TB7106F
Evaluation Board Manual

This document provides the usage considerations for the evaluation board of DC-DC converter IC TB7106F.

Safety Precautions

This manual important precautions which users of semiconductor devices (and anyone else) should observe in order to avoid injury to human body and damage to property, and to ensure safe and correct use of our products. Please be sure that you understand the meanings of the labels and graphic symbols described below before you move on to the detailed descriptions of the precautions, and comply with the precautions stated.

⚠CAUTION	
 Prohibited	Do not touch the device and its heat sink while the device is on or immediately after the device has been turned off. Devices and Heat sinks become hot. Contact to the heat sink may result in a burn.
 Prohibited	Do not touch the lead tips of a device. Some devices have leads with sharp tips. Contact to sharp tips may result in a puncture wound.

Summary

This is the evaluation circuit board which mounted DC-DC converter IC TB7106F. Inductor, capacitor and resistor required in order to operate IC are mounted. And it can operate such as DC-DC converter, if input voltage (V_{IN}) is impressed. Moreover, the thing for which an input-and-output filter capacitor is added and operation is checked, and the soft-start time can be extended by adding an external capacitor (C_{SS}).

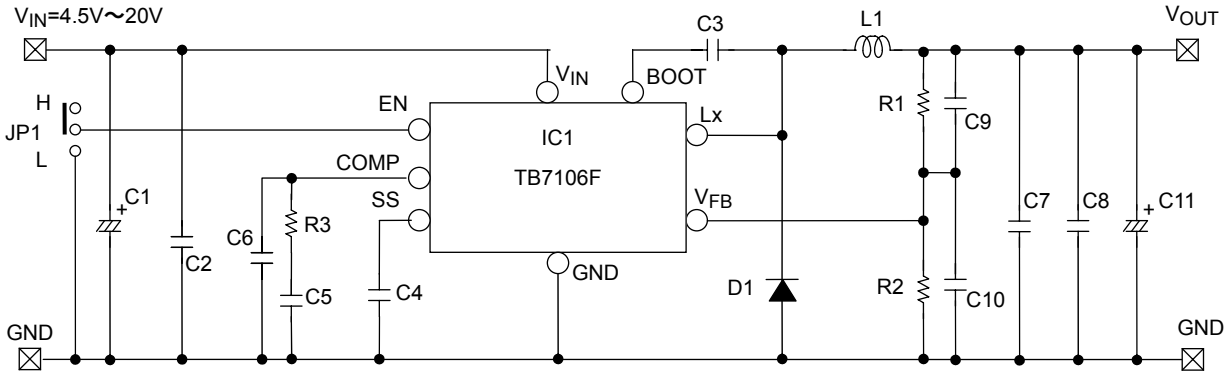
Board Specification

Content	Specification
Board size	60mm × 60mm ×1.6mm
Copper foil	Double-sided board 35 μm
Quality of the material	Glass epoxy (FR-4)

Usage Precautions

- The input voltage, output voltage, output current and temperature conditions should be considered when selecting capacitors, inductors and resistors. These components should be evaluated on an actual system prototype for best selection.
- Parts of this product in the surrounding are examples of the representative, and the supply might become impossible. Please confirm latest information when using it.

Evaluation Board Schematic



Directions for Use

- Connect the V_{IN} and GND pins to an electric source.
- Connect the V_{OUT} and GND pins to electric load.
- TB7106F will be operated when EN pin is connected with H side of JP1..
- When soft-start time should be adjusted, connect the capacitor (C4) of arbitrary capacity between SS and GND pins.

Component List

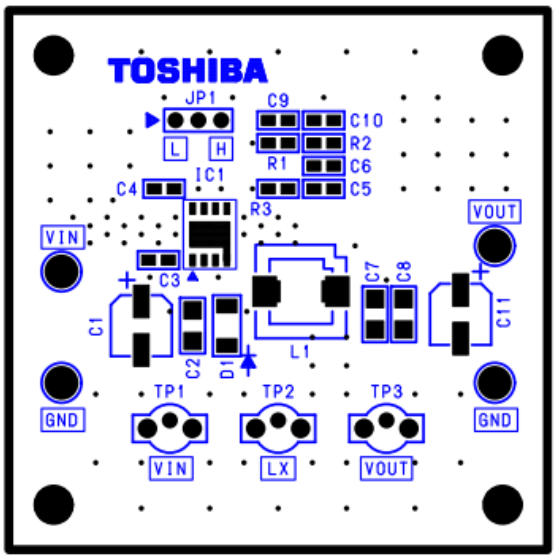
Description	Ref	Manufacturer	Part Number	Value
DC-DC Converter IC	IC1	TOSHIBA	TB7106F	–
Schottky Barrier Diode	D1	TOSHIBA	CRS30I30A	–
Input Filter Capacitor C_{IN}	C1	–	–	–
Input Filter Capacitor C_{IN}	C2	Murata	GRM31CR71E106K	10 μF
Bootstrap Capacitor C_{BOOT}	C3	Murata	GRM188R71H104J	0.1 μF
Soft-Start Capacitor C_{SS}	C4	–	–	–
Phase Compensation Capacitor C_P	C5	TDK	C2012CH2E222J	2200pF *2
Phase Compensation Capacitor C_{P1}	C6	–	–	–
Output Filter Capacitor C_{OUT}	C7	TDK	C2012X5R0J226M	22 μF
Output Filter Capacitor C_{OUT}	C8	TDK	C2012X5R0J226M	22 μF
Feedback Capacitor C_{FB1}	C9	–	–	–
Feedback Capacitor C_{FB2}	C10	–	–	–
Output Filter Capacitor C_{OUT}	C11	–	–	–
Feedback Resistor R_{FB1}	R1	KOA	RK73H1E	*1
Feedback Resistor R_{FB2}	R2	KOA	RK73H1E	*1
Phase Compensation Resistor R_P	R3	KOA	RK73H1E	33kΩ *2
Inductor L	L1	TDK	SLF10165T-100M3R83PF	10 μH *3

*1 : A Feedback Resistor changes with setting values of output voltage. Refer to the following table(Page3).

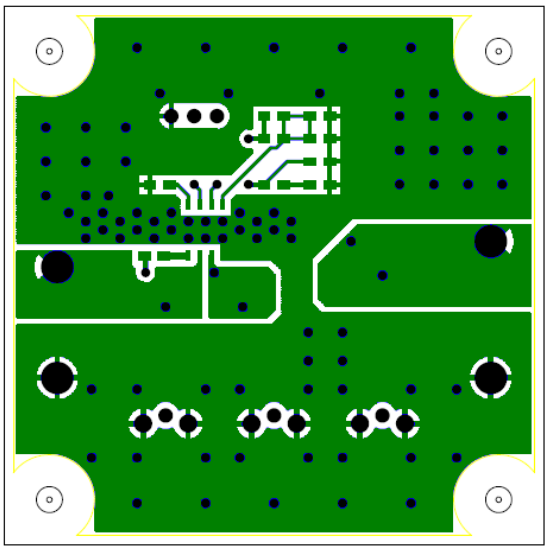
*2 : A Phase Compensation Capacitor and Resistor changes with setting values of output voltage. Refer to the following table(Page 3).

*3 : An Output Filter Capacitor changes with setting values of output voltage. Refer to the following table(Page 3).

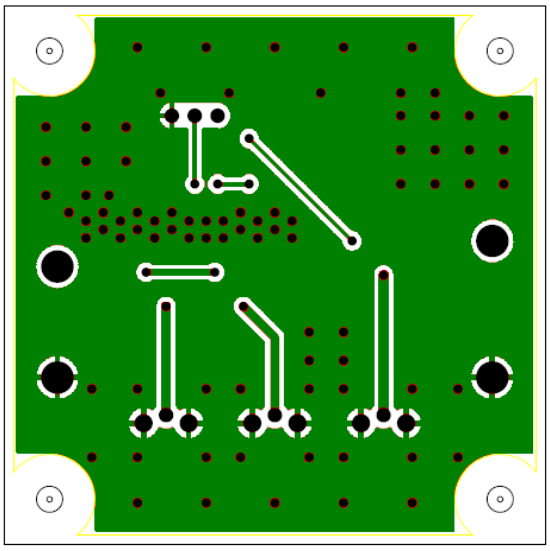
Board Layout



Top Silk Layer



Top Layer



Bottom Layer

Example of Component Values (For Reference Only)

Output Voltage V_{OUT}	Inductor L	Input Filter Capacitor C_{IN}	Output Filter Capacitor C_{OUT}	Feedback Resistor R_{FB1}(R1)	Feedback Resistor R_{FB2}(R2)	Phase Compensation Capacitance C_P	Phase Compensation Resistor R_P
1.2 V	6.8 μH	10 μF	44 μF	7.5 kΩ	15 kΩ	4700pF	10kΩ
1.51 V	6.8 μH	10 μF	44 μF	16 kΩ	18 kΩ	4700pF	15kΩ
1.8 V	6.8 μH	10 μF	44 μF	15 kΩ	12 kΩ	2200pF	15kΩ
2.5 V	10 μH	10 μF	44 μF	5.1 kΩ	2.4 kΩ	2200pF	22kΩ
3.3 V	10 μH	10 μF	44 μF	7.5 kΩ	2.4 kΩ	2200pF	27kΩ
5.0V	10 μH	10 μF	44 μF	27 kΩ	5.1kΩ	2200pF	33kΩ

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