TJA1152/3 – FAILURE RATE INPUT AND FAILURE MODES

TJA1152/3 Failure rate Evaluation:

TJA1152T FIT	Estimate	Field Returns
FIT Category	IEC62380	Experienced
Die	13,7 FIT	0,5 FIT
Package	4,2 FIT	0,4 FIT
EOS	3,5 FIT	0,1 FIT
Total	**21,5 FIT**	**1,0 FIT**

TJA1153A FIT	Estimate	Field Returns
FIT Category	IEC62380	Experienced
Die	8,2 FIT	0,5 FIT
Package	4,4 FIT	0,4 FIT
EOS	2,4 FIT	0,1 FIT
Total	**15,0 FIT**	**1,0 FIT**

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TJA1152 – FAILURE RATE INPUT AND FAILURE MODES

TJA1152 Failure modes split:

for information only**

TJA1152T Die

Block Nr	Block Name	Failure Mode	Failure Mode Distribution	Failure Rate Distribution (All)
1	Filters (Time-out)	Stuck at faults (basic)	25,00%	0,06%
1	Filters (Time-out)	Open faults (basic)	25,00%	0,06%
1	Filters (Time-out)	Register data errors (basic)	25,00%	0,06%
1	Filters (Time-out)	Timing violation (basic)	25,00%	0,06%
2	Buffers (Mux/Driver)	Buffer output stuck at low	20,00%	0,17%
2	Buffers (Mux/Driver)	Buffer output stuck at high	20,00%	0,17%
2	Buffers (Mux/Driver)	Buffer output response to slow	20,00%	0,17%
2	Buffers (Mux/Driver)	Buffer supply too low	20,00%	0,17%
2	Buffers (Mux/Driver)	Buffer supply too high	20,00%	0,17%
3	OSC	Output is stuck Low	16,67%	0,05%
3	OSC	Output is stuck High	16,67%	0,05%
3	OSC	Frequency of the output signal is too high	16,67%	0,05%
3	OSC	Frequency of the output signal is too low	16,67%	0,05%
3	OSC	Jitter too high of the output signal	16,67%	0,05%
3	OSC	Incorrect duty cycle	16,67%	0,05%
4	Temperature protection	Over temperature shutdown always activated	25,00%	0,10%
4	Temperature protection	Over temperature shutdown never activated	25,00%	0,10%
4	Temperature protection	Over temperature threshold too low	25,00%	0,10%
4	Temperature protection	Over temperature threshold too high	25,00%	0,10%
5	CANRX	Received Data is stuck at high	25,00%	2,16%
5	CANRX	Received Data is stuck at low	25,00%	2,16%
5	CANRX	Timing fault (timeout)	25,00%	2,16%
5	CANRX	Received data corrupted	25,00%	2,16%
6	Undervoltage detection	Under Voltage detection always detected	50,00%	0,61%
6	Undervoltage detection	Under Voltage detection never detected	50,00%	0,61%
7	CANTX	Transmitted Data is stuck at high	25,00%	3,90%
7	CANTX	Transmitted Data is stuck at low	25,00%	3,90%
7	CANTX	Timing fault (timeout)	25,00%	3,90%
7	CANTX	Transmitted data corrupted	25,00%	3,90%
8	Wake	Buffer input stuck at low	25,00%	0,13%
8	Wake	Buffer input stuck at high	25,00%	0,13%
8	Wake	Buffer threshold too high	25,00%	0,13%
8	Wake	Buffer threshold too low	25,00%	0,13%
9	Digital	Stuck at faults (basic)	25,00%	0,57%
9	Digital	Open faults (basic)	25,00%	0,57%
9	Digital	Register data errors (basic)	25,00%	0,57%
9	Digital	Timing violation (basic)	25,00%	0,57%
10	Security	Security check Always activated	50,00%	28,35%
10	Security	Security Check Never Activated	50,00%	28,35%
11	Sealring & sawlane	Not split up	100,00%	13,21%
Total				100,0%

TJA1152T Package

Pin Nr	Pin Name	Failure Mode	Failure Mode Distribution	Failure Rate Distribution (All)
1	TXD	shorted to ground	25,00%	3,13%
1	TXD	open mode	25,00%	3,13%
1	TXD	shorted to neighbour pin	25,00%	3,13%
1	TXD	shorted to supply	25,00%	3,13%
2	GND	open mode	33,33%	4,17%
2	GND	shorted to neighbour pin	33,33%	4,17%
2	GND	shorted to supply	33,33%	4,17%
3	VCC	shorted to ground	33,33%	4,17%
3	VCC	open mode	33,33%	4,17%
3	VCC	shorted to neighbour pin	33,33%	4,17%
4	RXD	shorted to ground	33,33%	4,17%
4	RXD	open mode	33,33%	4,17%
4	RXD	shorted to supply	33,33%	4,17%
5	VIO	shorted to ground	33,33%	4,17%
5	VIO	open mode	33,33%	4,17%
5	VIO	shorted to neighbour pin	33,33%	4,17%
6	CANL	shorted to ground	25,00%	3,13%
6	CANL	open mode	25,00%	3,13%
6	CANL	shorted to neighbour pin	25,00%	3,13%
6	CANL	shorted to supply	25,00%	3,13%
7	CANH	shorted to ground	25,00%	3,13%
7	CANH	open mode	25,00%	3,13%
7	CANH	shorted to neighbour pin	25,00%	3,13%
7	CANH	shorted to supply	25,00%	3,13%
8	STB	shorted to ground	33,33%	4,17%
8	STB	open mode	33,33%	4,17%
8	STB	shorted to supply	33,33%	4,17%
Total				100,00%

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TJA1153 – FAILURE RATE INPUT AND FAILURE MODES

TJA1153 Failure modes split:

for information only**

TJA1153A Die

Block Nr	Block Name	Failure Mode	Failure Mode Ratio	Failure rate Distribution (All)
1	OSC	Output is stuck Low	16,67%	0,10%
1	OSC	Output is stuck High	16,67%	0,10%
1	OSC	Frequency of the output signal is too high	16,67%	0,10%
1	OSC	Frequency of the output signal is too low	16,67%	0,10%
1	OSC	Jitter too high of the output signal	16,67%	0,10%
1	OSC	Incorrect duty cycle	16,67%	0,10%
2	Supply	Regulated Output in overvoltage outside maximum rating	7,14%	0,23%
2	Supply	Regulated Output in overvoltage inside maximum rating	7,14%	0,23%
2	Supply	Regulated Output in undervoltage	14,29%	0,47%
2	Supply	Regulated Output affected by spikes	14,29%	0,47%
2	Supply	Regulated Output drift	14,29%	0,47%
2	Supply	Incorrect start-up time	14,29%	0,47%
2	Supply	Regulated Output Oscillation inside regulation range	14,29%	0,47%
2	Supply	Regulated Output Oscillation outside regulation range (inc drift)	14,29%	0,47%
3	Temperature protection	Over temperature shutdown always activated	25,00%	0,08%
3	Temperature protection	Over temperature shutdown never activated	25,00%	0,08%
3	Temperature protection	Over temperature threshold too low	25,00%	0,08%
3	Temperature protection	Over temperature threshold too high	25,00%	0,08%
4	CANRX	Received Data is stuck at high	25,00%	2,13%
4	CANRX	Received Data is stuck at low	25,00%	2,13%
4	CANRX	Timing fault (timeout)	25,00%	2,13%
4	CANRX	Received data corrupted	25,00%	2,13%
5	WAKE	Buffer input stuck at low	25,00%	0,51%
5	WAKE	Buffer input stuck at high	25,00%	0,51%
5	WAKE	Buffer threshold too high	25,00%	0,51%
5	WAKE	Buffer threshold too low	25,00%	0,51%
6	Undervoltage detection	Under Voltage detection always detected	50,00%	0,85%
6	Undervoltage detection	Under Voltage detection never detected	50,00%	0,85%
7	CANTX	Transmitted Data is stuck at high	25,00%	4,14%
7	CANTX	Transmitted Data is stuck at low	25,00%	4,14%
7	CANTX	Timing fault (timeout)	25,00%	4,14%
7	CANTX	Transmitted data corrupted	25,00%	4,14%
8	Digital	Stuck at faults (basic)	25,00%	1,86%
8	Digital	Open faults (basic)	25,00%	1,86%
8	Digital	Register data errors (basic)	25,00%	1,86%
8	Digital	Timing violation (basic)	25,00%	1,86%
9	Security	Security check Always Activated	50,00%	21,37%
9	Security	Security Check Never Activated	50,00%	21,37%
10	Others	Not split up	100,00%	3,30%
11	Sealring & sawlane	Not split up	100,00%	13,56%
Total				100,0%

TJA1153A Package

Pin Nr	Pin Name	Failure Mode	Failure Mode Ratio	Failure rate Distribution (All)
1	TXD	shorted to ground	25,00%	1,79%
1	TXD	open mode	25,00%	1,79%
1	TXD	shorted to neighbour pin	25,00%	1,79%
1	TXD	shorted to supply	25,00%	1,79%
2	GND	open mode	33,33%	2,38%
2	GND	shorted to neighbour pin	33,33%	2,38%
2	GND	shorted to supply	33,33%	2,38%
3	VCC	shorted to ground	33,33%	2,38%
3	VCC	open mode	33,33%	2,38%
3	VCC	shorted to neighbour pin	33,33%	2,38%
4	RXD	shorted to ground	25,00%	1,79%
4	RXD	open mode	25,00%	1,79%
4	RXD	shorted to neighbour pin	25,00%	1,79%
4	RXD	shorted to supply	25,00%	1,79%
5	VIO	shorted to ground	33,33%	2,38%
5	VIO	open mode	33,33%	2,38%
5	VIO	shorted to neighbour pin	33,33%	2,38%
6	EN	shorted to ground	25,00%	1,79%
6	EN	open mode	25,00%	1,79%
6	EN	shorted to neighbour pin	25,00%	1,79%
6	EN	shorted to supply	25,00%	1,79%
7	INH	shorted to ground	33,33%	2,38%
7	INH	open mode	33,33%	2,38%
7	INH	shorted to supply	33,33%	2,38%
8	i.c.	shorted to ground	25,00%	1,79%
8	i.c.	open mode	25,00%	1,79%
8	i.c.	shorted to neighbour pin	25,00%	1,79%
8	i.c.	shorted to supply	25,00%	1,79%
9	WAKE	shorted to ground	25,00%	1,79%
9	WAKE	open mode	25,00%	1,79%
9	WAKE	shorted to neighbour pin	25,00%	1,79%
9	WAKE	shorted to supply	25,00%	1,79%
10	VBAT	shorted to ground	33,33%	2,38%
10	VBAT	open mode	33,33%	2,38%
10	VBAT	shorted to neighbour pin	33,33%	2,38%
11	n.c.	shorted to ground	25,00%	1,79%
11	n.c.	open mode	25,00%	1,79%
11	n.c.	shorted to neighbour pin	25,00%	1,79%
11	n.c.	shorted to supply	25,00%	1,79%
12	CANL	shorted to ground	25,00%	1,79%
12	CANL	open mode	25,00%	1,79%
12	CANL	shorted to neighbour pin	25,00%	1,79%
12	CANL	shorted to supply	25,00%	1,79%
13	CANH	shorted to ground	25,00%	1,79%
13	CANH	open mode	25,00%	1,79%
13	CANH	shorted to neighbour pin	25,00%	1,79%
13	CANH	shorted to supply	25,00%	1,79%
14	STB_N	shorted to ground	33,33%	2,38%
14	STB_N	open mode	33,33%	2,38%
14	STB_N	shorted to supply	33,33%	2,38%
Total				100,00%

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