermediate and End-Point Electrical Measurements
• Burn-in 2 Conditions table
• Appendix A (ref. Item 24 above, specifically the deviation to the Internal Visual Inspection, Bond Strength and Die Shear during the De-encapsulation Subgroups in Charts F4A and F4B)

28) The Physical Dimensions and Terminal Identification information for the Naked Die Components is added.

29) Details of the Materials and Finishes of the Naked Die Components are added.

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30) A Junction Capacitance characteristic, with associated note (Note 6) is added to Room Temperature Electrical Measurements.

31) New Notes added to Tables 2 and 3.

32) Appendix A: A Deviation to Radiographic Inspection is added such that Cobham Microwave need not perform Radiographic Inspection on Packaged Test Sublot samples for Naked Die Components.

Justification:

• Part of the ongoing conversion of legacy ESA/SCC specifications to the ESCC format. Amendments are made to the format and presentation to be consistent with the various other ESCC Detail Specifications, already converted to ESCC format, as well as the current issue of ESCC Generic Specification No. 5010.
• Addition of naked die versions of the current range of packaged components.

See also change details above for justification for specific items.

Attachments:

5513037_draft_5d_for_dcr.docx

Modifications:

N/A

Approval signature:



Date signed:

2016-11-14