

**Document Number** SPIRE-RAL-NOT-002216  
**Document Title** CQM Electrical Interface Checkout  
**Current Issue** 5.0  
**Date** 14 January 2005

**Issue Record**

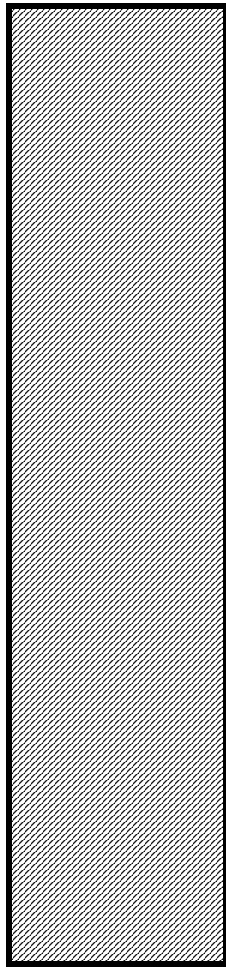
Date	General details	Units Tested					Issue	Comments
		FPU	JFP-PSW	JFP-PMW-PLW	JFS	DCU		
13/11/2004	pre-delivery checkout before delivery to ASED for EQM programme	Yes	No	No	No	Yes	1.0	
23/11/2004	incoming checkout at ASED for pre-integration checks	Yes	Yes	Yes	Yes	Yes	2.0	
26/11/2004	adjusted formatting to make table more intuitive (hopefully!)	No	No	No	No	No	3.0	
12/01/2005	Inserted a procedure section and incorporated reminders from NCR-92	No	No	No	No	No	4.0	
14/01/2005	Outgoing inspection of CQM from RAL to OTN	Yes	Yes	Yes	Yes	No	5.0	* SMEC Drive Col Sense open circuit * PSW_JFETV2_B open circuit * PLW_JFETV1_B possible intermittent fault but probably BOB

# SPIRE-RAL-NOT-002216

Function	HSJFS J9	HSJFS J10	CQM Inspection at OTN 23/11/04	pre-delivery 1/01/05
	MDM 37	MDM 37		
PTC Bias_A	1, 20	[REDACTED]	2049 Ω	2050 Ω
PTC Ground A	2, Chassis		OK	OK
PTC JFETV Bias_A	3, 21		8040 Ω	8040 Ω
PTC JFETV Bias_A Shield	NC		Not Tested	
SLW_BIAS_A1	4, 22		2049 Ω	2049 Ω
SLW_BIAS_A1 shld	NC		Not Tested	
SLW_BIAS_A2	5, 24		2049 Ω	2049 Ω
SLW_BIAS_A2 shld	23		0.8 Ω	OK
SLW Ground A	6		1.1 Ω	OK
SLW_JFETV_A1	7, 25		8040 Ω	8040 Ω
SLW_JFETV_A1 shld	NC		Not Tested	
SLW_JFETV_A2	8, 27		8040 Ω	8040 Ω
SLW_JFETV_A2 shld	6		0.8 Ω	OK
SSW_BIAS1_A	10, 28		2049 Ω	2050 Ω
SSW_BIAS1_A shld	9		0.9 Ω	OK
SSW_JFETV1_A	11, 30		8040 Ω	8040 Ω
SSW_JFETV1_A shld	29		1.1 Ω	OK
SSW Ground A	12		0.9 Ω	OK
SSW_BIAS2_A	13, 32		2050 Ω	2050 Ω
SSW_BIAS2_A shld	31		1.3 Ω	OK
SSW_JFETV2_A	15, 33		8040 Ω	8040 Ω
SSW_JFETV2_A shld	14		0.8 Ω	OK
PTC JFET_HTR_A	16, 35		1999 Ω	2000 Ω
PTC JFET_HTR_A shld	NC		Not Tested	
SLW_JFET_HEATER_A	17, 36		2005 Ω	2005 Ω
SLW_JFET_HEATER_A shld	18		OK	OK
SSW_JFET_HEATER_A	19, 37		1000 Ω	1000 Ω
SSW_JFET_HEATER_A shld	NC		Not Tested	Not Tested

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PTC Bias_B	1, 20	2049 $\Omega$	2051 $\Omega$
PTC Bias_B Shield	2	OK	OK
PTC JFETV Bias_B +ve	3, 21	8040 $\Omega$	8040 $\Omega$
PTC JFETV Bias_B Shield	2	OK	OK
PTC Ground B			
SLW_BIAS_B1	4, 22	2049 $\Omega$	2049 $\Omega$
SLW_BIAS_B1 shld	6	0.8 $\Omega$	OK
SLW_BIAS_B2	5, 24	2049 $\Omega$	2049 $\Omega$
SLW_BIAS_B2 shld	23	0.8 $\Omega$	OK
SLW Ground B	6	0.8 $\Omega$	OK
SLW_JFETV_B1	7, 25	8040 $\Omega$	8040 $\Omega$
SLW_JFETV_B1 shld	6	0.9 $\Omega$	OK
SLW_JFETV_B2	8, 27	8040 $\Omega$	8040 $\Omega$
SLW_JFETV_B2 shld	6	0.8 $\Omega$	OK
SSW_BIAS1_B	10, 28	2049 $\Omega$	2050 $\Omega$
SSW_BIAS1_B shld	9	0.8 $\Omega$	OK
SSW_JFETV1_B	11, 30	8040 $\Omega$	8040 $\Omega$
SSW_JFETV1_B shld	29	1.2 $\Omega$	OK
SSW Ground B	12	0.8 $\Omega$	OK
SSW_BIAS2_B	13, 32	2049 $\Omega$	2050 $\Omega$
SSW_BIAS2_B shld	31	0.8 $\Omega$	OK
SSW_JFETV2_B	15, 33	8040 $\Omega$	8040 $\Omega$
SSW_JFETV2_B shld	14	0.8 $\Omega$	OK
SLW_HEATER_B	17, 36	2005 $\Omega$	2005 $\Omega$
SLW_HEATER_B shld	18	OK	OK
SSW_HEATER_B +ve	19, 37	1000 $\Omega$	1000 $\Omega$
SSW_HEATER_B shld	NC	Not Tested	Not Tested
PTC JFET_HTR_B +ve	16, 35	2000 $\Omega$	2000 $\Omega$
PTC JFET_HTR_B shld	NC	Not Tested	Not Tested



# SPIRE-RAL-NOT-002216

Name

JFP J27

JFP J28

CQM Inspection at  
OTN 23/11/04

pre-delivery  
checkout  
14/01/2005

PMW_JFETV1_A	2, 20		8040 Ω	8040 Ω
PMW_JFETV1_A shld	1, Chassis		OK	OK
PMW_JFETV2_A	3, 22		8040 Ω	8040 Ω
PMW_JFETV2_A shld	21, Chassis		OK	OK
PMW_JFETV3_A	5, 23		8040 Ω	8040 Ω
PMW_JFETV3_A shld	4, Chassis		OK	OK
PMW_JFETV4_A	6, 25		8040 Ω	8040 Ω
PMW_JFETV4_A shld	24, Chassis		OK	OK
PMW_BIAS1/2_A	8, 26		1024 Ω	1025 Ω
PMW_BIAS1/2_A shld	7, Chassis		OK	OK
PMW_BIAS3/4_A	9, 27		1025 Ω	1025 Ω
PMW_BIAS3/4_A shld	28, Chassis		OK	OK
PMW_GND_WIRE_A	28, Chassis		OK	OK
PMW_HEATER_A1	10, 29		1001 Ω	1001 Ω
PMW_HEATER_A1 shld	11, Chassis		OK	OK
PMW_HEATER_A2	12, 30		1001 Ω	1001 Ω
PMW_HEATER_A2 shld	11, Chassis		OK	OK
PLW_HEATER_A	13, 31		1447 Ω	1444 Ω
PLW_HEATER_A shld	11, Chassis		OK	OK
PLW_JFETV1_A	14, 32		1803 Ω	1798 Ω
PLW_JFETV1_A shld	33, Chassis		OK	OK
PLW_JFETV2_A	15, 34		1789 Ω	1786 Ω
PLW_JFETV2_A shld	16, Chassis		OK	OK
PLW_BIAS1_A	17, 35		641000 Ω	641 Ω
PLW_BIAS1_A shld	36, Chassis		OK	OK
PLW_BIAS2_A	18, 37		742000 Ω	741 Ω
PLW_BIAS2_A shld	19, Chassis		OK	OK
PLW_GROUND_WIRE_A	19, Chassis		OK	OK
PMW_JFETV1_B +		2, 20	8040 Ω	8040 Ω
PMW_JFETV1_B shld		1	OK	OK
PMW_JFETV2_B +		3, 22	8040 Ω	8040 Ω
PMW_JFETV2_B shld		21	OK	OK
PMW_JFETV3_B +		5, 23	8040 Ω	8040 Ω
PMW_JFETV3_B shld		4	OK	OK
PMW_JFETV4_B +		6, 25	8040 Ω	8040 Ω
PMW_JFETV4_B shld		24	OK	OK
PMW_BIAS1/2_B +		8, 26	1025 Ω	1025 Ω
PMW_BIAS1/2_B shld		7	OK	OK
PMW_BIAS3/4_B +		9, 27	1025 Ω	1025 Ω
PMW_BIAS3/4_B shld		28	OK	OK
PMW_GND_WIRE_B		28	OK	OK
PMW_HEATER_B1 +		10, 29	1001 Ω	1001 Ω
PMW_HEATER_B1 shld		11	OK	OK
PMW_HEATER_B2 +		12, 30	1001 Ω	1001 Ω
PMW_HEATER_B2 shld		11	OK	OK
PLW_HEATER_B +		13, 31	1447 Ω	1444 Ω

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PLW HEATER B shld		11	OK	OK
PLW_JFETV1_B +		14, 32	1803 $\Omega$	1800 $\Omega$
PLW_JFETV1_B shld		33	OK	OK
PLW_JFETV2_B +		15, 34	1790 $\Omega$	1787 $\Omega$
PLW_JFETV2_B shld		16	OK	OK
PLW_BIAS1_B +		17, 35	642000 $\Omega$	641 $\Omega$
PLW_BIAS1_B shld		36	OK	OK
PLW_BIAS2_B +		18, 37	742000 $\Omega$	743 $\Omega$
PLW_BIAS2_B shld		19	OK	OK
PLW GROUND WIRE B		19	OK	OK

Name

JFP J25  
MDM 37JFP J26  
MDM 37post-delivery  
checkout  
23/11/04pre-delivery  
checkout  
14/01/2005

PSW_JFETV1_A	20, 2		8040 Ω	8040 Ω
PSW_JFETV1_A shld	1, Chassis		53300 Ω	OK
PSW_JFETV2_A	3, 22		8040 Ω	8040 Ω
PSW_JFETV2_A shld	21, Chassis		53300 Ω	OK
PSW_JFETV3_A	5, 23		8040 Ω	8040 Ω
PSW_JFETV3_A shld	4, Chassis		53300 Ω	OK
PSW_JFETV4_A	6, 25		8040 Ω	8040 Ω
PSW_JFETV4_A shld	24, Chassis		53300 Ω	OK
PSW_JFETV5_A	8, 26		8040 Ω	8040 Ω
PSW_JFETV5_A shld	7, Chassis		53300 Ω	OK
PSW_JFETV6_A	9, 28		8040 Ω	8040 Ω
PSW_JFETV6_A shld	27, Chassis		53200 Ω	OK
PSW_GRND_A	10		53300 Ω	OK
PSW_BIAS1/2_A	11, 29		1025 Ω	1025 Ω
PSW_BIAS1/2_A shld	30, Chassis		53300 Ω	OK
PSW_BIAS3/4_A	12, 31		1024 Ω	1025 Ω
PSW_BIAS3/4_A shld	13, Chassis		53200 Ω	OK
PSW_BIAS5/6_A	14, 32		1025 Ω	1025 Ω
PSW_BIAS5/6_A shld	33, Chassis		53300 Ω	OK
PSW_HEATER_A1	15, 34		999 Ω	1000 Ω
PSW_HEATER_A1 shld	16, Chassis		OK	OK
PSW_HEATER_A2	17, 35		998 Ω	999 Ω
PSW_HEATER_A2 shld	36, Chassis		OK	OK
PSW_HEATER_A3 +	18, 37		1000 Ω	1001 Ω
PSW_HEATER_A3 shld	36, Chassis		OK	OK
PSW_JFETV1_B		20, 2	8040 Ω	8040 Ω
PSW_JFETV1_B shld		1, Chassis	53200 Ω	OK
PSW_JFETV2_B		3, 22	O/C	O/C
PSW_JFETV2_B shld		21, Chassis	53200 Ω	OK
PSW_JFETV3_B		5, 23	8040 Ω	8040 Ω
PSW_JFETV3_B shld		4, Chassis	53200 Ω	OK
PSW_JFETV4_B		6, 25	8040 Ω	8040 Ω
PSW_JFETV4_B shld		24, Chassis	53200 Ω	OK
PSW_JFETV5_B		8, 26	8040 Ω	8040 Ω
PSW_JFETV5_B shld		7, Chassis	53200 Ω	OK
PSW_JFETV6_B		9, 28	8040 Ω	8040 Ω
PSW_JFETV6_B shld		27, Chassis	53200 Ω	OK
PSW_GRND_B		10	53200 Ω	OK
PSW_BIAS1/2_B		11, 29	1025 Ω	1025 Ω
PSW_BIAS1/2_B shld		30, Chassis	53200 Ω	OK
PSW_BIAS3/4_B		12, 31	1024 Ω	1025 Ω
PSW_BIAS3/4_B shld		13	53200 Ω	OK
PSW_BIAS5/6_B		14, 32	1024 Ω	1025 Ω
PSW_BIAS5/6_B shld		33	53200 Ω	OK
PSW_HEATER_B1		15, 34	999 Ω	999 Ω
PSW_HEATER_B1 shld		16	OK	OK
PSW_HEATER_B2 +		17, 35	998 Ω	999 Ω
PSW_HEATER_B2 shld		36	OK	OK
PSW_HEATER_B3 +		18, 37	1001 Ω	1001 Ω
PSW_HEATER_B3 shld		36	OK	OK

# SPIRE-RAL-NOT-002216

	Function	Wire desc.	Pin Numbers	Pre-delivery checkout 13/11/04	post-delivery checkout 23/11/04	pre-delivery checkout 14/01/05
P19 Cooler	Sorption Pump temp.	I+ to V+	20, 1	5.8 Ω	5.8 Ω	5.8 Ω
		I- to V-	2, 21	5.9 Ω	5.9 Ω	5.8 Ω
		V+ to V-	1, 2	54.3 Ω	53.8 Ω	54.3 Ω
		Shield	3, 1, Chassis	OK	OK	ok
	Evaporator temperature	I+ to V+	22, 4	8.9 Ω	8.9 Ω	9 Ω
		I- to V-	5, 23	8.9 Ω	8.9 Ω	8.9 Ω
		V+ to V-	4, 5	47.2 Ω	46.9 Ω	47.4 Ω
		Shield	24, 4, Chassis	OK	OK	ok
	Sorption Pump Heat Switch temperature	I+ to V+	25, 6	6.2 Ω	6.2 Ω	6.2 Ω
		I- to V-	7, 26	6.3 Ω	6.2 Ω	6.2 Ω
		V+ to V-	6, 7	52.6 Ω	52.1 Ω	52.6 Ω
		Shield	8, 6, Chassis	OK	OK	ok
Evaporator Heat Switch temperature	I+ to V+	27, 9	6.1 Ω	6 Ω	6 Ω	
	I- to V-	10, 28	6.1 Ω	6.1 Ω	6 Ω	
	V+ to V-	9, 10	50.4 Ω	49.9 Ω	50.4 Ω	
	Shield	29, 27, Chassis	OK	OK	ok	
Thermal Shunt temperature	I+ to V+	30, 11	5.6 Ω	5.5 Ω	5.7 Ω	
	I- to V-	12, 31	5.6 Ω	5.6 Ω	5.6 Ω	
	V+ to V-	11, 12	47.6 Ω	47.2 Ω	47.6 Ω	
	Shield	13, 30, Chassis	OK	OK	ok	
Sorption Pump Heater	I+ to V+	14, 32	6.8 Ω	6.7 Ω	6.7 Ω	
	I- to V-	15, 33	6.8 Ω	6.7 Ω	6.7 Ω	
	V+ to V-	32, 15	408.3 Ω	408.2 Ω	408.2 Ω	
Sorption Pump Heat Switch Heater	I+ to V+	16, 34	6.3 Ω	6.2 Ω	6.3 Ω	
	I- to V-	17, 35	6.3 Ω	6.2 Ω	6.2 Ω	
	V+ to V-	34, 17	408.3 Ω	408.2 Ω	408.2 Ω	
Evaporator Heat Switch Heater	I+ to V+	18, 36	5.9 Ω	5.9 Ω	5.9 Ω	
	I- to V-	19, 37	5.9 Ω	5.9 Ω	5.9 Ω	
	V+ to V-	36, 19	408 Ω	407.8 Ω	407.8 Ω	
J21 S-Cal	HS Spect. 4% temperature	I+ to V+	5, 6	26.6 Ω	26.4 Ω	26.4 Ω
		I- to V-	24, 25	27.1 Ω	27.5 Ω	27.1 Ω
		V+ to V-	6, 24	89.7 Ω	89.4 Ω	89.8 Ω
		Shield	23, 5, Chassis	OK	OK	ok
	HS Spect. 2% temperature	I+ to V+	7, 8	16.1 Ω	16.1 Ω	16.1 Ω
		I- to V-	26, 27	16.4 Ω	16.5 Ω	16.4 Ω
		V+ to V-	8, 26	80.9 Ω	80.6 Ω	81 Ω
		Shield	9, 7, Chassis	OK	OK	ok
	HS Spect. Stim Flange temperature	I+ to V+	10, 11	0.9 Ω	0.9 Ω	0.9 Ω
		I- to V-	28, 29	1 Ω	1.2 Ω	0.9 Ω
		V+ to V-	11, 28	38.5 Ω	39.5 Ω	38.5 Ω
		Shield	30, 10, Chassis	OK	OK	ok
HS Spect. 4% Heater	I+ to V+	14, 15	25.9 Ω	25.9 Ω	25.9 Ω	
	I- to V-	33, 34	24.4 Ω	24.4 Ω	24.4 Ω	
	V+ to V-	15, 33	524 Ω	527 Ω	524 Ω	
HS Spect. 2% Heater	I+ to V+	16, 17	17.4 Ω	17.4 Ω	17.4 Ω	
	I- to V-	35, 36	17 Ω	18 Ω	17.1 Ω	
	V+ to V-	17, 35	517 Ω	520 Ω	517 Ω	
FPU Filter temperature	I+ to V+	20, 2	3.1 Ω	3.2 Ω	3.1 Ω	
	I- to V-	3, 21	3.2 Ω	3.3 Ω	3.1 Ω	
	V+ to V-	2, 3	63.5 Ω	62.9 Ω	63.6 Ω	

## SPIRE-RAL-NOT-002216

Thermometry J23

	Shield	1, 2, Chassis	OK	OK	ok
Spectrometer Det. Box temperature	I+ to V+	4, 23	213.6 Ω	214.7 Ω	213.4 Ω
	I- to V-	24, 5	214.5 Ω	215.4 Ω	214.3 Ω
	V+ to V-	23, 24	253.1 Ω	253.6 Ω	252.9 Ω
	Shield	22, 4, Chassis	OK	OK	ok
Photometer Det. Box temperature	I+ to V+	25, 7	267.7 Ω	269 Ω	267.9 Ω
	I- to V-	8, 26	269.3 Ω	270.5 Ω	269.1 Ω
	V+ to V-	7, 8	306.2 Ω	307 Ω	306 Ω
	Shield	6, 7, Chassis	OK	OK	ok
Optical Sub-bench temperature	I+ to V+	9, 28	3 Ω	3.3 Ω	3 Ω
	I- to V-	29, 10	3.3 Ω	3.3 Ω	3.2 Ω
	V+ to V-	28, 29	41 Ω	40.6 Ω	41 Ω
	Shield	27, 9, Chassis	OK	OK	ok
HSFPU Input Baffle temperature	I+ to V+	30, 12	3.2 Ω	3.3 Ω	3.2 Ω
	I- to V-	13, 31	3.3 Ω	3.3 Ω	3.2 Ω
	V+ to V-	12, 13	40.2 Ω	39.9 Ω	40.2 Ω
	Shield	11, 12, Chassis	OK	OK	ok
BSM/SOB I/F temperature	I+ to V+	14, 33	3.3 Ω	3.3 Ω	3.2 Ω
	I- to V-	34, 15	3.3 Ω	3.3 Ω	3.3 Ω
	V+ to V-	33, 34	37.3 Ω	37 Ω	37.2 Ω
	Shield	32, 14, Chassis	OK	OK	ok
PTC Heater	I+ to V+	17, 18	~	~	~
	I- to V-	36, 37	~	~	~
	V+ to V-	18, 36	~	~	~
	Shield	35, 17, Chassis	OK	OK	ok

BSM J25

BSM temperature	I+ to V+	7,26	7.1 Ω	7.3 Ω	7.1 Ω
	I- to V-	8, 27	7.4 Ω	7.5 Ω	7.4 Ω
	V+ to V-	26, 8	43.5 Ω	43.2 Ω	43.4 Ω
	Shield	25, 7, Chassis	OK	ok	ok
Photometer Point Stim. Heater	I+ to V+	28,10	0.9 Ω	1.1 Ω	0.9 Ω
	I- to V-	29, 11	0.9 Ω	0.9 Ω	0.9 Ω
	V+ to V-	10, 29	250.7 Ω	258.8 Ω	250.7 Ω
	Shield	9, 11, Chassis	OK	OK	ok
Chop Motor Drive		15, 34	266.1 Ω	270.2 Ω	265.2 Ω
		16, 35	~	~	~
		34, 16	~	~	~
		17, 15, Chassis	OK	OK	ok
Jiggle Motor Drive		36, 18	264 Ω	268.5 Ω	411 Ω
		37, 19	~	~	~
		18, 37	~	~	~
		17, 18, Chassis	OK	OK	ok

J27

SMEC temperature	I+ to V+	28, 10	0.7 Ω	0.8 Ω	0.7 Ω
	I- to V-	29, 11	0.7 Ω	0.7 Ω	0.7 Ω
	V+ to V-	10, 29	911 Ω	908 Ω	911 Ω
	Shield	30,10, Chassis	OK	OK	ok
SMEC/SOB I/F temperature	I+ to V+	31, 13	0.7 Ω	0.7 Ω	0.7 Ω
	I- to V-	32, 14	0.7 Ω	0.8 Ω	0.7 Ω
	V+ to V-	13, 32	895 Ω	893 Ω	896 Ω
	Shield	12, 13, Chassis	OK	OK	ok

J29

SMEC Drive Coil		1, 2	492 Ω	500 Ω	491 Ω
		20,1, Chassis	OK	OK	ok
SMEC Drive Coil (Rob)		21, 22	492 Ω	500 Ω	491 Ω
		3, 21, Chassis	OK	OK	ok
SMEC Drive Coil Sense		4, 5	0.6 Ω	~	~
		23, 4, Chassis	OK	OK	ok



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 test, 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
- Ensure that the detector box is electrically isolated from the chassis of the FPU (e.g. is the electrical isolation on the
- 4 Spect. Det. Box LO Strap correct?)
- 5 Remove ESD Safeing plugs from JFET Bias connectors
- Sequentially mate a 37-Way MDM breakout box to each of the connectors listed on the "JFP-PSW" and "JFP-PLW-PMW"
- 6 worksheets
- 7 Measure and record the impedances listed in the worksheets
- 8 Replace ESD Safeing plugs to the JFET bias connectors
- 9 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