|  |  |  |  |
| --- | --- | --- | --- |
| Layer (type) | Output Shape | Param # | Connected to |
| input\_1 (InputLayer) | [(None, 224, 224, 3) | 0 |  |
| Conv1 (Conv2D) | (None, 112, 112, 32) | 864 | input\_1[0][0] |
| bn\_Conv1 (BatchNormalization) | (None, 112, 112, 32) | 128 | Conv1[0][0] |
| Conv1\_relu (ReLU) | (None, 112, 112, 32) | 0 | bn\_Conv1[0][0] |
| expanded\_conv\_depthwise | (Depthw (None, 112, 112, 32) | 288 | Conv1\_relu[0][0] |
| expanded\_conv\_depthwise\_BN | (Bat (None, 112, 112, 32) | 128 | 128 expanded\_conv\_depthwise[0][0] |
| expanded\_conv\_depthwise\_relu | (R (None, 112, 112, 32) | 0 | expanded\_conv\_depthwise\_BN[0][0] |
| expanded\_conv\_project (Conv2D) | (None, 112, 112, 16) | 512 | expanded\_conv\_depthwise\_relu[0][0 |
| expanded\_conv\_project\_BN | (Batch (None, 112, 112, 16) | 64 | expanded\_conv\_project[0][0] |
| block\_1\_expand (Conv2D) | (None, 112, 112, 96) | 1536 | expanded\_conv\_project\_BN[0][0] |
| block\_1\_expand\_BN | (BatchNormali (None, 112, 112, 96) | 384 | block\_1\_expand[0][0] |
| block\_1\_expand\_relu (ReLU) | (None, 112, 112, 96) | 0 | block\_1\_expand\_BN[0][0] |
| block\_1\_pad (ZeroPadding2D) | (None, 113, 113, 96) | 0 | block\_1\_expand\_relu[0][0] |
| block\_1\_depthwise | (DepthwiseCon (None, 56, 56, 96) | 864 | block\_1\_pad[0][0] |
| block\_1\_depthwise\_BN | (BatchNorm (None, 56, 56, 96) | 384 | block\_1\_depthwise[0][0] |
| block\_1\_depthwise\_relu (ReLU) | (None, 56, 56, 96) | 0 | block\_1\_depthwise\_BN[0][0] |
| block\_1\_project (Conv2D) | (None, 56, 56, 24) | 2304 | block\_1\_depthwise\_relu[0][0] |
| block\_1\_project\_BN | (BatchNormal (None, 56, 56, 24) | 96 | block\_1\_project[0][0] |
| block\_2\_expand (Conv2D) | (None, 56, 56, 144) | 3456 | block\_1\_project\_BN[0][0] |
| block\_2\_expand\_BN | (BatchNormali (None, 56, 56, 144) | 576 | block\_2\_expand[0][0] |
| block\_2\_expand\_relu (ReLU) | (None, 56, 56, 144) | 0 | block\_2\_expand\_BN[0][0] |
| block\_2\_depthwise | (DepthwiseCon (None, 56, 56, 144) | 1296 | block\_2\_expand\_relu[0][0] |
| block\_2\_depthwise\_BN | (BatchNorm (None, 56, 56, 144) | 576 | block\_2\_depthwise[0][0] |
| block\_2\_depthwise\_relu (ReLU) | (None, 56, 56, 144) | 0 | block\_2\_depthwise\_BN[0][0] |
| block\_2\_project (Conv2D) | (None, 56, 56, 24) | 3456 | block\_2\_depthwise\_relu[0][0] |
| block\_2\_project\_BN | (BatchNormal (None, 56, 56, 24) | 96 | block\_2\_project[0][0] |
| block\_2\_add (Add) | (None, 56, 56, 24) | 0 | block\_1\_project\_BN[0][0]  block\_2\_project\_BN[0][0] |
| block\_3\_expand (Conv2D) | (None, 56, 56, 144) | 3456 | block\_2\_add[0][0] |
| block\_3\_expand\_BN | (BatchNormali (None, 56, 56, 144) | 576 | block\_3\_expand[0][0] |
| block\_3\_expand\_relu (ReLU) | (None, 56, 56, 144) | 0 | block\_3\_expand\_BN[0][0] |
| block\_3\_pad (ZeroPadding2D) | (None, 57, 57, 144) | 0 | block\_3\_expand\_relu[0][0] |
| block\_3\_depthwise | (DepthwiseCon (None, 28, 28, 144) | 1296 | block\_3\_pad[0][0] |
| block\_3\_depthwise\_BN | (BatchNorm (None, 28, 28, 144) | 576 | block\_3\_depthwise[0][0] |
| block\_3\_depthwise\_relu (ReLU) | (None, 28, 28, 144) | 0 | block\_3\_depthwise\_BN[0][0] |
| block\_3\_project (Conv2D) | (None, 28, 28, 32) | 4608 | block\_3\_depthwise\_relu[0][0] |
| block\_3\_project\_BN | (BatchNormal (None, 28, 28, 32) | 128 | block\_3\_project[0][0] |
| block\_4\_expand (Conv2D) | (None, 28, 28, 192) | 6144 | block\_3\_project\_BN[0][0] |
| block\_4\_expand\_BN | (BatchNormali (None, 28, 28, 192) | 768 | block\_4\_expand[0][0] |
| block\_4\_expand\_relu (ReLU) | (None, 28, 28, 192) | 0 | block\_4\_expand\_BN[0][0] |
| block\_4\_depthwise | (DepthwiseCon (None, 28, 28, 192) | 1728 | block\_4\_expand\_relu[0][0] |
| block\_4\_depthwise\_BN | (BatchNorm (None, 28, 28, 192) | 768 | block\_4\_depthwise[0][0] |
| block\_4\_depthwise\_relu (ReLU) | (None, 28, 28, 192) | 0 | block\_4\_depthwise\_BN[0][0] |
| block\_4\_project (Conv2D) | (None, 28, 28, 32) | 6144 | block\_4\_depthwise\_relu[0][0] |
| block\_4\_project\_BN | (BatchNormal (None, 28, 28, 32) | 128 | block\_4\_project[0][0] |
| block\_4\_add (Add) | (None, 28, 28, 32) | 0 | block\_3\_project\_BN[0][0]  block\_4\_project\_BN[0][0] |
| block\_5\_expand (Conv2D) | (None, 28, 28, 192) | 6144 | block\_4\_add[0][0] |
| block\_5\_expand\_BN | (BatchNormali (None, 28, 28, 192) | 768 | block\_5\_expand[0][0] |
| block\_5\_expand\_relu (ReLU) | (None, 28, 28, 192) | 0 | block\_5\_expand\_BN[0][0] |
| block\_5\_depthwise | (DepthwiseCon (None, 28, 28, 192) | 1728 | block\_5\_expand\_relu[0][0] |
| block\_5\_depthwise\_BN | (BatchNorm (None, 28, 28, 192) | 768 | block\_5\_depthwise[0][0] |
| block\_5\_depthwise\_relu (ReLU) | (None, 28, 28, 192) | 0 | block\_5\_depthwise\_BN[0][0] |
| block\_5\_project (Conv2D) | (None, 28, 28, 32) | 6144 | block\_5\_depthwise\_relu[0][0] |
| block\_5\_project\_BN | (BatchNormal (None, 28, 28, 32) | 128 | block\_5\_project[0][0] |
| block\_5\_add (Add) | (None, 28, 28, 32) | 0 | block\_4\_add[0][0]  block\_5\_project\_BN[0][0] |
| block\_6\_expand (Conv2D) | (None, 28, 28, 192) | 6144 | block\_5\_add[0][0] |
| block\_6\_expand\_BN | (BatchNormali (None, 28, 28, 192) | 768 | block\_6\_expand[0][0] |
| block\_6\_expand\_relu (ReLU) | (None, 28, 28, 192) | 0 | block\_6\_expand\_BN[0][0] |
| block\_6\_pad (ZeroPadding2D) | (None, 29, 29, 192) | 0 | block\_6\_expand\_relu[0][0] |
| block\_6\_depthwise | (DepthwiseCon (None, 14, 14, 192) | 1728 | block\_6\_pad[0][0] |
| block\_6\_depthwise\_BN | (BatchNorm (None, 14, 14, 192) | 768 | block\_6\_depthwise[0][0] |
| block\_6\_depthwise\_relu (ReLU) | (None, 14, 14, 192) | 0 | block\_6\_depthwise\_BN[0][0] |
| block\_6\_project (Conv2D) | (None, 14, 14, 64) | 12288 | block\_6\_depthwise\_relu[0][0] |
| block\_6\_project\_BN | (BatchNormal (None, 14, 14, 64) | 256 | block\_6\_project[0][0] |
| block\_7\_expand (Conv2D) | (None, 14, 14, 384) | 24576 | block\_6\_project\_BN[0][0] |
| block\_7\_expand\_BN | (BatchNormali (None, 14, 14, 384) | 1536 | block\_7\_expand[0][0] |
| block\_7\_expand\_relu (ReLU) | (None, 14, 14, 384) | 0 | block\_7\_expand\_BN[0][0] |
| block\_7\_depthwise | (DepthwiseCon (None, 14, 14, 384) | 3456 | block\_7\_expand\_relu[0][0] |
| block\_7\_depthwise\_BN | (BatchNorm (None, 14, 14, 384) | 1536 | block\_7\_depthwise[0][0] |
| block\_7\_depthwise\_relu (ReLU) | (None, 14, 14, 384) | 0 | block\_7\_depthwise\_BN[0][0] |
| block\_7\_project (Conv2D) | (None, 14, 14, 64) | 24576 | block\_7\_depthwise\_relu[0][0] |
| block\_7\_project\_BN | (BatchNormal (None, 14, 14, 64) | 256 | block\_7\_project[0][0] |
| block\_7\_add (Add) | (None, 14, 14, 64) | 0 | block\_6\_project\_BN[0][0]  block\_7\_project\_BN[0][0] |
| block\_8\_expand (Conv2D) | (None, 14, 14, 384) | 24576 | block\_7\_add[0][0] |
| block\_8\_expand\_BN | (BatchNormali (None, 14, 14, 384) | 1536 | block\_8\_expand[0][0] |
| block\_8\_expand\_relu (ReLU) | (None, 14, 14, 384) | 0 | block\_8\_expand\_BN[0][0] |
| block\_8\_depthwise | (DepthwiseCon (None, 14, 14, 384) | 3456 | block\_8\_expand\_relu[0][0] |
| block\_8\_depthwise\_BN | (BatchNorm (None, 14, 14, 384) | 1536 | block\_8\_depthwise[0][0] |
| block\_8\_depthwise\_relu (ReLU) | (None, 14, 14, 384) | 0 | block\_8\_depthwise\_BN[0][0] |
| block\_8\_project (Conv2D) | (None, 14, 14, 64) | 24576 | block\_8\_depthwise\_relu[0][0] |
| block\_8\_project\_BN | (BatchNormal (None, 14, 14, 64) | 256 | block\_8\_project[0][0] |
| block\_8\_add (Add) | (None, 14, 14, 64) | 0 | block\_7\_add[0][0]  block\_8\_project\_BN[0][0] |
| block\_9\_expand (Conv2D) | (None, 14, 14, 384) | 24576 | block\_8\_add[0][0] |
| block\_9\_expand\_BN | (BatchNormali (None, 14, 14, 384) | 1536 | block\_9\_expand[0][0] |
| block\_9\_expand\_relu (ReLU) | (None, 14, 14, 384) | 0 | block\_9\_expand\_BN[0][0] |
| block\_9\_depthwise | (DepthwiseCon (None, 14, 14, 384) | 3456 | block\_9\_expand\_relu[0][0] |
| block\_9\_depthwise\_BN | (BatchNorm (None, 14, 14, 384) | 1536 | block\_9\_depthwise[0][0] |
| block\_9\_depthwise\_relu (ReLU) | (None, 14, 14, 384) | 0 | block\_9\_depthwise\_BN[0][0] |
| block\_9\_project (Conv2D) | (None, 14, 14, 64) | 24576 | block\_9\_depthwise\_relu[0][0] |
| block\_9\_project\_BN | (BatchNormal (None, 14, 14, 64) | 256 | block\_9\_project[0][0] |
| block\_9\_add (Add) | (None, 14, 14, 64) | 0 | block\_8\_add[0][0]  block\_9\_project\_BN[0][0] |
| block\_10\_expand (Conv2D) | (None, 14, 14, 384) | 24576 | block\_9\_add[0][0] |
| block\_10\_expand\_BN | (BatchNormal (None, 14, 14, 384) | 1536 | block\_10\_expand[0][0] |
| block\_10\_expand\_relu (ReLU) | (None, 14, 14, 384) | 0 | block\_10\_expand\_BN[0][0] |
| block\_10\_depthwise | (DepthwiseCo (None, 14, 14, 384) | 3456 | block\_10\_expand\_relu[0][0] |
| block\_10\_depthwise\_BN | (BatchNor (None, 14, 14, 384) | 1536 | block\_10\_depthwise[0][0] |
| block\_10\_depthwise\_relu (ReLU) | (None, 14, 14, 384) | 0 | block\_10\_depthwise\_BN[0][0] |
| block\_10\_project (Conv2D) | (None, 14, 14, 96) | 36864 | block\_10\_depthwise\_relu[0][0] |
| block\_10\_project\_BN | (BatchNorma (None, 14, 14, 96) | 384 | block\_10\_project[0][0] |
| block\_11\_expand (Conv2D) | (None, 14, 14, 576) | 55296 | block\_10\_project\_BN[0][0] |
| block\_11\_expand\_BN | (BatchNormal (None, 14, 14, 576) | 2304 | block\_11\_expand[0][0] |
| block\_11\_expand\_relu (ReLU) | (None, 14, 14, 576) | 0 | block\_11\_expand\_BN[0][0] |
| block\_11\_depthwise | (DepthwiseCo (None, 14, 14, 576) | 5184 | block\_11\_expand\_relu[0][0] |
| block\_11\_depthwise\_BN | (BatchNor (None, 14, 14, 576) | 2304 | block\_11\_depthwise[0][0] |
| block\_11\_depthwise\_relu (ReLU) | (None, 14, 14, 576) | 0 | block\_11\_depthwise\_BN[0][0] |
| block\_11\_project (Conv2D) | (None, 14, 14, 96) | 55296 | block\_11\_depthwise\_relu[0][0] |
| block\_11\_project\_BN | (BatchNorma (None, 14, 14, 96) | 384 | block\_11\_project[0][0] |
| block\_11\_add (Add) | (None, 14, 14, 96) | 0 | block\_10\_project\_BN[0][0]  block\_11\_project\_BN[0][0] |
| block\_12\_expand (Conv2D) | (None, 14, 14, 576) | 55296 | block\_11\_add[0][0] |
| block\_12\_expand\_BN | (BatchNormal (None, 14, 14, 576) | 2304 | block\_12\_expand[0][0] |
| block\_12\_expand\_relu (ReLU) | (None, 14, 14, 576) | 0 | block\_12\_expand\_BN[0][0] |
| block\_12\_depthwise | (DepthwiseCo (None, 14, 14, 576) | 5184 | block\_12\_expand\_relu[0][0] |
| block\_12\_depthwise\_BN | (BatchNor (None, 14, 14, 576) | 2304 | block\_12\_depthwise[0][0] |
| block\_12\_depthwise\_relu (ReLU) | (None, 14, 14, 576) | 0 | block\_12\_depthwise\_BN[0][0] |
| block\_12\_project (Conv2D) | (None, 14, 14, 96) | 55296 | block\_12\_depthwise\_relu[0][0] |
| block\_12\_project\_BN | (BatchNorma (None, 14, 14, 96) | 384 | block\_12\_project[0][0] |
| block\_12\_add (Add) | (None, 14, 14, 96) | 0 | block\_11\_add[0][0]  block\_12\_project\_BN[0][0] |
| block\_13\_expand (Conv2D) | (None, 14, 14, 576) | 55296 | block\_12\_add[0][0] |
| block\_13\_expand\_BN | (BatchNormal (None, 14, 14, 576) | 2304 | block\_13\_expand[0][0] |
| block\_13\_expand\_relu (ReLU) | (None, 14, 14, 576) | 0 | block\_13\_expand\_BN[0][0] |
| block\_13\_pad (ZeroPadding2D) | (None, 15, 15, 576) | 0 | block\_13\_expand\_relu[0][0] |
| block\_13\_depthwise | (DepthwiseCo (None, 7, 7, 576) | 5184 | block\_13\_pad[0][0] |
| block\_13\_depthwise\_BN | (BatchNor (None, 7, 7, 576) | 2304 | block\_13\_depthwise[0][0] |
| block\_13\_depthwise\_relu (ReLU) | (None, 7, 7, 576) | 0 | block\_13\_depthwise\_BN[0][0] |
| block\_13\_project (Conv2D) | (None, 7, 7, 160) | 92160 | block\_13\_depthwise\_relu[0][0] |
| block\_13\_project\_BN | (BatchNorma (None, 7, 7, 160) | 640 | block\_13\_project[0][0] |
| block\_14\_expand (Conv2D) | (None, 7, 7, 960) | 153600 | block\_13\_project\_BN[0][0] |
| block\_14\_expand\_BN | (BatchNormal (None, 7, 7, 960) | 3840 | block\_14\_expand[0][0] |
| block\_14\_expand\_relu (ReLU) | (None, 7, 7, 960) | 0 | block\_14\_expand\_BN[0][0] |
| block\_14\_depthwise | (DepthwiseCo (None, 7, 7, 960) | 8640 | block\_14\_expand\_relu[0][0] |
| block\_14\_depthwise\_BN | (BatchNor (None, 7, 7, 960) | 3840 | block\_14\_depthwise[0][0] |
| block\_14\_depthwise\_relu (ReLU) | (None, 7, 7, 960) | 0 | block\_14\_depthwise\_BN[0][0] |
| block\_14\_project (Conv2D) | (None, 7, 7, 160) | 153600 | block\_14\_depthwise\_relu[0][0] |
| block\_14\_project\_BN | (BatchNorma (None, 7, 7, 160) | 640 | block\_14\_project[0][0] |
| block\_14\_add (Add) | (None, 7, 7, 160) | 0 | block\_13\_project\_BN[0][0]  block\_14\_project\_BN[0][0] |
| block\_15\_expand (Conv2D) | (None, 7, 7, 960) | 153600 | block\_14\_add[0][0] |
| block\_15\_expand\_BN | (BatchNormal (None, 7, 7, 960) | 3840 | block\_15\_expand[0][0] |
| block\_15\_expand\_relu (ReLU) | (None, 7, 7, 960) | 0 | block\_15\_expand\_BN[0][0] |
| block\_15\_depthwise | (DepthwiseCo (None, 7, 7, 960) | 8640 | block\_15\_expand\_relu[0][0] |
| block\_15\_depthwise\_BN | (BatchNor (None, 7, 7, 960) | 3840 | block\_15\_depthwise[0][0] |
| dropout (Dropout) | (None, 128) | 0 | dense[0][0] |
| dense\_1 (Dense) | (None, 2) | 258 | dropout[0][0] |

Total params: 2,422,210

Trainable params: 164,226

Non-trainable params: 2,257,984

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