

Document Number SPIRE-RAL-NOT-002216
Document Title CQM Electrical Interface Checkout
Current Issue 2.0
Date 23 November 2004

Issue Record

Date	General details	Units Tested					Issue
		FPU	JFP-PSW	JFP-PMW-PLW	JFS	DCU	
13/11/2004	pre-delivery checkout before delivery to ASED for EQM programme	Yes	No	No	No	Yes	1.0
23/11/2004	incoming checkout at ASED for pre-integration checks	Yes	Yes	Yes	Yes	Yes	2.0

Notes

Below is the test procedure for carrying out the SPIRE Electrical Interface Checkout

Each time the test is carried out, the excel spreadsheet "CQM Electrical IF Checkout 2216 Issue X.xls" is to be updated. Once the test is completed, the document is re-issued by RAL. The spreadsheet will become a historical log of the interface status.

As it is foreseen that only RAL person will perform these tests, RAL will maintain the configuration control of the spreadsheet.

Procedures

FPU

- 1 Ensure that the FPU Chassis is connected to laboratory ground via grounding strap
- 2 Ensure that all personnel wear ESD wrist straps
- 3 Update the Test Details
- 4 Sequentially mate a 37-Way MDM breakout box to each of the connectors listed on the "FPU" worksheet
- 5 Measure and record the impedances listed in the "FPU" Worksheet
- 6 Update Cover Sheet or proceed to the next test

JFP/JFS

- 1 Ensure that the FPU Chassis is connected to laboratory ground via grounding strap
- 2 Ensure that all personnel wear ESD wrist straps
- 3 Update the Test Details
- 4 Sequentially mate a 37-Way MDM breakout box to each of the connectors listed on the "JFP-PSW" and "JFP-PLW-PMW" worksheets
- 5 Measure and record the impedances listed in the worksheets
- 6 Update Cover Sheet or proceed to the next test

DCU

- 1 Ensure that the DCU Chassis is connected to laboratory ground via grounding strap
- 2 Ensure that all personnel wear ESD wrist straps
- 3 Update the Test Details
- 4 Sequentially mate a breakout box to each of the connectors listed on the "DCU" worksheet
- 5 Measure and record the impedances listed in the worksheets
- 6 Update Cover Sheet or proceed to the next test

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Function	I+ to V+		I- to V-		V+ to V-		Shield		
	Pins	Measure	Pins	Measure	Pins	Measure	Pins	Measure	
P19 Cooler	Sorption Pump temp.	20, 1	5.8 Ω	2, 21	5.9 Ω	1, 2	54.3 Ω	3, 1, Chassis	O/C
	Evaporator temperature	22, 4	8.9 Ω	5, 23	8.9 Ω	4, 5	47.2 Ω	24, 4, Chassis	O/C
	Sorption Pump Heat Switch temperature	25, 6	6.2 Ω	7, 26	6.3 Ω	6, 7	52.6 Ω	8, 6, Chassis	O/C
	Evaporator Heat Switch temperature	27, 9	6.1 Ω	10, 28	6.1 Ω	9, 10	50.4 Ω	29, 27, Chassis	O/C
	Thermal Shunt temperature	30, 11	5.6 Ω	12, 31	5.6 Ω	11, 12	47.6 Ω	13, 30, Chassis	O/C
	Sorption Pump Heater	14, 32	6.8 Ω	15, 33	6.8 Ω	32, 15	408.3 Ω	NA	NA
	Sorption Pump Heat Switch Heater	16, 34	6.3 Ω	17, 35	6.3 Ω	34, 17	408.3 Ω	NA	NA
	Evaporator Heat Switch Heater	18, 36	5.9 Ω	19, 37	5.9 Ω	36, 19	408.0 Ω	NA	NA
J21 S-Cal	HS Spect. 4% temperature	5, 6	26.6 Ω	24, 25	27.1 Ω	6, 24	89.7 Ω	23, 5, Chassis	O/C
	HS Spect. 2% temperature	7, 8	16.1 Ω	26, 27	16.4 Ω	8, 26	80.9 Ω	9, 7, Chassis	O/C
	HS Spect. Stim Flange temperature	10, 11	0.9 Ω	28, 29	1.0 Ω	11, 28	38.5 Ω	30, 10, Chassis	O/C
	HS Spect. 4% Heater	14, 15	25.9 Ω	33, 34	24.4 Ω	15, 33	0.524 kΩ	NA	NA
	HS Spect. 2% Heater	16, 17	17.4 Ω	35, 36	17.1 Ω	17, 35	0.517 kΩ	NA	NA
Thermometry J23	FPU Filter temperature	20, 2	3.1 Ω	3, 21	3.2 Ω	2, 3	63.5 Ω	1, 2, Chassis	O/C
	Spectrometer Det. Box temperature	4, 23	213.6 Ω	24, 5	214.5 Ω	23, 24	253.1 Ω	22, 4, Chassis	O/C
	Photometer Det. Box temperature	25, 7	267.7 Ω	8, 26	269.3 Ω	7, 8	306.2 Ω	6, 7, Chassis	O/C
	Optical Sub-bench temperature	9, 28	3.0 Ω	29, 10	3.3 Ω	28, 29	41.0 Ω	27, 9, Chassis	O/C
	HSFPU Input Baffle temperature	30, 12	3.2 Ω	13, 31	3.3 Ω	12, 13	40.2 Ω	11, 12, Chassis	O/C
	BSM/SOB I/F temperature	14, 33	3.3 Ω	34, 15	3.3 Ω	33, 34	37.3 Ω	32, 14, Chassis	O/C
	PTC Heater	17, 18	O/C Ω	36, 37	O/C Ω	18, 36	O/C kΩ	35, 17, Chassis	NA

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	Function	I+ to V+		I- to V-		V+ to V-		Shield	
		Pins	Measure	Pins	Measure	Pins	Measure	Pins	Measure
BSM J25	BSM temperature	7,26	7.1 Ω	8, 27	7.4 Ω	26, 8	43.5 Ω	25, 7, Chassis	O/C
	Photometer Point Stim. Heater	28,10	0.9 Ω	29, 11	0.9 Ω	10, 29	250.7 Ω	9, 11, Chassis	O/C
	Chop Motor Drive	15, 34	266.1 Ω	16, 35	O/C Ω	34, 16	O/C Ω	17, 15, Chassis	O/C
	Jiggle Motor Drive	36, 18	264 Ω	37, 19	O/C Ω	18, 37	O/C Ω	17, 18, Chassis	O/C
J27	SMEC temperature	28, 10	0.7 Ω	29, 11	0.7 Ω	10, 29	0.911 k Ω	30,10, Chassis	O/C Ω
	SMEC/SOB I/F temperature	31, 13	0.7 Ω	32, 14	0.7 Ω	13, 32	0.895 k Ω	12, 13, Chassis	O/C Ω
J29	SMEC Drive Coil	1, 2	0.492 k Ω	NA	NA	NA	NA	20,1, Chassis	O/C
	SMEC Drive Coil (Rob)	21, 22	0.492 k Ω	NA	NA	NA	NA	3, 21, Chassis	O/C
	SMEC Drive Coil Sense	4, 5	0.6 Ω	NA	NA	NA	NA		O/C
P19 Cooler	Sorption Pump temp.	20, 1	5.8	2, 21	5.9	1, 2	53.8	3, 1, Chassis	ok
	Evaporator temperature	22, 4	8.9	5, 23	8.9	4, 5	46.9	24, 4, Chassis	ok
	Sorption Pump Heat Switch temperature	25, 6	6.2	7, 26	6.2	6, 7	52.1	8, 6, Chassis	ok
	Evaporator Heat Switch temperature	27, 9	6	10, 28	6.1	9, 10	49.9	29, 27, Chassis	ok
	Thermal Shunt temperature	30, 11	5.5	12, 31	5.6	11, 12	47.2	13, 30, Chassis	ok
	Sorption Pump Heater	14, 32	6.7	15, 33	6.7	32, 15	408.2	NA	NA
	Sorption Pump Heat Switch Heater	16, 34	6.2	17, 35	6.2	34, 17	408.2	NA	NA
Evaporator Heat Switch Heater	18, 36	5.9	19, 37	5.9	36, 19	407.8	NA	NA	
J21 S-Cal	HS Spect. 4% temperature	5, 6	26.4	24, 25	27.5	6, 24	89.4	23, 5, Chassis	ok
	HS Spect. 2% temperature	7, 8	16.1	26, 27	16.5	8, 26	80.6	9, 7, Chassis	ok
	HS Spect. Stim Flange temperature	10, 11	0.9	28, 29	1.2	11, 28	39.5	30, 10, Chassis	ok
	HS Spect. 4% Heater	14, 15	25.9	33, 34	24.4	15, 33	527000	NA	NA
	HS Spect. 2% Heater	16, 17	17.4	35, 36	18	17, 35	520000	NA	NA

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	Function	I+ to V+		I- to V-		V+ to V-		Shield	
		Pins	Measure	Pins	Measure	Pins	Measure	Pins	Measure
Thermometry J23	FPU Filter temperature	20, 2	3.2	3, 21	3.3	2, 3	62.9	1, 2, Chassis	ok
	Spectrometer Det. Box temperature	4, 23	214.7	24, 5	215.4	23, 24	253.6	22, 4, Chassis	ok
	Photometer Det. Box temperature	25, 7	269	8, 26	270.5	7, 8	307	6, 7, Chassis	ok
	Optical Sub-bench temperature	9, 28	3.3	29, 10	3.3	28, 29	40.6	27, 9, Chassis	ok
	HSFPU Input Baffle temperature	30, 12	3.3	13, 31	3.3	12, 13	39.9	11, 12, Chassis	ok
	BSM/SOB I/F temperature	14, 33	3.3	34, 15	3.3	33, 34	37	32, 14, Chassis	ok
	PTC Heater	17, 18	oc	36, 37	oc	18, 36	oc	35, 17, Chassis	NA
BSM J25	BSM temperature	7,26	7.3	8, 27	7.5	26, 8	43.2	25, 7, Chassis	ok
	Photometer Point Stim. Heater	28,10	1.1	29, 11	0.9	10, 29	258.8	9, 11, Chassis	ok
	Chop Motor Drive	15, 34	270.2	16, 35	oc	34, 16	oc	17, 15, Chassis	ok
	Jiggle Motor Drive	36, 18	268.5	37, 19	oc	18, 37	oc	17, 18, Chassis	ok
J27	SMEC temperature	28, 10	0.8	29, 11	0.7	10, 29	908	30,10, Chassis	ok
	SMEC/SOB I/F temperature	31, 13	0.7	32, 14	0.8	13, 32	893	12, 13, Chassis	ok
J29	SMEC Drive Coil	1, 2	500	NA	NA	NA	NA	20,1, Chassis	ok
	SMEC Drive Coil (Rob)	21, 22	500	NA	NA	NA	NA	3, 21, Chassis	ok
	SMEC Drive Coil Sense	4, 5	oc	NA	NA	NA	NA		

Name	HSJFP		CQM Inspection at OTN 23/11/04
	JFP J25	JFP J26	
	MDM 37	MDM 37	
PSW_JFETV1_A +	20		
PSW_JFETV1_A -	2		8040
PSW_JFETV1_A shld	1		53300
PSW_JFETV2_A +	3		
PSW_JFETV2_A -	22		8040
PSW_JFETV2_A shld	21		53300
PSW_JFETV3_A +	23		
PSW_JFETV3_A -	5		8040
PSW_JFETV3_A shld	4		53300
PSW_JFETV4_A +	6		
PSW_JFETV4_A -	25		8040
PSW_JFETV4_A shld	24		53300
PSW_JFETV5_A +	26		
PSW_JFETV5_A -	8		8040
PSW_JFETV5_A shld	7		53300
PSW_JFETV6_A +	9		
PSW_JFETV6_A -	28		8040
PSW_JFETV6_A shld	27		53200
PSW GRND_A	10		53300
PSW_BIAS1/2_A +	11		
PSW_BIAS1/2_A -	29		1025
PSW_BIAS1/2_A shld	30		53300
PSW_BIAS3/4_A +	31		
PSW_BIAS3/4_A -	12		1024
PSW_BIAS3/4_A shld	13		53200
PSW_BIAS5/6_A +	14		
PSW_BIAS5/6_A -	32		1025
PSW_BIAS5/6_A shld	33		53300
PSW_HEATER_A1 +	34		
PSW_HEATER_A1 -	15		999
PSW_HEATER_A1 shld	16		ok
PSW_HEATER_A2 +	17		
PSW_HEATER_A2 -	35		998
PSW_HEATER_A2 shld	36		ok
PSW_HEATER_A3 +	37		
PSW_HEATER_A3 -	18		1000
PSW_HEATER_A3 shld	36		ok
PSW_JFETV1_B +		20	
PSW_JFETV1_B -		2	8040
PSW_JFETV1_B shld		1	53200
PSW_JFETV2_B +		3	
PSW_JFETV2_B -		22	oc
PSW_JFETV2_B shld		21	53200
PSW_JFETV3_B +		23	
PSW_JFETV3_B -		5	8040
PSW_JFETV3_B shld		4	53200
PSW_JFETV4_B +		6	

Name	HSJFP		CQM Inspection at OTN 23/11/04
	JFP J25	JFP J26	
	MDM 37	MDM 37	
PSW_JFETV4_B -		25	8040
PSW_JFETV4_B shld		24	53200
PSW_JFETV5_B +		26	
PSW_JFETV5_B -		8	8040
PSW_JFETV5_B shld		7	53200
PSW_JFETV6_B +		9	
PSW_JFETV6_B -		28	8040
PSW_JFETV6_B shld		27	53200
PSW_GRND_B		10	53200
PSW_BIAS1/2_B +		11	
PSW_BIAS1/2_B -		29	1025
PSW_BIAS1/2_B shld		30	53200
PSW_BIAS3/4_B +		31	
PSW_BIAS3/4_B -		12	1024
PSW_BIAS3/4_B shld		13	53200
PSW_BIAS5/6_B +		14	
PSW_BIAS5/6_B -		32	1024
PSW_BIAS5/6_B shld		33	53200
PSW_HEATER_B1 +		34	
PSW_HEATER_B1 -		15	999
PSW_HEATER_B1 shld		16	ok
PSW_HEATER_B2 +		17	
PSW_HEATER_B2 -		35	998
PSW_HEATER_B2 shld		36	ok
PSW_HEATER_B3 +		37	
PSW_HEATER_B3 -		18	1001
PSW_HEATER_B3 shld		36	ok

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Name	HSJFP		CQM Inspection at OTN 23/11/04
	JFP J27	JFP J28	
PMW_JFETV1_A +	20		
PMW_JFETV1_A -	2		8040
PMW_JFETV1_A shld	1	ok	
PMW_JFETV2_A +	3		
PMW_JFETV2_A -	22		8040
PMW_JFETV2_A shld	21	ok	
PMW_JFETV3_A +	23		
PMW_JFETV3_A -	5		8040
PMW_JFETV3_A shld	4	ok	
PMW_JFETV4_A +	6		
PMW_JFETV4_A -	25		8040
PMW_JFETV4_A shld	24	ok	
PMW_BIAS1/2_A +	26		
PMW_BIAS1/2_A -	8		1024
PMW_BIAS1/2_A shld	7	ok	
PMW_BIAS3/4_A +	27		
PMW_BIAS3/4_A -	9		1025
PMW_BIAS3/4_A shld	28	ok	
PMW_GND WIRE_A	28	ok	
PMW_HEATER A1 +	29		
PMW_HEATER A1 -	10		1001
PMW_HEATER A1 shld	11	ok	
PMW_HEATER A2 +	12		
PMW_HEATER A2 -	30		1001
PMW_HEATER A2 shld	11	ok	
PLW_HEATER A +	13		
PLW_HEATER A -	31		1447
PLW_HEATER A shld	11	ok	
PLW_JFETV1_A +	14		
PLW_JFETV1_A -	32		1803
PLW_JFETV1_A shld	33	ok	
PLW_JFETV2_A +	34		
PLW_JFETV2_A -	15		1789
PLW_JFETV2_A shld	16	ok	
PLW_BIAS1_A +	17		
PLW_BIAS1_A -	35		641000
PLW_BIAS1_A shld	36	ok	
PLW_BIAS2_A +	37		
PLW_BIAS2_A -	18		742000
PLW_BIAS2_A shld	19	ok	
PLW_GROUND WIRE A	19	ok	
PMW_JFETV1_B +		20	
PMW_JFETV1_B -		2	8040
PMW_JFETV1_B shld		1	ok
PMW_JFETV2_B +		3	
PMW_JFETV2_B -		22	8040
PMW_JFETV2_B shld		21	ok

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Name	HSJFP		CQM Inspection at OTN 23/11/04
	JFP J27	JFP J28	
PMW_JFETV3_B +		23	
PMW_JFETV3_B -		5	8040
PMW_JFETV3_B shld		4 ok	
PMW_JFETV4_B +		6	
PMW_JFETV4_B -		25	8040
PMW_JFETV4_B shld		24 ok	
PMW_BIAS1/2_B +		26	
PMW_BIAS1/2_B -		8	1025
PMW_BIAS1/2_B shld		7 ok	
PMW_BIAS3/4_B +		27	
PMW_BIAS3/4_B -		9	1025
PMW_BIAS3/4_B shld		28 ok	
PMW_GND WIRE_B		28 ok	
PMW HEATER B1 +		29	
PMW HEATER B1 -		10	1001
PMW HEATER B1 shld		11 ok	
PMW HEATER B2 +		12	
PMW HEATER B2 -		30	1001
PMW HEATER B2 shld		11 ok	
PLW HEATER B +		13	
PLW HEATER B -		31	1447
PLW HEATER B shld		11 ok	
PLW_JFETV1_B +		14	
PLW_JFETV1_B -		32	1803
PLW_JFETV1_B shld		33 ok	
PLW_JFETV2_B +		34	
PLW_JFETV2_B -		15	1790
PLW_JFETV2_B shld		16 ok	
PLW_BIAS1_B +		17	
PLW_BIAS1_B -		35	642000
PLW_BIAS1_B shld		36 ok	
PLW_BIAS2_B +		37	
PLW_BIAS2_B -		18	742000
PLW_BIAS2_B shld		19 ok	
PLW GROUND WIRE B		19 ok	

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Function	HSJFS J9	HSJFS J10	CQM Inspection at OTN 23/11/04
	MDM 37	MDM 37	
PTC Bias_A +ve	1		
PTC Bias_A -ve	20		2049
PTC Bias_A Shield	NC		
PTC Ground A	2		OC
PTC JFETV Bias_A +ve	21		
PTC JFETV Bias_A -ve	3		8040
PTC JFETV Bias_A Shield	NC		
SLW_BIAS_A1+ve	22		
SLW_BIAS_A1-ve	4		2049
SLW_BIAS_A1 shld	NC		
SLW_BIAS_A2 +ve	5		
SLW_BIAS_A2 -ve	24		2049
SLW_BIAS_A2 shld	23		0.8
SLW Ground A	6		1.1
SLW_JFETV_A1 +ve	25		
SLW_JFETV_A1 -ve	7		8040
SLW_JFETV_A1 shld	NC		
SLW_JFETV_A2 +ve	8		
SLW_JFETV_A2 -ve	27		8040
SLW_JFETV_A2 shld	6		0.8
SSW_BIAS1_A +ve	28		
SSW_BIAS1_A -ve	10		2049
SSW_BIAS1_A shld	9		0.9
SSW_JFETV1_A +ve	11		
SSW_JFETV1_A -ve	30		8040
SSW_JFETV1_A shld	29		1.1
SSW Ground A	12		0.9
SSW_BIAS2_A +ve	13		
SSW_BIAS2_A -ve	32		2050
SSW_BIAS2_A shld	31		1.3
SSW_JFETV2_A +ve	33		
SSW_JFETV2_A -ve	15		8040
SSW_JFETV2_A shld	14		0.8
PTC JFET_HTR_A +ve	16		
PTC JFET_HTR_A -ve	35		1999
PTC JFET_HTR_A shld	NC		
SLW_JFET_HEATER_A +ve	17		
SLW_JFET_HEATER_A -ve	36		2005
SLW_JFET_HEATER_A shld	18		OC
SSW_JFET_HEATER_A +ve	37		
SSW_JFET_HEATER_A -ve	19		1000
SSW_JFET_HEATER_A shld	NC		
PTC Bias_B +ve		1	
PTC Bias_B -ve		20	2049
PTC Bias_B Shield		2	OC
PTC JFETV Bias_B +ve		21	
PTC JFETV Bias_B -ve		3	8040
PTC JFETV Bias_B Shield		2	OC

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Function	HSJFS J9	HSJFS J10	CQM Inspection at OTN 23/11/04
	MDM 37	MDM 37	
PTC Ground B			
SLW_BIAS_B1+ve		22	
SLW_BIAS_B1-ve		4	2049
SLW_BIAS_B1 shld		6	0.8
SLW_BIAS_B2 +ve		5	
SLW_BIAS_B2 -ve		24	2049
SLW_BIAS_B2 shld		23	0.8
SLW Ground B		6	0.8
SLW_JFETV_B1 +ve		25	
SLW_JFETV_B1 -ve		7	8040
SLW_JFETV_B1 shld		6	0.9
SLW_JFETV_B2 +ve		8	
SLW_JFETV_B2 -ve		27	8040
SLW_JFETV_B2 shld		6	0.8
SSW_BIAS1_B +ve		28	
SSW_BIAS1_B -ve		10	2049
SSW_BIAS1_B shld		9	0.8
SSW_JFETV1_B +ve		11	
SSW_JFETV1_B -ve		30	8040
SSW_JFETV1_B shld		29	1.2
SSW Ground B		12	0.8
SSW_BIAS2_B +ve		13	
SSW_BIAS2_B -ve		32	2049
SSW_BIAS2_B shld		31	0.8
SSW_JFETV2_B +ve		33	
SSW_JFETV2_B -ve		15	8040
SSW_JFETV2_B shld		14	0.8
SLW_HEATER_B +ve		17	
SLW_HEATER_B -ve		36	2005
SLW_HEATER_B shld		18	OC
SSW_HEATER_B +ve		37	
SSW_HEATER_B -ve		19	1000
SSW_HEATER_B shld		NC	
PTC JFET_HTR_B +ve		16	
PTC JFET_HTR_B -ve		35	2000
PTC JFET_HTR_B shld		NC	

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Name	DCU P31		
	S. Bias Tail A	Pin to chassis	
PTC Bias_A +ve	1	4.75M	5.86E+06
PTC Bias_A -ve	20	4.69M	5.86E+06
PTC Ground_A	2	0.4 Ohm	0.7
PTC JFETV Bias_A +ve	21	99.8k	9.99E+04
PTC JFETV Bias_A -ve	3	99.8k	9.99E+04
SLW_BIAS_A1+ve	22	6.12M	5.88E+06
SLW_BIAS_A1-ve	4	4.56M	5.88E+06
SLW_BIAS_A1 shld	6 (B)	0.30hm	7.00E-01
SLW_BIAS_A2 +ve	5	4.4M	5.88E+06
SLW_BIAS_A2 -ve	24	4.65M	5.88E+06
SLW_BIAS_A2 shld	23 (B)	0.40hm	7.00E-01
SLW_JFETV_A1 +ve	25	99.7k	9.97E+04
SLW_JFETV_A1 -ve	7	99.7k	9.98E+04
SLW_JFETV_A2 +ve	8	99.7k	9.97E+04
SLW_JFETV_A2 -ve	27	99.7k	9.98E+04
SSW_BIAS1_A +ve	28	4.53M	5.87E+06
SSW_BIAS1_A -ve	10	4.58M	5.87E+06
SSW_BIAS1_A shld	9 (C)	0.40hm	6.00E-01
SSW_JFETV1_A +ve	11	99.6k	9.97E+04
SSW_JFETV1_A -ve	30	99.6k	9.97E+04
SSW_JFETV1_A shld	29 (C)	0.40hm	7.00E-01
SSW GND WIRE_A	12 (C)	O/C	O/C
SSW_BIAS2_A +ve	13	4.5M	5.87E+06
SSW_BIAS2_A -ve	32	4.6M	5.87E+06
SSW_BIAS2_A shld	31 (C)	0.50hm	6.00E-01
SSW_JFETV2_A +ve	33	99.5k	9.96E+04
SSW_JFETV2_A -ve	15	99.4k	9.95E+04
SSW_JFETV2_A shld	14 (C)	0.40hm	5.00E-01
SLW_JFET_HEATER_A +ve	17	0.40hm	5.00E-01
SLW_JFET_HEATER_A -ve	36	99.7k	9.97E+04
SSW_JFET_HEATER_A +ve	37	0.30hm	7.00E-01

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SSW_JFET_HEATER_A -ve	19	99.4k	9.95E+04
PTC JFET HEATER_A +ve	16	0.4Ohm	7.00E-01
PTC JFET HEATER_A -ve	35	99.7k	9.98E+04

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Name	Function	DCU P27	DCU P28	Pin to Chassis	
Channel 1 +	SLW-R1	20		0.831M	9.86E+05
Channel 1 -		2		98.5k	9.97E+04
Channel 1gnd shld		1		0.995k	9.95E+02
Channel 2 +	SLW-T1	3		0.839M	9.88E+05
Channel 2 -		22		0.839M	9.76E+05
Channel 2gnd shld		21		1.004k	1.00E+03
Channel 3 +	SLW-C1	23		0.831M	9.86E+05
Channel 3 -		5		97.9k	9.94E+04
Channel 3gnd shld		4		0.999k	9.98E+02
Channel 4 +	SLW-DK1	6		0.785M	9.95E+05
Channel 4 -		25		0.848M	9.80E+05
Channel 4gnd shld		24		1.005k	1.01E+03
Channel 5 +	SLW-B1	26		98.7k	1.00E+05
Channel 5 -		8		97.7k	9.90E+04
Channel 5gnd shld		7		1.006k	1006
Channel 6 +	SLW-D1	9		0.845M	9.78E+05
Channel 6 -		28		0.792M	9.73E+05
Channel 6gnd shld		27		1.002k	1.00E+03
		10			9.99E+02
Channel 7 +	SLW-E1	11		0.812M	9.79E+05
Channel 7 -		29		0.841M	9.76E+05
Channel 7gnd shld		30		1.002k	1.00E+03
Channel 8 +	SLW-A1	31		0.834M	9.76E+05
Channel 8 -		12		0.815M	9.87E+05
Channel 8gnd shld		13		1.009k	1009
Channel 9 +	SLW-C2	14		97.8k	9.92E+04
Channel 9 -		32		98.6k	9.98E+04
Channel 9gnd shld		33		1.009k	1.01E+03
Channel 10 +	SLW-D2	34		0.831M	9.80E+05
Channel 10 -		15		0.797M	9.99E+05
Channel 10gnd shld		16		0.999M	9.99E+02
Channel 11 +		17		98.3k	9.95E+04

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Channel 11 -		35		0.841M	9.77E+05
Channel 11gnd shld	SLW-B2	36		1k	1.00E+03
Channel 12 +		37		0.821M	9.85E+05
Channel 12 -		18		0.806M	9.79E+05
Channel 12gnd shld	SLW-E2	19		1k	1.00E+03
Channel 13 +			20	0.762M	9.64E+05
Channel 13 -			2	97k	9.94E+04
Channel 13gnd shld	SLW-A2		1	0.999k	999
Channel 14 +			3	0.815M	9.92E+05
Channel 14 -			22	0.828M	9.82E+05
Channel 14gnd shld	SLW-C3		21	1k	9.99E+02
Channel 15 +			23	0.86M	9.85E+05
Channel 15 -			5	98.4k	9.97E+04
Channel 15gnd shld	SLW-D3		4	O/C	O/C
Channel 16 +			6	0.86M	9.88E+05
Channel 16 -			25	0.86M	9.88E+05
Channel 16gnd shld	SLW-B3		24	1.009k	1.01E+03

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Channel 17 +	SLW-E3		26	98.5k	9.98E+04
Channel 17 -			8	0.84M	9.78E+05
Channel 17gnd shld			7	1.001k	1.00E+03
Channel 18 +	SLW-C4		9	0.8M	9.78E+05
Channel 18 -			28	0.85M	9.84E+05
Channel 18gnd shld			27	1k	1.01E+03
SLW GND WIRE	SLW_GND		10	O/C	O/C
Channel 19 +	SLW-DK2		11	0.805M	9.88E+05
Channel 19 -			29	97.7k	9.90E+04
Channel 19gnd shld			30	1k	1.01E+03
Channel 20 +	SLW-D4		31	0.80M	9.85E+05
Channel 20 -			12	0.814M	9.79E+05
Channel 20gnd shld			13	1k	1.00E+03
Channel 21 +	SLW-C5		14	99k	1.00E+05
Channel 21 -			32	98.5k	9.99E+04
Channel 21gnd shld			33	1.0k	1.01E+03
Channel 22 +	SLW-B4		34	0.812M	9.81E+05
Channel 22 -			15	0.84M	9.80E+05
Channel 22gnd shld			16	0.999k	9.99E+02
Channel 23 +	SLW-A3		17	0.806M	9.82E+05
Channel 23 -			35	98.4k	9.96E+04
Channel 23gnd shld			36	1.0k	1.01E+03
Channel 24 +	SLW-T2		37	0.80M	9.85E+05
Channel 24 -			18	0.808M	9.82E+05
Channel 24gnd shld			19	0.997k	9.97E+02

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Description	78-way Photometer Biases (J29)	Pin to Chassis	
PSW_JFETV1_A +	1	99.7k	99800
PSW_JFETV1_A -	2	99.7k	99900
PSW_JFETV1_A shld	21 (A1)	0.3Ohm	0.5
PSW_JFETV2_A +	3	99.8k	99900
PSW_JFETV2_A -	23	99.8k	99900
PSW_JFETV2_A shld	22 (A1)	0.4Ohm	0.4
PSW_JFETV3_A +	4	99.9k	100000
PSW_JFETV3_A -	5	99.9k	99900
PSW_JFETV3_A shld	24 (A1)	0.3Ohm	0.4
PSW_JFETV4_A +	41	99.6k	99700
PSW_JFETV4_A -	60	99.5k	99400
PSW_JFETV4_A shld	40 (A1)	0.3Ohm	0.4
PSW_JFETV5_A +	61	99.4k	99400
PSW_JFETV5_A -	62	99.9k	100000
PSW_JFETV5_A shld	42 (A1)	0.3Ohm	0.4
PSW_JFETV6_A +	63	99.7k	9.98E+04
PSW_JFETV6_A -	44	100.1k	1.00E+05
PSW_JFETV6_A shld	43 (A1)	0.3Ohm	0.4
PSW_GRND_A	27 (A1)	0.2Ohm	0.4
PSW_BIAS1/2_A +	6	4.14M	5.88E+06
PSW_BIAS1/2_A -	26	4.6M	5.88E+06
PSW_BIAS1/2_A shld	25 (A1)	0.3Ohm	4.00E-01
PSW_BIAS3/4_A +	65	4.7M	5.88E+06
PSW_BIAS3/4_A -	64	4.8M	5.88E+06
PSW_BIAS3/4_A shld	45 (A1)	0.3Ohm	5.00E-01
PSW_BIAS5/6_A +	47	4.9M	5.88E+06
PSW_BIAS5/6_A -	66	5.0M	5.88E+06
PSW_BIAS5/6_A shld	46 (A1)	0.3 Ohm	4.00E-01
PSW_HEATER_A1 +	8	0.2 Ohm	4.00E-01
PSW_HEATER_A1 -	9	99.7k	9.98E+04
PSW_HEATER_A2 +	29	0.3 Ohm	4.00E-01

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PSW_HEATER_A2 -	49	99.8k	9.99E+04
PSW_HEATER_A3 +	68	0.3 Ohm	4.00E-01
PSW_HEATER_A3 -	67	99.7 k	9.98E+04
PMW_JFETV1_A +	10	99.6k	9.97E+04
PMW_JFETV1_A -	11	99.5k	9.96E+04
PMW_JFETV1_A shld	30 (C1)	0.3 Ohm	4.00E-01
PMW_JFETV2_A +	12	99.7k	9.98E+04
PMW_JFETV2_A -	31	99.5k	9.95E+04
PMW_JFETV2_A shld	32 (C1)	0.2 Ohm	4.00E-01
PMW_JFETV3_A +	69	99.5k	9.96E+04
PMW_JFETV3_A -	70	99.8k	9.98E+04
PMW_JFETV3_A shld	50 (C1)	0.3 Ohm	4.00E-01
PMW_JFETV4_A +	71	99.4k	9.95E+04
PMW_JFETV4_A -	52	99.9k	9.99E+04
PMW_JFETV4_A shld	51 (C1)	0.3 Ohm	4.00E-01
PMW_BIAS1/2_A +	14	4.9M	5.88E+06
PMW_BIAS1/2_A -	13	4.9M	5.89E+06
PMW_BIAS1/2_A shld	33 (C1)	0.3 Ohm	7.00E-01
PMW_BIAS3/4_A +	73	4.9M	5.89E+06
PMW_BIAS3/4_A -	72	5.0M	5.89E+06
PMW_BIAS3/4_A shld	53 (C1)	0.4 Ohm	6.00E-01
PMW_GND WIRE_A	34 (C1)	0.3 Ohm	5.00E-01
PMW HEATER A1 +	16	0.2 Ohm	5.00E-01
PMW HEATER A1 -	15	99.7k	9.98E+04
PMW HEATER A2 +	54	0.3 Ohm	5.00E-01
PMW HEATER A2 -	74	99.8k	9.98E+04
PLW HEATER A +	20	0.2 Ohm	5.00E-01
PLW HEATER A -	39	99.5k	9.96E+04
PLW_JFETV1_A +	36	99.5k	9.97E+04
PLW_JFETV1_A -	17	99.7k	9.98E+04
PLW_JFETV1_A shld	37 (D1)	0.3 Ohm	5.00E-01
PLW_JFETV2_A +	18	99.8k	9.99E+04
PLW_JFETV2_A -	19	100.0k	1.00E+05
PLW_JFETV2_A shld	38 (D1)	0.3 Ohm	8.00E-01

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PLW_BIAS1_A +	75	5.0M	5.88E+06
PLW_BIAS1_A -	76	4.9M	5.88E+06
PLW_BIAS1_A shld	56 (D1)	0.3 Ohm	1.00E+00
PLW_BIAS2_A +	77	4.9M	5.88E+06
PLW_BIAS2_A -	57	4.9M	5.88E+06
PLW_BIAS2_A shld	58 (D1)	0.3 Ohm	9.00E-01
PLW GROUND WIRE A	78 (D1)	0.3 Ohm	1.00E+00

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Pixel	DCU J14	Pin to Chassis	
PLW-R1	1	0.85M	9.75E+05
	18	0.84M	9.74E+05
	34	1k	1.00E+03
PLW-A8	2	0.86M	9.87E+05
	19	0.86M	9.84E+05
	35	1k	1.00E+03
PLW-A7	3	0.84M	9.73E+05
	20	0.85M	9.85E+05
	36	0.996k	9.96E+02
PLW-A6	4	0.86M	9.78E+05
	21	0.85M	9.85E+05
	37	1.0k	1.00E+03
PLW-A9	5	0.84M	9.79E+05
	22	0.83M	9.74E+05
	38	1.0k	1.00E+03
PLW-C9	6	0.85M	9.82E+05
	23	0.76M	9.58E+05
	39	0.998k	9.98E+02
PLW-B8	7	0.85M	9.81E+05
	24	0.83M	9.79E+05
	40	1.0k	1.01E+03
PLW-B7	8	0.84M	9.75E+05
	25	0.87M	9.84E+05
	41	1.0k	1.01E+03
	9	1.0k	1003
	42		1.00E+03
PLW-C7	26	0.83M	9.70E+05
	10	0.85M	9.81E+05
	43	1.0k	1.00E+03
PLW-B5	27	0.85M	9.84E+05
	11	0.85M	9.88E+05
	44	1.0k	1.00E+03

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PLW-B6	28	0.85M	9.86E+05
	12	0.84M	9.75E+05
	45	1.0k	1.00E+03
PLW-A5	29	0.86M	9.80E+05
	13	0.85M	9.78E+05
	46	1.0k	1.01E+03
PLW-T1	30	0.84M	9.72E+05
	14	0.85M	9.78E+05
	47	1.0k	1.00E+03
PLW-B4	31	0.86M	9.80E+05
	15	0.85M	9.89E+05
	48	1.0k	1.00E+03
PLW-C4	32	0.86M	9.84E+05
	16	0.87M	9.87E+05
	49	0.998k	9.98E+02
PLW-B3	33	0.85M	9.78E+05
	17	0.83M	9.83E+05
	50	1.0k	1.01E+03

Pixel	DCU J15	Pin to Chassis	
PLW-C2	1	0.85M	9.77E+05
	18	0.85M	9.81E+05
	34	1.0k	1.01E+03
PLW-B2	2	0.85M	9.73E+05
	19	0.86M	9.87E+05
	35	1.0k	1.00E+03
PLW-B1	3	0.84M	9.76E+05
	20	0.85M	9.81E+05
	36	1.0k	1.01E+03
PLW-A3	4	0.85M	9.75E+05
	21	0.84M	9.76E+05
	37	1.0k	1.00E+03
	5	0.86M	9.88E+05

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PLW-A4	22	0.82M	9.69E+05
	38	1.0k	1.00E+03
PLW-A1	6	0.86M	9.91E+05
	23	0.86M	9.81E+05
	39	1.0k	1.01E+03
PLW-DK1	7	0.88M	9.92E+05
	24	0.87M	9.87E+05
	40	1.0k	1.00E+03
PLW-A2	8	0.84M	9.80E+05
	25	0.87M	9.83E+05
	41	1.0k	1.00E+03
	9	0.999k	999
	42		9.99E+02
PLW-E1	26	0.85M	9.84E+05
	10	0.85M	9.84E+05
	43	1.0k	1.00E+03
PLW-E2	27	0.86M	9.83E+05
	11	0.85M	9.71E+05
	44	1.0k	1.01E+03
PLW-E3	28	0.87M	9.81E+05
	12	0.87M	9.88E+05
	45	1.0k	1.01E+03
PLW-E4	29	0.85M	9.76E+05
	13	0.85M	9.72E+05
	46	0.998k	9.98E+02
PLW-D1	30	0.85M	9.86E+05
	14	0.86M	9.80E+05
	47	1.0k	1.00E+03
PLW-D2	31	0.86M	9.74E+05
	15	0.85M	9.83E+05
	48	1.0k	1.01E+03
PLW-D3	32	0.80M	9.87E+05
	16	0.83M	9.78E+05
	49	1.0k	1.00E+03

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PLW-D4	33	0.88M	9.80E+05
	17	0.84M	9.78E+05
	50	1.0k	1.00E+03

Pixel	DCU J16	Pin to Chassis	
PLW-C1	1	7.00E+06	9.87E+05
	18	0.82 M	9.86E+05
	34	1.0 k	1.01E+03
PLW-C3	2	0.86 M	9.93E+05
	19	0.84 M	9.78E+05
	35	1.0 k	1.00E+03
PLW-C5	3	0.85 M	9.83E+05
	20	0.85 M	9.80E+05
	36	1.0 k	1.00E+03
PLW-T2	4	0.86 M	9.78E+05
	21	0.85 M	9.85E+05
	37	1.0 k	1.00E+03
PLW-E5	5	0.84 M	9.85E+05
	22	0.85 M	9.89E+05
	38	1.0 k	1.00E+03
PLW-C6	6	0.86 M	9.98E+05
	23	0.84 M	9.84E+05
	39	1.0 k	1.01E+03
PLW-C8	7	0.85 M	1.00E+06
	24	0.85 M	9.92E+05
	40	0.99 k	9.98E+02
PLW-D5	8	0.85 M	9.94E+05
	25	0.84 M	9.80E+05
	41	0.999 k	9.99E+02
	9	0.999 k	9.99E+02
	42		9.99E+02
	26	0.836M	9.79E+05
	10	0.86M	9.86E+05

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PLW-D6	43	1.0 k	1.01E+03
PLW-D7	27	0.82 M	9.75E+05
	11	0.86 M	9.86E+05
	44	1.0 k	1.00E+03
PLW-D8	28	0.86 M	9.89E+05
	12	0.85 M	9.85E+05
	45	1.0 k	1.01E+03
PLW-E7	29	0.84 M	9.81E+05
	13	0.85 M	9.91E+05
	46	1.0 k	1.01E+03
PLW-E6	30	0.84 M	9.86E+05
	14	0.82 M	9.79E+05
	47	1.0 k	1.00E+03
PLW-E8	31	0.83 M	9.88E+05
	15	0.86 M	9.85E+05
	48	0.999 k	9.98E+02
PLW-DK2	32	0.84 M	9.73E+05
	16	0.84 M	9.87E+05
	49	1.0 k	1.01E+03
PLW-E9	33	0.84 M	9.90E+05
	17	0.84 M	9.82E+05
	50	1.0 k	1.00E+03