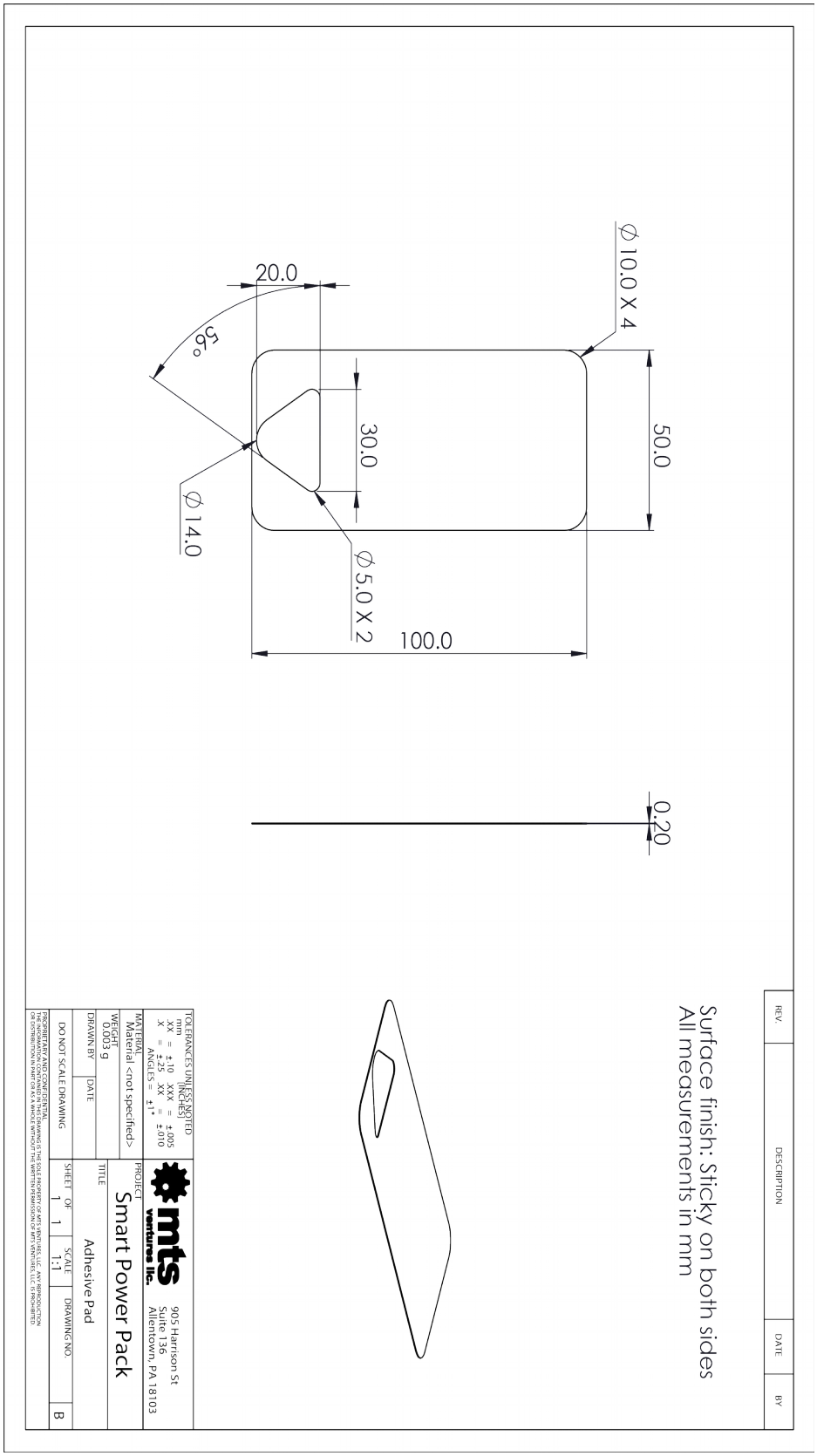
TECHNICAL DOCUMENTATION

Table of Contents

Dimensioned Drawings


Surface finish: Sticky on both sides
All measurements in mm
REV.
DESCRIPTION
DATE
BY
Ø10.0 X 4
20.0
50.0
30.0
Ø14.0
Ø5.0 X 2
100.0
0.20
TOLERANCES (UNLESS NOTED)
mm
XX = ± .10
XXX = ± .005
ANGLES ± 1°
[INCHES]
XX = ± .05
XXX = ± .010
MATERIAL
Material <not specified>
WEIGHT
0.003 g
DRAWN BY
DATE
DO NOT SCALE DRAWING
PROPRIETARY AND CONFIDENTIAL
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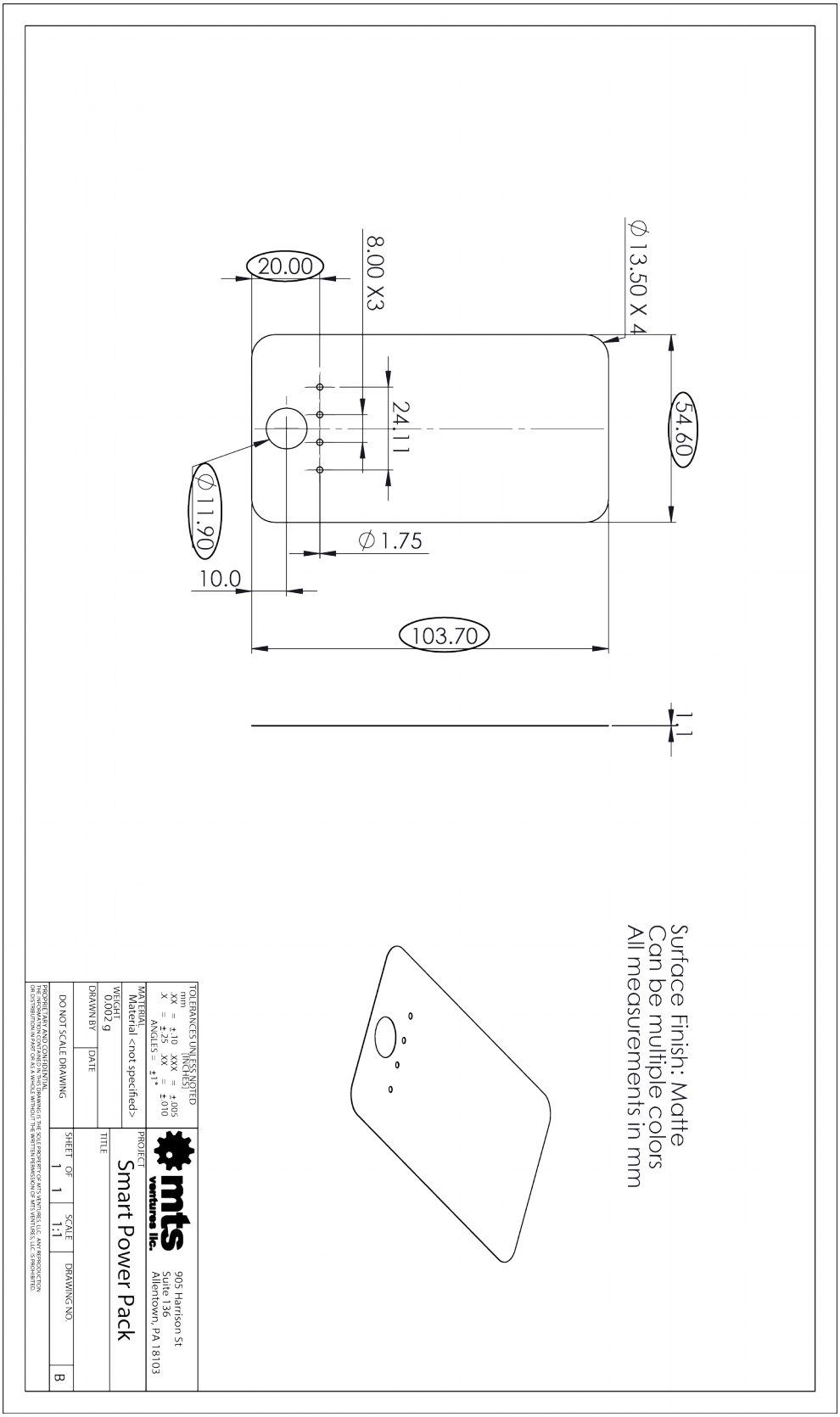
mts ventures llc.
905 Harrison St
Suite 136
Allentown, PA 18103
PROJECT
Smart Power Pack
TITLE
Adhesive Pad
SHEET 1 OF 1
SCALE 1:1
DRAWING NO.
B


Surface Finish: Matte
Can be multiple colors
All measurements in mm
∅13.50 X 4
8.00 X3
20.00
24.11
54.60
∅11.90
∅1.75
10.0
103.70
1.1
TOLERANCES UNLESS NOTED
mm
XX = ±.10
X = ± .25
ANGLES = ±1°
[INCHES]
XXX = ±.005
XX = ± 010
MATERIAL
Material <not specified>
WEIGHT
0.002 g
DRAWN BY
DATE
DO NOT SCALE DRAWING
mts
ventures llc.
905 Harrison St
Suite 136
Allentown, PA 18103
PROJECT
Smart Power Pack
TITLE
SHEET OF
1 1
SCALE
1:1
DRAWING NO.
B
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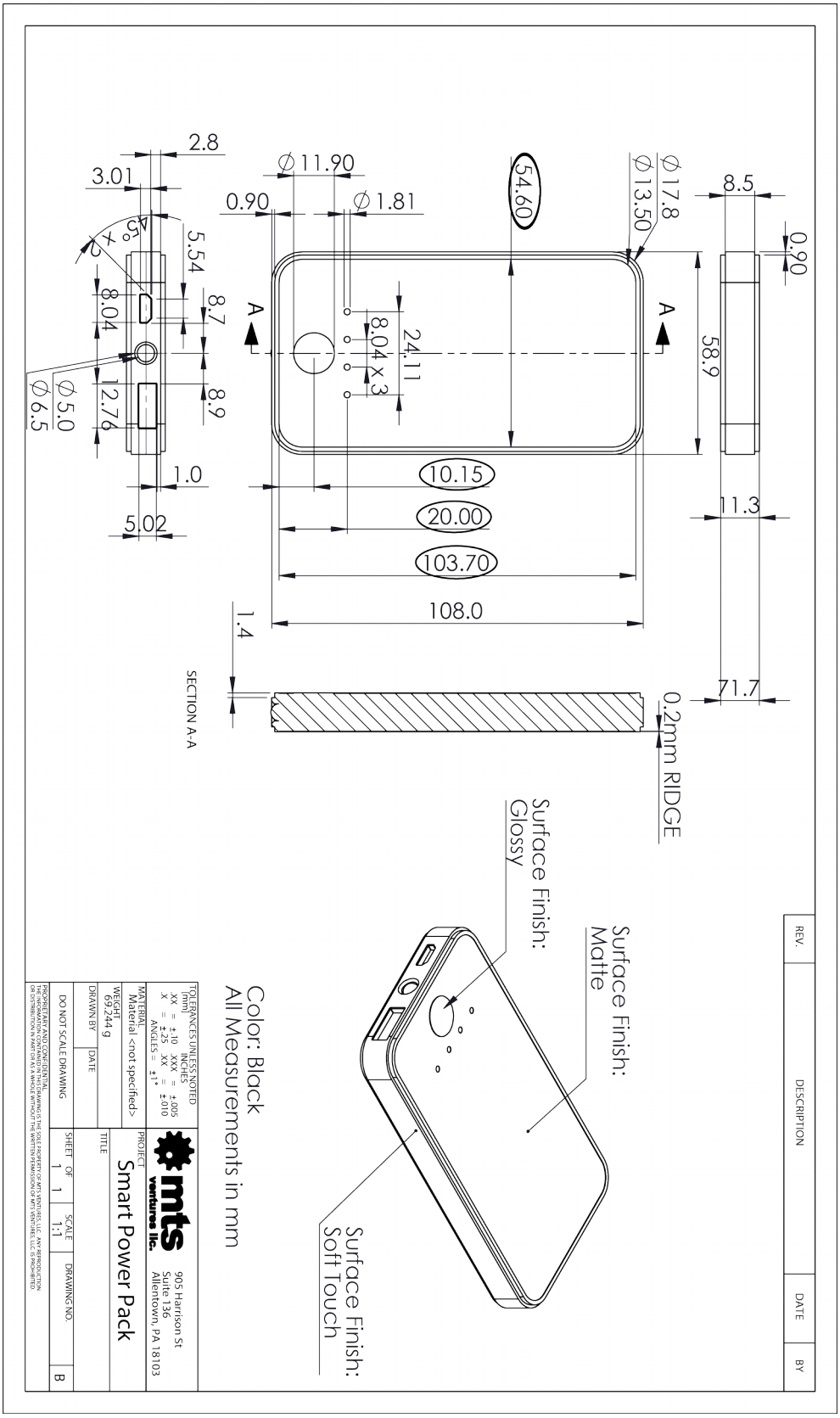
REV.
DESCRIPTION
DATE
BY
2.8
3.01
5.54
8.04
8.7
8.9
12.76
1.0
5.02
45°
∅11.90
0.90
∅1.81
∅17.8
∅13.50
54.60
8.04 x 3
24.11
10.15
20.00
103.70
108.0
1.4
8.5
0.90
58.9
11.3
71.7
0.2mm RIDGE
A
A
SECTION A-A
Surface Finish:
Glossy
Surface Finish:
Matte
Surface Finish:
Soft Touch
Color: Black
All Measurements in mm
TOLERANCES UNLESS NOTED
[mm]
INCHES
XX = ±.10
XXX = ±.005
X = ±.25
XX = ±.010
ANGLES = ±1°
MATERIAL
Material <not specified>
WEIGHT
69.244 g
DRAWN BY
DATE
DO NOT SCALE DRAWING
SHEET OF
1 1
SCALE
1:1
DRAWING NO.
B
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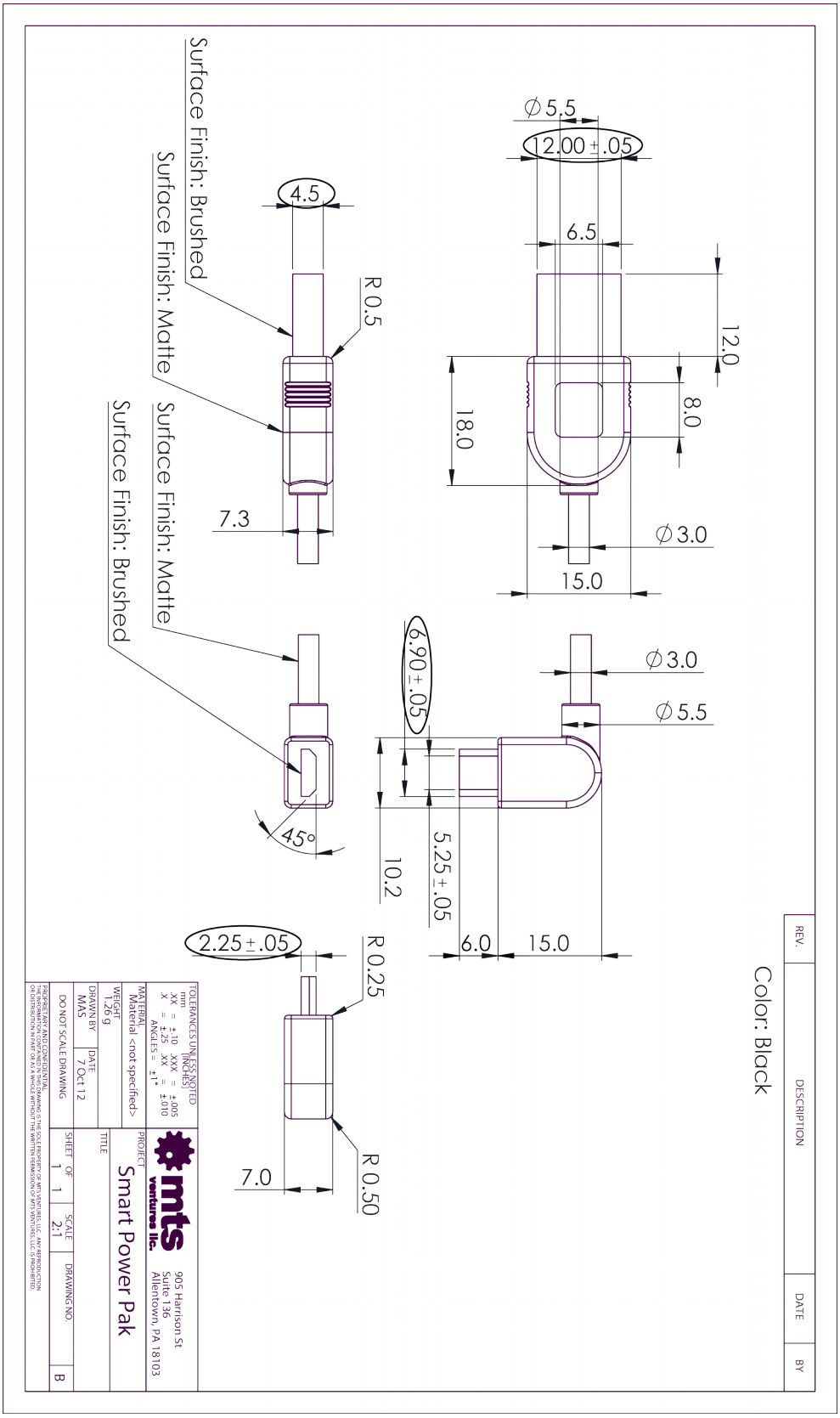
PROJECT
Smart Power Pack
TITLE
mts
ventures llc.
905 Harrison St
Suite 136
Allentown, PA 18103


Surface Finish: Brushed
Surface Finish: Matte
Surface Finish: Matte
Surface Finish: Brushed
4.5
R 0.5
7.3
45°
∅5.5
12.00 ± .05
6.5
12.0
8.0
18.0
∅3.0
15.0
6.90 ± .05
∅3.0
∅5.5
5.25 ± .05
10.2
6.0
15.0
2.25 ± .05
R 0.25
7.0
R 0.50
Color: Black
REV.
DESCRIPTION
DATE
BY
TOLERANCES UNLESS NOTED
mm
XX = ± .10
XXX = ± .005
ANGLES = ± 1°
[INCHES]
XX = ± .25
XXX = ± .010
MATERIAL
Material <not specified>
WEIGHT
126 g
DRAWN BY
MAS
DATE
7 Oct 12
DO NOT SCALE DRAWING
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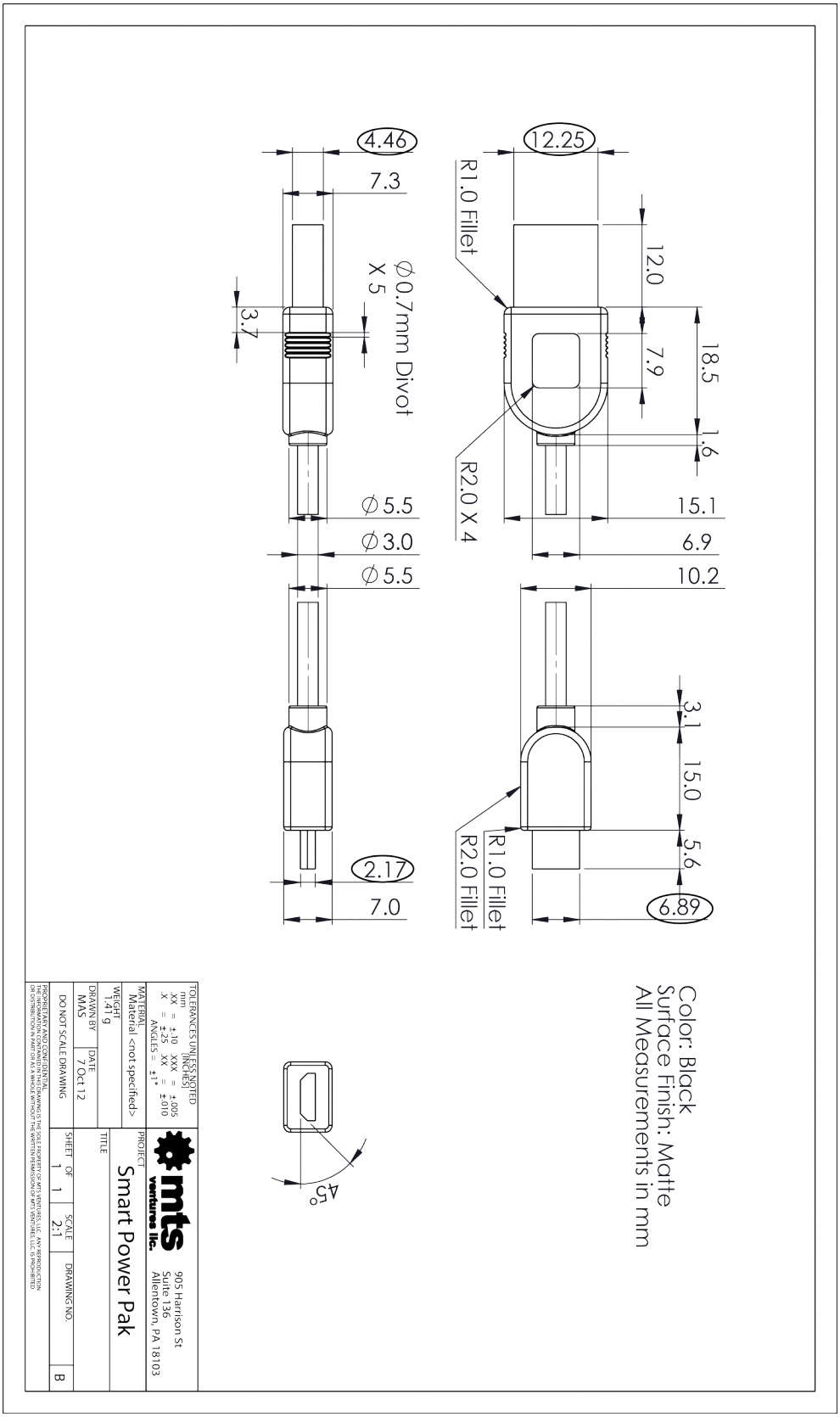
mts ventures llc.
905 Harrison St
Suite 136
Allentown, PA 18103
PROJECT
Smart Power Pak
TITLE
SHEET 1 OF 1
SCALE 2:1
DRAWING NO.
B


12.25
R1.0 Fillet
12.0
7.9
18.5
1.6
R2.0 X 4
15.1
6.9
10.2
3.1
15.0
5.6
R1.0 Fillet
R2.0 Fillet
6.89
4.46
7.3
Ø0.7mm Divot
X 5
3.7
Ø5.5
Ø3.0
Ø5.5
2.17
7.0
45°
Color: Black
Surface Finish: Matte
All Measurements in mm
TOLERANCES (UNLESS NOTED)
mm
XX = ±.10
XXX = ±.005
X = ±.25
XX = ±.010
ANGLES = ±1°
MATERIAL
Material <not specified>
WEIGHT
1.41 g
DRAWN BY
MAS
DATE
7 Oct 12
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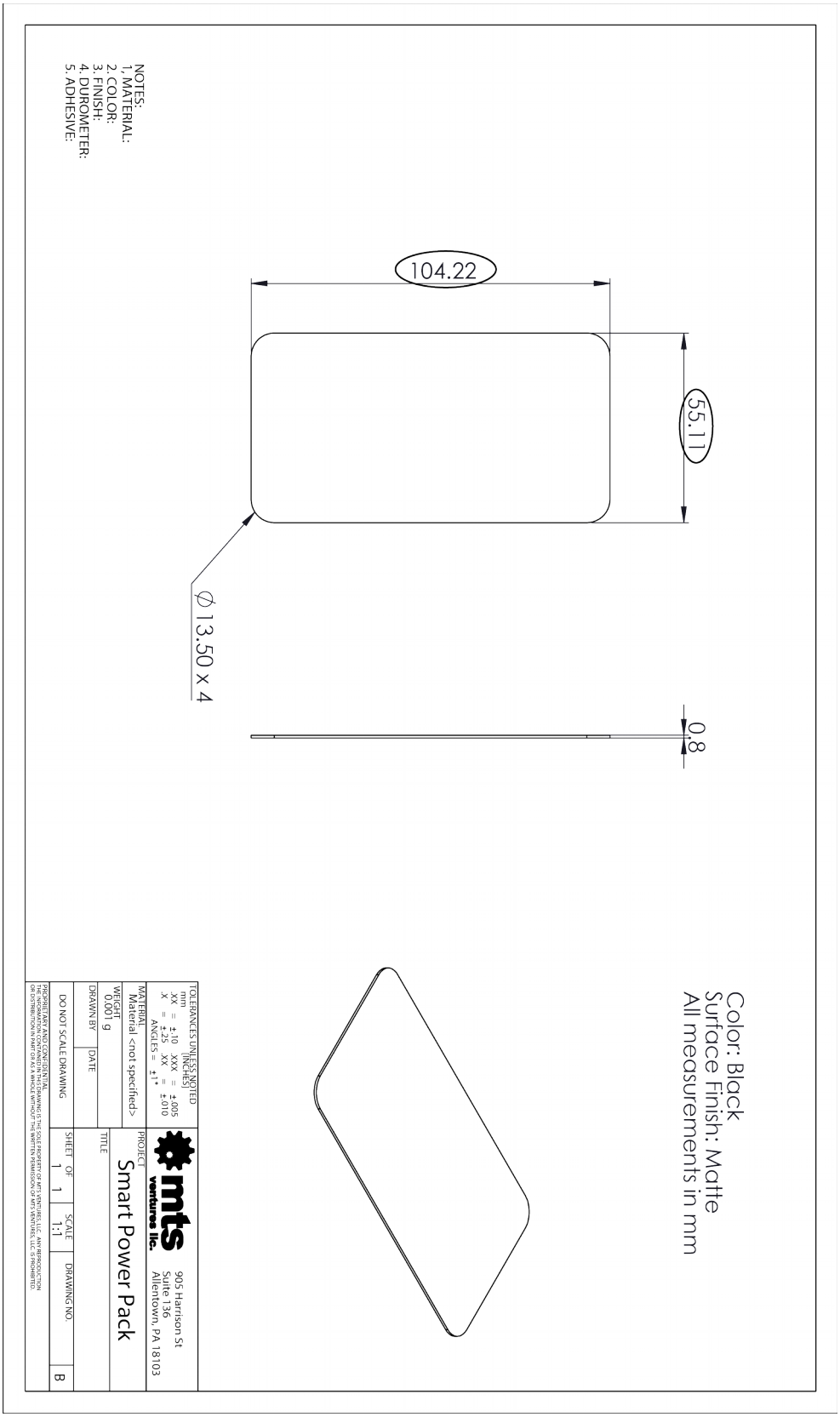
mts ventures llc.
905 Harrison St
Suite 136
Allentown, PA 18103
PROJECT
Smart Power Pak
TITLE
SHEET 1 OF 1
SCALE 2:1
DRAWING NO.
B


104.22
55.11
0.8
⌀13.50 x 4
Color: Black
Surface Finish: Matte
All measurements in mm
NOTES:
1. MATERIAL:
2. COLOR:
3. FINISH:
4. DUROMETER:
5. ADHESIVE:
TOLERANCES UNLESS NOTED
[INCHES]
mm
X = ±.10
XX = ±.005
XXX = ±.010
ANGLES = ±1°
MATERIAL
Material <not specified>
WEIGHT
0.001 g
DRAWN BY
DATE
DO NOT SCALE DRAWING
mts ventures llc.
905 Harrison St
Suite 136
Allentown, PA 18103
PROJECT
Smart Power Pack
TITLE
SHEET 1 OF 1
SCALE 1:1
DRAWING NO
B
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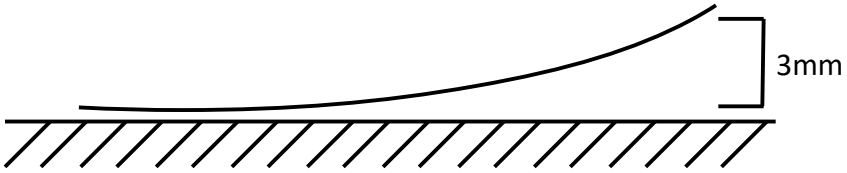
Functional Testing Specifications

The Front Adhesive

The front adhesive must be able to fit inside the seat for the front insert without obstructing the power / charge check button or the charge indication LEDs. It must be tacky enough to prevent the front insert from being readily peeled off.

The Front Insert

The front plate must fit snugly inside its Smart Power Paks without any resistance or needing to be forced on. The four holes for the power meter LEDs must not be positioned as to obscure them in any way. When one end of the front insert is held down to a flat surface, the curvature of the insert must not be such that the other end is suspended more that 3mm above the flat surface, as shown in the figure below.



The Rubber Back

The rubber back must fit snugly inside its Smart Power Pack without any resistance or needing to be forced on. It must adhere to the back of the Smart Power Pack so that it is not easily peeled off with the hand or to move in its seat when a fingernail or any other type of object is placed in between it and the edge. It must also protrude from the Smart Power Pack so that when the Smart Power Pack is placed on a polished incline of 30 degrees it does not slide down.

The USB Cables

The USB cables must fit snugly in a standard USB port / Micro USB port and stay in without being pulled out. They must also not become lodged into the USB port so that force is needed to dislodge them. They must also be able to transmit a 4.8-5.2V / 1.4-1.6A stream of power for a period of 4 hours regardless of orientation. This can be tested by pulling a sample of 36 of each cable from each shipment – if one does not pass, then further testing will need to be done.

The Power Pack

The charge check / flashlight button must depress without excessive force, and when pressed for less than 1 second continuously, must activate the four charge indication LEDs.

When activated, the charge indication LEDs must light up sequentially over the space of half a second and then display the charge level (4 on = 100% - 75% charged, 2 on = 50% - 25% charged, etc.) for another 2.9-3.1 seconds. The LEDs must be bright enough as to be seen even in full daylight. To check the fidelity of the charge level measurements, a battery may be totally discharged and then re-charged at a predefined rate so that the amount of energy inside of the battery is known. The amount of energy input over the total capacity of the battery may cross referenced in this way with the reading of the charge indicator LEDs. An acceptable value can be ± 10% of the battery's actual charge. When charging, once the USB is inserted and starts transmitting power, the charging LEDs must light up in the following fashion:

❶②③④ ❶❷③④ ❶❷❸④ ❶❷❸❹ ❶❷❸④ ❶❷③④ ❶②③④ ①②③④

with a 0.1 second pause in between each state. When charging, the charge indicator LEDs must walk to the current fill level. For example, if the phone is charging and is at 70%, the animation would be:

❶②③④ ❶❷③④ ❶❷❸④ ①②③④

and would be repeated for each charge level until the Smart Power Pack is unplugged. The pause in between states will be 0.1 seconds. Once unplugged, all four LEDs should light up for 05. seconds.

If the charge check / flashlight button is depressed for over 1 second, it must activate the white flashlight LED. Once the button is depressed for over one second again, the LED must go off. The charge indication LEDs must still activate. The flashlight LED must be bright enough as to momentarily blind anyone who looks directly into it.

The battery must have a capacity of at least 50.0 kJ (2778 mAh at 5V) and be able to output at least 0.7A. The output voltage must be between 4.35V and 5.25V.

The USB and Micro USB ports must be dimensioned properly so that a USB or Micro Usb can be snugly fit inside without force. The USB must not come loose or come out without being pulled out.

As with the USB cables, a sample of 36 Smart Power Paks can be taken from each shipment to be tested for dimensions and the above requirements. If any of them do not comply, further testing will be necessary.

Appearance Requirements

The Front Insert

The front insert must not have any visible scratches on its front, or any scratches deep enough on the back to cause structural issues. The design must be clear, and reproduced without any smudges. The design must have colors true to the original digital design, which is to be referenced against on a master design sheet.

The Rubber Back

The rubber back must not have any scratches or any other irregularities in its patterning. Its color must be a homogeneous, to be measured against a reference black. The patterning on the back should be apparent from two feet away under daylight.

The USB cables

The plastic heads of the USB cable should be free of visible scratches and scuffs. They should have a homogeneous speckled texture. Any details on the heads should be sharp and easily recognizable. The seam running around the middle of the head should not protrude so that it may be felt by the finger. The cord itself must have a consistent diameter and a smooth surface. The entirety of the USB cable must be a homogeneous black color, to be measured against a reference.

The Smart Power Pack

The Smart Power Pack must be free from any visible scuffs or scratches on its sides. Scratches and scuffs on the front and back of the Smart Power Pack are acceptable as long as they are not structurally damaging and will be covered up by the front insert or rubber back. The coloring must be homogeneous, with the color to be measured against a reference.

Part Numbering System

PART-01-COL

The first four digits of the part number are the name of the part.

BODY: The Smart Power Pack itself	ADHS - Adhesive
USBR – Right Angle USB cable	FINS – Front Insert
USBS – Straight USB cables	BINS – Back Insert

The two numbers in the middle are the revision number for the part, so the first Power Pack part designed would be 01, and so on. The numbers in the case of the USB cables are their length in centimeters, truncated.

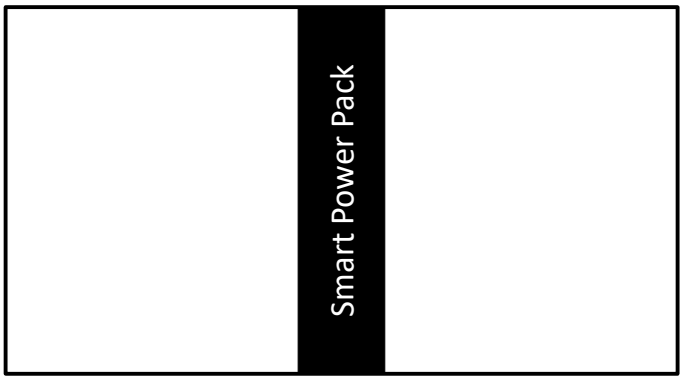
The last three digits are the color / material of the part. For example, the code would be BLK for the Smart Power Pack body and the USB cables in black. The 3-digit code would be randomly assigned for the front and back inserts, due to the number of options available. The 3 digit codes for each color / material / texture must all be completely unique across all parts. For example, the code XM1, if used for the front insert, cannot be reused for a different material / color for the back insert. They also cannot overlap with any of the color codes for the body or USB cables, so stick with nonsense.

Packaging Specifications

The types of boxes that will be used will be white self locking boxes with internal dimensions of 110mm x 60mm x 25mm. They will be made out of 1/8” corrugated cardboard, colored white on the outside.

The USB cords will be placed inside of 100mm x 200mm standard zip lock bags.

The box will be sealed with a black sticker running around its circumference at its center (on the long side) 1.5cm wide and 35cm long. In the middle of the sticker will be the words ‘Smart Power Pack’.



Insert Options

PLA

This insert will be 3D printed from PLA. After it is printed, the surface will be filled in with spray paint and polished to a gloss. The holes for the button and charge LEDs will be reamed to ensure that they are the proper size.

GOLD!

This insert will be made out of 24 karat gold. It will be polished to a mirror shine when it is shipped out. There can be no imperfections or divots in the gold surface on the front, it must be completely flat. The other side will be brushed and at a higher roughness to improve its ability to adhere to the body. It will have the same dimensions and thickness as the original insert. It will be manufactured with an industrial stamping process. This will require the manufacture of a stamping die.

Fine Art

This insert will be made out of fine art. The way it will be manufactured is by removing notable impressionist paintings (Good ones, not Renoir) from their frames and then laser-cutting the canvas into the shape of the front insert. No custom tooling is required.

Tooling / Manufacturing Methods

Front Adhesive

The front adhesive is made with stamping. It will require a stamping die to be custom made. The dies can be made through Walker Tool and the stamping can be done through Wedge Products.

Front Insert

The front insert is made with stamping primarily. The stamping process will require a stamping die to be custom made. The dies can be made through Walker Tool and the stamping can be done through Wedge Products.

Rear Rubber Insert

The rear insert is made with stamping as well. The dies can be made again through Walker Tool and the stamping can be done through Wedge Products.

USB Cables

The electronic components of the USB cables will be assembled, the coated wire in between the two heads will be soldered on, and then they will be inserted into an injection molding machine to be encased in another layer of plastic. All of this can be done at Feiya Precision Mold Co. in China. It will require 3 different types of molds, one for the USB head and two for the different types of Micro USB heads.

Smart Power Pack Body

The Smart Power Pack body components will be injection molded. They include the bottom and sides, which is one piece, and the top. This can be done again through Feiya Precision Mold Co. in China. The strip around the middle of the body will be brushed for a softer finish. Screen printing of information on the back will be done in-house.

Assembly Documentation

1. Remove paper backing from rubber back.
2. Place rubber back onto back of Smart Power Pack body. Press down firmly and evenly to make sure it is secure.
3. Remove the solid paper back from the front adhesive.
4. Place the front adhesive onto the front of the Smart Power Pack body. Make sure not to obstruct the button or the charge indicator LEDs.
5. Peel the paper top off of the front adhesive.
6. Place the front insert over the front adhesive so that it fits snugly inside of its seat. Apply pressure evenly over the front insert to ensure that it is secure.
7. Place the cords into the small bag and seal it.
8. Assemble the box.
9. Place the bag with cords inside of the box and place the Smart Power Pack on top of them.
10. Close the box and seal it with the sticker.
11. Lightly kiss the box once for good luck.