ISOFACE™

ISO1H815G

Galvanic Isolated 8 Channel High-Side Switch

Datasheet

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Power Management & Multimarket

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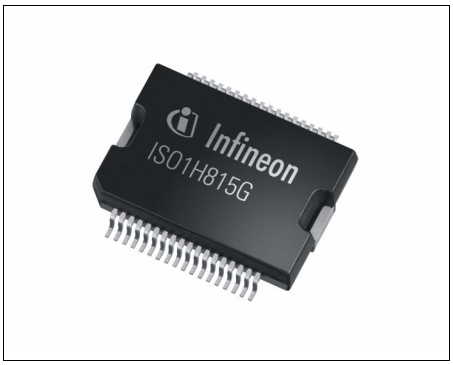
Revision History	
Page or Item	**Subjects (major changes since previous revision)**
Revision 2.4, 2014-10-20	
Page 4	Typo in Headline corrected Feature list updated, Vbb Monitoring included
Page 7	Page 7 Chapter 2 Block diagram updated
Page 9	Page 9 Chapter 3.3.3 Description for repetitive short circuit corrected
Page 9	Page 9 Chapter 3.4 Vbb Monitoring included in common diagnostic output description
Page 14	Page 14 Chapter 4.4 V_{ISO} changed to correct value ΔV_{ISO} = 500V
Page 15	Page 15 Chapter 4.5 Footnotes corrected
Page 16	Page 16 table 4.8 Timing parameter for CS delay split into t_{CSD} and t_{CSDMD}
Page 16	Page 16 table 4.8 Parameter t_{OR} removed and replaced by t_{IOJ}
Page 17	Page 17 table 4.10 Parameter Minimum Internal Gap removed
all	Correction of formats and typos
Revision 2.0	
all	Final Datasheet

Coreless Transformer Isolated Digital Output 8 Channel 1.2 A High-Side Switch

Product Highlights

- **Coreless transformer isolated data interface**
- **Galvanic isolation**
- **8 High-side output switches 1.2A**
- **µC compatible 8-bit parallel peripheral**



Features

- Interface 3.3/5V CMOS operation compatible
- Parallel interface
- Direct control mode
- High common mode transient immunity
- Short circuit protection
- Maximum current internally limited
- Overload protection
- Overvoltage protection (including load dump)
- Undervoltage shutdown with autorestart and hysteresis
- Switching inductive loads
- Common output disable pin
- Thermal shutdown with restart
- Thermal independence of separate channels
- Common diagnostic output
- ESD protection
- Loss of GNDbb and loss of V_{bb} protection
- Reverse Output Voltage protection
- Isolated return path for $\overline{DIAG}$ signal
- V_{bb} monitoring
- RoHS compliant

Typical Application

- Isolated switch for industrial applications (PLC)
- All types of resistive, inductive and capacitive loads
- µC compatible power switch for 24V DC applications
- Driver for solenoid, relays and resistive loads

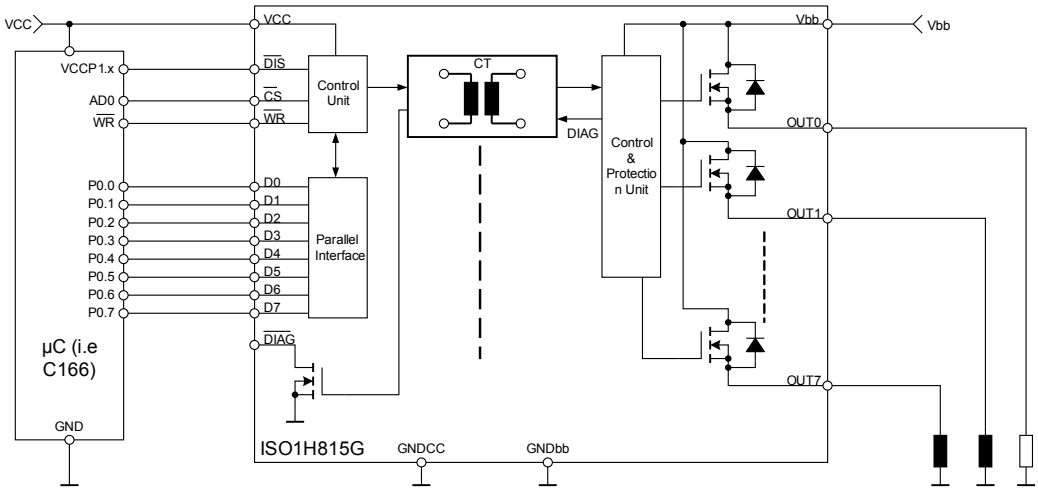
Description

The ISO1H815G is a galvanically isolated 8 bit data interface in PG-DSO-36 package that provides 8 fully protected high-side power switches that are able to handle currents up to 1.2A.

An 8 bit parallel µC compatible interface allows to connect the IC directly to a µC system. The input interface supports also a direct control mode and is designed to operate with 3.3/5V CMOS compatible levels.

The data transfer from input to output side is realized by the integrated Coreless Transformer Technology.

Typical Application



Type		On-state Resistance	Package
ISO1H815G		200mΩ	PG-DSO36

1 Pin Configuration and Functionality

1.1 Pin Configuration

Pin	Symbol	Function
1	N.C.	Not connected
2	VCC	Positive 3.3/5V logic supply
3	$\overline{DIS}$	Output disable
4	$\overline{CS}$	Chip select
5	$\overline{WR}$	Parallel write
6	D0	Data input bit0
7	D1	Data input bit1
8	D2	Data input bit2
9	D3	Data input bit3
10	D4	Data input bit4
11	D5	Data input bit5
12	D6	Data input bit6
13	D7	Data input bit7
14	$\overline{DIAG}$	Common diagnostic output
15	GNDCC	Input logic ground
16	N.C.	Not connected
17	N.C.	Not connected
18	N.C.	Not connected
19	GNDbb	Output driver ground
20	N.C	Not connected
21	OUT7	High-side output of channel 7
22	OUT7	High-side output of channel 7
23	OUT6	High-side output of channel 6
24	OUT6	High-side output of channel 6
25	OUT5	High-side output of channel 5
26	OUT5	High-side output of channel 5
27	OUT4	High-side output of channel 4
28	OUT4	High-side output of channel 4
29	OUT3	High-side output of channel 3
30	OUT3	High-side output of channel 3
31	OUT2	High-side output of channel 2
32	OUT2	High-side output of channel 2
33	OUT1	High-side output of channel 1
34	OUT1	High-side output of channel 1
35	OUT0	High-side output of channel 0
36	OUT0	High-side output of channel 0
TAB	Vbb	Positive driver power supply voltage

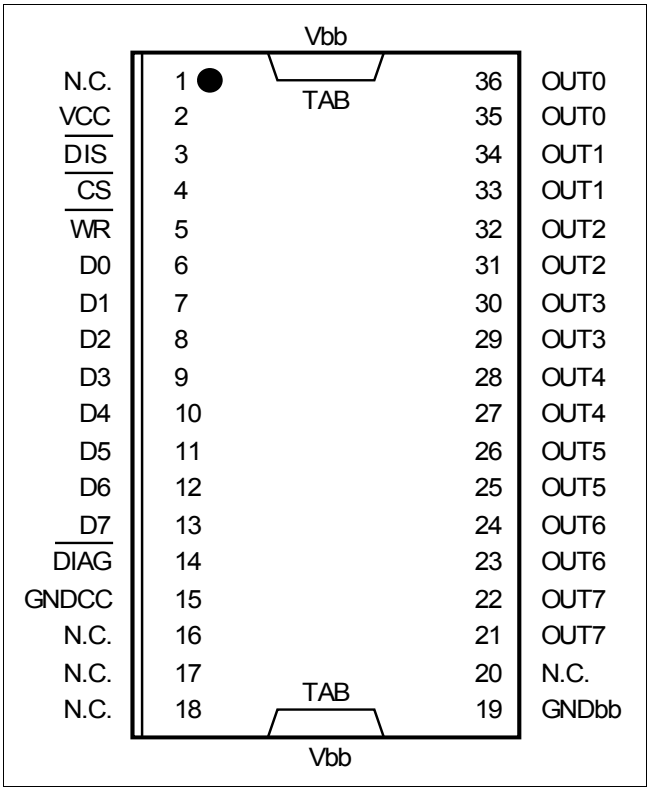


Figure 1 Power SO-36 (430mil)

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1.2 Pin Functionality

VCC (Positive 3.3/5V logic supply)

The VCC supplies the input interface that is galvanically isolated from the output driver stage. The input interface can be supplied with 3.3/5V.

$\overline{\text{DIS}}$ (Output disable)

The high-side outputs OUT0...OUT7 can be immediately switched off by means of the low active pin $\overline{\text{DIS}}$ that is an asynchronous signal. The input registers are also reset by the $\overline{\text{DIS}}$ signal. The Output remains switched off after low-high transition of $\overline{\text{DIS}}$ signal, till new information is written into the input register. Current Sink to GNDCC.

$\overline{\text{CS}}$ (Chip select)

The system microcontroller selects the ISO1H815G by means of the low active pin $\overline{\text{CS}}$ to activate the parallel interface. By connecting the $\overline{\text{CS}}$ pin and $\overline{\text{WR}}$ pin to ground the parallel direct control is activated. Current Source to VCC.

$\overline{\text{WR}}$ (Parallel write)

In parallel mode data at the input pins (D0 ... D7) are latched by means of the rising edge of the low active signal $\overline{\text{WR}}$ (write). Current Source to VCC.

D0 ... D7 (Data input bit0 ... bit7)

The present data can be latched on the rising edge of the write signal $\overline{\text{WR}}$. D0 ... D7 control the corresponding output channels OUT0 ...OUT7. By connecting $\overline{\text{CS}}$ and $\overline{\text{WR}}$ to ground, the signals at D0 ... D7 directly control the outputs. Current Sink to GNDCC.

$\overline{\text{DIAG}}$ (Common diagnostic output)

The low active $\overline{\text{DIAG}}$ signal contains the OR-wired information of the separated overtemperature detection units for each channel.The output pin $\overline{\text{DIAG}}$ provides an open drain functionality. A current source is also connected to the pin $\overline{\text{DIAG}}$. In normal operation the signal $\overline{\text{DIAG}}$ is high. When overtemperature or Vbb below ON-Limit is detected the signal $\overline{\text{DIAG}}$ changes to low.

GNDCC (Ground for VCC domain)

This pin acts as the ground reference for the input interface that is supplied by VCC.

GNDbb (Output driver ground domain)

This pin acts as the ground reference for the output driver that is supplied by Vbb.

OUT0 ... OUT7 (High side output channel 0 ... 7)

The output high side channels are internally connected to Vbb and controlled by the corresponding data input pins D0 ... D7 in parallel mode.

TAB (Vbb, Positive supply for output driver)

The heatslug is connected to the positive supply port of the output interface.

2 Blockdiagram

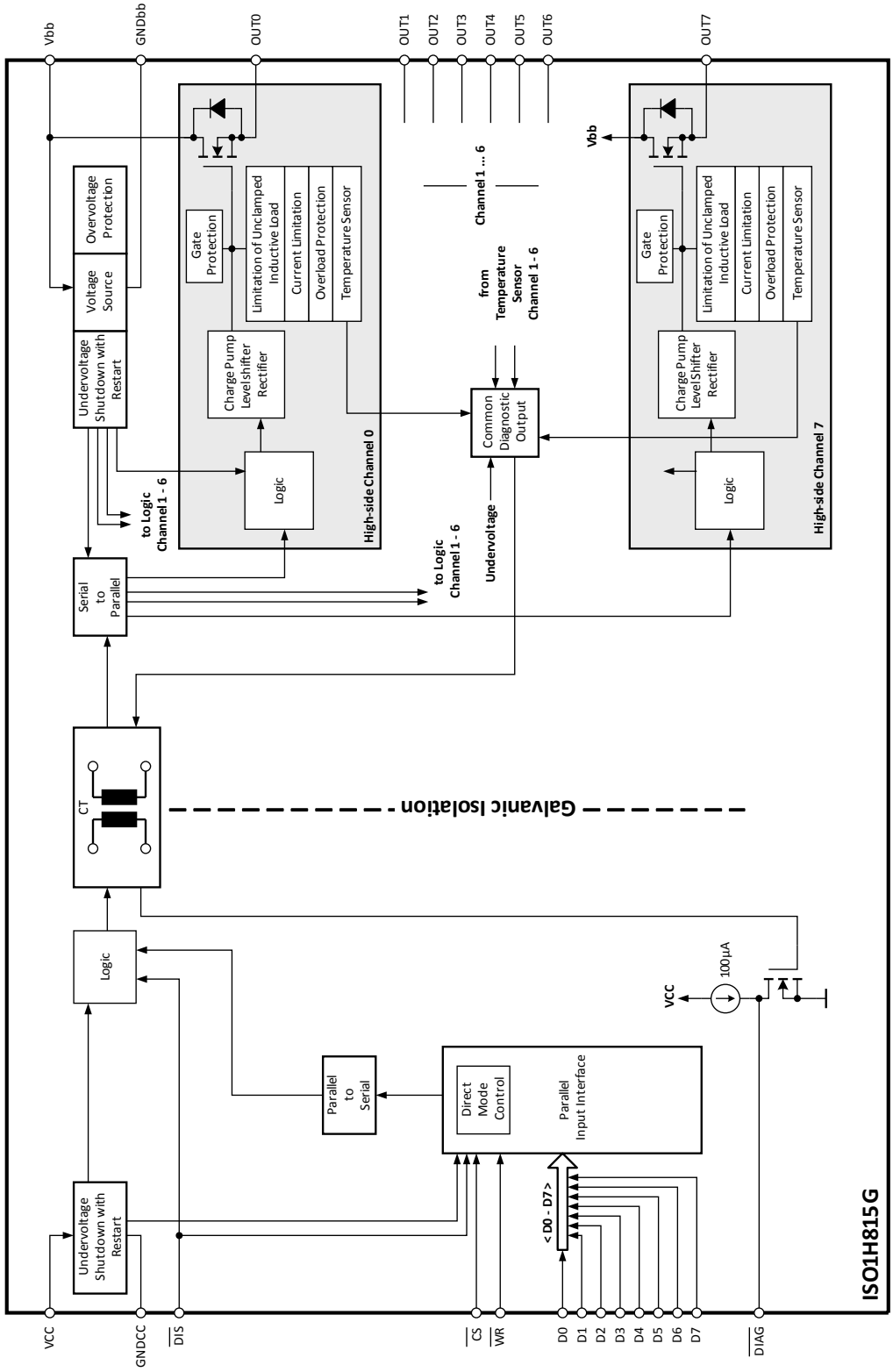

Figure 2 Blockdiagram

3 Functional Description

3.1 Introduction

The ISOFACE ISO1H815G includes 8 high-side power switches that are controlled by means of the integrated parallel interface. The interface is 8bit µC compatible. Furthermore a direct control mode can be selected that allows the direct control of the outputs OUT0...OUT7 by means of the inputs D0...D7 without any additional logic signal. The IC can replace 8 optocouplers and the 8 high-side switches in conventional I/O-Applications as a galvanic isolation is implemented by means of the integrated coreless transformer technology. The µC compatible interface allows a direct connection to the ports of a microcontroller without the need for other components. Each of the 8 high-side power switches is protected against short to Vbb, overload, overtemperature and against overvoltage by an active zener clamp.

The diagnostic logic on the power chip recognizes the overtemperature information of each power transistor The information is send via the internal coreless transformer to the pin $\overline{\text{DIAG}}$ at the input interface.

3.2 Power Supply

The IC contains 2 galvanic isolated voltage domains that are independent from each other. The input interface is supplied at VCC and the output stage is supplied at Vbb. The different voltage domains can be switched on at different time. The output stage is only enabled once the input stage enters a stable state.

3.3 Output Stage

Each channel contains a high-side vertical power FET that is protected by embedded protection functions.

The continuous current for each channel is 1.2A (all channels ON).

3.3.1 Output Stage Control

Each output is independently controlled by an output latch and a common reset line via the pin $\overline{\text{DIS}}$ that disables all eight outputs and resets the latches. The parallel input data is transferred to the input latches with a high-to-low transition of the signal $\overline{\text{WR}}$ (write) while the $\overline{\text{CS}}$ is logic low. A low-to-high transition of $\overline{\text{CS}}$ transfers then the data of the input latches to the output buffer.

3.3.2 Power Transistor Overvoltage Protection

Each of the eight output stages has it own zener clamp that causes a voltage limitation at the power transistor when solenoid loads are switched off. V_{ON} is then clamped to 47V (min.).

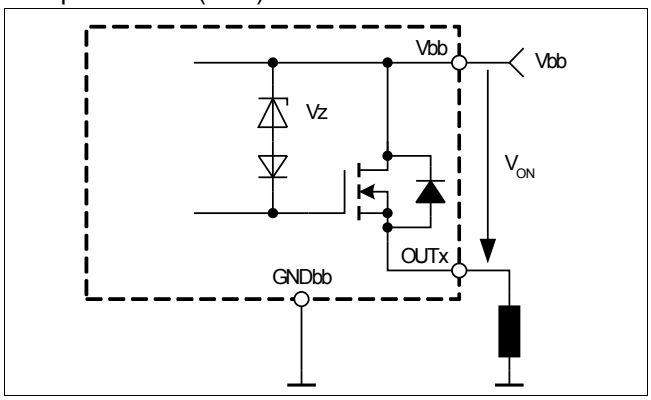

Figure 3 Inductive and overvoltage output clamp (each channel)

Energy is stored in the load inductance during an inductive load switch-off.

$$E_L = 1/2 \times L \times I_L^2$$

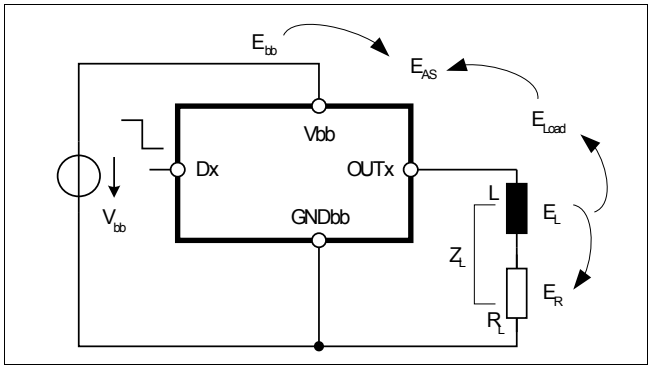

Figure 4 Inductive load switch-off energy dissipation (each channel)

While demagnetizing the load inductance, the energy dissipation in the DMOS is

$$E_{AS} = E_{bb} + E_L - E_R = V_{ON(CL)} \times i_L(t)dt$$

with an approximate solution for $R_L > 0\Omega$:

$$E_{AS} = \frac{I_L \times L}{2 \times R_L} \times (V_{bb} + |V_{ON(CL)}|) \times \ln\left(1 + \frac{I_L \times R_L}{|V_{ON(CL)}|}\right)$$

3.3.3 Power Transistor Overcurrent Protection

The outputs are provided with a current limitation that enters a repetitive switched mode after an initial peak current has been exceeded. The initial peak short circuit current limit is set to $I_{L(SCp)}$. During the repetitive short circuit the current limit is set to $I_{L(SCr)}$. If this operation leads to an overtemperature condition, a second protection level (T_j > 135°C) will change the output into a low duty cycle PWM (selective thermal shutdown with restart) to prevent critical chip temperatures.

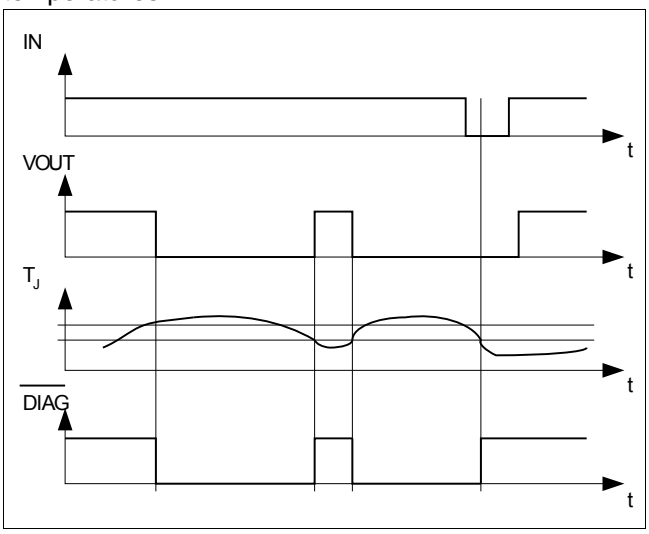

Figure 5 Overtemperature detection

The following figures show the timing for a turn on into short circuit and a short circuit in on-state. Heating up of the chip may require several milliseconds, depending on external conditions.

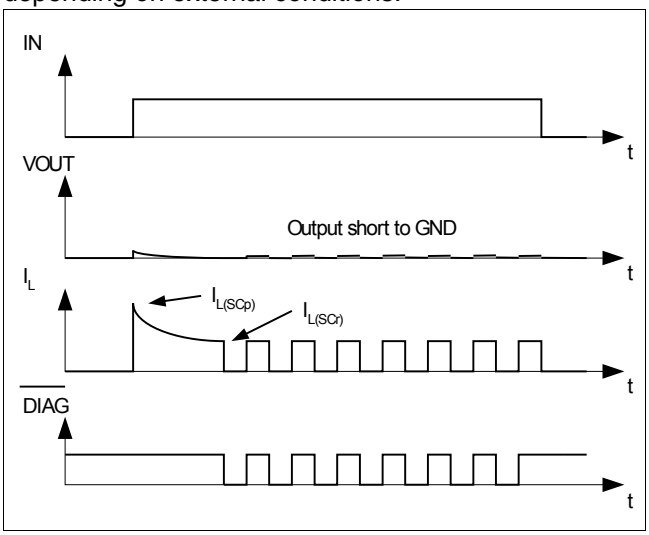

Figure 6 Turn on into short circuit, shut down by overtemperature, restart by cooling

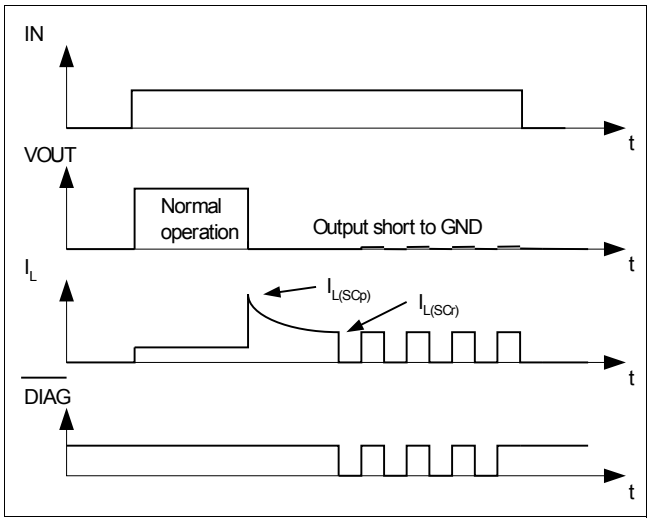

Figure 7 Short circuit in on-state, shut down down by overtemperature, restart by cooling

3.4 Common Diagnostic Output

The overtemperature detection information are OR-wired in the common diagnostic output block. The information is send via the integrated coreless transformer to the input interface. In addition Vbb undervoltage is indicated at the $\overline{\text{DIAG}}$ output.

The output stage at pin $\overline{\text{DIAG}}$ has an open drain functionality combined with a current source.

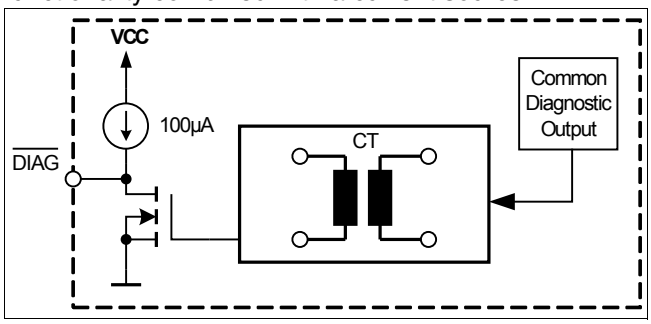

Figure 8 Common diagnostic output

3.5 Parallel Interface

The ISO1H815G contains a parallel interface that can be directly controlled by the microcontroller output ports. The parallel interface can also be switched over to a direct control that allows direct changes of the outputs OUT0 ... OUT7 by means of the corresponding inputs D0 ... D7 without additional logic signals. To activate the parallel direct control mode pin $\overline{CS}$ and pin $\overline{WR}$ have to be connected both to ground.

3.5.1 Parallel Interface Signal Description

$\overline{CS}$ - Chip select. The system microcontroller selects the ISO1H815G by means of the $\overline{CS}$ pin. Whenever the pin is in a logic low state, data can be transferred from the µC.

$\overline{CS}$ High to low transition:

- Parallel input data can be written in from then on

$\overline{CS}$ Low to high transition:

- The data in the input latches is transferred to the output buffer

$\overline{WR}$ - Write. The system controller enables the write procedure in the ISO1H815G by means of the signal $\overline{WR}$. A logic low state signal at pin $\overline{WR}$ writes the input data into the input latches when the $\overline{CS}$ pin is in a logic low state.

$\overline{WR}$ Logic low level:

- Parallel input data at the pins D0 - D7 is written into the input latches

$\overline{WR}$ Logic high level:

- The parallel input data is latched in the input latches. Any changes at the pins D0 - D7 after the low-to-high transition of $\overline{WR}$ do not affect the input latches.

D0 ... D7 - Parallel input. Parallel data bits are fed into the pins D0 ... D7. The data is written into the input latches when $\overline{WR}$ is logic low.

3.5.2 uC Control Mode

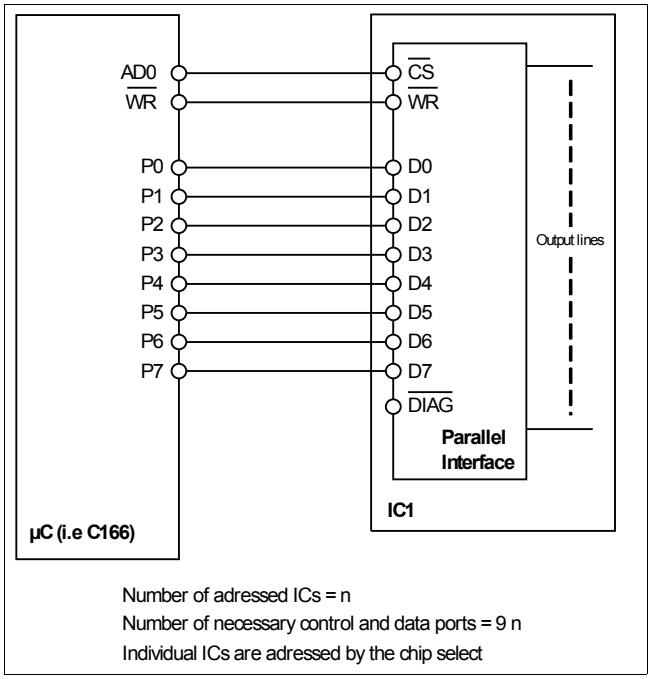

Figure 9 Parallel bus configuration

3.5.3 Direct Control Mode

Beside the use of the parallel µC compatible interface a parallel direct control mode can be chosen. In this mode the output OUT0...OUT7 can be directly controlled via the inputs D0...D7 without the need for additional logic signals. To activate this mode pin $\overline{CS}$ and $\overline{WR}$ need to be connected to ground.

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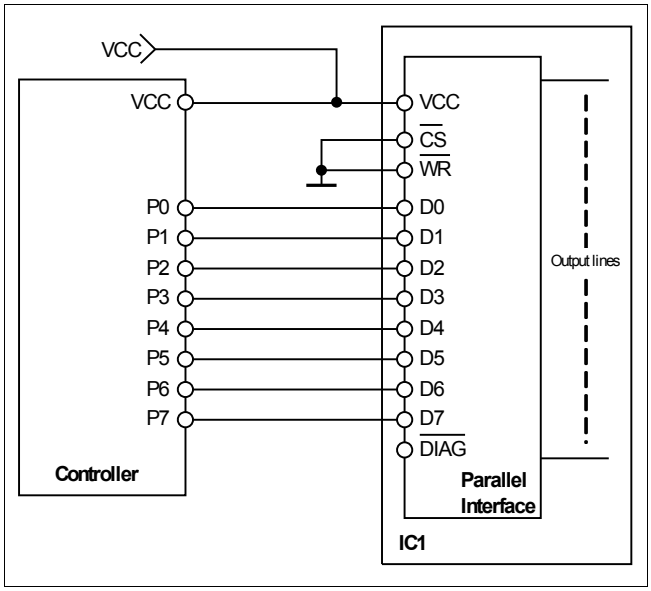


Figure 10 Parallel Direct Control

3.6 Parallel Interface Timing

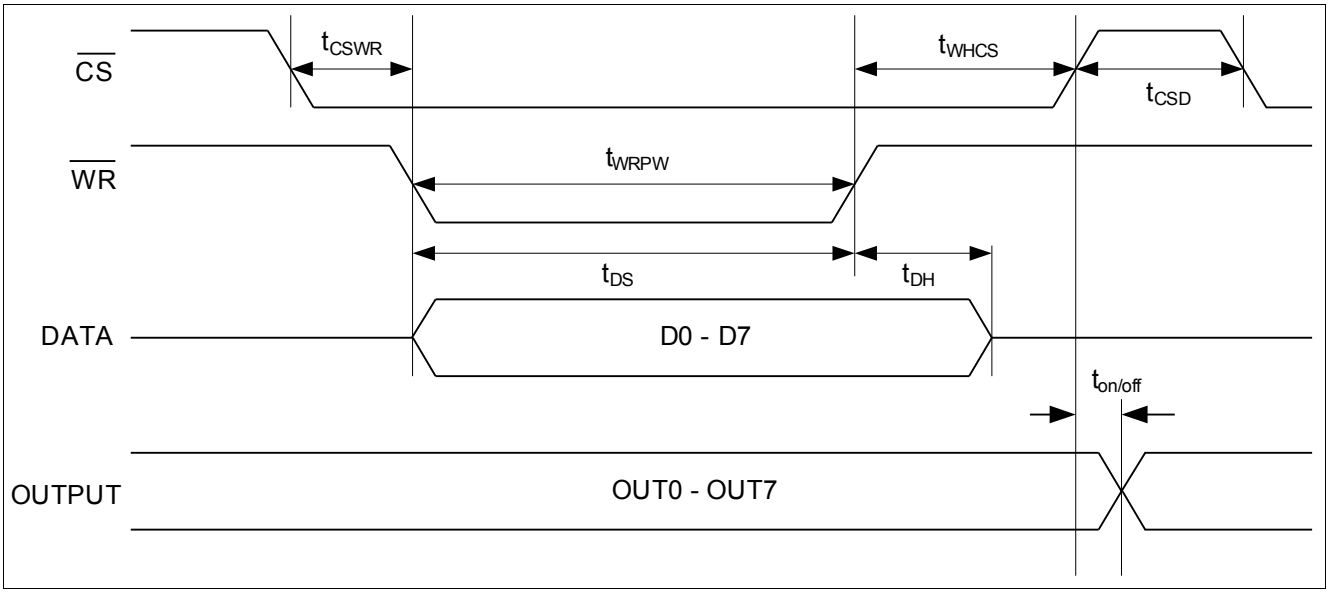


Figure 11 Parallel input - output timing diagram

3.7 Transmission Failure Detection

There is a failure detection unit integrated to ensure also a stable functionality during the integrated coreless transformer transmission. This unit decides whether the transmitted data is valid or not. If four times serial data coming in from the internal registers is not accepted, the output stages are switched off until the next valid data is received.

4 Electrical Characteristics

Note: All voltages at pins 2 to 14 are measured with respect to ground GNDCC (pin 15). All voltages at pin 20 to pin 36 and TAB are measured with respect to ground GNDbb (pin 19). The voltage levels are valid if other ratings are not violated. The two voltage domains V_{CC} and V_{bb} are internally galvanically isolated.

4.1 Absolute Maximum Ratings

Note: Absolute maximum ratings are defined as ratings, which when being exceeded may lead to destruction of the integrated circuit. For the same reason make sure, that any capacitor that will be connected to pin 2 (VCC) and TAB (Vbb) is discharged before assembling the application circuit. Supply voltages higher than $V_{bb(AZ)}$ require an external current limit for the GNDbb pin, e.g. with a 15Ω resistor in GNDbb connection. Operating at absolute maximum ratings can lead to a reduced lifetime.

Parameter at T_j = -40 ... 135°C, unless otherwise specified	**Symbol**	**Limit Values**		**Unit**
		min.	**max.**	
Supply voltage input interface (VCC)	V_{CC}	-0.5	6.5	V
Supply voltage output interface (Vbb)	V_{bb}	-1[1)]	45	
Continuos voltage at data inputs (D0 ... D7)	V_{Dx}	-0.5	6.5	
Continuos voltage at pin $\overline{CS}$	V_{CS}	-0.5	6.5	
Continuos voltage at pin $\overline{WR}$	V_{WR}	-0.5	6.5	
Continuos voltage at pin $\overline{DIS}$	V_{DIS}	-0.5	6.5	
Continuos voltage at pin $\overline{DIAG}$	V_{DIAG}	-0.5	6.5	
Load current (short-circuit current)	I_L	—	self limited	A
Reverse current through GNDbb[1)]	I_{GNDbb}	-1.6	—	
Operating Temperature	T_j	-25	internal limited	°C
Extended Operation Temperature	T_j	-40	internal limited	
Power Dissipation[2)]	P_{tot}	—	3.3	W
Inductive load switch-off energy dissipation[3)] single pulse, T_j = 125°C, I_L = 1.2A one channel active all channel simultaneously active (each channel)	E_{AS}	—	 5 0.5	J
Load dump protection[3)] $V_{loadDump}$[4)]=V_A + V_S V_{IN} = low or high t_d = 400ms, R_I = 2Ω, R_L = 27Ω, V_A = 13.5V t_d = 350ms, R_I = 2Ω, R_L = 57Ω, V_A = 27V	$V_{Loaddump}$		 90 117	V
Electrostatic discharge voltage (Human Body Model) according to JESD22-A114-B	V_{ESD}		2	kV
Electrostatic discharge voltage (Charge Device Model) according to ESD STM5.3.1 - 1999	V_{ESD}		1	kV
Continuos reverse drain current[1)3)], each channel	I_S	—	4	A

1) defined by P_{tot}

2) Device on 50mm*50mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70µm thick) copper area for drain connection. PCB is vertical without blown air.

3) not subject to production test, specified by design

4) $V_{Loaddump}$ is setup without the DUT connected to the generator per ISO7637-1 and DIN40839

4.2 Thermal Characteristics

Parameter at T_j = -25 ... 125°C, V_{bb}=15...30V, V_{CC}=3.0...5.5V, unless otherwise specified	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance junction - case	R_{thJC}	—	—	1.5	K/W	
Thermal resistance @ min. footprint	$R_{th(JA)}$	—	—	50		
Thermal resistance @ 6cm² cooling area[1)]	$R_{th(JA)}$	—	—	38		

1) Device on 50mm*50mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70µm thick) copper area for drain connection. PCB is vertical without blown air.

4.3 Load Switching Capabilities and Characteristics

Parameter at T_j = -25 ... 125°C, V_{bb}=15...30V, V_{CC}=3.0...5.5V, unless otherwise specified	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
On-state resistance, I_L = 0.5A, each channel	R_{ON}				mΩ	
T_j = 25°C		—	150	200		
T_j = 125°C		—	270	320		
two parallel channels, T_j = 25°C:[1)]			75	100		
four parallel channels, T_j = 25°C:[1)]			38	50		
Nominal load current Device on PCB 38K/W, T_a = 85°C, T_j < 125°C						
one channel:[1)]	$I_{L(NOM)}$		1.4		A	
two parallel channels:[1)]			2.2			
four parallel channels:[1)]			4.4			
Turn-on time to 90% V_{OUT}[2)] R_L = 47Ω, V_{Dx} = 0 to 5V	t_{on}	—	64	120	µs	
Turn-off time to 10% V_{OUT}[2)] R_L = 47Ω, V_{Dx} = 5 to 0V	t_{off}	—	89	170		
Slew rate on 10 to 30% V_{OUT} R_L = 47Ω, V_{bb} = 15V	dV/dt_{on}	—	1	2	V/µs	
Slew rate off 70 to 40% V_{OUT} R_L = 47Ω, V_{bb} = 15V	$-dV/dt_{off}$	—	1	2		

1) not subject to production test, specified by design

2) The turn-on and turn-off time includes the switching time of the high-side switch and the transmission time via the coreless transformer in normal operating mode. During a failure on the coreless transformer transmission turn-on or turn-off time can increase by up to 50µs.

4.4 Operating Parameters

Parameter at T_j = -25 ... 125°C, V_{bb}=15...30V, V_{CC}=3.0...5.5V, unless otherwise specified		Symbol	Limit Values			Unit	Test Condition
			min.	typ.	max.		
Common mode transient immunity[1]		$\Delta V_{ISO}/dt$	-25	-	25	kV/µs	ΔV_{ISO} = 500V
Magnetic field immunity[1]		H_{IM}	100			A/m	IEC61000-4-8
Voltage domain V_{bb} (Output interface)	Operating voltage	V_{bb}	11	—	35	V	
	Undervoltage shutdown	$V_{bb(under)}$	7	—	10.5		
	Undervoltage restart	$V_{bb(u\_rst)}$	—	—	11		
	Undervoltage hysteresis	$\Delta V_{bb(under)}$	—	0.5	—		
	Undervoltage current	$I_{bb(uvlo)}$	—	1	2.5	mA	V_{bb} < 7V
	Operating current	I_{GNDL}	—	10	14	mA	All Channels ON - no load
	Leakage output current (included in $I_{bb(off)}$) V_{Dx} = low, each channel	$I_{L(off)}$	—	5	30	µA	
Voltage domain V_{CC} (Input interface)	Operating voltage	V_{CC}	3.0	—	5.5	V	
	Undervoltage shutdown	$V_{CC(under)}$	2.5	—	2.9		
	Undervoltage restart	$V_{CC(u\_rst)}$	—	—	3		
	Undervoltage hysteresis	$\Delta V_{CC(under)}$	—	0.1	—		
	Undervoltage current	$I_{CC(uvlo)}$	—	1	2	mA	V_{cc} < 2.5V
	Operating current	$I_{CC(on)}$	—	4.5	6	mA	

1) not subject to production test

4.5 Output Protection Functions

Parameter[1)] at T_j = -25 ... 125°C, V_{bb}=15...30V, V_{CC}=3.0...5.5V, unless otherwise specified	Symbol	Limit Values min.	Limit Values typ.	Limit Values max.	Unit	Test Condition
Initial peak short circuit current limit, each channel T_j = -25°C, V_{bb} = 30V, t_m = 700µs T_j = 25°C T_j = 125°C	$I_{L(SCp)}$	 — — 1.4	 — 3.0 —	 4.5 — —	A	
two parallel channels:[2)] four parallel channels:[2)]		twice the current of one channel four times the current of one channel				
Repetitive short circuit current limit $T_j = T_{jt}$ (see timing diagrams)	$I_{L(SCr)}$	—		—		
each channel:[2)]			2.2			
two parallel channels:[2)]			2.2			
four parallel channels:[2)]			2.2			
Output clamp (inductive load switch off)[3)] at $V_{OUT} = V_{bb} - V_{ON(CL)}$	$V_{ON(CL)}$	47	53	60	V	
Overvoltage protection	$V_{bb(AZ)}$	47	—	—		
Thermal overload trip temperature[2)4)]	T_{jt}	135	—	—	°C	
Thermal hysteresis[2)]	ΔT_{jt}	—	10	—	K	

1) Integrated protection functions are designed to prevent IC destruction under fault conditions described in the data sheet. Fault conditions are considered as “outside” normal operating range. Protection functions are not designed for continuous repetitive operation.

2) not subject to production test, specified by design

3) If channels are connected in parallel, output clamp is usually accomplished by the channel with the lowest $V_{ON(CL)}$

4) Higher operating temperature at normal function for each channel available

4.6 Diagnostic Characteristics at pin $\overline{\text{DIAG}}$

Parameter at T_j = -25 ... 125°C, V_{bb}=15...30V, V_{CC}=3.0...5.5V, unless otherwise specified	Symbol	Limit Values min.	Limit Values typ.	Limit Values max.	Unit	Test Condition
Common diagnostic sink current (overtemperature of any channel) T_j = 135°C	$I_{diagsink}$			5	mA	V_{diagon} < 0.25xVCC
Common diagnostic source current	$I_{diagsource}$		100		µA	

4.7 Input Interface

Parameter at T_j = -25 ... 125°C, V_{bb}=15...30V, V_{CC}=3.0...5.5V, unless otherwise specified	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
Input low state voltage (D0 ... D7, $\overline{DIS}$, $\overline{CS}$, $\overline{WR}$)	V_{IL}	-0.3	—	0.3 x V_{CC}	V	
Input high state voltage (D0 ... D7, $\overline{DIS}$, $\overline{CS}$, $\overline{WR}$)	V_{IH}	0.7 x V_{CC}	—	V_{CC}+ 0.3		
Input voltage hysteresis (D0 ... D7, $\overline{DIS}$, $\overline{CS}$, $\overline{WR}$)	V_{IHys}		100		mV	
Input pull down current (D0 ... D7, $\overline{DIS}$)	I_{Idown}		100		µA	
Input pull up current ($\overline{CS}$, $\overline{WR}$)	$-I_{Iup}$		100			
Output disable time (transition $\overline{DIS}$ to logic low)[1)2)] Normal operation Turn-off time to 10% V_{OUT} R_L = 47Ω	t_{DIS}	---	85	170	µs	
Output disable time (transition $\overline{DIS}$ to logic low)[1)2)3)] Disturbed operation Turn-off time to 10% V_{OUT} R_L = 47Ω	t_{DIS}	---	---	230		

1) The time includes the turn-on/off time of the high-side switch and the transmission time via the coreless transformer.

2) If Pin $\overline{DIS}$ is set to low the outputs are set to low; after $\overline{DIS}$ set to high a new write cycle is necessary to set the output again.

3) The parameter is not subject to production test - verified by design/characterization

4.8 Parallel Interface Input Timing

Parameter at T_j = -25 ... 125°C, V_{bb}=15...30V, V_{CC}=3.0...5.5V, unless otherwise specified	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
$\overline{WR}$ pulse width	t_{WRPW}	20	—	—	ns	
Data setup time before $\overline{WR}$	t_{DS}	20	—	—		
Data hold time after $\overline{WR}$	t_{DH}	10	—	—		
Chip select valid to $\overline{WR}$	t_{CSWR}	0	—	—		
$\overline{WR}$ logic high to $\overline{CS}$ logic high	t_{WHCS}	10	—	—		
Delay to next $\overline{CS}$ cycle	t_{CSD}	20	—	—		
Delay to next $\overline{CS}$ cycle for multiple device synchronization[1)]	t_{CSDMD}	20	—	—	µs	2)
Input to output data transmission jitter in direct mode[1)]	t_{IOJ}	8	—	20		2)

1) necessary $\overline{CS}$ delay time to ensure a proper data update for multiple devices

2) not subject to production test, specified by design

4.9 Reverse Voltage

Parameter at T_j = -25 ... 125°C, V_{bb}=15...30V, V_{CC}=3.0...5.5V, unless otherwise specified	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
Reverse voltage[1) 2)] R_{GND} = 0 Ω R_{GND} = 150 Ω	$-V_{bb}$	 — —	 — —	 1 45	V	
Diode forward on voltage IF = 1.25A, V_{Dx} = low, each channel	$-V_{ON}$	—	—	1.2		

1) defined by P_{tot}

2) not subject to production test, specified by design

4.10 Isolation and Safety-Related Specification

Parameter Measured from input terminals to output terminals, unless otherwise specified	Value	Unit	Conditions
Rated dielectric isolation voltage V_{ISO}	500	V_{AC}	1 - minute duration[1)]
Short term temporary overvoltage	1250	V	5s acc. DIN EN60664-1 [1)]
Minimum external air gap (clearance)	2.6	mm	shortest distance through air.
Minimum external tracking (creepage)	2.6	mm	shortest distance path along body.

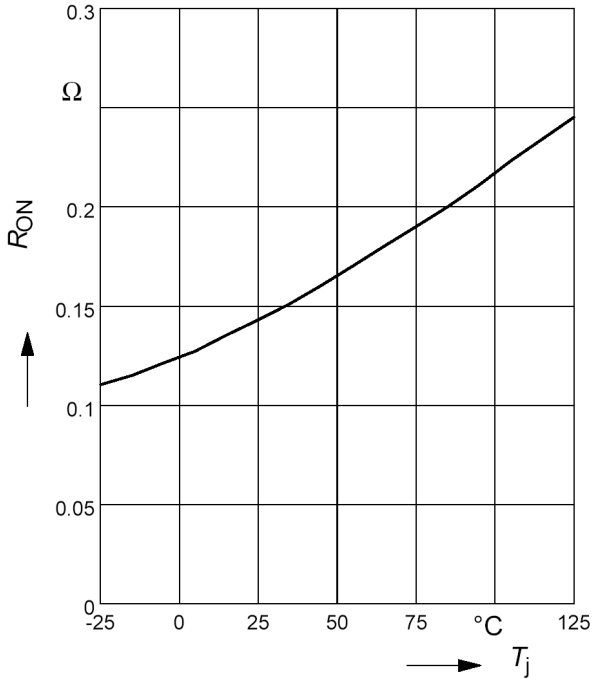
1) not subject to production test, verified by characterization; Production Test with 1100V, 100ms duration

4.11 Reliability

For Qualification Report please contact your local Infineon Technologies office!

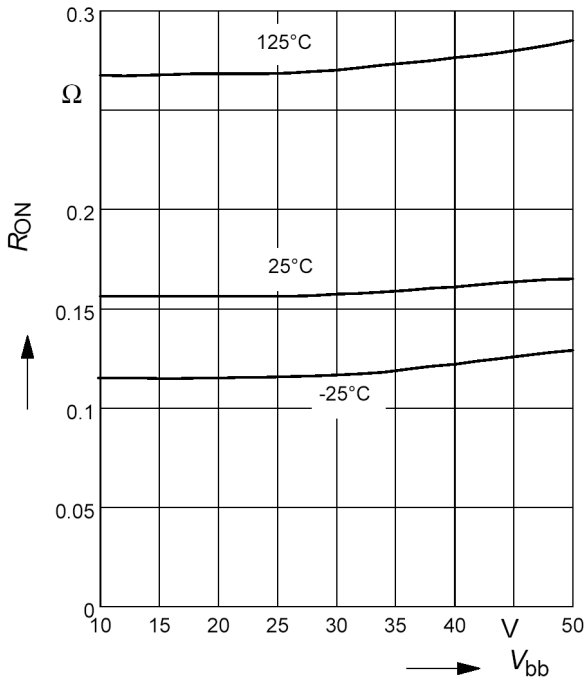
Typ. on-state resistance

$R_{ON} = f(T_j)$; V_{bb} = 15V ; V_{in} = high



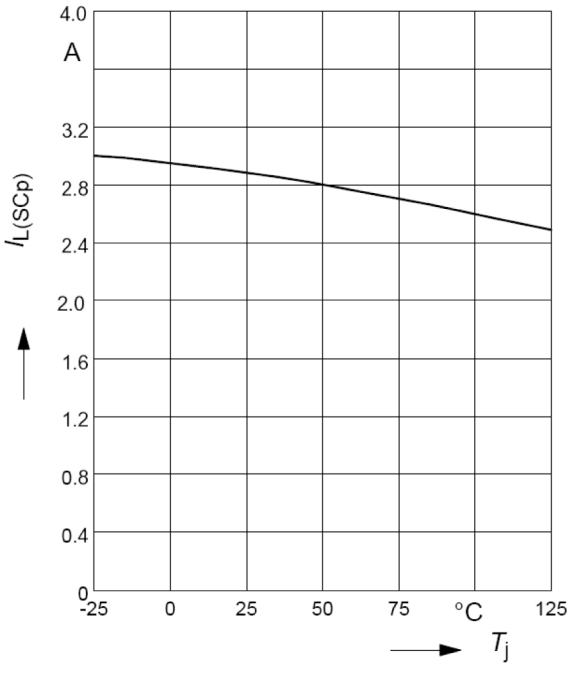
Typ. on-state resistance

$R_{ON} = f(V_{bb})$; I_L = 0.5A ; V_{in} = high

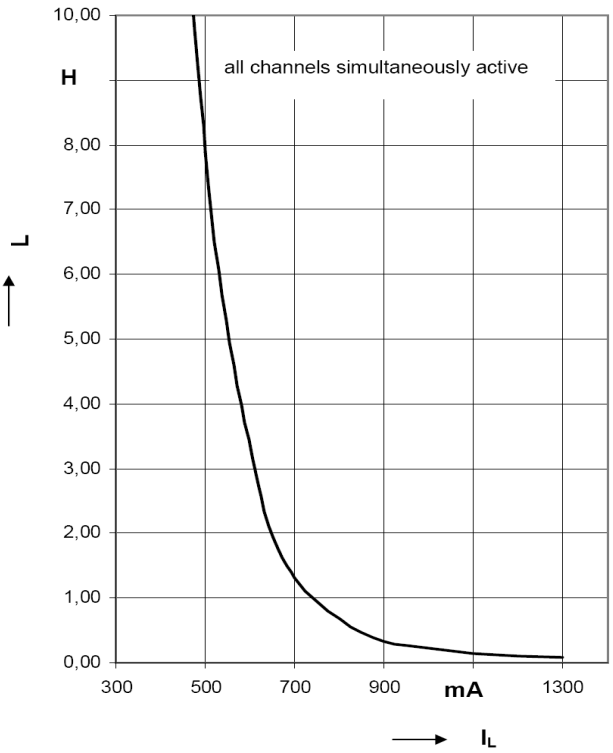


Typ. initial peak short circuit current limit

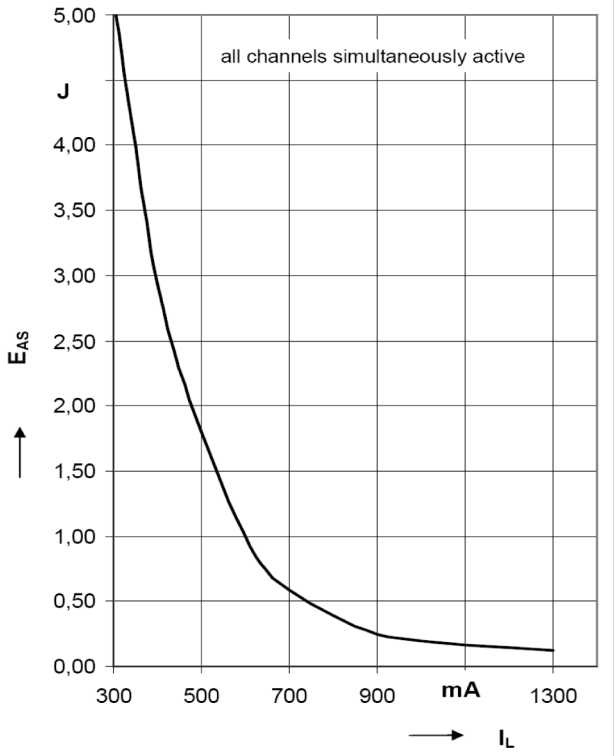
$I_{L(SCp)} = f(T_j)$; V_{bb} = 24V



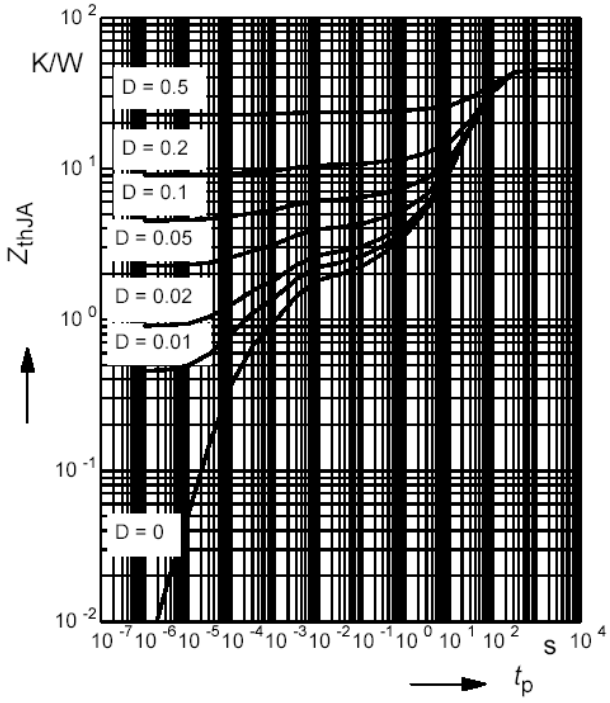
Maximum allowable load inductance for a single switch off, calculated
$L = f(I_L)$; T_{istart} = 125°C, Vbb=24V, R_L=0Ω



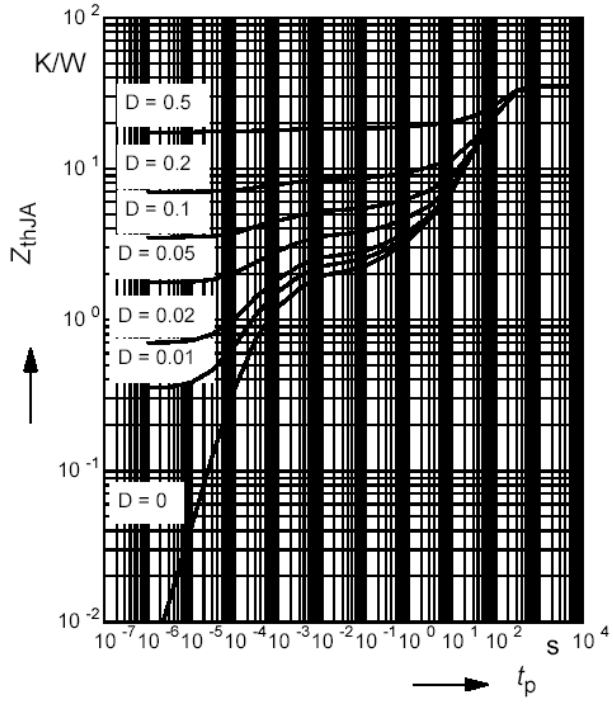
Maximum allowable inductive switch-off Energy, single pulse
$E_{AS} = f(I_L)$; T_{istart} = 125°C, Vbb=24V



Typ. transient thermal impedance
$Z_{thJA}=f(t_p)$ @ min. footprint
Parameter: $D=t_p/T$



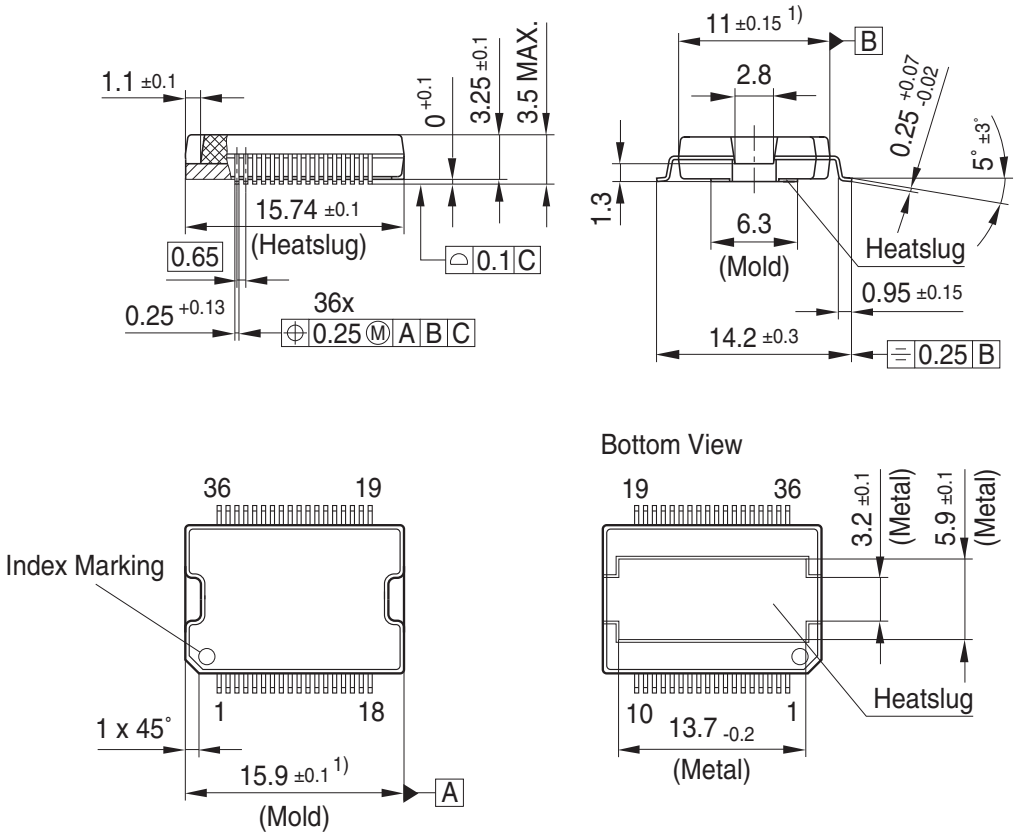
Typ. transient thermal impedance
$Z_{thJA}=f(t_p)$ @ 6cm² heatsink area
Parameter: $D=t_p/T$



5 Package Outlines

PG-DSO-36

(Plastic Dual Small Outline Package)



1) Does not include plastic or metal protrusion of 0.15 max. per side

gps09181_1

Figure 12 PG-DSO36

w w w . i n f i n e o n . c o m

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