

FCC ID: HYQDNNS125

To whom it may concern,

We, UL Japan, Inc, hereby declare that Cockpit Control Unit, model: DNNS125 (FCC ID: HYQDNNS125) of DENSO CORPORATION is exempt from RF exposure SAR evaluation because the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula according to the Code of Federal Regulation title 47 section 1.1307(b)(3)(i)(B). This method is used at separation distances d (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive) for single RF sources. P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d / 20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz}$$

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

When the minimum separation distance is shorter than 0.5 cm, 0.5 cm is applied.

The SAR evaluation exemption threshold is calculated as below.

[WLAN 2.4 GHz band part]

P_{th} (mW)	3060
f (GHz)	2.462
$ERP_{20 \text{ cm}}$ (mW)	3060
d (cm)	20.0

Conducted Power (dBm)	16.00
(mW)	39.81
Antenna Gain (dBi)	1.78
EIRP (dBm)	17.78
(dBm)	15.64
ERP (mW)	36.64

The Maximum time-averaged power or ERP whichever greater is 39.9 mW.
(Rounded up to two decimals place)

[Bluetooth (BR / EDR) part]

P_{th} (mW)	3060
f (GHz)	2.48
$ERP_{20\text{ cm}}$ (mW)	3060
d (cm)	20.0

Conducted Power	(dBm)	0.30
	(mW)	1.07
Antenna Gain	(dBi)	1.83
EIRP	(dBm)	2.13
ERP	(dBm)	-0.01
	(mW)	1.00

The Maximum time-averaged power or ERP whichever greater is 1.1 mW.
(Rounded up to two decimals place)

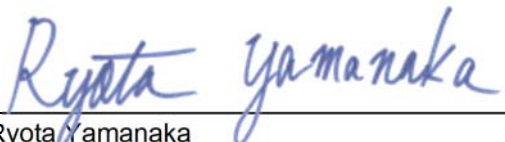
[WLAN 5 GHz band part]

P_{th} (mW)	3060
f (GHz)	5.825
$ERP_{20\text{ cm}}$ (mW)	3060
d (cm)	20.0

Conducted Power	(dBm)	9.50
	(mW)	8.91
Antenna Gain	(dBi)	0.99
EIRP	(dBm)	10.49
ERP	(dBm)	8.35
	(mW)	6.84

The Maximum time-averaged power or ERP whichever greater is 9 mW.

Thank you for your attention to this matter.


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 Engineer