
src Documentation

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`psd-tools2` is a Python package for working with Adobe Photoshop PSD files as described in [specification](#).
`psd-tools2` is a fork of [psd-tools](#) that implements various functionalities.

CHAPTER 1

Installation

Use `pip` to install the package:

```
pip install psd-tools2
```

Note: In order to extract images from 32bit PSD files PIL/Pillow must be built with LITTLECMS or LITTLECMS2 support.

For complete layer image composition functionality, also install NumPy/SciPy. This will be only necessary when the PSD files are saved without maximized compatibility and the image contains gradient fill:

```
pip install numpy scipy
```


CHAPTER 2

Getting started

```
from psd_tools2 import PSDImage

psd = PSDImage.open('example.psd')
psd.compose().save('example.png')

for layer in psd:
    print(layer)
```

Check out the *Usage* documentation for more examples.

2.1 Usage

2.1.1 Command line

The package provides command line tools to handle a PSD document:

```
psd-tools2 export <input_file> <output_file> [options]
psd-tools2 show <input_file> [options]
psd-tools2 debug <input_file> [options]
psd-tools2 -h | --help
psd-tools2 --version
```

Example:

```
psd-tools2 show example.psd # Show the file content
psd-tools2 export example.psd example.png # Export as PNG
psd-tools2 export example.psd[0] example-0.png # Export layer as PNG
```

2.1.2 Working with PSD document

`psd_tools2.api` package provides the user-friendly API to work with PSD files. `PSDImage` represents a PSD file.

Open an image:

```
from psd_tools2 import PSDImage
psd = PSDImage.open('my_image.psd')
```

Most of the data structure in the `psd-tools2` supports pretty printing in IPython environment.

```
In [1]: PSDImage.open('example.psd')
Out[1]:
PSDImage(mode=RGB size=101x55 depth=8 channels=3)
  [0] PixelLayer('Background' size=101x55)
  [1] PixelLayer('Layer 1' size=85x46)
```

Internal layers are accessible by iterator or indexing:

```
for layer in psd:
    print(layer)
    if layer.is_group():
        for child in layer:
            print(child)

child = psd[0][0]
```

Note: The iteration order is from background to foreground, which is reversed from version prior to 1.7.x. Use `reversed(list(psd))` to iterate from foreground to background.

The opened file can be saved:

```
psd.save('output.psd')
```

2.1.3 Working with Layers

There are various layer kinds in Photoshop.

The most basic layer type is `PixelLayer`:

```
print(layer.name)
layer.kind == 'pixel'
```

Some of the layer attributes are editable, such as a layer name:

```
layer.name = 'Updated layer 1'
```

Note: Currently, the package does not support adding or removing of a layer.

`Group` has internal layers:

```
for layer in group:
    print(layer)

first_layer = group[0]
```

TypeLayer is a layer with texts:

```
print(layer.text)
```

ShapeLayer draws a vector shape, and the shape information is stored in *vector_mask* and *origination* property. Other layers can also have shape information as a mask:

```
print(layer.vector_mask)
for shape in layer.origination:
    print(shape)
```

SmartObjectLayer embeds or links an external file for non-destructive editing. The file content is accessible via *smart_object* property:

```
import io
if layer.smart_object.filetype in ('jpg', 'png'):
    image = Image.open(io.BytesIO(layer.smart_object.data))
```

SolidColorFill, *PatternFill*, and *GradientFill* are fill layers that paint the entire region if there is no associated mask. Sub-classes of *AdjustmentLayer* represents layer adjustment applied to the composed image. See *Adjustment layers*.

2.1.4 Exporting data to PIL

Export the entire document as `PIL.Image`:

```
image = psd.compose()
image.save('exported.png')
```

Note that above `compose()` might return `None` if the PSD document has no visible pixel.

Export a single layer including masks and clipping layers:

```
image = layer.compose()
```

Export layer, mask, or clipping layers separately without composition:

```
image = layer.topil()
mask = layer.mask.topil()

from psd_tools2 import compose
clip_image = compose(layer.clip_layers)
```

2.2 Migrating from version 1.7 to 1.8

There are major API changes in version 1.8.x.

2.2.1 Package name

Starting version 1.8.0, the package name is changed from *psd_tools* to *psd_tools2*.

version 1.7.x:

```
import psd_tools
from psd_tools import PSDImage
```

version 1.8.x:

```
import psd_tools2
from psd_tools2 import PSDImage
```

2.2.2 PSDImage

File open method is changed from *load* to *open()*.

version 1.7.x:

```
psd = PSDImage.load(filename)
with open(filename, 'rb') as f:
    psd = PSDImage.from_stream(f)
```

version 1.8.x:

```
psd = PSDImage.open(filename)
with open(filename, 'rb') as f:
    psd = PSDImage.open(f)
```

2.2.3 Layers

Children of PSDImage or Group is directly accessible by iterator or indexing.

version 1.7.x:

```
for layer in group.layers:
    print(layer)

first_child = group.layers[0]
```

version 1.8.x:

```
for layer in group:
    print(layer)

first_child = group[0]
```

2.2.4 PIL export

Primary PIL export method is now *compose()*.

version 1.7.x:

```
image = psd.as_PIL()

layer_image = compose(layer)
raw_layer_image = layer.as_PIL()
```

version 1.8.x:

```
image = psd.compose()

layer_image = layer.compose()
raw_layer_image = layer.topil()
```

2.2.5 Low-level data structure

Data structures are completely rewritten to support writing functionality. See `psd_tools2.psd` subpackage.

version 1.7.x:

```
psd.decoded_data
```

version 1.8.x:

```
psd._psd
```

2.3 Contributing

Development happens at github: [bug tracker](#). Feel free to submit [bug reports](#) or pull requests. Attaching an erroneous PSD file makes the debugging process faster. Such PSD file might be added to the test suite.

The license is MIT.

2.3.1 Package design

The package consists of two major subpackages:

1. `psd_tools.psd`: subpackage that reads/writes low-level binary structure of the PSD/PSB file. The core data structures are built around `attrs` class that all implement `read` and `write` methods. Each data object tries to resemble the structure described in the [specification](#). Although documented, the [specification](#) is far from complete and some are even inaccurate. When `psd-tools2` finds unknown data structure, the package keeps such data as `bytes` in the parsed result.
2. `psd_tools.api`: User-facing API that implements various easy-to-use methods that manipulate low-level `psd_tools.psd` data structures.

2.3.2 Testing

In order to run tests, make sure PIL/Pillow is built with LittleCMS or LittleCMS2 support, install `tox` and type:

```
tox
```

from the source checkout. Or, it is a good idea to install and run `detox` for parallel execution:

```
detox
```

2.3.3 Documentation

Install Sphinx to generate documents:

```
pip install sphinx sphinx_rtd_theme
```

Once installed, use Makefile:

```
make docs
```

2.3.4 Acknowledgments

Great thanks to [all the contributors](#) and the original *psd-tools* author Mikhail Korobov.

Supported:

- Read and write of the low-level PSD/PSB file structure;
- Raw layer image export;
- ICC profile handling for sRGB images.

Limited support:

- Composition of basic pixel-based layers by normal blending;
- Editing of some layer attributes such as layer name.

Not supported:

- Editing of layer structure, such as adding or removing a layer.
- Blending modes other than normal;
- Composition of layer effects;
- Drawing of bezier curves;
- Font rendering.

3.1 psd_tools2

See *Usage* for examples.

3.1.1 PSDImage

class psd_tools2.**PSDImage** (*psd*)
Photoshop PSD/PSB file object.

Example:

```
from psd_tools2 import PSDImage

psd = PSDImage.open('example.psd')
image = psd.topil()

for layer in psd:
    if layer.has_pixels():
        layer_image = layer.topil()
```

bbox

Minimal bounding box that contains all the visible layers.

Use `viewport` to get viewport bounding box. When the psd is empty, `bbox` is equal to the canvas bounding box.

Returns (left, top, right, bottom) *tuple*.

bottom

Bottom coordinate.

Returns *int*

channels

Number of color channels.

Returns *int*

color_mode

Document color mode, such as 'RGB' or 'GRAYSCALE'. See [ColorMode](#).

Returns *str*

compose (*force=False, bbox=None, **kwargs*)

Compose the PSD image.

See [compose\(\)](#) for available extra arguments.

Parameters `bbox` – Viewport tuple (left, top, right, bottom).

Returns PIL. Image, or *None* if there is no pixel.

depth

Pixel depth bits.

Returns *int*

descendants (*include_clip=True*)

Return a generator to iterate over all descendant layers.

Example:

```
# Iterate over all layers
for layer in psd.descendants():
    print(layer)

# Iterate over all layers in reverse order
for layer in reversed(list(psd.descendants())):
    print(layer)
```

Parameters `include_clip` – include clipping layers.

classmethod frompil (*image*, *compression=<Compression.PACK_BITS: 1>*)

Create a new PSD document from PIL Image.

Parameters

- **image** – PIL Image object.
- **compression** – ImageData compression option. See *Compression*.

Returns A PSDImage object.

has_preview ()

Returns if the document has real merged data. When True, *topil()* returns pre-composed data.

has_thumbnail ()

True if the PSDImage has a thumbnail resource.

height

Document height.

Returns *int*

image_resources

Document image resources.

Returns ImageResouces.

is_group ()

Return True if the layer is a group.

Returns *bool*

is_visible ()

Returns visibility of the element.

Returns *bool*

kind

Kind.

Returns *'psdimage'*

left

Left coordinate.

Returns *0*

name

Element name.

Returns *'Root'*

classmethod new (*mode*, *size*, *color=0*, *depth=8*, ***kwargs*)

Create a new PSD document.

Parameters

- **mode** – The color mode to use for the new image.
- **size** – A tuple containing (width, height) in pixels.
- **color** – What color to use for the image. Default is black.

Returns A PSDImage object.

offset

(left, top) tuple.

Returns *tuple*

classmethod open (*fp*)

Open a PSD document.

Parameters **fp** – filename or file-like object.

Returns A PSDImage object.

parent

Parent of this layer.

right

Right coordinate.

Returns *int*

save (*fp, mode='wb'*)

Save the PSD file.

Parameters

- **fp** – filename or file-like object.
- **mode** – file open mode, default 'wb'.

size

(width, height) tuple.

Returns *tuple*

tagged_blocks

Document tagged blocks.

Returns *TaggedBlocks* or *None*.

thumbnail ()

Returns a thumbnail image in PIL.Image. When the file does not contain an embedded thumbnail image, returns *None*.

top

Top coordinate.

Returns *0*

topil ()

Get PIL Image.

Returns *PIL. Image*, or *None* if the composed image is not available.

viewbox

Return bounding box of the viewport.

Returns (left, top, right, bottom) *tuple*.

visible

Visibility.

Returns *True*

width

Document width.

Returns *int*

3.1.2 compose

`psd_tools2.compose` (*layers*, *bbox=None*, *layer_filter=None*, *color=None*)

Compose layers to a single `PIL`.Image. If the layers do not have visible pixels, the function returns *None*.

Example:

```
image = compose([layer1, layer2])
```

In order to skip some layers, pass *layer_filter* function which should take *layer* as an argument and return *True* to keep the layer or return *False* to skip:

```
image = compose(
    layers,
    layer_filter=lambda x: x.is_visible() and x.kind == 'type'
)
```

By default, visible layers are composed.

Note: This function is experimental and does not guarantee Photoshop-quality rendering.

Currently the following are ignored:

- Adjustments layers
- Layer effects
- Blending mode (all blending modes become normal)

Shape drawing is inaccurate if the PSD file is not saved with maximum compatibility.

Parameters

- **layers** – a layer, or an iterable of layers.
- **bbox** – (left, top, bottom, right) tuple that specifies a region to compose. By default, all the visible area is composed. The origin is at the top-left corner of the PSD document.
- **layer_filter** – a callable that takes a layer and returns *bool*.
- **color** – background color in *int* or *tuple*.

Returns `PIL`.Image or *None*.

3.2 psd_tools2.api.adjustments

Adjustment and fill layers.

Example:

```
if layer.kind == 'brightnesscontrast':
    print(layer.brightness)

if layer.kind == 'gradient-fill':
    print(layer.gradient_kind)
```

3.2.1 Fill layers

Fill layers are similar to *ShapeLayer* except that the layer might not have an associated vector mask. The layer therefore expands the entire canvas of the PSD document.

Fill layers all inherit from `FillLayer`.

Example:

```
if isinstance(layer, psd_tools2.layers.FillLayer):
    image = layer.compose()
```

class `psd_tools2.api.adjustments.SolidColorFill(*args)`
Solid color fill.

bbox
(left, top, right, bottom) tuple.

blend_mode
Blend mode of this layer. Writable.

Example:

```
from psd_tools2.constants import BlendMode
if layer.blend_mode == BlendMode.NORMAL:
    layer.blend_mode = BlendMode.SCREEN
```

Returns *BlendMode*.

bottom
Bottom coordinate.

Returns int

clip_layers
Clip layers associated with this layer.

To compose clipping layers:

```
from psd_tools2 import compose
clip_mask = compose(layer.clip_layers)
```

Returns list of layers

compose(*args, **kwargs)
Compose layer and masks (mask, vector mask, and clipping layers).

Returns `PIL.Image`, or `None` if the layer has no pixel.

data
Color in Descriptor(RGB).

effects
Layer effects.

Returns *Effects*

has_clip_layers()
Returns True if the layer has associated clipping.

Returns *bool*

has_effects ()
Returns True if the layer has effects.
Returns *bool*

has_mask ()
Returns True if the layer has a mask.
Returns *bool*

has_origination ()
Returns True if the layer has live shape properties.
Returns *bool*

has_pixels ()
Returns True if the layer has associated pixels. When this is True, `topil` method returns `PIL.Image`.
Returns *bool*

has_vector_mask ()
Returns True if the layer has a vector mask.
Returns *bool*

height
Height of the layer.
Returns *int*

is_group ()
Return True if the layer is a group.
Returns *bool*

is_visible ()
Layer visibility. Takes group visibility in account.
Returns *bool*

kind
Kind of this layer, either of group, pixel, shape, type, smartobject, or psdimage.
Returns *str*

layer_id
Layer ID.
Returns *int* layer id. if the layer is not assigned an id, -1.

left
Left coordinate. Writable.
Returns *int*

mask
Returns mask associated with this layer.
Returns *Mask* or *None*

name
Layer name. Writable.
Returns *str*

offset
(left, top) tuple. Writable.

Returns *tuple*

opacity

Opacity of this layer in [0, 255] range. Writable.

Returns *int*

origination

Property for a list of live shapes or a line.

Some of the vector masks have associated live shape properties, that are Photoshop feature to handle primitive shapes such as a rectangle, an ellipse, or a line. Vector masks without live shape properties are plain path objects.

Returns List of *Invalidated, Rectangle, RoundedRectangle, Ellipse, or Line*.

parent

Parent of this layer.

right

Right coordinate.

Returns *int*

size

(width, height) tuple.

Returns *tuple*

top

Top coordinate. Writable.

Returns *int*

topil ()

Get PIL Image of the layer.

Returns *PIL. Image*, or *None* if the layer has no pixels.

vector_mask

Returns vector mask associated with this layer.

Returns *VectorMask* or *None*

visible

Layer visibility. Doesn't take group visibility in account. Writable.

Returns *bool*

width

Width of the layer.

Returns *int*

class `psd_tools2.api.adjustments.PatternFill (*args)`

Pattern fill.

bbox

(left, top, right, bottom) tuple.

blend_mode

Blend mode of this layer. Writable.

Example:

```

from psd_tools2.constants import BlendMode
if layer.blend_mode == BlendMode.NORMAL:
    layer.blend_mode = BlendMode.SCREEN

```

Returns *BlendMode*.

bottom

Bottom coordinate.

Returns *int*

clip_layers

Clip layers associated with this layer.

To compose clipping layers:

```

from psd_tools2 import compose
clip_mask = compose(layer.clip_layers)

```

Returns *list of layers*

compose (*args, **kwargs)

Compose layer and masks (mask, vector mask, and clipping layers).

Returns *PIL. Image*, or *None* if the layer has no pixel.

data

Pattern in Descriptor(PATTERN).

effects

Layer effects.

Returns *Effects*

has_clip_layers ()

Returns True if the layer has associated clipping.

Returns *bool*

has_effects ()

Returns True if the layer has effects.

Returns *bool*

has_mask ()

Returns True if the layer has a mask.

Returns *bool*

has_origination ()

Returns True if the layer has live shape properties.

Returns *bool*

has_pixels ()

Returns True if the layer has associated pixels. When this is True, *topil* method returns *PIL. Image*.

Returns *bool*

has_vector_mask ()

Returns True if the layer has a vector mask.

Returns *bool*

height

Height of the layer.

Returns *int*

is_group()

Return True if the layer is a group.

Returns *bool*

is_visible()

Layer visibility. Takes group visibility in account.

Returns *bool*

kind

Kind of this layer, either of group, pixel, shape, type, smartobject, or psdimage.

Returns *str*

layer_id

Layer ID.

Returns *int* layer id. if the layer is not assigned an id, -1.

left

Left coordinate. Writable.

Returns *int*

mask

Returns mask associated with this layer.

Returns *Mask* or *None*

name

Layer name. Writable.

Returns *str*

offset

(left, top) tuple. Writable.

Returns *tuple*

opacity

Opacity of this layer in [0, 255] range. Writable.

Returns *int*

origination

Property for a list of live shapes or a line.

Some of the vector masks have associated live shape properties, that are Photoshop feature to handle primitive shapes such as a rectangle, an ellipse, or a line. Vector masks without live shape properties are plain path objects.

Returns List of *Invalidated*, *Rectangle*, *RoundedRectangle*, *Ellipse*, or *Line*.

parent

Parent of this layer.

right

Right coordinate.

Returns int

size

(width, height) tuple.

Returns *tuple*

top

Top coordinate. Writable.

Returns int

topil()

Get PIL Image of the layer.

Returns `PIL.Image`, or *None* if the layer has no pixels.

vector_mask

Returns vector mask associated with this layer.

Returns *VectorMask* or *None*

visible

Layer visibility. Doesn't take group visibility in account. Writable.

Returns *bool*

width

Width of the layer.

Returns int

class `psd_tools2.api.adjustments.GradientFill(*args)`

Gradient fill.

bbox

(left, top, right, bottom) tuple.

blend_mode

Blend mode of this layer. Writable.

Example:

```
from psd_tools2.constants import BlendMode
if layer.blend_mode == BlendMode.NORMAL:
    layer.blend_mode = BlendMode.SCREEN
```

Returns *BlendMode*.

bottom

Bottom coordinate.

Returns int

clip_layers

Clip layers associated with this layer.

To compose clipping layers:

```
from psd_tools2 import compose
clip_mask = compose(layer.clip_layers)
```

Returns list of layers

compose (*args, **kwargs)

Compose layer and masks (mask, vector mask, and clipping layers).

Returns `PIL.Image`, or `None` if the layer has no pixel.

data

Gradient in Descriptor(`GRADIENT`).

effects

Layer effects.

Returns `Effects`

gradient_kind

Kind of the gradient, one of the following:

- *linear*
- *radial*
- *angle*
- *reflected*
- *diamond*

has_clip_layers ()

Returns True if the layer has associated clipping.

Returns `bool`

has_effects ()

Returns True if the layer has effects.

Returns `bool`

has_mask ()

Returns True if the layer has a mask.

Returns `bool`

has_origination ()

Returns True if the layer has live shape properties.

Returns `bool`

has_pixels ()

Returns True if the layer has associated pixels. When this is True, `topil` method returns `PIL.Image`.

Returns `bool`

has_vector_mask ()

Returns True if the layer has a vector mask.

Returns `bool`

height

Height of the layer.

Returns `int`

is_group ()

Return True if the layer is a group.

Returns `bool`

is_visible()

Layer visibility. Takes group visibility in account.

Returns *bool*

kind

Kind of this layer, either of group, pixel, shape, type, smartobject, or psdimage.

Returns *str*

layer_id

Layer ID.

Returns int layer id. if the layer is not assigned an id, -1.

left

Left coordinate. Writable.

Returns int

mask

Returns mask associated with this layer.

Returns *Mask* or *None*

name

Layer name. Writable.

Returns *str*

offset

(left, top) tuple. Writable.

Returns *tuple*

opacity

Opacity of this layer in [0, 255] range. Writable.

Returns int

origination

Property for a list of live shapes or a line.

Some of the vector masks have associated live shape properties, that are Photoshop feature to handle primitive shapes such as a rectangle, an ellipse, or a line. Vector masks without live shape properties are plain path objects.

Returns List of *Invalidated*, *Rectangle*, *RoundedRectangle*, *Ellipse*, or *Line*.

parent

Parent of this layer.

right

Right coordinate.

Returns int

size

(width, height) tuple.

Returns *tuple*

top

Top coordinate. Writable.

Returns int

topil()

Get PIL Image of the layer.

Returns `PIL.Image`, or `None` if the layer has no pixels.**vector_mask**

Returns vector mask associated with this layer.

Returns `VectorMask` or `None`**visible**

Layer visibility. Doesn't take group visibility in account. Writable.

Returns `bool`**width**

Width of the layer.

Returns `int`

3.2.2 Adjustment layers

Adjustment layers apply image filtering to the composed result. All adjustment layers inherit from `AdjustmentLayer`. Adjustment layers do not have pixels, and currently ignored in `compose`. Attempts to call `topil` on adjustment layers always return `None`.

Just as any other layer, adjustment layers might have an associated mask or vector mask. Adjustment can appear in other layers' clipping layers.

Example:

```
if isinstance(layer, psd_tools2.layers.AdjustmentLayer):
    print(layer.kind)
```

```
class psd_tools2.api.adjustments.BrightnessContrast(*args)
    Brightness and contrast adjustment.
```

automatic**brightness****contrast****lab****mean****use_legacy****vrsn**

```
class psd_tools2.api.adjustments.Curves(*args)
    Curves adjustment.
```

data

Raw data.

Returns `Curves`**extra**

```
class psd_tools2.api.adjustments.Exposure(*args)
    Exposure adjustment.
```

exposure

Exposure.

Returns *float*

gamma

Gamma.

Returns *float*

offset

Offset.

Returns *float*

class `psd_tools2.api.adjustments.Levels(*args)`

Levels adjustment.

Levels contain a list of `LevelRecord`.

data

List of level records. The first record is the master.

Returns `Levels`.

master

Master record.

class `psd_tools2.api.adjustments.Vibrance(*args)`

Vibrance adjustment.

saturation

Saturation.

Returns *int*

vibrance

Vibrance.

Returns *int*

class `psd_tools2.api.adjustments.HueSaturation(*args)`

Hue/Saturation adjustment.

HueSaturation contains a list of data.

colorization

Colorization.

Returns *tuple*

data

List of Hue/Saturation records.

Returns *list*

enable_colorization

Enable colorization.

Returns *int*

master

Master record.

Returns *tuple*

class psd_tools2.api.adjustments.**ColorBalance**(*args)
Color balance adjustment.

highlights
Highlights.

Returns *tuple*

luminosity
Luminosity.

Returns *int*

midtone
Mid-tones.

Returns *tuple*

shadows
Shadows.

Returns *tuple*

class psd_tools2.api.adjustments.**BlackAndWhite**(*args)
Black and white adjustment.

blue

cyan

green

magenta

preset_file_name

preset_kind

red

tint_color

use_tint

yellow

class psd_tools2.api.adjustments.**PhotoFilter**(*args)
Photo filter adjustment.

color_components

color_space

density

luminosity

xyz

xyz.

Returns *bool*

class psd_tools2.api.adjustments.**ChannelMixer**(*args)
Channel mixer adjustment.

data

monochrome

```
class psd_tools2.api.adjustments.ColorLookup(*args)
    Color lookup adjustment.

class psd_tools2.api.adjustments.Posterize(*args)
    Posterize adjustment.

    posterize
        Posterize value.

        Returns int

class psd_tools2.api.adjustments.Threshold(*args)
    Threshold adjustment.

    threshold
        Threshold value.

        Returns int

class psd_tools2.api.adjustments.SelectiveColor(*args)
    Selective color adjustment.

    data

    method

class psd_tools2.api.adjustments.GradientMap(*args)
    Gradient map adjustment.

    color_model

    color_stops

    dithered

    expansion

    gradient_name

    interpolation
        Interpolation between 0.0 and 1.0.

    length

    max_color

    min_color

    mode

    random_seed

    reversed

    roughness

    show_transparency

    transparency_stops

    use_vector_color
```

3.3 psd_tools2.api.effects

Effects module.

class `psd_tools2.api.effects.Effects` (*layer*)

List-like effects.

enabled

Whether if all the effects are enabled.

Return type `bool`

scale

Scale value.

3.3.1 DropShadow

class `psd_tools2.api.effects.DropShadow` (*value, psd=None*)

angle

Angle value.

anti_aliased

Anti-aliased.

blend_mode

Effect blending mode.

choke

Choke level.

color

Color.

contour

Contour configuration.

distance

Distance.

enabled

Whether if the effect is enabled.

layer_knocks_out

Layers are knocking out.

noise

Noise level.

opacity

Layer effect opacity in percentage.

present

Whether if the effect is present in Photoshop UI.

shown

Whether if the effect is shown in dialog.

size

Size in pixels.

use_global_light

Using global light.

3.3.2 InnerShadow

class `psd_tools2.api.effects.InnerShadow` (*value*, *psd=None*)

angle
Angle value.

anti_aliased
Anti-aliased.

blend_mode
Effect blending mode.

choke
Choke level.

color
Color.

contour
Contour configuration.

distance
Distance.

enabled
Whether if the effect is enabled.

noise
Noise level.

opacity
Layer effect opacity in percentage.

present
Whether if the effect is present in Photoshop UI.

shown
Whether if the effect is shown in dialog.

size
Size in pixels.

use_global_light
Using global light.

3.3.3 OuterGlow

class `psd_tools2.api.effects.OuterGlow` (*value*, *psd=None*)

anti_aliased
Anti-aliased.

blend_mode
Effect blending mode.

choke
Choke level.

color
Color.

contour
Contour configuration.

enabled
Whether if the effect is enabled.

glow_type
Glow type. 'softer' or 'precise'.

gradient
Gradient configuration.

noise
Noise level.

opacity
Layer effect opacity in percentage.

present
Whether if the effect is present in Photoshop UI.

quality_jitter
Quality jitter

quality_range
Quality range.

shown
Whether if the effect is shown in dialog.

size
Size in pixels.

3.3.4 InnerGlow

class `psd_tools2.api.effects.InnerGlow` (*value*, *psd=None*)

anti_aliased
Anti-aliased.

blend_mode
Effect blending mode.

choke
Choke level.

color
Color.

contour
Contour configuration.

enabled
Whether if the effect is enabled.

glow_source
Elements source, 'edge' or 'center'.

glow_type
Glow type. 'softer' or 'precise'.

gradient
Gradient configuration.

noise
Noise level.

opacity
Layer effect opacity in percentage.

present
Whether if the effect is present in Photoshop UI.

quality_jitter
Quality jitter

quality_range
Quality range.

shown
Whether if the effect is shown in dialog.

size
Size in pixels.

3.3.5 ColorOverlay

class `psd_tools2.api.effects.ColorOverlay` (*value*, *psd=None*)

blend_mode
Effect blending mode.

color
Color.

enabled
Whether if the effect is enabled.

opacity
Layer effect opacity in percentage.

present
Whether if the effect is present in Photoshop UI.

shown
Whether if the effect is shown in dialog.

3.3.6 GradientOverlay

class `psd_tools2.api.effects.GradientOverlay` (*value*, *psd=None*)

aligned
Aligned.

angle
Angle value.

blend_mode

Effect blending mode.

dithered

Dither flag.

enabled

Whether if the effect is enabled.

gradient

Gradient configuration.

offset

Offset value.

opacity

Layer effect opacity in percentage.

present

Whether if the effect is present in Photoshop UI.

reversed

Reverse flag.

scale

Scale value.

shown

Whether if the effect is shown in dialog.

type

Gradient type, one of *linear*, *radial*, *angle*, *reflected*, or *diamond*.

3.3.7 PatternOverlay

class `psd_tools2.api.effects.PatternOverlay` (*value*, *psd=None*)

aligned

Aligned.

blend_mode

Effect blending mode.

enabled

Whether if the effect is enabled.

opacity

Layer effect opacity in percentage.

pattern

Pattern config.

phase

Phase value in Point.

present

Whether if the effect is present in Photoshop UI.

scale

Scale value.

shown
Whether if the effect is shown in dialog.

3.3.8 Stroke

class `psd_tools2.api.effects.Stroke` (*value*, *psd=None*)

blend_mode
Effect blending mode.

color
Color.

enabled
Whether if the effect is enabled.

fill_type
Fill type, solid-color, gradient, or pattern.

gradient
Gradient configuration.

opacity
Layer effect opacity in percentage.

overprint
Overprint flag.

pattern
Pattern config.

position
Position of the stroke, *inner*, *outer*, or *center*.

present
Whether if the effect is present in Photoshop UI.

shown
Whether if the effect is shown in dialog.

size
Size value.

3.3.9 BevelEmboss

class `psd_tools2.api.effects.BevelEmboss` (*value*, *psd=None*)

altitude
Altitude value.

angle
Angle value.

anti_aliased
Anti-aliased.

bevel_style
Bevel style, one of *outer*, *inner*, *emboss*, *pillow-emboss*, or *stroke-emboss*.

bevel_type
Bevel type, one of *smooth*, *chiesel-hard*, *chiesel-soft*.

contour
Contour configuration.

depth
Depth value.

direction
Direction, either *in* or *out*.

enabled
Whether if the effect is enabled.

highlight_color
Highlight color value.

highlight_mode
Highlight blending mode.

highlight_opacity
Highlight opacity value.

opacity
Layer effect opacity in percentage.

present
Whether if the effect is present in Photoshop UI.

shadow_color
Shadow color value.

shadow_mode
Shadow blending mode.

shadow_opacity
Shadow opacity value.

shown
Whether if the effect is shown in dialog.

size
Size value in pixel.

soften
Soften value.

use_global_light
Using global light.

use_shape
Using shape.

use_texture
Using texture.

3.3.10 Satin

```
class psd_tools2.api.effects.Satin (value, psd=None)  
    Satin effect
```

angle	Angle value.
anti_aliased	Anti-aliased.
blend_mode	Effect blending mode.
color	Color.
contour	Contour configuration.
distance	Distance value.
enabled	Whether if the effect is enabled.
inverted	Inverted.
opacity	Layer effect opacity in percentage.
present	Whether if the effect is present in Photoshop UI.
shown	Whether if the effect is shown in dialog.
size	Size value in pixel.

3.4 psd_tools2.api.layers

Layer module.

3.4.1 Group

class `psd_tools2.api.layers.Group(*args)`
Group of layers.

Example:

```
group = psd[1]
for layer in group:
    if layer.kind == 'pixel':
        print(layer.name)
```

bbox
(left, top, right, bottom) tuple.

blend_mode
Blend mode of this layer. Writable.

Example:

```
from psd_tools2.constants import BlendMode
if layer.blend_mode == BlendMode.NORMAL:
    layer.blend_mode = BlendMode.SCREEN
```

Returns *BlendMode*.

clip_layers

Clip layers associated with this layer.

To compose clipping layers:

```
from psd_tools2 import compose
clip_mask = compose(layer.clip_layers)
```

Returns list of layers

compose ()

Compose layer and masks (mask, vector mask, and clipping layers).

Returns PIL Image object, or None if the layer has no pixels.

descendants (include_clip=True)

Return a generator to iterate over all descendant layers.

Example:

```
# Iterate over all layers
for layer in psd.descendants():
    print(layer)

# Iterate over all layers in reverse order
for layer in reversed(list(psd.descendants())):
    print(layer)
```

Parameters **include_clip** – include clipping layers.

effects

Layer effects.

Returns *Effects*

has_clip_layers ()

Returns True if the layer has associated clipping.

Returns *bool*

has_effects ()

Returns True if the layer has effects.

Returns *bool*

has_mask ()

Returns True if the layer has a mask.

Returns *bool*

has_origination ()

Returns True if the layer has live shape properties.

Returns *bool*

has_pixels ()

Returns True if the layer has associated pixels. When this is True, `topil` method returns `PIL.Image`.

Returns *bool*

has_vector_mask ()

Returns True if the layer has a vector mask.

Returns *bool*

height

Height of the layer.

Returns *int*

is_group ()

Return True if the layer is a group.

Returns *bool*

is_visible ()

Layer visibility. Takes group visibility in account.

Returns *bool*

kind

Kind of this layer, either of group, pixel, shape, type, smartobject, or psdimage.

Returns *str*

layer_id

Layer ID.

Returns *int* layer id. if the layer is not assigned an id, -1.

mask

Returns mask associated with this layer.

Returns *Mask* or *None*

name

Layer name. Writable.

Returns *str*

offset

(left, top) tuple. Writable.

Returns *tuple*

opacity

Opacity of this layer in [0, 255] range. Writable.

Returns *int*

origination

Property for a list of live shapes or a line.

Some of the vector masks have associated live shape properties, that are Photoshop feature to handle primitive shapes such as a rectangle, an ellipse, or a line. Vector masks without live shape properties are plain path objects.

Returns List of *Invalidated*, *Rectangle*, *RoundedRectangle*, *Ellipse*, or *Line*.

parent

Parent of this layer.

size
(width, height) tuple.
Returns *tuple*

topil()
Get PIL Image of the layer.
Returns `PIL.Image`, or *None* if the layer has no pixels.

vector_mask
Returns vector mask associated with this layer.
Returns *VectorMask* or *None*

visible
Layer visibility. Doesn't take group visibility in account. Writable.
Returns *bool*

width
Width of the layer.
Returns *int*

3.4.2 PixelLayer

class `psd_tools2.api.layers.PixelLayer` (*psd, record, channels, parent*)
Layer that has rasterized image in pixels.

Example:

```
assert layer.kind == 'pixel':
image = layer.topil()
image.save('layer.png')

composed_image = layer.compose()
composed_image.save('composed-layer.png')
```

bbox
(left, top, right, bottom) tuple.

blend_mode
Blend mode of this layer. Writable.

Example:

```
from psd_tools2.constants import BlendMode
if layer.blend_mode == BlendMode.NORMAL:
    layer.blend_mode = BlendMode.SCREEN
```

Returns *BlendMode*.

bottom
Bottom coordinate.
Returns *int*

clip_layers
Clip layers associated with this layer.

To compose clipping layers:

```
from psd_tools2 import compose
clip_mask = compose(layer.clip_layers)
```

Returns list of layers

compose (*args, **kwargs)

Compose layer and masks (mask, vector mask, and clipping layers).

Returns PIL. Image, or *None* if the layer has no pixel.

effects

Layer effects.

Returns *Effects*

has_clip_layers ()

Returns True if the layer has associated clipping.

Returns *bool*

has_effects ()

Returns True if the layer has effects.

Returns *bool*

has_mask ()

Returns True if the layer has a mask.

Returns *bool*

has_origination ()

Returns True if the layer has live shape properties.

Returns *bool*

has_pixels ()

Returns True if the layer has associated pixels. When this is True, `topil` method returns PIL. Image.

Returns *bool*

has_vector_mask ()

Returns True if the layer has a vector mask.

Returns *bool*

height

Height of the layer.

Returns *int*

is_group ()

Return True if the layer is a group.

Returns *bool*

is_visible ()

Layer visibility. Takes group visibility in account.

Returns *bool*

kind

Kind of this layer, either of group, pixel, shape, type, smartobject, or psdimage.

Returns *str*

layer_id

Layer ID.

Returns int layer id. if the layer is not assigned an id, -1.

left

Left coordinate. Writable.

Returns int

mask

Returns mask associated with this layer.

Returns *Mask* or *None*

name

Layer name. Writable.

Returns *str*

offset

(left, top) tuple. Writable.

Returns *tuple*

opacity

Opacity of this layer in [0, 255] range. Writable.

Returns int

origination

Property for a list of live shapes or a line.

Some of the vector masks have associated live shape properties, that are Photoshop feature to handle primitive shapes such as a rectangle, an ellipse, or a line. Vector masks without live shape properties are plain path objects.

Returns List of *Invalidated*, *Rectangle*, *RoundedRectangle*, *Ellipse*, or *Line*.

parent

Parent of this layer.

right

Right coordinate.

Returns int

size

(width, height) tuple.

Returns *tuple*

top

Top coordinate. Writable.

Returns int

topil ()

Get PIL Image of the layer.

Returns *PIL*. Image, or *None* if the layer has no pixels.

vector_mask

Returns vector mask associated with this layer.

Returns *VectorMask* or *None*

visible

Layer visibility. Doesn't take group visibility in account. Writable.

Returns *bool*

width

Width of the layer.

Returns *int*

3.4.3 ShapeLayer

class `psd_tools2.api.layers.ShapeLayer` (*psd, record, channels, parent*)

Layer that has drawing in vector mask.

bbox

(left, top, right, bottom) tuple.

blend_mode

Blend mode of this layer. Writable.

Example:

```
from psd_tools2.constants import BlendMode
if layer.blend_mode == BlendMode.NORMAL:
    layer.blend_mode = BlendMode.SCREEN
```

Returns *BlendMode*.

bottom

Bottom coordinate.

Returns *int*

clip_layers

Clip layers associated with this layer.

To compose clipping layers:

```
from psd_tools2 import compose
clip_mask = compose(layer.clip_layers)
```

Returns list of layers

compose (**args, **kwargs*)

Compose layer and masks (mask, vector mask, and clipping layers).

Returns `PIL`. Image, or *None* if the layer has no pixel.

effects

Layer effects.

Returns *Effects*

has_clip_layers ()

Returns True if the layer has associated clipping.

Returns *bool*

has_effects ()

Returns True if the layer has effects.

Returns *bool*

has_mask ()

Returns True if the layer has a mask.

Returns *bool*

has_origination ()

Returns True if the layer has live shape properties.

Returns *bool*

has_pixels ()

Returns True if the layer has associated pixels. When this is True, `topil` method returns `PIL.Image`.

Returns *bool*

has_stroke ()

Returns True if the shape has a stroke.

has_vector_mask ()

Returns True if the layer has a vector mask.

Returns *bool*

height

Height of the layer.

Returns *int*

is_group ()

Return True if the layer is a group.

Returns *bool*

is_visible ()

Layer visibility. Takes group visibility in account.

Returns *bool*

kind

Kind of this layer, either of group, pixel, shape, type, smartobject, or psdimage.

Returns *str*

layer_id

Layer ID.

Returns *int* layer id. if the layer is not assigned an id, -1.

left

Left coordinate. Writable.

Returns *int*

mask

Returns mask associated with this layer.

Returns *Mask* or *None*

name

Layer name. Writable.

Returns *str*

offset

(left, top) tuple. Writable.

Returns *tuple*

opacity

Opacity of this layer in [0, 255] range. Writable.

Returns *int*

origination

Property for a list of live shapes or a line.

Some of the vector masks have associated live shape properties, that are Photoshop feature to handle primitive shapes such as a rectangle, an ellipse, or a line. Vector masks without live shape properties are plain path objects.

Returns List of *Invalidated*, *Rectangle*, *RoundedRectangle*, *Ellipse*, or *Line*.

parent

Parent of this layer.

right

Right coordinate.

Returns *int*

size

(width, height) tuple.

Returns *tuple*

stroke

Property for strokes.

top

Top coordinate. Writable.

Returns *int*

topil ()

Get PIL Image of the layer.

Returns *PIL*. Image, or *None* if the layer has no pixels.

vector_mask

Returns vector mask associated with this layer.

Returns *VectorMask* or *None*

visible

Layer visibility. Doesn't take group visibility in account. Writable.

Returns *bool*

width

Width of the layer.

Returns *int*

3.4.4 SmartObjectLayer

class `psd_tools2.api.layers.SmartObjectLayer` (*psd*, *record*, *channels*, *parent*)

Layer that inserts external data.

Use `smart_object` attribute to get the external data. See *SmartObject*.

Example:

```
import io
if layer.smart_object.filetype == 'jpg':
    image = Image.open(io.BytesIO(layer.smart_object.data))
```

bbox

(left, top, right, bottom) tuple.

blend_mode

Blend mode of this layer. Writable.

Example:

```
from psd_tools2.constants import BlendMode
if layer.blend_mode == BlendMode.NORMAL:
    layer.blend_mode = BlendMode.SCREEN
```

Returns *BlendMode*.

bottom

Bottom coordinate.

Returns `int`

clip_layers

Clip layers associated with this layer.

To compose clipping layers:

```
from psd_tools2 import compose
clip_mask = compose(layer.clip_layers)
```

Returns list of layers

compose (*args, **kwargs)

Compose layer and masks (mask, vector mask, and clipping layers).

Returns `PIL.Image`, or `None` if the layer has no pixel.

effects

Layer effects.

Returns *Effects*

has_clip_layers ()

Returns True if the layer has associated clipping.

Returns *bool*

has_effects ()

Returns True if the layer has effects.

Returns *bool*

has_mask ()

Returns True if the layer has a mask.

Returns *bool*

has_origination()

Returns True if the layer has live shape properties.

Returns *bool*

has_pixels()

Returns True if the layer has associated pixels. When this is True, `topil` method returns `PIL.Image`.

Returns *bool*

has_vector_mask()

Returns True if the layer has a vector mask.

Returns *bool*

height

Height of the layer.

Returns *int*

is_group()

Return True if the layer is a group.

Returns *bool*

is_visible()

Layer visibility. Takes group visibility in account.

Returns *bool*

kind

Kind of this layer, either of group, pixel, shape, type, smartobject, or psdimage.

Returns *str*

layer_id

Layer ID.

Returns *int* layer id. if the layer is not assigned an id, -1.

left

Left coordinate. Writable.

Returns *int*

mask

Returns mask associated with this layer.

Returns *Mask* or *None*

name

Layer name. Writable.

Returns *str*

offset

(left, top) tuple. Writable.

Returns *tuple*

opacity

Opacity of this layer in [0, 255] range. Writable.

Returns *int*

origination

Property for a list of live shapes or a line.

Some of the vector masks have associated live shape properties, that are Photoshop feature to handle primitive shapes such as a rectangle, an ellipse, or a line. Vector masks without live shape properties are plain path objects.

Returns List of *Invalidated*, *Rectangle*, *RoundedRectangle*, *Ellipse*, or *Line*.

parent

Parent of this layer.

right

Right coordinate.

Returns int

size

(width, height) tuple.

Returns tuple

top

Top coordinate. Writable.

Returns int

topil ()

Get PIL Image of the layer.

Returns PIL. Image, or *None* if the layer has no pixels.

vector_mask

Returns vector mask associated with this layer.

Returns *VectorMask* or *None*

visible

Layer visibility. Doesn't take group visibility in account. Writable.

Returns bool

width

Width of the layer.

Returns int

3.4.5 TypeLayer

class psd_tools2.api.layers.**TypeLayer** (*args)

Layer that has text and styling information for fonts or paragraphs.

Text is accessible at *text* property. Styling information for paragraphs is in *engine_dict*. Document styling information such as font list is in *resource_dict*.

Currently, textual information is read-only.

Example:

```
if layer.kind == 'type':
    print(layer.text)
    print(layer.engine_dict['StyleRun'])
```

bbox
(left, top, right, bottom) tuple.

blend_mode
Blend mode of this layer. Writable.

Example:

```
from psd_tools2.constants import BlendMode
if layer.blend_mode == BlendMode.NORMAL:
    layer.blend_mode = BlendMode.SCREEN
```

Returns *BlendMode*.

bottom
Bottom coordinate.

Returns int

clip_layers
Clip layers associated with this layer.

To compose clipping layers:

```
from psd_tools2 import compose
clip_mask = compose(layer.clip_layers)
```

Returns list of layers

compose (*args, **kwargs)
Compose layer and masks (mask, vector mask, and clipping layers).

Returns PIL. Image, or *None* if the layer has no pixel.

document_resources
Resource set relevant to the document.

effects
Layer effects.

Returns *Effects*

engine_dict
Styling information dict.

has_clip_layers ()
Returns True if the layer has associated clipping.

Returns *bool*

has_effects ()
Returns True if the layer has effects.

Returns *bool*

has_mask ()
Returns True if the layer has a mask.

Returns *bool*

has_origination ()
Returns True if the layer has live shape properties.

Returns *bool*

has_pixels ()

Returns True if the layer has associated pixels. When this is True, `topil` method returns `PIL.Image`.

Returns *bool*

has_vector_mask ()

Returns True if the layer has a vector mask.

Returns *bool*

height

Height of the layer.

Returns *int*

is_group ()

Return True if the layer is a group.

Returns *bool*

is_visible ()

Layer visibility. Takes group visibility in account.

Returns *bool*

kind

Kind of this layer, either of group, pixel, shape, type, smartobject, or psdimage.

Returns *str*

layer_id

Layer ID.

Returns *int* layer id. if the layer is not assigned an id, -1.

left

Left coordinate. Writable.

Returns *int*

mask

Returns mask associated with this layer.

Returns *Mask* or *None*

name

Layer name. Writable.

Returns *str*

offset

(left, top) tuple. Writable.

Returns *tuple*

opacity

Opacity of this layer in [0, 255] range. Writable.

Returns *int*

origination

Property for a list of live shapes or a line.

Some of the vector masks have associated live shape properties, that are Photoshop feature to handle primitive shapes such as a rectangle, an ellipse, or a line. Vector masks without live shape properties are plain path objects.

Returns List of *Invalidated*, *Rectangle*, *RoundedRectangle*, *Ellipse*, or *Line*.

parent

Parent of this layer.

resource_dict

Resource set.

right

Right coordinate.

Returns int

size

(width, height) tuple.

Returns *tuple*

text

Text in the layer. Read-only.

Note: New-line character in Photoshop is ‘\r’.

top

Top coordinate. Writable.

Returns int

topil ()

Get PIL Image of the layer.

Returns *PIL*. Image, or *None* if the layer has no pixels.

transform

Matrix (xx, xy, yx, yy, tx, ty) applies affine transformation.

vector_mask

Returns vector mask associated with this layer.

Returns *VectorMask* or *None*

visible

Layer visibility. Doesn’t take group visibility in account. Writable.

Returns *bool*

warp

Warp configuration.

width

Width of the layer.

Returns int

3.5 psd_tools2.api.mask

Mask module.

3.5.1 Mask

class `psd_tools2.api.mask.Mask` (*layer*)

Mask data attached to a layer.

There are two distinct internal mask data: user mask and vector mask. User mask refers any pixel-based mask whereas vector mask refers a mask from a shape path. Internally, two masks are combined and referred real mask.

background_color

Background color.

bbox

BBox

bottom

Bottom coordinate.

disabled

Disabled.

flags

Flags.

height

Height.

left

Left coordinate.

parameters

Parameters.

real_flags

Real flag.

right

Right coordinate.

size

(Width, Height) tuple.

top

Top coordinate.

topil ()

Get PIL Image of the mask.

Returns PIL Image object.

width

Width.

3.6 psd_tools2.api.shape

Shape module.

3.6.1 VectorMask

class `psd_tools2.api.shape.VectorMask` (*data*)

Vector mask data.

Vector mask is a resolution-independent mask that consists of one or more Path objects. In Photoshop, all the path objects are represented as Bezier curves. Check *paths* property for how to deal with path objects.

bbox

Bounding box tuple (left, top, right, bottom) in relative coordinates, where top-left corner is (0., 0.) and bottom-right corner is (1., 1.).

Returns *tuple*

clipboard_record

Clipboard record containing bounding box information.

Depending on the Photoshop version, this field can be *None*.

disabled

If the mask is disabled.

initial_fill_rule

Initial fill rule.

When 0, fill inside of the path. When 1, fill outside of the shape.

Returns *int*

inverted

Invert the mask.

not_linked

If the knots are not linked.

paths

List of *Subpath*. Subpath is a list-like structure that contains one or more *Knot* items. Knot contains relative coordinates of control points for a Bezier curve. *index* indicates which origination item the subpath belongs, and *operation* indicates how to combine multiple shape paths.

In PSD, path fill rule is even-odd.

Example:

```
for subpath in layer.vector_mask.paths:
    anchors = [(
        int(knot.anchor[1] * psd.width),
        int(knot.anchor[0] * psd.height),
    ) for knot in subpath]
```

Returns List of Subpath.

3.6.2 Stroke

class `psd_tools2.api.shape.Stroke` (*data*)

Stroke contains decorative information for strokes.

This is a thin wrapper around *Descriptor* structure. Check *_data* attribute to get the raw data.

blend_mode

Blend mode.

content

Fill effect.

enabled

If the stroke is enabled.

fill_enabled

If the stroke fill is enabled.

line_alignment

Alignment, one of *inner*, *outer*, *center*.

line_cap_type

Cap type, one of *butt*, *round*, *square*.

line_dash_offset

Line dash offset in float.

Returns float

line_dash_set

Line dash set in list of `UnitFloat`.

Returns list

line_join_type

Join type, one of *miter*, *round*, *bevel*.

line_width

Stroke width in float.

miter_limit

Miter limit in float.

opacity

Opacity value.

stroke_adjust

Stroke adjust

3.6.3 Origination

Origination keeps live shape properties for some of the primitive shapes. Origination objects are accessible via `origination` property of layers. Following primitive shapes are defined: *Invalidated*, *Line*, *Rectangle*, *Ellipse*, and *RoundedRectangle*.

```
class psd_tools2.api.shape.Invalidated(data)
```

Invalidated live shape.

This equals to a primitive shape that does not provide Live shape properties. Use `VectorMask` to access shape information instead of this origination object.

invalidated

Returns *bool*

```
class psd_tools2.api.shape.Line(data)
```

Line live shape.

arrow_conc

Returns *int*

arrow_end
Line arrow end.
Returns *bool*

arrow_length
Line arrow length.
Returns *float*

arrow_start
Line arrow start.
Returns *bool*

arrow_width
Line arrow width.
Returns *float*

bbox
Bounding box of the live shape.
Returns *Descriptor*

index
Origination item index.
Returns *int*

invalidated
Returns *bool*

line_end
Line end.
Returns *Descriptor*

line_start
Line start.
Returns *Descriptor*

line_weight
Line weight
Returns *float*

origin_type
Type of the vector shape.

- 1: Rectangle
- 2: RoundedRectangle
- 4: Line
- 5: Ellipse

Returns *int*

resolution
Resolution.
Returns *float*

class `psd_tools2.api.shape.Ellipse` (*data*)
Ellipse live shape.

bbox
Bounding box of the live shape.
Returns *Descriptor*

index
Origination item index.
Returns *int*

invalidated
Returns *bool*

origin_type
Type of the vector shape.

- 1: Rectangle
- 2: RoundedRectangle
- 4: Line
- 5: Ellipse

Returns *int*

resolution
Resolution.
Returns *float*

class `psd_tools2.api.shape.Rectangle` (*data*)
Rectangle live shape.

bbox
Bounding box of the live shape.
Returns *Descriptor*

index
Origination item index.
Returns *int*

invalidated
Returns *bool*

origin_type
Type of the vector shape.

- 1: Rectangle
- 2: RoundedRectangle
- 4: Line
- 5: Ellipse

Returns *int*

resolution
Resolution.

Returns *float*

class `psd_tools2.api.shape.RoundedRectangle` (*data*)
Rounded rectangle live shape.

bbox
Bounding box of the live shape.

Returns *Descriptor*

index
Origination item index.

Returns *int*

invalidated
Returns *bool*

origin_type
Type of the vector shape.

- 1: Rectangle
- 2: RoundedRectangle
- 4: Line
- 5: Ellipse

Returns *int*

radii
Corner radii of rounded rectangles. The order is top-left, top-right, bottom-left, bottom-right.

Returns *Descriptor*

resolution
Resolution.

Returns *float*

3.7 psd_tools2.api.smart_object

Smart object module.

3.7.1 SmartObject

class `psd_tools2.api.smart_object.SmartObject` (*layer*)
Smart object that represents embedded or external file.

data
Embedded file content, or empty if kind is *external* or *alias*

filename
Original file name of the object.

filesize

File size of the object.

filetype

Preferred file extension, such as *jpg*.

is_psd()

Return True if the file is embedded PSD/PSB.

kind

Kind of the link, 'data', 'alias', or 'external'.

open (*external_dir=None*)

Open the smart object as binary IO.

Parameters **external_dir** – Path to the directory of the external file.

resolution

Resolution of the object.

save (*filename=None*)

Save the smart object to a file.

Parameters **filename** – File name to export. If None, use the embedded name.

unique_id

UUID of the object.

warp

Warp parameters.

3.8 psd_tools2.constants

Various constants for psd_tools2

3.8.1 BlendMode

class psd_tools2.constants.BlendMode

Blend modes.

COLOR = b'colr'

COLOR_BURN = b'idiv'

COLOR_DODGE = b'div '

DARKEN = b'dark'

DARKER_COLOR = b'dkCl'

DIFFERENCE = b'diff'

DISSOLVE = b'diss'

DIVIDE = b'fdiv'

EXCLUSION = b'smud'

HARD_LIGHT = b'hLit'

HARD_MIX = b'hMix'

```
HUE = b'hue '  
LIGHTEN = b'lite'  
LIGHTER_COLOR = b'lgCl'  
LINEAR_BURN = b'lbrn'  
LINEAR_DODGE = b'lddg'  
LINEAR_LIGHT = b'lLit'  
LUMINOSITY = b'lum '  
MULTIPLY = b'mul '  
NORMAL = b'norm'  
OVERLAY = b'over'  
PASS_THROUGH = b'pass'  
PIN_LIGHT = b'pLit'  
SATURATION = b'sat '  
SCREEN = b'scrn'  
SOFT_LIGHT = b'sLit'  
SUBTRACT = b'fsub'  
VIVID_LIGHT = b'vLit'
```

3.8.2 ChannelID

```
class psd_tools2.constants.ChannelID
```

Channel types.

```
CHANNEL_0 = 0  
CHANNEL_1 = 1  
CHANNEL_2 = 2  
CHANNEL_3 = 3  
CHANNEL_4 = 4  
CHANNEL_5 = 5  
CHANNEL_6 = 6  
CHANNEL_7 = 7  
CHANNEL_8 = 8  
CHANNEL_9 = 9  
REAL_USER_LAYER_MASK = -3  
TRANSPARENCY_MASK = -1  
USER_LAYER_MASK = -2
```

3.8.3 Clipping

```
class psd_tools2.constants.Clipping
    Clipping.

    BASE = 0
    NON_BASE = 1
```

3.8.4 ColorMode

```
class psd_tools2.constants.ColorMode
    Color mode.

    BITMAP = 0
    CMYK = 4
    DUOTONE = 8
    GRAYSCALE = 1
    INDEXED = 2
    LAB = 9
    MULTICHANNEL = 7
    RGB = 3
```

3.8.5 ColorSpaceID

```
class psd_tools2.constants.ColorSpaceID
    Color space types.

    CMYK = 2
    GRAYSCALE = 8
    HSB = 1
    LAB = 7
    RGB = 0
```

3.8.6 Compression

```
class psd_tools2.constants.Compression
    Compression modes.

    Compression. 0 = Raw Data, 1 = RLE compressed, 2 = ZIP without prediction, 3 = ZIP with prediction.

    PACK_BITS = 1
    RAW = 0
    ZIP = 2
    ZIP_WITH_PREDICTION = 3
```

3.8.7 EffectOSType

```
class psd_tools2.constants.EffectOSType
    OS Type keys for Layer Effects.

    BEVEL = b'bev1'
    COMMON_STATE = b'cmnS'
    DROP_SHADOW = b'dsdw'
    INNER_GLOW = b'iglw'
    INNER_SHADOW = b'isdw'
    OUTER_GLOW = b'oglw'
    SOLID_FILL = b'sofi'
```

3.8.8 GlobalLayerMaskKind

```
class psd_tools2.constants.GlobalLayerMaskKind
    Global layer mask kind.

    COLOR_PROTECTED = 1
    COLOR_SELECTED = 0
    PER_LAYER = 128
```

3.8.9 LinkedLayerType

```
class psd_tools2.constants.LinkedLayerType
    Linked layer types.

    ALIAS = b'liFA'
    DATA = b'liFD'
    EXTERNAL = b'liFE'
```

3.8.10 ImageResourceID

```
class psd_tools2.constants.ImageResourceID
    Image resource keys.

    Other than the attributes below, path and plugin resources exist:
    • PATH_INFO_0 to PATH_INFO_999 corresponding to 2000 - 2999
    • PLUGIN_RESOURCES_0 to PLUGIN_RESOURCES_999 corresponding to 4000 - 4999

    ALPHA_IDENTIFIERS = 1053
    ALPHA_NAMES_PASCAL = 1006
    ALPHA_NAMES_UNICODE = 1045
    ALTERNATE_DUOTONE_COLORS = 1066
    ALTERNATE_SPOT_COLORS = 1067
```

AUTO_SAVE_FILE_PATH = 1086
AUTO_SAVE_FORMAT = 1087
BACKGROUND_COLOR = 1010
BORDER_INFO = 1009
CAPTION_DIGEST = 1061
CAPTION_PASCAL = 1008
CLIPPING_PATH_NAME = 2999
COLOR_HALFTONING_INFO = 1013
COLOR_SAMPLERS_RESOURCE = 1073
COLOR_SAMPLERS_RESOURCE_OBSOLETE = 1038
COLOR_TRANSFER_FUNCTION = 1016
COPYRIGHT_FLAG = 1034
COUNT_INFO = 1080
DISPLAY_INFO = 1077
DISPLAY_INFO_OBSOLETE = 1007
DUOTONE_HALFTONING_INFO = 1014
DUOTONE_IMAGE_INFO = 1018
DUOTONE_TRANSFER_FUNCTION = 1017
EFFECTIVE_BW = 1019
EFFECTS_VISIBLE = 1042
EPS_OPTIONS = 1021
EXIF_DATA_1 = 1058
EXIF_DATA_3 = 1059
GLOBAL_ALTITUDE = 1049
GLOBAL_ANGLE = 1037
GRAYSCALE_HALFTONING_INFO = 1012
GRAYSCALE_TRANSFER_FUNCTION = 1015
GRID_AND_GUIDES_INFO = 1032
HDR_TONING_INFO = 1070
ICC_PROFILE = 1039
ICC_UNTAGGED_PROFILE = 1041
IDS_SEED_NUMBER = 1044
IMAGE_MODE_RAW = 1029
IMAGE_READY_DATA_SETS = 7001
IMAGE_READY_VARIABLES = 7000
INDEXED_COLOR_TABLE_COUNT = 1046


```
IPTC_NAA = 1028
JPEG_QUALITY = 1030
JUMP_TO_XPEP = 1052
LAYER_COMPS = 1065
LAYER_GROUPS_ENABLED_ID = 1072
LAYER_GROUP_INFO = 1026
LAYER_SELECTION_IDS = 1069
LAYER_STATE_INFO = 1024
LIGHTROOM_WORKFLOW = 8000
MAC_NSPRINTINFO = 1084
MAC_PRINT_MANAGER_INFO = 1001
MEASUREMENT_SCALE = 1074
OBSOLETE1 = 1000
OBSOLETE2 = 1003
OBSOLETE3 = 1020
OBSOLETE4 = 1023
OBSOLETE5 = 1027
ONION_SKINS = 1078
ORIGIN_PATH_INFO = 3000
PATH_INFO_0 = 2000
PATH_SELECTION_STATE = 1088
PIXEL_ASPECT_RATIO = 1064
PLUGIN_RESOURCES_0 = 4000
PRINT_FLAGS = 1011
PRINT_FLAGS_INFO = 10000
PRINT_INFO_CS2 = 1071
PRINT_INFO_CS5 = 1082
PRINT_SCALE = 1062
PRINT_STYLE = 1083
QUICK_MASK_INFO = 1022
RESOLUTION_INFO = 1005
SHEET_DISCLOSURE = 1076
SLICES = 1050
SPOT_HALFTONE = 1043
THUMBNAIL_RESOURCE = 1036
THUMBNAIL_RESOURCE_PS4 = 1033
```

```
TIMELINE_INFO = 1075
TRANSPARENCY_INDEX = 1047
URL = 1035
URL_LIST = 1054
VERSION_INFO = 1057
WATERMARK = 1040
WINDOWS_DEVMODE = 1085
WORKFLOW_URL = 1051
WORKING_PATH = 1025
XMP_METADATA = 1060
```

3.8.11 PathResourceID

class psd_tools2.constants.PathResourceID

An enumeration.

```
CLIPBOARD = 7
CLOSED_KNOT_LINKED = 1
CLOSED_KNOT_UNLINKED = 2
CLOSED_LENGTH = 0
INITIAL_FILL = 8
OPEN_KNOT_LINKED = 4
OPEN_KNOT_UNLINKED = 5
OPEN_LENGTH = 3
PATH_FILL = 6
```

3.8.12 PlacedLayerType

class psd_tools2.constants.PlacedLayerType

An enumeration.

```
IMAGE_STACK = 3
RASTER = 2
UNKNOWN = 0
VECTOR = 1
```

3.8.13 PrintScaleStyle

class psd_tools2.constants.PrintScaleStyle

Print scale style.

```
CENTERED = 0
```

```

SIZE_TO_FIT = 1
USER_DEFINED = 2

```

3.8.14 SectionDivider

```

class psd_tools2.constants.SectionDivider
    An enumeration.
    BOUNDING_SECTION_DIVIDER = 3
    CLOSED_FOLDER = 2
    OPEN_FOLDER = 1
    OTHER = 0

```

3.8.15 TaggedBlockID

```

class psd_tools2.constants.TaggedBlockID
    Tagged blocks keys.
    ALPHA = b'Alph'
    ANIMATION_EFFECTS = b'anFX'
    ANNOTATIONS = b'Anno'
    ARTBOARD_DATA1 = b'artb'
    ARTBOARD_DATA2 = b'artd'
    ARTBOARD_DATA3 = b'abdd'
    BLACK_AND_WHITE = b'blwh'
    BLEND_CLIPPING_ELEMENTS = b'clbl'
    BLEND_FILL_OPACITY = b'iOpa'
    BLEND_INTERIOR_ELEMENTS = b'infx'
    BRIGHTNESS_AND_CONTRAST = b'brit'
    CHANNEL_BLENDING_RESTRICTIONS_SETTING = b'brst'
    CHANNEL_MIXER = b'mixr'
    COLOR_BALANCE = b'blnc'
    COLOR_LOOKUP = b'clrL'
    COMPUTER_INFO = b'cinf'
    CONTENT_GENERATOR_EXTRA_DATA = b'CgEd'
    CURVES = b'curv'
    EFFECTS_LAYER = b'lrFX'
    EXPORT_SETTING1 = b'extd'
    EXPORT_SETTING2 = b'extn'
    EXPOSURE = b'expA'

```

```
FILTER_EFFECTS1 = b'FXid'  
FILTER_EFFECTS2 = b'FEid'  
FILTER_EFFECTS3 = b'FELS'  
FILTER_MASK = b'Fmsk'  
FOREIGN_EFFECT_ID = b'ffxi'  
GRADIENT_FILL_SETTING = b'GdFl'  
GRADIENT_MAP = b'grdm'  
HUE_SATURATION = b'hue2'  
HUE_SATURATION_V4 = b'hue '  
INVERT = b'nvrt'  
KNOCKOUT_SETTING = b'knko'  
LAYER = b'Layr'  
LAYER_16 = b'Lr16'  
LAYER_32 = b'Lr32'  
LAYER_ID = b'lyid'  
LAYER_MASK_AS_GLOBAL_MASK = b'lmgm'  
LAYER_NAME_SOURCE_SETTING = b'lnsr'  
LAYER_VERSION = b'lyvr'  
LEVELS = b'levl'  
LINKED_LAYER1 = b'lnkD'  
LINKED_LAYER2 = b'lnk2'  
LINKED_LAYER3 = b'lnk3'  
LINKED_LAYER_EXTERNAL = b'lnkE'  
METADATA_SETTING = b'shmd'  
NESTED_SECTION_DIVIDER_SETTING = b'lsdk'  
OBJECT_BASED_EFFECTS_LAYER_INFO = b'lfx2'  
OBJECT_BASED_EFFECTS_LAYER_INFO_V0 = b'lmfx'  
OBJECT_BASED_EFFECTS_LAYER_INFO_V1 = b'lfxs'  
PATTERNS1 = b'Patt'  
PATTERNS2 = b'Pat2'  
PATTERNS3 = b'Pat3'  
PATTERN_DATA = b'shpa'  
PATTERN_FILL_SETTING = b'PtFl'  
PHOTO_FILTER = b'phfl'  
PIXEL_SOURCE_DATA1 = b'PxSc'  
PIXEL_SOURCE_DATA2 = b'PxSD'
```

```
PLACED_LAYER1 = b'plLd'  
PLACED_LAYER2 = b'PlLd'  
POSTERIZE = b'post'  
PROTECTED_SETTING = b'lspf'  
REFERENCE_POINT = b'fxrp'  
SAVING_MERGED_TRANSPARENCY = b'Mtrn'  
SAVING_MERGED_TRANSPARENCY16 = b'Mt16'  
SAVING_MERGED_TRANSPARENCY32 = b'Mt32'  
SECTION_DIVIDER_SETTING = b'lset'  
SELECTIVE_COLOR = b'selc'  
SHEET_COLOR_SETTING = b'lclr'  
SMART_OBJECT_LAYER_DATA1 = b'SoLd'  
SMART_OBJECT_LAYER_DATA2 = b'SoLE'  
SOLID_COLOR_SHEET_SETTING = b'SoCo'  
TEXT_ENGINE_DATA = b'Txt2'  
THRESHOLD = b'thrs'  
TRANSPARENCY_SHAPES_LAYER = b'tsly'  
TYPE_TOOL_INFO = b'tySh'  
TYPE_TOOL_OBJECT_SETTING = b'TySh'  
UNICODE_LAYER_NAME = b'luni'  
UNICODE_PATH_NAME = b'pths'  
USER_MASK = b'lMsk'  
USING_ALIGNED_RENDERING = b'sn2P'  
VECTOR_MASK_AS_GLOBAL_MASK = b'vmgm'  
VECTOR_MASK_SETTING1 = b'vmsk'  
VECTOR_MASK_SETTING2 = b'vsms'  
VECTOR_ORIGINATION_DATA = b'vogk'  
VECTOR_STROKE_CONTENT_DATA = b'vscg'  
VECTOR_STROKE_DATA = b'vstk'  
VIBRANCE = b'viba'
```

3.9 psd_tools2.psd

Low-level API that translates binary data to Python structure

3.9.1 PSD

class `psd_tools2.psd.PSD` (*header=NOTHING*, *color_mode_data=NOTHING*, *image_resources=NOTHING*, *layer_and_mask_information=NOTHING*, *image_data=NOTHING*)

Low-level PSD file structure that resembles the [specification](#).

Example:

```
from psd_tools.psd import PSD

with open(input_file, 'rb') as f:
    psd = PSD.read(f)

with open(output_file, 'wb') as f:
    psd.write(f)
```

header

See [FileHeader](#).

color_mode_data

See [ColorModeData](#).

image_resources

See [ImageResources](#).

layer_and_mask_information

See [LayerAndMaskInformation](#).

image_data

See [ImageData](#).

color_mode_data

classmethod `frombytes` (*data*, **args*, ***kwargs*)

Read the element from bytes.

Parameters `data` – bytes

header

image_data

image_resources

layer_and_mask_information

classmethod `read` (*fp*, *encoding='macroman'*, ***kwargs*)

Read the element from a file-like object.

Parameters `fp` – file-like object

Return type [PSD](#)

tobytes (**args*, ***kwargs*)

Write the element to bytes.

Return type bytes

validate ()

Validate the attribute.

write (*fp*, *encoding='macroman'*, ***kwargs*)

Write the element to a file-like object.

3.10 psd_tools2.psd.color_mode_data

Color mode data structure.

3.10.1 ColorModeData

class `psd_tools2.psd.color_mode_data.ColorModeData` (*value: bytes = b''*)
Color mode data section of the PSD file.

For indexed color images the data is the color table for the image in a non-interleaved order.

Duotone images also have this data, but the data format is undocumented.

interleave ()

classmethod read (*fp*)
Read the element from a file-like object.

Parameters *fp* – file-like object

Return type *ColorModeData*

value

write (*fp*)
Write the element to a file-like object.

Parameters *fp* – file-like object

3.11 psd_tools2.psd.descriptor

Descriptor data structure.

Descriptors are basic data structure used throughout PSD files.

3.11.1 Alias

class `psd_tools2.psd.descriptor.Alias` (*value: bytes = b'x00x00x00x00'*)
Alias structure equivalent to *RawData*.

value

ostype = `b'alis'`

3.11.2 Bool

class `psd_tools2.psd.descriptor.Bool` (*value=False*)
Bool structure.

value

ostype = `b'bool'`

classmethod read (*fp*)
Read the element from a file-like object.

Parameters *fp* – file-like object

write (*fp*)
Write the element to a file-like object.
Parameters **fp** – file-like object

3.11.3 Class

class `psd_tools2.psd.descriptor.Class` (*name: str = "", classID: bytes = b'x00x00x00x00'*)
Class structure.

name

classID

classmethod **read** (*fp*)
Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)
Write the element to a file-like object.

Parameters **fp** – file-like object

3.11.4 Class1

class `psd_tools2.psd.descriptor.Class1` (*name: str = "", classID: bytes = b'x00x00x00x00'*)
Class structure equivalent to `Class`.

ostype = `b'type'`

3.11.5 Class2

class `psd_tools2.psd.descriptor.Class2` (*name: str = "", classID: bytes = b'x00x00x00x00'*)
Class structure equivalent to `Class`.

ostype = `b'G1bC'`

3.11.6 Class3

class `psd_tools2.psd.descriptor.Class3` (*name: str = "", classID: bytes = b'x00x00x00x00'*)
Class structure equivalent to `Class`.

ostype = `b'Clss'`

3.11.7 Descriptor

class `psd_tools2.psd.descriptor.Descriptor` (*items=NOTHING, name: str = "", classID=<DescriptorClassID.NULL: b'null'>*)
Dict-like descriptor structure.

Example:

```
for key in descriptor:  
    print(descriptor[key])
```



```

name
classID
ostype = b'Objc'
classmethod read (fp)
    Read the element from a file-like object.
        Parameters fp – file-like object
write (fp)
    Write the element to a file-like object.
        Parameters fp – file-like object

```

3.11.8 Double

```

class psd_tools2.psd.descriptor.Double (value=0.0)
    Double structure.
value
ostype = b'doub'
classmethod read (fp)
    Read the element from a file-like object.
        Parameters fp – file-like object
write (fp)
    Write the element to a file-like object.
        Parameters fp – file-like object

```

3.11.9 Enum

```

class psd_tools2.psd.descriptor.Enum (TypeID: bytes = b'x00x00x00x00', enum: bytes = b'x00x00x00x00')
    Enum structure.
value
ostype = b'enum'
classmethod read (fp)
    Read the element from a file-like object.
        Parameters fp – file-like object
write (fp)
    Write the element to a file-like object.
        Parameters fp – file-like object

```

3.11.10 EnumeratedReference

```
class psd_tools2.psd.descriptor.EnumeratedReference (name: str = "", classID: bytes = b'x00x00x00x00', typeId: bytes = b'x00x00x00x00', enum: bytes = b'x00x00x00x00')
```

Enumerated reference structure.

value

ostype = b'Enmr'

classmethod read (*fp*)

Read the element from a file-like object.

Parameters *fp* – file-like object

write (*fp*)

Write the element to a file-like object.

Parameters *fp* – file-like object

3.11.11 GlobalObject

```
class psd_tools2.psd.descriptor.GlobalObject (items=NOTHING, name: str = "", classID=<DescriptorClassID.NULL: b'null'>)
```

Global object structure equivalent to *Descriptor*.

ostype = b'Glb0'

3.11.12 Identifier

```
class psd_tools2.psd.descriptor.Identifier (value=0)
```

Identifier equivalent to *Integer*.

ostype = b'Idnt'

3.11.13 Index

```
class psd_tools2.psd.descriptor.Index (value=0)
```

Index equivalent to *Integer*.

ostype = b'indx'

3.11.14 Integer

```
class psd_tools2.psd.descriptor.Integer (value=0)
```

Integer structure.

value

ostype = b'long'

classmethod read (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)

Write the element to a file-like object.

Parameters **fp** – file-like object

3.11.15 LargeInteger

class `psd_tools2.psd.descriptor.LargeInteger` (*value=0*)

LargeInteger structure.

value

ostype = `b'comp'`

classmethod **read** (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)

Write the element to a file-like object.

Parameters **fp** – file-like object

3.11.16 List

class `psd_tools2.psd.descriptor.List` (*items=NOTHING*)

List structure.

items

ostype = `b'VLLs'`

classmethod **read** (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)

Write the element to a file-like object.

Parameters **fp** – file-like object

3.11.17 Name

class `psd_tools2.psd.descriptor.Name` (*name: str = "", classID: bytes = b'x00x00x00x00', value: str = ""*)

Name structure (Undocumented).

ostype = `b'name'`

classmethod **read** (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)

Write the element to a file-like object.

Parameters **fp** – file-like object

3.11.18 ObjectArray

```
class psd_tools2.psd.descriptor.ObjectArray (items=NOTHING,          items_count:  
                                           int = 0, name: str = "", clas-  
                                           sID=<DescriptorClassID.NULL: b'null'>)
```

Object array structure almost equivalent to *Descriptor*.

items_count

name

classID

ostype = b'ObAr'

classmethod read (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)

Write the element to a file-like object.

Parameters **fp** – file-like object

3.11.19 Property

```
class psd_tools2.psd.descriptor.Property (name: str = "", classID: bytes = b'x00x00x00x00',  
                                           keyID: bytes = b'x00x00x00x00')
```

Property structure.

name

ostype = b'prop'

classmethod read (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)

Write the element to a file-like object.

Parameters **fp** – file-like object

3.11.20 Offset

```
class psd_tools2.psd.descriptor.Offset (name: str = "", classID: bytes = b'x00x00x00x00',  
                                           value=0)
```

Offset structure.

value

ostype = b'rele'

classmethod read (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)
Write the element to a file-like object.
Parameters *fp* – file-like object

3.11.21 Path

class `psd_tools2.psd.descriptor.Path` (*value: bytes = b'x00x00x00x00'*)
Undocumented path structure equivalent to *RawData*.
ostype = `b'Pth '`

3.11.22 RawData

class `psd_tools2.psd.descriptor.RawData` (*value: bytes = b'x00x00x00x00'*)
RawData structure.
value
bytes
ostype = `b'tdta'`
classmethod `read` (*fp*)
Read the element from a file-like object.
Parameters *fp* – file-like object
write (*fp*)
Write the element to a file-like object.
Parameters *fp* – file-like object

3.11.23 Reference

class `psd_tools2.psd.descriptor.Reference` (*items=NOTHING*)
Reference structure equivalent to *List*.
ostype = `b'obj '`

3.11.24 String

class `psd_tools2.psd.descriptor.String` (*value: str = ""*)
String structure.
value
ostype = `b'TEXT'`

3.11.25 UnitFloat

class `psd_tools2.psd.descriptor.UnitFloat` (*value: float = 0.0, unit=<UnitFloatType.NONE: b'#Nne'>*)
Unit float structure.
unit

value

ostype = b'UntF'

classmethod read (*fp*)
Read the element from a file-like object.
Parameters *fp* – file-like object

unit

value

write (*fp*)
Write the element to a file-like object.
Parameters *fp* – file-like object

3.11.26 UnitFloats

class psd_tools2.psd.descriptor.**UnitFloats** (*unit=<UnitFloatType.NONE: b'#Nne'>, values=NOTHING*)
Unit floats structure.

unit

values

ostype = b'UnF1'

classmethod read (*fp*)
Read the element from a file-like object.
Parameters *fp* – file-like object

write (*fp*)
Write the element to a file-like object.
Parameters *fp* – file-like object

3.12 psd_tools2.psd.engine_data

EngineData parser.

PSD file embeds text formatting data in its own markup language referred EngineData. The format looks like the following:

```
<<
/EngineDict
<<
  /Editor
  <<
    /Text (~Make a change and save.)
  >>
>>
/Font
<<
  /Name (~HelveticaNeue-Light)
  /FillColor
<<
```

(continues on next page)

(continued from previous page)

```

    /Type 1
    /Values [ 1.0 0.0 0.0 0.0 ]
  >>
  /StyleSheetSet [
  <<
    /Name (~Normal RGB)
  >>
  ]
  >>
>>

```

3.12.1 EngineData

class `psd_tools2.psd.engine_data.EngineData` (*items=NOTHING*)

Dict-like element.

TYPE_TOOL_OBJECT_SETTING tagged block contains this object in its descriptor.

3.12.2 EngineData2

class `psd_tools2.psd.engine_data.EngineData2` (*items=NOTHING*)

Dict-like element.

TEXT_ENGINE_DATA tagged block has this object.

write (*fp, indent=None, write_container=False, **kwargs*)

Write the element to a file-like object.

3.12.3 Bool

class `psd_tools2.psd.engine_data.Bool` (*value=False*)

Bool element.

classmethod `frombytes` (*data*)

Read the element from bytes.

Parameters *data* – bytes

classmethod `read` (*fp*)

Read the element from a file-like object.

Parameters *fp* – file-like object

write (*fp, indent=0*)

Write the element to a file-like object.

3.12.4 Dict

class `psd_tools2.psd.engine_data.Dict` (*items=NOTHING*)

Dict-like element.

classmethod `frombytes` (*data, **kwargs*)

Read the element from bytes.

Parameters *data* – bytes

classmethod read (*fp*, ***kwargs*)
Read the element from a file-like object.
Parameters **fp** – file-like object
write (*fp*, *indent=0*, *write_container=True*)
Write the element to a file-like object.

3.12.5 Float

class `psd_tools2.psd.engine_data.Float` (*value=0.0*)
Float element.
classmethod frombytes (*data*)
Read the element from bytes.
Parameters **data** – bytes
classmethod read (*fp*)
Read the element from a file-like object.
Parameters **fp** – file-like object
write (*fp*)
Write the element to a file-like object.

3.12.6 Integer

class `psd_tools2.psd.engine_data.Integer` (*value=0*)
Integer element.
classmethod frombytes (*data*)
Read the element from bytes.
Parameters **data** – bytes
classmethod read (*fp*)
Read the element from a file-like object.
Parameters **fp** – file-like object
write (*fp*, *indent=0*)
Write the element to a file-like object.

3.12.7 List

class `psd_tools2.psd.engine_data.List` (*items=NOTHING*)
List-like element.
classmethod frombytes (*data*)
Read the element from bytes.
Parameters **data** – bytes
classmethod read (*fp*)
Read the element from a file-like object.
Parameters **fp** – file-like object

write (*fp*, *indent=None*)
Write the element to a file-like object.

3.12.8 Property

class `psd_tools2.psd.engine_data.Property` (*value=None*)
Property element.

classmethod **frombytes** (*data*)
Read the element from bytes.

Parameters **data** – bytes

classmethod **read** (*fp*)
Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)
Write the element to a file-like object.

3.12.9 String

class `psd_tools2.psd.engine_data.String` (*value=None*)
String element.

classmethod **frombytes** (*data*)
Read the element from bytes.

Parameters **data** – bytes

classmethod **read** (*fp*)
Read the element from a file-like object.

Parameters **fp** – file-like object

write (*fp*)
Write the element to a file-like object.

3.13 psd_tools2.psd.header

File header structure.

3.13.1 FileHeader

class `psd_tools2.psd.header.FileHeader` (*signature: bytes = b'8BPS', version: int = 1, channels: int = 4, height: int = 64, width: int = 64, depth: int = 8, color_mode=<ColorMode.RGB: 3>*)

Header section of the PSD file.

Example:

```
from psd_tools2.psd.header import FileHeader
from psd_tools2.constants import ColorMode

header = FileHeader(channels=2, height=359, width=400, depth=8,
                    color_mode=ColorMode.GRAYSCALE)
```

signature

Signature: always equal to b'8BPS'.

version

Version number. PSD is 1, and PSB is 2.

channels

The number of channels in the image, including any alpha channels.

height

The height of the image in pixels.

width

The width of the image in pixels.

depth

The number of bits per channel.

color_mode

The color mode of the file. See *ColorMode*

channels**color_mode****depth****height****classmethod read** (*fp*)

Read the element from a file-like object.

Parameters *fp* – file-like object

Return type *FileHeader*

signature**version****width****write** (*fp*)

Write the element to a file-like object.

Parameters *fp* – file-like object

3.14 psd_tools2.psd.image_data

Image data section structure.

3.14.1 ImageData

class `psd_tools2.psd.image_data.ImageData` (*compression*=<*Compression.RAW*: 0>, *data*:
bytes = b"")

Merged channel image data.

compression

See *Compression*.

data

compression

data

get_data (*header*)

Get decompressed data.

Parameters *header* – See *FileHeader*.

Returns list of bytes corresponding each channel.

Return type list

classmethod **new** (*header*, *color*=0, *compression*=<*Compression.RAW*: 0>)

Create a new image data object.

Parameters

- **header** – FileHeader.
- **compression** – compression type.
- **color** – default color. int or iterable for channel length.

classmethod **read** (*fp*)

Read the element from a file-like object.

Parameters *fp* – file-like object

Return type *ImageData*

set_data (*data*, *header*)

Set raw data and compress.

Parameters

- **data** – list of raw data bytes corresponding channels.
- **compression** – compression type, see *Compression*.
- **header** – See *FileHeader*.

Returns length of compressed data.

write (*fp*)

Write the element to a file-like object.

Parameters *fp* – file-like object

Return type int

3.15 psd_tools2.psd.image_resources

Image resources section structure. Image resources are used to store non-pixel data associated with images, such as pen tool paths.

The following resources are plain bytes:

```
ImageResourceID.OBSOLETE1: 1000
ImageResourceID.MAC_PRINT_MANAGER_INFO: 1001
ImageResourceID.OBSOLETE2: 1003
ImageResourceID.DISPLAY_INFO_OBSOLETE: 1007
ImageResourceID.BORDER_INFO: 1009
ImageResourceID.DUOTONE_IMAGE_INFO: 1018
ImageResourceID.EFFECTIVE_BW: 1019
ImageResourceID.OBSOLETE3: 1020
ImageResourceID.EPS_OPTIONS: 1021
ImageResourceID.QUICK_MASK_INFO: 1022
ImageResourceID.OBSOLETE4: 1023
ImageResourceID.WORKING_PATH: 1025
ImageResourceID.OBSOLETE5: 1027
ImageResourceID.IPTC_NAA: 1028
ImageResourceID.IMAGE_MODE_RAW: 1029
ImageResourceID.JPEG_QUALITY: 1030
ImageResourceID.URL: 1035
ImageResourceID.COLOR_SAMPLERS_RESOURCE_OBSOLETE: 1038
ImageResourceID.ICC_PROFILE: 1039
ImageResourceID.SPOT_HALFTONE: 1043
ImageResourceID.JUMP_TO_XPEP: 1052
ImageResourceID.EXIF_DATA_1: 1058
ImageResourceID.EXIF_DATA_3: 1059
ImageResourceID.XMP_METADATA: 1060
ImageResourceID.CAPTION_DIGEST: 1061
ImageResourceID.ALTERNATE_DUOTONE_COLORS: 1066
ImageResourceID.ALTERNATE_SPOT_COLORS: 1067
ImageResourceID.HDR_TONING_INFO: 1070
ImageResourceID.PRINT_INFO_CS2: 1071
ImageResourceID.COLOR_SAMPLERS_RESOURCE: 1073
ImageResourceID.DISPLAY_INFO: 1077
ImageResourceID.MAC_NSPRINTINFO: 1084
ImageResourceID.WINDOWS_DEVMODE: 1085
ImageResourceID.PATH_INFO_N: 2000-2999
ImageResourceID.PLUGIN_RESOURCES_N: 4000-4999
ImageResourceID.IMAGE_READY_VARIABLES: 7000
ImageResourceID.IMAGE_READY_DATA_SETS: 7001
ImageResourceID.LIGHTROOM_WORKFLOW: 8000
```

3.15.1 ImageResources

class `psd_tools2.psd.image_resources.ImageResources` (*items=NOTHING*)

Image resources section of the PSD file. Dict of *ImageResource*.

enum

alias of `psd_tools2.constants.ImageResourceID`

get_data (*key, default=None*)

Get data from the image resources.

Shortcut for the following:

```
if key in image_resources:
    value = tagged_blocks[key].data
```

classmethod new (***kwargs*)

Create a new default image resources.

Returns ImageResources

classmethod read (*fp*, *encoding='macroman'*)

Read the element from a file-like object.

Parameters *fp* – file-like object

Return type ImageResources

write (*fp*, *encoding='macroman'*)

Write the element to a file-like object.

Parameters *fp* – file-like object

3.15.2 ImageResource

class psd_tools2.psd.image_resources.ImageResource (*signature: bytes = b'8BIM', key: int = 1000, name: str = "", data: bytes = b""*)

Image resource block.

signature

Binary signature, always b'8BIM'.

key

Unique identifier for the resource. See *ImageResourceID*.

name

data

The resource data.

data

key

name

classmethod read (*fp*, *encoding='macroman'*)

Read the element from a file-like object.

Parameters *fp* – file-like object

Return type ImageResource

signature

write (*fp*, *encoding='macroman'*)

Write the element to a file-like object.

Parameters *fp* – file-like object

Return type int

3.16 psd_tools2.psd.layer_and_mask

Layer and mask data structure.

3.16.1 LayerAndMaskInformation

```
class psd_tools2.psd.layer_and_mask.LayerAndMaskInformation (layer_info=None,  
global_layer_mask_info=None,  
tagged_blocks=None)
```

Layer and mask information section.

layer_info

See *LayerInfo*.

global_layer_mask_info

See *GlobalLayerMaskInfo*.

tagged_blocks

See *TaggedBlocks*.

global_layer_mask_info

layer_info

```
classmethod read (fp, encoding='macroman', version=1)
```

Read the element from a file-like object.

Parameters

- **fp** – file-like object
- **encoding** – encoding of the string
- **version** – psd file version

Return type *LayerAndMaskInformation*

tagged_blocks

```
write (fp, encoding='macroman', version=1, padding=4)
```

Write the element to a file-like object.

Parameters

- **fp** – file-like object
- **encoding** – encoding of the string
- **version** – psd file version

3.16.2 LayerInfo

```
class psd_tools2.psd.layer_and_mask.LayerInfo (layer_count: int = 0,  
layer_records=None, channel_image_data=None)
```

High-level organization of the layer information.

layer_count

Layer count. If it is a negative number, its absolute value is the number of layers and the first alpha channel contains the transparency data for the merged result.

layer_records

Information about each layer. See *LayerRecords*.

channel_image_data

Channel image data. Contains one or more image data records. See *ChannelImageData*.

channel_image_data**layer_count****layer_records**

classmethod read (*fp*, *encoding='macroman'*, *version=1*)

Read the element from a file-like object.

Parameters

- **fp** – file-like object
- **encoding** – encoding of the string
- **version** – psd file version

Return type *LayerInfo*

write (*fp*, *encoding='macroman'*, *version=1*, *padding=4*)

Write the element to a file-like object.

Parameters **fp** – file-like object

Return type int

3.16.3 GlobalLayerMaskInfo

```
class psd_tools2.psd.layer_and_mask.GlobalLayerMaskInfo (overlay_color=None,
                                                    opacity: int = 0,
                                                    kind=<GlobalLayerMaskKind.PER_LAYER: 128>)
```

Global mask information.

overlay_color

Overlay color space (undocumented) and color components.

opacity

Opacity. 0 = transparent, 100 = opaque.

kind

Kind. 0 = Color selected–i.e. inverted; 1 = Color protected; 128 = use value stored per layer. This value is preferred. The others are for backward compatibility with beta versions.

kind**opacity****overlay_color**

classmethod read (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

Return type *GlobalLayerMaskInfo*

write (*fp*)

Write the element to a file-like object.

Parameters **fp** – file-like object

3.16.4 LayerRecords

class `psd_tools2.psd.layer_and_mask.LayerRecords` (*items=NOTHING*)

List of layer records. See *LayerRecord*.

classmethod `read` (*fp, layer_count, encoding='macroman', version=1*)

Read the element from a file-like object.

Parameters **fp** – file-like object

Return type *LayerRecords*

3.16.5 LayerRecord

class `psd_tools2.psd.layer_and_mask.LayerRecord` (*top: int = 0, left: int = 0, bottom: int = 0, right: int = 0, channel_info=NOTHING, signature: bytes = b'8BIM', blend_mode=<BlendMode.NORMAL: b'norm'>, opacity: int = 255, clipping=<Clipping.BASE: 0>, flags=NOTHING, mask_data=None, blending_ranges=NOTHING, name: str = "", tagged_blocks=NOTHING*)

Layer record.

top

Top position.

left

Left position.

bottom

Bottom position.

right

Right position.

channel_info

List of *ChannelInfo*.

signature

Blend mode signature `b'8BIM'`.

blend_mode

Blend mode key. See *BlendMode*.

opacity

Opacity, 0 = transparent, 255 = opaque.

clipping

Clipping, 0 = base, 1 = non-base. See *Clipping*.

flags

See *LayerFlags*.

mask_data

MaskData or None.

blending_ranges

See *LayerBlendingRanges*.

name

Layer name.

tagged_blocks

See *TaggedBlocks*.

blend_mode**blending_ranges****bottom****channel_info****channel_sizes**

List of channel sizes: [(width, height)].

clipping**flags****height**

Height of the layer.

left**mask_data****name****opacity**

classmethod `read(fp, encoding='macroman', version=1)`

Read the element from a file-like object.

Parameters

- **fp** – file-like object
- **encoding** – encoding of the string
- **version** – psd file version

Return type *LayerRecord*

right**signature****tagged_blocks****top****width**

Width of the layer.

write (`fp, encoding='macroman', version=1`)

Write the element to a file-like object.

Parameters

- **fp** – file-like object

- **encoding** – encoding of the string
- **version** – psd file version

3.16.6 LayerFlags

```
class psd_tools2.psd.layer_and_mask.LayerFlags (transparency_protected: bool = False,  
visible: bool = True, obsolete: bool =  
False, photoshop_v5_later: bool = True,  
pixel_data_irrelevant: bool = False,  
undocumented_1: bool = False, un-  
documented_2: bool = False, undocu-  
mented_3: bool = False)
```

Layer flags.

Note there are undocumented flags. Maybe photoshop version.

transparency_protected

visible

pixel_data_irrelevant

obsolete

photoshop_v5_later

pixel_data_irrelevant

classmethod read (*fp*)

Read the element from a file-like object.

Parameters *fp* – file-like object

Return type *LayerFlags*

transparency_protected

undocumented_1

undocumented_2

undocumented_3

visible

write (*fp*)

Write the element to a file-like object.

Parameters *fp* – file-like object

3.16.7 LayerBlendingRanges

```
class psd_tools2.psd.layer_and_mask.LayerBlendingRanges (composite_ranges=NOTHING,  
chan-  
nel_ranges=NOTHING)
```

Layer blending ranges.

All ranges contain 2 black values followed by 2 white values.

composite_ranges

List of composite gray blend source and destination ranges.

channel_ranges

List of channel source and destination ranges.

channel_ranges**composite_ranges****classmethod read** (*fp*)

Read the element from a file-like object.

Parameters *fp* – file-like object

Return type *LayerBlendingRanges*

write (*fp*)

Write the element to a file-like object.

Parameters *fp* – file-like object

3.16.8 MaskData

```
class psd_tools2.psd.layer_and_mask.MaskData (top: int = 0, left: int = 0, bot-
tom: int = 0, right: int = 0, back-
ground_color: int = 0, flags=NOTHING,
parameters=None, real_flags=None,
real_background_color=None,
real_top=None, real_left=None,
real_bottom=None, real_right=None)
```

Mask data.

Real user mask is a final composite mask of vector and pixel masks.

top

Top position.

left

Left position.

bottom

Bottom position.

right

Right position.

background_color

Default color. 0 or 255.

flags

See *MaskFlags*.

parameters

MaskParameters or None.

real_flags

Real user mask flags. See *MaskFlags*.

real_background_color

Real user mask background. 0 or 255.

real_top

Top position of real user mask.

real_left

Left position of real user mask.

real_bottom

Bottom position of real user mask.

real_right

Right position of real user mask.

background_color

bottom

flags

height

Height of the mask.

left

parameters

classmethod read (*fp*)

Read the element from a file-like object.

Parameters **fp** – file-like object

Return type *MaskData* or None

real_background_color

real_bottom

real_flags

real_height

Height of real user mask.

real_left

real_right

real_top

real_width

Width of real user mask.

right

top

width

Width of the mask.

write (*fp*)

Write the element to a file-like object.

Parameters **fp** – file-like object

3.16.9 MaskFlags

```
class psd_tools2.psd.layer_and_mask.MaskFlags (pos_relative_to_layer: bool = False, mask_disabled: bool = False, invert_mask: bool = False, user_mask_from_render: bool = False, parameters_applied: bool = False, undocumented_1: bool = False, undocumented_2: bool = False, undocumented_3: bool = False)
```

Mask flags.

pos_relative_to_layer

Position relative to layer.

mask_disabled

Layer mask disabled.

invert_mask

Invert layer mask when blending (Obsolete).

user_mask_from_render

The user mask actually came from rendering other data.

parameters_applied

The user and/or vector masks have parameters applied to them.

invert_mask

mask_disabled

parameters_applied

pos_relative_to_layer

classmethod read (*fp*)

Read the element from a file-like object.

Parameters *fp* – file-like object

Return type *MaskFlags*

undocumented_1

undocumented_2

undocumented_3

user_mask_from_render

write (*fp*)

Write the element to a file-like object.

Parameters *fp* – file-like object

3.16.10 MaskParameters

```
class psd_tools2.psd.layer_and_mask.MaskParameters (user_mask_density=None, user_mask_feather=None, vector_mask_density=None, vector_mask_feather=None)
```

Mask parameters.

user_mask_density
user_mask_feather
vector_mask_density
vector_mask_feather
classmethod read (*fp*)
Read the element from a file-like object.
Parameters **fp** – file-like object
Return type *MaskParameters*

user_mask_density
user_mask_feather
vector_mask_density
vector_mask_feather
write (*fp*)
Write the element to a file-like object.
Parameters **fp** – file-like object

3.16.11 ChannelInfo

class `psd_tools2.psd.layer_and_mask.ChannelInfo` (*id=<ChannelID.CHANNEL_0: 0>*,
length: int = 0)

Channel information.

id
Channel ID: 0 = red, 1 = green, etc.; -1 = transparency mask; -2 = user supplied layer mask, -3 real user supplied layer mask (when both a user mask and a vector mask are present). See *ChannelID*.

length
Length of the corresponding channel data.

id
length
classmethod read (*fp*, *version=1*)
Read the element from a file-like object.
Parameters

- **fp** – file-like object
- **version** – psd file version

Return type *ChannelInfo*

write (*fp*, *version=1*)
Write the element to a file-like object.
Parameters

- **fp** – file-like object
- **version** – psd file version

3.16.12 ChannelImageData

class `psd_tools2.psd.layer_and_mask.ChannelImageData` (*items=NOTHING*)
List of channel image data.

See *ChannelDataList*.

classmethod `read` (*fp*, *layer_records=None*)
Read the element from a file-like object.

Parameters `fp` – file-like object

Return type *ChannelImageData*

write (*fp*, ***kwargs*)
Write the element to a file-like object.

Parameters `fp` – file-like object

3.16.13 ChannelDataList

class `psd_tools2.psd.layer_and_mask.ChannelDataList` (*items=NOTHING*)
List of channel image data.

See *ChannelData*.

classmethod `read` (*fp*, *channel_info*)
Read the element from a file-like object.

Parameters

- `fp` – file-like object
- `channel_info` – *ChannelInfo*

Return type *ChannelDataList*

3.16.14 ChannelData

class `psd_tools2.psd.layer_and_mask.ChannelData` (*compression=<Compression.RAW: 0>*, *data: bytes = b''*)

Channel data.

compression
Compression type. See *Compression*.

data
Data.

compression

data

get_data (*width*, *height*, *depth*, *version=1*)
Get decompressed channel data.

Parameters

- `width` – width.
- `height` – height.
- `depth` – bit depth of the pixel.

- **version** – psd file version.

Return type bytes

classmethod `read(fp)`

Read the element from a file-like object.

Parameters `fp` – file-like object

Return type `ChannelData`

set_data (`data`, `width`, `height`, `depth`, `version=1`)

Set raw channel data and compress to store.

Parameters

- **data** – raw data bytes to write.
- **compression** – compression type, see `Compression`.
- **width** – width.
- **height** – height.
- **depth** – bit depth of the pixel.
- **version** – psd file version.

write (`fp`, `**kwargs`)

Write the element to a file-like object.

Parameters `fp` – file-like object

3.17 psd_tools2.psd.tagged_blocks

Tagged block data structure.

Todo: Support the following tagged blocks: `TaggedBlockID.PATTERN_DATA`, `TaggedBlockID.TYPE_TOOL_INFO`, `TaggedBlockID.LAYER`, `TaggedBlockID.ALPHA`

3.17.1 TaggedBlocks

class `psd_tools2.psd.tagged_blocks.TaggedBlocks` (`items=NOTHING`)

Dict of tagged blocks.

Example:

```
from psd_tools2.constants import TaggedBlockID

# Iterate over fields
for key in tagged_blocks:
    print(key)

# Get a field
block = tagged_blocks.get(TaggedBlockID.TYPE_TOOL_OBJECT_SETTING)
type_setting = block.data

block = tagged_blocks[TaggedBlockID(b'TySh')]
```


3.17.2 TaggedBlock

class `psd_tools2.psd.tagged_blocks.TaggedBlock` (*signature=b'8BIM', key=b'', data=b''*)
Layer tagged block with extra info.

key
4-character code. See TaggedBlock

data
Data.

3.18 psd_tools2.psd.vector

Vector mask, path, and stroke structure.

3.18.1 Subpath

class `psd_tools2.psd.vector.Subpath` (*items=NOTHING, operation: int = 1, unknown1: int = 1, unknown2: int = 0, index: int = 0, unknown3: bytes = b'x00x00x00x00x00x00x00x00x00x00'*)

Subpath element.

Operation types:

1: Or (union), 2: Not-Or, 3: And (intersect), 4: Xor (exclude), -1: Subtract?

index

operation

classmethod read (*fp*)
Read the element from a file-like object.

Parameters *fp* – file-like object

write (*fp*)
Write the element to a file-like object.

3.18.2 Knot

class `psd_tools2.psd.vector.Knot` (*preceding: tuple = (0.0, 0.0), anchor: tuple = (0.0, 0.0), leaving: tuple = (0.0, 0.0)*)

Knot element consisting of 3 control point for Bezier curves.

`..py:attribute:` preceding `..py:attribute:` anchor `..py:attribute:` leaving

anchor

leaving

preceding

classmethod read (*fp*)
Read the element from a file-like object.

Parameters *fp* – file-like object

write (*fp*)
Write the element to a file-like object.

3.18.3 VectorMaskSetting

```
class psd_tools2.psd.vector.VectorMaskSetting(version: int = 3, flags: int = 0,  
                                             path=None)
```

VectorMaskSetting structure.

```
version  
invert  
not_link  
disable  
path
```

3.18.4 VectorStrokeContentSetting

```
class psd_tools2.psd.vector.VectorStrokeContentSetting(items=NOTHING,  
                                                         name: str = "", clas-  
                                                         sID=<DescriptorClassID.NULL:  
                                                         b'null'>, key: bytes =  
                                                         b'x00x00x00x00', version:  
                                                         int = 1)
```

Dict-like Descriptor-based structure. See *Descriptor*.

```
key  
version
```

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