

Product Advisory (PA)

Subject: Correction to the Renesas ISL73033SLH* Datasheet

Publication Date: 5/25/2021

Effective Date: 5/25/2021

Revision Description:

Initial Release

Description of Change:

This notice is to inform you of datasheet corrections as below;

1. Update to Section 3.4
2. Update to Section 5.5

Corrections are reflected in Appendix A of the notice.

Products Impacted by the change;

ISL73033SLHEV1Z

ISL73033SLHMKZ

ISL73033SLHMKZ/PROTO

Reason for Change:

Change corrects the datasheet to reflect the actual product performance. Details regarding the change are contained within Appendix A, for an updated datasheet please contact your local sales or marketing representative.

Impact on fit, form, function, quality & reliability:

The change will have no impact on the form, fit, function, quality, reliability and environmental compliance of the devices.

Product Identification:

There have been no changes to the product, this is a documentation correction only. There will be no change in the external marking of the packaged products.

Qualification status: Not Applicable, correction only

Sample availability: 5/25/2021

Device material declaration: Available upon request

Questions or requests pertaining to this change notice, including additional data or samples, must be sent to Intersil within 30 days of the publication date.

For additional information regarding this notice, please contact your regional change coordinator (below)			
Americas: PCN-US@Renesas.COM	Europe: PCN-EU@Renesas.COM	Japan: PCN-JP@Renesas.COM	Asia Pac: PCN-APAC@Renesas.COM

Appendix A:
Datasheet changes to Section 3.4

FROM:

ISL73033SLHM

3. Specifications

3.4 Recommended Operating Conditions

Parameter	Minimum	Maximum	Unit
Case Operating Temperature Range	-55	+125	°C
V _{DD}	4.5	13.2	V
IN, INB	0	13.2	V
V _{DS} Voltage		80	V
I _D (T _C = +25°C) ^[1]		45	A
I _D (T _C = +105°C) ^[1]		20	A

1. T_J = +150°C. Current is limited by package constraints.

TO:

ISL73033SLHM

3. Specifications

3.4 Recommended Operating Conditions

Parameter	Minimum	Maximum	Unit
Case Operating Temperature Range	-55	+125	°C
V _{DD}	4.5	13.2	V
IN, INB	0	13.2	V
V _{DS} Voltage		80	V
I _D (T _C = +25°C) ^[1]		36	A
I _D (T _C = +105°C) ^[2]		20	A

1. T_J = +150°C. Current is limited by die constraints.

2. T_J = +150°C. Current is limited by package constraints.

Datasheet change to Section 5.5

FROM:

5.5 Power Dissipation of the Driver

The power dissipation of the ISL73033SLHM is dominated by the losses associated with the gate charge of the driven FETs and the switching frequency. The internal bias current also contributes to the total dissipation but is usually not significant compared to the gate charge losses.

For example, the included GaN FET has a total gate charge of 8nC (typical) when $V_{DS} = 50V$ and $V_{GS} = 4.5V$. This is the charge that a driver must source to turn on the GaN FET and must sink to turn off the GaN FET.

Use [Equation 1](#) to calculate the power dissipation of the driver:

$$(EQ. 1) \quad P_D = 2 \cdot Q_g \cdot \text{freq} \cdot V_{GS} \cdot r_{DS(ON)} + I_{DD}(\text{freq}) \cdot V_{DD}$$

where:

- freq = switching frequency
- $V_{GS} = V_{DRV}$ bias of the ISL73033SLHM, 4.5V
- Q_g = Gate charge for V_{GS}
- $I_{DD}(\text{freq})$ = Bias current at the switching frequency
- $r_{DS(ON)}$ = ON-resistance of the driver

TO:

5.5 Power Dissipation of the Driver

The total power dissipation of the ISL73033SLHM is a combination of the power losses in the gate driver circuitry and the power losses of the GaN FET.

The power dissipation of the gate driver is dominated by the losses associated with the gate charge of the driven FETs and the switching frequency. The internal bias current also contributes to the total dissipation but is usually not significant compared to the gate charge losses.

For example, the included GaN FET has a total gate charge of 8nC (typical) when $V_{DS} = 50V$ and $V_{GS} = 4.5V$. This is the charge that a driver must source to turn on the GaN FET and must sink to turn off the GaN FET. Use [Equation 1](#) to calculate the power dissipation of the driver.

$$(EQ. 1) \quad P_{D_{\text{driver}}} = Q_g \cdot \text{freq} \cdot V_{GS} \cdot I_{DD}(\text{freq}) \cdot V_{DD}$$

where:

- freq = switching frequency
- $V_{GS} = V_{DRV}$ bias of the ISL73033SLHM, 4.5V
- Q_g = Gate charge for V_{GS}
- $I_{DD}(\text{freq})$ = Bias current at the switching frequency

The power dissipation of the GaN FET includes the conduction, switching, dead time, and output capacitance C_{OSS} related losses. Use [Equation 2](#) to calculate the power dissipation of the GaN FET.

$$(EQ. 2) \quad P_{D_{\text{FET}}} = P_{\text{cond}} + P_{\text{sw}} + P_{\text{oss}} + P_{\text{dt}}$$

- $P_{\text{cond}} = I_{\text{DRAIN}}^2 \cdot r_{DS(ON)} \cdot (t_{\text{ON}}/t_{\text{period}})$
- $P_{\text{sw}} = 0.5 \cdot V_{SD} \cdot I_{\text{DRAIN}} \cdot (t_{\text{RISE}} + t_{\text{FALL}}) \cdot \text{freq}$
- $P_{\text{oss}} = 0.5 \cdot C_{\text{OSS}} \cdot V_{\text{IN}}^2 \cdot \text{freq}$
- $P_{\text{dt}} = V_{SD} \cdot I_{\text{DRAIN}} \cdot (Tdt_{\text{ON}} + Tdt_{\text{OFF}})$

where:

- $r_{DS(ON)}$ = GaN FET ON-resistance
- V_{SD} = GaN FET off source-drain forward conduction
- $t_{\text{ON}}/t_{\text{PERIOD}}$ = GaN FET on duty cycle
- t_{RISE} is the drain voltage rise time from 0V to V_{in}
- t_{FALL} is the drain voltage fall time from V_{in} to 0V
- V_{IN} is the FET off drain voltage
- C_{OSS} is FET output capacitance
- Tdt_{ON} is the dead time before the FET turns on for a synchronous application
- Tdt_{OFF} is the dead time after the FET turns off for a synchronous application

The total power dissipation of the ISL73033SLHM is the sum of [Equation 1](#) and [Equation 2](#).