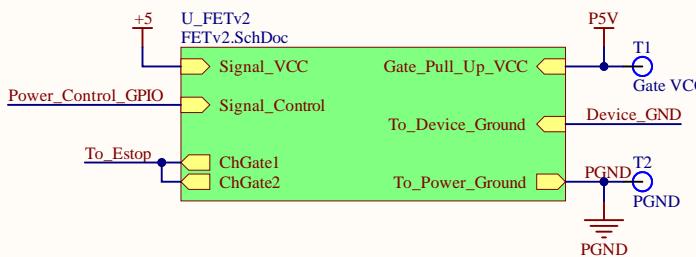
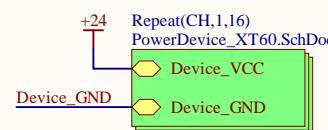


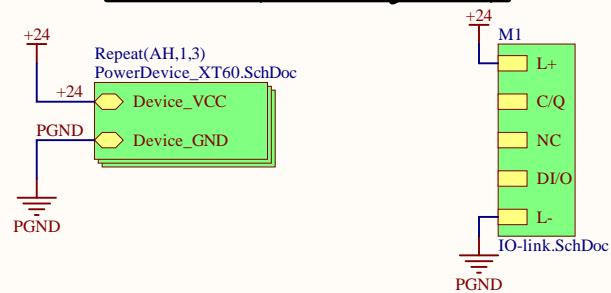
## Power Switch



## Device



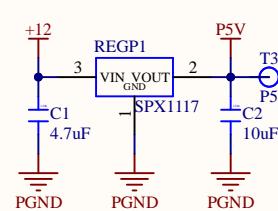
## Device(AllwayON)



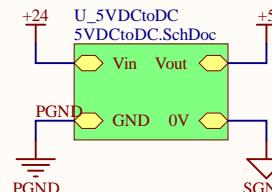
## 12V to 5V



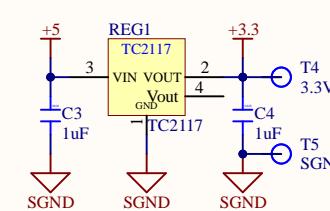
## P5V



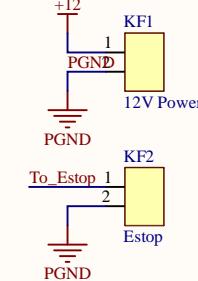
## 5V Isolator



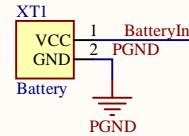
## 5V to 3.3V



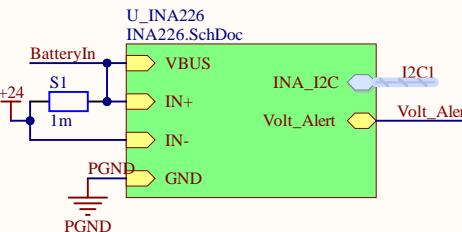
## Connector



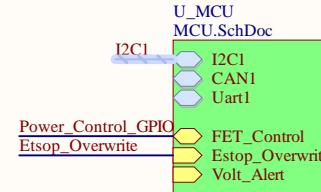
## Battery



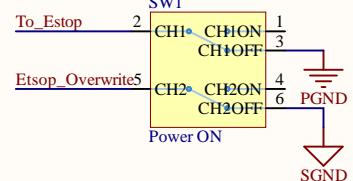
## Voltage Mon



## MCU



## E-Stop



Title **CCC Power Board V2**

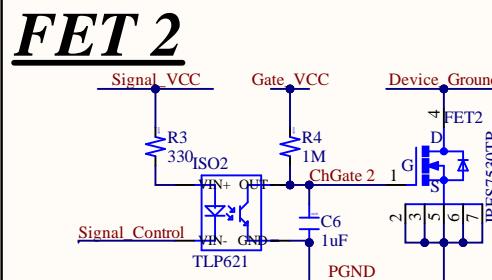
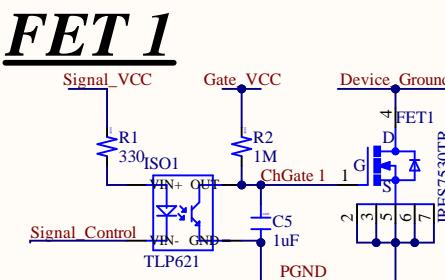
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Date: 14/7/2021 Time: 3:58:48 Sheet 1 of 8

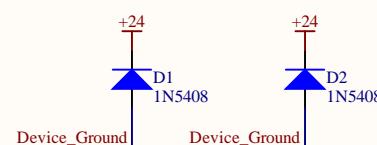
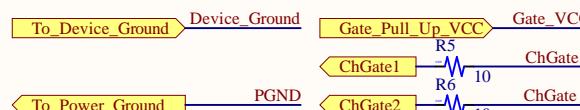
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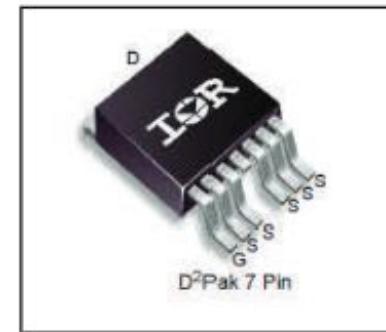




## Output Port



Characteristic	Symbol	Rating		Unit
		TLP621	TLP621-2 TLP621-4	
Forward current	I <sub>F</sub>	60	50	mA
Forward current derating (Note 1)	ΔI <sub>F</sub> /°C	-0.7 (Ta ≥ 39°C)	-0.5 (Ta ≥ 25°C)	mA /°C
Pulse forward current	I <sub>FP</sub>	1 (100μs pulse, 100pps)		A
Power dissipation	P <sub>D</sub>	100	70	mW
Power dissipation derating	ΔP <sub>D</sub> /°C	-1.0(Ta ≥ 39°C)	-0.7(Ta ≥ 25°C)	mW /°C
Reverse voltage	V <sub>R</sub>	5		V
Junction temperature	T <sub>j</sub>	125		°C
Collector-emitter voltage	V <sub>CEO</sub>	55		V
Emitter-collector voltage	V <sub>ECO</sub>	7		V
Collector current	I <sub>C</sub>	50		mA
Collector power dissipation (1 circuit, Ta ≥ 25°C)	P <sub>C</sub>	150	100	mW
Collector power dissipation derating (1 circuit, Ta ≥ 25°C)	ΔP <sub>C</sub> /°C	-1.5	-1.0	mW /°C
Junction temperature	T <sub>j</sub>	125		°C
Storage temperature range	T <sub>stg</sub>	-55 to 125		°C
Operating temperature range	T <sub>opr</sub>	-55 to 100		°C
Lead soldering temperature	T <sub>sol</sub>	260 (10 s)		°C
Total package power dissipation	P <sub>T</sub>	250	150	mW
Total package power dissipation derating (Ta ≥ 25°C)	ΔP <sub>T</sub> /°C	-2.5	-1.5	mW /°C
Isolation voltage (Note 2)	B <sub>VS</sub>	5000 (AC, 60 s, R.H. ≤ 60 %)		V <sub> rms</sub>



**G**  
Gate

**D**  
Drain

**S**  
Source

### Absolute Maximum Rating

Symbol	Parameter	Max.	Units
I <sub>D</sub> @ T <sub>C</sub> = 25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V (Silicon Limited)	338	①
I <sub>D</sub> @ T <sub>C</sub> = 100°C	Continuous Drain Current, V <sub>GS</sub> @ 10V (Silicon Limited)	239	
I <sub>D</sub> @ T <sub>C</sub> = 25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V (Wire Bond Limited)	240	
I <sub>DM</sub>	Pulsed Drain Current ②	1450	
P <sub>D</sub> @ T <sub>C</sub> = 25°C	Maximum Power Dissipation	375	W
	Linear Derating Factor	2.5	W/°C
V <sub>GS</sub>	Gate-to-Source Voltage	± 20	V
T <sub>j</sub>	Operating Junction and	-55 to + 175	
T <sub>STG</sub>	Storage Temperature Range	°C	
	Soldering Temperature, for 10 seconds (1.6mm from case)	300	

### Avalanche Characteristics

E <sub>AS</sub> (Thermally limited)	Single Pulse Avalanche Energy ③	526	mJ
E <sub>AS</sub> (Thermally limited)	Single Pulse Avalanche Energy ③	1029	
I <sub>AR</sub>	Avalanche Current ②	See Fig 14, 15, 23a, 23b	
E <sub>AR</sub>	Repetitive Avalanche Energy ②	mJ	

### Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
R <sub>JC</sub>	Junction-to-Case ④	—	0.40	°C/W
R <sub>JA</sub>	Junction-to-Ambient ④	—	40	

### Static @ T<sub>j</sub> = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>BR(DSS)</sub>	Drain-to-Source Breakdown Voltage	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
ΔV <sub>BR(DSS)/ΔT<sub>j</sub></sub>	Breakdown Voltage Temp. Coefficient	—	33	—	mV/°C	Reference to 25°C, I <sub>D</sub> = 1mA ②
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance	—	1.15	1.4	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 100A
—	—	—	1.4	—	mΩ	V <sub>GS</sub> = 6.0V, I <sub>D</sub> = 50A
V <sub>GS(th)</sub>	Gate Threshold Voltage	2.1	—	3.7	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
I <sub>DS</sub>	Drain-to-Source Leakage Current	—	—	1.0	μA	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0V
—	—	—	150	—	—	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0V, T <sub>j</sub> = 125°C
I <sub>GS</sub>	Gate-to-Source Forward Leakage	—	—	100	nA	V <sub>GS</sub> = 20V
—	—	—	—	-100	—	V <sub>GS</sub> = -20V
R <sub>G</sub>	Gate Resistance	—	2.2	—	Ω	—

### Title **FET V2**

Size: A4	Number:*	Revision:2.2	*
Date: 14/7/2021	Time: 3:58:49	Sheet 2 of 8	*
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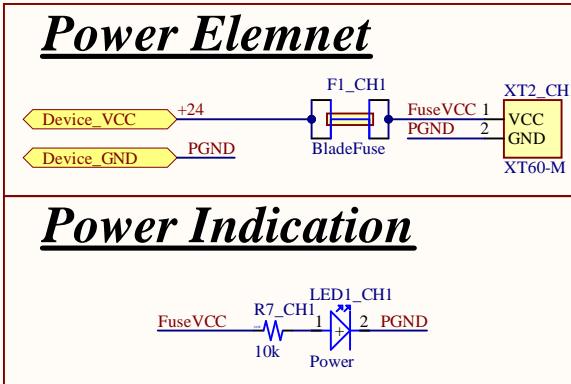
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

Date: 14/7/2021 Time: 3:58:49 Sheet 3 of 8

File: C:\Users\Public\Documents\Altium\Projects\CCCpowerSeries\CCCpowerV2.5\Schematic\PowerDevice\_XT60.SchDoc

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 \* XT60 and ATO Blade Fuse  
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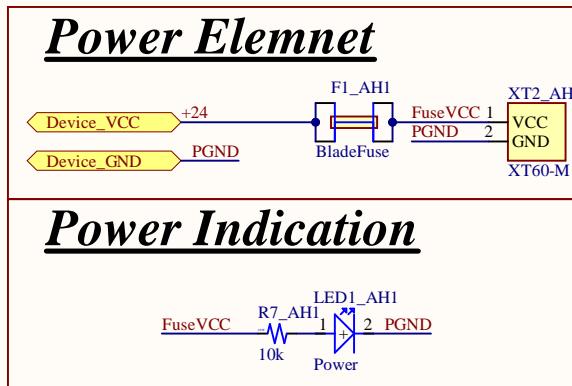
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**Title *Power Device***

Size: A4	Number:*	Revision:1.0
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Date: 14/7/2021	Time: 3:58:49	Sheet 3 of 8
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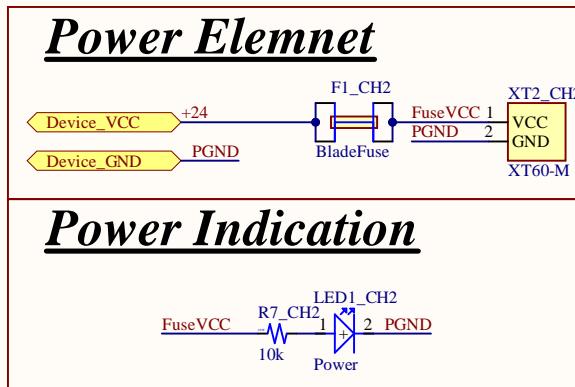
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

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 \* XT60 and ATO Blade Fuse  
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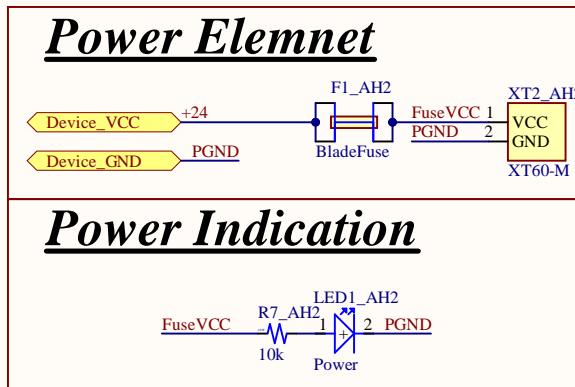
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Title **Power Device**

Size: A4	Number:*	Revision:1.0
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Date: 14/7/2021	Time: 3:58:50	Sheet 3 of 8
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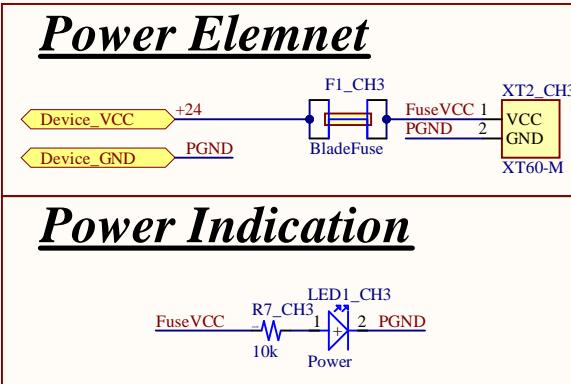
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

Date: 14/7/2021 Time: 3:58:50 Sheet 3 of 8

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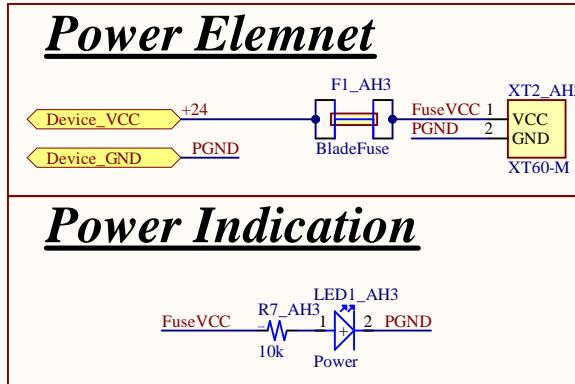
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**Title *Power Device***

 Size: **A4** Number: \* Revision: 1.0

Date: 14/7/2021 Time: 3:58:50 Sheet 3 of 8

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 \* XT60 and ATO Blade Fuse  
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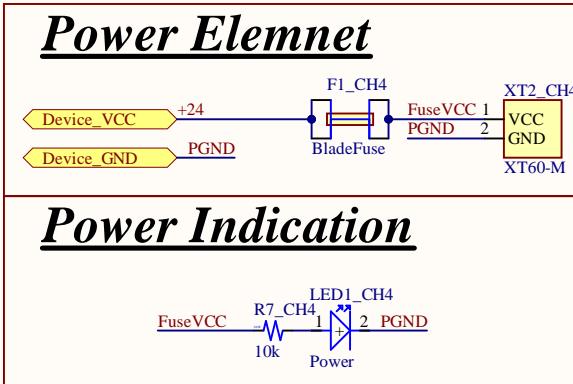
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**Title Power Device**

Size: A4 Number: \* Revision: 1.0

Date: 14/7/2021 Time: 3:58:51 Sheet 3 of 8

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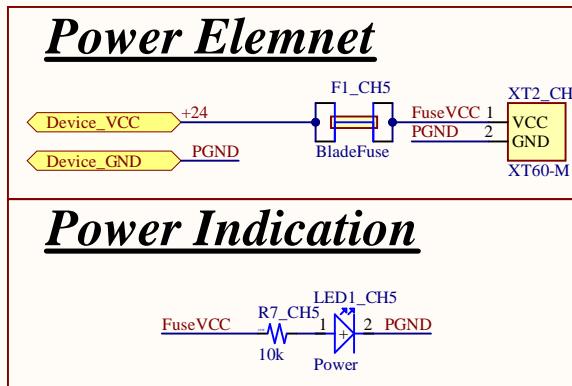
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

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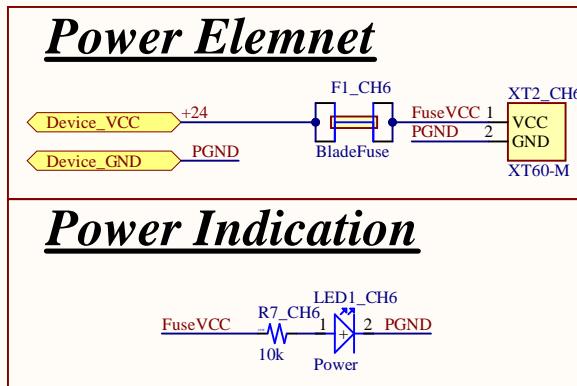
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

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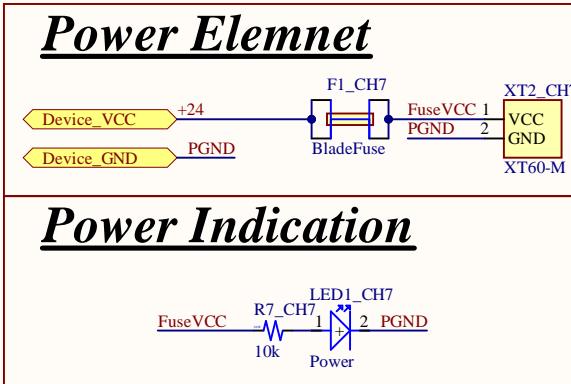
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

Date: 14/7/2021 Time: 3:58:51 Sheet 3 of 8

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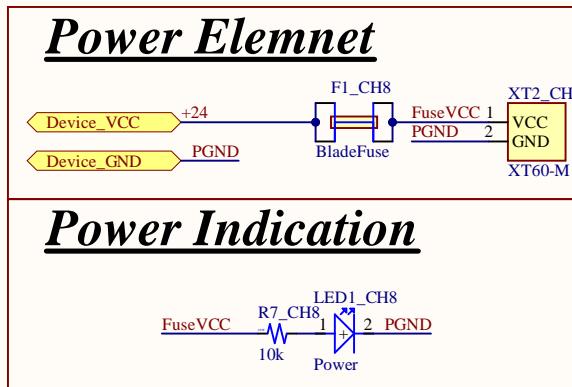
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

Date: 14/7/2021 Time: 3:58:51 Sheet 3 of 8

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 XT60 and ATO Blade Fuse  
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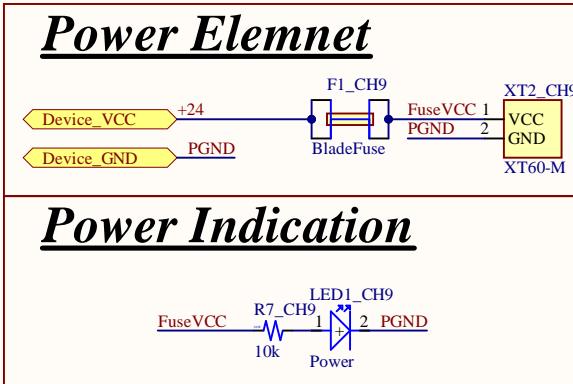
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

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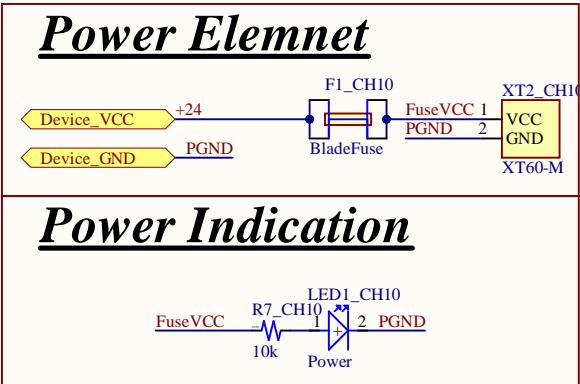
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Size: A4	Number:*	Revision:1.0
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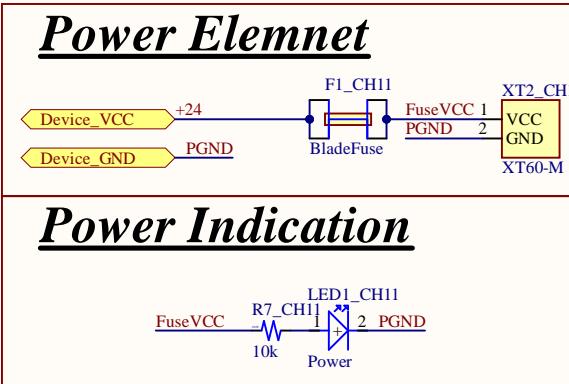
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Size: A4	Number:*	Revision:1.0	XT60 and ATO Blade Fuse
Date: 14/7/2021	Time: 3:58:52	Sheet 3 of 8	*
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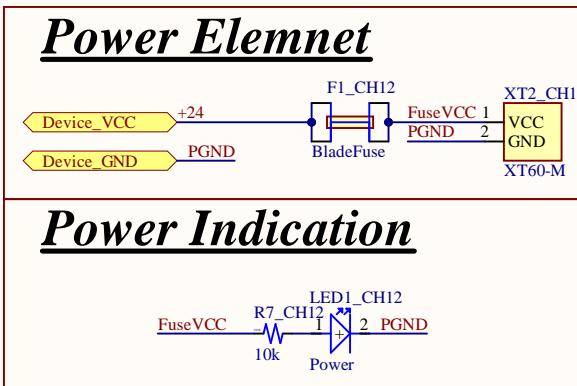
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

Date: 14/7/2021 Time: 3:58:52 Sheet 3 of 8

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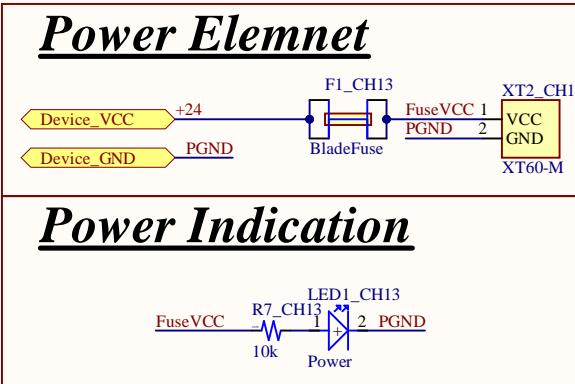
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**Title *Power Device***

Size: A4 Number: \* Revision: 1.0

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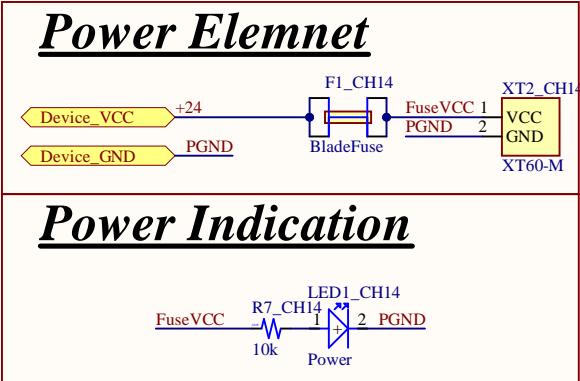
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Title <b>Power Device</b>			*
Size: A4	Number:*	Revision:1.0	*
Date: 14/7/2021	Time: 3:58:53	Sheet 3 of 8	*
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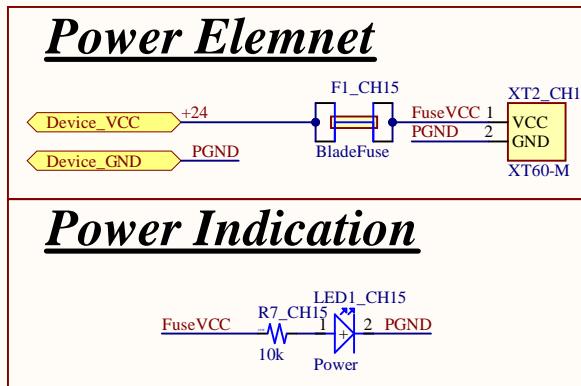
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**Title *Power Device***

 Size: **A4** Number: \* Revision: 1.0

Date: 14/7/2021 Time: 3:58:53 Sheet 3 of 8

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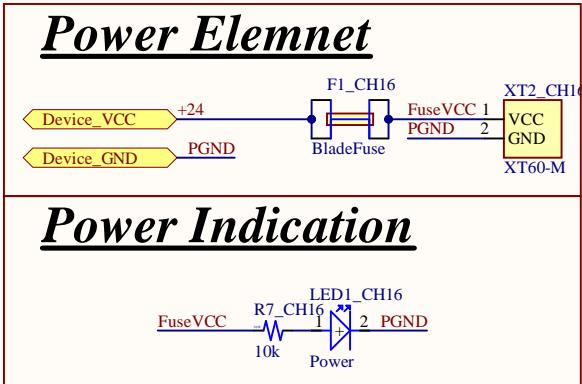
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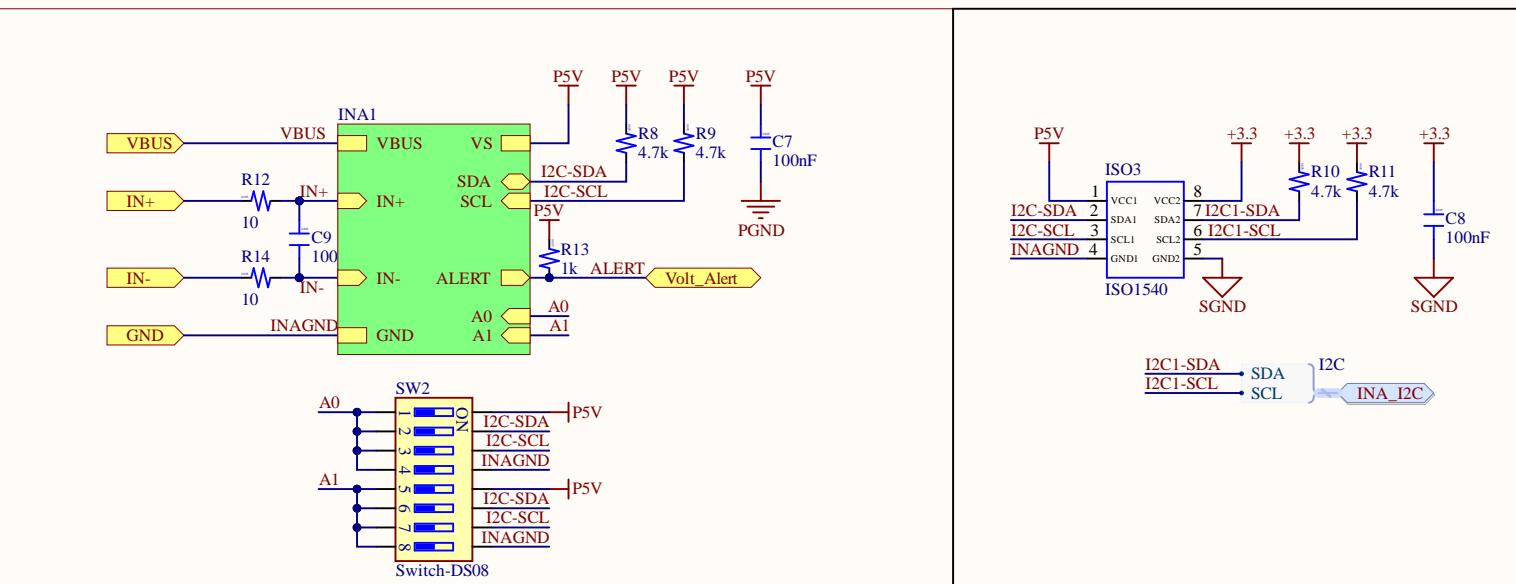

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Size: A4 Number: \* Revision: 1.0

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Title *			*
Size: <b>A4</b>	Number:*	Revision:*	*
Date: 14/7/2021	Time: 3:58:54	Sheet 4 of 8	*
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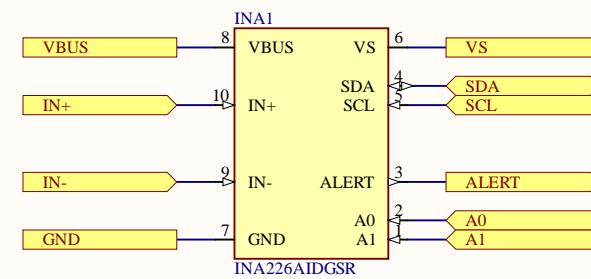
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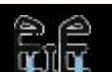
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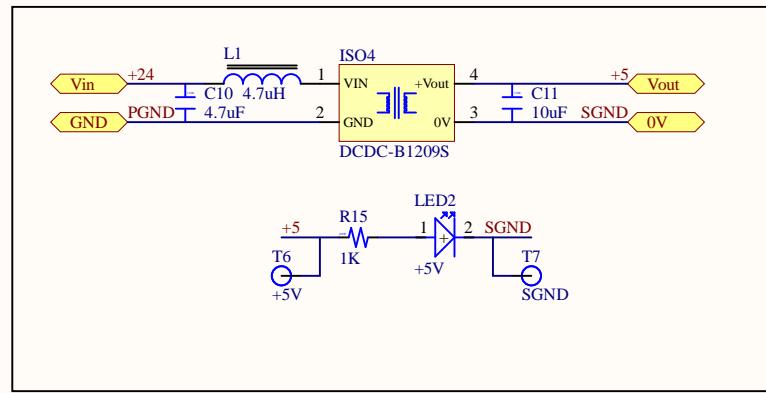
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**Title *5V 2W isolation***

Size: <b>A4</b>	Number: *	Revision: *
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Date: 14/7/2021	Time: 3:58:54	Sheet 6 of 8
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A

B

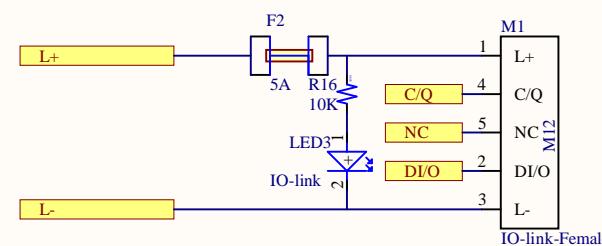
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C

C

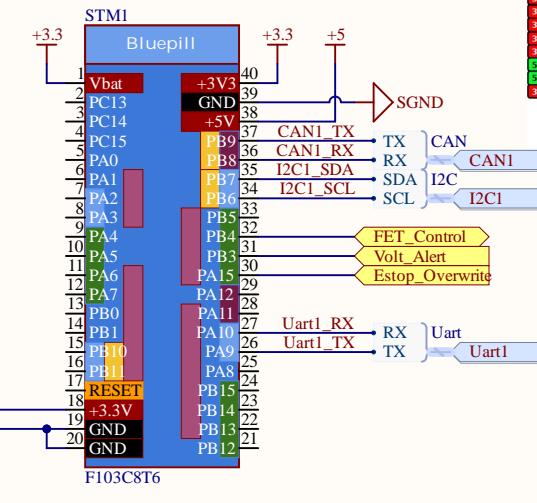
D

D

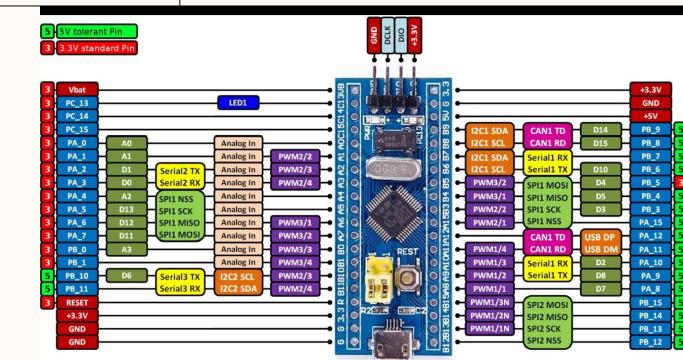


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Size: A4	Number:*	Revision:*	*
Date: 14/7/2021	Time: 3:58:54	Sheet 7 of 8	*
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A



B



A

A

C

C

D

D

Title **MCU**Size: **A4** Number: \* Revision: \*

Date: 14/7/2021 Time: 3:58:55 Sheet 8 of 8

File: C:\Users\Public\Documents\Altium\Projects\CCCpowerSeries\CCCpowerV2.5\Schematic\MCU.SchDoc



