PRODUCT CHANGE NOTICE

CAES

1. TITLE MICROCIRCUIT, MEMORY, DIGITAL,CMOS, 1MEG X 39-BIT (40M), RADIATION-HARDENED DUAL VOLATGE, SRAM, MULTICHIP MODULE	**2. DOCUMENT NUMBER** SPO-2012-PCN-0009

3. DATE *(Year, Month, Date)*
2012, OCTOBER, 04

4. MANUFACTURER NAME AND ADDRESS CAES 4350 CENTENNIAL BOULEVARD COLORADO SPRINGS, COLORADO 80907-3486	**5. MANUFACTURER POINT OF CONTACT NAME** Mike Leslie
	6. MANUFACTURER POINT OF CONTACT TELEPHONE (719) 594-8148
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8. CAGE CODE 65342	**9. EFFECTIVE DATE** 2010, April, 08	**10. PRODUCT IDENTIFICATION CODE** QS13	**11. BASE PART** UT8R1M39
12. BLANK		**13. SMD NUMBER** 5962-10205	**14. DEVICE TYPE DESIGNATOR** 01, 02
		15. RHA LEVELS R	**16. QML LEVEL** Q, Q+, V
		17. NON QML LEVEL HiRel, Protos	**18. BLANK**

19. PRODUCT CHANGE

CAES is working in coordination with DLA Land and Maritime to revise SMD 5962-10205, revision level B, for the following changes:

Section 1.5 Radiation features (sheet 3)

PREVIOUS:

1.5 Radiation features
  Maximum total dose available (effective dose rate = 1 rads(Si)/s) .... 10.0×10^4 rads(Si) <u>5/</u>
  Single event phenomenon (SEP) effective
    linear energy threshold (LET) with no upsets... 1 MeV – cm^2/mg
    with no latch-up.. > 111 MeV-cm^2/mg

CORRECTED:

1.5 Radiation features
    Maximum total dose available (effective dose rate = 1 rads(Si)/s) .... 100 K rads(Si) <u>5/</u>
    Single event phenomenon (SEP):
      Effective linear energy transfer (LET) with no upsets (see 4.4.4.3)................... 0.8 MeV - cm^2/mg   <u>6/</u>
      Effective LET with no latch-up (see 4.4.4.2)... ≤ 110 MeV-cm^2/mg
    Single event upset (SEU) error rate (Adam's 90% worst case environment)....... 7.3×10^{-7} errors/bit-day
    Neutron irradiation test (Displacement damage test) .... 3.0×10^{14} n/cm2   <u>7/</u>

ADDED: Notes /6 and /7 (bottom of sheet 3)

<u>6/</u>   0.8 MeV-cm^2/mg is the estimated onset LET with no errors based on SEU testing where the minimum heavy ion LET available at the test facility was 0.9 MeV-cm^2/mg. At 0.9 MeV-cm^2/mg the cross-section is three orders of magnitude lower than the saturated cross-section and will therefore be close to the onset LET with no upsets.

<u>7/</u>   Parameter is guaranteed to the limit shown but not specifically tested.

20. DISPOSITIONARY RECOMMENDATION:	USE AS IS ☐	CONTACT ☐ MANUFACTURER	REMOVE & ☐ REPLACE	CHECK & ☒ USE AS IS
21. ADEPT REPRESENTATIVE Timothy L. Meade	**22. SIGNATURE** *Timothy J. Meade*			**23. DATE** 2012, October, 04

ADDED: Table 1B SEP test limits and corresponding notes (sheet 9)

Table IB. SEP test limits   1/ 2/

Device type	Memory pattern	Single Event Upset 3/ 4/ Bias V_{DD1} = 1.7 V, V_{DD2} = 3.0 V		Single Event Latch-up 5/ Bias V_{DD1} = 2.0 V, V_{DD2} = 3.6 V
		Effective LET No upsets [MeV/(mg/cm^2)]	Maximum device Cross section (LET = 80) (cm^2)	Effective LET No latch-up [MeV/(mg/cm^2)]
All	6/	0.8 7/	7.5x10^{-8}	≤ 110

1/ For SEP test conditions, see 4.4.4.4 herein.

2/ Technology characterization and model verification supplemented by in-line data may be used in lieu of end-of-line testing. Test plan must be approved by TRB and qualifying activity.

3/ Test temperature T_A = +25°C ±10°C.

4/ Soft error rate = 7.3 x 10^{-7} error/bit-day assuming Adam's 90% worst case environment, geosynchronous orbit, and 100 mil aluminum shielding. Contact the device manufacturer for detailed information.

5/ Worst case test temperature T_A = +125°C ±10°C.

6/ Memory patterns are as specified in Appendix A, Algorithm A herein.

7/ 0.8 MeV-cm^2/mg is the estimated onset LET with no errors based on SEU testing where the minimum heavy ion LET available at the test facility was 0.9 MeV-cm^2/mg. At 0.9 MeV-cm^2/mg the cross-section is three orders of magnitude lower than the saturated cross-section and will therefore be close to the onset LET with no upsets.

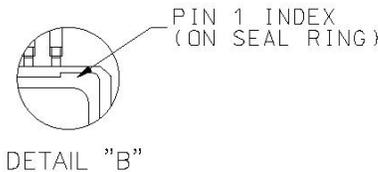## ADDED: Alternative marking as package pin one indenifier to FIGURE 1. Case outline (sheet 11).

CORRECTED: Drawing of original pin one identifier corrected and detail B drawing added.

PREVIOUS: **CORRECTED:**
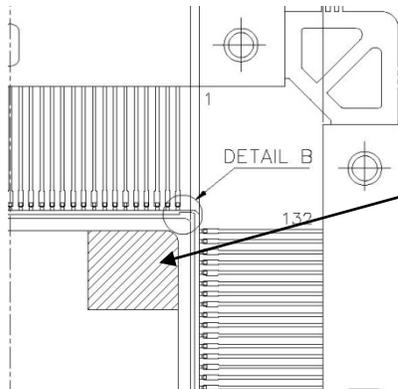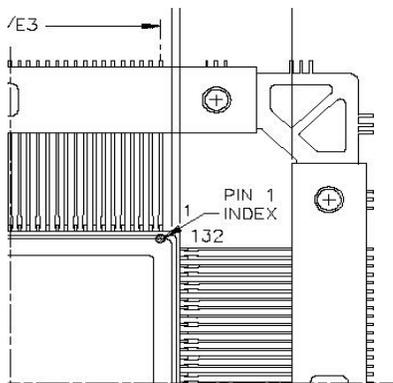
ADDED: Note 9 (sheet 12):

9/. A dot may be marked on lid to indicate pin 1 index within area shown.

CORRECTED: FIGURE 2. Terminal connections (sheet 13).

PREVIOUS:		CORRECTED:	
Terminal Number	Terminal Symbol	Terminal Number	Terminal Symbol
100	TOP_DQ36	100	BOT_DQ36
101	BOT_DQ36	101	TOP_DQ36