

ANX POE External Supply Gating

(External supply has priority)



This application note shows how to gate the output of a PoE Powered Device (PD) module and an external power supply; with the external supply having priority (see Figure 1).

When the PD module and the external power supplies are present; D1 will conduct turning Q4 ON. This will result in Q1 turning ON and the external supply will be connected to the load. When Q4 is ON this will also turn Q3 ON and as a result Q2 will be OFF. The value of R2 is set to ensure that the PD module has the minimum load connected* when the external supply is present.

D1 sets the threshold that turns Q4 OFF, when the external supply is removed. When Q4 turns OFF, Q1 and Q3 will also turn OFF and Q2 will turn ON. The PD module output will now be connected to the external load via D2. This diode should be a Schottky, for its low forward voltage drop. The reason for D2 is to prevent the external supply from powering the (PD module) minimum load circuit. R4 is used to increase the PD module output voltage to take into account the loss of D2 (and Q2).

D3 is required to prevent Q3 turning ON, if the unpowered external supply output impedance is low. When Q3 and Q4 are OFF the minimum load is removed.

When the external power supply output is restored, D1 now sets the threshold for changing the priority back to the external supply.

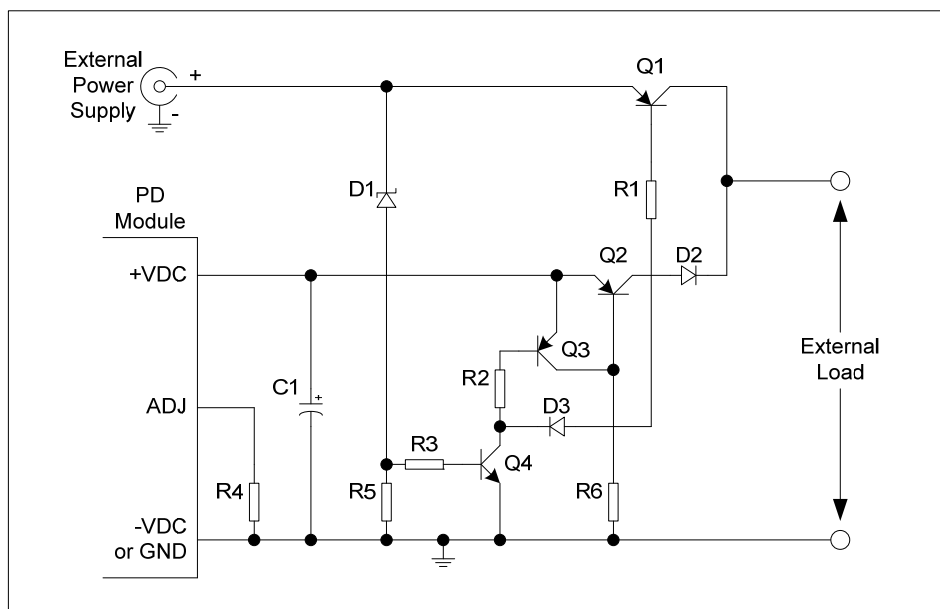


Figure 1: External Supply Gating Circuit

*Note: The minimum load is shown in the DC Electrical Characteristics section in the PD module datasheet. Some modules can be operated below the specified minimum load, but there are consequences that will need to be considered, contact Silvertel for more details.

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The component values are shown below: -

Fixed values

R5	-	47K Ω (64mW)
C1	-	470 μ F
D2	-	SS34
D3	-	BAS16
Q1, Q2 & Q3	-	PBSS4032PX or equivalent
Q4	-	FMMT619 or equivalent

Table 1 shows the nominal PD output voltage; R2 sets the minimum load current, see the PD module datasheet.

Voltage	3.3V		5V		12V	24V
	100mA	200mA	100mA	200mA	100mA	50mA
R2	18 Ω (250mW)	9.1 Ω (1W)	36 Ω (500mW)	18 Ω (1W)	100 Ω (2W)	430 Ω (2W)
R1 & R6	75 Ω (125mW)		150 Ω (125mW)		1K Ω (250mW)	4.3K Ω (250mW)
R3	120 Ω (64mW)**		150 Ω (64mW)		270 Ω (64mW)	270 Ω (64mW)
R4	20K Ω (64mW)		20K Ω (64mW)		20K Ω * (64mW)	20K Ω (64mW)
D1	2V**		3.6V		10V	22V

Table 1: Component Values

Notes –

* - The Ag9120 requires a 150K Ω (64mW) to set the output adjust voltage.

** - If 2V is too low, D1 can be increased to 2.4V and R3 reduced to 43 Ω (64mW).