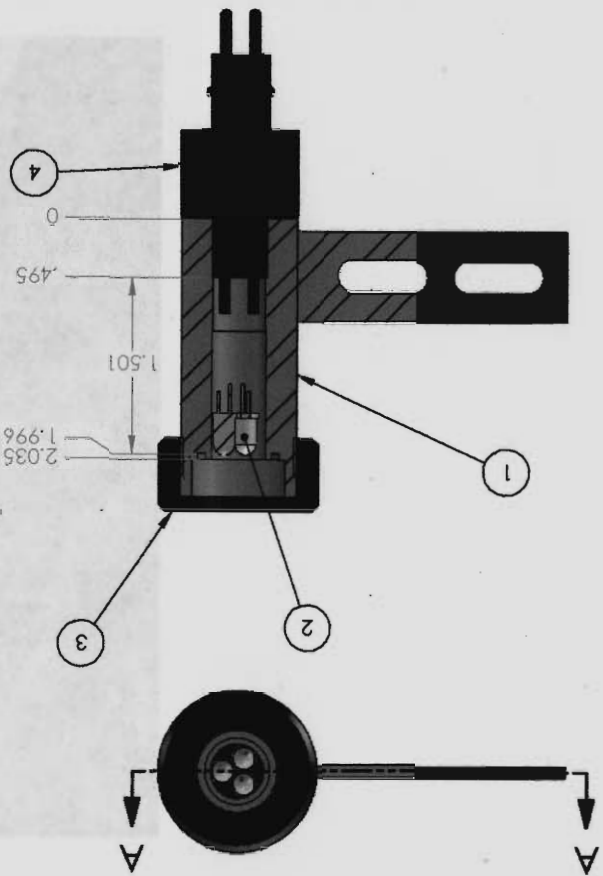
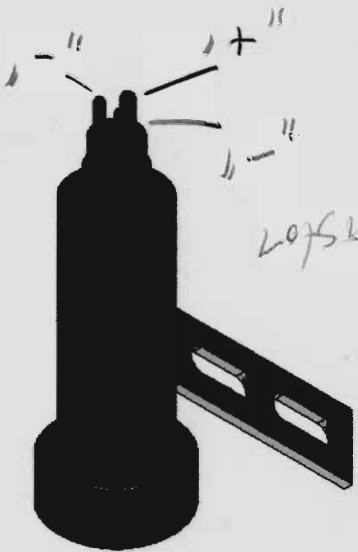


SECTION A-A



Shop / Q.C.	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:	REV 1	DATE 6/1/2011	DRAWN BY: MARIAN	7700 Sandhills RD., Mesa, Arizona, CA 95039	DESIGNED BY: MARIAN	901027-A-S20 - LED Light	SCALE: 1:1	PROJECT: 901027	PROJECT NO. 901027	PROJECT: 901027-A-S20
Inspector	1. DIMENSIONS ARE IN INCHES 2. DIMENSIONS ARE IN MILLIMETERS 3. REMOVE ALL SHARP EDGES AND MAX. 4. MACHINED SURFACES TO A FINISH OF 5. MACHINED SURFACES TO A FINISH OF 6. MACHINED SURFACES TO A FINISH OF	DESIGNER	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
Shop Foreman	1. DIMENSIONS ARE IN INCHES 2. DIMENSIONS ARE IN MILLIMETERS 3. REMOVE ALL SHARP EDGES AND MAX. 4. MACHINED SURFACES TO A FINISH OF 5. MACHINED SURFACES TO A FINISH OF 6. MACHINED SURFACES TO A FINISH OF	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
Engineer	1. DIMENSIONS ARE IN INCHES 2. DIMENSIONS ARE IN MILLIMETERS 3. REMOVE ALL SHARP EDGES AND MAX. 4. MACHINED SURFACES TO A FINISH OF 5. MACHINED SURFACES TO A FINISH OF 6. MACHINED SURFACES TO A FINISH OF	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
Next Ass't Description	1. DIMENSIONS ARE IN INCHES 2. DIMENSIONS ARE IN MILLIMETERS 3. REMOVE ALL SHARP EDGES AND MAX. 4. MACHINED SURFACES TO A FINISH OF 5. MACHINED SURFACES TO A FINISH OF 6. MACHINED SURFACES TO A FINISH OF	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
Application	1. DIMENSIONS ARE IN INCHES 2. DIMENSIONS ARE IN MILLIMETERS 3. REMOVE ALL SHARP EDGES AND MAX. 4. MACHINED SURFACES TO A FINISH OF 5. MACHINED SURFACES TO A FINISH OF 6. MACHINED SURFACES TO A FINISH OF	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE

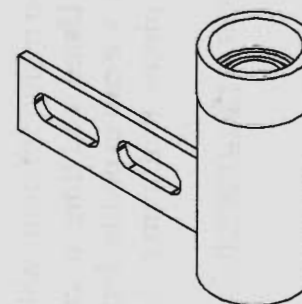
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	901027-200 - LED Housing		1
2	LED 5 mm-White-S1X1X5093UWC		3
3	901027-201 - LED Housing Closure		1
4	901027-203 - LED Housing Connector		1



3 LEDs IN SERIES
with 125 Ohm resistor
Get the PCB

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	901027-200 - LED Housing		1
2	LED 5 mm-White-SLX-LX5093UWC		3
3	901027-201 - LED Housing Closure		1
4	901027-203 - LED Housing Connector		1

Shop / Q.C.	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE		INITIAL RELEASE rev 1	DATE 6/1/2011	Monterey Bay Aquarium Research Institute	
Inspector	1. PLACE DIMA	2. PLACE DIMA	3. PLACE DIMA	4. DIMA	DRYING	MEASLEY 7780 Sandhald Rd. Mass Landing, CA 95039 PH: (831) 775-1786
Shop Foreman	1. DIMENSIONS ARE IN INCHES		DIMENSIONS UNLESS OTHERWISE PLACING		ENGINEER	
Engineer	2. REMOVE BURRS AND SHARP EDGES MAX.		3. MACHINED PELLET RADI 0.000-0.005		EXEMPT	
NEXT ASSY Description	4. MACHINED DIAMETERS ON A CENTRELINE CONCENTRIC WITH OGS		5. PERPENDICULARITY & PARALLELISM		CHECKED	DRAWING NAME 901027-AS20 - LED Light
Application	6. MACHINED SURFACES 0.02 PER INCH MAX 0.02 INCHES FOR SINGLE PLACING		PROJECT NO.		901027	REV B 901027-AS20
	DO NOT SCALE DRAWING		PROJECT		SES	SHEET 1 OF 1

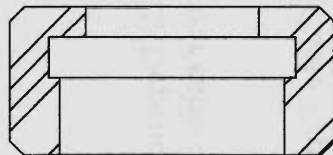
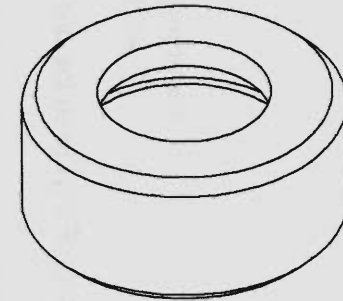
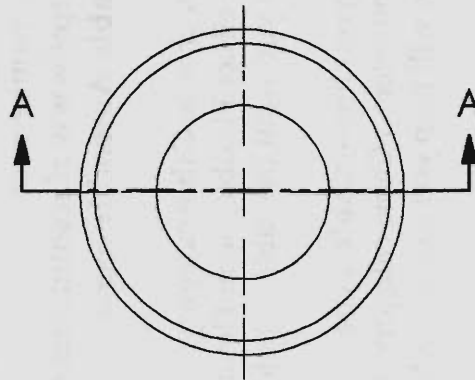


-O-ring groove #015
1/16 x 9/16 x 11/16
0.551 x 0.691

SECTION A-A

Shop / Q.C.	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:						DATE	Monterey Bay Aquarium Research Institute	
Inspector	1 PLACE DIA ± .015	2 PLACE DIA ± .015	3 PLACE DIA ± .015	ANGLE .015	DRAWN	BY	6/7/2011	MELBAE	7780 Saddle Rd.
Shop Foreman					CHK'D	BY		New Landing, CA 95039	
Engineer					ENGINEER	LAST UPDATE		PH: (831) 775-1780	
Next Assy Description					CHECKED	DATE		DRWING NAME & FILE NAME	
Application					PROJECT NO.			901027-200 - LED Housing	
						901027	SIZE DWG NO.	B	REV.
					PROJECT	S&S	SCALE	1:1	901027-200
					DO NOT SCALE DRAWING				SHEET 1 OF 1

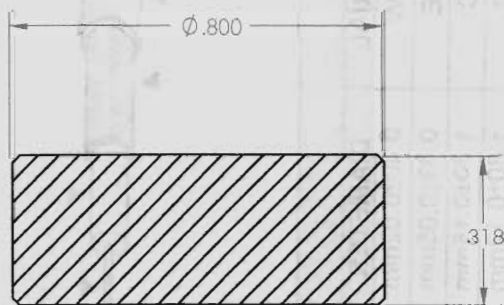
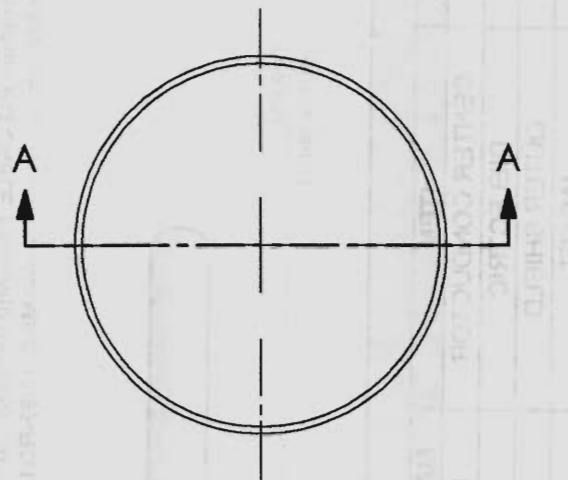
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MBARI. REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF MBARI IS PROHIBITED.



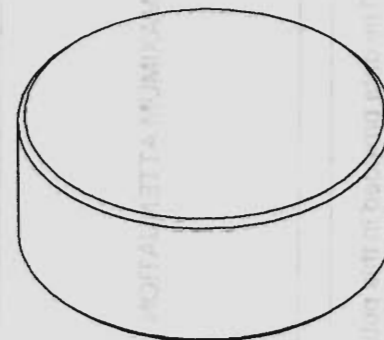
SECTION A-A

Shop / G.C.	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:	INITIAL RELEASE	DATE	Monterey Bay Aquarium Research Institute
Inspector	1. PLACE DIM. 2. PLACE DIM. 3. PLACE DIM. 4. PLACE DIM.	rev 1	6/1/2011	MBARI
Shop Foreman	1. DIMENSIONS ARE IN INCHES	DRAWN	xxx	7700 Sandholdt RD.
Engineer	2. DIMENSION LIMITS HELD AFTER PLATING	ENGINEER	xxx	Marine Landing, CA 95039
	3. REMOVE BURRS AND SHARP EDGES 0.05 MAX.	ENGINEER	xxx/xxx/xxxx	PH: (831) 775-1700
	4. MACHINED FILLET RADII 0.05-0.001	CHECKED		DRAWING NAME AND FILE NAME
NEXT ASSY Description	5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN 0.03	PROJECT NO.	901027	901027-201 - LED Housing Closure
Application	6. PERPENDICULARITY 3 PARALLELISM OF MACHINED SURFACES 0.02 PER INCH MAX. 0.12 INCHES FOR SINGLE SURFACE.	PROJECT	SES	SEE DWG. NO. 901027-100
	DO NOT SCALE DRAWING	SCALE	2:1	REV. 1
				SHEET 1 OF 1

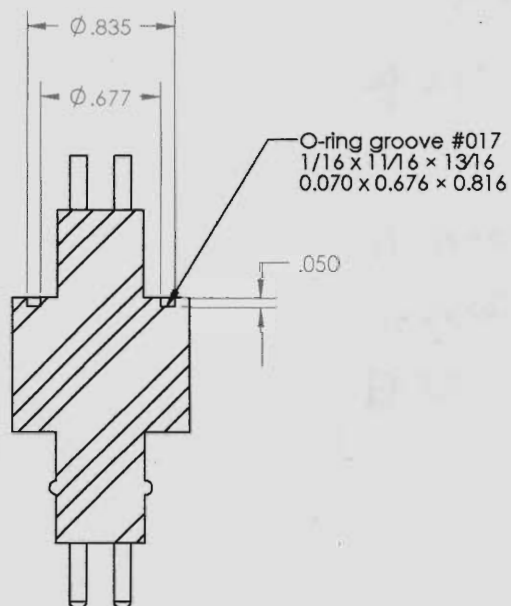
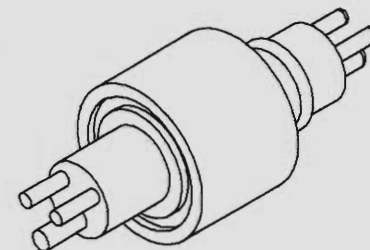
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SECTION A-A



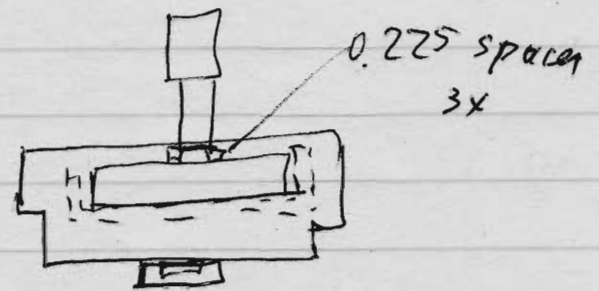
Shop / Q.C.	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:	INITIAL RELEASE	DATE	Monterey Bay Aquarium Research Institute
Inspector	1. PLACE DIA FRA	REV 1	6/1/2011	MBARI
Shop Foreman	2. DIMENSIONS ARE IN INCHES	DRAWN	XX	7700 Sandholdt RD.
Engineer	3. DIMENSION LINES FIELD AFTER PLATING.	ENGINEER	XX	New Landing, CA 95039
	4. REMOVE BURRS AND SHARP EDGES 0.015 MAX.	ENGINEER	XX	TEL: (831) 775-1700
	5. MACHINED DIMETERS ON A COMMON	CHECKED	XX	DRAWING NAME and FILE NAME
	6. MACHINED DIMETERS ON A COMMON			901027-202 - LED Housing Window
NEXT ASSY Description	7. MACHINED DIMETERS ON A COMMON	PROJECT NO.	901027	SHEET NO. 8
Application	8. MACHINED DIMETERS ON A COMMON	PROJECT	SES	SCALE 4:1
	DO NOT SCALE DRAWING			901027-202
				REV. 1
				SHEET 1 OF 1



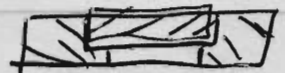
SECTION A-A

Shop / Q.C.	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		DATE	Mentzer Bay Aquarium Research Institute	
Inspector	1. PLACEMENT ±.010	2. PLACEMENT ±.010	6/4/2011	MEBARI	
Shop Foreman	3. DIMENSIONS ARE IN INCHES DIMENSION LIMITS LEFT AFTER PLATING.	4. REMOVE BURRS AND SHARP EDGES TO MAX.	DRAWN Eltmov	XX	7708 Sandhill RD. Moss Landing, CA 95039 TEL: (831) 775-1750
Engineer	5. MACHINED HOLE DIA. 0.010-0.002	6. MACHINED DIMENSIONS TO A COMMON CENTERING CONCENTRIC WITH INDS.	ENGR Eltmov	LAST UPDATE 2010/07/0000	
NEXT ASST Description	7. MACHINED SURFACES ±.001 PER INCH MAX DIA INCHES FOR SINGLE SURFACE.		CHECKED		DRAWING NAME AND FILE NAME 901027-203 - LED Housing Connector
Application	DO NOT SCALE DRAWING		PROJECT NO. 901027	SIZE DWG. NO. B	901027-203
			PROJECT SES	SCALE 1:5:1	
					SHEET 1 OF 1

4/14/2011



I need additional diffuser; - right to go thru bush



Light source: ~~incandescent~~, otherwise OK
for 12V 70mA @ 9V

↓
may replace LEDs

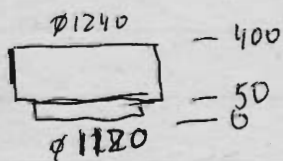
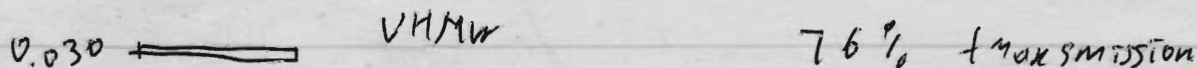
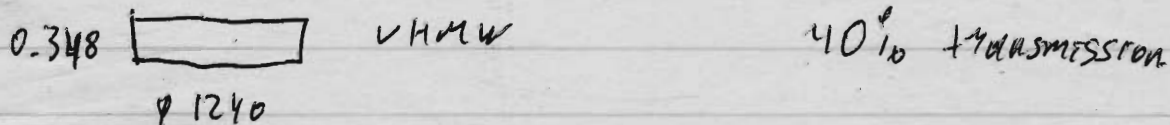
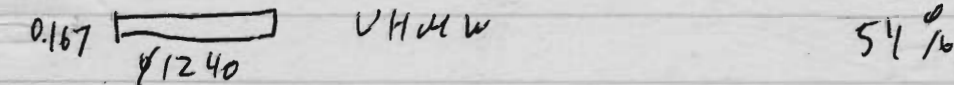
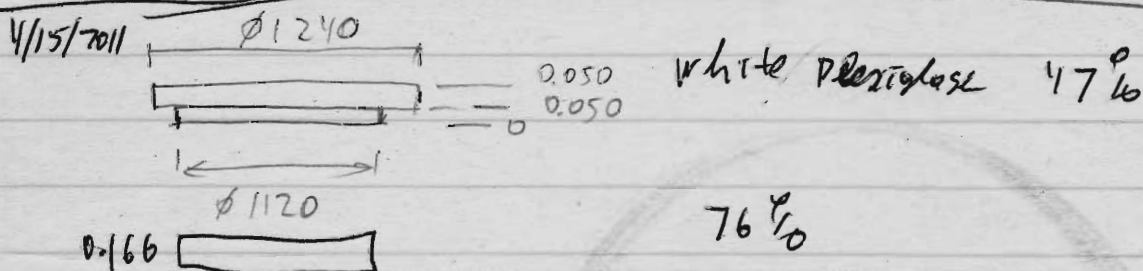
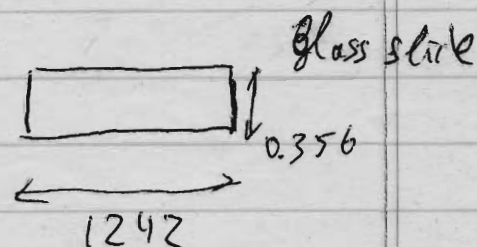
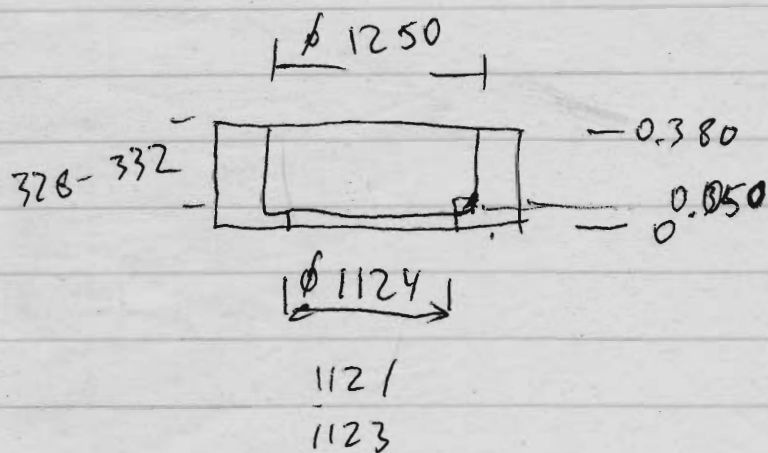
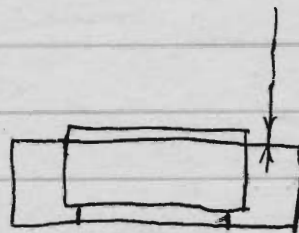
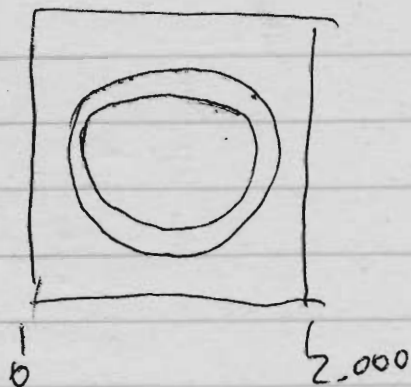
Mounting bracket

21/11/2011

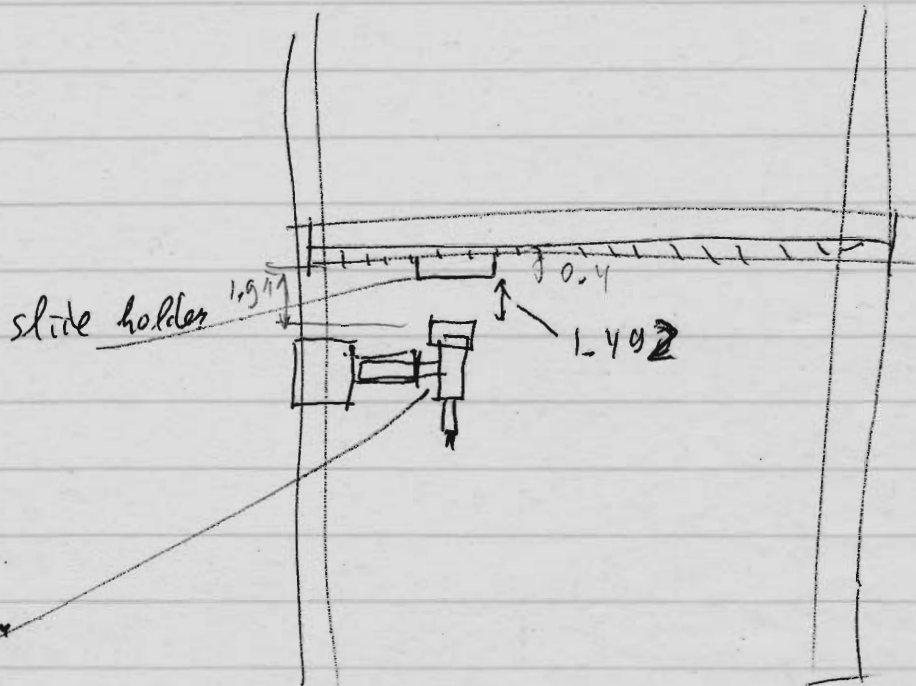
SES

slide holder.

$$= 356 + 50 - 380 = 26$$



LED Light

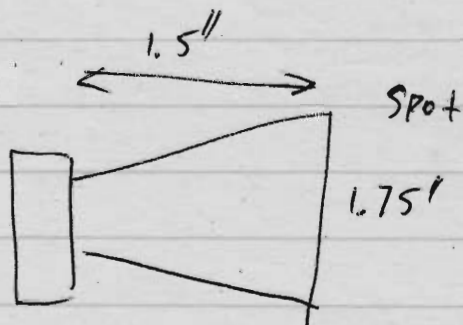


4 LEDs 3mm

9V 80mA $19.4 \text{ mW} \times 200 = 3.88 \text{ mW}$

10V 80mA $21 \text{ mW} \times 200 = 4.2 \text{ mW}$

Required 1.25" at 1.5"



11/27/2011

80mA 9.77V

4mW total power

testing for 2" at 2.5"

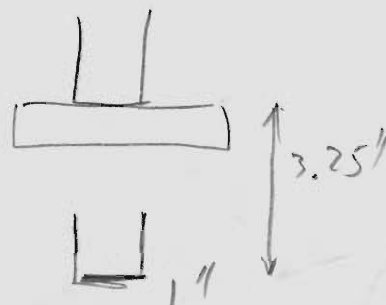
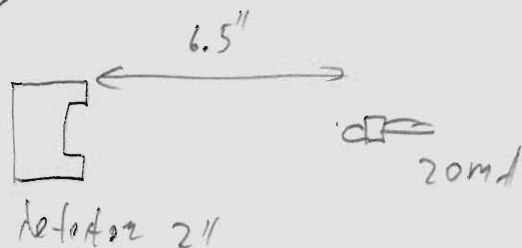
2.4mW into 2" at 2.5"



Resistors 4V

1/27/2011 SES Illuminator

LED Testing



1. 67-1691-ND 9 mW total power.

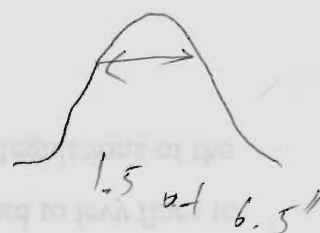
1.6 mW into 2/6.5 aperture

full spot 1" at 6.5"

2. LTW-253D7 6 mW total

1.4 mW into 2/6.5 aperture

more warm white



3. 160-1772-ND 4.6 mW total

0.6 mW into 2/6.5 aperture