SSR-60V300A

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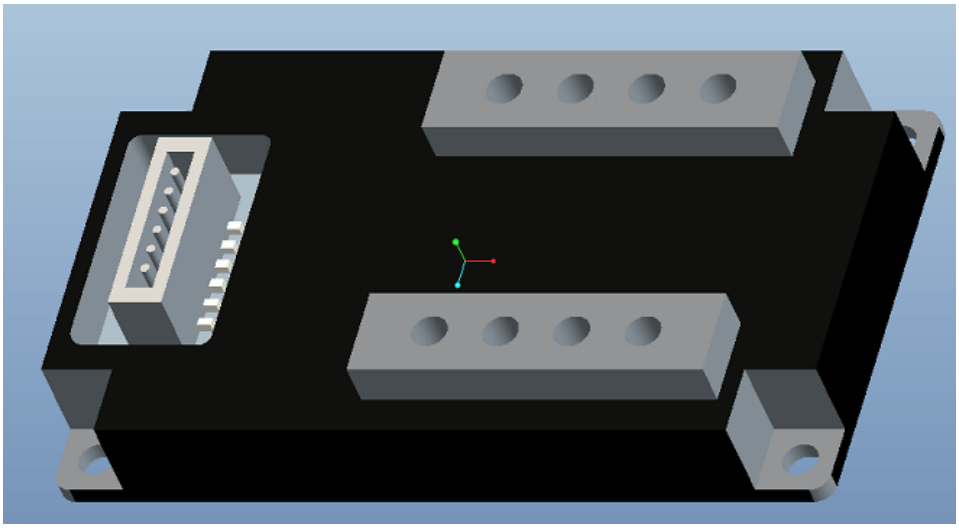
Bi-Directional Semiconductor Solid State Relay



Abstract:

The new compact &cost-effective bi-directional pure type Solid State
Relay was designed with the ultra-low ON Resistance MOSFET for high current operation.
The SSR combines input to output isolated, support bi-directional load current, high inrush current, high switch life time functions, can be used for 48V micro-hygrid start/stop system, Battert energy storage system, UPS…

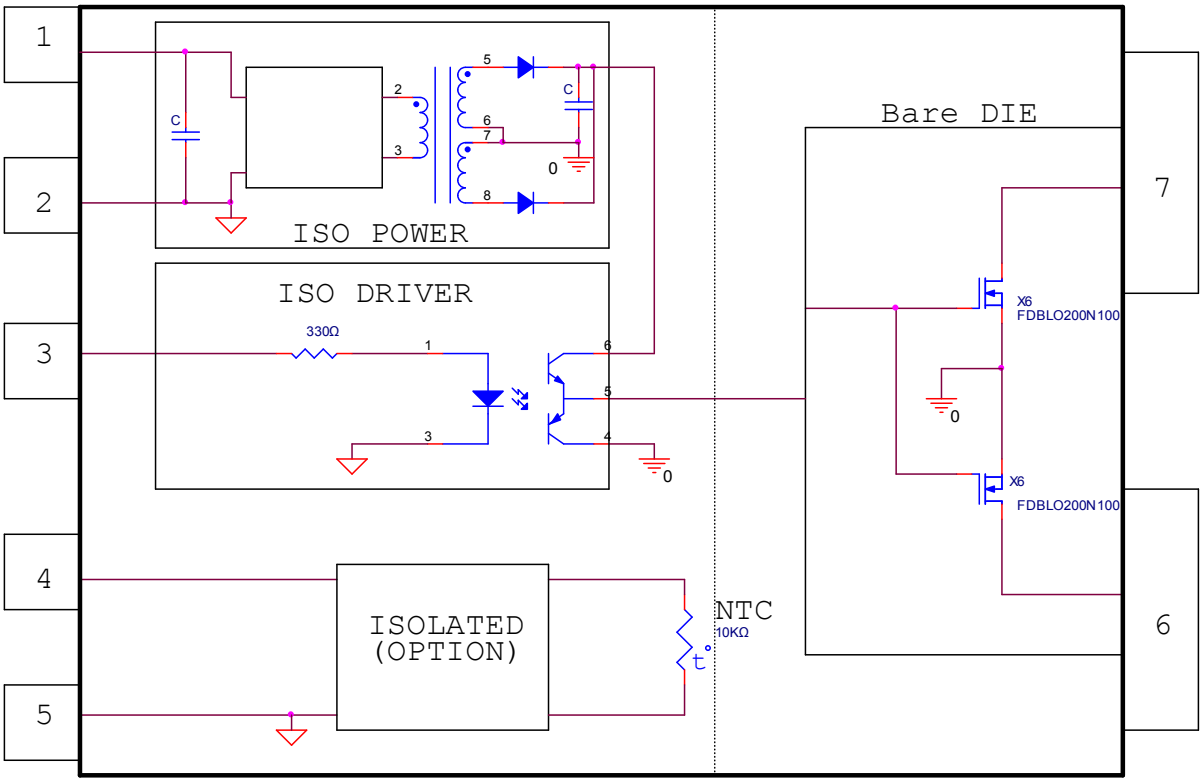
Product Highlights:

- ✓ Up to 250ADC continue current
- ✓ 70mm×60mm×18mm ultra-compact design for high power density
- ✓ ＞ 100,000 full power switching lifetime
- ✓ Bi-directional current type, can be used for DC or AC application
- ✓ Without traditional mechanical switch bounce
- ✓ 12VDC input supply, input signal can be used for PWM control
- ✓ Up to 2500Vrms safe isolation voltage for to input to output, 1500Vms for input or base plate
- ✓Short propagation delay time
- ✓ Wide operation temperature range:-40℃ ～ 85℃

Targert Applications:

- → Micro-Hybrid Vehicle
- → High Frequency Power Supply
- → Battery Fomation
- → Photovoltaic
- → Energy Storage Systems
- → Battery Protection

Functional Bolck Diagram:



Pin1:VDD PIN2:PGND PIN3:VSGN PIN4:TEMP1 PIN5:TGND PIN6:PWR1 PIN7:PWR2

散熱基材(FR4) +Bare Die 散熱基材(ALN)

表一、各類材料散熱系數

Material	Conductivity(W/mK)
FR4	0.2
Alumina	17-27
Aluminium Nitride	170-230
Gold	315
Silver	425
Copper	398

Source : UEC Inc

Absolute Maximum Ratings:

Symbol	Parameter	Condition/Description	Win.	Typ.	Max.	Unit
V_{DD}	Input power supply voltage	V_{DD} ~ GND	0		20	V
V_{RSGN}	Input signal max voltage	SGN ~ GND	0		6	V
I_{PWR}	Max output current	PWR1 to PWR2	-250		+250	A
V_{PWR}	Max output voltage	PWR1 to PWR2	-100		+100	V
$P_{OP(MAX)}$	Max continue output power				12000	w
$f_{(MAX)}$	Max switching frequency				1	Hz
V_{ISOI-O}	Insulation voltage	Input to Output, AC 50Hz, 60s			2500	V_{rms}
V_{ISOI-O}	Insulation voltage	In/Output to Base Plate, AC 50Hz			1500	V_{rms}
T_{OPR}	Operating temperature	No condensation allowable	-40		85	℃
T_{ST}	Storage temperature	No condensation allowable	-55		125	℃

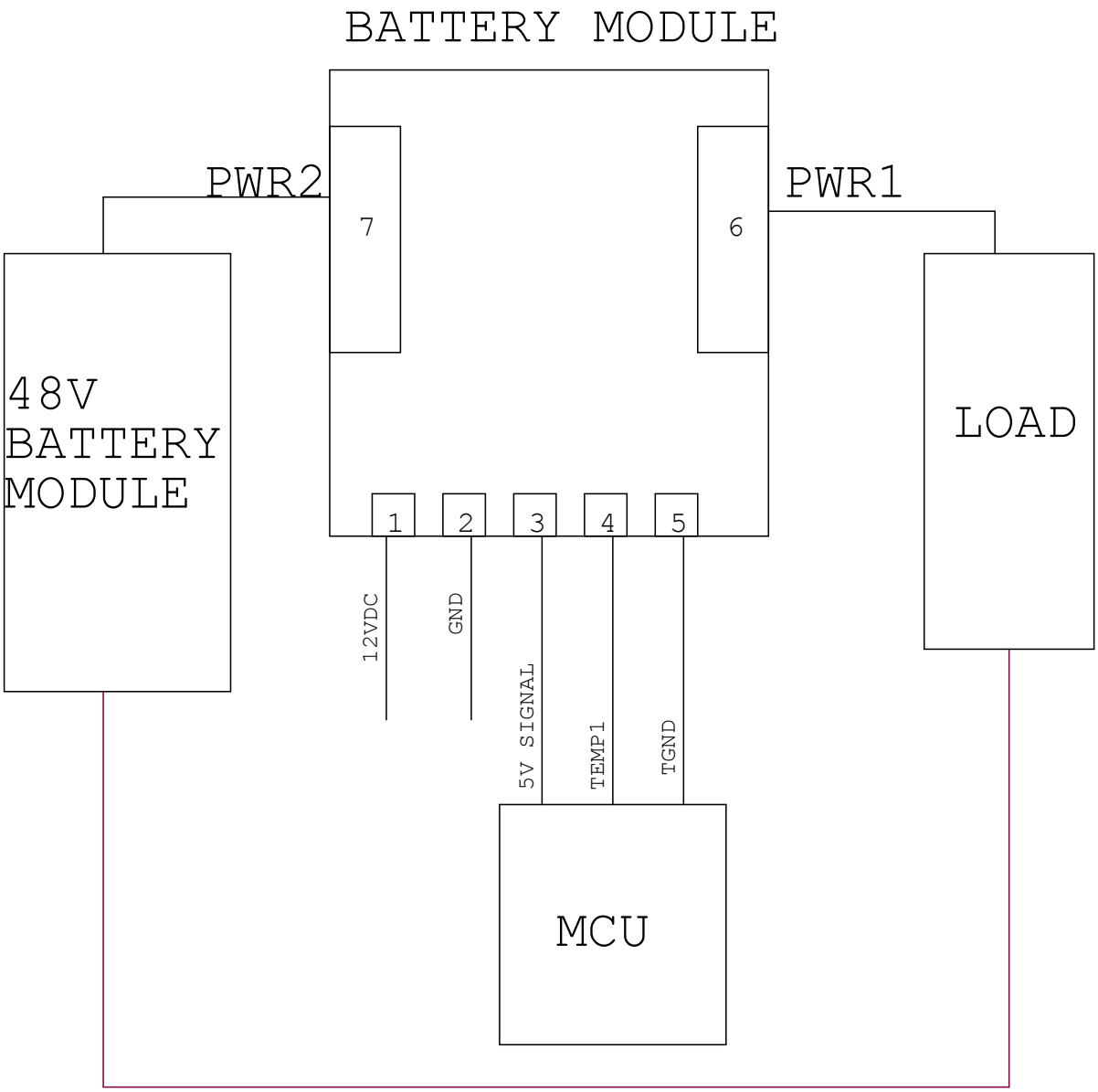
Recommend Electrical Characteristics: (T_A=25℃,V_{DD}=12V unless otherwise specified)

Symbol	Parameter	Condition/Description	Win.	Typ.	Max.	Unit
V_{DD}	Input power supply voltage	V_{DD} ~ GND, Recommended range	11.5	12	13	V
I_{SGN+}	Logic ON input current	SGN ~ GND, Recommended range	10		20	mA
V_{SGN-}	Logic OFF input voltage	SGN ~ GND, Recommended range	-3		0.8	V
R_{temp}	NTC Parameter	Temp1~Tgnd	0		10	kΩ
I_{DD}	Input static current	Output signal Low		20		mA
I_{DCPWR}	Power output current	PWR1 ~ PWR2	-250		+250	A
V_{DCPWR}	Power output voltage	PWR1 ~ PWR2	-60	±48	+60	V
I_{Lk}	Leakage current	PWR1 ~ PWR2, off state			40	μA

Bi-Directional Relay

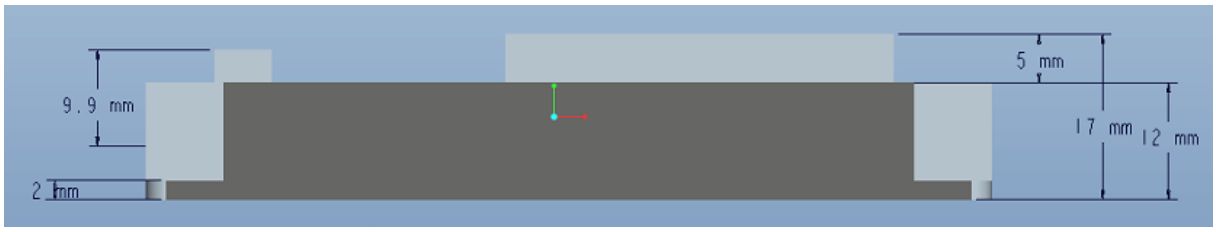
V_{DCON}	ON state voltage drop	I_{DCPWR}=250A		0.15	0.25	V
PWD	Minimum input pulse width				TBD	ms
t_{DLH}	Turn-on propagation delay	Input to Output			TBD	μs
t_{DHL}	Turn-off propagation delay	Input to Output			TBD	μs
t_r	Input static current				TBD	μs
t_f	Turn-on rise time				TBD	μs
Di/dt_{OFF}	Turn-off fall time	V_{PWR} = 48V,IDCPWR = 150A		4		A/μs
$R_{th(J-C)}$	Thermal resistance	Junction to base plate			TBD	℃/W

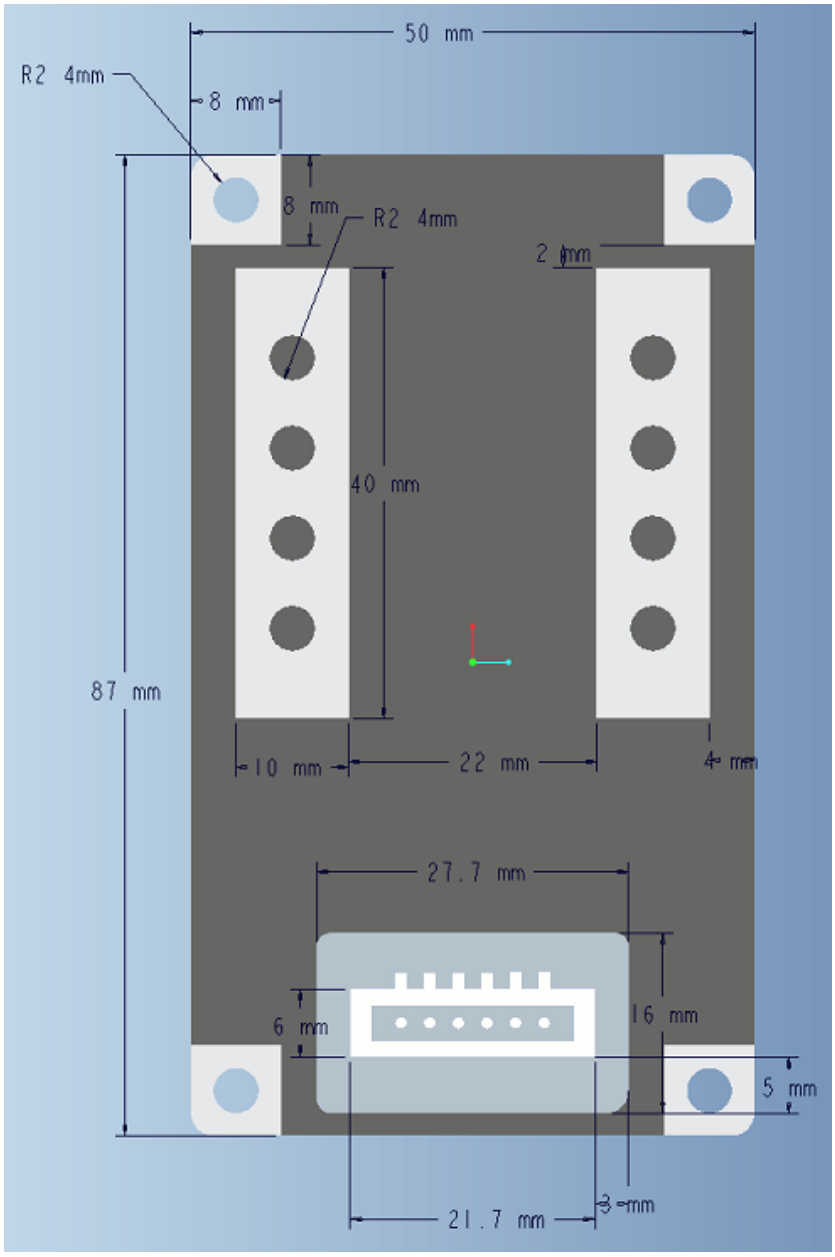
Typical Application:



1. It's recommended to connect a low ESL/ESR, ＞ 47uF catacitor between V_{DD} ~ GND, and as close the RELAY as possible.
2. To prevent the noise, optimized the input signal loop and distance.
3. Optimized the driver output loop, for reducing the loop stray inductance Ls. But if in the inductance load application, when the voltage spike over than 100Vpead at switching off,please considering parallel a 0.1-0.68uF snubber capacitor between PWR1 and PWR2 terminal.
4. In the capacitance load application, please considering parallel the pre-charge circuit for LOAD charging. If not, please make sure that the inrush current no higher than 600A@1ms.

Mechanical Dimensions:(mm)





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