International
IOR Rectifier

Power IC Quality / Reliability
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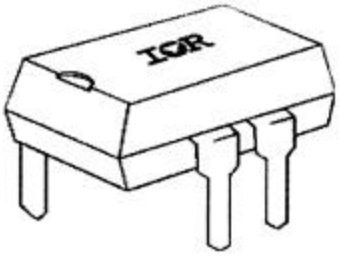
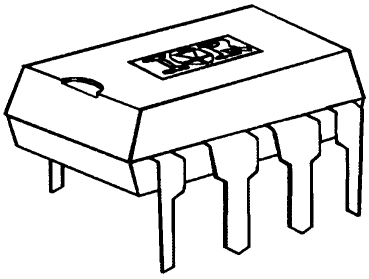
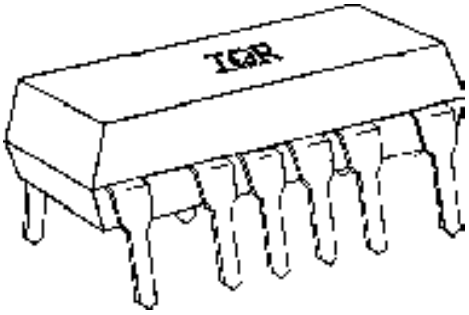
Reliability Qualification of PVA13XXN, PVA23XXN, PVA30XXN, PVA33XXN, PVD13XXN, PVD23XXN, PVD33XXN, PVI1050N, PVI50XXN, 75-00XXN, PVR13XXN, PVR2300N and PVR33XXN Products

October 2000







POWER IC PRODUCTS

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Contents

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STATEMENT OF QUALIFICATION

The PVA3354N, PVD3354N, PVI1050N and PVR3301N PVG dice in the 8/16L-DIP packages have successfully completed reliability qualification. The PVA3354N, PVD3354N, PVI1050N and PVR3301N dice in the 8/16L-DIP packages are qualified for production in 330K Fab. According to PVA13XXN, PVA30XXN, PVA33XXN, PVD13XXN, 75-00XXN, PVD23XXN, PVD33XXN, PVI1050N, PVI50XXN, PVR13XXN, PVR2300N, PVR33XXN qualification matrix and previously qualified PVG25 (ref.: MER PVG25 Reliability Qualification Report, dated: May 24th, 1999) product that have the same processes, the PVA1352N, PVA1354N, 75-0032N, 75-0037N, 75-0038N, PVA3055N, PVA3054N, PVA2352N, PVA3324N, PVD13XXN, PVD23XXN, PVD33XXN, PVI5050N, PVI5080N, 75-0040N, PVR1300N, PVR1301N, PVR2300N and PVR3300N are also qualified by extension and can be released for production.

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1.0

SUMMARY OF TEST RESULTS

PVA3354N's various tests performance during the reliability qualification testing

Reliability Stress Test	Lot Number	Qty	Instantaneous Failures 0 Hr/Cy	16 Hr/Cy	168 Hr/Cy	500 Hr/Cy	1000 Hr/Cy	Total Failure	EOT
1. **AC:** 121◦C, 100%RH, 15PSI No Bias	**275802**	20	0	0	-	-	-	0	06/07/00
2. **TC:** -55◦C to 150◦C, air to air No Bias	**275802**	20	0	-	-	0	0	0	07/03/00
3. **THB:** 85◦C, 85%RH Vin=6V , Vout=10V	**275802**	20	0	-	0	0	0	0	08/08/00
4. **HTB:** Ta=110◦C Vin=6V , Vout=240V	**275802**	20	0	-	0	0	0	0	07/17/00

PVD3354N's various tests performance during the reliability qualification testing

Reliability Stress Test	Lot Number	Qty	Instantaneous Failures 0 Hr/Cy	16 Hr/Cy	168 Hr/Cy	500 Hr/Cy	1000 Hr/Cy	Total Failure	EOT
1. **AC:** 121◦C, 100%RH, 15PSI No Bias	**275803**	20	0	0	-	-	-	0	06/07/00
2. **TC:** -55◦C to 150◦C, air to air No Bias	**275803**	20	0	-	-	0	0	0	07/03/00
3. **THB:** 85◦C, 85%RH Vin=6V , Vout=10V	**275803**	20	0	-	0	0	0	0	08/08/00
4. **HTB:** Ta=110◦C Vin=6V , Vout=240V	**275803**	20	0	-	0	0	0	0	07/17/00

PVI1050N's various tests performance during the reliability qualification testing

Reliability Stress Test	Lot Number	Qty	Instantaneous Failures 0 Hr/Cy	16 Hr/Cy	168 Hr/Cy	500 Hr/Cy	1000 Hr/Cy	Total Failure	EOT
1. **AC:** 121◦C, 100%RH, 15PSI No Bias	**P100200**	20	0	0	-	-	-	0	07/11/00
2. **TC:** -55◦C to 150◦C, air to air No Bias	**P100200**	20	0	-	-	0	0	0	07/19/00
3. **THB:** 85◦C, 85%RH Vin=6V , Vout=6V	**P100200**	20	0	-	0	0	0	0	08/31/00
4. **HTB:** Ta=110◦C Vin=6V , Vout=6V	**P100200**	20	0	-	0	0	0	0	07/31/00

SUMMARY OF TEST RESULTS Continue…

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PVR3301N's various tests performance during the reliability qualification testing

Reliability Stress Test	Lot Number	Qty	Instantaneous Failures 0 Hr/Cy	16 Hr/Cy	168 Hr/Cy	500 Hr/Cy	1000 Hr/Cy	Total Failure	EOT
1. **AC:** 121◦C, 100%RH, 15PSI No Bias	**275802**	20	0	0	-	-	-	0	08/23/00
2. **TC:** -55◦C to 150◦C, air to air No Bias	**275802**	20	0	-	-	0	0	0	09/19/00
3. **THB:** 85◦C, 85%RH Vin=6V , Vout=10V	**275802**	20	0	-	0	0	0	0	10/10/00
4. **HTB:** Ta=110◦C Vin=6V , Vout=240V	**275802**	20	0	-	0	0	0	0	10/10/00

PVG die (PVAZ172N) various tests performance during the reliability qualification testing

Reliability Stress Test	Lot Number	Qty	Instantaneous Failures 0 Hr/Cy	16 Hr/Cy	168 Hr/Cy	500 Hr/Cy	1000 Hr/Cy	Total Failure	EOT
1. **AC:** 121◦C, 100%RH, 15PSI No Bias	**413900**	10	0	0	-	-	-	0	12/23/98
	7405	10	0	0	-	-	-	0	12/23/98
2. **TC:** -55◦C to 150◦C, air to air No Bias	**413900**	20	0	-	-	0	0	0	01/12/99
	7405	20	0	-	-	0	0	0	01/12/99
3. **THB:** 85◦C, 85%RH Vin=6V , Vout=60V	**413900**	10	0	-	0	0	0	0	02/01/99
	7405	10	0	-	0	0	0	0	02/01/99
4. **HTB:** Ta=110◦C Vin=6V , Vout=60V	**413900**	10	0	-	0	0	0	0	01/26/99
	7405	10	0	-	0	0	0	0	01/26/99

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SUMMARY OF ELECTRICAL TEST RESULTS

2.1

AUTOCLAVE (AC)

Actual ATE Static Electrical Characteristics of PVA3354N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (16 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	896.6	30.80	871.3	27.19	-2.80
VONS <1.140V	V	IC=50.0mA, IF=5.0mA	901.4	30.72	879.2	27.14	-2.50
ICCL	mA	VCC=5.0V, IF=2.0mA	362.0	11.52	369.7	9.385	2.10
ICCL	mA	VCC=5.0V, IF=5.0mA	357.8	11.28	365.2	9.202	2.10
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	332.3	5.953	329.1	5.896	-1.00
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	329.7	5.605	326.2	6.265	-1.10
IROUT <12nA	nA	VR=240V	0.065	0.088	0.015	0.037	-76.90
IROUT <12nA	nA	VR=240V	0.440	1.063	0.630	1.067	43.18

Actual ATE Static Electrical Characteristics of PVD3354N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (16 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <297.mV	mV	IC=50.0mA, IF=5.0mA	248.9	4.278	248.3	5.442	-0.24
ICCL	mA	VCC=5.0V, IF=4.0mA	709.9	8.926	710.1	10.76	0.03
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	336.4	3.214	336.7	3.898	0.09
IROUT <12nA	nA	VR=240V	0.355	.206	0.415	0.221	16.90

AUTOCLAVE (AC) CONTINUE...

Actual ATE Static Electrical Characteristics of PVI1050N (SS = 20 units)

Parameters			Electrical Testing @ +25°C Pre Data (0 Hour)		Post Data (16 Hours)		Mean shift (%)
Symbol	Unit	Condition	Mean	s	Mean	s	
9 VONF <5.0V	V	IC=0A, ILED=10mA	6.920	34.06	6.990	30.90	1.012
10 ICCH <5.0uA	uA	VCC=0V, ILED=10mA	7.320	814.1	7.405	770.8	1.161
13 ICCH <14uA	uA	VCC=0V, ILED=25mA	20.99	2.194	21.22	2.086	1.10
26 VONF <5.0V	V	IC=0A, ILED=10mA	6.915	36.19	6.981	33.22	0.954
27 ICCH <5.0uA	uA	VCC=0V, ILED=10mA	7.660	681.6	7.680	644.5	0.261
30 ICCH <14uA	uA	VCC=0V, ILED=25mA	21.89	1.818	21.90	1.793	0.05

Actual ATE Static Electrical Characteristics of PVR3301N (SS = 20 units)

Parameters			Electrical Testing @ +25°C Pre Data (0 Hour)		Post Data (16 Hours)		Mean shift (%)
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	0.909	18.4	0.925	20.1	1.76
			0.916	18.3	0.926	19.0	1.09
VONS <1.140V	V	IC=50.0mA, IF=5.0mA	0. 914	18.4	0.930	20.0	1.75
			0.920	18.6	0.931	19.0	1.20
ICCL	mA	VCC=5.0V, IF=2.0mA	360	4.16	353	5.65	-1.94
			357	3.87	354	4.79	-0.840
ICCL	mA	VCC=5.0V, IF=5.0mA	355	3.98	348	5.54	-1.97
			352	3.77	349	4.56	-0.852
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	332	2.46	334	2.71	0.602
			333	2.15	334	2.07	0.300
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	332	4.89	334	4.70	0.602
			333	4.84	333	4.69	-0-
IROUT <12nA	nA	VR=240V	0.910	0.215	1.38	0.449	51.65
			1.08	0 .379	1.17	0.260	8.33
IROUT <12nA	nA	VR=240V	2.76	2.77	3.93	4.01	42.39

			2.58	2.39	4.20	4.04	62.79

2.2

TEMPERATURE CYCLING (TC)

Actual ATE Static Electrical Characteristics of PVA3354N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Cycles)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	883.9	23.59	869.0	21.33	-1.70
VONS <1.140V	V	IC=50.0mA, IF=5.0mA	888.6	23.49	873.5	21.26	-1.70
ICCL	mA	VCC=5.0V, IF=2.0mA	366.5	8.089	372.1	7.536	1.50
ICCL	mA	VCC=5.0V, IF=5.0mA	362.2	7.902	367.6	7.392	1.50
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	329.7	4.182	329.6	4.080	-0.03
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	326.9	4.813	326.4	4.694	-0.15
IROUT <12nA	nA	VR=240V	0.230	0.685	0.025	0.055	-89.00
IROUT <12nA	nA	VR=240V	0.730	2.065	0.355	0.903	-51.00

Actual ATE Static Electrical Characteristics of PVD3354N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Cycles)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <297.mV	m	IC=50.0mA, IF=5.0mA	246.6	8.008	243.8	7.802	-1.14
ICCL	mA	VCC=5.0V, IF=4.0mA	715.4	19.02	725.6	19.38	1.43
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	334.5	5.737	334.0	5.720	-0.15
IROUT <12nA	nA	VR=240V	0.440	0.228	0.285	0.195	-35.23

TEMPERATURE CYCLING (TC) CONTINUE…

Actual ATE Static Electrical Characteristics of PVI1050N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Cycles)		
Symbol	Unit	Condition	Mean	s	Mean	s	
9 VONF <5.0V	V	IC=0A, ILED=10mA	6.895	135.7	6.826	148.2	-1.001
10 ICCH <5.0uA	uA	VCC=0V, ILED=10mA	7.905	586.2	6.930	558.3	-12.334
13 ICCH <14uA	uA	VCC=0V, ILED=25mA	22.53	1.593	19.93	1.53	-11.54
26 VONF <5.0V	V	IC=0A, ILED=10mA	6.920	31.82	6.860	40.23	-0.867
27 ICCH <5.0uA	uA	VCC=0V, ILED=10mA	7.950	502.1	7.125	494.0	-10.377
30 ICCH <14uA	uA	VCC=0V, ILED=25mA	22.69	1.317	20.43	1.314	-9.96

Actual ATE Static Electrical Characteristics of PVR3301N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Cycles)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	0.914	18.7	0.895	18.1	-2.08
			0.918	19.0	0.897	18.9	-2.28
VONS <1.140V	V	IC=50.0mA, IF=5.0mA	0.918	18.7	0.900	18.3	-1.96
			0.922	19.2	0.902	19.0	2.17
ICCL	mA	VCC=5.0V, IF=2.0mA	356	8.39	362	8.01	1.69
			355	7.06	362	7.23	1.97
ICCL	mA	VCC=5.0V, IF=5.0mA	351	8.11	357	7.73	1.71
			351	6.84	357	7.03	1.71
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	334	4.06	333	3.84	-0.299
			334	4.06	333	4.04	-0.299

BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	331	4.55	331	4.52	-0-
			331	4.49	331	4.35	-0-
IROUT <12nA	nA	VR=240V	1.29	0.250	1.42	0.217	10.78
			1.24	0.376	1.19	0.177	-4.03
IROUT <12nA	nA	VR=240V	3.71	1.24	3.99	3.61	7.55
			4.22	2.36	8.33	3.99	97.39

2.3

TEMPERATURE HUMIDITY BIAS (THB)

Actual ATE Static Electrical Characteristics of PVA3354N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	878.4	17.94	878.1	21.41	-0.03
VONS <1.140V	V	IC=50.0mA, IF=5.0mA	883.1	17.88	885.9	21.44	0.32
ICCL	mA	VCC=5.0V, IF=2.0mA	368.5	7.684	366.7	8.616	-0.49
ICCL	mA	VCC=5.0V, IF=5.0mA	364.0	7.546	362.5	8.598	-0.41
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	330.5	4.143	330.1	4.812	-0.12
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	327.5	4.218	327.6	4.535	0.03
IROUT <12nA	nA	VR=240V	0.230	0.134	0.195	0.201	-15.20
IROUT <12nA	nA	VR=240V	0.290	0.569	1.180	1.428	30.70

Actual ATE Static Electrical Characteristics of PVD3354N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <297.V	mV	IC=50.0mA, IF=5.0mA	251.2	4.199	252.7	7.209	0.60
ICCL	mA	VCC=5.0V, IF=4.0mA	704.2	10.08	703.2	11.27	-0.14
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	337.2	2.615	336.9	2.462	-0.09
IROUT <12nA	nA	VR=240V	0.945	0.235	0.860	0.315	-8.99

TEMPERATURE HUMIDITY (THB) CONTINUE...

Actual ATE Static Electrical Characteristics of PVI1050N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
9 VONF <5.0V	V	IC=0A, ILED=10mA	6.912	51.70	6.922	62.31	0.145
10 ICCH <5.0uA	uA	VCC=0V, ILED=10mA	7.410	1.069	7.891	997.1	6.491
13 ICCH <14uA	uA	VCC=0V, ILED=25mA	21.30	2.869	21.58	2.851	1.31
26 VONF <5.0V	V	IC=0A, ILED=10mA	6.906	58.58	6.919	63.76	0.188
27 ICCH <5.0uA	uA	VCC=0V, ILED=10mA	7.685	775.5	8.231	821.5	7.105
30 ICCH <14uA	uA	VCC=0V, ILED=25mA	21.96	2.111	22.36	2.221	1.82

Actual ATE Static Electrical Characteristics of PVR3301N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	0.919	16.8	0.924	15.4	0.544
			0.926	16.8	0.928	15.5	0.216
VONS <1.140V	V	IC=50.0mA, IF=5.0mA	0.923	16.8	0.929	1.55	0.650
			0.930	16.7	0.923	15.4	-0.753
ICCL	mA	VCC=5.0V, IF=2.0mA	356	7.95	354	7.23	-0.562
			354	8.82	353	8.49	-0.282
ICCL	mA	VCC=5.0V, IF=5.0mA	351	7.77	349	7.07	-0.570

			349	8.50	348	8.21	-0.287
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	334	4.43	334	4.49	-0-
			333	5.17	334	5.07	0.300
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	332	4.16	332	4.36	-0-
			332	4.02	332	4.19	-0-
IROUT <12nA	nA	VR=240V	1.16	0.176	0.915	0.184	-21.12
			1.07	0.150	0.990	0.236	-7.48
IROUT <12nA	nA	VR=240V	4.52	4.08	7.04	6.10	55.75
			3.71	1.77	6.69	5.32	80.32

2.4

HIGH TEMPERATURE BIAS (HTB)

Actual ATE Static Electrical Characteristics of PVA3354N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	878.5	29.59	880.1	30.03	0.18
VONS <1.140V	V	IC=50.0mA, IF=5.0mA	883.2	29.45	884.4	29.88	0.14
ICCL	mA	VCC=5.0V, IF=2.0mA	368.3	11.03	368.1	11.17	-0.05
ICCL 240.0mA	mA	VCC=5.0V, IF=5.0mA	364.0	10.78	363.8	10.92	-0.05
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	327.7	6.749	328.0	6.666	0.09
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	325.3	6.523	325.4	6.401	0.03
IROUT <12nA	nA	VR=240V	0.050	0.083	0.135	0.232	170.00
IROUT <12nA	nA	VR=240V	0.330	0.674	0.330	0.686	0.00

Actual ATE Static Electrical Characteristics of PVD3354N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <297.V	mV	IC=50.0mA, IF=5.0mA	251.1	3.060	252.2	3.588	0.44
ICCL	mA	VCC=5.0V, IF=4.0mA	703.2	6.775	702.8	7.424	-0.06

BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	337.2	1.619	337.2	2.082	0
IROUT <12nA	nA	VR=240V	0.450	0.317	0.730	.192	62.22

HIGH TEMPERATURE BIAS (HTB) CONTINUE...

Actual ATE Static Electrical Characteristics of PVI1050N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	878.5	29.59	880.1	30.03	0.18
9 VONF <5.0V	V	IC=0A, ILED=10mA	6.951	42.95	6.884	41.05	-0.964
10 ICCH <5.0uA	uA	VCC=0V, ILED=10mA	8.150	700.8	8.102	625.7	-0.589
13 ICCH <14uA	uA	VCC=0V, ILED=25mA	23.17	1.845	22.03	1.631	-4.92
26 VONF <5.0V	V	IC=0A, ILED=10mA	6.943	38.52	6.882	40.27	-0.879
27 ICCH <5.0uA	uA	VCC=0V, ILED=10mA	7.940	787.0	8.030	601.5	1.134
30 ICCH <14uA	uA	VCC=0V, ILED=25mA	22.64	2.027	21.84	1.568	-3.53

Actual ATE Static Electrical Characteristics of PVR3301N (SS = 20 units)

Parameters			Electrical Testing @ +25°C				Mean shift (%)
			Pre Data (0 Hour)		Post Data (1000 Hours)		
Symbol	Unit	Condition	Mean	s	Mean	s	
VONF <1.140V	V	IC=50.0mA, IF=5.0mA	0.909	18.5	0.916	17.0	0.770
			0.918	16.9	0.922	16.6	0.436
VONS <1.140V	V	IC=50.0mA, IF=5.0mA	0.913	18.7	0.921	17.3	0.876

			0.922	17.2	0.927	17.0	0.542
ICCL	mA	VCC=5.0V, IF=2.0mA	358	6.34	356	6.09	-0.559
			355	6.34	354	5.98	-0.282
ICCL	mA	VCC=5.0V, IF=5.0mA	353	6.10	352	5.86	-0.283
			350	6.12	349	5.77	-0.286
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	333	3.20	334	3.24	0.300
			334	3.50	334	3.40	-0-
BVOUT >309.0V	V	IR=50.0uA, Vmax=420V	330	6.62	331	6.77	0.303
			330	6.79	331	6.74	0.303
IROUT <12nA	nA	VR=240V	0.900	0.186	0.935	0.163	3.89
			0.815	0.252	1.09	0.190	33.74
IROUT <12nA	nA	VR=240V	3.44	3.80	9.06	3.85	163.37
			1.76	2.58	8.94	4.06	407.95

3.0 ENVIRONMENTAL STRESS TEST

3.1 AUTOCLAVE (AC)

CONDITIONS:

TEMPERATURE	T_A = +121°C
RELATIVE HUMIDITY	100% RH
PRESSURE	P_A = 15 psi
DURATION	16 Hours
BIAS	No bias applied during testing

PURPOSE: The purpose of autoclave testing is to subject non-hermetic encapsulated devices at temperature-humidity-pressure conditions accelerated at 121°C / 100% RH test. This test is being evaluated as a potential accelerated temperature/humidity test that would provide a more effective process control monitor. The devices are placed unbiased in a pressure cooker chamber for the specified time, removed and examined for physical and electrical degradation.

Power IC Quality / Reliability
233 Kansas Street
El Segundo, California 90245

Tel: 310 726-8000
Fax: 310 726-8846

3.2

ENVIRONMENTAL STRESS TEST

TEMPERATURE CYCLING (TC)

CONDITIONS:

TEMPERATURE	T_{Amin} = -55°C T_{Amax} = +150°C
DURATION	1000 Cycles
BIAS	No bias applied during testing

PURPOSE: The purpose of temperature cycling is to simulate thermal stresses, which devices will encounter in the actual circuit applications (as with operational life testing) in combination with potentially extreme operating ambient temperature. Some equipment is designed to be used in extreme conditions, subject to daily temperature cycles.

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3.3

ENVIRONMENTAL STRESS TEST

TEMPERATURE HUMIDITY BIAS TEST (THB or 85/85)

CONDITIONS:

TEMPERATURE	T_A = +85°C
RELATIVE HUMIDITY	85% RH
DURATION	1000 Hours

BIAS for PVA3354N and PVD3354N:

Vin = 6V through 5.1KΩ resistor
(Reverse Bias)

Vout = 10V through 222KΩ resistor
(Forward Bias)

BIAS for PVI1050N:

Vin = 6V through 5.1KΩ resistor
(Reverse Bias)

Vout = 6V through 222KΩ resistor
(Forward Bias)

BIAS for PVR3301N:

Vin = 6V through 5.1KΩ resistor
(Reverse Bias)

Vout = 240V through 222KΩ resistor
(Forward Bias)

PURPOSE: The purpose of 85/85 (temperature-humidity-bias) testing is to subject non-hermetic encapsulated devices to temperature and humidity extremes with bias on both logic and power sections of the die. This test is a method of examining the ability of a non-hermetic package to withstand the deleterious effect of a humid environment. The devices are placed in a temperature and humidity chamber at ambient pressure and are biased in the blocking mode.

3.4

ENVIRONMENTAL STRESS TEST

HIGH TEMPERATURE BIAS TEST (HTB)

CONDITIONS:

TEMPERATURE	T_A = +110°C
DURATION	1000 Hours

BIAS for PVA3354N and PVD3354N:

Vin = 6V through 5.1KΩ resistor
(Reverse Bias)

Vout = 240V through 222KΩ resistor
(Forward Bias)

BIAS for PVI1050N:

Vin = 6V through 5.1KΩ resistor
(Reverse Bias)

Vout = 6V through 222KΩ resistor
(Forward Bias)

BIAS for PVR3301N:

Vin = 6V through 5.1KΩ resistor
(Reverse Bias)

Vout = 240V through 222KΩ resistor
(Forward Bias)

PURPOSE: The purpose of high temperature bias testing is to stress the devices with applied bias in the blocking mode while at elevated junction temperature. This will accelerate any blocking voltage degradation process.