

DeQuMa - Tutorial

How to use the ZVEI - DeltaQualificationMatrix

Instructions how to use the DeltaQualificationMatrix (DeQuMa)

What is the DeQuMa?

It's a tool to describe the requested change, the evaluation level and the test which should be considered for qualification based on common international standards
(i.e. AEC Q10x, IEC 60810)

Motivation – Why to use?

Standardized scope of Qualification for selection of tests .
Common understanding for tests and changes will decrease the PCN throughput time.

Do not use for Information Notes!

The DeQuMa should only be submitted in case of changes which are assessed as “P”. For changes which are assessed as “I” the DeQuMa is not necessary.

ZVEI:
Die Elektroindustrie

1b) Select in Active Component folder if AEC Q100 or 101 is applicable and complete Header Data

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ZVEI:
Die Elektroindustrie

1c) in Order to reduce the number of lines (> 400) select a product group first

ZVEI:
Die Elektroindustrie

3) If the wording for the change category you selected (column D) is not clear enough, you will find additional explanations for the specific category in column G and H.

ZVEI
Die Elektroindustrie

Improved readability by buttons:

- i. **Hide Text** compresses columns G, H and J
- ii. **Values: Hide Rows** filters the change lines only
- iii. **Values: Hide Columns** compresses all columns between N and AT for ,-' listed stress tests

Instructions how to use the DeltaQualificationMatrix (DeQuMa)

Example - DeQuMa for Active Components

Understanding of semiconductor experts	Examples to explain	Evaluation level A/B/C	Further applicable conditions	includes integration			
				AEC-Q100 Revision H	Automotive (AEC-Q100)	Industrial (IEC 60747-1)	Consumer (IEC 60747-1)
		A					
		B					
		C					
		D					
		E					
		F					
		G					
		H					
		I					
		J					
		K					
		L					
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		N					
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		BW					
		BX					
		BY					
		BZ					
		CA					
		CB					
		CC					
		CD					
		CE					
		CF					
		CG					
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		KL					
		KM					
		KN					
		KO					

Example - DeQuMa for Active Components

[illegible]

5) The yellow section shows the stress tests which should be considered for the appropriate changes

**6) The condition table needs to be completed for non-relevant part details
→ Please mark for 'No' with 'X', default is 'YES'**

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Example - DeQuMa for Active Components

Hide Text		Values: Show Rows		Values: Show Columns		Evaluation level A/B/C	Further applicable conditions	AEC-Q100 Revision H											
ID	Type of change	Remainin g risks on Supply Chain?		Understanding of semiconductors experts				Examples to explain		A: Designation level B: Bare die level C: Final assembly level O: Component level 1: Not relevant for qualification matrix 2: Relevant for qualification matrix	Check off specification (for new material only)								
		No	Yes					THB Temperature: Immediate Ely or Based HAST A2 Autoclave: 1. Based on HAST A3 Autoclave: 2. Based on HAST A4 Temperature: Cycling A5 Power/Empirical Cycling A6 High Temperature: Storage Life A7 High Temperature: Operating Life B1 ESD B2 ESD B3 ESD B4 ESD B5 ESD B6 ESD B7 ESD B8 ESD B9 ESD B10 ESD B11 ESD B12 ESD B13 ESD B14 ESD B15 ESD B16 ESD B17 ESD B18 ESD B19 ESD B20 ESD B21 ESD B22 ESD B23 ESD B24 ESD B25 ESD B26 ESD B27 ESD B28 ESD B29 ESD B30 ESD B31 ESD B32 ESD B33 ESD B34 ESD B35 ESD B36 ESD B37 ESD B38 ESD B39 ESD B40 ESD B41 ESD B42 ESD B43 ESD B44 ESD B45 ESD B46 ESD B47 ESD B48 ESD B49 ESD B50 ESD B51 ESD B52 ESD B53 ESD B54 ESD B55 ESD B56 ESD B57 ESD B58 ESD B59 ESD B60 ESD B61 ESD B62 ESD B63 ESD B64 ESD B65 ESD B66 ESD B67 ESD B68 ESD B69 ESD B70 ESD B71 ESD B72 ESD B73 ESD B74 ESD B75 ESD B76 ESD B77 ESD B78 ESD B79 ESD B80 ESD B81 ESD B82 ESD B83 ESD B84 ESD B85 ESD B86 ESD B87 ESD B88 ESD B89 ESD B90 ESD B91 ESD B92 ESD B93 ESD B94 ESD B95 ESD B96 ESD B97 ESD B98 ESD B99 ESD B100 ESD B101 ESD B102 ESD B103 ESD B104 ESD B105 ESD B106 ESD B107 ESD B108 ESD 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B997 ESD B998 ESD B999 ESD B1000 ESD B1001 ESD B1002 ESD B1003 ESD B1004 ESD B1005 ESD B1006 ESD B1007 ESD B1008 ESD B1009 ESD B1010 ESD B1011 ESD B1012 ESD B1013 ESD B1014 ESD B1015 ESD B1016 ESD B1017 ESD B1018 ESD B1019 ESD B1020 ESD B1021 ESD B1022 ESD B1023 ESD B1024 ESD B1025 ESD B1026 ESD B1027 ESD B1028 ESD B1029 ESD B1030 ESD B1031 ESD B1032 ESD B1033 ESD B1034 ESD B1035 ESD B1036 ESD B1037 ESD B1038 ESD B1039 ESD B1040 ESD B1041 ESD B1042 ESD B1043 ESD B1044 ESD B1045 ESD B1046 ESD B1047 ESD B1048 ESD B1049 ESD B1050 ESD B1051 ESD B1052 ESD B1053 ESD B1054 ESD B1055 ESD B1056 ESD B1057 ESD B1058 ESD B1059 ESD B1060 ESD B1061 ESD B1062 ESD B1063 ESD B1064 ESD B1065 ESD B1066 ESD B1067 ESD B1068 ESD B1069 ESD B1070 ESD B1071 ESD B1072 ESD B1073 ESD B1074 ESD B1075 ESD B1076 ESD B1077 ESD B1078 ESD B1079 ESD B1080 ESD B1081 ESD B1082 ESD B1083 ESD B1084 ESD B1085 ESD B1086 ESD B1087 ESD B1088 ESD B1089 ESD B1090 ESD B1091 ESD B1092 ESD B1093 ESD B1094 ESD B1095 ESD B1096 ESD 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B1197 ESD B1198 ESD B1199 ESD B1200 ESD B1201 ESD B1202 ESD B1203 ESD B1204 ESD B1205 ESD B1206 ESD B1207 ESD B1208 ESD B1209 ESD B1210 ESD B1211 ESD B1212 ESD B1213 ESD B1214 ESD B1215 ESD B1216 ESD B1217 ESD B1218 ESD B1219 ESD B1220 ESD B1221 ESD B1222 ESD B1223 ESD B1224 ESD B1225 ESD B1226 ESD B1227 ESD B1228 ESD B1229 ESD B1230 ESD B1231 ESD B1232 ESD B1233 ESD B1234 ESD B1235 ESD B1236 ESD B1237 ESD B1238 ESD B1239 ESD B1240 ESD B1241 ESD B1242 ESD B1243 ESD B1244 ESD B1245 ESD B1246 ESD B1247 ESD B1248 ESD B1249 ESD B1250 ESD B1251 ESD B1252 ESD B1253 ESD B1254 ESD B1255 ESD B1256 ESD B1257 ESD B1258 ESD B1259 ESD B1260 ESD B1261 ESD B1262 ESD B1263 ESD B1264 ESD B1265 ESD B1266 ESD B1267 ESD B1268 ESD B1269 ESD B1270 ESD B1271 ESD B1272 ESD B1273 ESD B1274 ESD B1275 ESD B1276 ESD B1277 ESD B1278 ESD B1279 ESD B1280 ESD B1281 ESD B1282 ESD B1283 ESD B1284 ESD B1285 ESD B1286 ESD B1287 ESD B1288 ESD B1289 ESD B1290 ESD B1291 ESD B1292 ESD B1293 ESD B1294 ESD B1295 ESD B1296 ESD B1297 ESD B1298 ESD B1299 ESD B1300 ESD B1301 ESD B1302 ESD B1303 ESD B1304 ESD B1305 ESD B1306 ESD B1307 ESD B1308 ESD B1309 ESD B1310 ESD B1311 ESD B1312 ESD B1313 ESD B1314 ESD B1315 ESD B1316 ESD B1317 ESD B1318 ESD B1319 ESD B1320 ESD B1321 ESD B1322 ESD B1323 ESD B1324 ESD B1325 ESD B1326 ESD B1327 ESD B1328 ESD B1329 ESD B1330 ESD B1331 ESD B1332 ESD B1333 ESD B1334 ESD B1335 ESD B1336 ESD B1337 ESD B1338 ESD B1339 ESD B1340 ESD B1341 ESD B1342 ESD B1343 ESD B1344 ESD B1345 ESD B1346 ESD B1347 ESD B1348 ESD B1349 ESD B1350 ESD B1351 ESD B1352 ESD B1353 ESD B1354 ESD B1355 ESD B1356 ESD B1357 ESD B1358 ESD B1359 ESD B1360 ESD B1361 ESD B1362 ESD B1363 ESD B1364 ESD B1365 ESD B1366 ESD B1367 ESD B1368 ESD B1369 ESD B1370 ESD B1371 ESD B1372 ESD B1373 ESD B1374 ESD B1375 ESD B1376 ESD B1377 ESD B1378 ESD B1379 ESD B1380 ESD B1381 ESD B1382 ESD B1383 ESD B1384 ESD B1385 ESD B1386 ESD B1387 ESD B1388 ESD B1389 ESD B1390 ESD B1391 ESD B1392 ESD B1393 ESD B1394 ESD B1395 ESD B1396 ESD B1397 ESD B1398 ESD B1399 ESD B1400 ESD B1401 ESD B1402 ESD B1403 ESD B1404 ESD B1405 ESD B1406 ESD B1407 ESD B1408 ESD B1409 ESD B1410 ESD B1411 ESD B1412 ESD B1413 ESD B1414 ESD B1415 ESD B1416 ESD B1417 ESD B1418 ESD B1419 ESD B1420 ESD B1421 ESD B1422 ESD B1423 ESD B1424 ESD B1425 ESD B1426 ESD B1427 ESD B1428 ESD B1429 ESD B1430 ESD B1431 ESD B1432 ESD B1433 ESD B1434 ESD B1435 ESD B1436 ESD B1437 ESD B1438 ESD B1439 ESD B1440 ESD B1441 ESD B1442 ESD B1443 ESD B1444 ESD B1445 ESD B1446 ESD B1447 ESD B1448 ESD B1449 ESD B1450 ESD B1451 ESD B1452 ESD B1453 ESD B1454 ESD B1455 ESD B1456 ESD B1457 ESD B1458 ESD B1459 ESD B1460 ESD B1461 ESD B1462 ESD 											

7a) This line provides a summary of all stress tests of selected changes excluding selection from condition table.

7b) This line provides a summary of all stress tests incl. selection from condition table according to the recommendations of the international standards.

Example - DeQuMa for Active Components

		BARE DIE		PROCESS - ASSEMBLY																													
X	SEM-PA-03	Change in leadframe dimensions	P	P	B	-	*	-	-	*	M	-	-	-	-	*	-	*	*	*	-	L	H	-	-	-	-	-	-				
X	SEM-PA-07	Die attach material	P	P	C	-	*	*	*	*	M	-	*	-	-	-	-	-	*	*	*	-	L	H	H	H	-	*	-				
X	SEM-PA-11	Change of mold compound/ encapsulation material	P	P	B	-	*	*	*	*	M	*	*	*	-	*	-	*	-	-	*	L	-	-	-	-	-	-	-				
X	SEM-PA-16	Move of all or part of assembly to a different location/diebin constructs	P	P	C	*	*	-	*	*	M	-	*	*	*	*	T	*	-	-	-	L	H	H	H	G	*	-	-				
PACKING/SHIPPING																																	
X	SEM-PG-02	Dry pack requirements change	P	P	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
EQUIPMENT																																	
X	SEM-EQ-03	Change in test equipment type that uses a different technology	P	P	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	*					
TEST FLOW																																	
Q-DAYE																																	
Tests, which should be considered for the appropriate process change.																																	
A * * * * M * * * * T * * * * L H H H G *																																	
Tests, which should be considered for the appropriate process change after selection of condition table.																																	
* * * * - * * * * - * * * * L - - - G *																																	
Suppliers performed tests (mark with an 'X' for done or 'G' for generic)																																	
G G G - G G G G G X - 1 2 X 3 4 G - - - G G																																	
Reason for exception of tests:																																	
Generic data used from one product of product family [XXXX] which has highest performance out of that. 1 - not applicable, because SMD package; 2 - not applicable, because also changes in Wafer Fab process; 3 - not applicable, for smart power devices only; 4 - not applicable, because no memory included																																	

8) The tests performed by the supplier should be marked with an 'X' for tests at the specific device or 'G' for generic.

For tests that were not performed, please enter a numeric value (1,2,3,..) for referencing in the explanation line (see 9)).

Instructions how to use the DeltaQualificationMatrix (DeQuMa)

Example - DeQuMa for Active Components

[illegible]

9) Please provide a comment / explanation for each value (1,2,3,..) why certain listed tests are not performed or performed under different conditions.

ZVEI:
Die Elektroindustrie

10) For further instructions and descriptions see sheet **GUIDANCE within the DeQuMa Excel File.**