PROCUREMENT SPECIFICATIONS FOR MOSFET DICE

SUBMISSION OF OFFER

Please quote for any one of the available options as per enclosed specs.
Highlight deviations, if any from the requested specs.

The offer should provide price break up under the following headings:

I. JANKC Qualified Dice

1. Wafer Lot Acceptance as per MIL-PRF-19500.
2. Dice Evaluation as per Table G-II of Appendix 'G' of MIL-PRF-19500.
3. Other costs, as applicable.

II. Dice used in ESCC Qualified Packaged Part or Equivalent

1. Wafer lot acceptance test as per ESCC 5000
2. Dice Evaluation as per manufacturer's internal Hi-Rel Dice document & shall be submitted as part of offer.
3. Other costs, as applicable.

Please provide the point-by-point compliance to specification in your quote.

PROCUREMENT SPECIFICATIONS FOR MOSFET DICE AS PER MIL SPECIFICATION

A. DICE DETAILS

SL No.	Part Number	Description
1	2N7549	200 V, P-Channel MOSFET

B. QUALITY REQUIREMENTS

1. Dice shall be Qualified to JANKC of MIL-PRF-19500.
2. Each wafer lot shall undergo Wafer Lot Acceptance Test in accordance with MIL-PRF-19500.
3. The dice shall meet the following Radiation Hardness specifications:
   a. Total Ionizing Dose(TID) of minimum 100krad (Si).
   b. Single Event Effects(SEE) capability shall be $\geq$35MeV-cm^2/mg.
4. Dice from each wafer lot shall be evaluated as per Table G-II of Appendix G of MIL-PRF-19500.
5. Test samples shall be assembled in suitable package using standard assembly procedures.
6. All Electrical, mechanical and environmental specifications shall be as per applicable detail specification.

C. DATAPACK REQUIREMENTS

The following data shall accompany the dice in soft copy (CD):

1. Read and Record data (for evaluation samples) of:
   a. Pre and Post HTRB (if applicable), Pre and Post Burn in, Pre and post Life test with deltas calculated
   b. Report of 100% final electrical parameters measurements, as per Group A, subgroups 2 and 3
2. Wafer Lot Acceptance Test report
3. SEM report along with photographs
4. Bond pull and Die shear test reports
5. Test conditions/limits referred for electrical characterization of die during evaluation shall be provided
6. TID Radiation test report with Pre and Post radiation electrical parameter measurements
7. Certificate of Conformance issued by the manufacturer

D. OTHER REQUIREMENTS

1. The name of the manufacturer shall be specified as part of the offer.
2. Appropriate ordering Part Number along with applicable datasheet shall be provided with the quote.
3. The wafer lot number, the certification mark, manufacturer identification shall be marked on each waffle pack.
4. Dice shall be from single wafer lot and within 5 years from the date of manufacture.
5. Die Topography shall be supplied along with the offer.
6. Back metallization of the dice shall be suitable for epoxy/solder attachment.
7. All waffles containing dice to be suitably packed.
8. Only Vendors/Suppliers authorized to source above Space Grade dice from the Manufacturer will be considered. Necessary Certificate from the Manufacturer shall be enclosed along with the offer.
9. Report to URSC all NCR/DCN during procurement/testing.

Please provide the point-by-point compliance to specification in your quote.

PROCUREMENT SPECIFICATIONS FOR MOSFET DICE AS PER ESCC SPECIFICATION

A. DICE DETAILS

SL No.	Part Number	Description
1	2N7549 or equivalent	200 V, P-Channel MOSFET

B. DICE QUALITY

1. Dice quality shall be same as that used in ESCC qualified packaged part.
2. Each wafer lot shall undergo wafer lot acceptance test as per ESCC 5000.
3. The dice shall meet the following Radiation Hardness specifications:
   a. Total Ionizing Dose(TID) of minimum 100krad (Si).
   b. Single Event Effects(SEE) capability shall be ≥35MeV-cm^2/mg.
4. Dice from each wafer lot shall be evaluated as per manufacturer's Hi-Rel Dice internal document. Manufacturer's internal Hi-Rel Dice document shall be submitted as part of offer.
5. Test samples shall be assembled in suitable packages using standard assembly procedures.
6. All Electrical, mechanical and environmental specifications shall be as per applicable detail specification.

C. DATAPACK REQUIREMENTS

The following data shall accompany the dice in soft copy (CD):

1. Read and Record data (for evaluation samples) of:
   a. Pre and Post HTRB, Pre and Post Burn in, Pre and post Life test with deltas calculated as applicable.
   b. Report of 100% final electrical parameter measurements and post burn in high and low temperature parameter measurements as per ESCC detail specification.
2. Wafer Lot Acceptance Test report.
3. SEM report along with photographs.
4. Die shear and bond pull test reports.
5. Test conditions/limits referred for electrical characterization of die during evaluation shall be provided.
6. TID Radiation test report with Pre and Post radiation electrical parameter measurements.
7. Certificate of Conformance issued by the manufacturer.

D. OTHER REQUIREMENTS

1. The name of the manufacturer shall be specified as part of the offer.
2. Appropriate ordering Part Number along with applicable datasheet shall be provided with the quote.
3. The wafer lot number, the diffusion lot number, manufacturer identification shall be marked on each waffle pack.
4. Dice shall be from single wafer lot and within 5 years from the date of manufacture.
5. Die topography shall be supplied along with the offer.
6. Back metallization of the dice shall be suitable for epoxy/solder attachment.
7. All waffles containing dice to be suitably packed.
8. Only Vendors/suppliers authorized to source space grade dice from the manufacturer will be considered. Necessary Certificate from the manufacturer shall be enclosed along with the offer.
9. Report to URSC all NCR/DCN during procurement/testing.

Please provide the point-by-point compliance to specification in your quote.

MOSFET DICE COMPLIANCE MATRIX AS PER MIL SPECIFICATION

<table>
<tr><th>Sl no</th><th>Specification</th><th>Remarks</th></tr>
<tr><td>A</td><td>DICE DETAILS</td><td></td></tr>
<tr><td>A1</td><td><table><tr><th>SL No.</th><th>Part Number</th><th>Description</th></tr><tr><td>1</td><td>2N7549</td><td>200 V, P-Channel MOSFET</td></tr></table></td><td></td></tr>
<tr><td>B</td><td>DICE QUALITY</td><td></td></tr>
<tr><td>B1</td><td>Dice shall be Qualified to JANKC of MIL-PRF-19500.</td><td></td></tr>
<tr><td>B2</td><td>Each wafer lot shall undergo wafer lot acceptance test in accordance with MIL-PRF-19500.</td><td></td></tr>
<tr><td>B3</td><td>The dice shall meet the following Radiation Hardness specifications</td><td></td></tr>
<tr><td>B3a</td><td>Total Ionizing Dose(TID) of minimum 100krad (Si)</td><td></td></tr>
<tr><td>B3b</td><td>Single Event Effects(SEE) capability shall be $\geq$35MeV-cm^2/mg</td><td></td></tr>
<tr><td>B4</td><td>Dice from each wafer lot shall be evaluated as per Table G-II of Appendix ‘G’ of MIL-PRF-19500.</td><td></td></tr>
<tr><td>B5</td><td>Test Samples shall be assembled in suitable package using standard assembly procedures.</td><td></td></tr>
<tr><td>B6</td><td>All Electrical, mechanical and environmental specifications shall be as per applicable detail specification.</td><td></td></tr>
<tr><td>C</td><td>DATA-PACK REQUIREMENTS</td><td></td></tr>
<tr><td>C1</td><td>Read and Record data (for evaluation samples) of:</td><td></td></tr>
<tr><td>C1a</td><td>Pre and Post HTRB (if applicable), Pre and Post Burn-in and Pre & Post life test with deltas calculated.</td><td></td></tr>
<tr><td>C1b</td><td>Report of 100% final electrical parameters measurements as per Group A, subgroups 2 and 3.</td><td></td></tr>
<tr><td>C2</td><td>Wafer Lot Acceptance Test report.</td><td></td></tr>
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<tr><td>C6</td><td>TID Radiation test report with Pre and Post radiation electrical parameter measurements.</td><td></td></tr>
<tr><td>C7</td><td>Certificate of Conformance issued by the manufacturer.</td><td></td></tr>
<tr><td>D</td><td>OTHER REQUIREMENTS</td><td></td></tr>
<tr><td>D1</td><td>The name of the manufacturer shall be specified as part of the offer.</td><td></td></tr>
<tr><td>D2</td><td>Appropriate ordering Part Number along with applicable datasheet shall be provided with the quote.</td><td></td></tr>
<tr><td>D3</td><td>The wafer lot number, the certification mark, manufacturer identification shall be marked on each waffle pack.</td><td></td></tr>
<tr><td>D4</td><td>Dice shall be preferably from single wafer lot and preferably within 5 years from the date of manufacture.</td><td></td></tr>
<tr><td>D5</td><td>Die topology shall be supplied along with offer.</td><td></td></tr>
<tr><td>D6</td><td>Back metallization of the dice shall be suitable for epoxy/solder attachment.</td><td></td></tr>
<tr><td>D7</td><td>All waffles containing dice to be suitably packed.</td><td></td></tr>
<tr><td>D8</td><td>Only Vendors/Suppliers authorized to source Space Grade dice from the Manufacturer will be considered. Necessary Certificate from the Manufacturer shall be enclosed along with the offer.</td><td></td></tr>
<tr><td>D9</td><td>Report to URSC all NCR/DCN during procurement/testing.</td><td></td></tr>
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COMPLIANCE MATRIX FOR MOSFET DICE AS PER ESCC SPECIFICATION

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