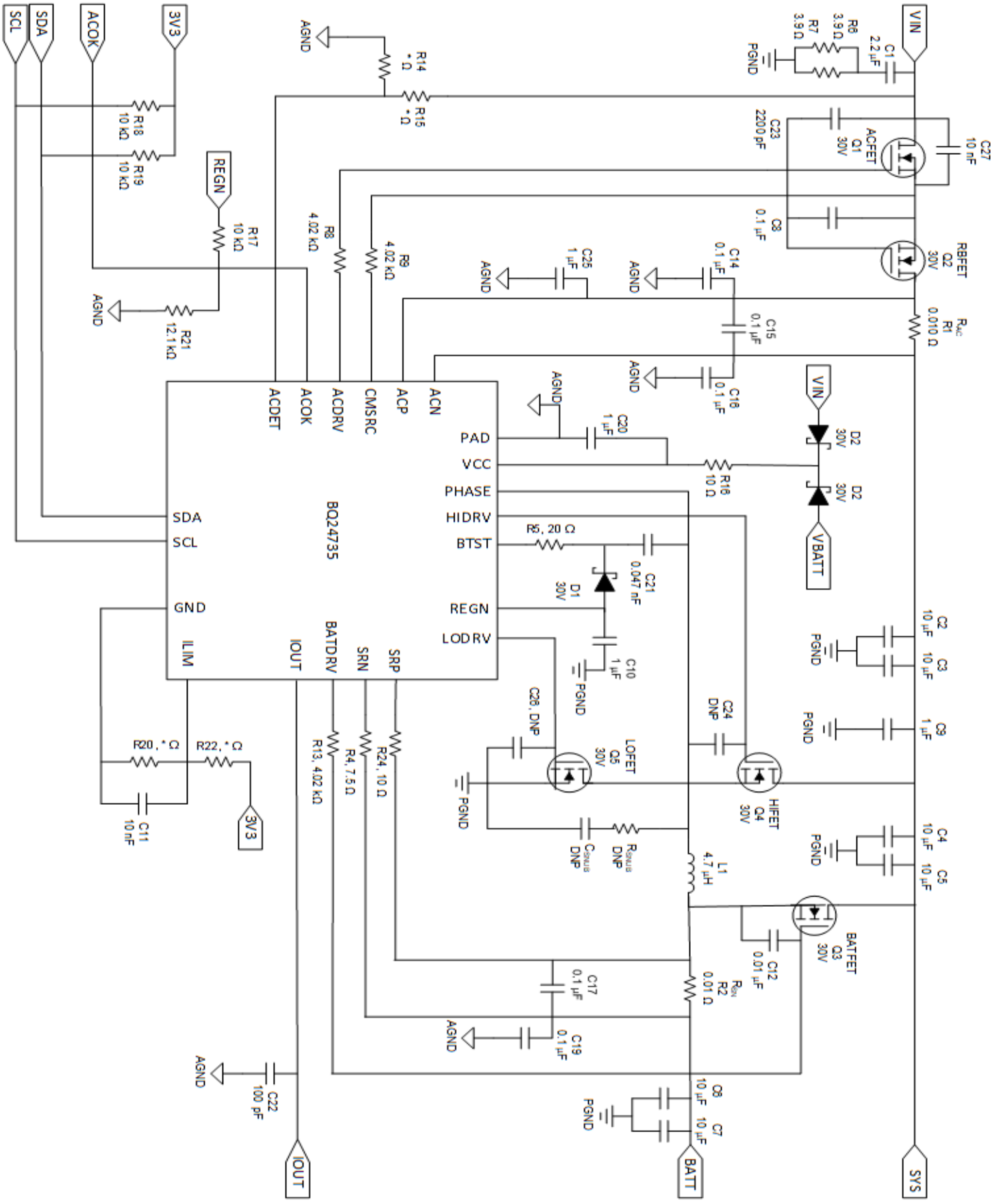
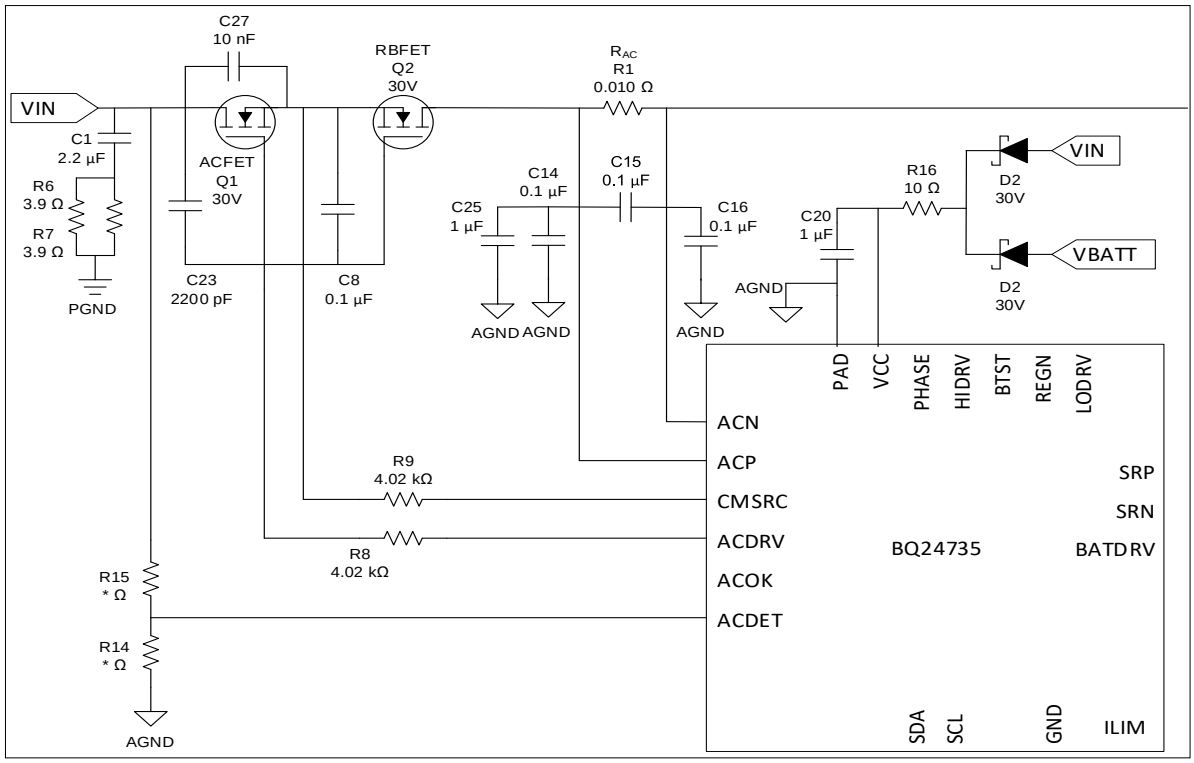
BQ24735 TYPICAL SCHEMATIC

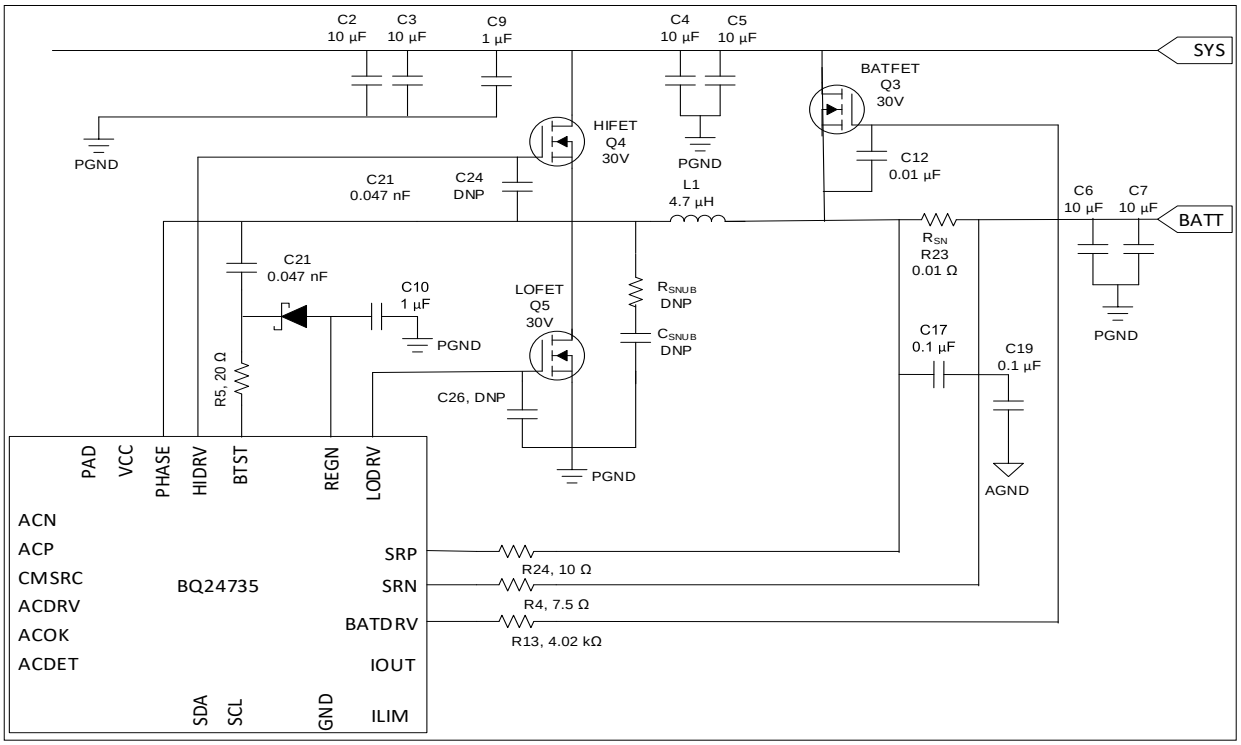


BQ24735 - Input Power Design



INPUT POWER - DESIGN CHECKLIST								
PIN NAME		**REQUIREMENT**	**COMPONENT**	**MIN**	**TYP**	**MAX**	**DESCRIPTION**	**COMMENTS AND RELEVANT EQUATIONS**
ADAPTER+ / ADAPTER-	-						**Input source to the charger**	
		Required	Q1		-		Back-to-back input protection N-Channel MOSFETs	Used to isolate the battery and adapter. This blocks reverse current from the battery back to the input and prevents short from adapter into battery.
			Q2		-			
		Required	R8		4.02 kΩ		Current-limiting resistors	
			R9		4.02 kΩ			
		Recommended	R6/R7		2 Ω		Input hot-plug snubber circuit	
			C1		2.2 uF			Used to dampen the ringing due to input inrush current
		Recommended	C23		2200 pF		Input MOSFETs turn-on/turn-off delay	
			C8		0.1 uF			
			C27		10 nF			
ACP-ACN	1-2						**Differential input current sensing**	
		Required	R1 (R_{AC})		10 mΩ		Input current sensing resistor	
		Recommended	C25		1 uF		Noise filtering	
		Recommended	C14		0.1 uF		Differential mode noise filtering	
		Recommended	C15		0.1 uF		Common mode noise filtering	
		Recommended	C16		0.1 uF			
ACDET	6						**AC Detect Resistor-Divider**	
		Required	R15		* kΩ		High side of resistor-divider for adapter detection threshold	$V_{th} = 2.4V\frac{R_{14}+R_{15}}{R_{14}}$ $R_{14}+R_{15} \approx 1\ M\Omega$
		Required	R14		* kΩ		Low side of resistor-divider for adapter detection threshold	
VCC	20						**IC power positive supply**	
		Required	R16		10 Ω		VCC current limiting	
		Required	C20		1.0 uF		VCC decoupling capacitor	
		Required	D2		-		Adapter/Battery Diode-OR	
			D2		-		Adapter/Battery Diode-OR	

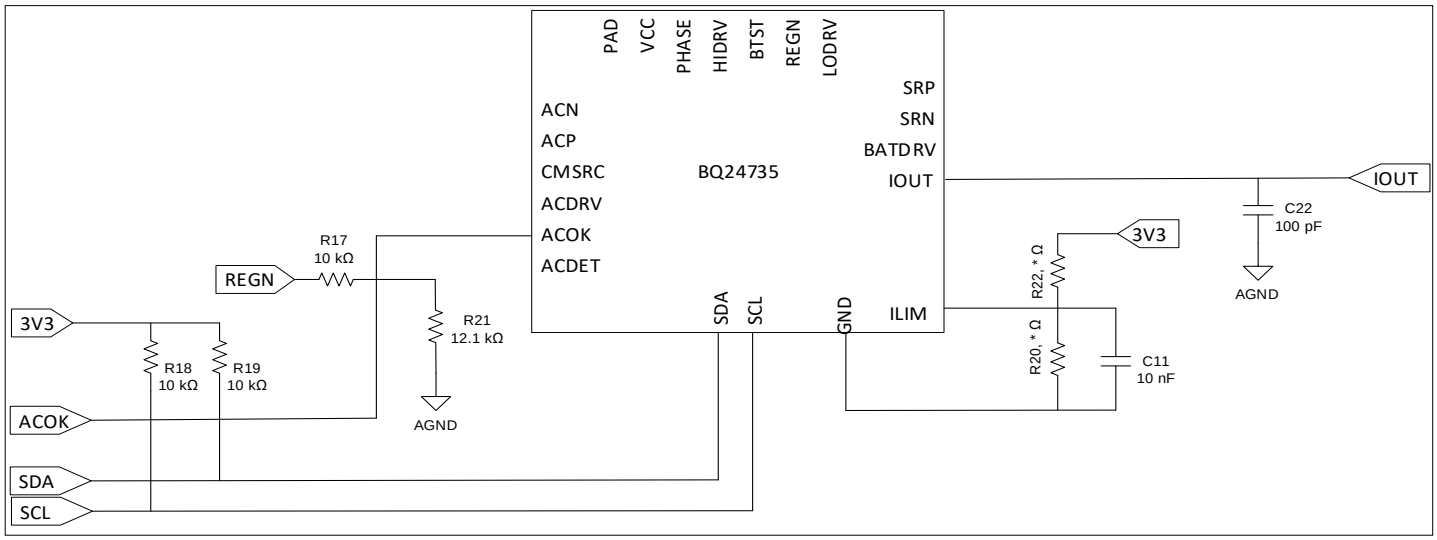
BQ24735 - Output Power Design



OUTPUT POWER - DESIGN CHECKLIST

PIN NAME		REQUIREMENT	COMPONENT	MIN	TYP	MAX	DESCRIPTION	COMMENTS AND RELEVANT EQUATIONS
SYSTEM	-						**System output**	
		Required	C2/C3		20 uF		High frequency converter input capacitor(s)	
		Required	C4/C5		20 uF		Power path noise filtering capacitor(s)	
		Recommended	C9		1 uF		Switching Noise Filtering capacitor	
BATDRV	11						**P-Channel BATFET power path gate driver**	
		Required	Q3		-		External N-Channel BATFET for power path	
		Required	R13		4.02 kΩ		BATDRV current limiting resistor	
		Recommended	C12		0.01 uF		BATFET turn on/off delay capacitor	
Switching Regulator Output Stage	-						**Switching Regulator Output Stage**	
		Required	L1		*uH		Switching regulator inductor	**Recommended: 10 kHz < fo < 20 kHz, typical L= 4.7 uH, C = 20 uF** $f_o = \frac{1}{2 \cdot \pi \cdot \sqrt{L_{out} \cdot C_{out}}}$
		Required	C6/C7		*uF		Switching regulator ouput capacitor(s)	
SRP-SRN	12-13						**Differential charge current sensing**	
		Required	R2 (R_{SR})		10 mΩ		Charge current sensing resistor	
		Recommended	C17		0.1 uF		Differential mode noise filtering	
		Recommended	C19		0.1 uF		Common mode noise filtering	Note: Common mode noise filter is purposefully antisymmetric, i.e. cap on SRN but not on SRP
		Recommended	R24		10 Ω		SRP Current Limiting	
		Recommended	R4		7.5 Ω		SRN Current Limiting	Note: SRP/SRN resistors are purposefully antisymmetric.
REGN	16						**Internal LDO output**	
		Required	C10		1 uF		Internal LDO output stabilizing capacitor	
LODRV	15						**Low-Side N-Channel MOSFET driver**	
		Optional (DNP)	C26		* pF		Low-side FET timing capacitor	make adjustment if needed.
		Required	Q5		-		Converter Low-Side N-Channel MOSFET	
PHASE & BTST	17 & 19							
		Required	C21		0.047 uF		Converter bootstrap capacitor	
		Recommended	R5		20 Ω		Bootstrap capacitor snubbing resistor	
		Optional (DNP)	R_SNUB		* Ω		Switching converter snubber circuit	Snubber circuit values empirically determined if required. Recommend unpopulated footprint on new designs.
			C_SNUB		* uF			
HIDRV	18						**High-Side N-Channel MOSFET driver**	
		Required	Q4		-		Converter active High-Side N-Channel MOSFET	
		Optional (DNP)	C23		* pF		High-Side MOSFET timing capacitor	Slowing MOSFET turn-on/off reduces noise and EMI, but also reduces efficiency. Consider footprint to make adjustment if needed.

BQ24735 - Miscellaneous Components Design



Miscellaneous - DESIGN CHECKLIST								
PIN		REQUIREMENT	COMPONENT	MIN	TYP	MAX	DESCRIPTION	COMMENTS AND RELEVANT EQUATIONS
SDA/SCL	19-20						I2C Pullups	
		Required	R39		10 kΩ		Pull-up resistors to 3.3V	
		Required	R40		10 kΩ			
ACOK	5						ACOK Pullup	
		Required	R11		10 kΩ		ACOK pull-up resistor to 3.3V	
IOUT							Adapter or Charge Current	
	7	Optional	C8		100 pF	100 pF		Float pin if unused
ILIM	21						External Current Limit	$V_{ILIM} = 20 * R_{AC} * I_{ILIM}$
		Required	R20		* Ω		ILIM Resistor divider	
		Required	R21		* Ω		ILIM Resistor divider	
GND & PAD	22 & PAD						IC Ground return	Recommend separate analog and power ground. GND pin 22 connects to analog ground, PAD connects to power ground. Join analog and power ground at single point with 0-ohm resistor, net tie or 10 mil trace
		Required	-		-		IC Ground return	