TPS6283810EVM-078 Evaluation Module

The TPS6283810EVM-078 facilitates the evaluation of the TPS6283810 3-A, step-down converter with DCS-Control™ in a tiny 1.2-mm by 0.8-mm WCSP package with 0.4-mm pitch. The EVM outputs a 1.0-V output voltage with 1% accuracy from input voltages between 2.4V and 5.5V with a maximum solution height of 1 mm. The TPS6283810 is a highly efficient and tiny solution for point-of-load (POL) converters for space-constrained applications, such as solid state drives (SSDs), wearables, and smart phones.

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1 Introduction

The TPS6283810 is a synchronous, step-down converter in a 1.2- x 0.8- x 0.5-mm wafer chip-scale package (WCSP).

1.1 Performance Specification

Table 1 provides a summary of the TPS6283810EVM-078 performance specifications.

Table 1. Performance Specification Summary

SPECIFICATION	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input voltage		2.4	5	5.5	V
Output voltage setpoint			1.0		V
Output current		0		3000	mA

1.2 Modifications

Additional input and output capacitors can be added.

2 Setup

This section describes how to properly use the TPS6283810EVM-078.

2.1 Input/Output Connector Descriptions

J1, Pin 1 and 2 – VIN	Positive input connection from the input supply for the EVM.
J1, Pin 3 and 4 – S+/S-	Input voltage sense connections. Measure the input voltage at this point.
J1, Pin 5 and 6 – GND	Input return connection from the input supply for the EVM.
J2, Pin 1 and 2 – VOUT	Output voltage connection.
J2, Pin 3 and 4 – S+/S-	Output voltage sense connections. Measure the output voltage at this point.
J2, Pin 5 and 6 – GND	Output return connection.
J3 – PG/GND	The PG output appears on pin 1 of this header with ground on pin 2.
JP1 – EN	EN pin input jumper. Place the supplied jumper across ON and EN to turn on the IC. Place the jumper across OFF and EN to turn off the IC.
JP2 – PG Pullup Voltage	PG pin pullup voltage jumper. Place the supplied jumper on JP2 to connect the PG pin pullup resistor to V_{IN}. Alternatively, the jumper can be removed and a different voltage can be supplied on pin 1 to pull up the PG pin to a different level. This externally applied voltage must remain below 5.5 V.

2.2 Setup

To operate the EVM, set jumpers JP1 and JP2 to the desired position per Section 2.1. Connect the input supply to J1 and connect the load to J2.

3 TPS6283810EVM-078 Test Results

The TPS6283810EVM-078 was used to take all the data in the TPS6283810 data sheet (SLVSEX7). See the device data sheet for the performance of this EVM.

4 Board Layout

This section provides the TPS6283810EVM-078 board layout and illustrations in Figure 1 through Figure 5. The Gerbers are available on the EVM product page: TPS6283810EVM-078

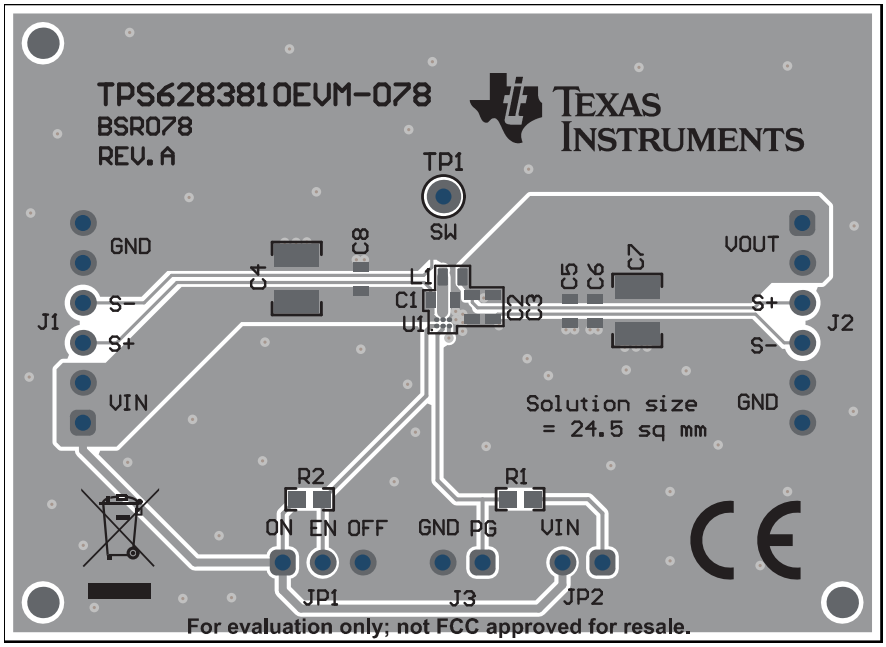

Figure 1. Top Assembly

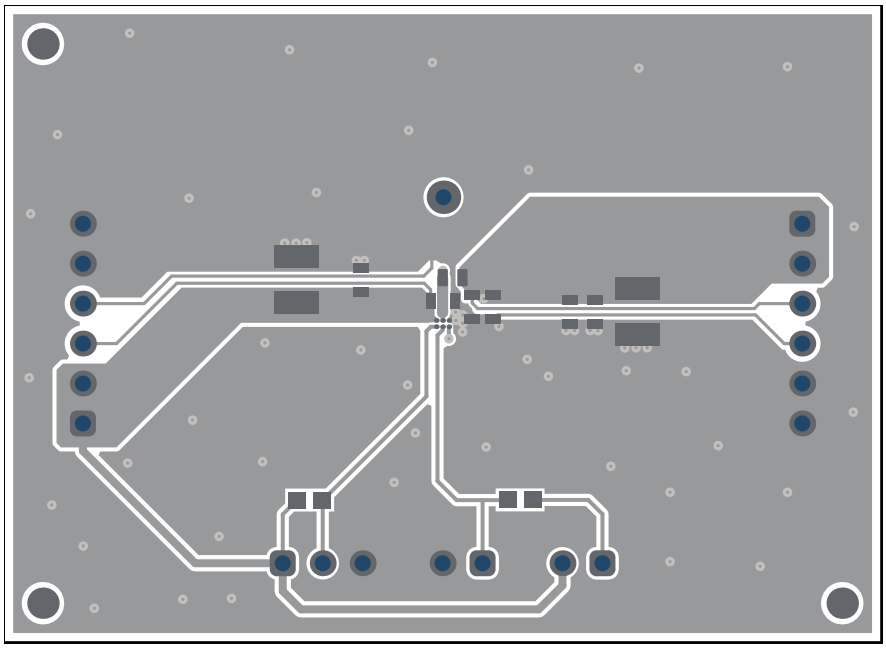

Figure 2. Top Layer

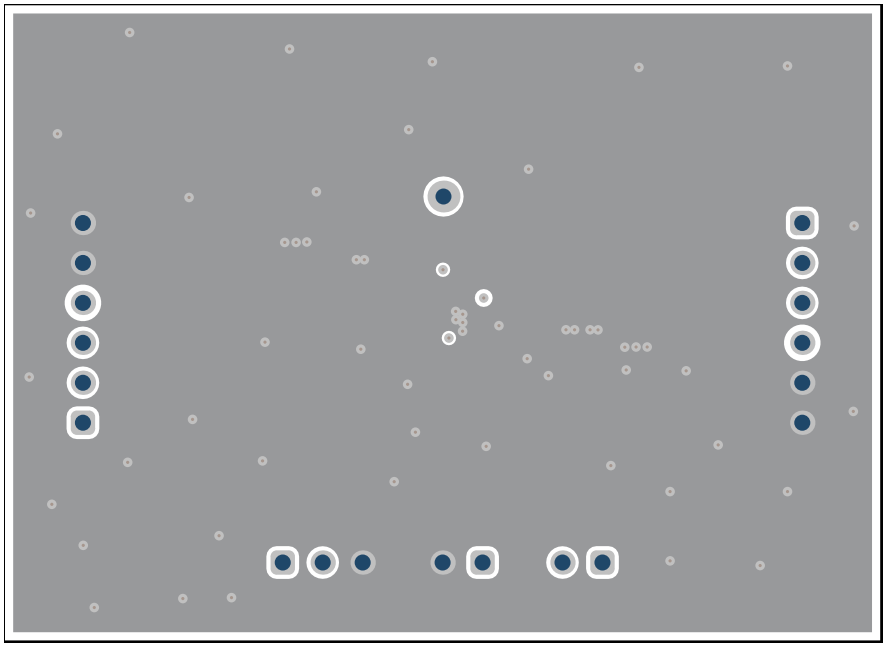

Figure 3. Signal Layer 1

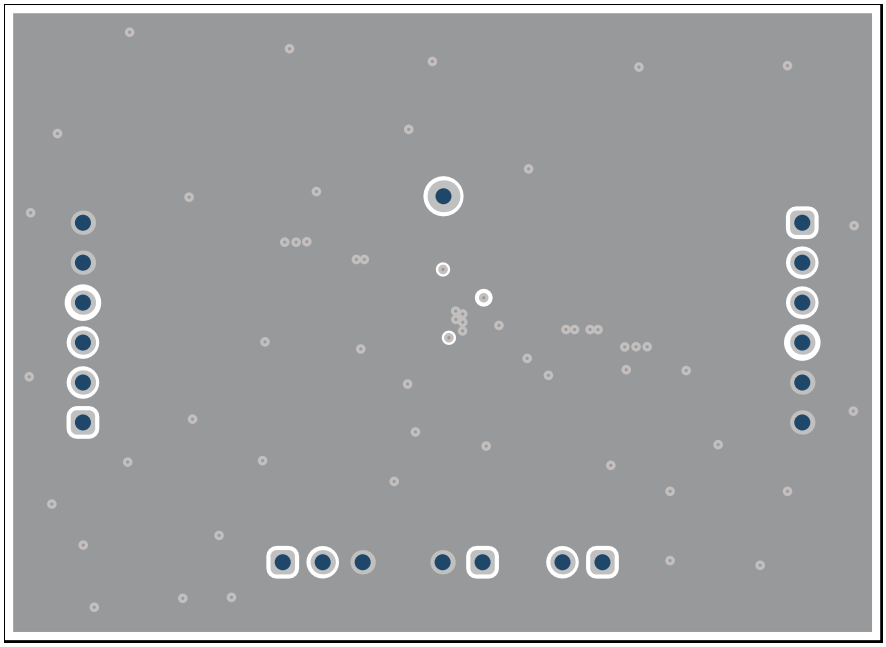

Figure 4. Signal Layer 2

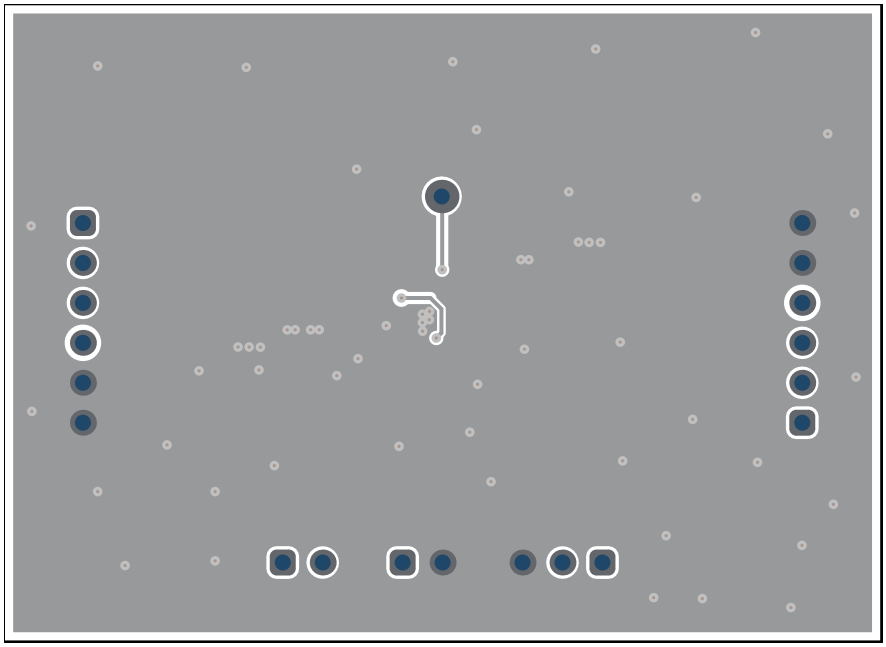

Figure 5. Bottom Layer

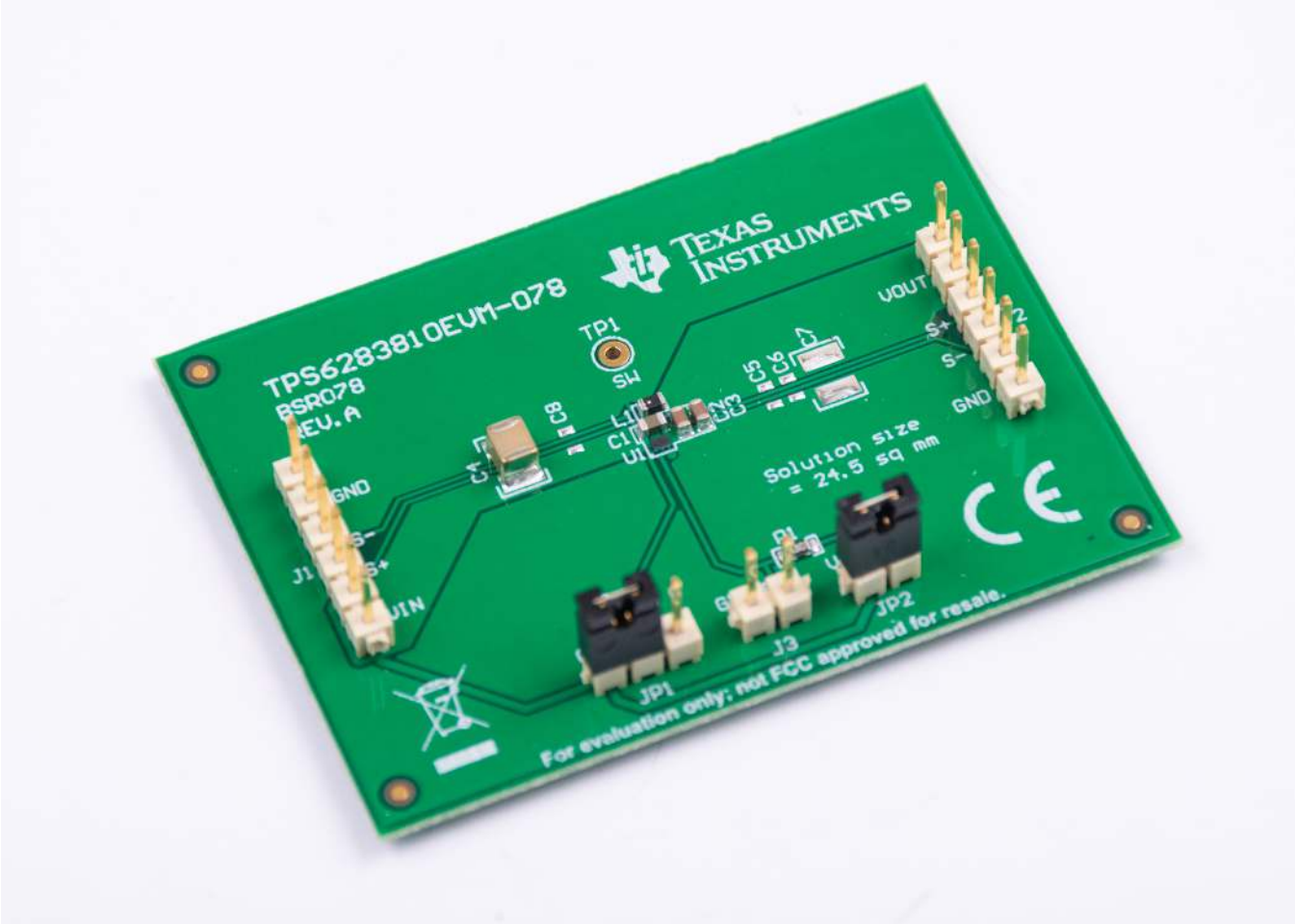

Figure 6. TPS6283810EVM-078 Angled View

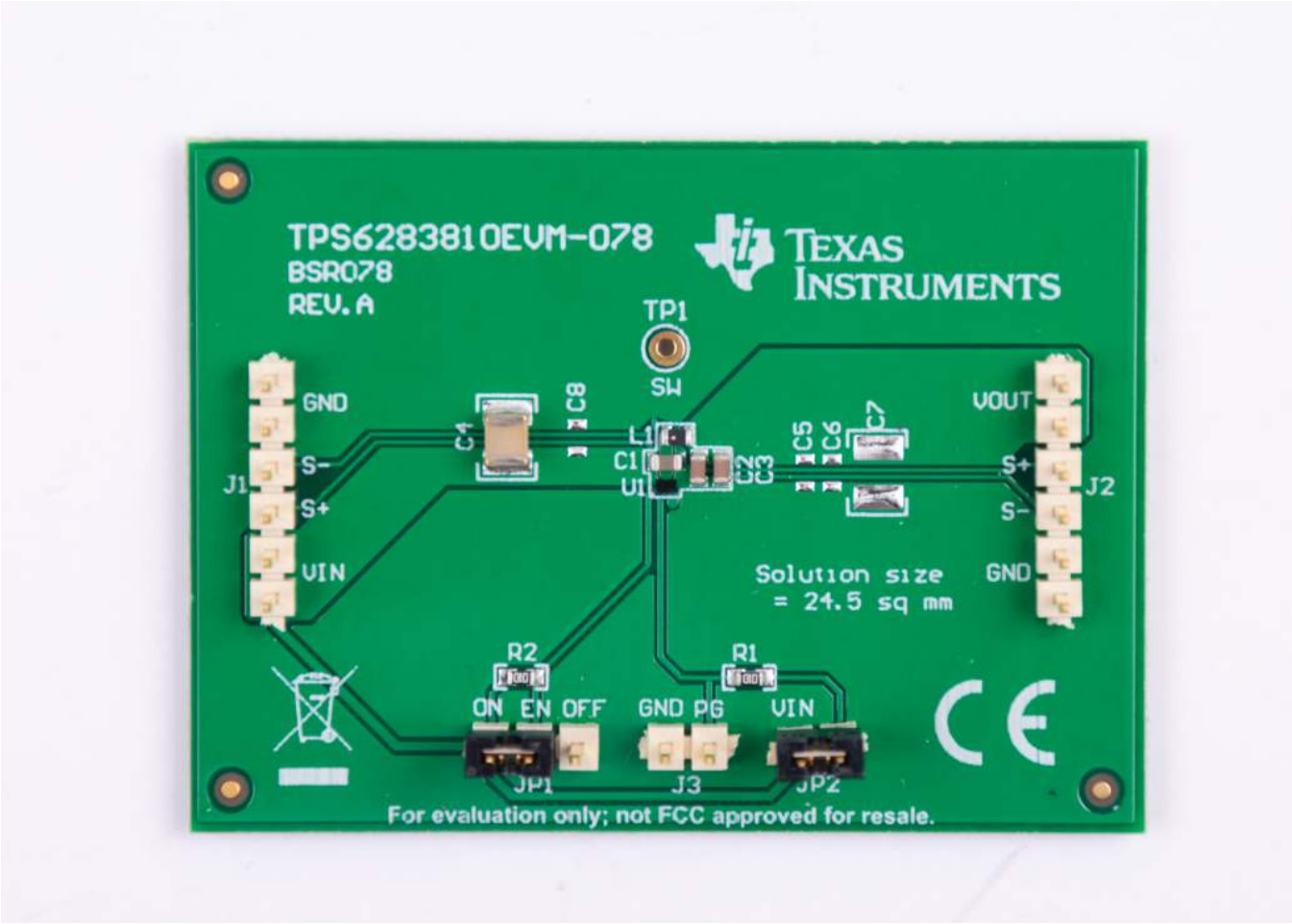

Figure 7. TPS6283810EVM-078 Overhead View

5 Schematic and List of Materials

This section provides the TPS6283810EVM-078 schematic and List of materials.

5.1 Schematic

Figure 8 illustrates the EVM schematic.

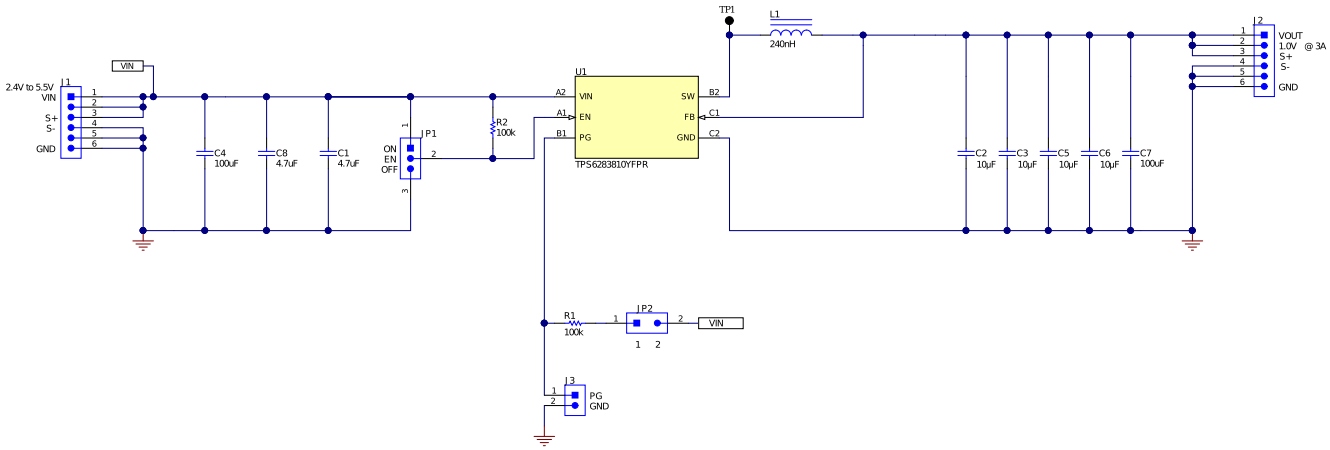

Figure 8. TPS6283810EVM-078 Schematic

5.2 List of Materials

Table 2 lists a list of materials for this EVM.

Table 2. TPS6283810EVM-078 List of Materials

DESIGNATOR	QTY	DESCRIPTION	PART NUMBER	MANUFACTURER
C1	1	Capacitor, ceramic, 4.7 µF, 6.3 V, ±10%, X7R, 0603	JMK107BB7475MA-T	Taiyo Yuden
C2, C3	2	Capacitor, ceramic, 10 µF, 10 V, ±20%, X7T, 0603	GRM188D71A106MA73D	Murata
C4	1	Capacitor, ceramic, 100 µF, 6.3 V, ±20%, X5R, 1210	GRM32ER60J107ME20L	Murata
L1	1	Inductor, 240 nH, 3.5 A, 0.03 Ω, SMD, 1608	DFE18SANR24MG0L	Murata
R1, R2	2	Resistor, 100 kΩ, 1%, 0.1 W, 0603	Std	Std
U1	1	Tiny 3-A high efficiency synchronous buck converter in chip scale package, 1.2 mm x 0.8 mm	TPS6283810YFP	Texas Instruments

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      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.

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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.*

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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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