This specification is intended to inform CSD manufacturers and launch service providers. It is compatible with 2002206 Rev A "Payload Specification for 6U, 12U and 27U".

FEATURES

A Canisterized Satellite Dispenser (canister or CSD) is a box that encapsulates the payload (PL) during launch and dispenses it on orbit. Canisters reduce risk to the primary payload and so maximize potential launch opportunity. Their relatively small size enables placement on most launch vehicles (LV). Canisters also ease restrictions on payload materials and components. This specification currently encompasses canisters for three sizes of payloads. The 6U, 12U and 27U incorporate two tabs running the length of the ejection axis. The canister may grip these tabs, providing a secure, modelable, preloaded junction during launch. To maintain compatibility with existing standards the 6U can be made with typical rails as used in CubeSat. Note however with rails the payload is not preloaded in its canister and may chatter during launch.

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REVISION HISTORY

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<th>Date</th>
<th>Design</th>
<th>Review</th>
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<tr>
<td>-</td>
<td>13-Jun-2011</td>
<td>RH</td>
<td>WH</td>
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Changes from previous revision:
This is the initial release.

COMMON REQUIREMENTS

1. Mounting surface to LV shall be electrically conductive.
2. Access panels to payload shall be removable with small flat or Phillips screwdriver or 3/32 in hex key. Torque spec, if applicable, shall be imprinted on CSD.
3. An ejection plate shall push on -Z face of payload to deploy. Plate shall fully encompass payload deployment switch zone and be flat to 0.5mm. See payload specification for deployment switch zone dimensions.
4. Payload shall be oriented in CSD per Figure 6.
5. Ejection Plate shall be electrically grounded to CSD walls. Payload side of ejection plate shall be conductive.
PARAMETERS

<table>
<thead>
<tr>
<th>SYM</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Units</th>
<th>6U</th>
<th>12U</th>
<th>27U</th>
</tr>
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<tbody>
<tr>
<td>M</td>
<td>Mass</td>
<td>Empty</td>
<td>kg</td>
<td>-</td>
<td>7.2</td>
<td>10.8</td>
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<tr>
<td>Depth</td>
<td>CSD depth, from origin, +X</td>
<td></td>
<td>mm</td>
<td>-</td>
<td>163</td>
<td>276</td>
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<tr>
<td>Width</td>
<td>CSD width, from origin, +/- Y</td>
<td></td>
<td>mm</td>
<td>-</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>Length</td>
<td>CSD length, from origin, +Z</td>
<td>Door closed</td>
<td>mm</td>
<td>-</td>
<td>470</td>
<td>470</td>
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<tr>
<td>ΔV</td>
<td>Payload ejection velocity</td>
<td>Max payload mass, infinite CSD mass</td>
<td>m/sec</td>
<td>0.5</td>
<td>5.0</td>
<td>5.0</td>
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<tr>
<td>V</td>
<td>Voltage provided from LV to open door</td>
<td>-34 to +71 °C, power to pins 1&amp;2, return from pins 3&amp;4</td>
<td>Vdc</td>
<td>22</td>
<td>36</td>
<td>22</td>
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<tr>
<td>I</td>
<td>Current available from LV to open door</td>
<td>-34 to +71 °C, power to pins 1&amp;2, return from pins 3&amp;4</td>
<td>A</td>
<td>5.0</td>
<td>-</td>
<td>5.0</td>
</tr>
<tr>
<td>T</td>
<td>Electrical pulse width provided from LV to open door</td>
<td>-34 to +71 °C, power to pins 1&amp;2, return from pins 3&amp;4</td>
<td>sec</td>
<td>4.0</td>
<td>10.0</td>
<td>4.0</td>
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<tr>
<td>Wire</td>
<td>Electrical wiring</td>
<td>Wiring shown in Figure 3.</td>
<td>AWG</td>
<td>20</td>
<td>26</td>
<td>20</td>
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<tr>
<td>RS</td>
<td>Switch terminal resistance</td>
<td>Closed circuit, door and occupancy switches</td>
<td>ohm</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
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<tr>
<td>IIR</td>
<td>Inrush current capacity of switch</td>
<td>&lt;0.5 sec, 30 Vdc, &lt;10e-5 torr, Door and occupancy switches</td>
<td>A</td>
<td>-</td>
<td>4.0</td>
<td>-</td>
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<tr>
<td>ISS</td>
<td>Steady state current capacity of switch</td>
<td>30 Vdc, &lt;10e-5 torr, door and occupancy switches</td>
<td>A</td>
<td>-</td>
<td>2.0</td>
<td>-</td>
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<tr>
<td>PT</td>
<td>Payload travel required for occupancy switch change state</td>
<td>+Z travel from launch position</td>
<td>mm</td>
<td>300</td>
<td>440</td>
<td>300</td>
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<tr>
<td>DP</td>
<td>Door position for door switch change of state</td>
<td>Angle (0 deg is closed)</td>
<td>deg</td>
<td>0.4</td>
<td>5.0</td>
<td>0.2</td>
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<tr>
<td>FEP</td>
<td>Ejection plate force on payload</td>
<td>During launch and deployment</td>
<td>N</td>
<td>0</td>
<td>200</td>
<td>0</td>
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<tr>
<td>LVF</td>
<td>LV flatness</td>
<td>Interface to CSD -X face</td>
<td>mm</td>
<td>0.0</td>
<td>0.3</td>
<td>0.0</td>
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<tr>
<td>TML</td>
<td>Total Mass Loss</td>
<td>Per ASTM E 595-77/84/90</td>
<td>%</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
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<tr>
<td>CVCM</td>
<td>Collected Volatile Condensable Material</td>
<td>Per ASTM E 595-77/84/90</td>
<td>%</td>
<td>0</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>DP</td>
<td>LV de-pressurization rate</td>
<td>During launch</td>
<td>psi/ sec</td>
<td>0</td>
<td>0.5</td>
<td>0</td>
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</tbody>
</table>

PLACARD

Canister Complies with Specification 2002220 Rev __
Payload Complies with Specification 2002226 Rev __

Canister

Responsible Organization:
Contact Name, Email and Phone Number:

PN and SN:
Empty Mass [kg]:

Payload

Responsible Organization:
Contact Name, Email and Phone Number:

PN and SN:
Installed Mass [kg]:
Installation Date:

Assembly

Total Launch Mass [kg]:
Ready for Launch (Date and Name):

Requirements
1. Locate on +Z face (door).
2. Minimum text height 0.12 in.
3. Engrave, etch or stamp.
4. Tag shall be replaceable.
5. Text shall be legible in poorly lit room and under direct sunshine.
6. May add additional information as desired.
6U, 12U & 27U CSD

Figure 4: CSD, 6U shown

Figure 5: CSD, mm [in]

1. See payload spec to locate panels.
2. Holes shall be blind.
3. Continue pattern for 27U.
4. Additional hole patterns may be added.
5. Only mounting areas need lie in Y-Z plane. Rest of -X face may be recessed.
6. Connector may reside anywhere on -Z face & orientation may vary from shown.
7. Payload, including deployables, shall not exceed during deployment. All 4 sides.

2x #4-40 \( [0.16] \) min

SECTION A-A

25.0
[0.984]

+X

+Z

+Y

+X

+Y

-2

LV Electrical Interface

+Z Face (Door)
TEST AND INTEGRATION FLOW

Test levels are for launch environment, not necessarily on-orbit.

1. Payload (PL) → Canister (CSD)
   - Fit Check
     - Install PL in CSD (integrated)

2. Thermal Vacuum
   - Intended to supersede MIL-STD-1540 D
   - Perform separation and first motion test under vacuum.

3. X, Y, Z Random Vibe
   - Test IAW GSFC-STD-7000, NASA GSFC, Tables 2.4-3 and 2.4-4.
   - Qualification: 3 min/axis
   - Acceptance: 1 min/axis
   - Configuration: integrated

4. Initiate Separation and Record Results
   - Fail
   - Success
   - Integrate to Launch Vehicle

ADDITIONAL INFORMATION

Verify this is the latest revision of the specification by visiting www.planetarysystems corp.com. Simple step models and 3D PDFs of the payloads and canisters are also available. Please contact Ryan Hevner, ryanh@planetarysystems corp.com with questions or comments. Feedback is welcome in order to realize the full potential of this technology.

AUTHORS

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