Impedance calculations for the MROD-X1 PCB

12 layers PCB 1,6 mm (1600 μ m) Cu 35 μ m (= 1,38 τ) Prepreg thickness: (1600 μ m - 12 * 35 μ m)/ (12 -1) = 107,3 μ m ϵ r = 4.2 (mean between glass fiber ϵ r = 6.1 and resin ϵ r = 3.2 ; see: http://www.polarinstruments.com/support/cits/AP148.html)

- 1. signal 50 Ω : 6 τ (49,5 Ω , figure 1)
- 2. power
- 3. signal 50 Ω : 3τ (impractical, figure 1)
- 4. ground
- 5. signal 50 Ω : 5 τ (48,5 Ω , figure 1, 2)
- 6. signal 100 Ω diff: 5τ - 6τ - 5τ (93.9 Ω, figure 1,2)/ 50 Ω : 8 τ (53,8 Ω, figure 3)
- 7. signal 100 Ω diff: 5 τ -6 τ -5 τ (93.9 Ω , figure 2) / 50 Ω : 8 τ (53,8 Ω , figure 3)
- 8. signal 50 Ω: 5τ (48,5 Ω, figure 2)
- 9. ground
- 10. signal 50 Ω : 3τ (impractical)
- 11. power
- 12. signal 50 Ω: 6τ (49,5 Ω)

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	INSULATOR_1	0.107												
	PHYSICAL_2	0.035	Power										HISPEED	
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	PHYSICAL_3	0.035	0.076	0.127	6.84	47.2	83.9	0.000739) 1	Ц			HE BEPORT	
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											-		INTERACT ELECTRICA	i l
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	Curve Mode			Sha	pe Mode a Pa	an On/Off							GUIDES CHANGE	-
	\$apply_calcu	late(["PHYSIC	CAL_3"], v	oid, 0.076,	0.127, vo	oid, void	, void, void	l);						-
	\$apply_calcu	late(["PHYSIC	CAL_1"], v	oid, void,	0.254, voi	d, void,	void, void)	3					ା ^{⊲ଃ} ^ ୢ୵ ୶ୖୄ	1
1	sapply_calcu	Tate([;AL_I"], V	010, V010,	U.152, V01	la, void,	void, void)	3				1		

Figure 1

-			Layout - /i	µser/peterj/o	lesigns∕imp	edance_wd/imp	edance -his	peed				l	
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Eleculeu cluss.	/////	•	net type n	aic	DEITIG		-	Setup Elec C	lass			SESSION	? HELP?
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								***************************************				AUTO #	AUTO #
physical	layer	trace	T–T	tpd	Zo	diffpair	crossta	lk parallel				PLACE #	ROUTE
layer	thickness	width	spacing	ps/length	ohms	Zo ohms	volts	length				DYNAMIC EDITOR	AREAFILL
INSULATOR 3	0.107				•••••			•••••	Π	хи.		CHANCER	
PHYSICAL_4	0.035	Power										REF	TEXT
INSULATOR_4	0.107	0 107	0 107	C 04	40 F	77 6	0.00100					u e de la B	
TNSULATOR 5	0.035	0.127	0.127	0.84	48.5	77.6	0.00133	1				INSPECU _E	
PHYSICAL_6	0.035	0.127	0.152	6.84	64.1	93.9	0.00183	1					DEDODT
INSULATOR_6	0.107											DISPLAY	SELECTED
PHYSICAL_7	0.035	0.127	0.152	6.84	64.1	93.9	0.00183	1				CONTINUES	
INSULATOR_/	0.107	0 197	0 197	6.84	48.5	77 6	0 00133	1					
INSULATOR 8	0.107	0.127	0.127	0.04	40.5	77.0	0.00133	-				SELECT FILTER	
PHYSICAL_9	0.035	Power							7	r		THE TEN	UNSELECT
												M 988 SETUP	SETUP
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Select one or more lay	ers using se		Indi-Select.	. Type in de	sireu vau	es and press	nppiy/cau	unatue .				<i>≤</i> ,∰~	
										-		INTERACT	ELECTRICAL
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												CHECK	CHECK
Field Solver P	recision:	High	Change to:	High	Med	Low Leng	jth unit:	mm.				ELEC RULES	SETUP
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F1 F2	F3	F4	F5	F6	F7	F8	F9	F10 F		F12		BY NAME	NET
Setup Sel FilterUnselect Area D	elete Vertex opu	ip Ext Mer Unh	ighlight Al Rou	uting Via s spl	ay Attribute	View All	E	dit Menu Edit	File Clo	se Windo	ow	121	H
Curve Mode	Nign Comps	F	'ivot 90 Piv Sha	/ot 180 c lisp pe Mode a Pa	lay Controlv an On/Off	lew Selected	8	oftkeys				MINIMIZE	CHANGE
\$apply_calcula	ate(["INSULA	ATOR 9"],	0.107, voi	d, void, vo	id, void	, void, void);					GOIDES	INET GUIDE
<pre>\$apply_calcula</pre>	te(["INSULA	ATOR 10"],	0.107, vo:	id, void, v	void, voi	d, void, voi	d);					o488≁1 ∕ ∙	SLT /+ C
Sapply_calcula	ate(["INSULA	ATUR_11"],	U.1U/, VO:	1d, void, v	701d, V01	d, void, voi	d);						

Figure 2



Figure 3