The R5550K Series are CMOS-based load switch ICs. Pch Tr. is used to achieve low On resistance (TYP. 180mΩ) and low supply current (TYP. 2.6μA at no-load operation). Internally, a single IC consists of a voltage reference unit, an error amplifier, resistors for setting output voltage and a current limit circuit. Output voltage is fixed inside the IC with high accuracy. The R5550K is suitable for monitoring abnormal current which may flow from lithium ion battery (one cell) to power lines connected to each load. If the abnormal current is detected, the switch turns off after a certain period of time (Dead-time).

If overcurrent is detected, switch turns off after dead-time of 10ms. If the output current exceeds the output current limit, the output current limit circuit immediately controls the output current after the short current response time of 4μs. Then, switch turns off after dead-time of 1.33ms.

The R5550K also includes a voltage sense pin which monitors abnormal voltage. If abnormal voltage is detected, switch turns off after dead-time of 10ms.

As protection circuits, the R5550K contains an output current limit circuit, a short-current protection circuit, and an undervoltage lockout (UVLO) circuit.

The R5550K is available in a DFN(PLP)1010-4F package which enables the high-density mounting.

**FEATURES**

- A single built-in Pch MOSFET
- Input Voltage Range ...................................... 2.3V to 5.25V
- Supply Current (I_{OUT}=0mA) ......................... TYP. 2.6μA
- Switch On Resistance ................................. TYP. 180mΩ (V_{IN}=3.3V)
- Output Current .......................................... MIN. 1000mA
- Package .............................................. DFN(PLP)1010-4F
- Current Limit Threshold ................................. MIN. 300mA
- Output Current Limit .................................. MIN. 1000mA
- Switching Operation (After turn-off) ........ Automatic Recovery Type

**APPLICATIONS**

- Load Switch for portable communication equipments
BLOCK DIAGRAMS
SELECTION GUIDE

R5550K001A-TR  DFN(PLP)1010-4F  10,000 pcs  Yes  Yes

001: Designation of current limit threshold, output current limit and protection delay time
   Current Limit Threshold: 300mA
   Output Current Limit: 1000mA
   Protection Delay Time: Refer to Table 1 below.

Table 1. Protection Delay Time

<table>
<thead>
<tr>
<th>Setting No.</th>
<th>Delay Time</th>
<th>Protection Delay Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Current Limit Threshold/SENSE Pin Voltage</td>
<td>Dead-time [ms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Output Current Limit</td>
<td>1.33</td>
</tr>
</tbody>
</table>

As for Dead-time, OFF-time and ON-time, refer to Theory of Operation.

A : Designation of version
Automatic recovery type protection, Voltage SENSE pin
PIN DESCRIPTION

DFN(PLP)1010-4F

Top View

Bottom View

R5550K001A

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>2</td>
<td>VSENSE</td>
<td>Voltage SENSE Pin</td>
</tr>
<tr>
<td>3</td>
<td>VIN</td>
<td>Input Pin</td>
</tr>
<tr>
<td>4</td>
<td>VOUT</td>
<td>Output Pin</td>
</tr>
</tbody>
</table>
ABSOLUTE MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Item</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIN</td>
<td>Input Voltage</td>
<td>-0.3 to 6.0</td>
<td>V</td>
</tr>
<tr>
<td>VSENSE</td>
<td>SENSE Pin Voltage</td>
<td>-0.3 to 6.0</td>
<td>V</td>
</tr>
<tr>
<td>VOUT</td>
<td>Output Voltage</td>
<td>-0.3 to VIN + 0.3</td>
<td>V</td>
</tr>
<tr>
<td>IOUT</td>
<td>Output Current</td>
<td>1000</td>
<td>mA</td>
</tr>
<tr>
<td>PD</td>
<td>Power Dissipation (Standard Land Pattern)*1</td>
<td>300</td>
<td>mW</td>
</tr>
<tr>
<td>Ta</td>
<td>Operating Temperature Range</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Tstg</td>
<td>Storage Temperature Range</td>
<td>-55 to +125</td>
<td>°C</td>
</tr>
</tbody>
</table>

*1 For more information about Power Dissipation and Standard Land Pattern, please refer to POWER DISSIPATION.

ABSOLUTE MAXIMUM RATINGS

Electronic and mechanical stress momentarily exceeded absolute maximum ratings may cause the permanent damages and may degrade the lifetime and safety for both device and system using the device in the field. The functional operation at or over these absolute maximum ratings is not assured.

RECOMMENDED OPERATING CONDITIONS (ELECTRICAL CHARACTERISTICS)

All of electronic equipment should be designed that the mounted semiconductor devices operate within the recommended operating conditions. The semiconductor devices cannot operate normally over the recommended operating conditions, even if when they are used over such conditions by momentary electronic noise or surge. And the semiconductor devices may receive serious damage when they continue to operate over the recommended operating conditions.
ELECTRICAL CHARACTERISTICS

\( \text{VIN}=3.7\,\text{V}, \text{IOUT}=1\,\text{mA}, \text{CIN}=0.1\,\mu\text{F}, \text{COUT}=\text{none}, \) unless otherwise noted.

The specifications surrounded by square brackets \([\) are guaranteed by Design Engineering at -40\(^\circ\)C \(\leq \text{Ta} \leq 85\,\text{C}^\circ\).

### Symbol Table

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Item</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{VIN} )</td>
<td>Input Voltage</td>
<td></td>
<td>2.3</td>
<td>5.25</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>( \text{RON} )</td>
<td>Switch On Resistance</td>
<td>( \text{IOUT}=100,\text{mA}^1, \text{VIN}=3.3,\text{V} )</td>
<td>180</td>
<td></td>
<td>m(\Omega)</td>
<td></td>
</tr>
<tr>
<td>( \text{IOUT} )</td>
<td>Output Current</td>
<td></td>
<td>1000</td>
<td></td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>( \text{ISS} )</td>
<td>Supply Current</td>
<td>( \text{IOUT}=0,\text{mA}, \text{VSENSE}=2.0,\text{V} )</td>
<td>2.6</td>
<td>15</td>
<td>(\mu)A</td>
<td></td>
</tr>
<tr>
<td>( \text{IDET} )</td>
<td>Current Limit Threshold (^3)</td>
<td></td>
<td>300</td>
<td>460</td>
<td>624</td>
<td>mA</td>
</tr>
<tr>
<td>( \text{ILIM} )</td>
<td>Output Current Limit (^3)</td>
<td>( \text{Initial Saturation Region}^4 )</td>
<td>1130</td>
<td>1470</td>
<td>1790</td>
<td>mA</td>
</tr>
<tr>
<td>( \text{ISC} )</td>
<td>Short Current Limit</td>
<td>( \text{VOUT}=0,\text{V} )</td>
<td>300</td>
<td></td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>( \text{VDET} )</td>
<td>SENSE Pin Detector Threshold</td>
<td>( \text{VSENSE} ) falling</td>
<td>x 0.97</td>
<td>0.5</td>
<td>x 1.03</td>
<td>V</td>
</tr>
<tr>
<td>( \text{VHYS} )</td>
<td>SENSE Pin Hysteresis</td>
<td>( \text{VSENSE} ) rising</td>
<td>0.63</td>
<td>0.9</td>
<td>1.2</td>
<td>V</td>
</tr>
<tr>
<td>( \text{TDET1} )</td>
<td>Dead-time 1</td>
<td>( \text{VSENSE} \leq \text{VDET} ) or ( \text{IDET} \leq \text{IOUT} &lt; \text{ILIM} )</td>
<td>x 0.72</td>
<td>10</td>
<td>x 1.32</td>
<td>ms</td>
</tr>
<tr>
<td>( \text{TOFF1} )</td>
<td>OFF-time 1</td>
<td></td>
<td>x 0.71</td>
<td>80</td>
<td>x 1.34</td>
<td>ms</td>
</tr>
<tr>
<td>( \text{TON1} )</td>
<td>ON-time 1</td>
<td></td>
<td>x 0.72</td>
<td>2.5</td>
<td>x 1.35</td>
<td>ms</td>
</tr>
<tr>
<td>( \text{TDET2} )</td>
<td>Dead-time 2</td>
<td>( \text{VOUT}=0,\text{V} ) or ( \text{IOUT} &gt; \text{ILIM} )</td>
<td>x 0.65</td>
<td>1.33</td>
<td>x 1.35</td>
<td>ms</td>
</tr>
<tr>
<td>( \text{TOFF2} )</td>
<td>OFF-time 2</td>
<td></td>
<td>x 0.65</td>
<td>80</td>
<td>x 1.35</td>
<td>ms</td>
</tr>
<tr>
<td>( \text{TON2} )</td>
<td>ON-time 2</td>
<td></td>
<td>x 0.65</td>
<td>1.33</td>
<td>x 1.35</td>
<td>ms</td>
</tr>
<tr>
<td>( \text{Tr} )</td>
<td>Start-up Time</td>
<td>( \text{VOUT}=10% ) to 90% , \text{COUT}=0.1,\mu\text{F} )</td>
<td>12</td>
<td></td>
<td>(\mu)s</td>
<td></td>
</tr>
<tr>
<td>( \text{Trdelay} )</td>
<td>Start-up Delay Time</td>
<td>( \text{VIN}=\text{VUVLO} ) to ( \text{VOUT}=10% )</td>
<td>60</td>
<td></td>
<td>(\mu)s</td>
<td></td>
</tr>
<tr>
<td>( \text{TSC} )</td>
<td>Short Current Response Time (^2)</td>
<td>( \text{VOUT}=0,\text{V} )</td>
<td>4</td>
<td></td>
<td>(\mu)s</td>
<td></td>
</tr>
<tr>
<td>( \text{VUVLO} )</td>
<td>UVLO Release Voltage</td>
<td>( \text{VIN} ) rising</td>
<td>2.0</td>
<td>2.1</td>
<td>2.2</td>
<td>V</td>
</tr>
<tr>
<td>( \text{VHYSLV} )</td>
<td>UVLO Hysteresis</td>
<td>( \text{VIN} ) falling</td>
<td>0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All test items listed under **ELECTRICAL CHARACTERISTICS** are done under the pulse load condition (\( \text{Tj}=\text{Ta}=25\,\text{C}^\circ \)) except Start-up Time, Start-up Delay Time, Short Current Response Time, Dead-time 2, OFF-time 2 and ON-time 2.

\(^1\) As for \( \text{RON} \) when \( \text{IOUT}>100\,\text{mA} \), refer to 12) Switch ON Resistance vs. Output Current of TYPICAL CHARACTERISTICS.

\(^2\) Refer to 36) Short-Protection-Circuit Transient Response of TYPICAL CHARACTERISTICS.

\(^3\) Each set value should be \( \text{Max. IDET} < \text{Min. ILIM} \). Note: Do not use with \( \text{IDET}=400\,\text{mA} \) and \( \text{ILIM}=500\,\text{mA} \).

\(^4\) \( \text{ILIM} \) could be influenced by the measurement time. All products were tested within the initial saturation region as shown in the following page.
R5550KxxxxA

$I_{LM\_SET} = 1000\text{mA}$
$Ta = 25^\circ\text{C}$

Measurement Board Information
- Board Size: 27.5mm x 40.0mm
- IC Mounting Position: Center of the board
- Board Material: Glass Cloth Epoxy Plastic (Single layer)
- Board Thickness: 1.6mm
- Diameter of Through-hole: 1.0mm
- Number of Through-holes: 12
THEORY OF OPERATION

Operation Example: R5550K001A with Automatic Recovery Protection and Voltage SENSE Pin

[1] Operation of Current Limit Detector Threshold (I\text{DET})

If $I_{\text{OUT}}$ exceeds $I_{\text{DET}}$, Timer 1 starts to operate and the switch turns off after Dead-time 1. After OFF-time 1, the switch automatically turns on. If $I_{\text{OUT}}$ ≥ $I_{\text{DET}}$ continues, the switch turns off again after ON-time 1. Afterwards, the switch repeats intermittent operation. If $I_{\text{OUT}}$ < $I_{\text{DET}}$, the IC recognizes it as back in normal operation and start to output as usual.

Even if $I_{\text{OUT}}$ < $I_{\text{DET}}$ during OFF-time 1, the switch automatically turns on after OFF-time 1.


If $I_{\text{OUT}}$ exceeds $I_{\text{LIM}}$ (including output short-circuit), $I_{\text{OUT}}$ becomes limited by $I_{\text{LIM}}$ or $I_{\text{SC}}$. So, Timer 2 starts to operate and the switch turns off after Dead-time 2.

After OFF-time 2, the switch automatically turns on. If $I_{\text{OUT}}$ ≥ $I_{\text{LIM}}$ or short current condition continues, the switch turns off again after ON-time 2. Afterwards, $I_{\text{OUT}}$ the switch repeats intermittent operation. If $I_{\text{OUT}}$ < $I_{\text{LIM}}$, the IC recognizes it as back in normal operation and start to output as usual.

Even if $I_{\text{OUT}}$ < $I_{\text{LIM}}$ during OFF-time 2, the switch automatically turns on after OFF-time 2.

If VSENSE falls below VDET, Timer 1 starts to operate and the switch turns off after Dead-time 1. After OFF-time 1, the switch automatically turns on. If VSENSE≤VDET continues, the switch turns off again after ON-time 1. Afterwards, IOUT repeats intermittent operation.

If VSENSE>(VDET+VHYS), when the switch is automatically turning on after OFF-time 1, the IC recognizes it as back in normal operation and start to output as usual.

Even if VSENSE>(VDET+VHYS) during OFF-time 1, the switch automatically turns on after OFF-time 1.
TYPICAL APPLICATIONS AND TECHNICAL NOTES

Typical Application

![Typical Application Diagram](image)

Technical Notes

The R5550K does not require any bypass capacitor between $V_{IN}$ and GND. However, it is recommended that a 0.1µF or more capacitor be connected between $V_{IN}$ and GND. Especially, if there's any possibility of generating spike noise due to the parasitic element (inductance) of $V_{IN}$, connect a proper size capacitor between $V_{IN}$ and GND.
POWER DISSIPATION (DFN(PLP)1010-4F)

Power Dissipation ($P_D$) depends on conditions of mounting on board. This specification is based on the measurement conditions below.

### Measurement Conditions

<table>
<thead>
<tr>
<th>Environment</th>
<th>Mounting on Board (Wind Velocity=0m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board Material</td>
<td>Glass Cloth Epoxy Plastic (Double-sided)</td>
</tr>
<tr>
<td>Board Dimensions</td>
<td>40mm x 40mm x 1.6mm</td>
</tr>
<tr>
<td>Copper Ratio</td>
<td>Topside: Approx. 50%, Backside: Approx. 50%</td>
</tr>
<tr>
<td>Through-holes</td>
<td>$\phi$ 0.54mm x 24pcs</td>
</tr>
</tbody>
</table>

### Measurement Result: ($T_a=25°C$, $T_{j\max}=125°C$)

<table>
<thead>
<tr>
<th>Power Dissipation</th>
<th>Standard Land Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>300mW</td>
<td></td>
</tr>
</tbody>
</table>

\[
\theta_{ja} = \frac{(125-25°C)/0.3W}{330°C/W} = 48°C/W
\]

### Power Dissipation

![Power Dissipation Chart](chart.png)

- **On Board**

### Measurement Board Pattern

![Measurement Board Pattern](board_pattern.png)

- **IC Mount Area (Unit : mm)**
TYPICAL CHARACTERISTICS

1) Output Voltage vs. Output Current

**R5550K001A**

- **I_{IN,SET} = 500mA**
- **T_a = -40°C**

**R5550K001A**

- **I_{IN,SET} = 500mA**
- **T_a = 25°C**

**R5550K001A**

- **I_{IN,SET} = 750mA**
- **T_a = -40°C**

**R5550K001A**

- **I_{IN,SET} = 750mA**
- **T_a = 25°C**

- **V_{IN} = 5.25V**
- **V_{IN} = 4.8V**
- **V_{IN} = 3.7V**
- **V_{IN} = 3.0V**
- **V_{IN} = 2.3V**
2) Current Limit vs. Temperature
3) Current Limit vs. Input Voltage

**R5550K001A**

**I\(_{\text{LM\_SET}}\) = 1000 mA**

![Graph showing Current Limit vs. Temperature for different Input Voltages](image)

**R5550K001A**

**I\(_{\text{LM\_SET}}\) = 500 mA**

![Graph showing Current Limit vs. Input Voltage for different temperatures](image)

**R5550K001A**

**I\(_{\text{LM\_SET}}\) = 750 mA**

![Graph showing Current Limit vs. Input Voltage for different temperatures](image)
4) Output Current Detector Threshold vs. Temperature

**R5550K001A**

- **I_{DET, SET}=200mA**

5) Output Current Detector Threshold vs. Input Voltage

**R5550K001A**

- **I_{DET, SET}=200mA**

**R5550K001A**

- **I_{DET, SET}=300mA**
6) Short Current Limit vs. Temperature

7) Short Current Limit vs. Input Voltage

8) Supply Current Limit vs. Input Voltage

9) Supply Current vs. Input Voltage
10) Switch ON Resistance vs. Temperature

11) Switch ON Resistance vs. Input Voltage

12) Switch ON Resistance vs. Output Current
13) Inrush Current vs. Output Capacitor (C_{IN}=NONE)

**R5550K001A**

- **Input Voltage (0V \rightarrow 3.7V)**

**R5550K001A**

- **Input Voltage (0V \rightarrow 3.7V)**

**R5550K001A**

- **Input Voltage (0V \rightarrow 3.7V)**

**R5550K001A**

- **Input Voltage (0V \rightarrow 3.7V)**
14) Inrush Current vs. Output Capacitor (C_{IN}=\text{NONE}, C_{OUT}=1\mu F)

R5550K001A

15) Output Rise Time vs. Input Voltage

R5550K001A

16) Output Delay Time vs. Input Voltage

R5550K001A
17) Output Rise Time + Output Delay Time vs. Input Voltage

18) \( V_{\text{SENSE}} \) Detector Threshold vs. Temperature

19) \( V_{\text{SENSE}} \) Released Voltage vs. Temperature

20) \( V_{\text{SENSE}} \) Hysteresis vs. Temperature

21) \( V_{\text{SENSE}} \) Detector Threshold vs. Input Voltage

22) \( V_{\text{SENSE}} \) Released Voltage vs. Input Voltage
23) $V_{\text{SENSE}}$ Hysterisis vs. Input Voltage

24) UVLO Released Voltage vs. Temperature

25) UVLO Hysterisis vs. Temperature

26) Supply Current at UVLO Detected vs. Temperature

27) Limit Ignoring Time1 vs. Temperature
28) Limit Ignoring Time1 vs. Input Voltage

**R5550K001A**

- $T_{\text{DEF1}_\text{SET}} = 2.5\text{ms}$
- $C_{\text{IN}} = 0.1\mu\text{F}$
- $C_{\text{OUT}} = 1\mu\text{F}$

**Graph 1:**
- $V_{\text{IN}} = 2.3\text{V}$
- $V_{\text{IN}} = 3.0\text{V}$
- $V_{\text{IN}} = 3.7\text{V}$
- $V_{\text{IN}} = 4.6\text{V}$
- $V_{\text{IN}} = 5.25\text{V}$

**Graph 2:**
- $T_{\text{DEF1}_\text{SET}} = 40\text{ms}$
- $C_{\text{IN}} = 0.1\mu\text{F}$
- $C_{\text{OUT}} = 1\mu\text{F}$

**Graph 3:**
- $T_{\text{DEF1}_\text{SET}} = 10\text{ms}$
- $C_{\text{IN}} = 0.1\mu\text{F}$
- $C_{\text{OUT}} = 1\mu\text{F}$

**Graph 4:**
- $T_{\text{DEF1}_\text{SET}} = 2.5\text{ms}$
- $C_{\text{IN}} = 0.1\mu\text{F}$
- $C_{\text{OUT}} = 1\mu\text{F}$

**Note:**
- The graphs show the relationship between Temperature $T_a$ (°C) and $T_{\text{DEF1}}$ (ms) for different input voltages and temperatures.
29) Limit Ignoring Time 2 vs. Temperature

**R5550K001A**

\[ T_{\text{SET}} = 5 \text{ms} \]

\[ C_{\text{IN}} = 0.1 \mu\text{F} \]

\[ C_{\text{OUT}} = 1 \mu\text{F} \]

- \( V_{\text{IN}} = 2.3\text{V} \)
- \( V_{\text{IN}} = 3.7\text{V} \)
- \( V_{\text{IN}} = 5.25\text{V} \)

![Graph showing \( T_{\text{SET}} \) vs. \( T_{\text{a}} \) for R5550K001A with different input voltages and constant \( C_{\text{IN}} \) and \( C_{\text{OUT}} \).]

30) Limit Ignoring Time2 vs. Input Voltage

**R5550K001A**

\[ T_{\text{SET}} = 0.33 \text{ms} \]

\[ C_{\text{IN}} = 0.1 \mu\text{F} \]

\[ C_{\text{OUT}} = 1 \mu\text{F} \]

- \( V_{\text{IN}} = 2.3\text{V} \)
- \( V_{\text{IN}} = 3.7\text{V} \)
- \( V_{\text{IN}} = 5.25\text{V} \)

![Graph showing \( T_{\text{SET}} \) vs. \( V_{\text{IN}} \) for R5550K001A with different input voltages and constant \( C_{\text{IN}} \) and \( C_{\text{OUT}} \).]

**R5550K001A**

\[ T_{\text{SET}} = 1.33 \text{ms} \]

\[ C_{\text{IN}} = 0.1 \mu\text{F} \]

\[ C_{\text{OUT}} = 1 \mu\text{F} \]

- \( -40^\circ\text{C} \)
- \( 25^\circ\text{C} \)
- \( 85^\circ\text{C} \)

![Graph showing \( T_{\text{SET}} \) vs. \( V_{\text{IN}} \) for R5550K001A with different temperatures and constant \( C_{\text{IN}} \) and \( C_{\text{OUT}} \).]
31) OFF Time1 vs. Temperature

**R5550K001A**

- \( T_{OFF1\_SET} = 320\, \text{ms} \)
- \( C_{IM} = 0.1\, \mu\text{F} \)
- \( C_{OUT} = 1\, \mu\text{F} \)

**R5550K001A**

- \( T_{OFF1\_SET} = 40\, \text{ms} \)
- \( C_{IM} = 0.1\, \mu\text{F} \)
- \( C_{OUT} = 1\, \mu\text{F} \)

---

**R5550K001A**

- \( T_{OFF2\_SET} = 0.33\, \text{ms} \)
- \( C_{IM} = 0.1\, \mu\text{F} \)
- \( C_{OUT} = 1\, \mu\text{F} \)
32) ON Time1 vs. Temperature

**R5550K001A**

*T\text{ON1\_SET} = 10\text{ms}  \quad C_m = 0.1\mu F  \quad C_{\text{OUT}} = 1\mu F*

![Graph showing ON Time1 vs. Temperature for R5550K001A](image)

33) OFF Time2 vs. Temperature

**R5550K001A**

*T\text{OFF2\_SET} = 320\text{ms}  \quad C_m = 0.1\mu F  \quad C_{\text{OUT}} = 1\mu F*

![Graph showing OFF Time2 vs. Temperature for R5550K001A](image)
34) ON Time2 vs. Temperature

**R5550K001A**

- **T\(_{\text{ON2\_SET}}\)** = 20 ms
- \(C_{\text{IM}} = 0.1 \mu\text{F}\)
- \(C_{\text{OIT}} = 1 \mu\text{F}\)

- \(\text{VIN} = 2.3\text{V}\)
- \(\text{VIN} = 3.7\text{V}\)
- \(\text{VIN} = 5.25\text{V}\)

---

**R5550K001A**

- **T\(_{\text{ON2\_SET}}\)** = 5 ms
- \(C_{\text{IM}} = 0.1 \mu\text{F}\)
- \(C_{\text{OIT}} = 1 \mu\text{F}\)

- \(\text{VIN} = 2.3\text{V}\)
- \(\text{VIN} = 3.7\text{V}\)
- \(\text{VIN} = 5.25\text{V}\)

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- **T\(_{\text{ON2\_SET}}\)** = 0.33 ms
- \(C_{\text{IM}} = 0.1 \mu\text{F}\)
- \(C_{\text{OIT}} = 1 \mu\text{F}\)

- \(\text{VIN} = 2.3\text{V}\)
- \(\text{VIN} = 3.7\text{V}\)
- \(\text{VIN} = 5.25\text{V}\)
35) Operation Waveform with SENSE Pin

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\[ V_{\text{SENSE}} = 3.7V \rightarrow 0V \rightarrow 3.7V \]

36) Short-Protection-Circuit Transient Response

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\[ V_{\text{IN}} = 3.7V, Ta = 25^\circ C \]
\[ C_{\text{IN}} = 1\mu F, C_{\text{OUT}} = \text{NONE} \]
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