

LM(2)5088-1/2 Quick Start Component Calculator

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Version 1.1

Note: The components calculated in this worksheet are reasonable starting values for a design using the LM(2)5088. They are not optimized for any particular performance attribute.

Step 1 General Requirements

Enter Design parameters in the shaded Cells

Vin(min)(V)	48
Vin(max)(V)	48
Vout(V)	40
Max. Load Current (A)	6
Ripple Current % of Max. Load Current	95%
Peak-Peak output voltage ripple(mV)	10
Max. output volts deviation(mV)	10

Step 2 Controller Selection

Select the Controller Version
Recommended Device

Step 3 Switching Frequency

Fsw(kHz)	300
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Step 4 Frequency Programming

$R_{RT}(k\Omega)$	20.09
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Step 5 Inductor Value

L(μH)	3.9
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Step 6 Current Limit

Target(% Beyond Max. Load)	10%
Peak Load Current at Current Limit (A)	9.735
Current Sense Resistor (Rs)(mΩ)	2.7

Step 7 Ramp Configuration

$C_{\text{Ramp}}(\text{pF})$	714
$R_{\text{ramp}}(\text{k}\Omega)$	38

Step 8 Output Capacitors

C _{OUT1} (uF)	382
C _{OUT2} (uF)	47
Max. Allowable ESR(mΩ)	2
C _{OUT_TOTAL} (uF)	429

Step 9 Input Capacitors

Input Capacitor $C_{in}(uF)$	10.0
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Step 10 VIN UV Shutdown

Select "Yes" or "No"	Yes
UV Voltage (V)	4.5
Ruv2(kΩ)	54.9
Ruv1(kΩ)	18.43

Step 11 Feedback Resistors

R_{FB1} (k Ω)	1.62
R_{FB2} (k Ω)	52.16

Step 12 Compensation Network

Bandwidth (kHz)	25
$R_{COMP}(k\Omega)$	85.4
$C_{COMP}(pF)$	746
$C_{HF}(pF)$	47

Step 13 Soft Start Capacitor

Soft-Start Time (ms)	2
Soft-Start Capacitor C _{SS} (μF)	0.017

Step 14 C_{BOOT} & VCC Capacitor

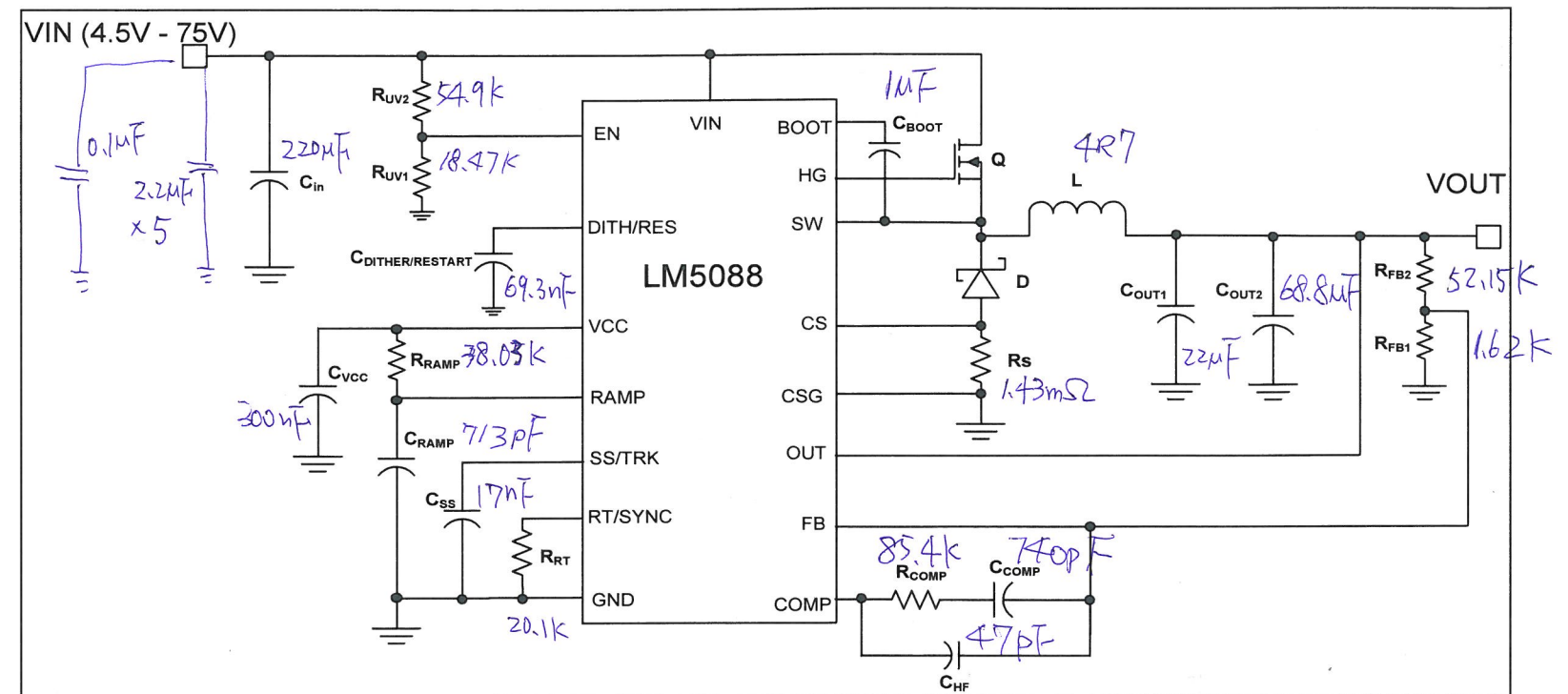
FET total gate charge Q_T (nano Coulombs)	10
C_{BOOT} (nF)	32
C_{VCC} (uF)	0.3

Step 15 Dither Capacitor(LM(2)5088-1)

Cdither(uF)	0.0694
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Step 16 Restart Capacitor(LM(2)5088-2)

NA	NA
NA	NA
NA	NA



LM5088 List of Components

Component	Description	Value	Rating
C_{in}	Input capacitor	5uF	62 V
C_{Ramp}	Ramp capacitor	714pF	5 V
C_{ss}	Soft start capacitor	0.017uF	5 V
C_{OUT1}	Output capacitor	382uF	44 V
C_{OUT2}	Output capacitor	47uF	44 V
C_{COMP}	Compensation capacitor	746pF	44 V
C_{HF}	Compensation capacitor	7pF	44 V
C_{VCC}	VCC bypass capacitor	0.325uF	16V
C_{BOOT}	Highside Bootstrap capacitor	32.468nF	16V
C_{DITHER} (LM(2)5088-1)	Dither Capacitor	0.069uF	5V
$C_{RESTART}$ (LM(2)5088-2)	Hiccup Restart	NA	NA
R_{FB1}	Feedback resistor	1.62 kohm	1/16 W
R_{FB2}	Feedback resistor	52.16 kohm	1/16 W
R_{UV1}	UVLO divider resistor	18.43 kohm	1/16W
R_{UV2}	UVLO divider resistor	54.90 kohm	1/16W
R_s	Sense Resistor	2.73 mohms	1/4 W
R_{RT}	Oscillator Timing resistor	20.09 kohms	1/8 W
L	Inductor	3.90 uH	10.7 A
R_{Ramp}	Optional Ramp resistor	38 kohms	1/16 W
R_{COMP}	Compensation resistor	85 kohm	1/8 W
D	Schottky Diode	Voltage Rating	53 V
Q	MOSFET	Voltage Rating	53 V