

dLan GreenPHY module in Automotive applications

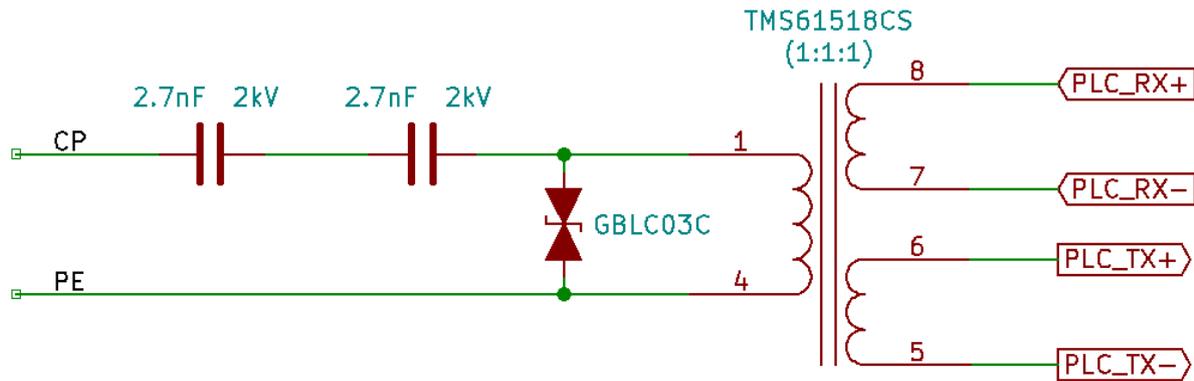
Application note

Change History

<i>Date</i>	<i>Version</i>	<i>Author</i>	<i>Changes</i>
2020-02-20	1.0	VBU	Initial release
2020-02-21	1.1	VBU	Circuits correction

Coupling to Control Pilot

Schematic of coupling devolo dLan GreenPHY module to Control Pilot which complies with IEC 15118-3 standard is shown below.

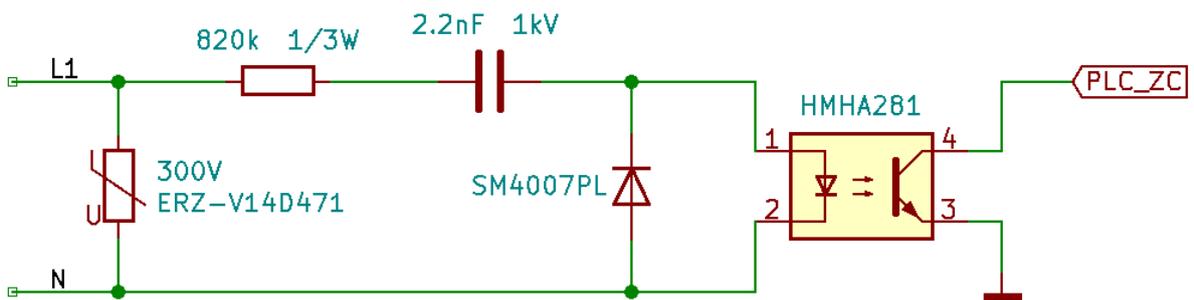


Zero-cross input

Zero-cross detection is used to synchronize operation of HomePlugAV logical networks using mains frequency (50 Hz or 60 Hz). It is recommended to use L1 to connect ZC input.

EVSE side

It is very important to use ZC input on EVSE side (on both AC and DC charging stations). Please note, that EVSEs could listen “foreign” beacons cross-coupled to mains via charging cable and AC-DC power convertor. A sporadic charge abortion may occur when EVSEs are not synchronized via ZC input mechanism due to potential collisions.



PE side

On PEV side ZC has to be directly connected to GND (ground).



Power supply schematic

Stability of EVSE-PEV communication over Control Pilot very much depends of signal to noise ratio (SNR). As transmit level is limited by IEC 15118-3, the only way to increase SNR is to reduce noise generated on the device. Power supply with a low ripple of output voltage and good rejection of input noise is very important.

We designed a low cost DC-DC switching regulator schematic for supplying HomePlug GreenPHY PLC module with a very low output ripple voltage. Proposed DC-DC switching regulator is based on MPS MP1479GTF.

Characteristics of switching regulator schematic

Recommended input level voltage +5V ... +12V DC

Absolute min/max input level voltage +4.5V ... +18V DC

Maximum recommended input voltage ripples 100mV

Output voltage ripples about 1mV when powered with 5V DC input voltage.

Bill of material

Reference	Quantity	Value	Manufacturer	Partnumber
C2, C10, C18	3	1u	Kemet	C0603C105K9RAC7867
C3	1	10p	Kemet	C1206C226K9RAC7800
C4, C11, C19	3	100n	Kemet	C0402C104K9RAC7867
C1, C5, C6, C13	4	22u		
C7, C8	2	10u	Kemet	C0805C106K9RAC7800
C12	1	150u 6,3V	Panasonic	6TPE150MAZB
L1	1	220n	Eaton	MPI4015V2-R22-R
L2	1	10u	MPS	MPL-SE5040-100
R1	1	10R		
R2	1	100k		
R3	1	40k2		
R4	1	13k		
R5	1	47k		
R6	1	10R		
U1	1	MP1479	MPS	MP1479GTF

Schematic of switching regulator could be found on the next page.

