Bitrelle Switch Module

Manual

1 Specifications

Bitrelle Tech SCHAEFER Rapid Prototyping and Development Switch Module.

Switches

Infineon Technologies Smart Lowside Power Switch x 4

Infineon HITFET(R) Technology

Overvoltage Protection

Short Circuit Protection

Overtemperature Protection

Current Limitation

Overload Protection

ESD Protection

Turn-On Time: max. 100 micro seconds

Turn-Off Time: max. 100 micro seconds

Optocouplers

Turn-On Time: typ. 9 micro seconds

Turn-Off Time: typ. 18 micro seconds

Dimensions

Length x Width: 50,8mm x 50,8mm

Height: 11,6 mm

Stacking Height: 5mm

Bores

Bore Diameter: 3,2mm

Distance: 44,8mm

Operating Voltage

Switching Voltage: 12V - 40V

Operating Current

Switching Current: 4A

Peak Current: max. 5A

Slow Acting SMD Chip Fuse: 4 x Bel Fuse Type C1S 5A

Operating Temperature

Ambient Temperature: -40°C .. 85°C

Expansion Ports

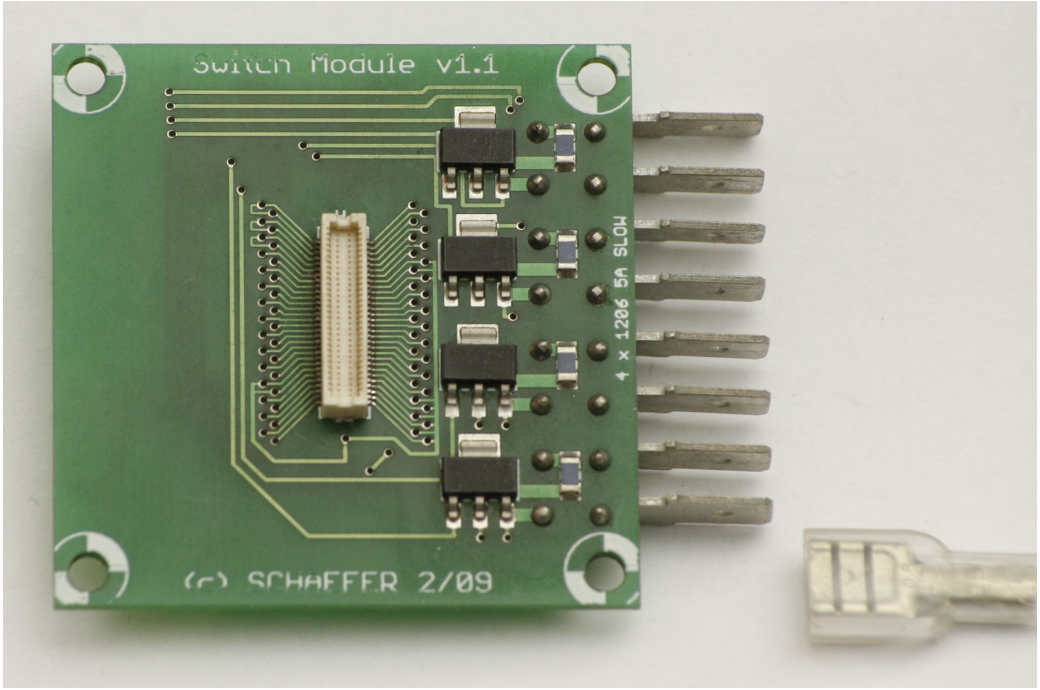
Number of Ports: 2

Length x Width: 17,2mm x 3,8mm

Stacking Height: 5mm

Number of Pins: 60

Pins used by Switch Module: 2, 3, 4, 5



2 Operation

To operate our Bitrelle Tech SCHAEFER Rapid Prototyping and Development Switch Module:

1. Connect board with the microcontroller board.
2. Check correct polarities, that you switch with pins 2 to 5 at the expansion ports
3. Connect the signals that You want to switch
4. Use rubber insulations at Your signal lines to avoid unwanted short circuits
5. Check correct polarities on Your signals to switch
6. Start microcontroller board operation procedure

If You switch 5A and more the fuse will blow after a while.

Don't switch more than 4A for a longer time, because the power electronics will become to hot an will get damaged.

If You connect less than 12V for the signal voltages the power electronics will not work. If You connect more than 40V the power electronics will be destroyed.

You have to connect the load, that You want to switch, on the upper side, the switch has to be on the lower side. So connect the load to the + connector and ground directly to the - connector.

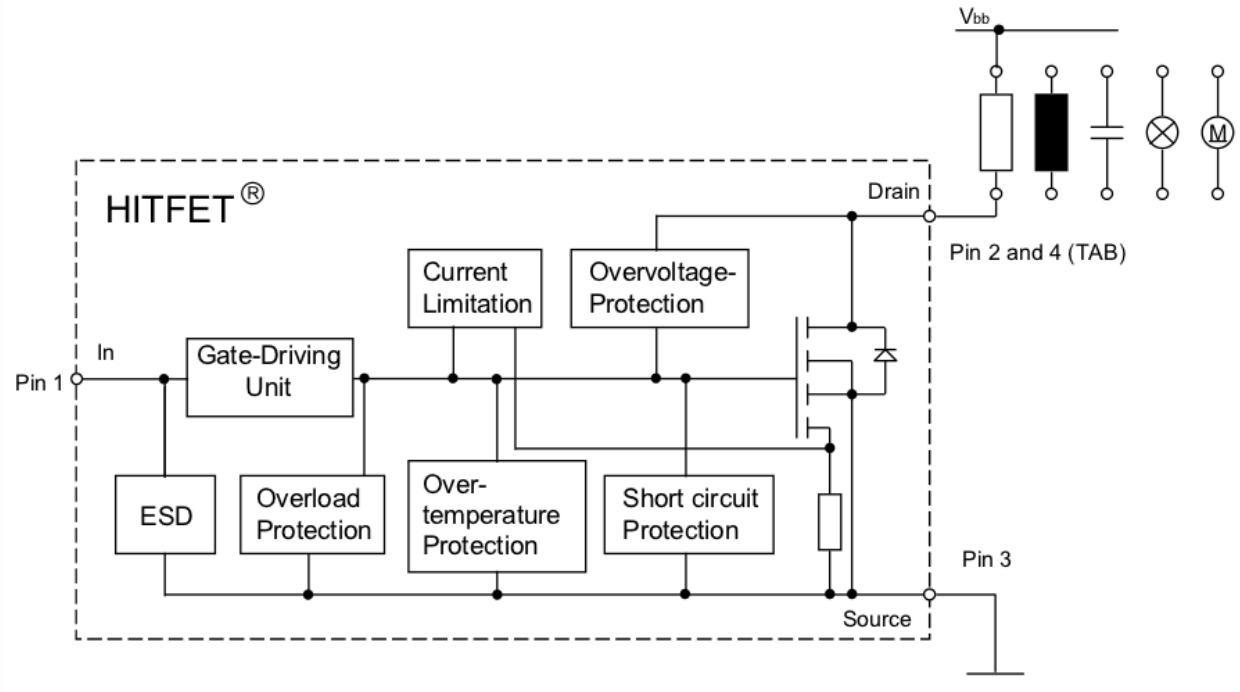


Figure: Infineon Technologies HITFET(R) techology

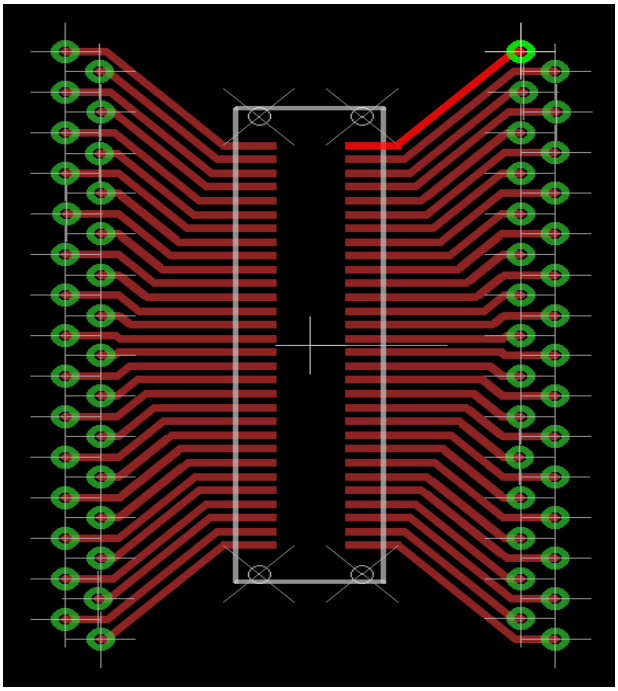
3 Expansion Port

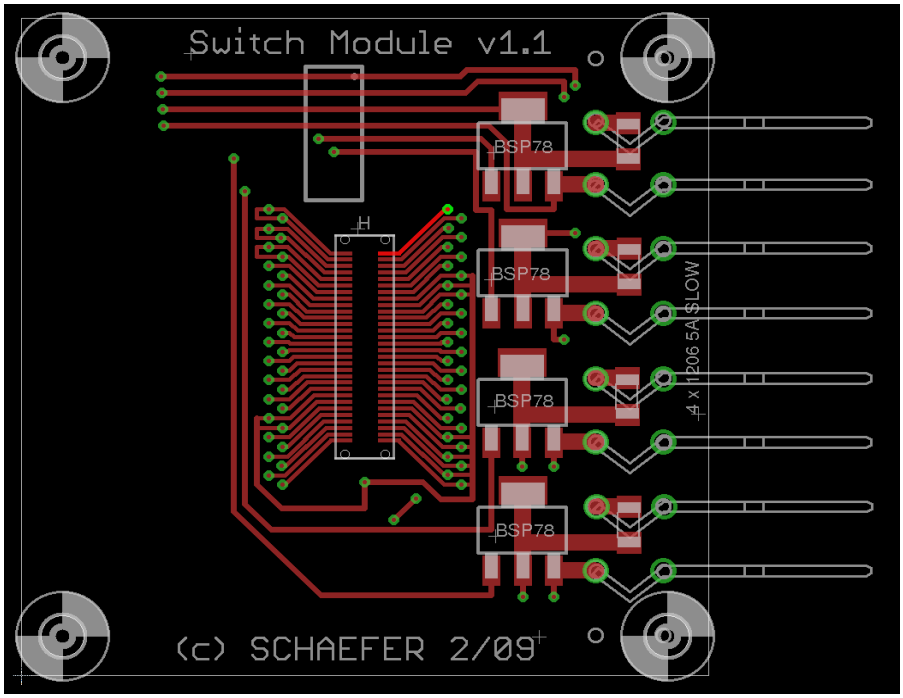
If You look from above on Your Switch Module and the board lies normal upside on the desk, with the labeling normal upside, You see the upper expansion port with the following polarities:

Pin Description		Pin Numb	Pin Numb		Pin Description
VDD	Supply voltage	60	1	Global reset	nRST
VDD		59	2	SWITCH MODULE	P0.30
+5V	5V stabilized	58	3	SWITCH MODULE	P0.29
+5V		57	4	SWITCH MODULE	P0.28
+3V3	3.3V stabilized	56	5	SWITCH MODULE	P0.27
+3V3		55	6	CAN1	TD1
TXD0	UART0	54	7		RD1
RXD0		53	8	Ground	GND
SCL	I2C	52	9		GND
SDA		51	10		GND
SCK0	SPI0	50	11	INERTIAL MODULE	P0.22
MISO0		49	12	INERTIAL MODULE	P0.21
MOSI0		48	13	SPI1	SSEL1
SSEL0		47	14		MOSI1
P1.16		46	15		MISO1
P1.17		45	16		SCK1
P1.18		44	17		USER0
P1.19		43	18		USER1
P1.20	INERTIAL MODULE	42	19		USER2
P1.21	INERTIAL MODULE	41	20		USER3
P1.22	INERTIAL MODULE	40	21		P0.13
P1.23	INERTIAL MODULE	39	22		P0.12
GND	Ground	38	23		P0.11
GND		37	24		P0.10
RTCK	JTAG	36	25	Ground	GND
TDO		35	26		GND
TDI		34	27		GND
TCK		33	28		GND
TMS		32	29		GND
nTRST		31	30		GND

Pins number 2 to 5 are used by the Switch Module, they are decoupled by four optocouplers.

If You look from above on Your Switch Module and the module lies normal upside on the desk, with the labeling normal upside, You see the upper expansion port with the pin number 1 on the upper right side:





The second expansion port lies on the reverse side of the board, and since all connectors are plated-through it is easy to assign the pin numbers mirror-inverted, if You look on the board from below.

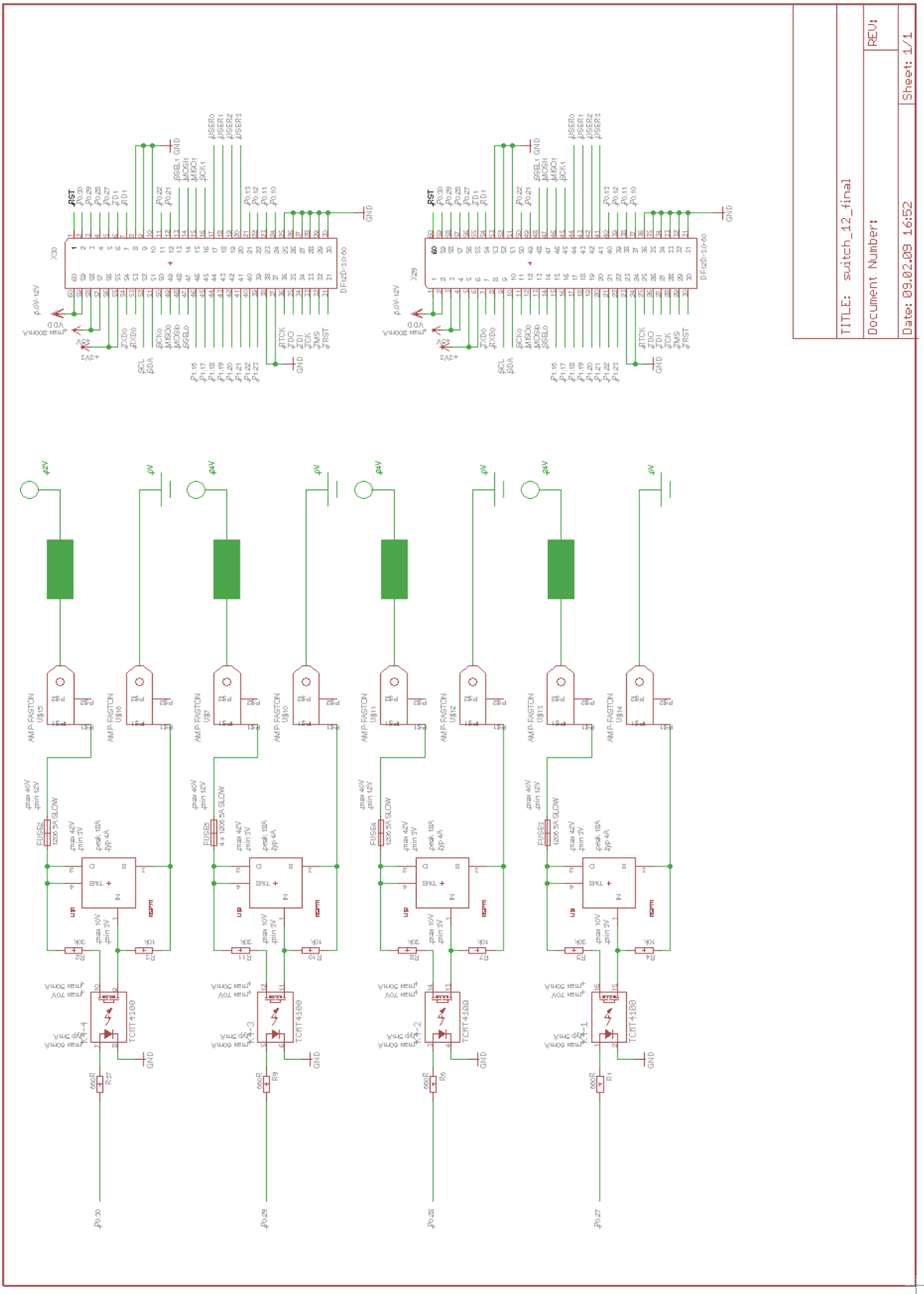
4 Legal Annotation

The Bitrelle Tech SCHAEFER Rapid Prototyping and Development Switch Module is a typical prototyping board. You get schematics and part lists (see annexes) with it. As though the board works very well and is tested several times we give absolutely no warranties.

5 Document History

Date	Description	Revision Number	Author(s)
3.6.2012	Initial Revision	1.0	R. Schaefer

6 Annex Schematics



7 Annex Partlist

Part	Value	Package
FUSE2	1206 5A SLOW	C1206
FUSE3	1206 5A SLOW	C1206
FUSE4	1206 5A SLOW	C1206
FUSE5	1206 5A SLOW	C1206
K4	TCMT4100	SOP16
R1	660R	R0603
R2	30k	R0603
R3	10k	R0603
R4	10k	R0603
R5	30k	R0603
R6	660R	R0603
R7	10k	R0603
R8	30k	R0603
R9	660R	R0603
R10	10k	R0603
R11	30k	R0603
R37	660R	R0603
U$1	BSP78	SOT-223
U$2	BSP78	SOT-223
U$3	BSP78	SOT-223
U$8	BSP78	SOT-223
X29	DF12D-3.0-60	DF12-3.0-60
X30	DF12D-3.0-60	DF12-3.0-60