LV2862XLVEVM Evaluation Module

User's Guide

Literature Number: SNVU729
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LV2862XLVEVM Evaluation Module

The Texas Instruments LV2862XLVEVM evaluation module (EVM) helps designers evaluate the operation and performance of the LV2862 switch-mode power-supply. This document describes the setup and the input/output connections of the EVM. Included are the board layout, schematic, and bill of materials.

1 Introduction

The Texas Instruments LV2862XLVEVM evaluation module (EVM) helps designers evaluate the operation and performance of the LV2862 switch mode power supply.

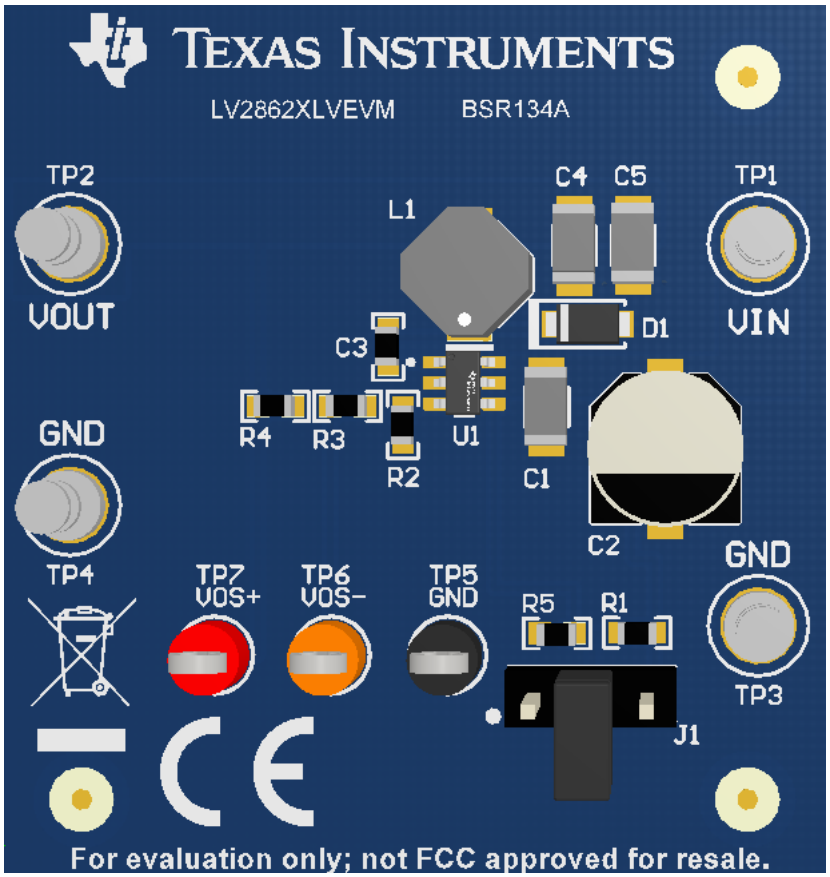

Figure 1. LV2862XLVEVM EVM View

The LV2862 is a PWM DC/DC buck (step-down) regulator. With a wide input range from 4 V to 60 V, it is suitable for a wide range of applications for power conditioning from unregulated sources. The LV2862XLVEVM evaluation board is designed to provide the design engineer with a fully functional power converter based on the buck topology to evaluate the LV2862 series of buck regulators.

1.1 EVM Features

A list of the EVM features follows:

- 6-V to 60-V input voltage range
- 5-V output voltage
- Up to 600-mA output current
- Switching frequency (0.770 MHz for X version, 2.1 MHz for Y version)
- Frequency foldback current limit of 1.2 A
- Internal compensation

The EVM contains one DC/DC converter (See Table 1).

Table 1. Device and Package Configurations

CONVERTER	EVM	IC	PACKAGE
U1	LV2862XLVEVM	LV2862XLVDDCR	SOT23-6

2 Setup

This section describes the jumpers and connectors on the EVM and how to properly connect, set up, and use the LV2862XLVEVM.

2.1 Input/Output Connector Description

V_{IN} – Input is the power input terminal for the device. Adjacent to it is the GND reference ground. Use those terminals to attach the EVM to a cable harness.

V_{OUT} – Output is the output terminal for the switch-mode regulator. Adjacent to it is the GND reference ground.

EN – is the jumper used to enable the switch-mode converter. The rail will be enabled when the respective jumper is high or floating, and disabled when low. External resistors can also be used to adjust the EN turn off trip point, and the jumper should not be used in that case.

2.2 Adjusting the Output Voltage

The output voltage can be changed from 5.0 V to another voltage by adjusting the feedback resistors using the following equation:

$$V_{OUT} = V_{FB} (1 + (R4 / R3)) \quad (1)$$

where

- V = 0.765 V

Test Points

TP3, TP4, TP5	Ground
TP1	BUCK input
TP2, TP7	BUCK output, Loop response receiver port
TP6	Loop response receiver port

3 Board Layout

Figure 2 through Figure 4 show the 2-layer PCB construction of the LV2862XLVEVM. The EVM includes a jumper to enable the regulator.

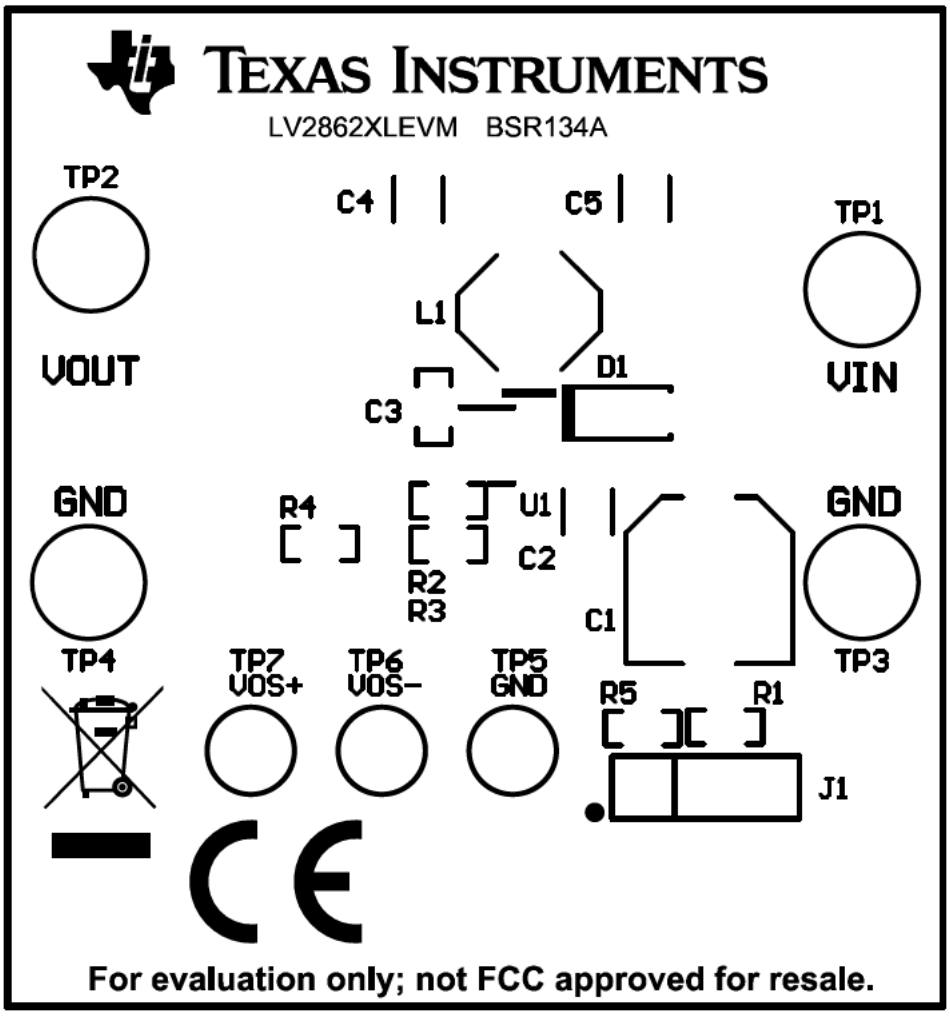

Figure 2. Top View

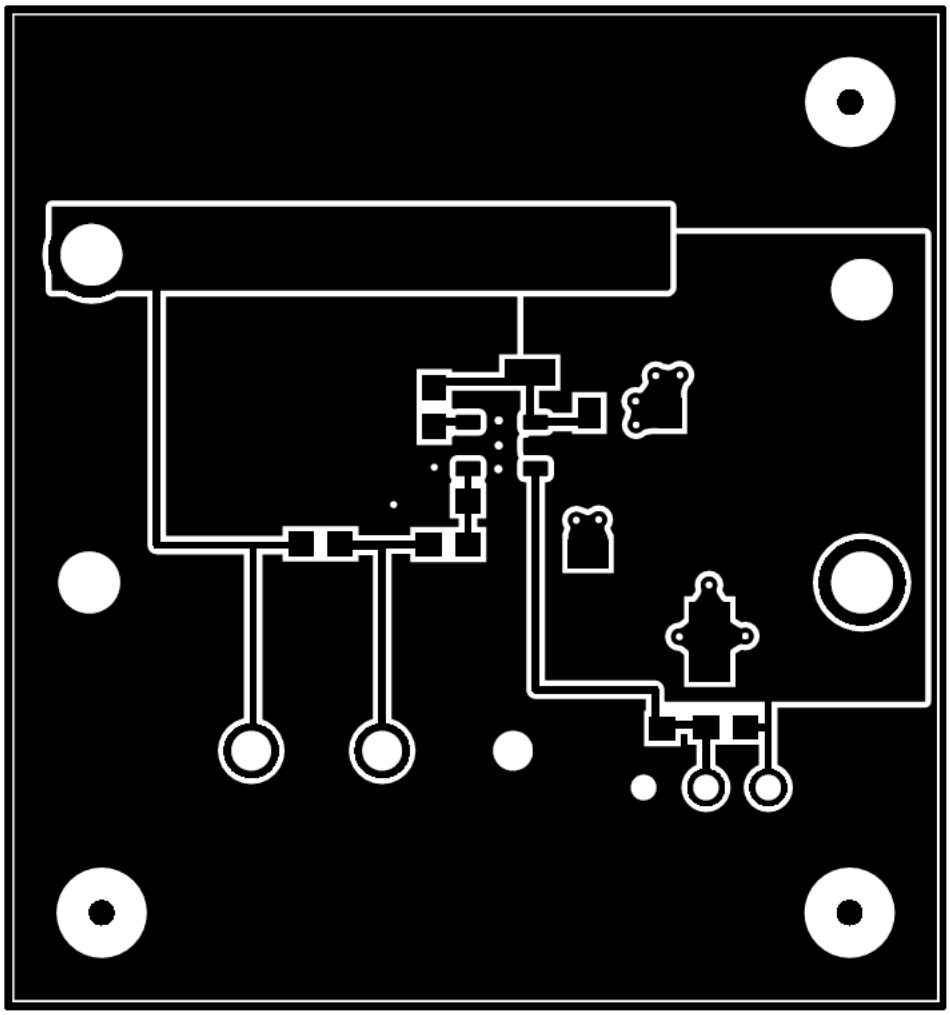

Figure 3. Top Layer

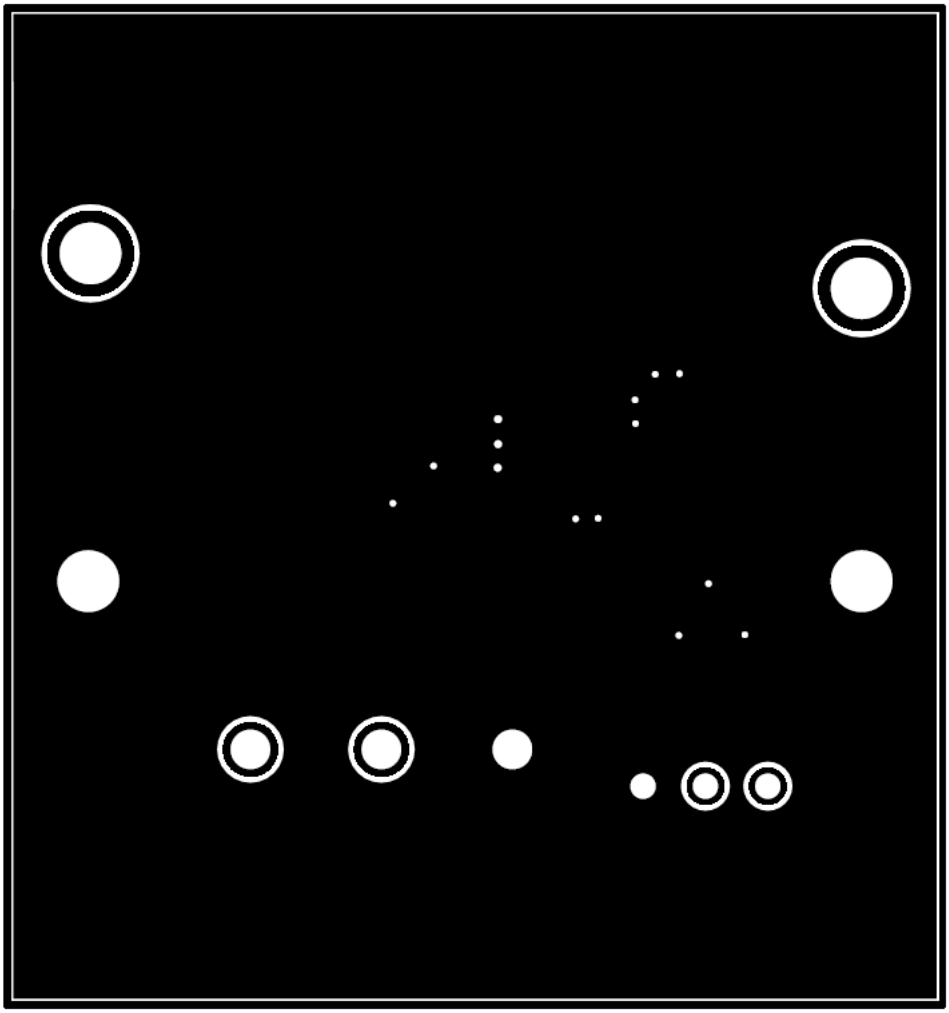

Figure 4. Bottom Layer

4 Schematic and Bill of Materials

Figure 5 illustrates the EVM schematic.

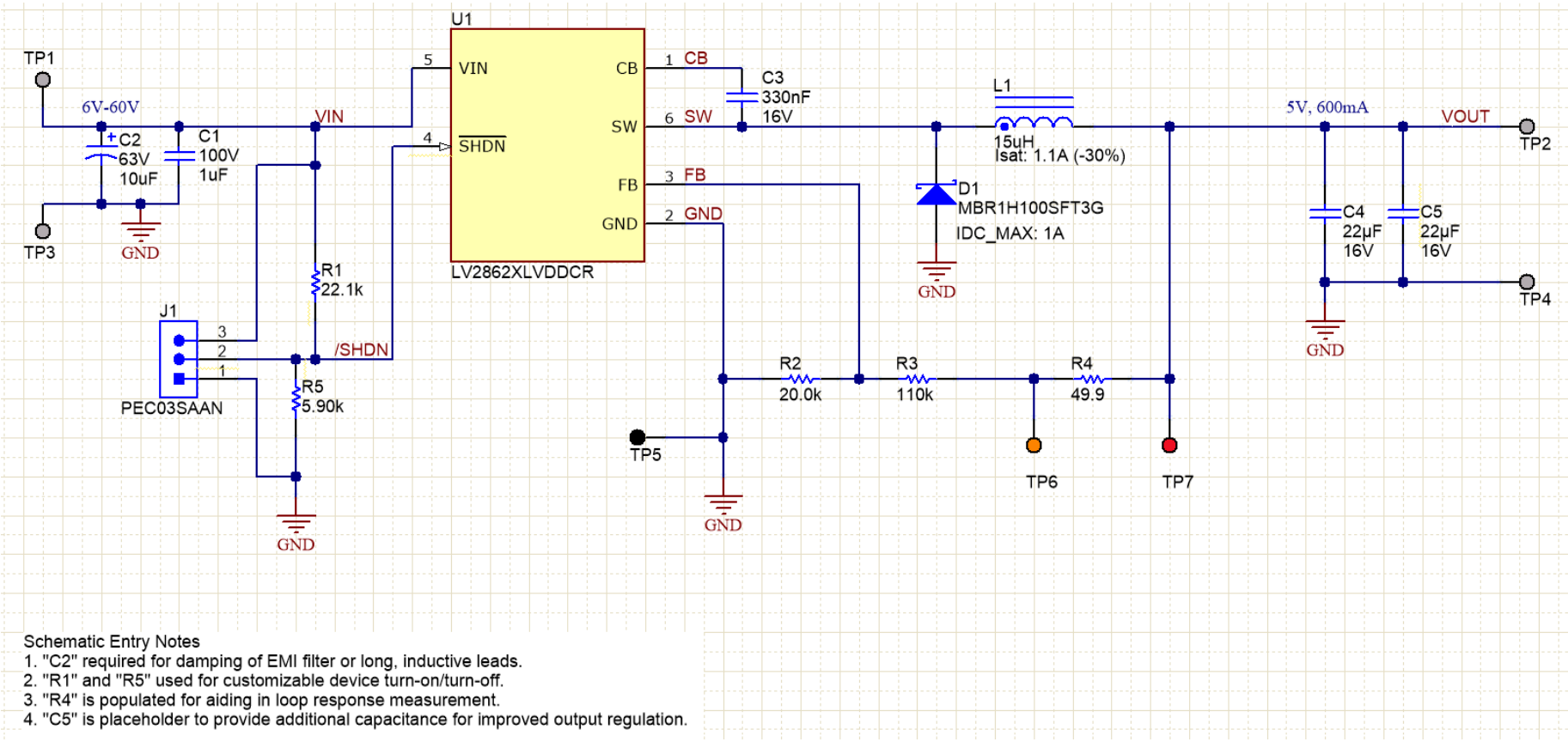

Figure 5. LV2862XLVEM Schematic

Table 2 lists the EVM bill of materials.

Table 2. LV2862XLVEM Bill of Materials (BOM)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer
C1	1	1uF	CAP, CERM, 1 uF, 100 V, ±10%, X7R, 1206	1206	GRM31CR72A105KA01L	MuRata
C3	1	0.33uF	CAP, CERM, 0.33 uF, 16 V, ± 10%, X7R, 0603	0603	C0603C334K4RACTU	Kemet
C4, C5	2	22uF	CAP, CERM, 22 µF, 16 V, ±20%, X5R, AEC-Q200 Grade 3, 1206	1206	CL31A226MOHNNNE	Samsung Electro-Mechanics
D1	1	100V	Diode, Schottky, 100 V, 1 A, SOD-123FL	SOD-123FL	MBR1H100SFT3G	ON Semiconductor
J1	1		Header, 100mil, 3x1, Tin, TH	Header, 3 PIN, 100mil, Tin	PEC03SAAN	Sullins Connector Solutions
L1	1	15uH	Inductor, Shielded Drum Core, Ferrite, 15 uH, 1.1 A, 0.122 ohm, SMD	5.72x3x5.2mm	SD53-150-R	Cooper Bussman
Logo2	1		Texas Instrument Corporate Signature		Texas Instruments	
R2	1	20.0k	RES, 20.0 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW060320K0FKEA	Vishay-Dale
R3	1	110k	RES, 110 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW0603110KFKEA	Vishay-Dale
R4	1	49.9	RES, 49.9, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW060349R9FKEA	Vishay-Dale
SH-J1	1	1x2	Shunt, 100mil, Flash Gold, Black	Closed Top 100mil Shunt	SPC02SYAN	Sullins Connector Solutions
TP1, TP2, TP3, TP4	4		Terminal, Turret, TH, Double	Keystone1502-2	1502-2	Keystone
TP5	1		Test Point, Compact, Black, TH	Black Compact Testpoint	5006	Keystone
TP6	1		Test Point, Compact, Orange, TH	Orange Compact Testpoint	5008	Keystone
TP7	1		Test Point, Compact, Red, TH	Red Compact Testpoint	5005	Keystone
U1	1		High Efficiency Wide Input Voltage Range Buck Converter	SOT23-6-THIN	LV2862XLVDDCR	Texas Instruments
C2	0	10uF	CAP, AL, 10 uF, 63 V, ±20%, 1.5 ohm, AEC-Q200 Grade 2, SMD	SMT Radial D	EEE-FK1J100P	Panasonic
FID1, FID2, FID3	0		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A
R1	0	22.1k	RES, 22.1 k, 0.1%, 0.1 W, 0603	0603	RT0603BRD0722K1L	Yageo America
R5	0	5.90k	RES, 5.90 k, 0.1%, 0.1 W, 0603	0603	RT0603BRD075K9L	Yageo America

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NOTE:

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CAUTION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement for Class A EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

3.2 *Canada*

3.2.1 *For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247*

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concernant les EVMs avec appareils radio:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concerning EVMs Including Detachable Antennas:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

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http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page

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2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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