DAILY ASSESSMENT FORMAT

Date:	10th June 2020	**Name:**	Soundarya NA
Course:	VLSI	**USN:**	4AL16EC077
Topic:	VLSI	**Semester & Section:**	8th - B

FORENOON SESSION DETAILS

Image of session

Outline

- MOSFET as a Switch ←
- MOSFET Structure]
- Types of MOSFET
- Threshold Voltage of MOSFET
- Current-Voltage Characteristics
- Transfer Characteristics and Sub-threshold Slope
- Basic Equations (to be remembered)
- Recapitulation

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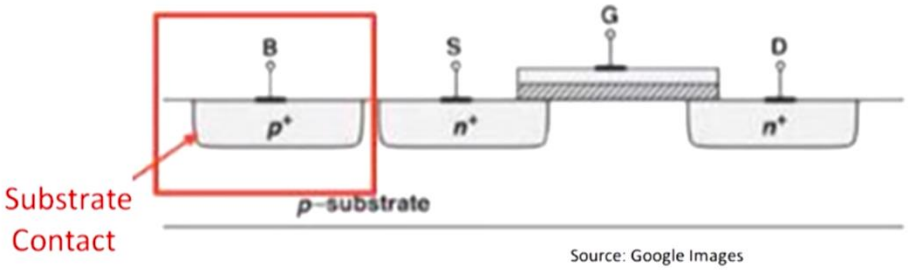
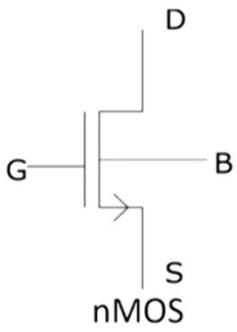
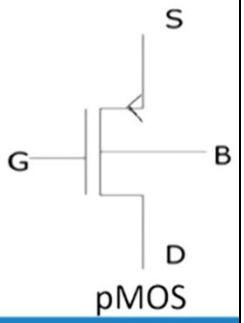
Body Terminal and MOS symbols



Source: Google Images





- The substrate bias should be connected with the negative most supply of the system.
- nMOS and pMOS are in general made in same wafer, in which one device can placed in local substrate called as well.

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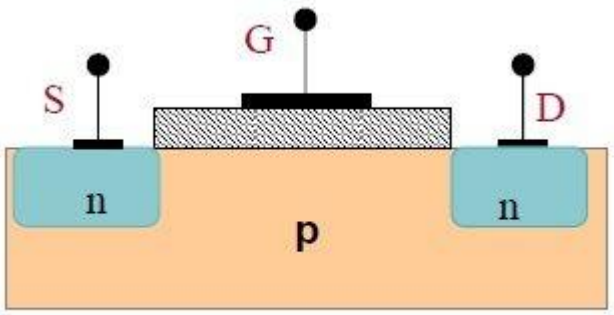
Report:

A metal–oxide–semiconductor field-effect transistor (MOSFET, MOS-FET, or MOS FET) is a field-effect transistor (FET with an insulated gate) where the voltage determines the conductivity of the device. It is used for switching or amplifying signals. The ability to change conductivity with the amount of applied voltage can be used for amplifying or switching electronic signals. MOSFETs are now even more common than BJTs (bipolar junction transistors) in digital and analog circuits.



MOSFET Structure

A MOSFET is by far the most common transistor in digital circuits, as hundreds of thousands or millions of them may be included in a memory chip or microprocessor. Since they can be made with either p-type or n-type semiconductors, complementary pairs of MOS transistors can be used to make switching circuits with very low power consumption, in the form of CMOS logic.

MOSFETs are particularly useful in amplifiers due to their input impedance being nearly infinite which allows the amplifier to capture almost all the incoming signal. The main advantage is that it requires almost no input current to control the load current, when compared with bipolar transistors.

MOSFETs are available in two basic forms:

Depletion Type: The transistor requires the Gate-Source voltage (VGS) to switch the device “OFF”. The depletion-mode MOSFET is equivalent to a “Normally Closed” switch.

Enhancement Type: The transistor requires a Gate-Source voltage (VGS) to switch the device “ON”. The enhancement-mode MOSFET is equivalent to a “Normally Open” switch.

MOSFET Structure:

It is a four-terminal device with source(S), gate (G), drain (D) and body (B) terminals. The body is frequently connected to the source terminal, reducing the terminals to three. It works by varying the width of a channel along which charge carriers flow (electrons or holes).

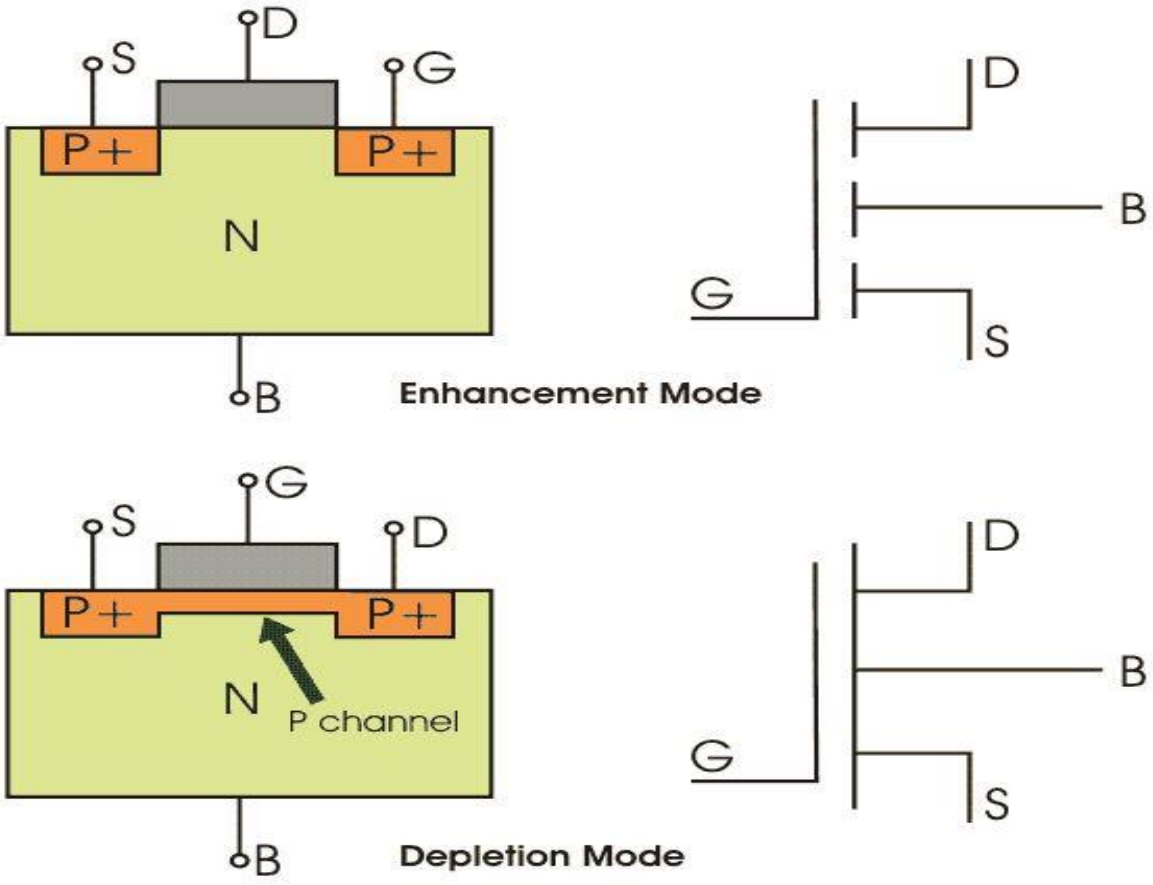
The charge carriers enter the channel at source and exit via the drain. The width of the channel is controlled by the voltage on an electrode is called gate which is located between source and drain. It is insulated from the channel near an extremely thin layer of metal oxide. A metal-insulator-semiconductor field-effect transistor or MISFET is a term almost synonymous with MOSFET. Another synonym is IGFET for the insulated-gate field-effect transistor.

MOSFET Operation:

The working of a MOSFET depends upon the MOS capacitor. The MOS capacitor is the main part of MOSFET. The semiconductor surface at the below oxide layer which is located between source and drain terminals. It can be inverted from p-type to n-type by applying positive or negative gate voltages.

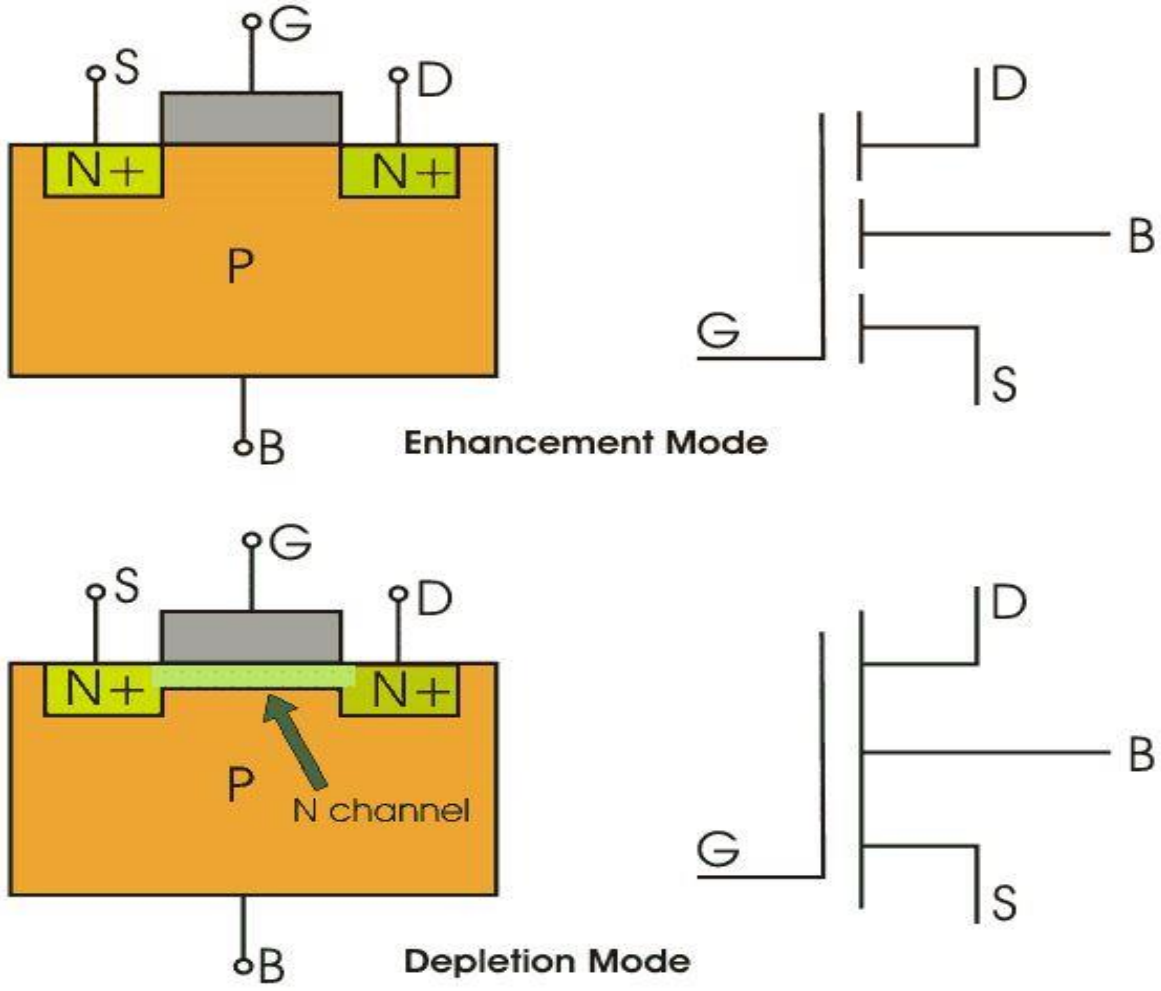
When we apply positive gate voltage the holes present under the oxide layer with a repulsive force and holes are pushed downward with the substrate. The depletion region populated by the bound negative charges which are associated with the acceptor atoms. The electrons reach the channel is formed. The positive voltage also attracts electrons from the n+ source and drain regions into the channel. Now, if a voltage is applied between the drain and source, the current flows freely between the source and drain and the gate voltage controls the electrons in the channel. If we apply negative voltage, a hole channel will be formed under the oxide layer.

P-Channel MOSFET:



The drain and source are heavily doped p+ region and the substrate is in n-type. The current flows due to the flow of positively charged holes also known as p-channel MOSFET. When we apply negative gate voltage, the electrons present beneath the oxide layer experience repulsive force and they are pushed downward in to the substrate, the depletion region is populated by the bound positive charges which are associated with the donor atoms. The negative gate voltage also attracts holes from p+ source and drain region into the channel region.

N-Channel MOSFET:



The drain and source are heavily doped n+ region and the substrate is p-type. The current flows due to the flow of negatively charged electrons, also known as n-channel MOSFET. When we apply the positive gate voltage the holes present beneath the oxide layer experience repulsive force and the holes are pushed downwards in to the bound negative charges which are associated with the acceptor atoms. The positive gate voltage also attracts electrons from n+ source and drain region in to the channel thus an electron reach channel is formed.

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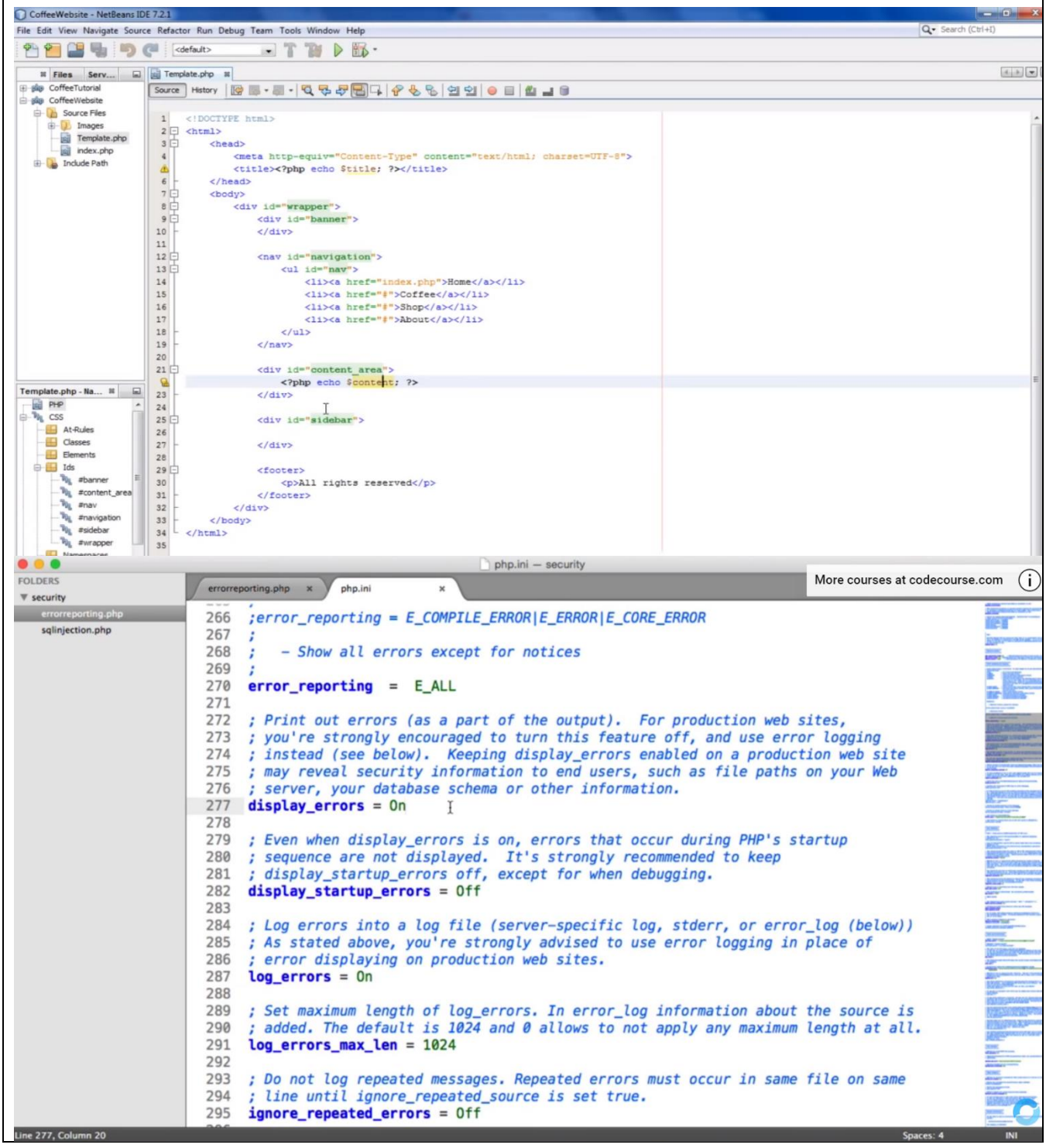
Course:	UDEMY	USN:	4AL16EC077
Topic:	MySQL	Semester & Section:	8th - B

Image:



Report:
MySQL join:
Code:

```
CREATE TABLE members (
   member_id INT AUTO_INCREMENT,
   name VARCHAR(100),
   PRIMARY KEY (member_id)
);

CREATE TABLE committees (
   committee_id INT AUTO_INCREMENT,
   name VARCHAR(100),
   PRIMARY KEY (committee_id)
);
INSERT INTO members(name)
VALUES('John'),('Jane'),('Mary'),('David'),('Amelia');

INSERT INTO committees(name)
VALUES('John'),('Mary'),('Amelia'),('Joe');
SELECT * FROM members;
SELECT * FROM committees;
```

MySQL inner join clause:
Code:

```
SELECT column_list
FROM table_1
INNER JOIN table_2 ON join_condition;
SELECT column_list
FROM table_1
INNER JOIN table_2 USING (column_name); SELECT
   m.member_id,
   m.name member,
   c.committee_id,
   c.name committee
FROM
   members m
INNER JOIN committees c
          ON c.name = m.name;
 SELECT
   m.member_id,
   m.name member,
   c.committee_id,
   c.name committee
FROM
```

```
    members m
INNER JOIN committees c USING(name);
```

MySQL left join clause:

Code:

```
SELECT column_list
FROM table_1
LEFT JOIN table_2 ON join_condition;
SELECT column_list
FROM table_1
LEFT JOIN table_2 USING (column_name);
SELECT
    m.member_id,
    m.name member,
    c.committee_id,
    c.name committee
FROM
    members m
LEFT JOIN committees c USING(name);
SELECT
    m.member_id,
    m.name member,
    c.committee_id,
    c.name committee
FROM
    members m
LEFT JOIN committees c USING(name)
WHERE c.committee_id IS NULL;
```

MySQL right join clause:

Code:

```
SELECT column_list
FROM table_1
RIGHT JOIN table_2 ON join_condition;
SELECT column_list
FROM table_1
RIGHT JOIN table_2 USING (column_name);
SELECT column_list
FROM table_1
RIGHT JOIN table_2 USING (column_name)
WHERE column_table_1 IS NULL;
SELECT
    m.member_id,
    m.name member,
    c.committee_id,
    c.name committee
```

```
FROM
   members m
RIGHT JOIN committees c on c.name = m.name;
SELECT
   m.member_id,
   m.name member,
   c.committee_id,
   c.name committee
FROM
   members m
RIGHT JOIN committees c USING(name);
SELECT
   m.member_id,
   m.name member,
   c.committee_id,
   c.name committee
FROM
   members m
RIGHT JOIN committees c USING(name)
WHERE m.member_id IS NULL;
```

PHP errors and security:

With PHP security, there are two sides to error reporting. One is beneficial to increasing security, the other is detrimental.

A standard attack tactic involves profiling a system by feeding it improper data, and checking for the kinds, and contexts, of the errors which are returned. This allows the system cracker to probe for information about the server, to determine possible weaknesses. For example, if an attacker had gleaned information about a page based on a prior form submission, they may attempt to override variables, or modify them:

Code:

```
<?php
if ($username) {  // Not initialized or checked before usage
   $good_login = 1;
}
if ($good_login == 1) { // If above test fails, not initialized or checked before usage
   readfile ("/highly/sensitive/data/index.html");
}
?>
```

Building a template page:

```
<?xml version="1.0"?>
<data>
 <value type="object" struct-name="workbench.model.reporting.TemplateInfo"
 id="{BD6879ED-814C-4CA3-A869-9864F83B88DF}" struct-checksum="0xb46b524d">
  <value type="string" key="description">
   A basic TEXT report listing schemata and objects.
  </value>
  <value type="string" key="name">HTML Basic Frame Report</value>
  <value type="list" content-type="object"
  content-struct-name="workbench.model.reporting.TemplateStyleInfo"
  key="styles">
   <value type="object" struct-name="workbench.model.reporting.TemplateStyleInfo"
   id="{7550655C-CD4B-4EB1-8FAB-AAEE49B2261E}" struct-checksum="0xab08451b">
    <value type="string" key="description">
     Designed to be viewed with a fixed sized font.
    </value>
    <value type="string" key="name">Fixed Size Font</value>
    <value type="string" key="previewImageFileName">
     preview_basic.png
    </value>
    <value type="string" key="styleTagValue">fixed</value>
   </value>
  </value>
  <value type="string" key="mainFileName">report.txt</value>
 </value>
</data>
id="{BD6879ED-814C-4CA3-A869-9864F83B88DF}"
...
id="{7550655C-CD4B-4EB1-8FAB-AAEE49B2261E}"
```

```
<?xml version="1.0"?>
<data>
 <value type="object" struct-name="workbench.model.reporting.TemplateInfo"
 id="{cac9ba3f-ee2a-49f0-b5f6-32580fab1640}" struct-checksum="0xb46b524d">
  <value type="string"
  key="description">
   Custom basic TEXT report listing schemata and objects.
  </value>
  <value type="string" key="name">Custom Basic text report</value>
  <value type="list" content-type="object"
  content-struct-name="workbench.model.reporting.TemplateStyleInfo" key="styles">
   <value type="object"
   struct-name="workbench.model.reporting.TemplateStyleInfo"
   id="{39e3b767-a832-4016-8753-b4cb93aa2dd6}" struct-checksum="0xab08451b">
    <value type="string" key="description">
     Designed to be viewed with a fixed sized font.
    </value>
    <value type="string" key="name">Fixed Size Font</value>
    <value type="string" key="previewImageFileName">preview_basic.png</value>
    <value type="string" key="styleTagValue">fixed</value>
   </value>
  </value>
  <value type="string" key="mainFileName">custom_report.txt</value>
 </value>
</data>
```