

**Tested By: Jay Copti****Date: 08/07/2013****ASC (WFS) Style Detector Measured Parameters**

All transimpedance measurements are referred to plane of the physical output connector and include the effect of the voltage divider created by the 50  $\Omega$  termination. All notch rejection ratios are relative to the magnitude of the transimpedance at the respective RF detection center frequency of the given RF output port. The notation, Q1 to Q4 refers to the specific quadrant of a four section (Quad) diode.

<b>Unit identification</b>	<b>Value</b>
Photodetector serial number	S1300505
Detector schematic D# and revision	D1101614-v2
Diode element manufacturer and serial number	N/A

<b>DC Parameters</b>	<b>Value</b>
Quiescent DC current (amps at +18 VDC)	169.7 mA
Quiescent DC current (amps at -18 VDC)	237.1 mA
PD bias regulator output voltage (VDC)	5.03 VDC
RF opamp positive voltage regulator (VDC)	5.87 VDC
RF opamp negative voltage regulator (VDC)	-6.02 VDC
Audio opamp positive voltage regulator (VDC)	14.76 VDC
Audio opamp negative voltage regulator (VDC)	-15.29 VDC

<b>DC readout transimpedance (<math>\Omega</math> at differential output)</b>	<b>Value</b>
Q1	998 $\Omega$
Q2	997 $\Omega$
Q3	997 $\Omega$
Q4	998 $\Omega$

<b>Global RF parameters</b>	<b>Value</b>
RF detection center frequency (MHz), f low	9 MHz
RF detection center frequency (MHz), f hi	45 MHz
Notch frequencies (MHz) used in design	18, 36, 54, 90 MHz

<b>Q1 RF notch parameters</b>	<b>Value</b>
Measured DC photocurrent (mA)	0.592 mA
f low, Rejection (dB) at notch1	-32.0 dB
f low, Rejection (dB) at notch2	-39.1 dB
f low, Rejection (dB) at notch3	-46.5 dB
f low, Rejection (dB) at notch4	-46.3 dB
f low, to f hi rejection	-28.1 dB
f hi, Rejection (dB) at notch1	-50.0 dB
f hi, Rejection (dB) at notch2	-36.1 dB
f hi, Rejection (dB) at notch3	-28.6 dB
f hi, Rejection (dB) at notch4	-44.6 dB
f hi, to f low rejection	-54.1 dB

<b>Q2 RF notch parameters</b>	<b>Value</b>
Measured DC photocurrent (mA)	0.390 mA
f low, Rejection (dB) at notch1	-31.5 dB
f low, Rejection (dB) at notch2	-39.0 dB
f low, Rejection (dB) at notch3	-38.1 dB
f low, Rejection (dB) at notch4	-42.6 dB
f low, to f hi rejection	-30.6 dB
f hi, Rejection (dB) at notch1	-50.0 dB
f hi, Rejection (dB) at notch2	-36.0 dB
f hi, Rejection (dB) at notch3	-28.5 dB
f hi, Rejection (dB) at notch4	-28.5 dB
f hi, to f low rejection	-53.2 dB

<b>Q3 RF notch parameters</b>	<b>Value</b>
Measured DC photocurrent (mA)	0.409 mA
f low, Rejection (dB) at notch1	-31.0 dB
f low, Rejection (dB) at notch2	-38.1 dB
f low, Rejection (dB) at notch3	-37.2 dB
f low, Rejection (dB) at notch4	-48.1 dB
f low, to f hi rejection	-26.7 dB
f hi, Rejection (dB) at notch1	-50.2 dB
f hi, Rejection (dB) at notch2	-36.4 dB
f hi, Rejection (dB) at notch3	-28.8 dB
f hi, Rejection (dB) at notch4	-43.2 dB
f hi, to f low rejection	-55.5 dB

<b>Q4 RF notch parameters</b>	<b>Value</b>
Measured DC photocurrent (mA)	0.305 mA
f low, Rejection (dB) at notch1	-29.9 dB
f low, Rejection (dB) at notch2	-38.0 dB
f low, Rejection (dB) at notch3	-37.1 dB
f low, Rejection (dB) at notch4	-40.5 dB
f low, to f hi rejection	-30.8 dB
f hi, Rejection (dB) at notch1	-49.3 dB
f hi, Rejection (dB) at notch2	-36.0 dB
f hi, Rejection (dB) at notch3	-40.5 dB
f hi, Rejection (dB) at notch4	-40.5 dB
f hi, to f low rejection	-55.9 dB

<b>Q1 RF transimpedance</b>	<b>Value</b>
Photocurrent from Calibrator (mA)	<b>10.30 mA ( LO ) / 10.12 mA ( HI )</b>
Transimpedance ( $\Omega$ ) at f low	793 $\Omega$
Transimpedance ( $\Omega$ ) at f hi	631 $\Omega$

<b>Q2 RF transimpedance</b>	<b>Value</b>
Photocurrent from Calibrator (mA)	<b>10.0 mA ( LO ) / 10.12 mA ( HI )</b>
Transimpedance ( $\Omega$ ) at f low	824 $\Omega$
Transimpedance ( $\Omega$ ) at f hi	637 $\Omega$

<b>Q3 RF transimpedance</b>	<b>Value</b>
Photocurrent from Calibrator (mA)	<b>10.15 mA ( LO ) / 10.15 mA ( HI )</b>
Transimpedance ( $\Omega$ ) at f low	802 $\Omega$
Transimpedance ( $\Omega$ ) at f hi	682 $\Omega$

<b>Q4 RF transimpedance</b>	<b>Value</b>
Photocurrent from Calibrator (mA)	<b>10.30 mA ( LO ) / 9.97 mA ( HI )</b>
Transimpedance ( $\Omega$ ) at f low	879 $\Omega$
Transimpedance ( $\Omega$ ) at f hi	595 $\Omega$

<b>Q1 Shot-noise limited input sensitivity</b>	<b>Value</b>	
f low (mA)	1.05 mA	
Dark Noise / Preamp Gain. For actual PD output noise, subtract RF preamplifier gain.	-123.3 dBm/Hz	20.4 dB
f hi (mA)	3.18 mA	
Dark Noise / Preamp Gain. For actual PD output noise, subtract RF preamplifier gain.	-120.5 dBm/Hz	20.4 dB

<b>Q2 Shot-noise limited input sensitivity</b>	<b>Value</b>	
f low (mA)	0.99 mA	
Dark Noise / Preamp Gain. For actual PD output noise, subtract RF preamplifier gain.	-123.2 dBm/Hz	20.4 dB
f hi (mA)	2.90 mA	
Dark Noise / Preamp Gain. For actual PD output noise, subtract RF preamplifier gain.	-120.8 dBm/Hz	20.4 dB

<b>Q3 Shot-noise limited input sensitivity</b>	<b>Value</b>	
f low (mA)	0.93 mA	
Dark Noise / Preamp Gain. For actual PD output noise, subtract RF preamplifier gain.	-123.7 dBm/Hz	20.4 dB
f hi (mA)	2.59 mA	
Dark Noise / Preamp Gain. For actual PD output noise, subtract RF preamplifier gain.	-120.7 dBm/Hz	20.4 dB

<b>Q4 Shot-noise limited input sensitivity</b>	<b>Value</b>	
f low (mA)	0.82 mA	
Dark Noise / Preamp Gain. For actual PD output noise, subtract RF preamplifier gain.	-123.5 dBm/Hz	20.4 dB
f hi (mA)	3.33 mA	
Dark Noise / Preamp Gain. For actual PD output noise, subtract RF preamplifier gain.	-120.8 dBm/Hz	20.4 dB

<b>Q1 test input transconductance</b>	<b>Value</b>
f low (mA/V)	2.84 mA/V
f hi (mA/V)	4.47 mA/V

<b>Q2 test input transconductance</b>	<b>Value</b>
f low (mA/V)	2.91 mA/V
f hi (mA/V)	4.42 mA/V

<b>Q3 test input transconductance</b>	<b>Value</b>
f low (mA/V)	2.65 mA/V
f hi (mA/V)	4.27 mA/V

<b>Q4 test input transconductance</b>	<b>Value</b>
f low (mA/V)	2.57 mA/V
f hi (mA/V)	4.77 mA/V