

“Resistance Detection” Tolerance Allocation and Test Limits

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Budget

		Relative to 25K ohm Reference			
PD Budget		Pos. Delta Influence		Neg. Delta Influence	
	Assumption	Ohms	%	Ohms	%
25 K ohm signature tolerance	Comp. Tolerance	250	1.0	-250	-1.0
Diode series effects (2 diodes)	26 mV/current	200	0.8	0	0.0
Diode leakage	~ Inf ohms, parallel	0	0.0	0	0.0
MOSFET/isolation leakage	~Inf. ohms, parallel	0	0.0	0	0.0
Flux leakage	10 meg, parallel	0	0.0	-62	-0.2
Other margin ("6 dB")		450	1.8	-312	-1.2
PD Shall Present	Total	900	3.6	-624	-2.5
Loop, X-Connect Budget		Pos. Delta Influence		Neg. Delta Influence	
	Assumption	Ohms	%	Ohms	%
Cable series effect	Loop length	25	0.1	0	0.0
Cable leakage	100 Meg ohms, parallel	0	0.0	-6	0.0
Cross-connect leakage	500K ohms, parallel	0	0.0	-1190	-4.8
Other margin ("6 dB")		25	0.1	-1196	-4.784
	Total	50	0.2	-2392	-9.6
Seen by PSE(PD + loop)	Total	950	3.8	-3016	-12.1
Margin to ensure Detection	(extra "6 dB")	950	3.8	-3016	-12.1
PSE Shall accept		1900	7.6	-6032	-24.1
PSE Budget		Pos. Delta Influence		Neg. Delta Influence	
	Assumption	Ohms	%	Ohms	%
25 K ohm reference tolerance	Comp. Tolerance	250	1.0	-250	-1.0
MOSFET/switch leakage	10 Meg, parallel	0	0.0	-62	-0.2
Flux leakage	10 meg, parallel	0	0.0	-62	-0.2
Calculation Precision	3%	750	3.0	-750	-3.0
Other margin ("6 dB")		1000	4	-1124	-4.496
	Total	2000	8.0	-2248	-9.0
PSE Shall reject	Total Variation	3900	15.6	-8280	-33.1
	Total variation (%)	49			
	+/- variation (%)	24			

Devise Simple Tests to Verify PD Slope and PSE Slope Detection

Limits on PD's Presented Slope			
	High (ohms)	Low (ohms)	
PD resistive slope shall be within:	25900	24376	

	Slope Presented to PSE	
	High (ohms)	Low (ohms)
PSE shall reject	Infinite	28900
PSE "Gray' area	28900	26900
PSE Shall Accept	26900	18968
Presented by PD/Loop	25950	21984
PSE "Gray' area	18968	16720
PSE Shall reject	16720	0

Actions on Slopes Presented to PSE

