

```
$begin 'AnsoftProject'

    Created='Thu Mar 13 09:56:47 2014'

    FileOwnedByWorkbench=false

    Product='Maxwell'

    NextUniqueID=0

    MoveBackwards=false

    $begin 'Desktop'

        Version(15, 0)

        InfrastructureVersion(1, 0)

    $end 'Desktop'

    $begin 'Maxwell3DEnvironment'

        Version(1, 0)

    $end 'Maxwell3DEnvironment'

    $begin 'Maxwell2DEnvironment'

        Version(1, 0)

    $end 'Maxwell2DEnvironment'

    $begin 'RMxpertEnvironment'

        Version(1, 0)

    $end 'RMxpertEnvironment'

    $begin 'geometry3deditor'

        Version(1, 0)

    $end 'geometry3deditor'

    $begin 'ProjectDatasets'

        NextUniqueID=0

        MoveBackwards=false

        DatasetType='ProjectDatasetType'

        $begin 'DatasetDefinitions'

            $end 'DatasetDefinitions'

        $end 'ProjectDatasets'

    $begin 'Definitions'

        $begin 'Folders'

            Definitions(1104, 10000, 1, 1, 0, false, false)

            Materials(1104, 9500, 9, 2, 1, false, false)

        $end 'Folders'

        $begin 'Materials'

            $begin 'vacuum'

                CoordinateSystemType='Cartesian'

            $begin 'AttachedData'

                $end 'AttachedData'

            $begin 'ModifierData'

                $end 'ModifierData'

            $end 'Materials'

        $end 'Definitions'

    $end 'AnsoftProject'
```

```
        permittivity='1'

        ModTime=1028307964

        Library='Materials'

        LibLocation='SysLibrary'

    Send 'vacuum'

    $begin 'copper'

        CoordinateSystemType='Cartesian'

        $begin 'AttachedData'

            Send 'AttachedData'

        $begin 'ModifierData'

            Send 'ModifierData'

            permeability='0.999991'

            conductivity='58000000'

            thermal_conductivity='400'

            mass_density='8933'

            specific_heat='385'

            youngs_modulus='120000000000'

            poissons_ratio='0.38'

            thermal_expansion_coefficient='1.77e-005'

            ModTime=1132068239

            Library='Materials'

            LibLocation='SysLibrary'

        Send 'copper'

    Send 'Materials'

    $begin 'Scripts'

        Send 'Scripts'

    Send 'Definitions'

    DesignIDServer=2

    MoveBackwards=false

    $begin 'Maxwell2DModel'

        RepRewriteV2=true

        Name='Maxwell2DDesign1'

        DesignID=0

        $begin 'TemperatureSettings'

            IncludeTemperatureDependence=false

            EnableFeedback=false

            Temperatures(66, '22cel')

        Send 'TemperatureSettings'

        PreserveTranSolnAfterDatasetEdit=false

        ComputeTransientInductance=false

        PerfectConductorThreshold=1e+030
```

```
InsulatorThreshold=1

EnableTranTranLinkWithSimplorer=false

BackgroundMaterialName='vacuum'

Multiplier='1'

SolutionType='Transient'

GeometryMode='about Z'

$begin 'OutputVariable'

    NextUniqueID=0

    MoveBackwards=false

$end 'OutputVariable'

$begin 'ModelSetup'

    $begin 'Editor3D Doc Preferences'

        'Plane Background'=true

        BackgroundColor1=16777215

        BackgroundColor2=0

        'Need Lights'=true

        'Ambient Light'=8355711

        'Num Lights'=2

        Light0[4: 8355711, 0.200000002980232, 0.400000005960464, 1]

        Light1[4: 8355711, -0.200000002980232, -0.400000005960464, -1]

    $end 'Editor3D Doc Preferences'

    $begin 'DesignDatasets'

        NextUniqueID=0

        MoveBackwards=false

        DatasetType='DesignDatasetType'

        $begin 'DatasetDefinitions'

            $end 'DatasetDefinitions'

        $end 'DesignDatasets'

    $begin 'GeometryCore'

        BlockVersionID=3

        DataVersion=9

        NativeKernel='ACIS'

        NativeKernelVersionID=4

        Units='mm'

        InstanceID=-1

        $begin 'ValidationOptions'

            EntityCheckLevel='Strict'

            IgnoreUnclassifiedObjects=false

            SkipIntersectionChecks=false

        $end 'ValidationOptions'

    $end 'GeometryCore'

$end 'ModelSetup'
```

Send 'ValidationOptions'

\$begin 'GeometryOperations'

BlockVersionID=2

\$begin 'AnsoftRangedIDServerManager'

\$begin 'AnsoftRangedIDServer'

IDServerObjectTypeID=0

IDServerRangeMin=0

IDServerRangeMax=2146483647

NextUniqueID=77

MoveBackwards=false

\$end 'AnsoftRangedIDServer'

\$begin 'AnsoftRangedIDServer'

IDServerObjectTypeID=1

IDServerRangeMin=2146483648

IDServerRangeMax=2146485547

NextUniqueID=2146483654

MoveBackwards=false

\$end 'AnsoftRangedIDServer'

\$end 'AnsoftRangedIDServerManager'

StartBackGroundFaceID=2146483648

\$begin 'CoordinateSystems'

\$end 'CoordinateSystems'

\$begin 'UserDefinedModels'

\$end 'UserDefinedModels'

\$begin 'ToplevelParts'

\$begin 'GeometryPart'

\$begin 'Attributes'

Name='Spule'

Flags=""

Color='{132 132 193}'

Transparency=0

PartCoordinateSystem=1

UDMid=-1

MaterialValue=""copper""

SolveInside=true

\$end 'Attributes'

\$begin 'Operations'

\$begin 'Operation'

OperationType='Rectangle'

ID=29

ReferenceCoordSystemID=1

```
$begin 'RectangleParameters'  
    KernelVersion=4  
    XStart='0.2mm'  
    YStart='0mm'  
    ZStart='-0.2mm'  
    Width='0.4mm'  
    Height='0.1mm'  
    WhichAxis='Y'  
$end 'RectangleParameters'  
ParentPartID=30  
IsSuppressed=false  
$begin 'OperationIdentity'  
    $begin 'Topology'  
        NumLumps=1  
        NumShells=1  
        NumFaces=0  
        NumWires=1  
        NumLoops=0  
        NumCoedges=4  
        NumEdges=4  
        NumVertices=4  
    $end 'Topology'  
    BodyID=30  
    StartFaceID=-1  
    StartEdgeID=31  
    StartVertexID=35  
    NumNewFaces=0  
    NumNewEdges=4  
    NumNewVertices=4  
    FaceNameAndIDMap()  
    EdgeNameAndIDMap()  
    VertexNameAndIDMap()  
$end 'OperationIdentity'  
$end 'Operation'  
$begin 'Operation'  
    OperationType='CoverLines'  
    ID=39  
    $begin 'LocalOperationParameters'  
        KernelVersion=4  
        LocalOpPart=30  
    $end 'LocalOperationParameters'
```

ParentPartID=30

IsSuppressed=false

\$begin 'OperationIdentity'

\$begin 'Topology'

NumLumps=1

NumShells=1

NumFaces=1

NumWires=0

NumLoops=1

NumCoedges=4

NumEdges=4

NumVertices=4

\$end 'Topology'

BodyID=-1

StartFaceID=40

StartEdgeID=-1

StartVertexID=-1

NumNewFaces=1

NumNewEdges=0

NumNewVertices=0

FaceNameAndIDMap()

EdgeNameAndIDMap()

VertexNameAndIDMap()

\$begin

'GeomTopolBasedOperationIdentityHelper'

\$begin 'NewFaces'

'Face'

\$begin

NormalizedSerialNum=0

ID=40

\$begin 'FaceGeomTopol'

FaceTopol(1, 4, 4, 4)

\$begin 'FaceGeometry'

Area=0.04

FcUVMid(0.25, 3.71414492440475e-017, -2.08166817117217e-017)

\$begin 'FcToIVts'

ToIVt(0.2, 0, -0.2, 0)

ToIVt(0.2, 6.43249059870655e-017, 0.2, 0)

ToIVt(0.3, 7.42828984880951e-017, 0.2, 0)

ToIVt(0.3, 9.9579925010296e-018, -0.2, 0)

Send 'FcToIVts'

Send 'FaceGeometry'

Send 'FaceGeomTopol'

Send 'Face'

Send 'NewFaces'

\$begin 'NewEdges'

Send 'NewEdges'

\$begin 'NewVertices'

Send 'NewVertices'

Send

'GeomTopolBasedOperationIdentityHelper'

Send 'OperationIdentity'

ParentOperationID=29

Send 'Operation'

Send 'Operations'

Send 'GeometryPart'

\$begin 'GeometryPart'

\$begin 'Attributes'

Name='Band'

Flags=""

Color=(132 132 193)'

Transparency=0

PartCoordinateSystem=1

UDMId=-1

MaterialValue=""vacuum""

SolveInside=true

Send 'Attributes'

\$begin 'Operations'

\$begin 'Operation'

OperationType='Rectangle'

ID=53

ReferenceCoordSystemID=1

\$begin 'RectangleParameters'

KernelVersion=4

XStart='0.1mm'

YStart='0mm'

ZStart='-3mm'

Width='6mm'

```
Height='0.3mm'  
WhichAxis='Y'  
$end 'RectangleParameters'  
ParentPartID=54  
IsSuppressed=false  
$begin 'OperationIdentity'  
    $begin 'Topology'  
        NumLumps=1  
        NumShells=1  
        NumFaces=0  
        NumWires=1  
        NumLoops=0  
        NumCoedges=4  
        NumEdges=4  
        NumVertices=4  
    $end 'Topology'  
    BodyID=54  
    StartFaceID=-1  
    StartEdgeID=55  
    StartVertexID=59  
    NumNewFaces=0  
    NumNewEdges=4  
    NumNewVertices=4  
    FaceNameAndIDMap()  
    EdgeNameAndIDMap()  
    VertexNameAndIDMap()  
$end 'OperationIdentity'  
$end 'Operation'  
$begin 'Operation'  
    OperationType='CoverLines'  
    ID=63  
    $begin 'LocalOperationParameters'  
        KernelVersion=4  
        LocalOpPart=54  
    $end 'LocalOperationParameters'  
    ParentPartID=54  
    IsSuppressed=false  
    $begin 'OperationIdentity'  
        $begin 'Topology'  
            NumLumps=1  
            NumShells=1
```



NumFaces=1  
NumWires=0  
NumLoops=1  
NumCoedges=4  
NumEdges=4  
NumVertices=4

\$end 'Topology'  
BodyID=-1  
StartFaceID=64  
StartEdgeID=-1  
StartVertexID=-1  
NumNewFaces=1  
NumNewEdges=0  
NumNewVertices=0  
FaceNameAndIDMap()  
EdgeNameAndIDMap()  
VertexNameAndIDMap()  
\$begin

'GeomTopolBasedOperationIdentityHelper'

\$begin 'NewFaces'

'Face'

\$begin

NormalizedSerialNum=0

ID=64

\$begin 'FaceGeomTopol'

FaceTopol(1, 4, 4, 4)

\$begin 'FaceGeometry'

Area=1.8

FcUVMid(0.250000000000001, 4.97373783654535e-016, 0)

\$begin 'FcToIVts'

ToIVt(0.1, 0, -3, 0)

ToIVt(0.100000000000001, 9.64873589805982e-016, 3, 0)

ToIVt(0.400000000000001, 9.94747567309071e-016, 3, 0)

ToIVt(0.4, 2.98739775030888e-017, -3, 0)

\$end 'FcToIVts'

\$end 'FaceGeometry'

\$end 'FaceGeomTopol'

\$end 'Face'

\$end 'NewFaces'

\$begin 'NewEdges'

\$end 'NewEdges'

\$begin 'NewVertices'

\$end 'NewVertices'

\$end

'GeomTopolBasedOperationIdentityHelper'

\$end 'OperationIdentity'

ParentOperationID=53

\$end 'Operation'

\$end 'Operations'

\$end 'GeometryPart'

\$begin 'GeometryPart'

\$begin 'Attributes'

Name='Rectangle1'

Flags=""

Color='{132 132 193}'

Transparency=0

PartCoordinateSystem=1

UDMid=-1

MaterialValue=""vacuum""

SolveInside=true

\$end 'Attributes'

\$begin 'Operations'

\$begin 'Operation'

OperationType='Rectangle'

ID=65

ReferenceCoordSystemID=1

\$begin 'RectangleParameters'

KernelVersion=4

XStart='0mm'

YStart='0mm'

ZStart='-25mm'

Width='50mm'

Height='50mm'

WhichAxis='Y'

\$end 'RectangleParameters'

ParentPartID=66

IsSuppressed=false

```
$begin 'OperationIdentity'
    $begin 'Topology'
        NumLumps=1
        NumShells=1
        NumFaces=0
        NumWires=1
        NumLoops=0
        NumCoedges=4
        NumEdges=4
        NumVertices=4
    $end 'Topology'
    BodyID=66
    StartFaceID=-1
    StartEdgeID=67
    StartVertexID=71
    NumNewFaces=0
    NumNewEdges=4
    NumNewVertices=4
    FaceNameAndIDMap()
    EdgeNameAndIDMap()
    VertexNameAndIDMap()
$end 'OperationIdentity'
$end 'Operation'
$begin 'Operation'
    OperationType='CoverLines'
    ID=75
    $begin 'LocalOperationParameters'
        KernelVersion=4
        LocalOpPart=66
    $end 'LocalOperationParameters'
    ParentPartID=66
    IsSuppressed=false
    $begin 'OperationIdentity'
        $begin 'Topology'
            NumLumps=1
            NumShells=1
            NumFaces=1
            NumWires=0
            NumLoops=1
            NumCoedges=4
            NumEdges=4
```

```

'GeomTopolBasedOperationIdentityHelper'

'Face'

    NormalizedSerialNum=0

    ID=76

    $begin 'FaceGeomTopol'

        FaceTopol(1, 4, 4, 4)

        $begin 'FaceGeometry'

            Area=2500

            FcUVMid(25, 6.50980474944899e-015, -6.21724893790088e-015)

            $begin 'FcTolVts'

                TolVt(0, 0, -25, 0)

                TolVt(9.18485099360515e-015, 8.04061324838318e-015, 25, 0)

                TolVt(50, 1.3019609498898e-014, 25, 0)

                TolVt(50, 4.9789962505148e-015, -25, 0)

            Send 'FcTolVts'

        Send 'FaceGeometry'

    Send 'FaceGeomTopol'

    NumVertices=4

    $end 'Topology'

    BodyID=-1

    StartFaceID=76

    StartEdgeID=-1

    StartVertexID=-1

    NumNewFaces=1

    NumNewEdges=0

    NumNewVertices=0

    FaceNameAndIDMap()

    EdgeNameAndIDMap()

    VertexNameAndIDMap()

    $begin

    $begin 'NewFaces'

    $begin

    Send 'Face'

    Send 'NewFaces'

    $begin 'NewEdges'

    Send 'NewEdges'

```

```
'GeomTopolBasedOperationIdentityHelper'
$begin 'NewVertices'
$end 'NewVertices'
$end
$end 'OperationIdentity'
ParentOperationID=65
$end 'Operation'
$end 'Operations'
$end 'GeometryPart'
$end 'ToplevelParts'
$begin 'OperandParts'
$end 'OperandParts'
$begin 'Planes'
$end 'Planes'
$begin 'Points'
$end 'Points'
$begin 'GeometryEntityLists'
$end 'GeometryEntityLists'
$begin 'CachedNames'
$begin 'allobjects'
allobjects(-1)
$end 'allobjects'
$begin 'band'
band(-1)
$end 'band'
$begin 'global'
global(-1)
$end 'global'
$begin 'rectangle'
rectangle(1)
$end 'rectangle'
$begin 'spule'
spule(-1)
$end 'spule'
$end 'CachedNames'
$end 'GeometryOperations'
$begin 'GeometryDependencies'
$begin 'DependencyInformation'
NumParents=1
DependencyObject('GeometryBodyOperation', 29)
DependencyObject('CoordinateSystem', 1)
$end 'DependencyInformation'
```

```
$begin 'DependencyInformation'
    NumParents=1
    DependencyObject('GeometryBodyOperation', 39)
    DependencyObject('GeometryBodyOperation', 29)
$end 'DependencyInformation'
$begin 'DependencyInformation'
    NumParents=1
    DependencyObject('GeometryBodyOperation', 53)
    DependencyObject('CoordinateSystem', 1)
$end 'DependencyInformation'
$begin 'DependencyInformation'
    NumParents=1
    DependencyObject('GeometryBodyOperation', 63)
    DependencyObject('GeometryBodyOperation', 53)
$end 'DependencyInformation'
$begin 'DependencyInformation'
    NumParents=1
    DependencyObject('GeometryBodyOperation', 65)
    DependencyObject('CoordinateSystem', 1)
$end 'DependencyInformation'
$begin 'DependencyInformation'
    NumParents=1
    DependencyObject('GeometryBodyOperation', 75)
    DependencyObject('GeometryBodyOperation', 65)
$end 'DependencyInformation'
    $end 'GeometryDependencies'
$end 'GeometryCore'
GroupByMaterial()
GroupSheetByMaterial('-1'=true)
$begin 'LastUserInputs'
$end 'LastUserInputs'
$begin 'MotionSetupList'
    NextUniqueID=2
    MoveBackwards=false
    $begin 'MotionSetup1'
        ID=0
        MotionType='Band'
        'Move Type'='Translate'
        'Coordinate System'=1
        'PostProcessing Coordinate System'=1
        Axis='Z'
```

```
'Is Positive'=true

InitPos='0mm'

NegativePos='-2.5mm'

PositivePos='2.5mm'

'Consider Mechanical Transient'=true

Velocity='20m_per_sec'

Mass='132gram'

Damping='0'

'Load Force'='-(2.672*Position^37.547*Position)*1000'

Objects(54)

Send 'MotionSetup1'

$begin 'Moving1'

    ID=1

    MotionType='Moving'

    BandName=0

    Objects(30)

Send 'Moving1'

Send 'MotionSetupList'

Send 'ModelSetup'

$begin 'BoundarySetup'

    $begin 'GlobalBoundData'

        CoreLossObjectIDs[0:]

        ConsiderCoreLossEffectOnField=false

        MinimumTimeStep='0s'

        ExternalCircuitFile[0:]

        ExternalCircuitFileExtension=""

        InductorNames[0:]

        SourceNames[0:]

        SourceType[0:]

        OriginalPath='XXXXXXX'

        OriginalDesign=""

        CurrentProbes()

        VoltageProbes()

        $begin 'ParamValues'

            Send 'ParamValues'

        $begin 'EddyEffect'

            Send 'EddyEffect'

        $begin 'Magnetization'

            IsTarget=false

            Objs[0:]

        Send 'Magnetization'
```

```
        $begin 'YConnectionData'
        $end 'YConnectionData'
    $end 'GlobalBoundData'
    $begin 'Boundaries'
        NextUniqueID=1
        MoveBackwards=false
        $begin 'Balloon1'
            ID=0
            BoundType='Balloon'
            Edges(68, 69, 70)
            ParentBndID=-1
        $end 'Balloon1'
    $end 'Boundaries'
    $begin 'ProductSpecificData'
    $end 'ProductSpecificData'
$end 'BoundarySetup'
$begin 'MaxwellParameterSetup'
    $begin 'MaxwellParameters'
        NextUniqueID=1
        MoveBackwards=false
    $end 'MaxwellParameters'
    MotionParams(Moving1=0)
$end 'MaxwellParameterSetup'
$begin 'MeshSetup'
    $begin 'MeshSettings'
        $begin 'GlobalSurfApproximation'
            SurfDevChoice=0
            NormalDevChoice=1
            AspectRatioChoice=1
            PullToTrueSurf=false
            SetFacePreservationLevel=0
        $end 'GlobalSurfApproximation'
    $end 'MeshSettings'
    $begin 'MeshOperations'
        NextUniqueID=0
        MoveBackwards=false
    $end 'MeshOperations'
$end 'MeshSetup'
$begin 'AnalysisSetup'
    $begin 'SolveSetups'
        NextUniqueID=1
```



```
MoveBackwards=false

$begin 'Setup1'

    ID=0

    SetupType='Transient'

    Enabled=true

    NonlinearSolverResidual='0.0001'

    TimeIntegrationMethod=0

    StopTime='0.2s'

    TimeStep='0.002s'

    OutputError=false

    UseControlProgram=false

    ControlProgramName=' '

    ControlProgramArg=' '

    CallCtrlProgAfterLastStep=false

    HasSweepSetup=true

    SweepSetupType='LinearStep'

    StartValue='0s'

    StopValue='0.2s'

    StepSize='0.002s'

    TransientComputeHc=false

    $begin 'HcOption'

        TransientHcNonLinearBH=true

        TransientComputeHc=false

    $end 'HcOption'

    UseAdaptiveTimeStep=false

    InitialTimeStep='0.002s'

    MinTimeStep='0.001s'

    MaxTimeStep='0.003s'

    TimeStepErrTolerance=0.0001

$end 'Setup1'

$end 'SolveSetups'

$end 'AnalysisSetup'

$begin 'Optimetrics'

    $begin 'OptimetricsSetups'

        NextUniqueID=0

        MoveBackwards=false

    $end 'OptimetricsSetups'

$end 'Optimetrics'

$begin 'Solutions'

$end 'Solutions'

$begin 'FieldsReporter'
```



```
$end 'PostprocessSweep'  
$begin 'PostprocessSweep'  
    Variable='Phi'  
    RegularSweep=1  
    Units='deg'  
    Minimum=0  
    Maximum=6.28318530717959  
    Increment=0.0872664625997165  
    CreateIndexedSubsweepFlag=false
```

```
$end 'PostprocessSweep'  
$begin 'PostprocessSweep'  
    Variable='Theta'  
    RegularSweep=1  
    Units='deg'  
    Minimum=0  
    Maximum=6.28318530717959  
    Increment=0.0872664625997165  
    CreateIndexedSubsweepFlag=false
```

```
$end 'PostprocessSweep'  
$begin 'PostprocessSweep'  
    Variable='Phase'  
    RegularSweep=1  
    Units='deg'  
    Minimum=0  
    Maximum=6.28318530717959  
    Increment=0.0872664625997165  
    CreateIndexedSubsweepFlag=false
```

```
$end 'PostprocessSweep'  
$begin 'Sweep'  
    Variable='Time'  
    Column=""  
    Units='s'
```

```
$end 'Sweep'
```

```
$end 'Sweeps'
```

```
$end 'SimDataExtractor'
```

```
$end 'Solution'
```

```
$end 'SimSetup'
```

```
$begin 'Version ID Map'
```

```
V=46
```

```
$begin 'Setup'
```

```
N='Setup1'
```

```

V=46
Soln(N='Transient', V=46)
Send 'Setup'
Send 'Version ID Map'
$begin 'ID Map'
$begin 'Setup'
N='Setup1'
I=14
Soln(N='Transient', I=15)
Send 'Setup'
Send 'ID Map'
Send 'SolutionManager'
$begin 'UserDefinedSolutionMgr'
NextUniqueID=1000000
MoveBackwards=false
Send 'UserDefinedSolutionMgr'
Notes=$begin_cdata$ Send_cdata$
$begin 'AnimationSetups'
Send 'AnimationSetups'
Send 'Maxwell2DModel'
$begin 'DataInstances'
$begin 'Instance'
DesignEditor='Maxwell2DDesign1'
$begin 'Maxwell2DDesignInstance'
DesignInstanceID=1
$begin 'ReportSetup'
$begin 'ReportManager'
$begin 'Reports'
Send 'Reports'
NextUniqueID=0
MoveBackwards=false
$begin 'NextVersID'
NextUniqueID=0
MoveBackwards=false
Send 'NextVersID'
Send 'ReportManager'
$begin 'Reports'
Send 'Reports'
$begin 'ReportsWindowInfoList'
Send 'ReportsWindowInfoList'
Send 'ReportSetup'

```

Send 'Maxwell2DDesignInstance'

Send 'Instance'

Send 'DataInstances'

\$begin 'WBSystemIDToDesignInstanceIDMap'

Send 'WBSystemIDToDesignInstanceIDMap'

\$begin 'WBSysIDSysDetails'

Send 'WBSysIDSysDetails'

\$begin 'WBConnIDConnDetails'

Send 'WBConnIDConnDetails'

Send 'AnsoftProject'