D e l i v e r i n g ***P O W E R*** **E x c e l l e n c e**

RELIABILITY REPORT
1/04

Power Semiconductor Devices

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QUALITY AND RELIABILITY

IXYS is committed to setting a new standard for excellence in Power Semiconductors. Reflecting our dedication to industry leadership in the manufacture of medium to high power devices, reliability has assumed a primary position in raw material selection, design, and process technology.
Reliability utilizes information derived from applied research, engineering design, analysis of field applications and accelerated stress testing and integrates this knowledge to optimize device design and manufacturing processes.
All areas that impact reliability have received considerable attention in order to achieve our goal to be the # 1 Reliability Supplier of Power Semiconductor products. We believe IXYS products should be the most reliable components in your system.
We have committed significant resources to continuously improve and optimize our device design, wafer fab processes, assembly processes and test capabilities. As a result of this investment, IXYS has realized a dramatic improvement in reliability performance on all standardized tests throughout the product line.
Excellence in product reliability is “built-in”, not tested-in. Moreover, it requires a total systems approach, involving all parties: from design to raw materials to manufacturing.
In addition to qualifying new products released to the market, life and environmental tests are periodically performed on standard products to maintain feedback on assembly and fabrication performance to assure product reliability. Further information on reliability of power devices is provided on pages www.ixys.com.

RELIABILITY TESTS

High Temperature Reverse Bias (HTRB)

Failure Modes: Gradual degradation of break-down characteristics due to presence of foreign materials and polar/ionic contaminants disturbing the electric field termination structure.

Sensitive Parameters: BV_{DSS}, BV_{CES}, V_{DRRM}, V_{RRM}, I_{DSS}, I_{CES}, I_{DRM}, I_{RRM}, V_{TH}.

High Temperature Gate Bias (HTGB)

Failure Modes: Rupture of the gate oxide due to localized thickness variations, structural anomalies, particulates in the oxide, channel inversion due to presence of mobile ions in the gate oxide.

Sensitive Parameters: I_{GSS}, I_{GES}, V_{TH}, I_{DSS}, I_{CES}.

Temperature Cycle

Failure modes: Thermal fatigue of silicon-metal and metal-metal interfaces due to heating and cooling, causing thermal and electrical performance degradation.

Sensitive Parameters: R_{thJC}, $R_{DS(on)}$, $V_{CE(sat)}$, V_T, V_F.

Humidity Test

Failure Modes: Degradation of electrical leakage characteristics due to moisture penetration into plastic packages.

Sensitive Parameters: BV_{DSS}, BV_{CES}, V_{DRRM}, V_{RRM}, I_{DSS}, I_{CES}, I_{DRM}, I_{RRM}, I_{GSS}, I_{GES}, V_{TH}.

Power Cycle

Failure Modes: Thermal fatigue of silicon-metal and metal-metal interfaces due to heating and cooling can cause thermal and electrical performance degradation.

Sensitive Parameters: R_{thJC}, $R_{DS(on)}$, $V_{CE(sat)}$, V_T, V_F, I_{DSS}, I_{CES}, I_{DRM}, I_{RRM}, BV_{DSS}, BV_{CES}, V_{DRRM}, V_{RRM}.

TERMS IN TABLES

SUMMARY TABLES 1 AND 2:

AF: acceleration factor

$$AF = \exp \{ Ea * [(T_2 - T_1) / (T_2 * T_1)] / k \} \quad (1)$$

Ea: activation energy; @ HTRB Ea = 1.0 eV
@ HTGB Ea = 0.4 eV

k: Boltzmann’s constant $8.6 \cdot 10^{-5}$ eV/K

T_1: abs. application junction temperature (273+Tj) K

T_2: abs. test junction temperature (273+Tj) K

UCL: upper confidence limit (60%)

Total Failures @ 60% UCL:

$$N = r + dr \quad (2)$$

r: number of failed devices

dr: additional term, depending on both r and UCL

MTTF: Mean Time To Failures = 1/Failure Rate

FIT: 1 FIT = 1 failure / 10^9 hrs

TABLES 3:

ΔT: max Tj - min Tj during Test

DEFINITION OF FAILURE

Parametric failure means a parameter specified in data sheet is exceeded as specified in IEC 60747-1 and the functionality of the device is not impaired.

Summary of Tables 1A - 1J: HTRB

		Table 1A MOSFET/IGBT discrete device *)	Table 1B MOSFET/IGBT Module	Table 1C Thyr./Diode Module	Table1D Controller/ Rec. Bridge*)	Table 1E FRED *)	Table 1F Schottky Diode*)	Table 1G Thyr./Diode discrete device*)	Table 1H ISOPLUS	Table 1J Breakover Diode
Failure Rate [FIT] 125°C, 60% UCL		470	54466	5257	8154	5316	4508	2593	-	61828
Failure Rate [FIT] 90°C, 60% UCL		28	3261	315	488	318	270	155	-	3702
Total Lots Tested		71	7	31	17	21	12	11	17	4
Total Devices Tested		2031	70	320	163	350	210	190	380	80
Total Failures	Actual	0	1	0	0	0	0	0	0	0
	60% UCL {eq. (2)}	0.92	2.00	0.92	0.92	0.92	0.92	0.92	-	0.92
Total Equivalent Device Hours @ 125°C {AF eq. (1)}		1959430	36720	174995	112824	173046	204077	354810	462726	14880
MTTF (Years)	125°C 60% UCL	243	2	22	14	21	25	44	-	2
	90°C 60% UCL	4060	35	363	234	359	423	735	-	31

Summary of Table 2A - 2C: HTGB

		Table 2A MOSFET/IGBT discrete device *)	Table 2B MOSFET/IGBT Module	Table 2C ISOPLUS
Failure Rate [FIT] 125°C, 60% UCL		722	26099	-
Failure Rate [FIT] 90°C, 60% UCL		43	1563	-
Total Lots Tested		45	5	5
Total Devices Tested		1290	50	140
Total Failures	Actual	0	0	0
	60% UCL {eq. (2)}	0.92	0.92	-
Total Equivalent Device Hours @ 125°C {AF eq. (1)}		1273360	35250	120000
MTTF (Years)	125°C 60% UCL	158	4	-
	90°C 60% UCL	2639	73	-

*) including ISOPLUS

Summary of Tables 3A - 3H: Power Cycle

	Table 3A MOSFET/IGBT discrete device *)	Table 3B MOSFET/IGBT Module	Table 3C Thyr./Diode Module	Table3D Controller/ Rec. Bridge*)	Table 3E FRED *)	Table 3F Schottky Diode*)	Table 3G Thyr./Diode discrete device*)	Table 3H Isoplus
Total Lots Tested	15	2	8	8	15	8	9	8
Total Devices Tested	347	20	80	80	250	150	170	176
Total Failures	0	0	0	0	0	0	0	0
Total Device Cycles	3580000	200000	1040000	390000	1160000	570000	1080000	1460000

Summary of Tables 4A - 4J: Temperature Cycle

	Table 4A MOSFET/IGBT discrete device *)	Table 4B MOSFET/IGBT Module	Table 4C Thyr./Diode Module	Table4D Controller/ Rec. Bridge*)	Table 4E FRED *)	Table 4F Schottky Diode*)	Table 4G Thyr./Diode discrete device*)	Table 4H Isoplus	Table 4J Breakover Diode
Total Lots Tested	14	6	29	24	28	22	22	9	10
Total Devices Tested	340	60	401	245	509	450	360	180	180
Total Failures	0	1	3	1	3	2	0	0	0
Total Device Cycles	76400	2700	69700	15600	40150	27400	46200	9600	16400

Summary of Tables 5A - 5H: Humidity Test

	Table 5A MOSFET/IGBT discrete device *)	Table 5C Thyr./Diode Module	Table5D Controller/ Rec. Bridge*)	Table 5E FRED *)	Table 5F Schottky Diode*)	Table 5G Thyr./Diode discrete device*)	Table 5H Isoplus	Table 5J Breakover Diode
Total Lots Tested	13	6	3	10	3	10	10	4
Total Devices Tested	350	60	30	160	60	190	190	80
Total Failures	0	0	0	0	0	1	1	0
Total Device Hours	54960	10080	5040	14160	5760	15840	15840	3840

*) including ISOPLUS

HTRB (Tables 1A .. 1J)

TABLE 1A: MOSFET/IGBT single device									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	IRFP260	SP0243	160	125	1000	30	0	30000	
2	IRFP450	SK0224	400	125	1000	30	0	30000	
3	IRFP460	SK0229	400	125	1000	30	0	30000	
4	IXDA20N120AS	446	960	125	168	20	0	3360	
5	IXDA20N120AS	640	960	125	1000	20	0	20000	
6	IXDA20N120AS	757	960	125	1000	20	0	20000	
7	IXDA20N120AS	757	960	125	1000	20	0	20000	
8	IXEH40N120	539	960	125	1000	20	0	20000	
9	IXER60N120	488	960	125	1000	20	0	20000	
10	IXFB70N60Q2	SP0335	480	125	1000	30	0	30000	
11	IXFB80N50Q2	SP0251	400	125	1000	30	0	30000	
12	IXFF24N100	389	800	125	1000	10	0	10000	
13	IXFH12N100F	SP0130	800	125	1000	30	0	30000	
14	IXFH13N50	SP0338	400	125	1000	30	0	30000	
15	IXFH15N80	SP 0224	640	125	1000	30	0	30000	
16	IXFH16N90Q	SP 0242	720	125	1000	30	0	30000	
17	IXFH17N80Q	SK0322	640	125	1000	30	0	30000	
18	IXFH20N60	SK0339	480	125	1000	30	0	30000	
19	IXFH21N50	SK0342	400	125	1000	30	0	30000	
20	IXFH21N50Q	K0246E	400	125	1000	30	0	30000	
21	IXFH23N60Q	SK0322	480	125	1000	30	0	30000	
22	IXFH24N50	K0314K	400	125	1000	30	0	30000	
23	IXFH26N50	SP 0228	400	125	1000	30	0	30000	
24	IXFH26N50	SP0237	400	125	1000	30	0	30000	
25	IXFH26N50Q	K0315H	400	125	1000	30	0	30000	
26	IXFH26N50Q	SK0339	400	125	1000	30	0	30000	
27	IXFH26N50Q	SP0308	400	125	1000	30	0	30000	
28	IXFH26N60Q	K0311J	480	125	1000	30	0	30000	
29	IXFH28N50F	SP 0151	400	125	1000	30	0	30000	
30	IXFH28N50Q	SP0325	400	125	1000	30	0	30000	
31	IXFH32N50	SK 0224	400	125	1000	30	0	30000	
32	IXFH32N50Q	SK0330	400	125	1000	30	0	30000	
33	IXFH32N50Q	SP 0147	400	125	1000	30	0	30000	
34	IXFH40N50Q	SP0326	400	125	1000	30	0	30000	
35	IXFH50N20	SK0325	160	125	1000	30	0	30000	
36	IXFH60N20F	SP 0151	160	125	1000	30	0	30000	
37	IXFH66N20Q	SK0306	160	125	1000	30	0	30000	
38	IXFH6N100F	SP 9936	800	105	1000	30	0	30000	
39	IXFH6N100Q	TP 0143	800	105	1000	29	0	29000	
40	IXFH80N10Q	SK0313	80	125	1000	30	0	30000	
41	IXFH88N20Q	SK0302	160	125	1000	30	0	30000	
42	IXFH9N80	TK 0229	640	125	1000	30	0	30000	
43	IXFK27N80	SP 0234	640	125	1000	30	0	30000	
44	IXFK48N50	SP0309	400	125	1000	30	0	30000	
45	IXFK55N50F	SP 0216	400	125	1000	30	0	30000	
46	IXFK73N30Q	SP0311	240	125	1000	30	0	30000	
47	IXFK90N30	SP 0244	240	125	1000	30	0	30000	
48	IXFN36N100	SP 0229	800	125	1000	30	0	30000	
49	IXFX27N80Q	SP 0236	640	125	1000	30	0	30000	
50	IXFX34N80	SP 0212	640	125	1000	30	0	30000	
51	IXFX48N50Q	SP0339	400	125	1000	30	0	30000	
52	IXFX55N50	SP 0223	400	125	1000	30	0	30000	
53	IXFX55N50F	SP0305	400	125	1000	30	0	30000	
54	IXKN40N60C	838	480	125	168	10	0	1680	
55	IXTH41N25	SP0311	200	125	1000	30	0	30000	
56	IXTH48N20	SP0315	160	125	1000	30	0	30000	
57	IXTH72N20	SP0320	160	125	1000	30	0	30000	
58	IXTH75N15	K0307B	120	125	1000	30	0	30000	
59	IXTH75N15	SK0338	120	125	1000	30	0	30000	
60	IXTK120N25	SP 0151	200	125	1000	25	0	25000	
61	IXTK120N25	SP0305	200	125	1000	30	0	30000	

TABLE 1A (cont'd): MOSFET/IGBT single device									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
62	IXTK180N15	SP 0151	120	125	1000	25	0	25000	
63	IXTK250N10	SP0318	80	125	1000	30	0	30000	
64	IXTK62N25	SP 0150	200	125	1000	39	0	39000	
65	IXTK62N25	SP0331	200	125	1000	30	0	30000	
66	IXTK62N25	SP0340	200	125	1000	30	0	30000	
67	IXTK62N25	SS0332	200	125	1000	30	0	30000	
68	IXTK90N15	SP 0150	120	125	1000	33	0	33000	
69	IXTP3N120	K0321	800	125	1000	30	0	30000	
70	IXTQ52N30P	SK0342	240	125	1000	30	0	30000	
71	IXTQ69N30P	SK0342	240	125	1000	30	0	30000	

TABLE 1B: MOSFET/IGBT Module									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	MUBW15-12A7	392	1120	125	168	10	0	1680	
2	MUBW50-12A8	390	960	125	1000	10	0	10000	
3	MWI30-06A7	553	480	125	168	10	0	1680	
4	MWI75-12A8	677	960	125	1000	10	0	10000	
5	MWI75-12A8	677	960	125	168	10	0	1680	
6	VMM300-03FP	636	240	125	168	10	0	1680	
7	VMM90-09F	508	720	125	1000	10	1	10000	

TABLE 1C: Thyristor/Diode Module									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	MCC162	874	1260	125	168	10	0	1680	
2	MCC162-18	732	1260	125	168	10	0	1680	
3	MCC21-14	396	980	125	168	10	0	1680	
4	MCC250-16	652	1120	125	168	10	0	1680	
5	MCC26-16	796	1120	125	500	10	0	5000	
6	MCC310-16	870	1120	125	168	10	0	1680	
7	MCC312-16	449	1120	125	168	10	0	1680	
8	MCC44-16io1	592	1120	125	168	10	0	1680	
9	MCC56	685	1260	125	1000	10	0	10000	
10	MCC56-16io1	448	1120	125	168	10	0	1680	
11	MCC56-18	696	1260	125	1000	20	0	20000	
12	MCC72-16	727	1120	125	168	10	0	1680	
13	MCC95-16io1	598	1120	125	168	10	0	1680	
14	MCC95-16io1	599	1280	125	168	10	0	1680	
15	MCC95-16io1B	816	1120	125	168	10	0	1680	
16	MCD162-16	564	1120	125	168	10	0	1680	
17	MCD162-16io1	564	1120	125	1100	10	0	11000	
18	MCD56-16io1B	809	1120	125	500	10	0	5000	
19	MCO150-12io1	607	960	125	1000	10	0	10000	
20	MCO150-12io1	607	840	150	168	10	0	1680	
21	MDD172-16	400	1120	150	1000	10	0	10000	
22	MDD172-16	400	1120	125	168	10	0	1680	
23	MDD26-16	519	1120	125	168	10	0	1680	
24	MDD56-16	679	1120	125	168	10	0	1680	
25	MDD56-18	423	1260	125	1000	10	0	10000	
26	MDD56-18	423	1260	125	1000	10	0	10000	
27	MDD56-18	423	1260	125	1000	10	0	10000	
28	MDD56-18	423	1280	125	1000	10	0	10000	
29	MDD56-18	739	1260	125	1000	10	0	10000	
30	MDD95-16	466	1120	125	168	10	0	1680	
31	MDO500-22	815	1540	125	168	10	0	1680	

TABLE 1D: Controller/Rectifier Bridge									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	MMO75-16	761	1120	125	168	10	0	1680	
2	VBO19-16DT1	794	1120	125	168	10	0	1680	
3	VBO25-16A	523	1120	125	168	10	0	1680	
4	VHF28-16io5	404	1120	125	1000	10	0	10000	
5	VHF36-16	463	1120	125	168	10	0	1680	
6	VUB120-12MO1	436	1120	125	168	3	0	504	
7	VUB120-16NO2	833	960	125	1000	10	0	10000	
8	VUB72-16	835	960	125	500	10	0	5000	
9	VUM24-05	846	560	125	300	10	0	3000	
10	VUM24-05	846	400	125	300	10	0	3000	
11	VUO121-16NO1	709	1120	125	1000	10	0	10000	
12	VUO34-18	422	1260	125	168	10	0	1680	
13	VUO34-18	422	1260	150	1000	10	0	10000	
14	VUO36-16NO8	740	1120	125	168	10	0	1680	
15	VUO50-16	625	1120	125	168	10	0	1680	
16	VUO86-16NO7	428	1120	125	168	10	0	1680	
17	VVY40-16	700	1120	125	168	10	0	1680	

TABLE 1E: FRED									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	DSEC60-02A	742	200	125	1000	20	0	20000	
2	DSEC60-03AR	600	240	125	168	20	0	3360	
3	DSEC60-06A	560	480	125	168	20	0	3360	
4	DSEI120-06A	554	480	125	1000	20	0	20000	
5	DSEI20-12A	486	960	125	168	20	0	3360	
6	DSEI2x121-02A	483	160	125	168	10	0	1680	
7	DSEI2x61-12B	722	960	125	1000	10	0	10000	
8	DSEK60-02	465	160	125	168	20	0	3360	
9	DSEP15-12CR	381	960	125	168	20	0	3360	
10	DSEP15-12CR	715	960	125	168	20	0	3360	
11	DSEP2x31-12A	575	960	125	168	10	0	1680	
12	DSEP30-06CR	525	480	125	168	20	0	3360	
13	DSEP30-06CR	525	480	150	168	20	0	3360	
14	DSEP60-06A	791	480	125	168	20	0	3360	
15	DSEP8-06B	552	480	125	1000	20	0	20000	
16	DSEP8-06B	552	480	125	1000	20	0	20000	
17	DSS17-06CR	714	600	150	168	20	0	3360	
18	MEK350-02B	487	160	125	1000	10	0	10000	
19	MEK350-02B	487	160	125	168	10	0	1680	
20	MEK90-06F	499	480	125	168	10	0	1680	
21	MEK95-06DA"E"	403	480	125	168	10	0	1680	

TABLE 1F: Schottky Diode									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	DGS3-03AS	582	240	125	1000	20	0	20000	
2	DGSK20-018A	518	144	125	168	20	0	3360	
3	DSS1-40BA	789	32	100	1000	20	0	20000	
4	DSS17-06CR	714	600	150	168	20	0	3360	
5	DSS2-40BB	790	32	100	1000	20	0	20000	
6	DSS2x160-01A	430	100	125	168	10	0	1680	
7	DSSK28-01A	513	100	150	168	20	0	3360	
8	DSSK50-015A	574	150	150	1000	20	0	20000	
9	DSSK70-008A	501	80	125	1000	20	0	20000	
10	DSSK80-0008D	500	8	100	1000	20	0	20000	
11	DSSK80-006B	676	50	100	168	10	0	1680	
12	DSSK80-006B	676	50	100	168	10	0	1680	

TABLE 1G: Thyristor/Diode single device									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	CS22-12	707	840	125	1000	20	0	20000	
2	CS30-16io1	417	1120	125	168	20	0	3360	
3	CS30-16io1	556	1120	125	1000	10	0	10000	
4	CS30-16io1	556	1120	125	1000	10	0	10000	
5	CS60-14io1	594	980	125	1000	30	0	30000	
6	DSA35-18	407	1260	150	168	10	0	1680	
7	DSAI75-16B	668	1120	150	168	10	0	1680	
8	DSI45-16AR	823	1120	150	168	20	0	3360	
9	DSIK45-16AR	608	1120	150	1000	20	0	20000	
10	DSP25-16A	877	1120	150	168	20	0	3360	
11	DSP8-12AC	529	840	150	1000	20	0	20000	

TABLE 1H: ISOPLUS									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	DSEC60-03AR	600	240	125	168	20	0	3360	
2	DSEK60-02	465	160	125	168	20	0	3360	
3	DSEP15-12CR	381	960	125	168	20	0	3360	
4	DSEP15-12CR	715		125	168	20	0	3360	
5	DSEP30-06CR	525	480	150	168	20	0	3360	
6	DSEP30-06CR	525	480	125	168	20	0	3360	
7	DSI45-16AR	823	1120	150	168	20	0	3360	
8	DSIK45-16AR	608	1120	150	1000	20	0	20000	
9	DSP8-12AC	529	840	150	1000	20	0	20000	
10	DSS17-06CR	714	600	150	168	20	0	3360	
11	IXER60N120	488	960	125	1000	20	0	20000	
12	IXFF24N100	389	800	125	1000	10	0	10000	
13	IXFX27N80Q	SP 0236	640	125	1000	30	0	30000	
14	IXFX34N80	SP 0212	640	125	1000	30	0	30000	
15	IXFX48N50Q	SP0339	400	125	1000	30	0	30000	
16	IXFX55N50	SP 0223	400	125	1000	30	0	30000	
17	IXFX55N50F	SP0305	400	125	1000	30	0	30000	

TABLE 1J: Breakover Diode									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	IXBOD1-06	521	480	125	168	20	0	3360	
2	IXBOD1-07	453	560	125	240	20	0	4800	
3	IXBOD1-09	743	720	125	168	20	0	3360	
4	IXBOD1-10	868	800	125	168	20	0	3360	

HTGB (Tables 2A .. 2C)

TABLE 2A: MOSFET/IGBT single device

#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	IRFP260	SP0243	16	125	1000	30	0	30000	
2	IRFP450	SK0224	16	125	1000	30	0	30000	
3	IRFP460	SK0229	16	125	1000	30	0	30000	
4	IXBH9N160G	440	16	125	1000	20	0	20000	
5	IXDN55N120D1	596	16	125	168	10	0	1680	
6	IXFB38N100Q2	SP0320	16	125	1000	30	0	30000	
7	IXFB80N50Q2	SP0251	16	125	1000	30	0	30000	
8	IXFH12N100F	SP0130	16	125	1000	30	0	30000	
9	IXFH13N50	SP0338	16	125	1000	30	0	30000	
10	IXFH15N80	SP 0224	16	125	1000	30	0	30000	
11	IXFH16N90Q	SP 0242	16	125	1000	30	0	30000	
12	IXFH20N60	SK0339	16	125	1000	30	0	30000	
13	IXFH21N50	SK0342	16	125	1000	30	0	30000	
14	IXFH21N50Q	K0246E	16	125	1000	30	0	30000	
15	IXFH24N50	K0314K	16	125	1000	30	0	30000	
16	IXFH26N50	SP0237	16	125	1000	30	0	30000	
17	IXFH26N50Q	K0315H	16	125	1000	30	0	30000	
18	IXFH26N50Q	SK0339	16	125	1000	30	0	30000	
19	IXFH26N50Q	SP0308	16	125	1000	30	0	30000	
20	IXFH26N60Q	K0311J	16	125	1000	30	0	30000	
21	IXFH32N50	SK 0224	16	125	1000	30	0	30000	
22	IXFH32N50Q	SK0330	16	125	1000	30	0	30000	
23	IXFH32N50Q	SP 0147	16	125	1000	30	0	30000	
24	IXFH50N20	SK0325	16	125	1000	30	0	30000	
25	IXFH80N10Q	SK0313	16	125	1000	30	0	30000	
26	IXFK27N80	SP 0234	16	125	1000	30	0	30000	
27	IXFK48N50	SP0309	16	125	1000	30	0	30000	
28	IXFK55N50F	SP 0216	16	125	1000	30	0	30000	
29	IXFK90N30	SP 0244	16	125	1000	30	0	30000	
30	IXFN36N100	SP 0229	16	125	1000	30	0	30000	
31	IXFX27N80Q	SP 0236	16	125	1000	30	0	30000	
32	IXFX34N80	SP 0212	16	125	1000	30	0	30000	
33	IXFX48N50Q	SP0339	16	125	1000	30	0	30000	
34	IXFX4N100Q	TP0149	16	125	1000	30	0	30000	
35	IXKN40N60C	838	20	125	168	10	0	1680	
36	IXLF19N250	577	30	125	1000	20	0	20000	
37	IXTH41N25	SP0311	16	125	1000	30	0	30000	
38	IXTH48N20	SP0315	16	125	1000	30	0	30000	
39	IXTH72N20	SK0306	16	125	1000	30	0	30000	
40	IXTH75N15	K0307B	16	125	1000	30	0	30000	
41	IXTH75N15	SK0338	16	125	1000	30	0	30000	
42	IXTK120N25	SP0305	16	125	1000	30	0	30000	
43	IXTK250N10	SP0318	16	125	1000	30	0	30000	
44	IXTQ52N30P	SK0342	16	125	1000	30	0	30000	
45	IXTQ69N30P	SK0342	16	125	1000	30	0	30000	

TABLE 2B: MOSFET/IGBT Module

#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	MUBW25-12A7	496	16	150	168	10	0	1680	
2	MUBW25-12A7	496	16	125	1685	10	0	16850	
3	MUBW30-06A7	391	16	150	168	10	0	1680	
4	MUBW30-06A7	391	16	125	168	10	0	1680	
5	VMM300-03FP	636	16	125	1000	10	0	10000	

TABLE 2C: ISOPLUS									
#	Part Number	Date Code or Test #	Voltage [V]	Temp. [°C]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	IXLF19N250	577	30	125	1000	20	0	20000	
2	IXFX27N80Q	SP 0236	16	125	1000	30	0	30000	
3	IXFX34N80	SP 0212	16	125	1000	30	0	30000	
4	IXFX48N50Q	SP0339	16	125	1000	30	0	30000	
5	IXFX4N100Q	TP0149	16	125	1000	30	0	30000	

POWER CYCLE (Tables 3A ..3H)

TABLE 3A: MOSFET/IGBT single device									
#	Part Number	Date Code or Test #	Tj(max) [°C]	ΔT [K]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	IXBH9N160G	440	125	80	5000	20	0	100000	
2	IXFB70N60Q2	SP0335	125	100	10000	24	0	240000	
3	IXFH12N100F	SP0130	125	100	10000	24	0	240000	
4	IXFH26N50	SP 0228	125	100	10000	24	0	240000	
5	IXFH26N50Q	K0315H	125	100	10000	24	0	240000	
6	IXFH26N60Q	K0311J	125	100	10000	24	0	240000	
7	IXFH50N20	SK0325	125	100	10000	24	0	240000	
8	IXFK90N30	SP 0244	125	100	10000	24	0	240000	
9	IXFN55N50	558	125	80	24000	15	0	360000	
10	IXFX27N80Q	SP 0236	125	100	10000	24	0	240000	
11	IXFX48N50Q	SP0339	125	100	10000	24	0	240000	
12	IXFX4N100Q	TP0149	125	100	10000	24	0	240000	
13	IXFX55N50	SP 0223	125	100	10000	24	0	240000	
14	IXTQ52N30P	SK0342	125	100	10000	24	0	240000	
15	IXTQ69N30P	SK0342	125	100	10000	24	0	240000	

TABLE 3B: MOSFET/IGBT Module									
#	Part Number	Date Code or Test #	Tj(max) [°C]	ΔT [K]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	MUBW50-12A8	390	125	80	10000	10	0	100000	
2	VWI6-12P1	433	125	80	10000	10	0	100000	

TABLE 3C: Thyristor/Diode Module									
#	Part Number	Date Code or Test #	Tj(max) [°C]	ΔT [K]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	MCC200	747	125	80	20000	10	0	200000	
2	MCC310-12	507	125	80	10000	10	0	100000	
3	MCC56	685	125	80	35000	10	0	350000	
4	MCC56-16io1	820	125	80	10000	10	0	100000	
5	MCO150-12io1	607	125	80	4000	10	0	40000	
6	MDD56-12	532	125	80	10000	10	0	100000	
7	MDD95-12	452	125	80	10000	10	0	100000	
8	VCO180-16io7	526	125	80	5000	10	0	50000	

TABLE 3D: Controller, Rectifier Bridge									
#	Part Number	Date Code or Test #	Tj(max) [°C]	ΔT [K]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	VBO125-16NO7	741	125	80	2000	10	0	20000	
2	VHF28-14	457	125	80	5000	10	0	50000	
3	VHF28-16io5	404	125	80	10000	10	0	100000	
4	VUE50-12	717	125	80	5000	10	0	50000	
5	VUO110-16NO7	565	125	80	8000	10	0	80000	
6	VUO110-16NO7	565	125	80	2000	10	0	20000	
7	VUO25-16NO8	434	125	80	2000	10	0	20000	
8	VUO34-16	516	125	80	5000	10	0	50000	

TABLE 3E: FRED									
#	Part Number	Date Code or Test #	Tj(max) [°C]	ΔT [K]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	DSEC30-02A	795	125	80	4000	20	0	80000	
2	DSEC60-06A	664	150	105	2000	20	0	40000	
3	DSEE15-12CC	394	125	80	10000	20	0	200000	
4	DSEI120-06A	554	130	85	4000	20	0	80000	
5	DSEI2x121-02A	483	125	80	2000	10	0	20000	
6	DSEI2x61-12B	722	125	80	5000	10	0	50000	
7	DSEK60-06A	720	150	105	2000	20	0	40000	
8	DSEP15-12CR	715	125	80	5000	20	0	100000	
9	DSEP29-06A	468	150	105	4000	20	0	80000	
10	DSEP29-06B	474	150	105	2000	20	0	40000	
11	DSEP8-06B	552	150	105	4000	20	0	80000	
12	DSS17-06CR	714	150	105	5000	20	0	100000	
13	MEK350-02	485	125	80	10000	10	0	100000	
14	MEK350-02	485	125	80	10000	10	0	100000	
15	MEO450-12DA "L"	639	125	80	5000	10	0	50000	

TABLE 3F: Schottky Diode									
#	Part Number	Date Code or Test #	Tj(max) [°C]	ΔT [K]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	DGS4-025A	471	145	100	4000	20	0	80000	
2	DSS17-06CR	714	150	105	5000	20	0	100000	
3	DSS2x41-01A	409	125	80	5000	10	0	50000	
4	DSS2x41-01A	409	125	80	5000	10	0	50000	
5	DSS2x61-0045A	514	125	80	5000	10	0	50000	
6	DSSK28-01A	513	125	80	2000	40	0	80000	
7	DSSK50-015A	574	125	80	6000	20	0	120000	
8	DSSK70-0015B	585	113	80	2000	20	0	40000	

TABLE 3G: Thyristor/Diode single device									
#	Part Number	Date Code or Test #	Tj(max) [°C]	ΔT [K]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	CS22-12	707	125	80	4000	20	0	80000	
2	CS45-16io1R	464	125	80	5000	20	0	100000	
3	CS9444L	602	125	80	6000	30	0	180000	
4	CS9444LD	601	125	80	6000	30	0	180000	
5	DS1-12D	470	150	105	20000	20	0	400000	
6	DSA17-16A	534	125	80	2000	10	0	20000	
7	DSA35-18	407	150	105	2000	10	0	20000	
8	DSA75-16B	718	150	105	2000	10	0	20000	
9	DSI45-12A	613	125	80	4000	20	0	80000	

TABLE 3H: ISOPLUS									
#	Part Number	Date Code or Test #	Tj(max) [°C]	ΔT [K]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	CS45-16io1R	464	125	80	5000	20	0	100000	
2	DSEE15-12CC	394	125	80	10000	20	0	200000	
3	DSEP15-12CR	715	125	80	5000	20	0	100000	
4	DSS17-06CR	714	150	105	5000	20	0	100000	
5	IXFX27N80Q	SP 0236	125	100	10000	24	0	240000	
6	IXFX48N50Q	SP0339	125	100	10000	24	0	240000	
7	IXFX4N100Q	TP0149	125	100	10000	24	0	240000	
8	IXFX55N50	SP 0223	125	100	10000	24	0	240000	

TEMPERATURE CYCLE (Tables 4A ..4J)

TABLE 4A: MOSFET/IGBT single device

#	Part Number	Date Code or Test #	Low Temp. [°C]	High Temp. [°C]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	FMM150-0075P	566	-55	150	250	20	0	5000	
2	FMM150-0075P	566	-55	150	40	20	0	800	
3	IXBH9N140G	542	-55	150	50	20	0	1000	
4	IXDH20N120D1	420	-55	150	20	20	0	400	
5	IXFC26N50Q	648	-45	150	250	30	0	7500	
6	IXFF24N100	389	-55	150	50	20	0	1000	
7	IXFF55N50	623	-45	150	250	30	0	7500	
8	IXFG55N50	622	-45	150	100	30	0	3000	
9	IXFK90N30	IX9X	-65	150	500	30	0	15000	-65, 150°C / 10min
10	IXFL55N50	621	-45	150	100	30	0	3000	
11	IXFN80N50	693	-40	150	100	20	0	2000	
12	IXKN40N60C	838	-40	150	20	10	0	200	
13	IXTK120N25	IX90	-65	150	500	30	0	15000	-65, 150°C / 10min
14	IXTK80N25	IX81	-65	150	500	30	0	15000	-65, 150°C / 10min

TABLE 4B: MOSFET/IGBT Module

#	Part Number	Date Code or Test #	Low Temp. [°C]	High Temp. [°C]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	MUBW25-12A7	496	-40	150	50	10	0	500	
2	MUBW30-06A7	391	-40	150	50	10	0	500	
3	MWI30-06A7	553	-40	150	50	10	0	500	
4	VMM90-09F	425	-40	150	50	10	0	500	
5	VWI6-12P1	433	-40	150	20	10	0	200	
6	VWM350-0075	590	-40	150	50	10	1	500	

TABLE 4C: Thyristor/Diode Module

#	Part Number	Date Code or Test #	Low Temp. [°C]	High Temp. [°C]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	MCC 162	847	-40	150	100	10	0	1000	
2	MCC162	0227	-40	150	50	10	0	500	
3	MCC21-14	725	-40	150	100	10	0	1000	
4	MCC26	495	-40	150	500	12	1	6000	
5	MCC26-14io8	723	-40	150	100	10	0	1000	
6	MCC44	495	-40	150	500	20	0	10000	
7	MCC44	673	-40	150	150	10	0	1500	
8	MCC44-12	469	-40	150	50	10	0	500	
9	MCC56	685	-40	150	300	20	0	6000	
10	MCC56	685	-40	150	100	20	0	2000	
11	MCC56-1	697	-40	150	200	10	0	2000	
12	MCC56-1	698	-40	150	200	10	0	2000	
13	MCC56-1	0307	-40	150	350	20	0	7000	
14	MCC56-12	754	-40	150	100	10	1	1000	
15	MCC56-12	784	-40	150	100	10	1	1000	
16	MCC56-14	405	-40	150	50	10	0	500	
17	MCC56-14	785	-40	150	100	10	0	1000	
18	MCC56-14	786	-40	150	100	10	1	1000	
19	MCC56-16	811	-40	150	100	30	0	3000	
20	MCC56-16	812	-40	150	100	30	0	3000	
21	MCC56-8	699	-40	150	200	10	0	2000	
22	MCC72-16	386	-40	150	50	10	0	500	
23	MCD162-16	803	-40	150	100	10	0	1000	
24	MCD56-16	783	-40	150	100	10	0	1000	
25	MCO150-12io1	607	-40	150	50	10	0	500	
26	MDD172	0329	-40	150	50	30	0	1500	
27	MDD26-14	724	-40	150	50	10	0	500	
28	MDD56	495	-40	150	500	20	0	10000	
29	MDD56	738	-40	150	300	9	1	2700	
30	MDD56	738	-40	150	290	10	1	2900	
31	MDD56-16	517	-40	150	50	10	0	500	
32	MDD95-08	637	-40	150	50	10	0	500	

TABLE 4E: FRED									
#	Part Number	Date Code or Test #	Low Temp. [°C]	High Temp. [°C]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	DSEC30-06A	484	-55	150	50	29	0	1450	
2	DSEC60-02A	782	-55	150	200	20	0	4000	
3	DSEC60-02AQ	839	-55	150	100	20	0	2000	
4	DSEC60-03A	681	-55	150	100	20	0	2000	
5	DSEC60-03AR	600	-55	150	20	20	0	400	
6	DSEI120-06A	554	-40	150	350	20	0	7000	
7	DSEI2x121-02A	483	-40	150	10	10	0	100	
8	DSEI2x61-12B	722	-40	150	50	10	0	500	
9	DSEI60-06A	705	-40	150	50	20	1	1000	
10	DSEI8-06A	778	-40	150	100	40	0	4000	
11	DSEK60-02	465	-40	150	20	20	0	400	
12	DSEK60-06A	720	-40	150	50	20	0	1000	
13	DSEP130-06A	616	-55	150	50	20	1	1000	
14	DSEP130-06A	616	-55	150	50	20	0	1000	
15	DSEP15-12CR	715	-55	150	100	20	0	2000	
16	DSEP15-12CR	381	-55	150	20	20	0	400	
17	DSEP29-06A	468	-55	150	50	20	0	1000	
18	DSEP29-06B	767	-55	150	100	20	0	2000	
19	DSEP29-06B	474	-55	150	20	20	0	400	
20	DSEP2x31-12A	575	-40	150	10	10	0	100	
21	DSEP30-06B	831	-55	150	150	20	0	3000	
22	DSEP30-06CR	525	-55	150	20	20	0	400	
23	DSEP60-06A	791	-55	150	100	20	0	2000	
24	MEK250-12	384	-40	150	50	10	0	500	
25	MEK250-12	384	-40	150	50	10	0	500	
26	MEK350-02B	651	-40	150	50	10	0	500	
27	MEK350-02B	0303	-40	150	100	10	1	1000	
28	MEO450-12I	438	-40	150	50	10	0	500	

TABLE 4F: Schottky Diode									
#	Part Number	Date Code or Test #	Low Temp. [°C]	High Temp. [°C]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	DGS19-025AS	583	-55	150	200	20	0	4000	
2	DGSK20-018A	518	-55	150	20	20	0	400	
3	DGSK24-025CS	763	-55	150	100	20	0	2000	
4	DGSK24-025CS	763	-55	150	100	20	0	2000	
5	DSS1-40BA	789	-55	150	100	20	1	2000	
6	DSS2-40BB	790	-55	150	100	20	0	2000	
7	DSS2x160-01A	430	-40	150	10	10	0	100	
8	DSS2x200-0008D	458	-40	150	100	10	0	1000	
9	DSS2x61-0045A	514	-40	150	10	10	0	100	
10	DSS81-0045	744	-40	150	10	40	0	400	
11	DSS81-0045B	744	-40	150	10	40	0	400	
12	DSSK20-0045AM	854	-55	150	100	20	0	2000	
13	DSSK28-01A	513	-55	150	20	20	0	400	
14	DSSK28-01AS	442	-40	150	20	20	0	400	
15	DSSK28-01AS	442	-55	150	120	20	0	2400	
16	DSSK28-01AS	442	-55	150	20	20	0	400	
17	DSSK50-015A	574	-55	150	50	20	0	1000	
18	DSSK50-01A	665	-55	150	50	20	0	1000	
19	DSSK70-0015B	585	-55	150	20	20	0	400	
20	DSSK80-0008D	489	-55	150	50	20	1	1000	
21	DSSK80-006B	729	-55	150	100	20	0	2000	
22	DSSK80-006B	729	-55	150	100	20	0	2000	

TABLE 4G: Thyristor/Diode single device									
#	Part Number	Date Code or Test #	Low Temp. [°C]	High Temp. [°C]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	CS22-12	707	-40	150	50	20	0	1000	
2	CS23-12io2	504	-40	150	20	10	0	200	
3	CS30-16io1	556	-40	150	350	20	0	7000	
4	CS30-16io1	556	-40	150	350	20	0	7000	
5	CS30-16io1	382	-55	150	50	20	0	1000	
6	CS35-14io4	825	-40	150	20	10	0	200	
7	CS45	687	-40	150	150	20	0	3000	
8	CS45	687	-40	150	50	20	0	1000	
9	CS9444L	602	-55	150	250	30	0	7500	
10	CS9444LD	601	-55	150	250	30	0	7500	
11	DSA17-16A	534	-40	150	20	10	0	200	
12	DSA9-16F	704	-40	150	20	10	0	200	
13	DSAI35-16A	735	-40	150	20	10	0	200	
14	DSAI75-18B	439	-40	150	20	10	0	200	
15	DSI45-16	764	-40	150	100	10	0	1000	
16	DSI45-16	764	-40	150	100	10	0	1000	
17	DSI45-16AR	823	-40	150	50	20	0	1000	
18	DSI75-04D	853	-40	150	50	10	0	500	
19	DSI75-04D	853	-40	150	50	10	0	500	
20	DSIK45-16AR	608	-40	150	100	20	0	2000	
21	DSP45-16AR	645	-40	150	100	20	0	2000	
22	DSP8-08S	758	-40	150	100	20	0	2000	

TABLE 4H: ISOPLUS									
#	Part Number	Date Code or Test #	Low Temp. [°C]	High Temp. [°C]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	DSEC60-03AR	600	-55	150	20	20	0	400	
2	DSEK60-02	465	-40	150	20	20	0	400	
3	DSEP15-12CR	381	-55	150	20	20	0	400	
4	DSEP15-12CR	715	-55	150	100	20	0	2000	
5	DSEP30-06CR	525	-55	150	20	20	0	400	
6	DSI45-16AR	823	-40	150	50	20	0	1000	
7	DSIK45-16AR	608	-40	150	100	20	0	2000	
8	DSP45-16AR	645	-40	150	100	20	0	2000	
9	IXFF24N100	389	-55	150	50	20	0	1000	

TABLE 4J: Breakover Diode									
#	Part Number	Date Code or Test #	Low Temp. [°C]	High Temp. [°C]	Number of Cycles	Sample Size	Failures	Device Cycles	Remark
1	IXBOD1-06	521	-40	150	20	20	0	400	
2	IXBOD1-07	453	-40	150	30	20	0	600	
3	IXBOD1-07	453	-40	150	20	20	0	400	
4	IXBOD1-07	597	-40	150	50	10	0	500	
5	IXBOD1-08	550	-40	150	200	20	0	4000	
6	IXBOD1-08	550	-40	150	200	20	0	4000	
7	IXBOD1-08	612	-40	150	200	20	0	4000	
8	IXBOD1-09	597	-40	150	50	10	0	500	
9	IXBOD1-09	743	-40	150	50	20	0	1000	
10	IXBOD1-10	868	-40	150	50	20	0	1000	

HUMIDITY TEST (Tables 5A ..5H)

TABLE 5A: MOSFET/IGBT single device									
#	Part Number	Date Code or Test #	Temp. [°C]	Rel. H. [%]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	FMM150-0075P	566	85	85	168	20	0	3360	
2	FMM150-0075P	566	85	85	168	20	0	3360	
3	IXDN75N120	482	121	100	48	20	0	960	
4	IXEH40N120	539	121	100	96	20	0	1920	
4	IXFB80N50F	647	121	100	168	30	0	5040	
5	IXFC26N50Q	648	121	100	168	30	0	5040	
6	IXFF55N50	623	121	100	168	30	0	5040	
7	IXFG55N50	622	121	100	168	30	0	5040	
7	IXFL55N50	621	121	100	168	30	0	5040	
8	IXTK110N25	IX90	121	100	168	30	0	5040	
9	IXTK120N25	IX90	121	100	168	30	0	5040	
10	IXTK80N25	IX81	121	100	168	30	0	5040	
11	IXTK90N30	IX9X	121	100	168	30	0	5040	

TABLE 5C: Thyristor/Diode Module									
#	Part Number	Date Code or Test #	Temp. [°C]	Rel. H. [%]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	MCC132-14	589	85	85	168	10	0	1680	
2	MCC250-14	387	85	85	168	10	0	1680	
3	MCC26-16	796	85	85	168	10	0	1680	
4	MCC56	631	85	85	168	10	0	1680	
5	MCC95-16io1	821	85	85	168	10	0	1680	
6	MCD56-12io1	414	85	85	168	10	0	1680	

TABLE 5D: Controller, Rectifier Bridge									
#	Part Number	Date Code or Test #	Temp. [°C]	Rel. H. [%]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	VUM24-05	846	85	85	168	10	0	1680	
2	VUO36-16NO8	435	85	85	168	10	0	1680	
3	VWO85-14	777	85	85	168	10	0	1680	

TABLE 5E: FRED									
#	Part Number	Date Code or Test #	Temp. [°C]	Rel. H. [%]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	DSEC30-02A	795	121	100	48	20	0	960	
2	DSEC60-02AQ	839	121	100	96	20	0	1920	
3	DSEI2x101-06	413	121	100	48	10	0	480	
4	DSEP130-06A	616	121	100	96	20	0	1920	
5	DSEP130-06A	616	121	100	96	20	0	1920	
6	DSEP2x91-06A	787	121	100	48	20	0	960	
7	DSEP30-06CR	525	121		48	20	0	960	
8	MEK250/12DA	429	85	85	168	10	0	1680	
9	MEK300-06D	399	85	85	168	10	0	1680	
10	MEK350-02DA	793	85	85	168	10	0	1680	

TABLE 5F: Schottky Diode									
#	Part Number	Date Code or Test #	Temp. [°C]	Rel. H. [%]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	DGS11-025C	807	121	100	96	20	0	1920	
2	DGSK24-025CS	763	121	100	96	20	0	1920	
3	DGSK24-025CS	763	121	100	96	20	0	1920	

TABLE 5G: Thyristor/Diode single device									
#	Part Number	Date Code or Test #	Temp. [°C]	Rel. H. [%]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	CS30-16io1	417	121	100	48	20	0	960	
2	CS45	687	121	100	96	20	0	1920	
3	CS45	687	121	100	96	20	1	1920	
4	CS45	687	121	100	96	20	0	1920	
5	DSI45-16	764	121	100	48	10	0	480	
6	DSI45-16AR	823	121	100	48	20	0	960	
7	DSP25-16A	388	121	100	96	20	0	1920	
8	DSP8-08S	758	121	100	96	20	0	1920	
9	DSP8-08S	758	121	100	96	20	0	1920	
10	DSP8-08S	758	121	100	96	20	0	1920	

TABLE 5H: ISOPLUS									
#	Part Number	Date Code or Test #	Temp. [°C]	Rel. H. [%]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	DSEP30-06CR	525	121		48	20	0	960	
2	DSI45-16AR	823	121	100	48	20	0	960	
3	IXFC26N50Q	648	121	100	168	30	0	5040	
4	IXFF24N100	389	121	100	96	20	1	1920	I_dss@ 96hr
5	IXFF24N100	389	121	100	96	20	1	1920	I_dss@ 96hr
6	IXFF55N50	623	121	100	168	30	0	5040	

TABLE 5J: Breakover diode									
#	Part Number	Date Code or Test #	Temp. [°C]	Rel. H. [%]	Time [hrs]	Sample Size	Failures	Device Hours [hrs]	Remark
1	IXBOD1-06	567	121	100	48	20	0	960	
2	IXBOD1-07	481	121	100	48	20	0	960	
3	IXBOD1-09	743	121	100	48	20	0	960	
4	IXBOD1-10	868	121	100	48	20	0	960	