

Appendix H: FMECA Worksheet

Failure No.	Failure Mode	Possible Causes	Failure Effects	Method of Detection	Criticality	Remarks
Block A: Power Supply						
A1	V _{cc} = 0V	Failure of J6 or failure of U13, U14, U15 (Any component in Block A fails or an external short)	No power to U10, therefore no image displayed at all.	Observation	HIGH	
A2	V _{cc} > 5V	Failure of U13, U14, U15	Unpredictable effects	Observation	HIGH	
A3	V _{cc} out of tolerance	C7, C20, C8	High ripple or Operation at out of spec voltage; Unpredictable	Observation	HIGH	Monitor Wall Wart
Block B: User Interface						
B1	No response to pushbuttons	SW2, SW3, SW4, SW5	No new pictures obtained	Observation	LOW	Limits the users control method to IR remote
B2	IR fluctuating or corrupted	U16, U17	Random pictures displayed for undetermined periods of time	Observation	HIGH	

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Block B: User Interface						
B3	One of IR decoder outputs (PE0 - 4) stuck at 1.	U16,U17	Infinite cycle through images; Switching on and off continuously	Observation	HIGH	
Block C : Physical Connectors						
C1	All Outputs 0	U10, J8 R39,R40,R41, D5,D6,D7	No pixel data sent out on VGA connector	Observation	HIGH	Replace connector
C2	All Outputs 1	U10, J8 R39,R40,R41, D5,D6,D7	Wrong data on output connector; Unpredictable effects	Observation	HIGH	
C3	Random Outputs	U10, J8 R39,R40,R41, D5,D6,D7	Unpredictable effects	Observation	HIGH	
Block D: Graphics						
D1	Incorrect PLD outputs	U2, U3, U7	Pixel data sent to the wrong addresses, corrupted display	Observation	HIGH	
D2	PLDs Outputs all 0	U2, U3, U7, J5, U13	No addressing information available	Observation	HIGH	Bad Chip
D3	PLDs Outputs all 1	U2, U3, U7	Same Address is sent pixel data and is overwritten each time	Observation	LOW	

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D4	EPSON all Outputs 0	U10, Q1, J20,U13	No meaningful data buffered in DRAM or sent to VGA output; Unpredictable	Observation	HIGH	User gets incorrect data from PC. Product is not useful. Easily detected.
D5	EPSON all Outputs 1	U10, Q1, J20,U13, C1 – C6, C11 – 13	No meaningful data buffered in DRAM or sent to VGA output; Unpredictable	Observation	HIGH	
D6	Clk always high (1)	U12	EPSON's communication and synchronization with rest of circuit is affected; can't interface easily	Observation	HIGH	
Block E : Microcontroller						
E1	All outputs 0	Failure in μ C , U15, J6	NO functionality, interfacing, image transferring, No output at all	Observation	HIGH	Use reset controller
E2	All Outputs 1	Failure in μ C	Unpredictable	Observation	HIGH	Reset μ C
E3	Random outputs	S/W problem	Unpredictable effects	Observation	HIGH	Use headers to test S/W