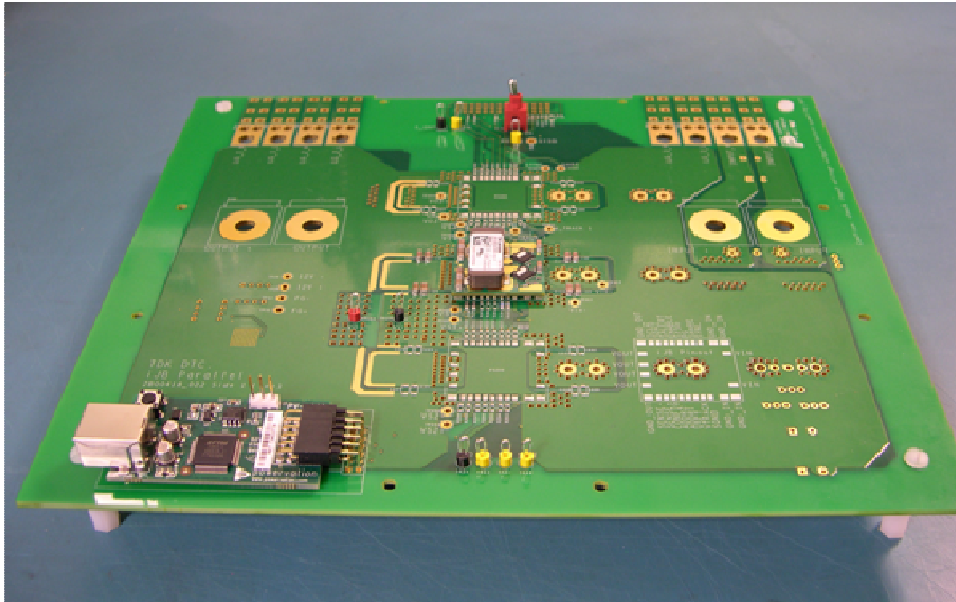


## Evaluation Kit for iJB Series Surface Mount Power Modules with PMBus™



### Features

- iJB12060A007V-001-R power module
- USB to PMBus Dongle Board
- Cables to make PC connection
- Required Input & Output filter capacitors
- CD with TDK Smart Power Module Interface GUI

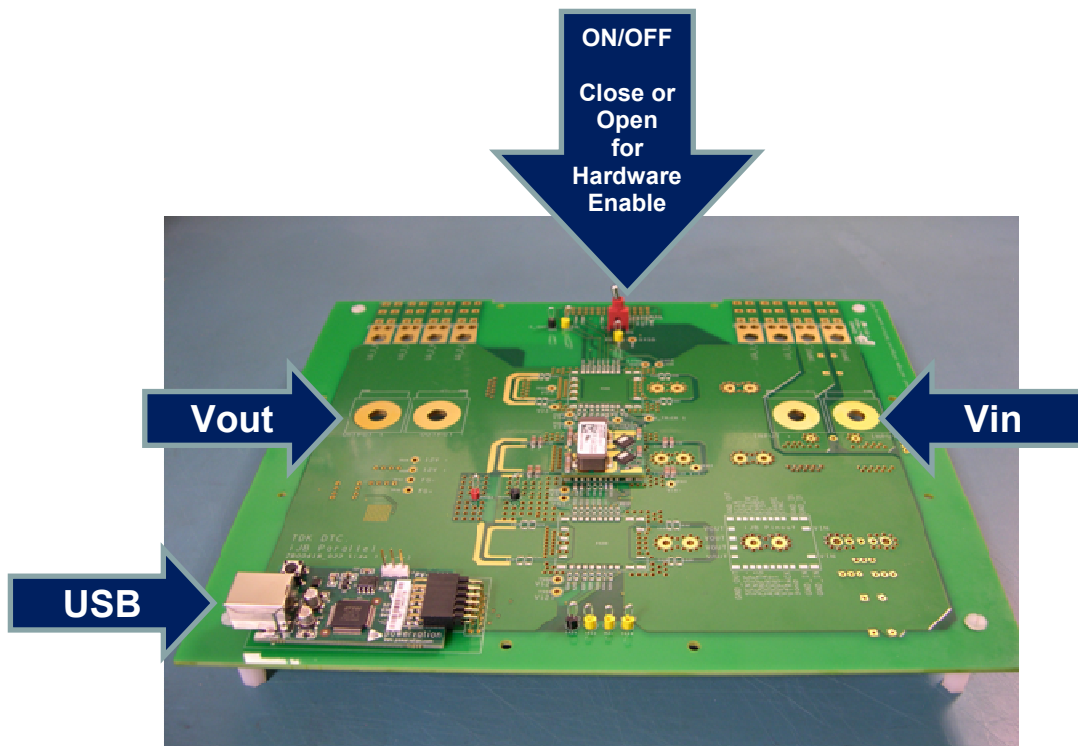
### Ordering Information

Code	Input Voltage	Output Voltage	Output Current	Note
iJB_Evaluation_Kit-R	8.0-14.0V	0.6 – 2V	60A	Refer to product data sheet for module performance details
iJB_Eval_Kit_Parallel-R	8.0-14.0V	0.6 – 2V	110A	Comes with two iJB modules installed to allow parallel module evaluation

-R indicates RoHS-6 compliance

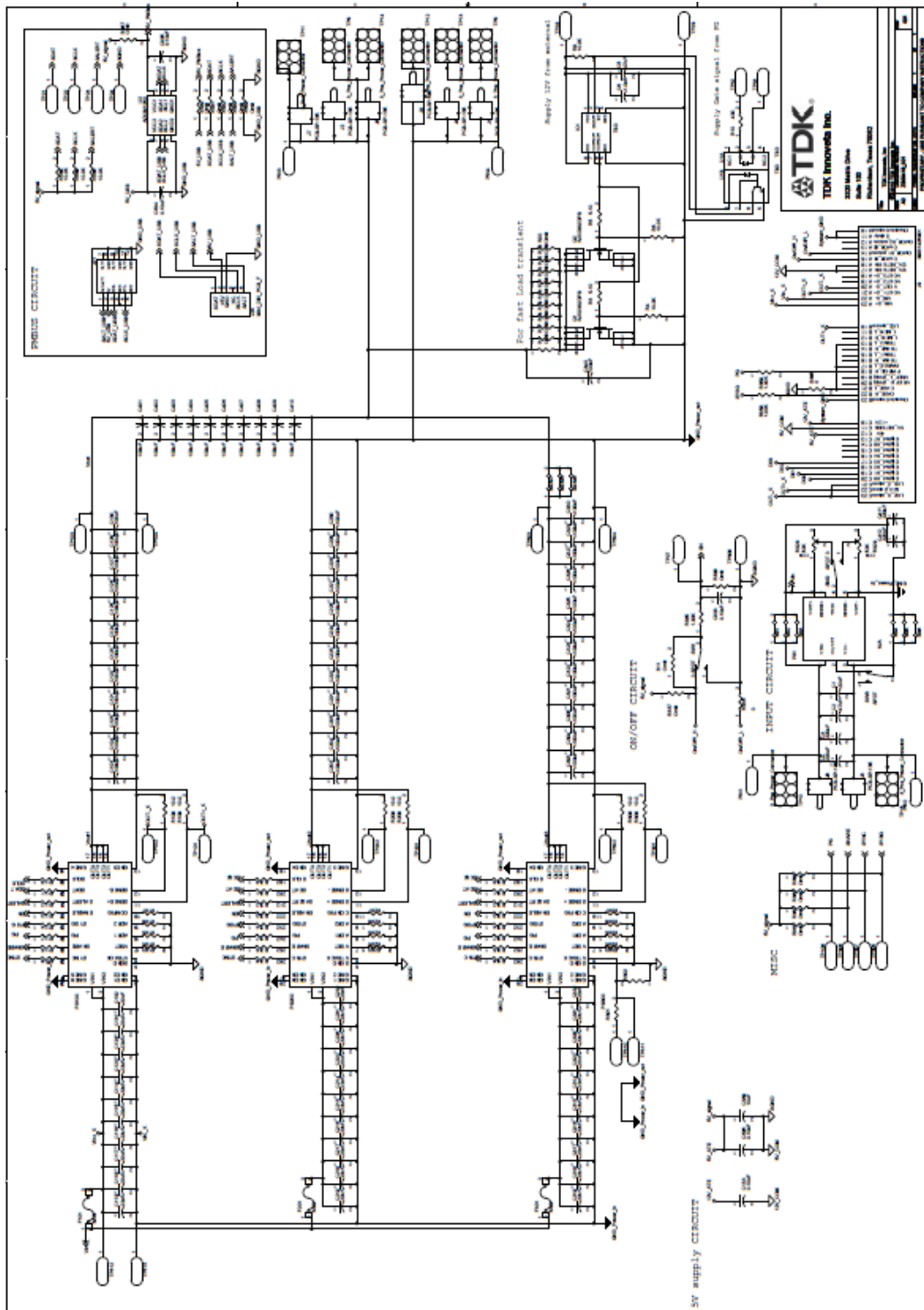
## iJB Evaluation Board Installation

- **System requirements**
  - Windows XP, Windows 7 (32bit or 64bit)
  - Java
  - Free USB port
- **GUI installation**
  - Do not connect USB cable !
  - Install “SmartPower\_1.1\_20130926\_win32-setup.exe”
    - Follow the instruction by the installer
    - Close GUI
- **Evaluation board set-up**
  - Apply 12V source to the Vin terminal (see picture 1)
  - Connect USB cable to board and PC
    - Driver will be installed

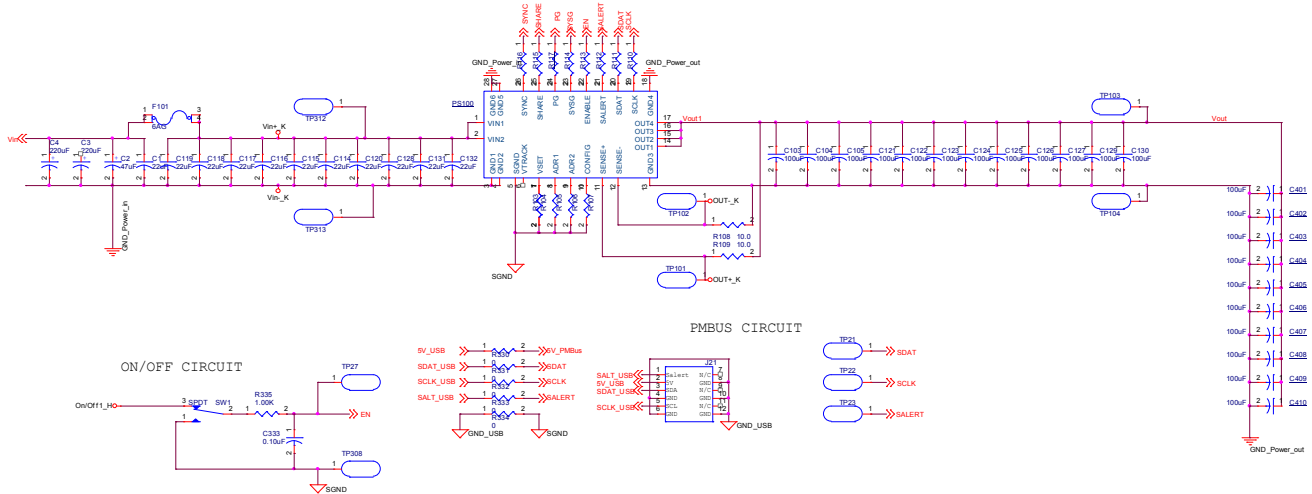


PICTURE 1

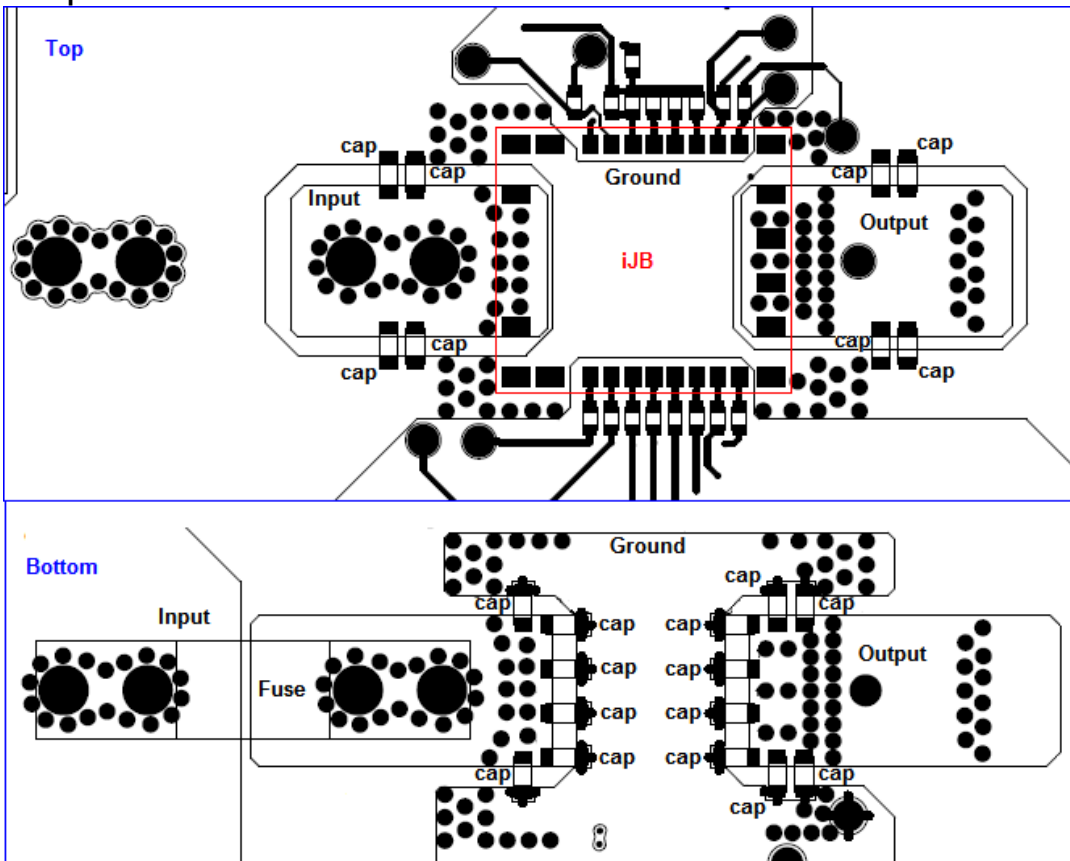
COMPLETE SCHEMATIC (not all parts are populated in standard EV Kit)



## SIMPLIFIED SCHEMATIC:



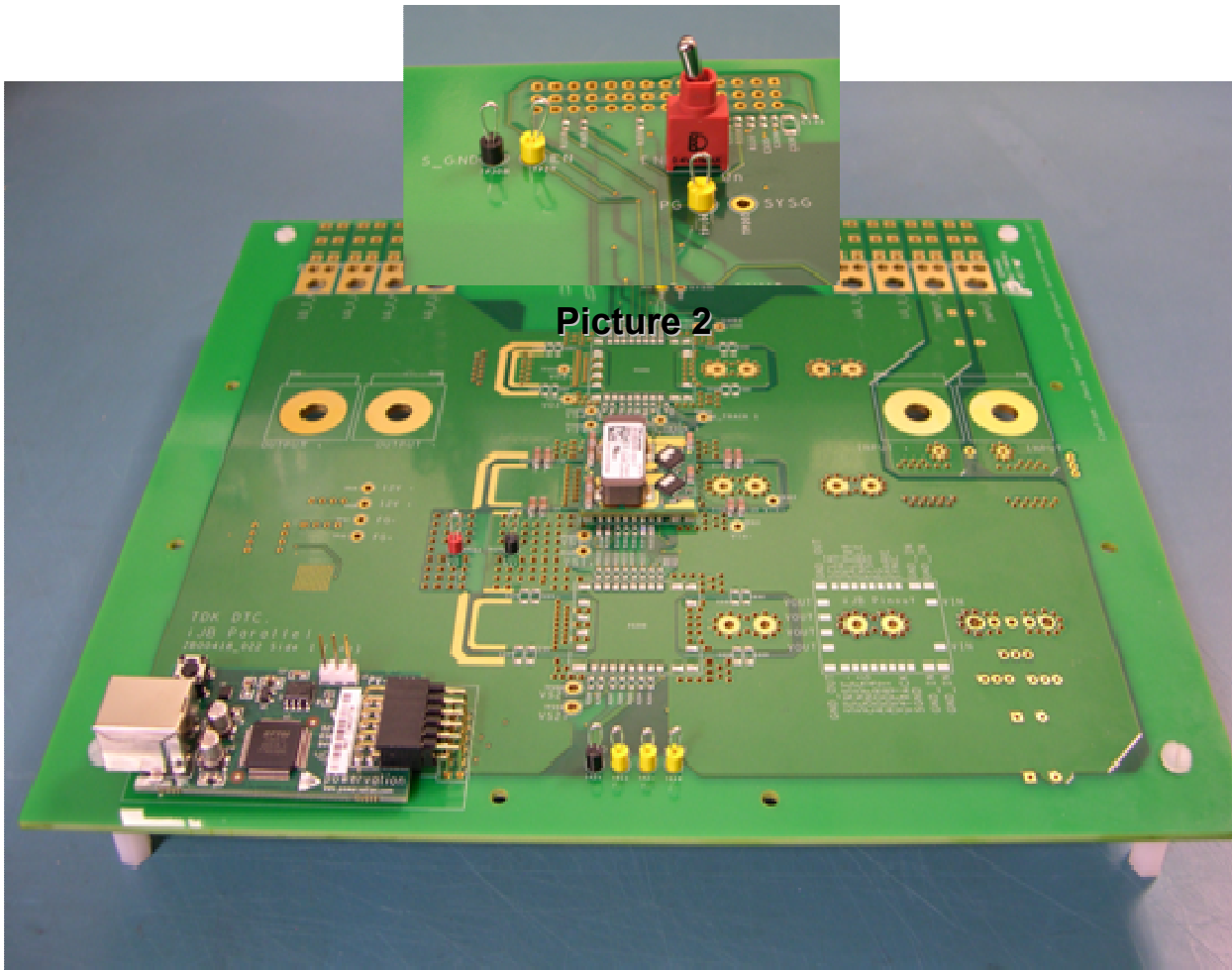
## SIMPLIFIED LAYOUT – showing vias & placement of suggested ceramic filter capacitors near power module



REF DESIGNATOR	VALUE, SIZE, RATING	PART NUMBER	SUPPLIER
COOUTPUT – 12 pieces	100uF, 1206, 6.3V	C3216X5R0J107MT	TDK
Note 10 additional output capacitors of same type (C401-C410) are populated further away from power module			
CINPUT – 10 pieces	22uF, 1206, 16V	C3216X5R1C226MT	TDK

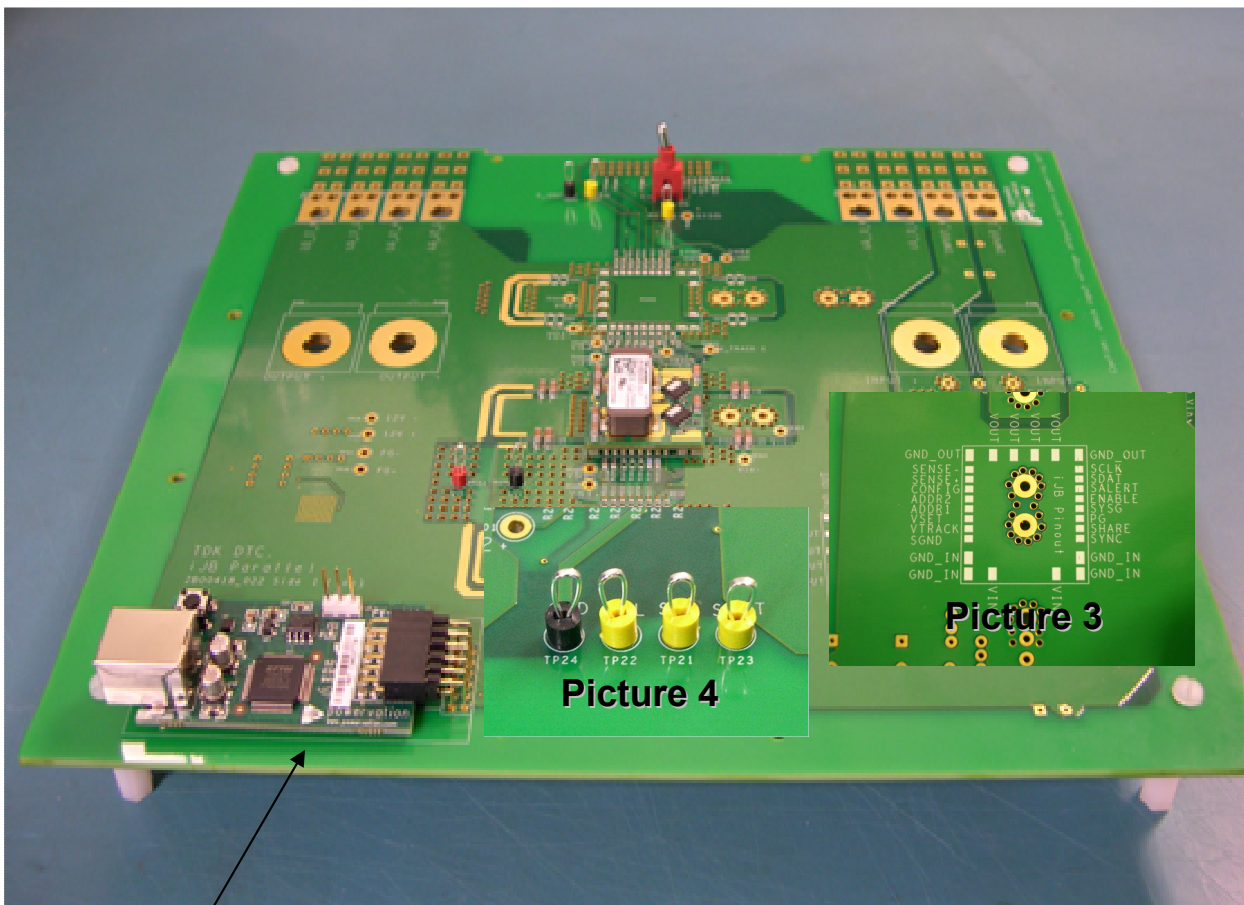
Convenient Test Point Terminal Locations:

- **Switch SW1**
  - **Position**
    - “Open” iJB module in ON mode
    - “Closed” iJB module in OFF mode
- **Test Points (see picture 2)**
  - TP 106: connected to PGOOD pin of each iJB
  - TP 308: Signal Ground
  - TP 27: via 10Ω connected to ENABLE pin of each iJB



**Convenient Test Point Terminal Locations:**

- **Test Points (see picture 4)**
  - TP 24: i<sup>2</sup>C Bus Signal Ground
  - TP 23: i<sup>2</sup>C Bus Signal Alert
  - TP 21: i<sup>2</sup>C Bus Signal Data
  - TP 22: i<sup>2</sup>C Bus Signal Clock
  
  - TP 103: + sense of iJB module
  - TP 104: - sense of iJB module
- **Picture 3 shows pin location of iJB Module**



USB Dongle board is attached by connector and can be easily removed and connected to real application board to assist with communication and debugging work.



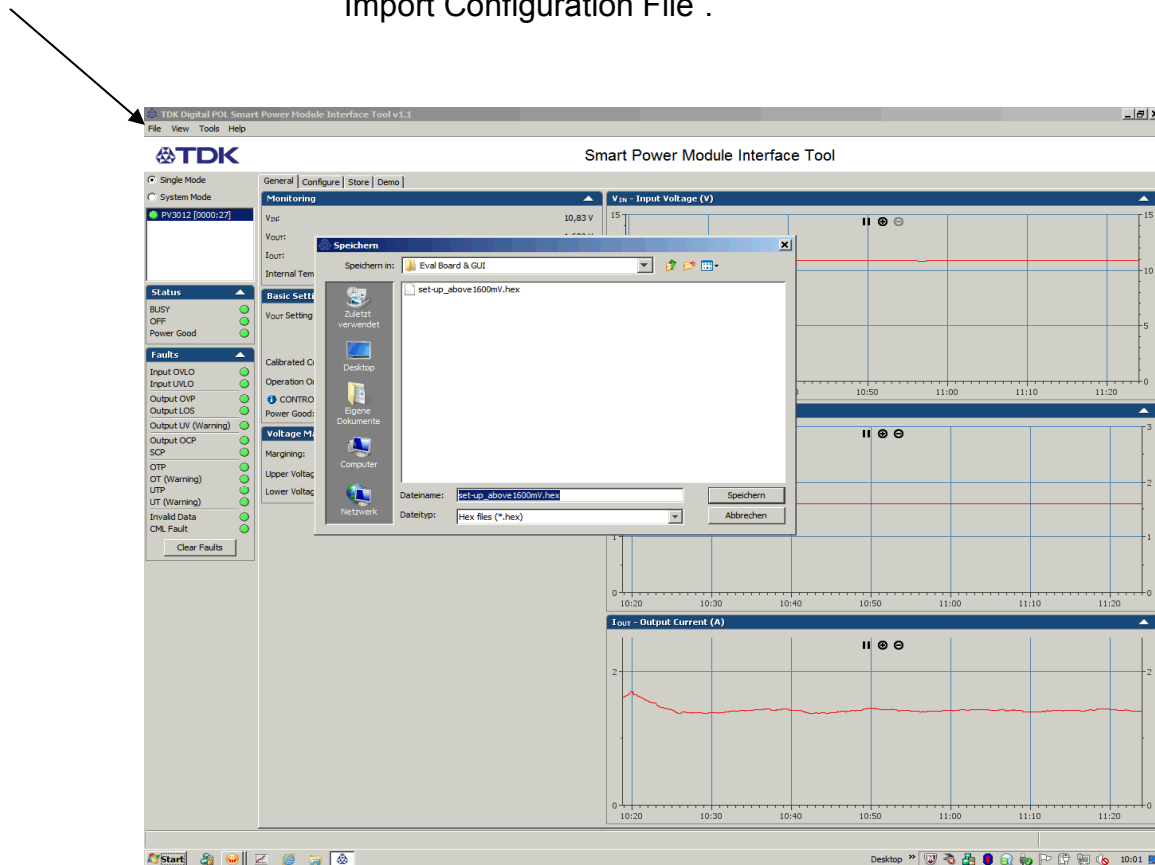
## GUI Operation:

The evaluation kit is designed to automatically detect and display the connected power module. Please refer to the power module data sheet for deeper understanding of supported commands and expected operation of the power module. The power module comes pre-configured with default settings. The GUI will allow users to easily change many settings and explore performance options.

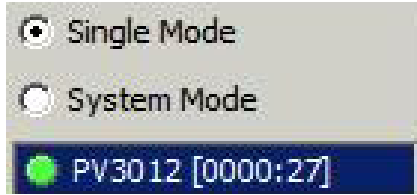
**Note:** The store function can be used only 2-3 times before memory is filled up and the device can not be reprogrammed any more. To ensure highest reliability, we did not use flash memory in this part. User can change settings as often as desired in working memory to try things, but generally should not store to the NVM (non-volatile memory). Settings can be exported to a file to use again later rather than storing to the device's NVM.

**Store:** Store your settings in the "FILE " menu "Export Configuration File".

**Load:** You can load your settings any time during operation by using the "FILE " menu "Import Configuration File".



Once the device is powered on and detected by PC on the USB port it will appear on the device list. Immediately below the device list is the status & faults window for the detected device.



System mode is for parallel evaluation only

I<sup>2</sup>C device name [ I<sup>2</sup>C address ]



green except during NVM storage operation

shows if the module is ON or OFF

indicates if  $V_{out}$  is within the limits

green when  $V_{in}$  is lower than set limit in the fault section

green when  $V_{in}$  is higher than set limit in the fault section

green when  $V_{out}$  is lower than set limit in the fault section

loss of sense, when  $V_{sense}$  is lost module will be set OFF

green when  $V_{out}$  is higher than set limit in the fault section

green when  $I_{out}$  is lower than set limit in the fault section

green when short circuit protection has not been active

green when Temp. is lower than set limit in the fault section

green when Temp. is lower than set limit in the fault section

green when Temp. is higher than set limit in the fault section

green when Temp. is higher than set limit in the fault section

indicates invalid or unsupported data

indicates communication / memory / logic status

Clear Faults can be used to clear any previous fault flags that were raised



**GUI main screen** – the output voltage set point can be changed, the margin up & down are automatically updated to keep a correct percentage. The monitoring graphs can be paused, zoomed in, zoomed out using the button bars in the top center of the charts.

**GUI configure tab screen** - the configure tab and sub tabs allow the device to be configured in more detail. The basic tab allows the user to change items such as turn on delay and rise time, on/off polarity, and voltage margining range. Users should pay special attention to the Vout Scale Loop button which may need to be changed to exercise the module over the full operating voltage range. This adjustment is generally automatically done by the module in a real / non-EV kit application.

## Basic Tab

**Configuration**

Vout Trim:	<input type="text" value="0,000"/>	V	0,000 V
Vout Max:	<input type="text" value="1,600"/>	V	1,600 V
Vout Scale Loop:	Internal Rdiv On/Off	<input type="text" value="1,0000"/>	1,0000
Vout Tracking:	<input checked="" type="radio"/> Off <input type="radio"/> 50% <input type="radio"/> 100% <input type="radio"/> OFF		OFF
Slew Rate:	<input type="text" value="3,125"/>	mv/us	3,125 mv/us
ON Rise Time:	<input type="text" value="9,9"/>	ms	9,9 ms
ON Time Delay:	<input type="text" value="0,0"/>	ms	0,0 ms
OFF Time Delay:	<input type="text" value="500,0"/>	ms	500,0 ms
Upper Voltage Margin:	<input type="text" value="20,0"/>	%	1,200 V
Lower Voltage Margin:	<input type="text" value="-20,0"/>	%	0,800 V

**On/Off Configuration**

Requires OPERATION ON:	<input checked="" type="radio"/> Yes	<input type="radio"/> No	YES
Requires CTRL Pin Asserted:	<input checked="" type="radio"/> Yes	<input type="radio"/> No	YES
CTRL Pin Polarity:	<input type="radio"/> Active High	<input checked="" type="radio"/> Active Low	LOW
CTRL Pin Off Action:	<input type="radio"/> Immediate OFF	<input checked="" type="radio"/> Turn Off Delay	DELAY

**Power Stage**

Calibrated Current Sense Element (@ 25°C):	<input type="text" value="0,717"/>	mΩ	0,717 mΩ
--	------------------------------------	----	----------

**Text Box 1:** In addition, the power modules feature an internal voltage divider which can be disabled to enhance voltage setpoint accuracy when no attenuation is required (output voltage 1.5V or lower). During startup the module will turn the divider on or off depending on the VOUT\_OV\_FAULT\_LIMIT that was determined based on Rset value. With voltage attenuation off VOUT\_MAX = 1.6V. With voltage attenuation on VOUT\_MAX=3.5V.

**Text Box 2:** If you want to change to higher voltage then you must turn voltage divider on (select 0.2857). This will happen automatically if resistor on Vset pin is changed so generally a user does not need to worry about this item, but in case of EV-kit they may need to turn on or off.

**Text Box 3:** Select "YES" to activate and use the "Operation" button located at bottom of the GENERAL page.

The fault tab allows the user to change items such as over current thresholds, input and output over voltage thresholds and response times. There are some software limits and safe guards to help prevent damage to the EV-kit, but users should still exercise care to keep settings within the power module's ratings to avoid inadvertent damage to the kit.

**Smart Power Module Interface Tool**

Single Mode  
System Mode

PV3012 [0000:27]

Status: BUSY, OFF, Power Good

Faults: Input OVLO, Input UVLO, Output OVP, Output LOS, Output UV (Warning), Output OCP, SCP, OTP, OT (Warning), UTP, UT (Warning), Invalid Data, CML Fault

Clear Faults

General | Configure | Store | Demo

Basic | **Fault**

**Fault Limits**

Input OVLO Limit:	14,00 V	14,00 V
Input UVLO Turn-On Threshold:	7,60 V	7,60 V
Input UVLO Turn-Off Threshold:	7,00 V	7,00 V
Output OVP Limit:	1,600 V	1,600 V
Output OVP Response Delay:	40,00 $\mu$ s	40,00 $\mu$ s
Output OVP Retry/Latch:	Retry	Retry
Output OCP Limit:	10 A	10 A
Output OCP Response Delay:	1500,0 $\mu$ s	1500,0 $\mu$ s
Output OCP Retry/Latch:	Retry	Retry
Output OCP Retry Delay:	500 ms	500 ms
OTP Limit:	50 $^{\circ}$ C	50 $^{\circ}$ C
UTP Limit:	-50 $^{\circ}$ C	-50 $^{\circ}$ C

**Warning Limits**

Output UV Limit:	0,721 V	0,721 V
OT Limit:	50 $^{\circ}$ C	50 $^{\circ}$ C
UT Limit:	-30 $^{\circ}$ C	-30 $^{\circ}$ C

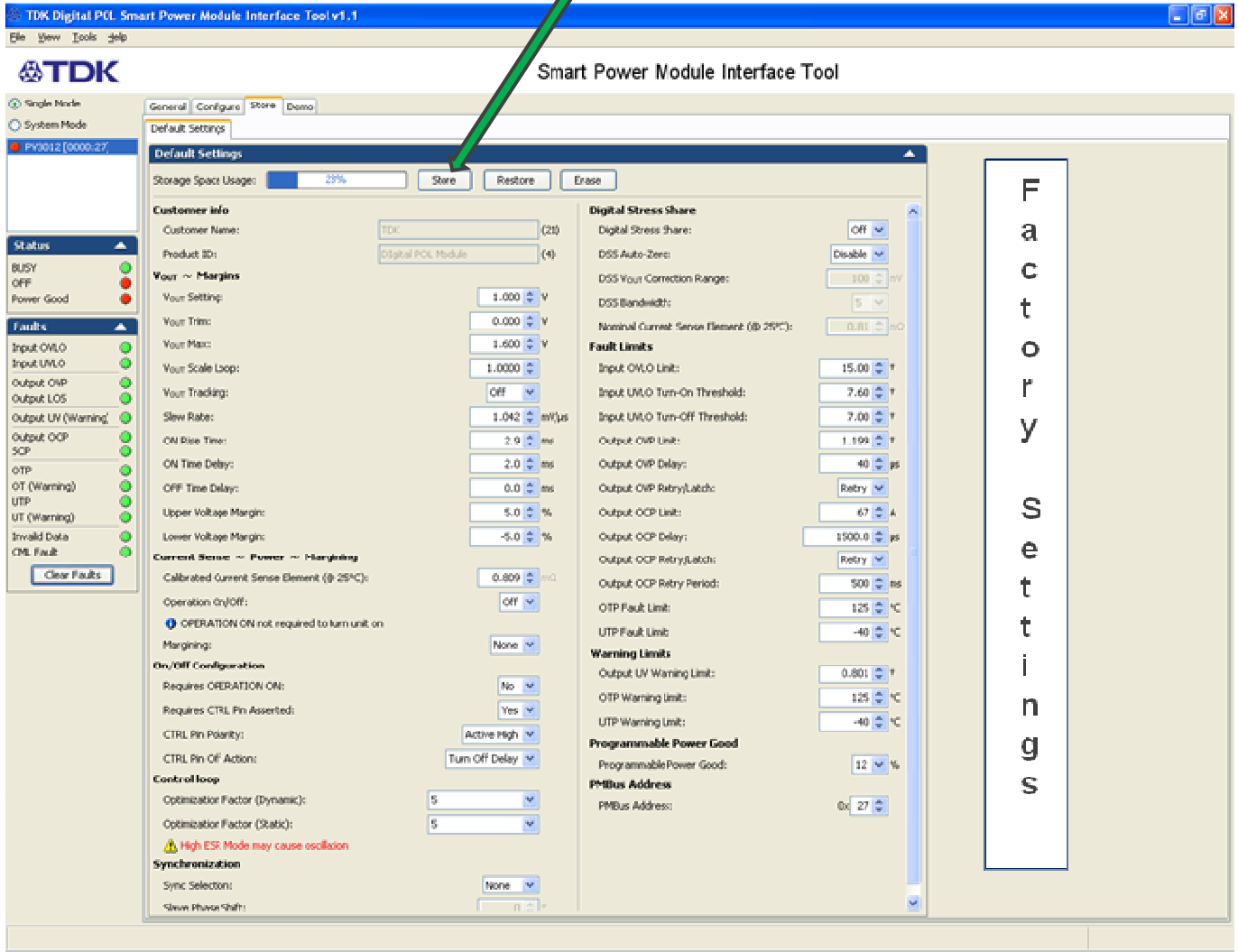
**Fault:** except for UTP when a fault limit is exceeded a fault signal is indicated, and the module will be shut down.

**Warning:** when a warning limit is exceeded a warning signal is indicated, the module will continue operation.

Windows Taskbar: Start, Desktop, 10:03

The store tab allows the user to permanently change the configuration in NVM so values will be retained during next power up. As explained on page 7, this feature generally should not be performed on the EV-kit.

**Do NOT use "STORE" function.**





# iJB Evaluation Kit

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- CN 10371856C 10452610C 10458656C 10459360C 10465848C 1069332A 11124619A 11346682A 1685299A 1685459A 1685582A 1685583A 1698023A 1802619A
- EP 1561156A1 1561268A2 1576710A1 1576711A1 1604254A4 1604264A4 1714369A2 1745536A4 1769382A4 1899789A2 1984801A2
- US 20040246754 2004090219A1 2004093533A1 2004123164A1 2004123167A1 2004178780A1 2004179382A1 20050200344 20050223252 2005289373A1 20060061214 2006015616A1 20060174145 20070226526 20070234095 20070240000 20080052551 20080072080 20080186006 6741099 6788036 6936999 6949916 7000125 7049798 7069021 7080265 7249267 7266709 7315156 7372682 7373527 7394445 7456617 7459892 7493504 7526660
- WO 04044718A1 04045042A3 04045042C1 04062061A1 04062062A1 04070780A3 04084390A3 04084391A3 05079227A3 05081771A3 06019569A3 2007001584A3 2007094935A3



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