MOSFET Application

Chino-Excel Technology Corp.
92, Jian Yi Rd., Chung-Ho Dist.,
Taipei City, Taiwan, R.O.C.

Applications

Adapter

DC Fan

Power Tool

SPS

Lin-Ion Battery

HID Ballast

M/B

N/B

UPS

Power-Inverter

LCD Monitor/TV

Adapter

Chino-Excel Technology Corp.
92, Jian Yi Rd., Chung-Ho Dist.,
Taipei City, Taiwan, R.O.C.

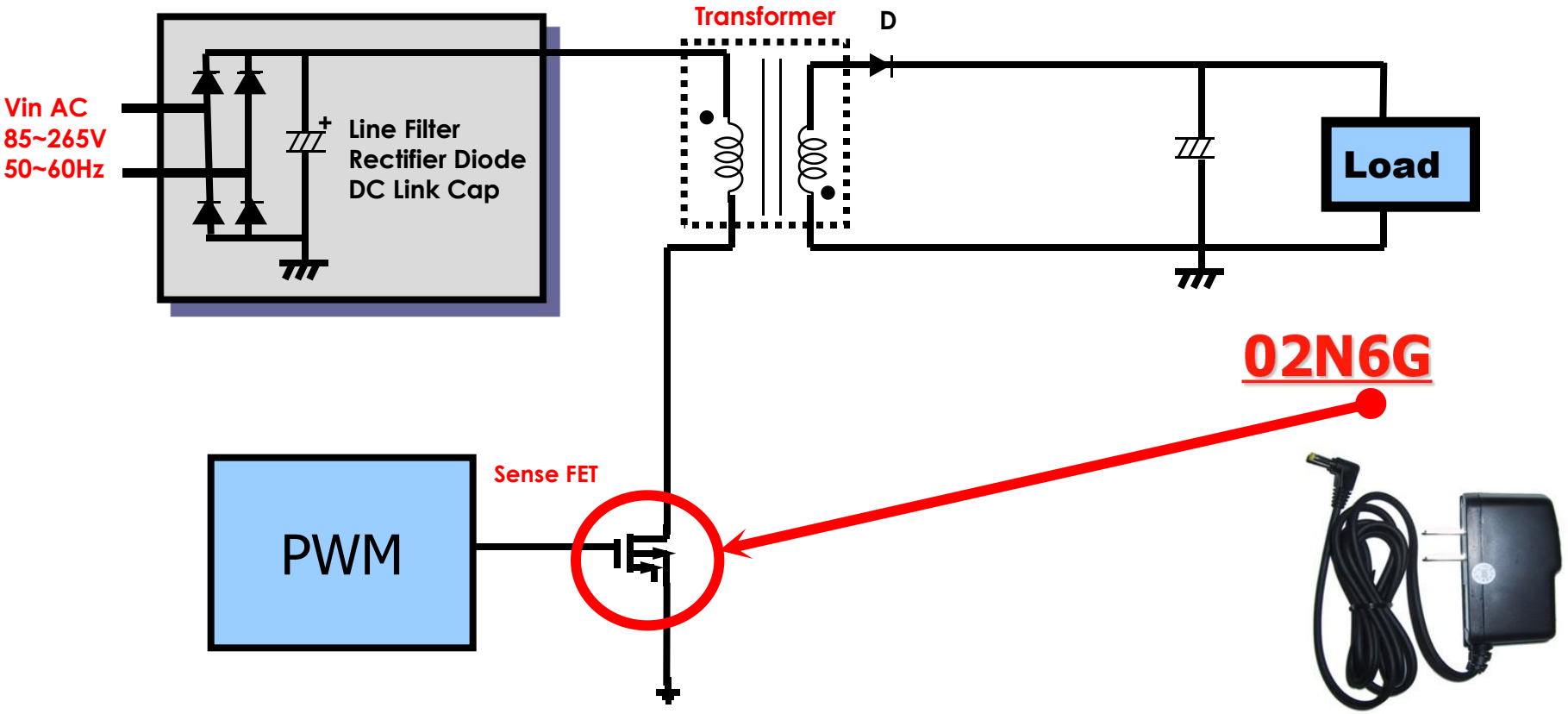
OVERVIEW

*Adapter Block diagram

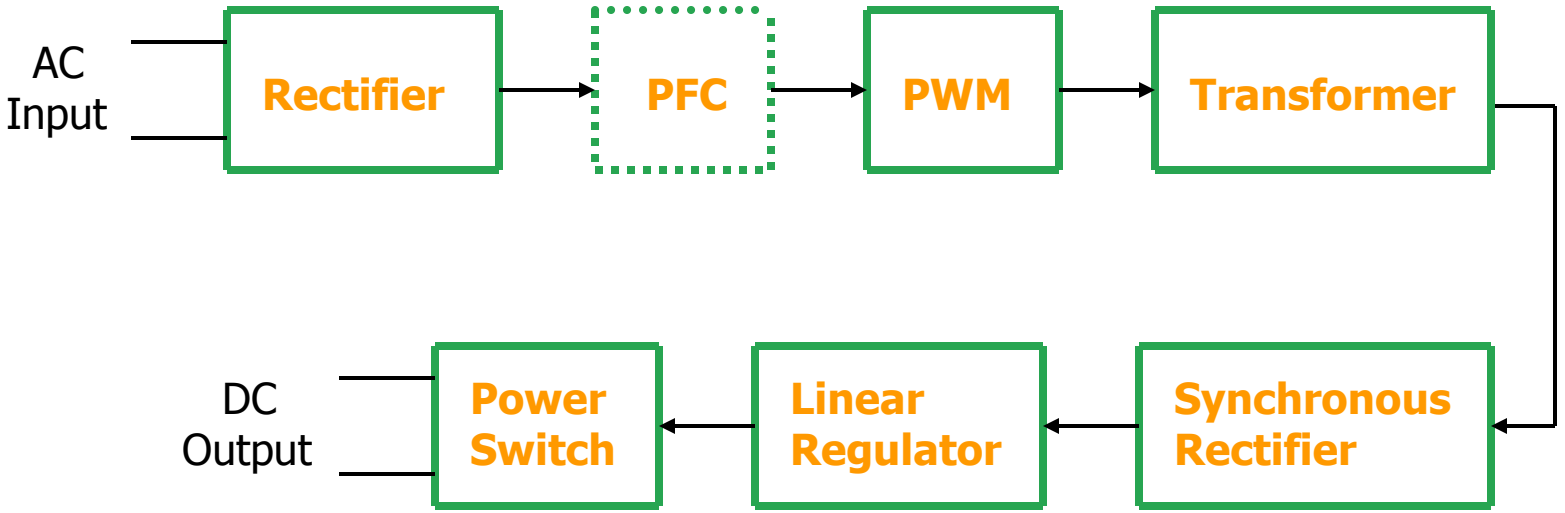
*Referenced Circuit

*MOSFET Selection Guide

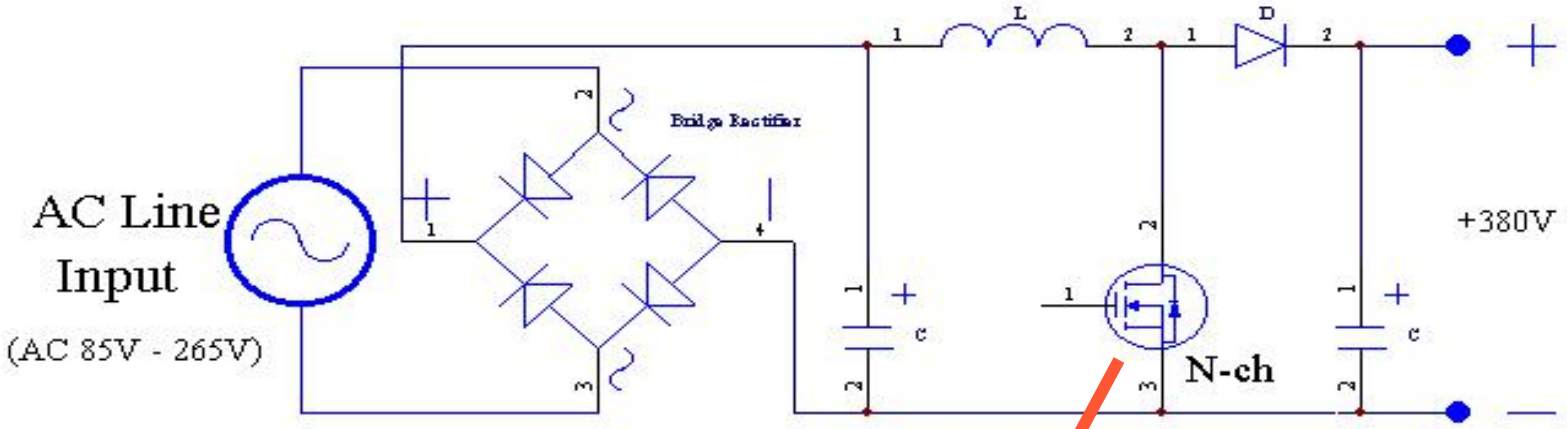
Adaptor Application



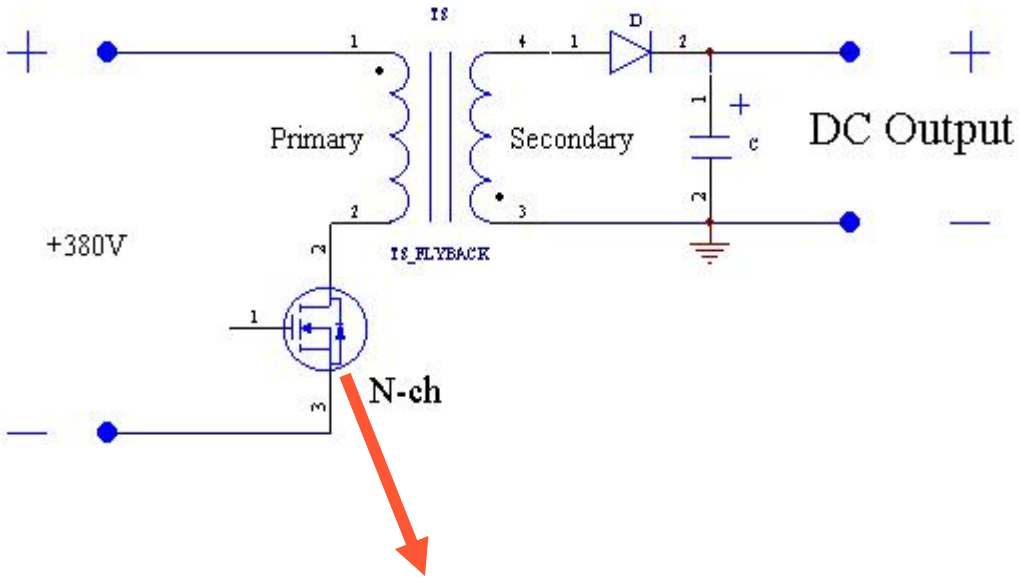
Block Diagram of Adapter



Application of Active PFC

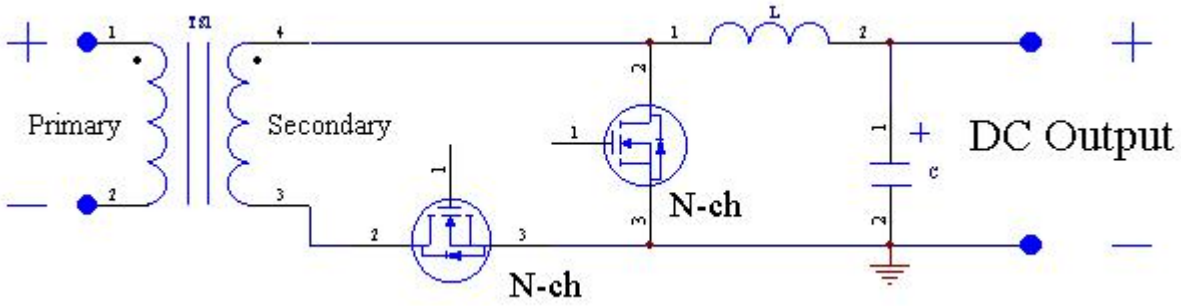


Application of PWM



01N65A, 04N7G, 02N7G,07N7, 09N7G, 10N6,12N6
02N6G , 05N65, 07N65,07N65A

Synchronous Rectifier



75N06G, 60N06G, 85N75, 60N10

Products Use for Adaptor

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	PACKAGE
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEP740G	N	400	550		10	125	35.6		3.1	Single	TO-220
CEP840A	N	500	850		7.5	125	33		3.1	Single	TO-251
CEP840G	N	500	850		8	125	33		3.1	Single	TO-220
CEP12N5	N	500	540		12	166	44.1		3	Single	TO-220
CEP14N5	N	500	380		14	178	50		3	Single	TO-220
CED02N6A	N	600	8500		1.3	35.7	9		3	Single	TO-251
CEP02N6G	N	600	5000		2.2	60	6.8		3.4	Single	TO-220
CEP10N6	N	600	750		10	166	44		3	Single	TO-220
CEP12N6	N	600	650		12	250	51		3.5	Single	TO-220
CED01N65A	N	650	15000		0.9	43	10		3.1	Single	TO-251
CED07N65A	N	650	1450		6	107	27		3	Single	TO-251
CEP05N65	N	650	2400		4.5	84	13		3.7	Single	TO-220
CEP07N65	N	650	1300		7	166	32.9		3.1	Single	TO-220
CEP02N7G	N	700	6750		1.9	60	7.5		3.3	Single	TO-220
CEP04N7G	N	700	3300		4	84	14		3	Single	TO-220
CEP09N7G	N	700	1000		9	166	46		3.5	Single	TO-220
CEP3205	N	55	8.5		108.5	200	102.3		3	Single	TO-220
CEP9060N	N	55	10.5		90	166	68.1		2.9	Single	TO-220
CEP6060N	N	60	25		42	88	28.7		2.8	Single	TO-220
CEP60N06G	N	60	16		60	125	52		2.8	Single	TO-220
CEP75N06	N	60	12		75	125	67.9		2.8	Single	TO-220
CEP85N75	N	75	12		86	200	90		3	Single	TO-220
CEP60N10	N	100	24		57	200	65		2	Single	TO-220

MOSFET for Battery pack

Chino-Excel Technology Corp.
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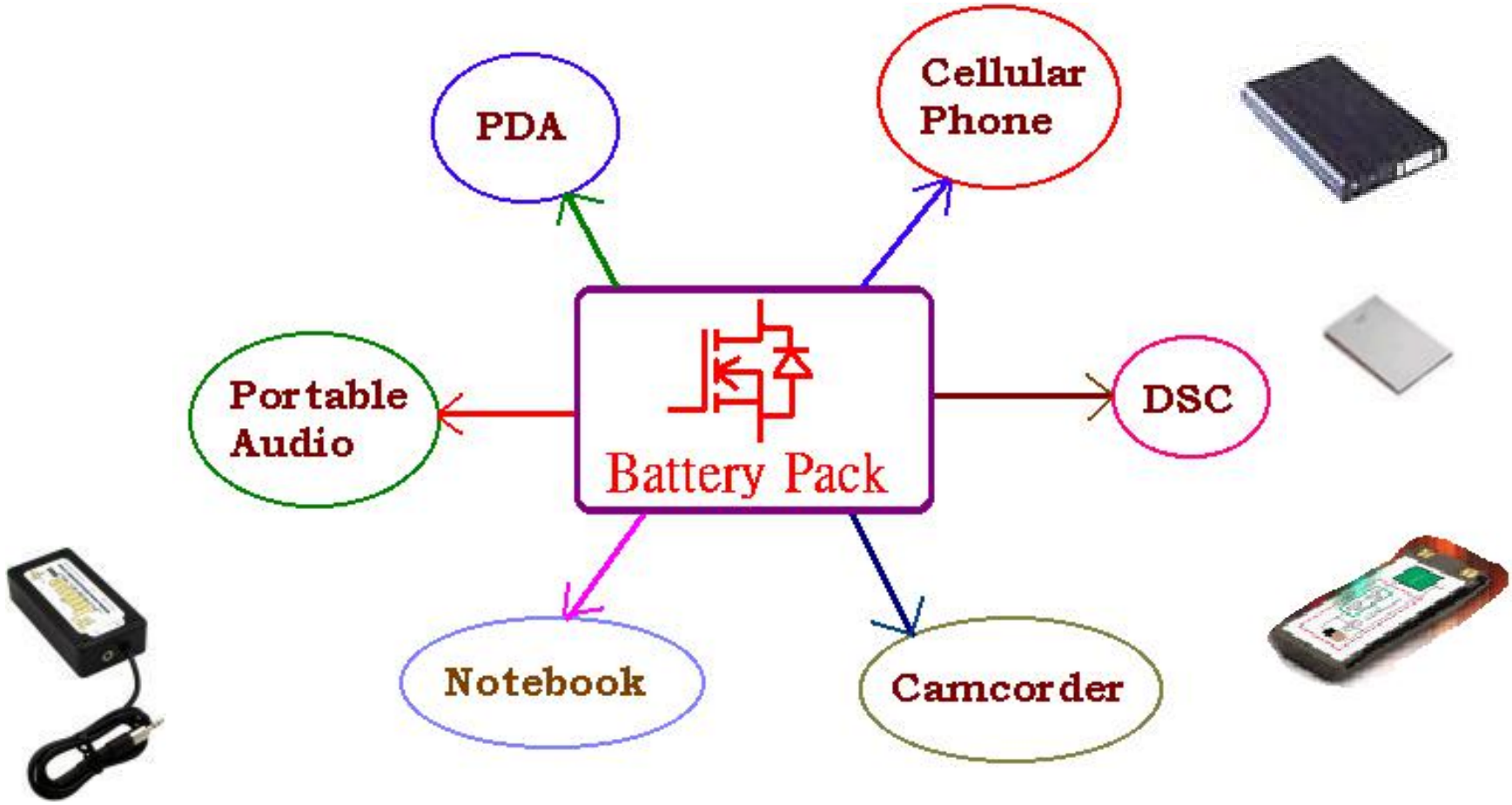
Taipei City, Taiwan, R.O.C.

MOSFET for Battery



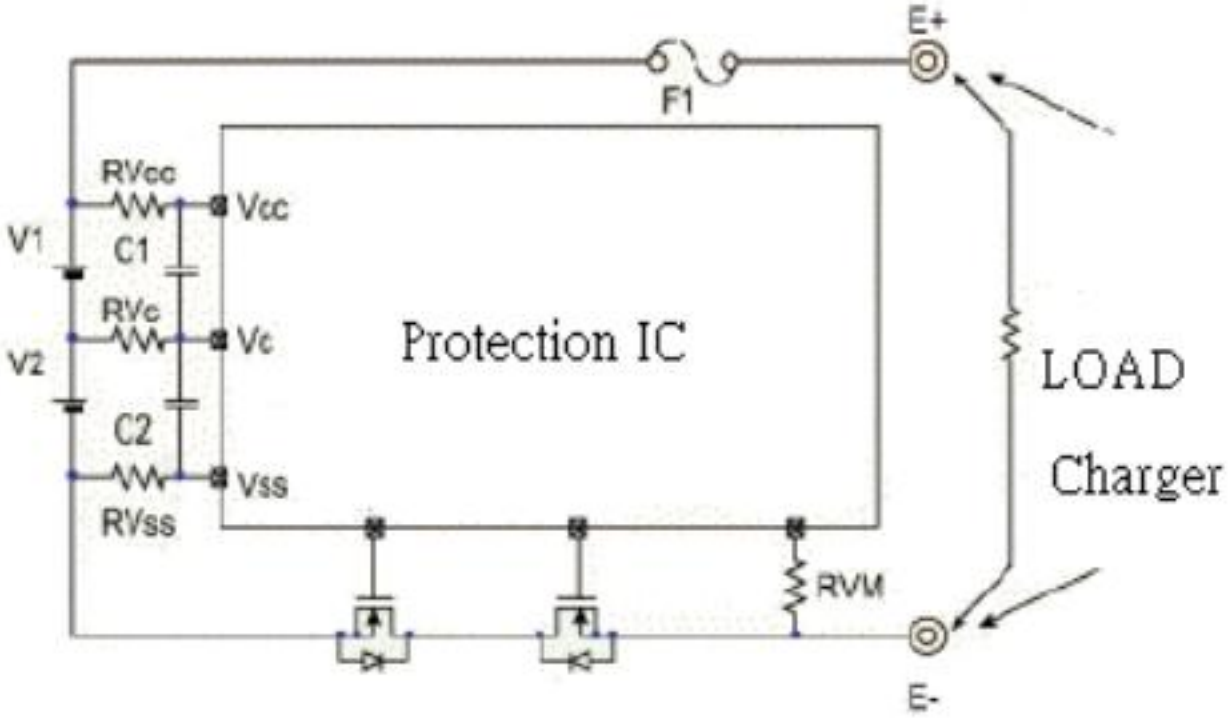
OVERVIEW

- Li-ion Battery pack
- Application circuit type
- Function Block
- MOSFET Selection
- Battery Protector

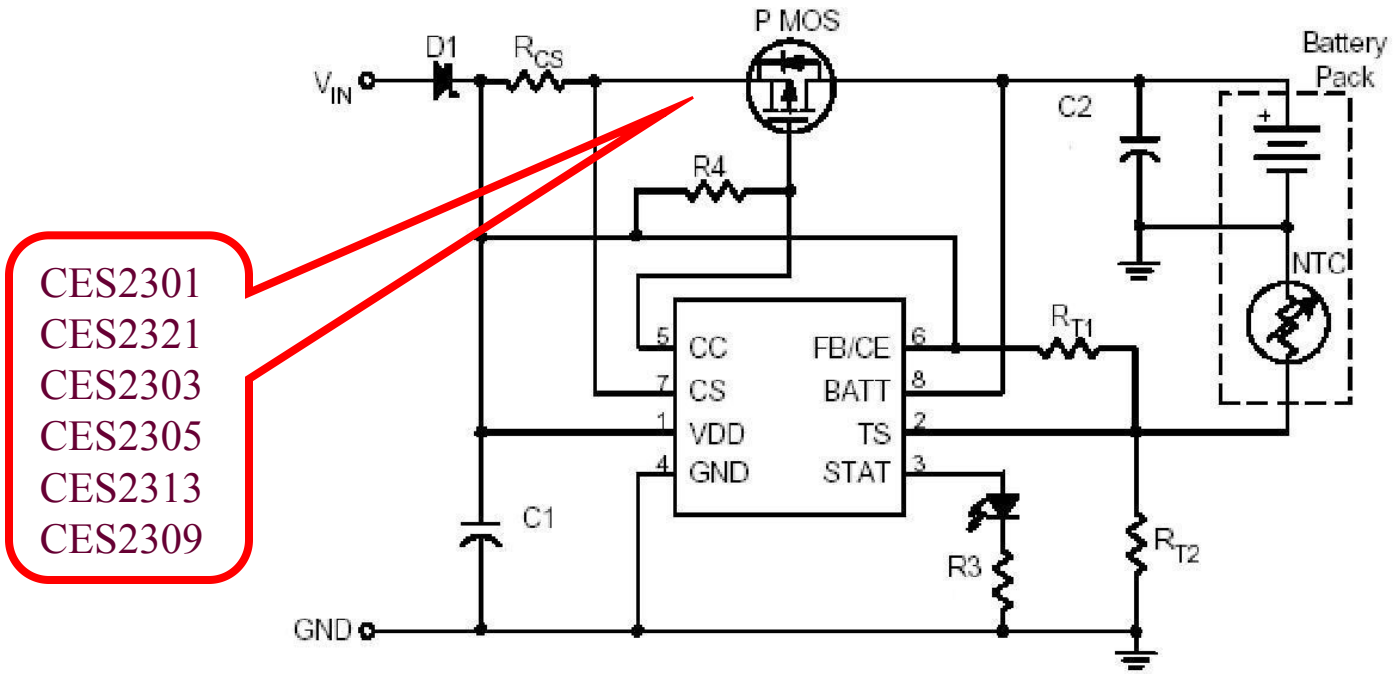
Li-Ion Battery

Voltage(V)	Application
3.6V	Mobile telephone PDA MD….
7.2V /14.4V	VTR , Handheld Device
10.8V /14.4V	Notebook ….

Application Circuit Type-I



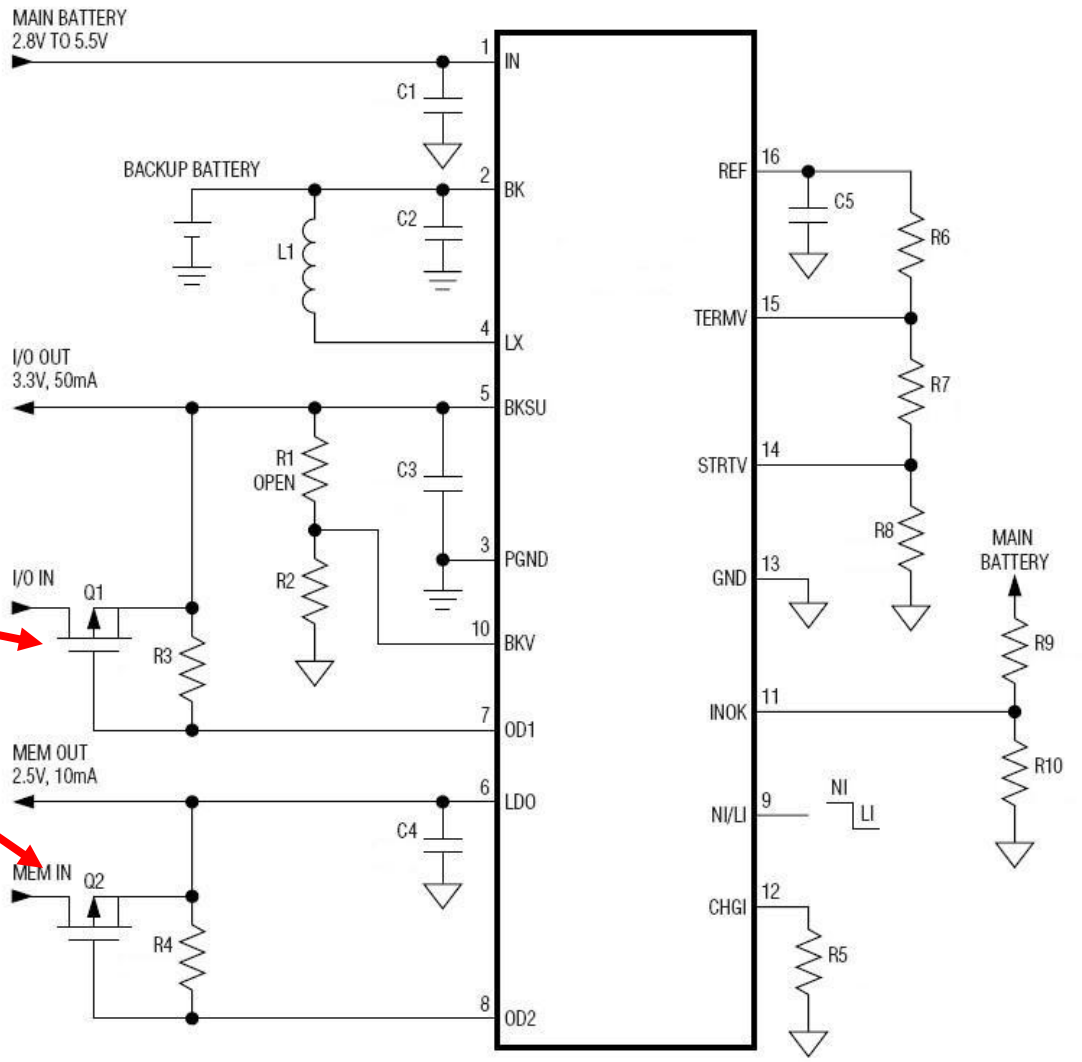
Application Circuit Type-II



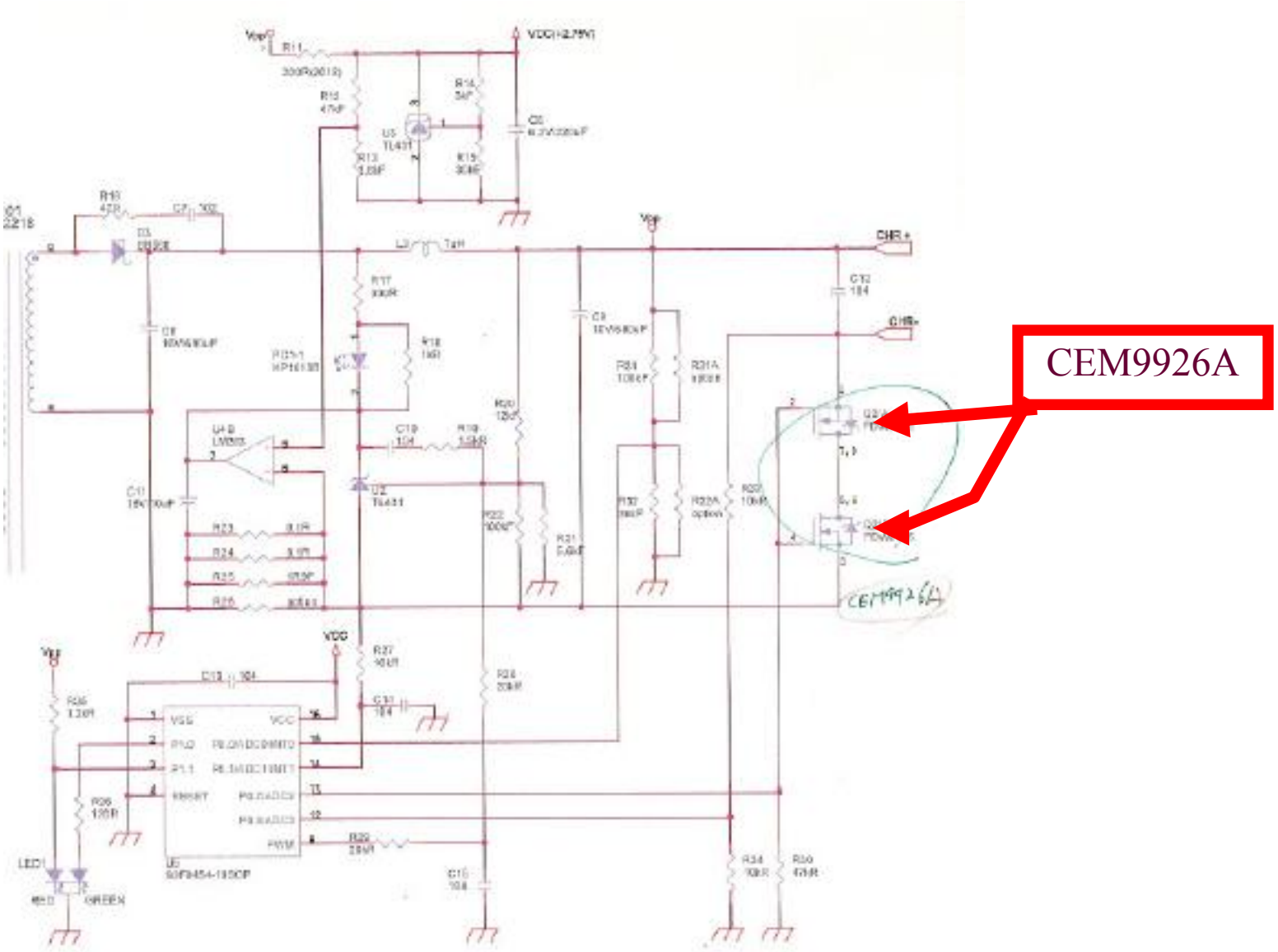
Application Circuit Type-III

Power Management IC
(Li-Ion Battery & Ni-MH Battery)

CES2301
CES2321
CES2303
CES2305
CES2313
CES2309



Application Circuit Type-VI

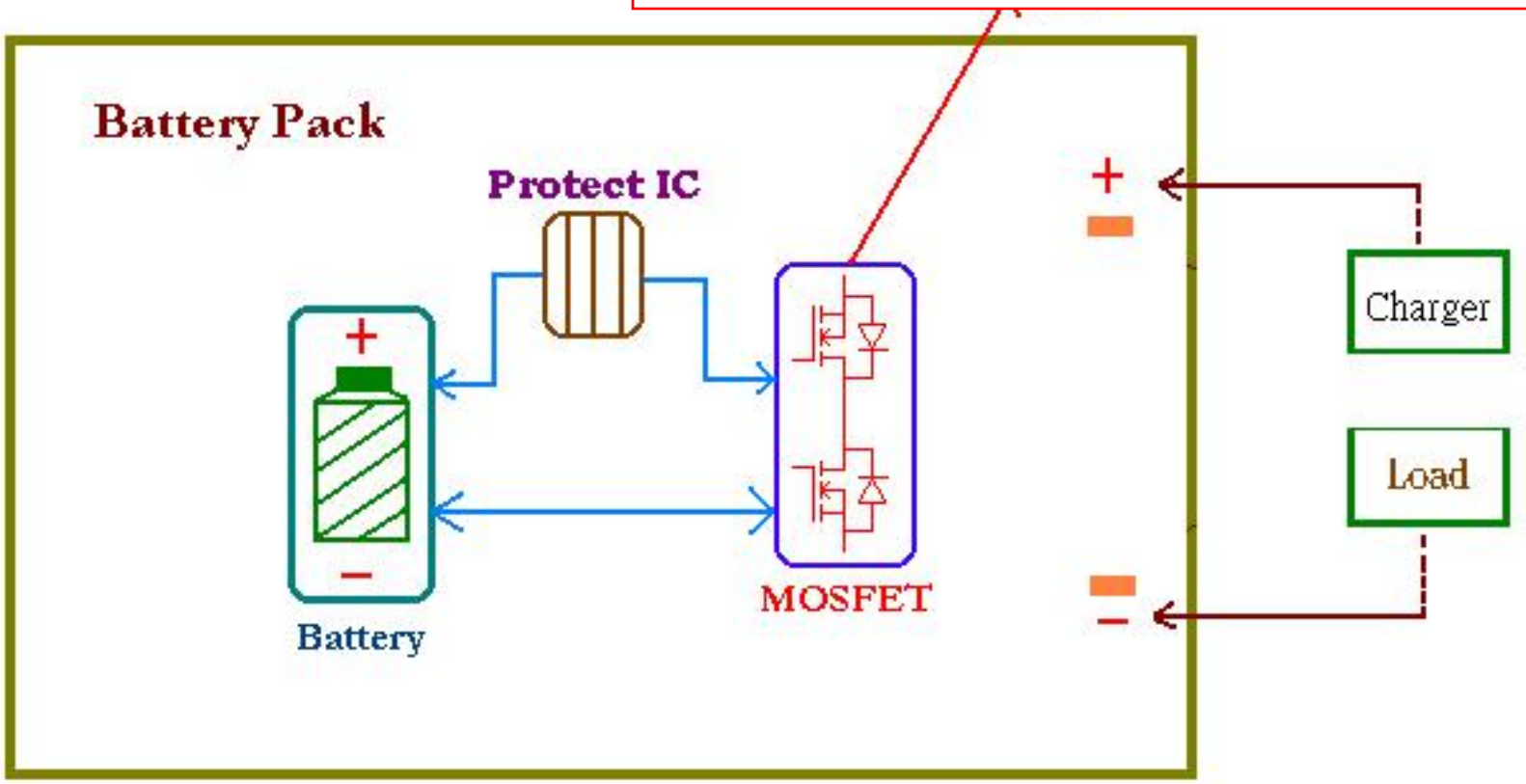


Block Diagram

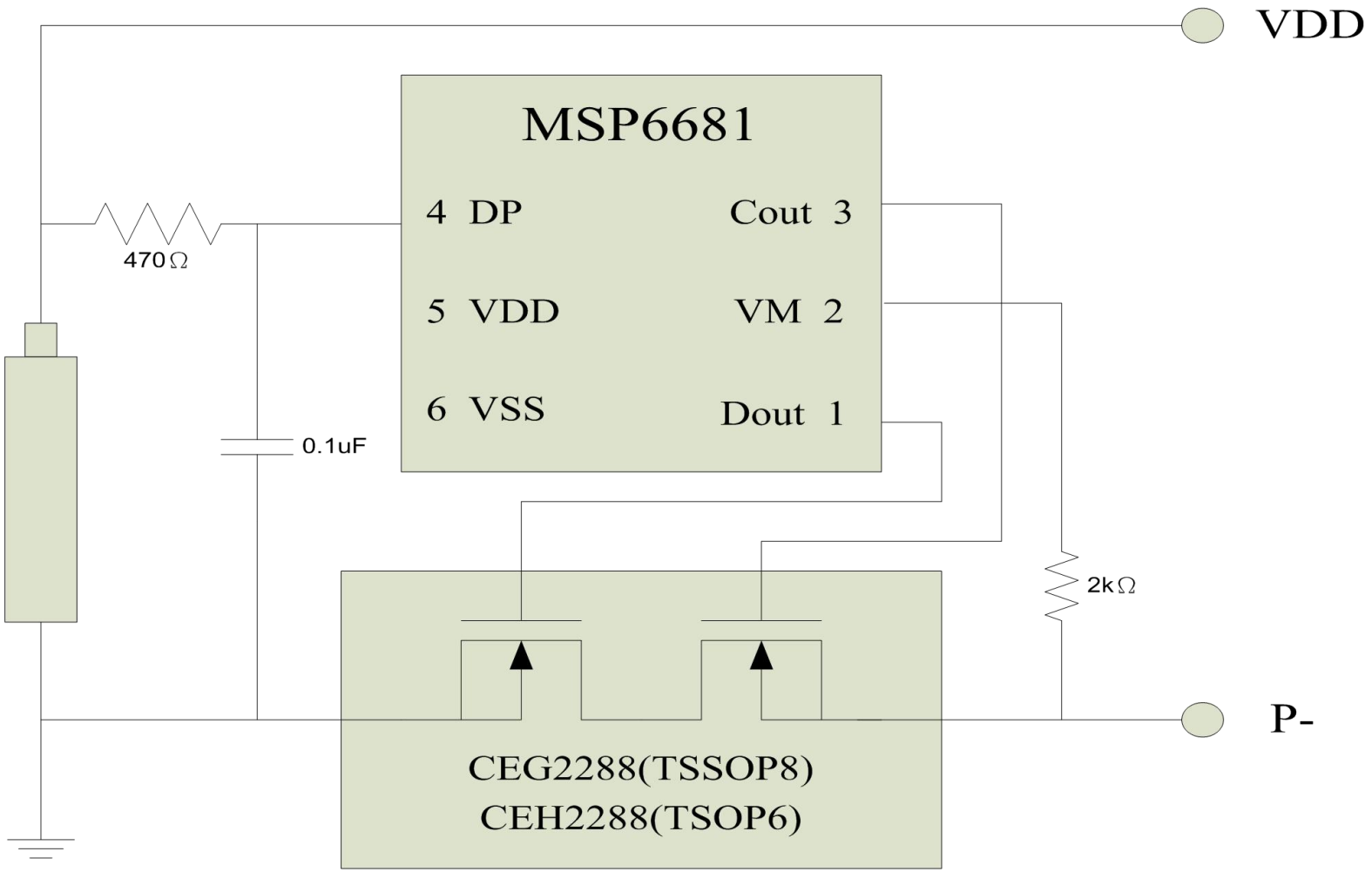
CEM9926A /CEM9935A /CEH2288

/CEG8205 /CEG8205A /CEG8208

/CEM8208 /CEM8809/CEC2288



1 Cell battery pack



Products Use for Battery

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)	
CEM9926A	N	20		27	6	2		6.8	0.7	Dual
CEM8208	N	20		22	6.5	1.5		4.3	0.7	Dual
CEM9935A	N	20	36	42	6	2		11	1	Dual
CEM8809	N	30	6.2	9	16	2.5	72		1.7	Single
CEG8205	N	20		30	4.5	1		10	0.7	Dual
CEG8205A	N	20		25	6	1.5		6.8	0.7	Dual
CEG2288	N	20		24	6.2	1.5		8.2	0.7	Dual
CEG8208	N	20		22	6.5	1.25		4.3	0.7	Dual
CEC8218	N	20		23	6.5	1.5		4.2	0.7	Dual
CEC2288	N	20		26	5.2	1.14		8.2	0.7	Dual
CEH2288	N	20		26	5.2	1.14		8.2	0.7	Dual
CES2308	N	20		27	5.4	1.25		4.3	0.7	Single
CES2312	N	20		33	4.5	1.25		10	0.7	Single
CES2324	N	20		45	4.2	1.25		10	0.7	Single
CES2302	N	20		72	3	1.25		6	1	Single
CES2320	N	30	29	45	5.2	1.25			1.6	Single
CES2310	N	30	33	38	4.8	1.25		9	1	Single
CES2316	N	30	34	50	4.8	1.25	12.3		1.6	Single
CES2314	N	30	50	70	4	1.25		5.3	1.6	Single
CES2321	P	-20		55	-3.8	1.25		13	-0.7	Single
CES2301	P	-20		100	-2.8	1.25		11	-0.7	Single
CES2309	P	-20		165	-2.2	1.25		6.2	-0.7	Single
CES2331	P	-20		48	-4.2	1.25		13	-0.7	Single
CES2305	P	-30	55	70	-4	1.25		8.4	-1.1	Single
CES2313A	P	-30	55	86	-3.8	1.25	13		-1.6	Single
CES2323	P	-30	48	80	-4.1	1.25	13.8		-1.6	Single
CES2303	P	-30	200	320	-1.9	1.25	6		-1.5	Single

MOSFET for DC FAN

Chino-Excel Technology Corp.
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Taipei City, Taiwan, R.O.C.

DC Fan

OVERVIEW

1. DC fan frequency :us~ms Level

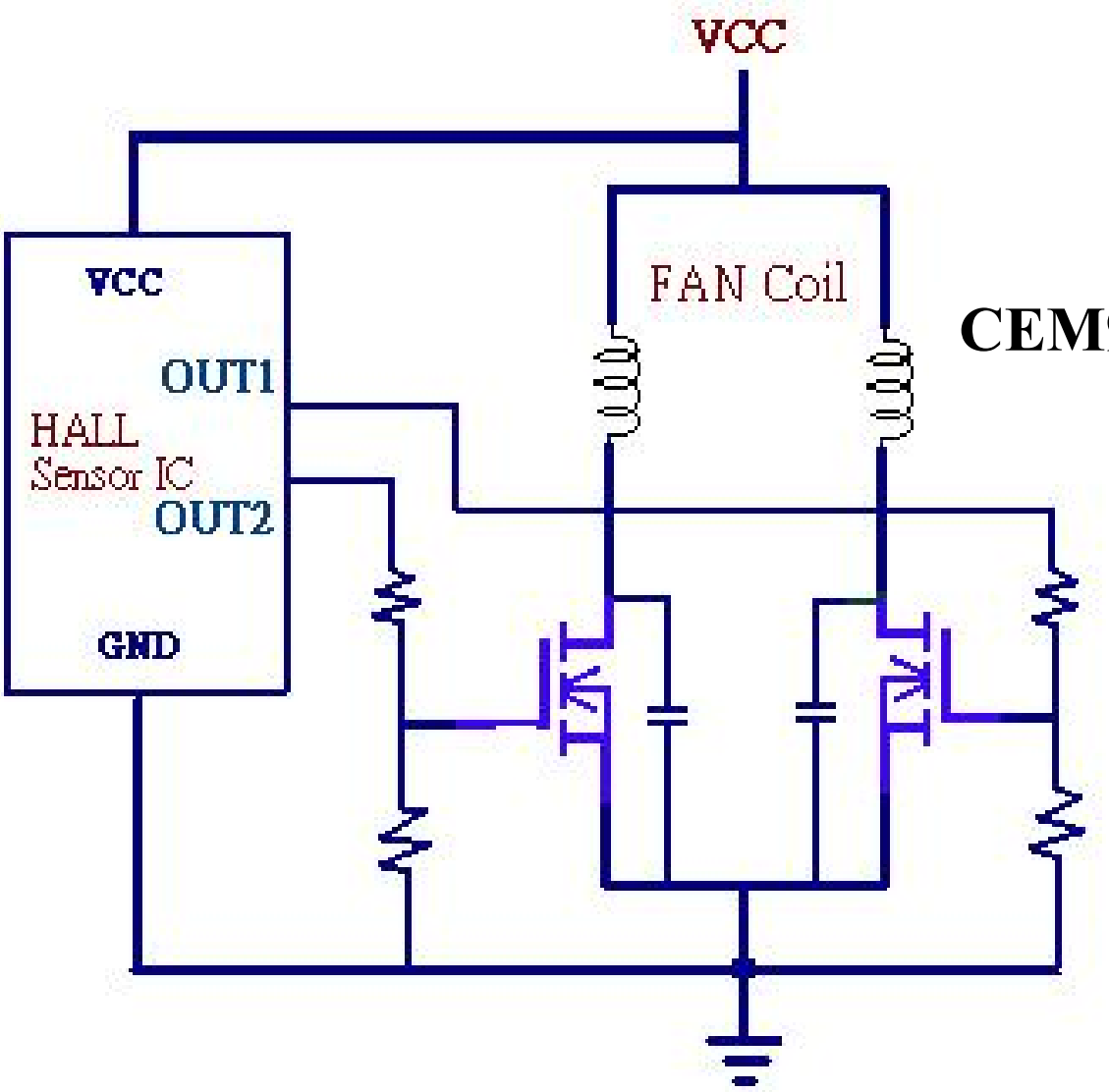
2. DC Motor/48v Vertical Fan /Fan for car

3. Thermal:Approximate 90deg~110deg

4. Controller Device: Hall IC / micron …

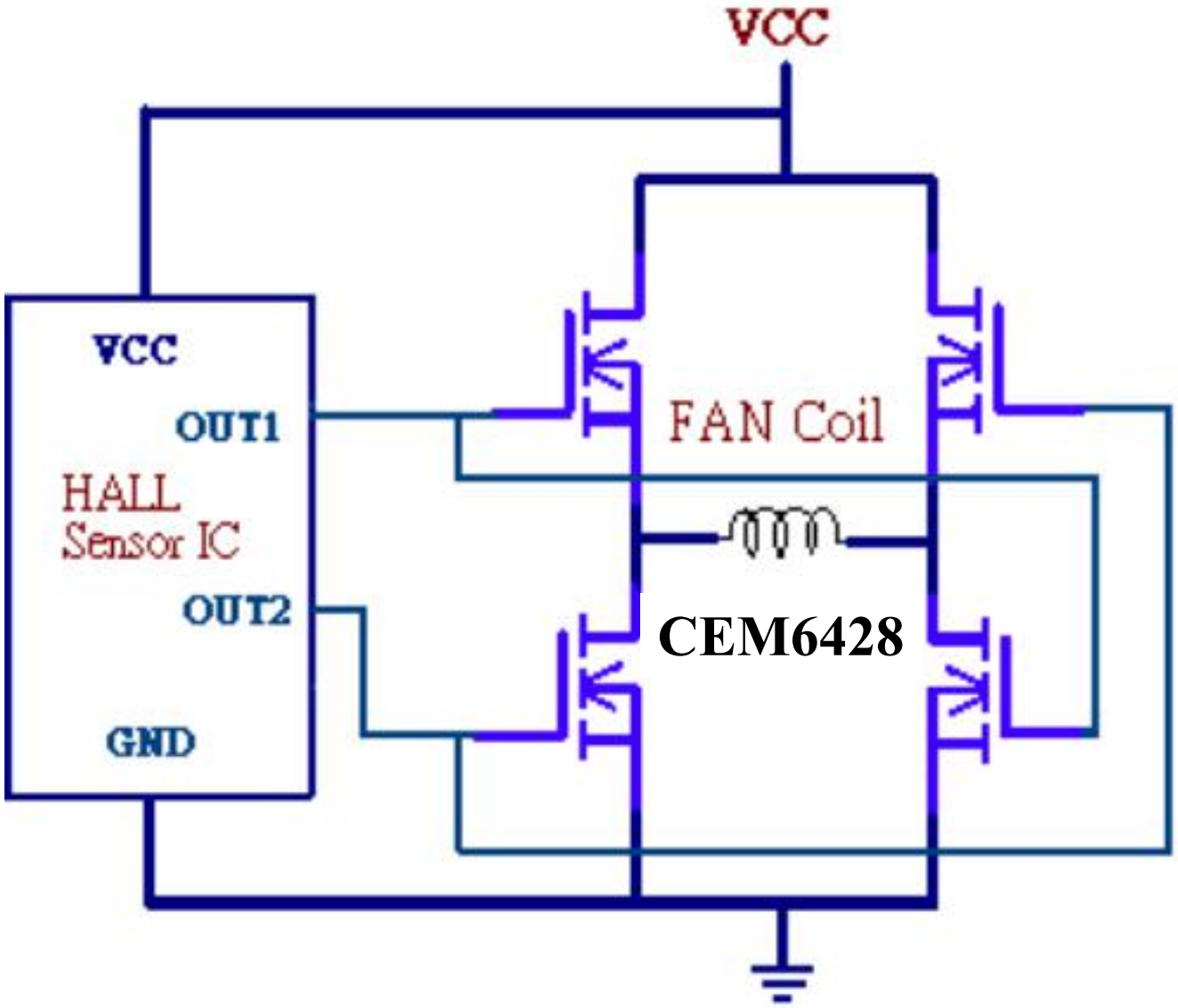
5. The driver usually have a 4ea MOS of One DC FAN

Application circuit type-I

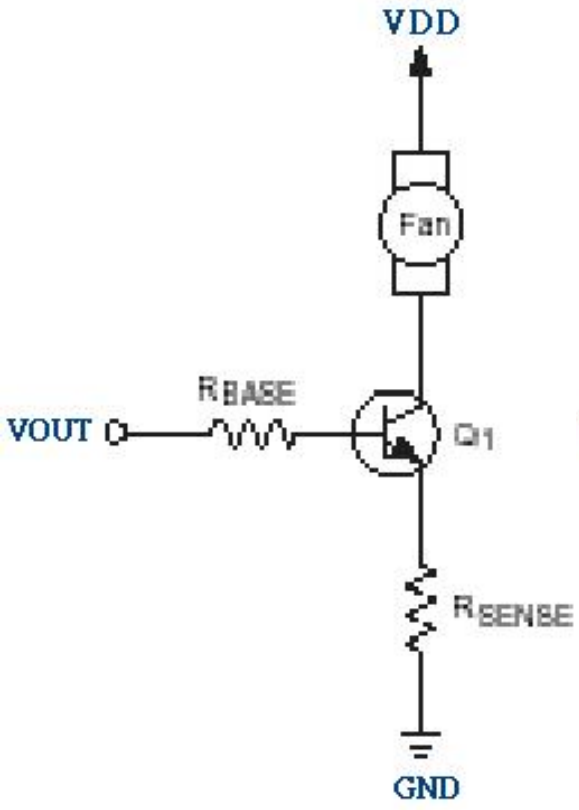


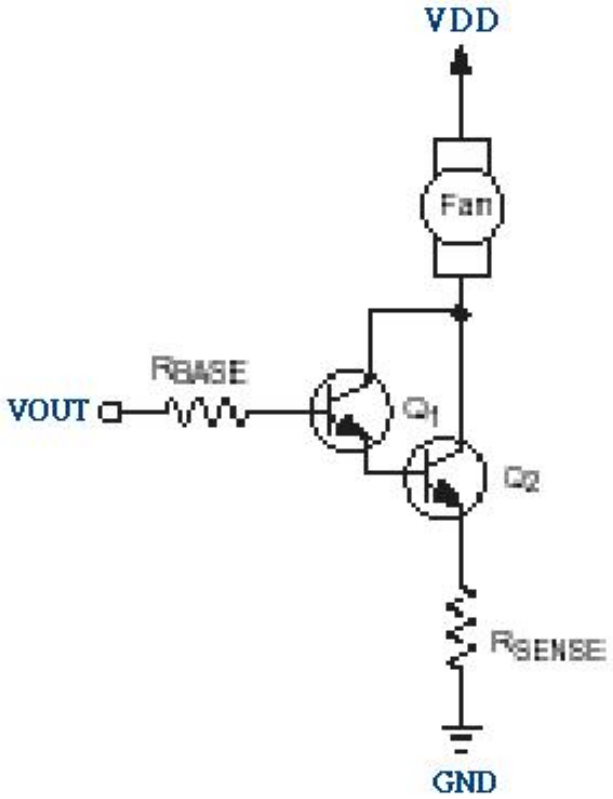
CEM9926A

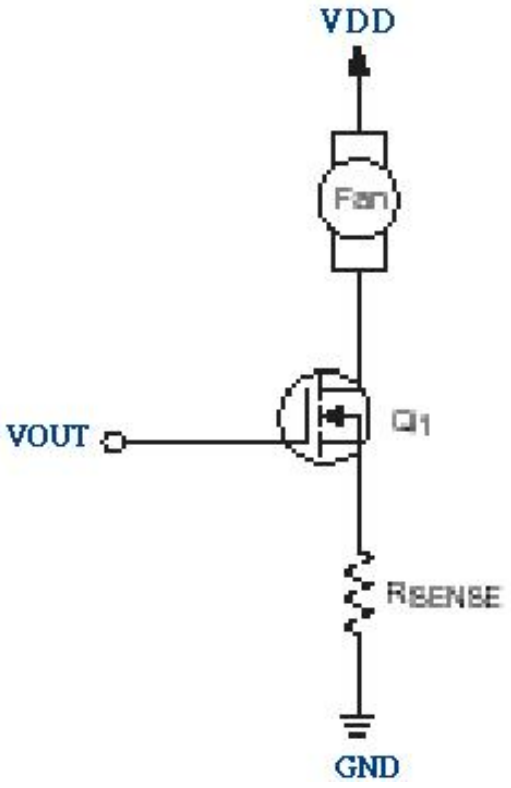
Application circuit type-II



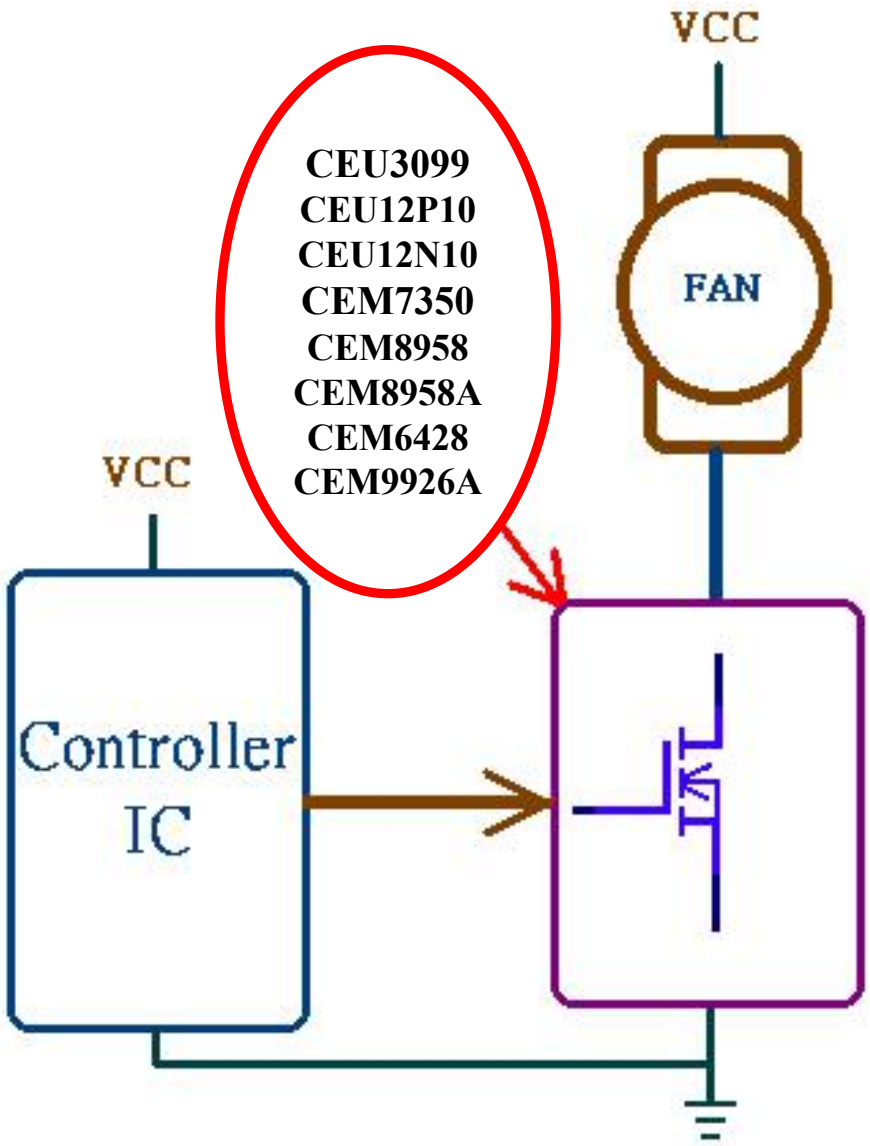
Application circuit type-III







Block Diagram



Products Use for DC FAN

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	Package
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEM9926A	N	20		27	6	2		6.8	0.7	Dual	SO-8
CEM3258	N	30	28	40	7	2	12.3		1.6	Dual	SO-8
CEM4308	N	40	38	50	5.8	2		6.6	2	Dual	SO-8
CEM4228	N	40	30	45	6.3	2	13		1.6	Dual	SO-8
CEM6188	N	60	26	35	7.3	2			1.5	Dual	SO-8
CEM6428	N	60	60	80	4.3	2	13.2		1.57	Dual	SO-8
CEM8958	N	30	28	40	7	2	12.3		1.5		SO-8
	P	-30	28	42	6.8	2	7.1		1.5		
CEM8958A	N	30	58	85	-4.8	2	9.3		-1.5		SO-8
	P	-30	52	80	-5.2	2	11		-1.7		
CEM8968	N	30	28	40	7	2	12		1.5		SO-8
	P	-30	33	52	-6.2	2	18.7		-1.7		
CEM3259	N	30	22	33	7.6	2	13		1.5		SO-8
	P	-30	36	52	-5.9	2	20		-1.7		
CEM7350	N	100	190		2.6	2	9		3.4		SO-8
	P	-100	320		-2	2	14		-2.9		
CEM6659	N	60	68	86	4.1	2	13		1.6		TO-252 (4 PIN)
	P	-60	130	170	-3.1	2	11		-1.9		
CEU3099	N	30	10	17	26	12.5	22		1.8		TO-252 (4 PIN)
	P	-30	20	30	-19	12.5	19		-1.9		
CEU12N10	N	100	180		11	43	8		2.7	Single	SO-8
CEU12P10	P	-100	315		-9	50	13		-2.9	Single	SO-8

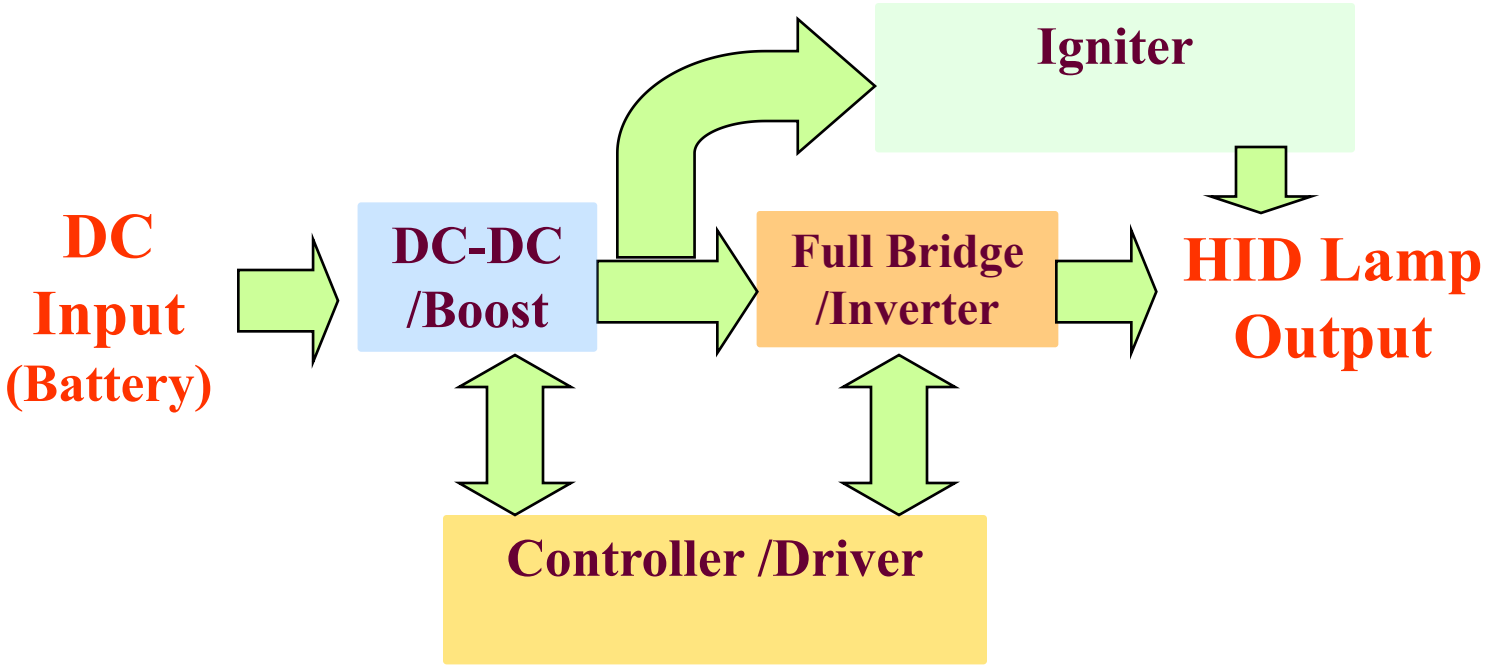
MOSFET for HID Ballast

Chino-Excel Technology Corp.
92, Jian Yi Rd., Chung-Ho Dist.,
Taipei City, Taiwan, R.O.C.

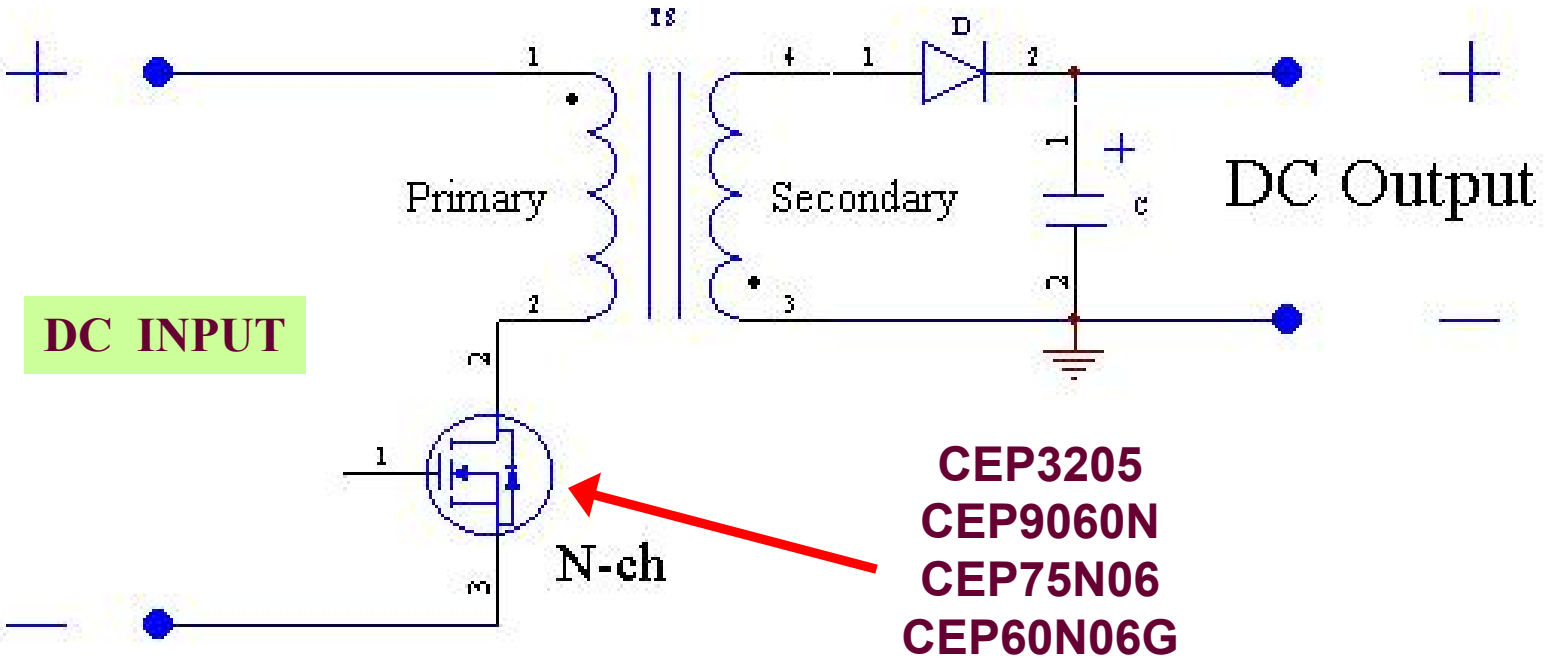
OVERVIEW

- HID Ballast Block Diagram
- DC-DC BOOST Diagram
- INVERTER Diagram
- MOSFET Selection Guide

HID Ballast Block diagram

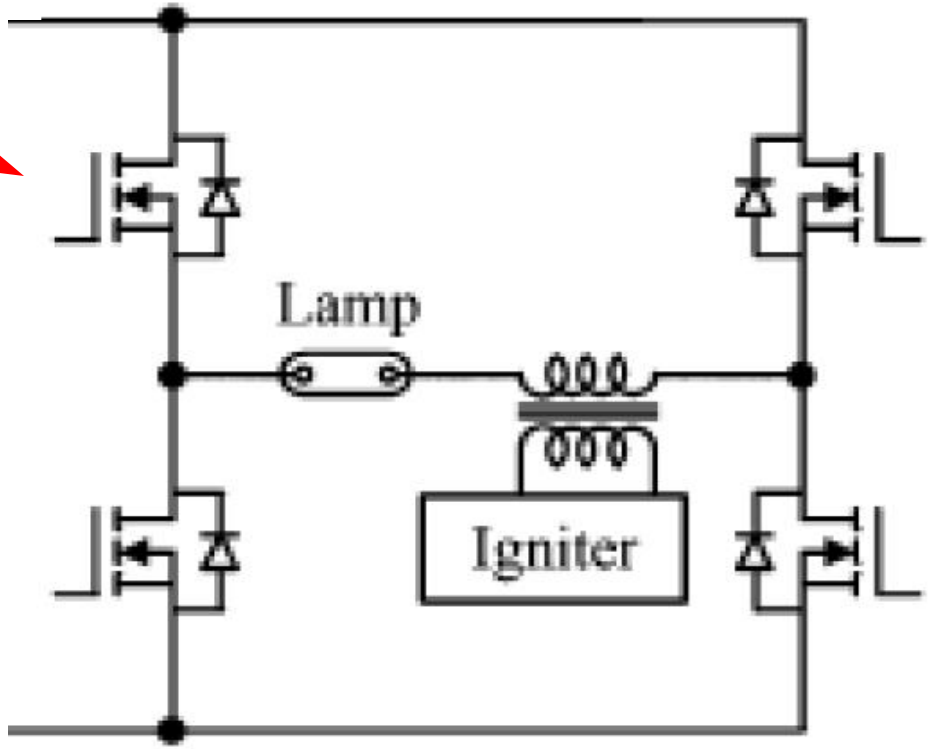


DC-DC BOOST Diagram



INVERTER Diagram

840G , 07N65, 10N6
12N5 ,12N6



Products Use for HID Ballast

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	Package
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEP3205	N	55	8.5		108.5	200	102.3		3	Single	TO220
CEP9060N	N	55	10.5		90	166	68.1		2.9	Single	TO220
CEP75N06	N	60	12		75	125	67.9		2.8	Single	TO220
CEP60N06G	N	60	16		60	125	52		2.8	Single	TO220
CEP6056	N	60	6.2		100	125	77		2.8	Single	TO220
CEP60N10	N	100	24		57	200	65		2	Single	TO220
CEP50N10	N	100	30		50	136	49		3.8	Single	TO220
CEP840G	N	500	850		8	125	33		3.1	Single	TO220
CEP12N5	N	500	540		12	166	44.1		3	Single	TO220
CEP14N5	N	500	380		14	178	50		3	Single	TO220
CEP10N6	N	600	750		10	166	44		3	Single	TO220
CEP12N6	N	600	650		12	250	51		3.5	Single	TO220
CEP10N65	N	650	850		10	200	44		3.1	Single	TO220
CEP07N65	N	650	1300		7	166	32.9		3.1	Single	TO220

LCD Monitor / TV

Chino-Excel Technology Corp.
92, Jian Yi Rd., Chung-Ho Dist.,
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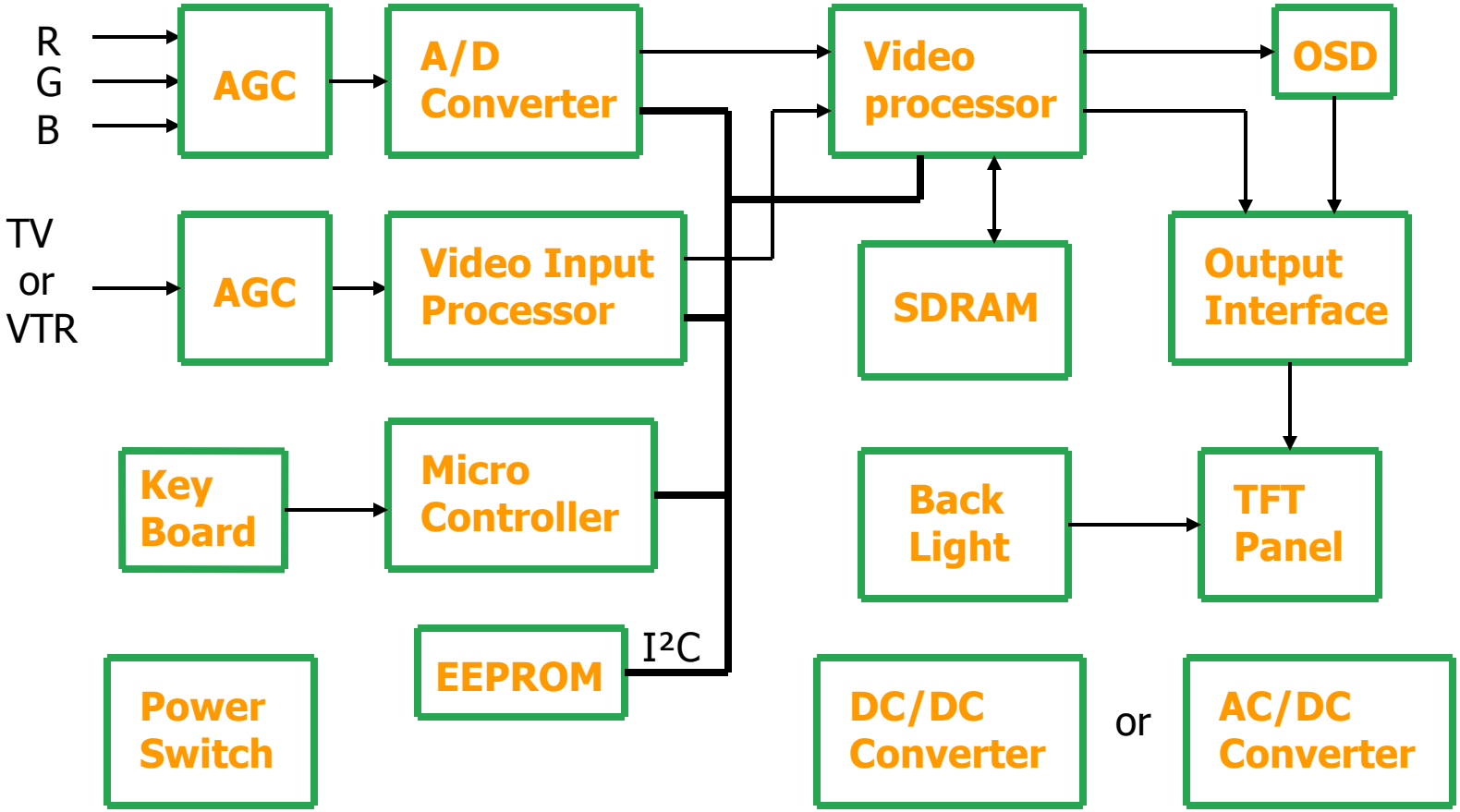
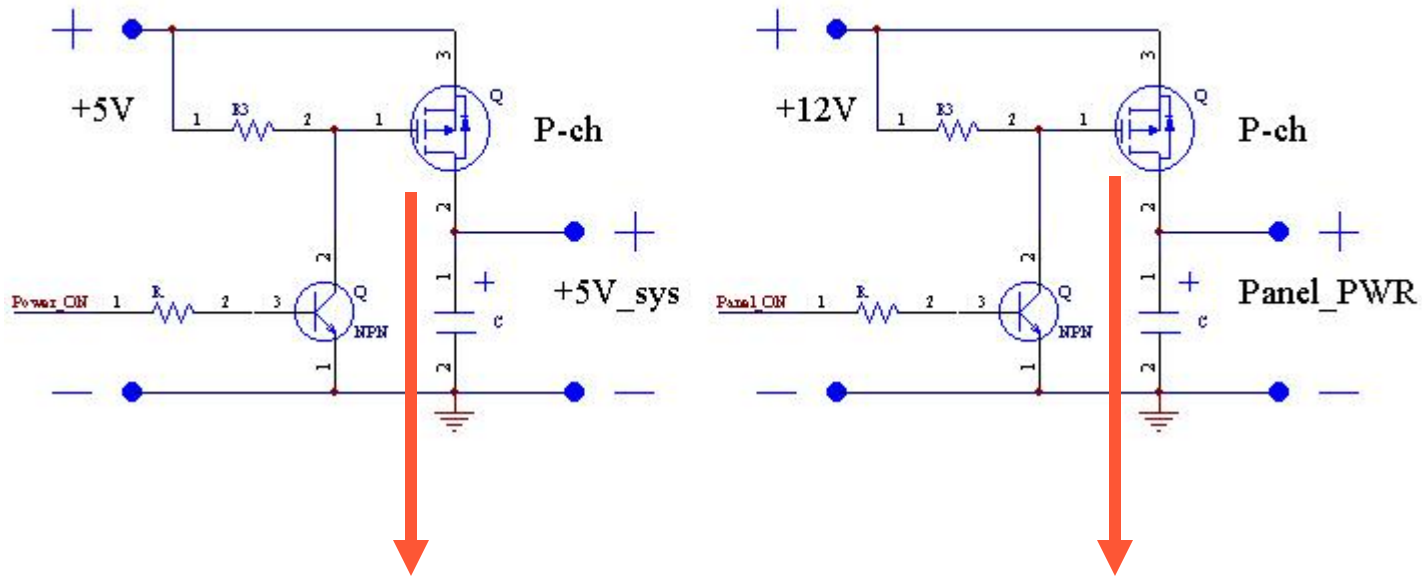
Block Diagram

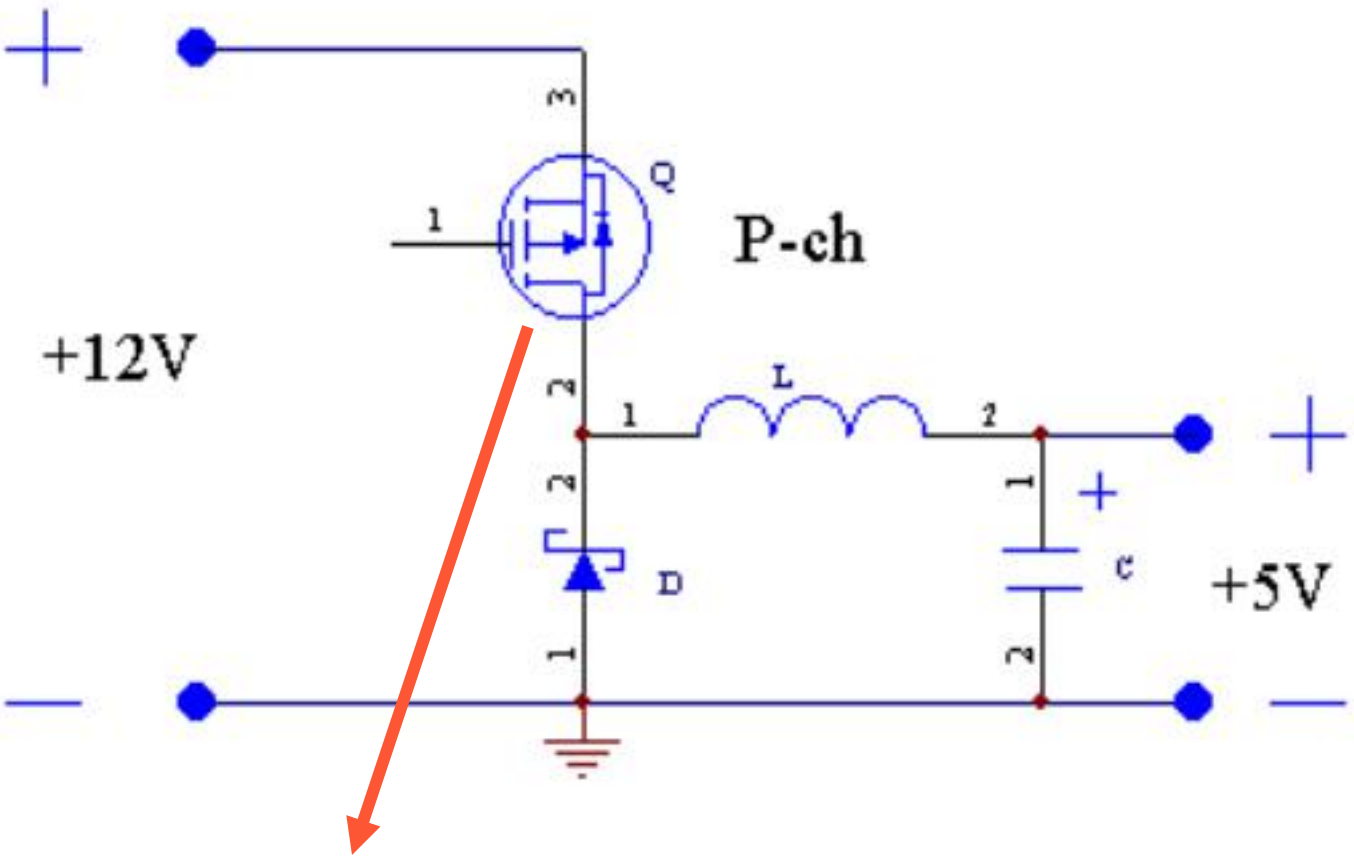


Power Switch



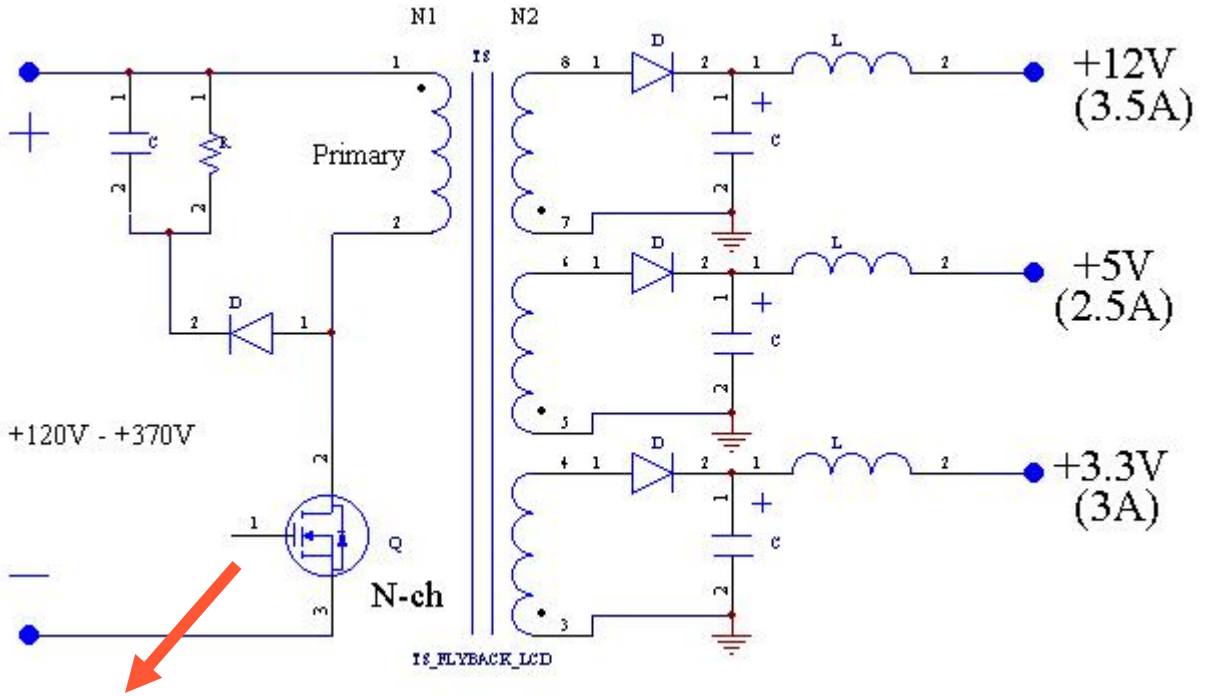
CEM3301, CEM9435A, CEM4953 , CEM4953A

DC-DC Converter



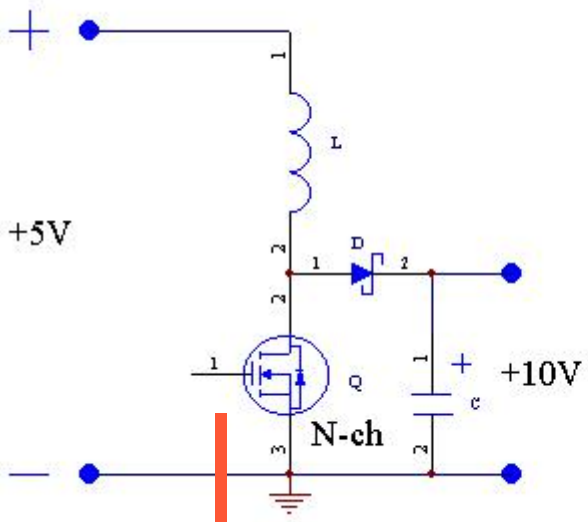
CEM4435A, CEM4311, CEM3301, CEM9435A

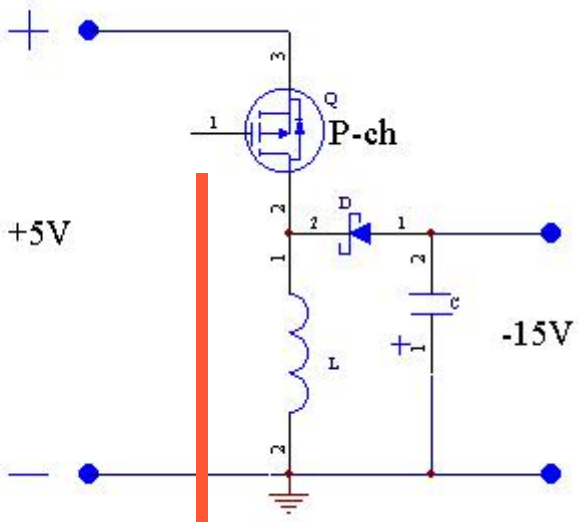
AC/DC Converter



10N6,12N6, 10N65, 12N65, 09N7G ,08N8 , 09N9

TFT Panel

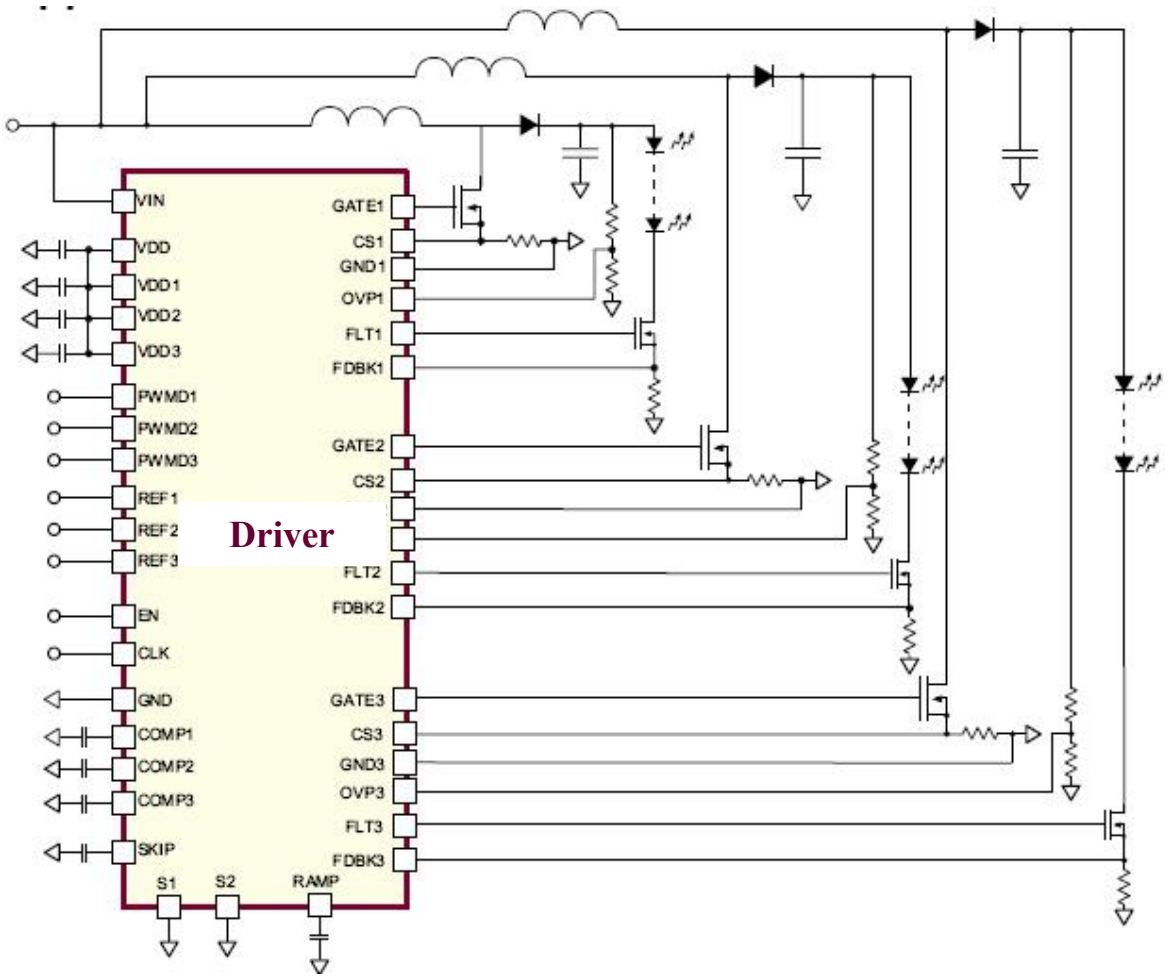




CES2302, CES2306

CES2301, CES2309

<5>LED Backlight Converter



CEU540N
CEU540L
CEU16N10
CEU1610L

Products Use for LCD Monitor / TV

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	Package
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEM3301	P	-30V	32	50	-7	2.5	24		-1.7	Single	SO-8
CEM4311	P	-30V	18	30	-9.3	2.5		16.4	-1.8	Single	SO-8
CEM9435A	P	-30V	50	90	-5.3	2.5	13		-1.5	Single	SO-8
CEM4953	P	-30V	53	95	-4.9	2	26		-1.5	Dual	SO-8
CEM4953A	P	-30V	58	85	-4.5	2	10		-1.46	Dual	SO-8
CEM4435A	P	-30V	20	33	-8	2.5	19		-1.7	Single	SO-8
CEM2407	P	-20V		45	-5.3	2		13	-0.65	Dual	SO-8
CES2301	P	-20V		100	-2.8	1.25		4.5	-0.7	Single	SOT-23
CES2302	N	20		72	3	1.25		6	1	Single	SOT-23
CES2312	N	20		33	4.5	1.25		10	0.7	Single	SOT-23
CEF14N5	N	500	380		14	178	50		3	Single	TO-220F
CEF10N6	N	600	750		10	50	44		3	Single	TO-220F
CEF12N6	N	600	650		12	60	51		3.5	Single	TO-220F
CEF12N65	N	650	730		12	60	51		3.1	Single	TO-220F
CEF10N65	N	650	850		10	60	44		3.1	Single	TO-220F
CEF09N7G	N	700V	1000		9	50	46		3.5	Single	TO-220F
CEF07N7	N	700V	1500		6.6	50	32.9		3.1	Single	TO-220F
CEF08N8	N	800V	1500		8	125	16.1		3	Single	TO-220F
CEF05N6	N	650V	2400		5	35	10		3.1	Single	TO-220F
CEU540N	N	100V	53		25	68	28		3	Single	TO-252
CUE540L	N	100V	50	53	25	56	28		2	Single	TO-252
CEU16N10	N	100V	120		13.3	43	13		3	Single	TO-252
CEU16N10L	N	100V	115	125 (5V)	13.3	43	17		3	Single	TO-252

Mother Board

Chino-Excel Technology Corp.
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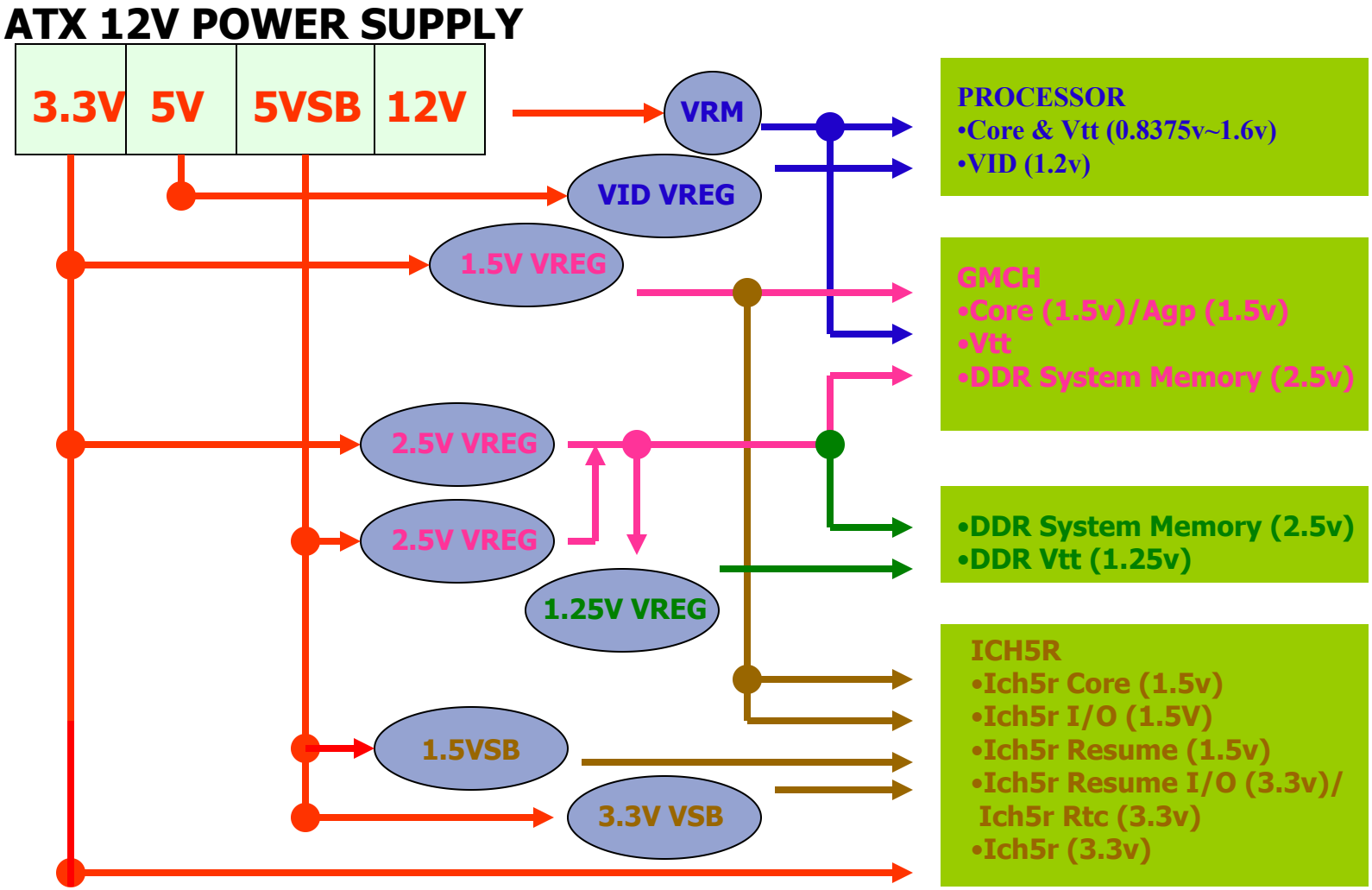
Taipei City, Taiwan, R.O.C.

OVERVIEW

- M/B Power Distribution
- M/B Diagram
- CPU Vcore Power Design
- MOSFET Power Dissipation
- M/B Power Application

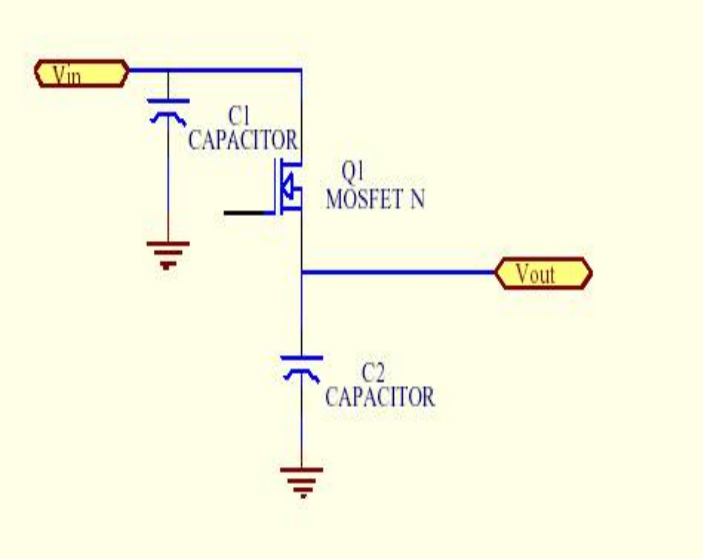
M/B Power Distribution



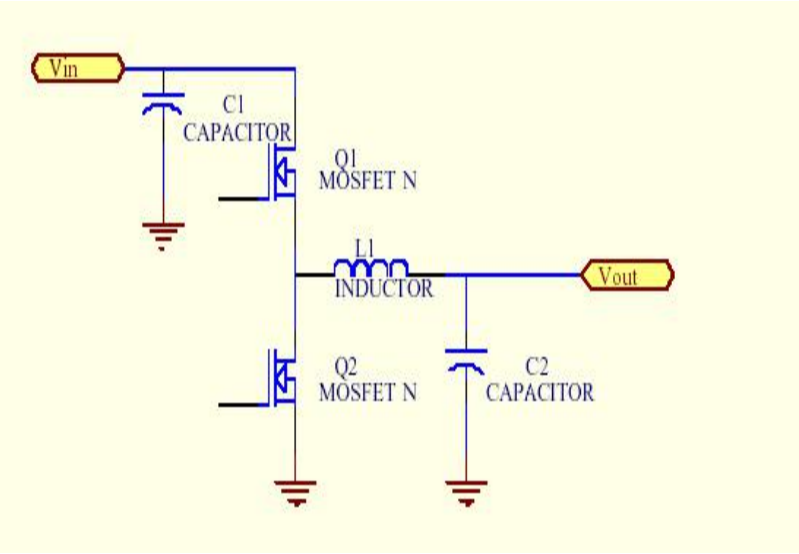
M/B Diagram

(Step Down Regulator)

(Linear Regulator)

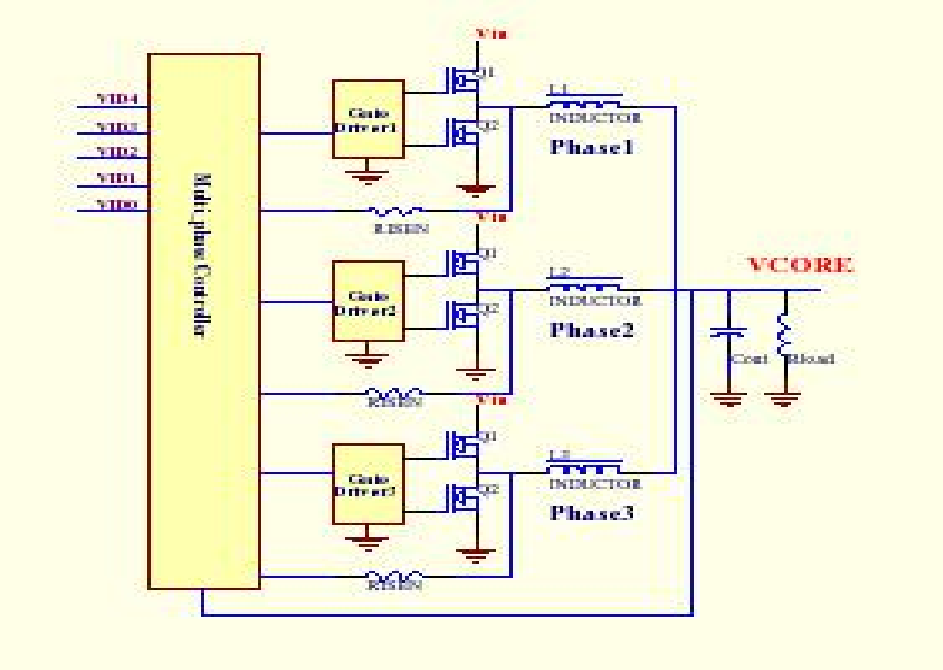


(Buck Regulator)



CPU Vcore Power Design

- **Multiphase Dc TO Dc Converter**



Typical Application

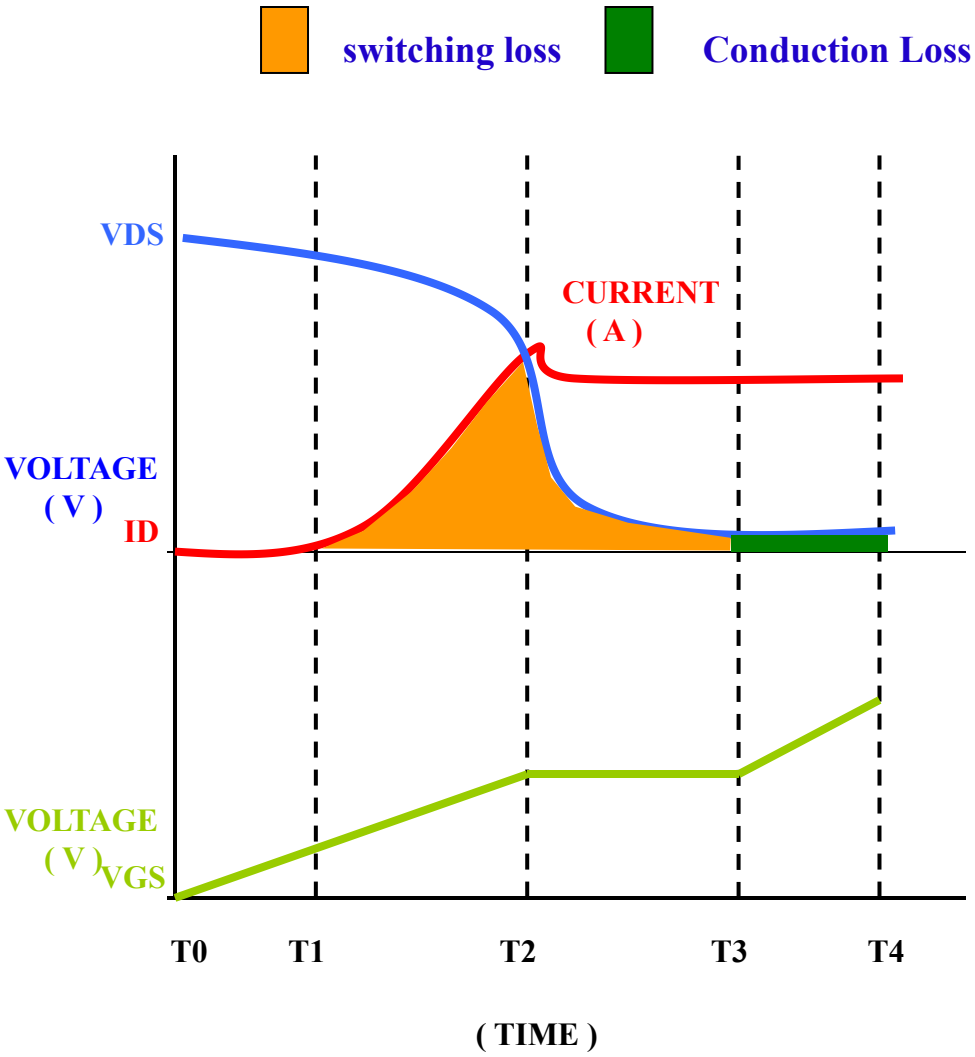
MOSFET Power Dissipation as follow:

1.conduction losses
2.switching losses

Choice MOSFET:

a. low-Rds-on
b. low- Gate-charge
c. Working voltage and current must accord MOSFET spec.

MOSFET Power Dissipation



1.Conduction Loss

During the conduction in the buck circuit, the R_{DSON} of MOSFET will produce the conduction loss which can be related with the duty time as the following equation.

$$Phi\_side\_on = IOUT^2 * Rds\_on * D$$

$$Plow\_side\_on = IOUT^2 * Rds\_on * (1-D)$$

2.switching loss

During the switching of ON and OFF, the overlapped V_{ds} and I_d will produce switching loss which depends on input voltage, output load and switching frequency can be expressed as the flowing equation.

$$Phi\_side\_sw = Iout * Vin * Ton * F/2 + Cds * Vin^2 * F/2$$

$$Plow\_side\_sw = Iout * Vin * Ton * F/2$$

M/B Power Application I

<1> Vcore :

TO-252 : CEU75A3 (High side), CEU85A3 (Low side)

CEU73A3G(High side) , CEU83A3G (Low side)

<2> GMCH :

TO-252 :CEU3172 (High side ,Low side)

S0-8L : CEM3060,CEM4892(High side) , CEM8809 (Low side)

M/B Power Application II

<3> DDR :

TO-252 :CEU3172(High side ,Low side)

SO-8L : CEM3060 (High side),CEM8809 (Low side)

<4> USB :

SO-8 : CEM3259, CEM8958A, CEM8968 , CEM2939

Products Use for Mother Board

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	Package
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEU83A3	N	30	6	9	80	70		50	1.7	Single	TO-252
CEU83A3G	N	30	4.2	6.2	93	75		37(5V)	1.7	Single	TO-252
CEU3060	N	30	6.6	9.5	75	62.5		15.6(5V)	1.8	Single	TO-252
CEU73A3G	N	30	9	16	65	75	22		1.4	Single	TO-252
CEU75A3	N	25	9	13	60	56		10	1.6	Single	TO-252
CEU85A3	N	25	6	9	80	70		17	1.8	Single	TO-252
CEZ3R01	N	30	2	3	160	83			2	Single	Power Pack 5*6
CEZ3R02	N	30	2.3	3.8	135	83	51		2	Single	Power Pack 5*6
CEZ3R03	N	30	4	6	85	48	63		2	Single	Power Pack 5*6
CEM4892	N	30	11	18	12	2.5	19.7		1.5	Single	SO-8
CEM3060	N	30	7.8	11.5	14	2.5		16(5V)	1.8	Single	SO-8
CEM8809	N	30	6.2	9	16	2.5	72		1.7	Single	SO-8
CEU3172	N	30	20	32	36	42		7.8	1.6	Single	TO-252
CEU51A3	N	30	18	28	35	50		14	1.7	Single	TO-252
CEU3252	N	30	28	39	25	31	13.8		1.6	Single	TO-252
CEU3120	N	30	15	22	36	33	21		1.8	Single	TO-252
CEM2939	N	-20		30	6.5	2		10	0.8	N-CH	SO-8
	P	20		55	-4.8	2		9.8	-0.7	P-CH	
CEM8958	N	-30	28	40	7	2	12.3		1.5	N-CH	SO-8
	P	30	52	80	-5.2	2	11		-1.7	P-CH	
CEM8968	N	-30	28	40	7	2	12		1.5	N-CH	SO-8
	P	30	33	52	-6.2	2	18.7		-1.7	P-CH	
CEM8958A	N	-30	28	42	6.8	2	7.1		1.5	N-CH	SO-8
	P	30	58	85	-4.8	2	9.3		-1.5	P-CH	
CEM2539A	N	-20	22	25	7.5	2		10	0.8	N-CH	SO-8
	P	20	80	100	-4	2		10.8	-0.7	P-CH	

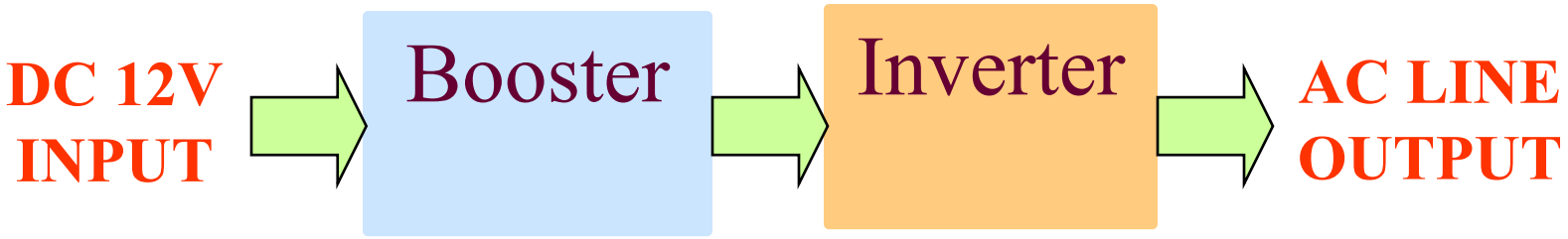
Power Inverter

Chino-Excel Technology Corp.
92, Jian Yi Rd., Chung-Ho Dist.,
Taipei City, Taiwan, R.O.C.

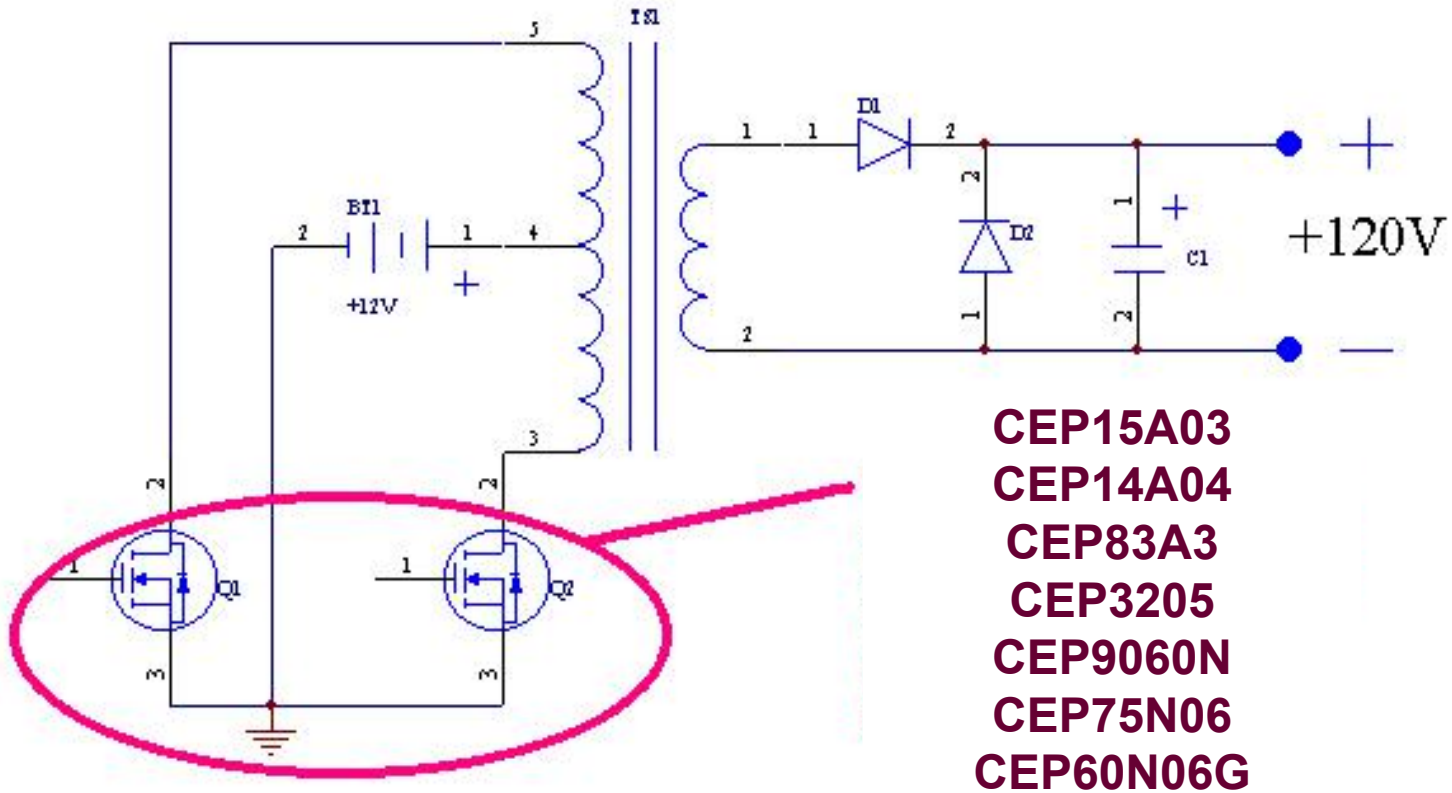
OVERVIEW

- POWER INVERTER Block diagram
- BOOSTER
- INVERTER
- BOOSTER & INVERTER
- MOSFET Selection Guide

Power Inverter Block diagram

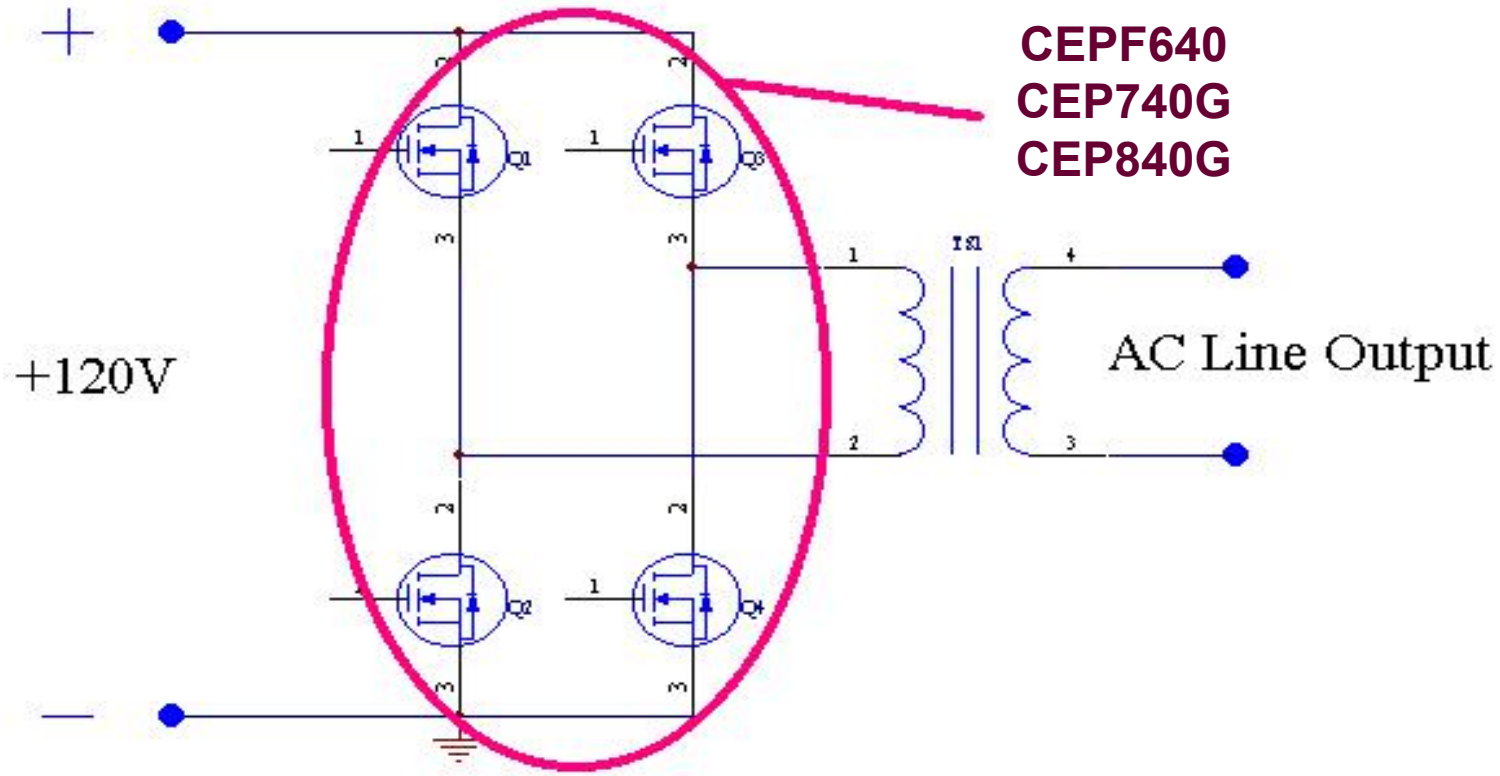


BOOSTER

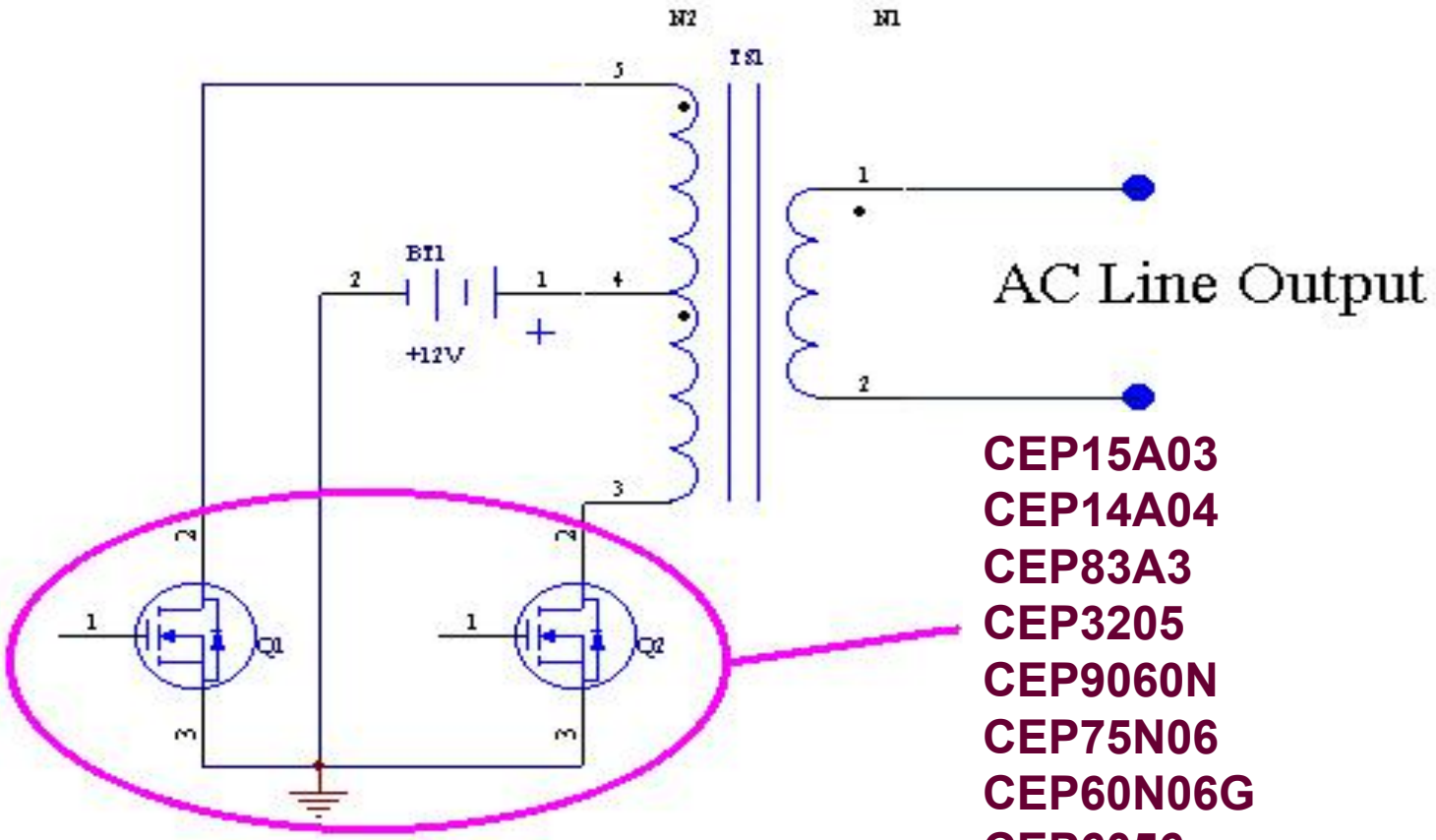


CEP15A03
CEP14A04
CEP83A3
CEP3205
CEP9060N
CEP75N06
CEP60N06G
CEP6056

INVERTER



BOOSTER & INVERTER



CEP15A03
CEP14A04
CEP83A3
CEP3205
CEP9060N
CEP75N06
CEP60N06G
CEP6056

Products Use for Power Inverter

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)	
CEP83A3	N	30	5.3	8	100	100		53(5V)	1.7	Single
CEP15A03	N	30	4.5		190	200	114.7		2.5	Single
CEP14A04	N	40	5		180	200	110		2	Single
CEP3205	N	60	8.5		108.5	200	102.3		3	Single
CEP9060N	N	60	10.5		90	166	68.1		2.9	Single
CEP75N06	N	60	12		75	125	67.9		2.8	Single
CEP60N06G	N	60	16		60	125	52		2.8	Single
CEP6056	N	60	6.2		100	125	77		2.8	Single
CEP6060N	N	60	25		42	88	28.7		2.8	Single
CEP60N10	N	100	24		57	200	65		2	Single
CEP50N10	N	100	30		50	136	49		3.8	Single
CEP630N	N	200	360		9	78	19		3.1	Single
CEPF640	N	200	150		19	125	44		2.95	Single
CEPF634	N	250	450		8.1	74	18		3.1	Single
CEP740G	N	400	550		10	125	35.6		3.1	Single
CEP840G	N	500	850		8	125	33		3.1	Single

Switching Power Supply

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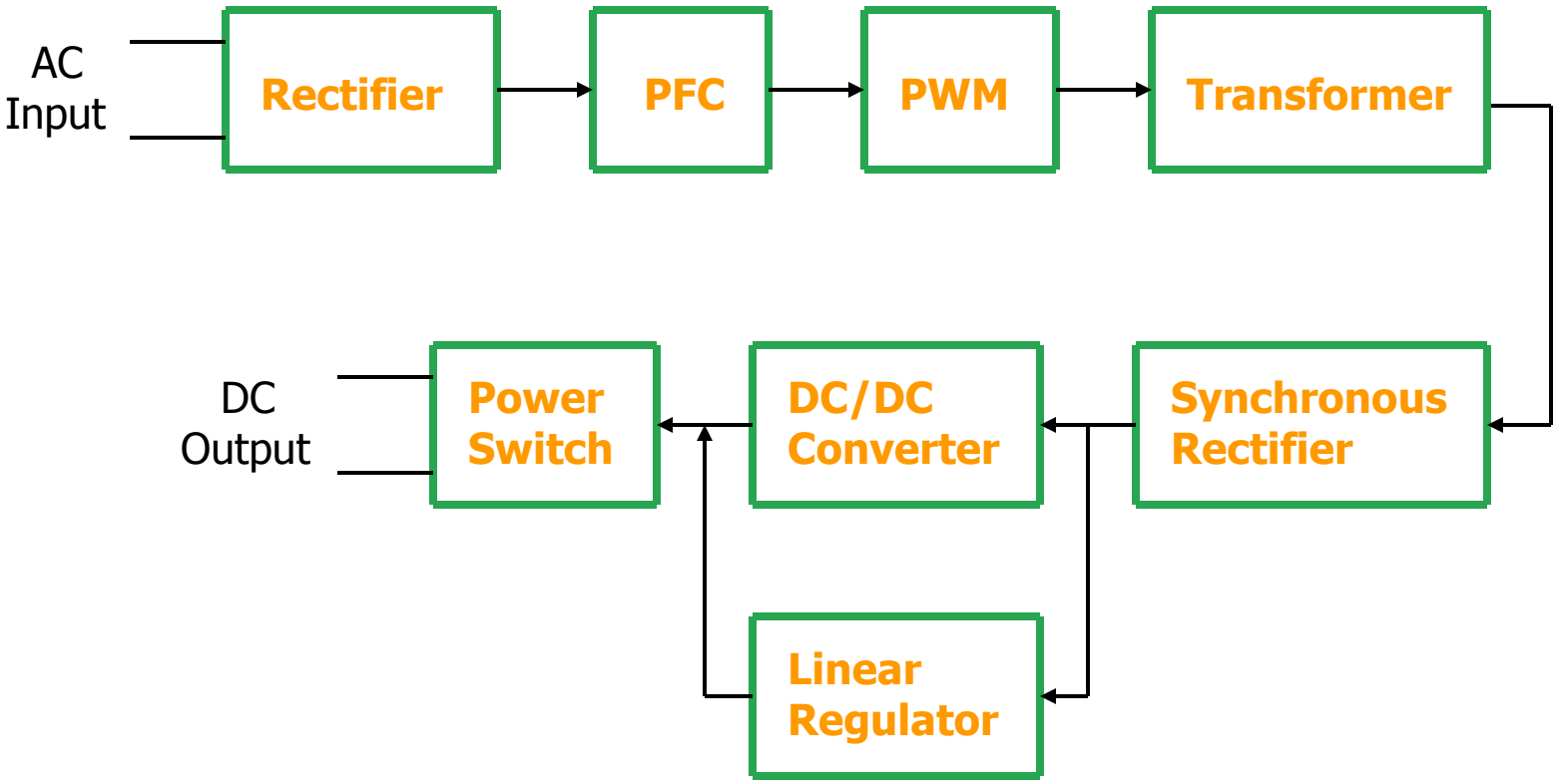
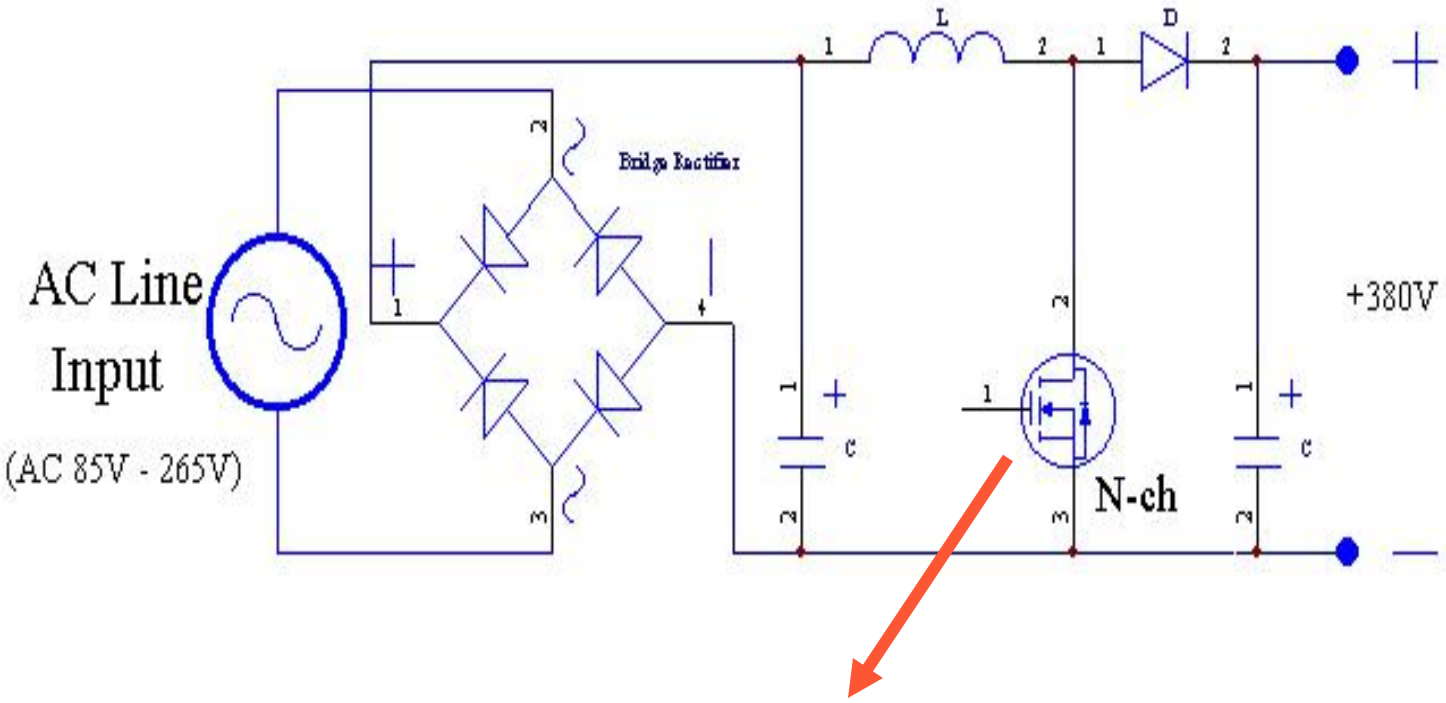
Taipei City, Taiwan, R.O.C.

1. Function block

2. MOSFET Selection Guide

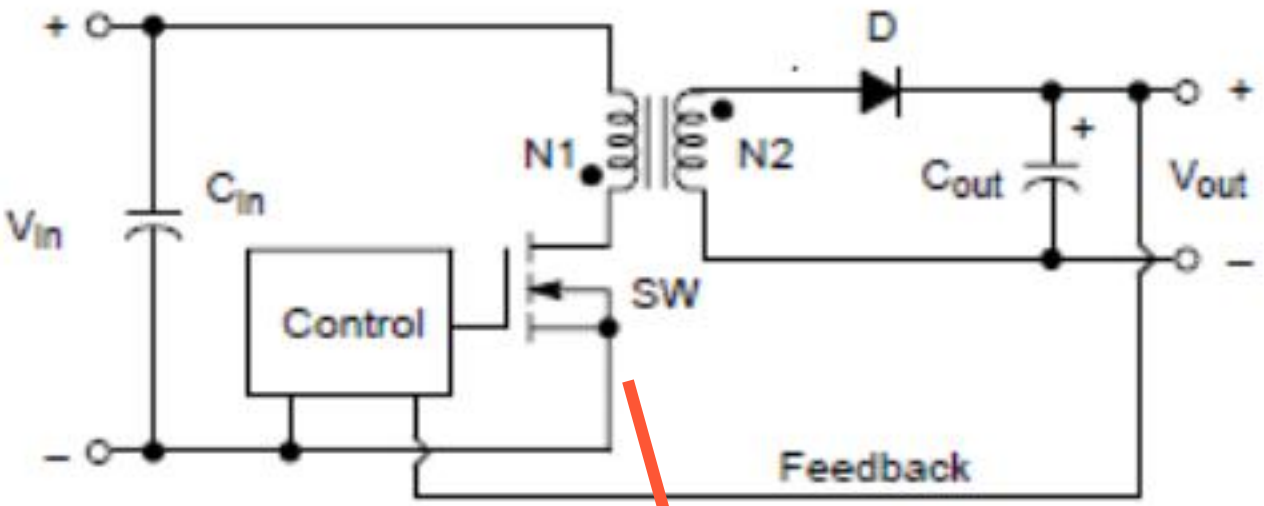
Function Block





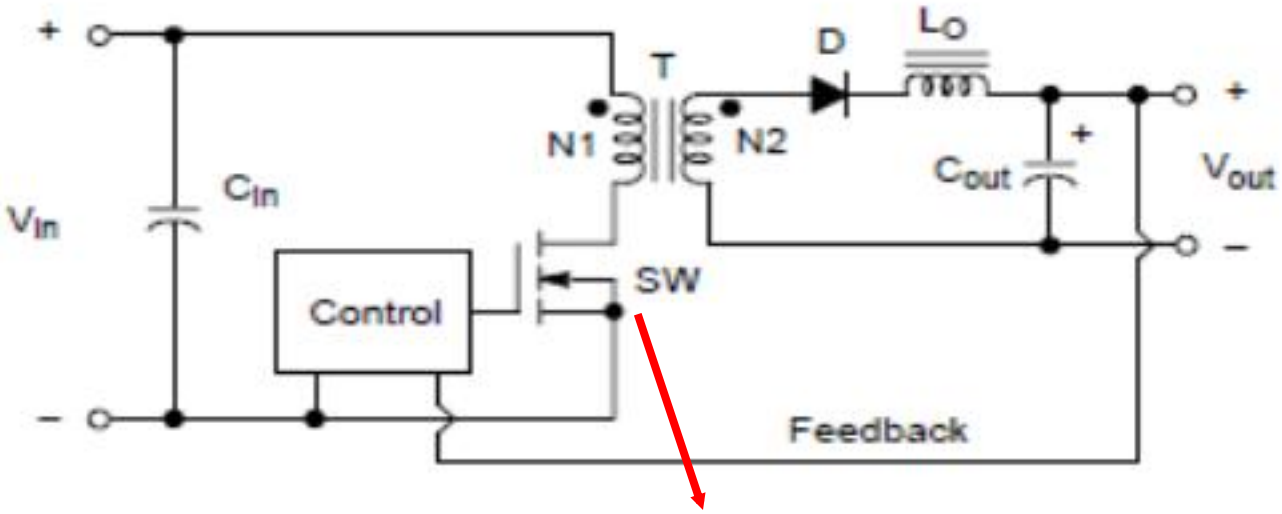
740G, 840G , 13N5A, 14N5 , 18N5, 12N6 , 10N6

Flyback VDss=1.5 Vin(max) ID= $\frac{(2.0\ P_{out})}{V_{in(min)}}$



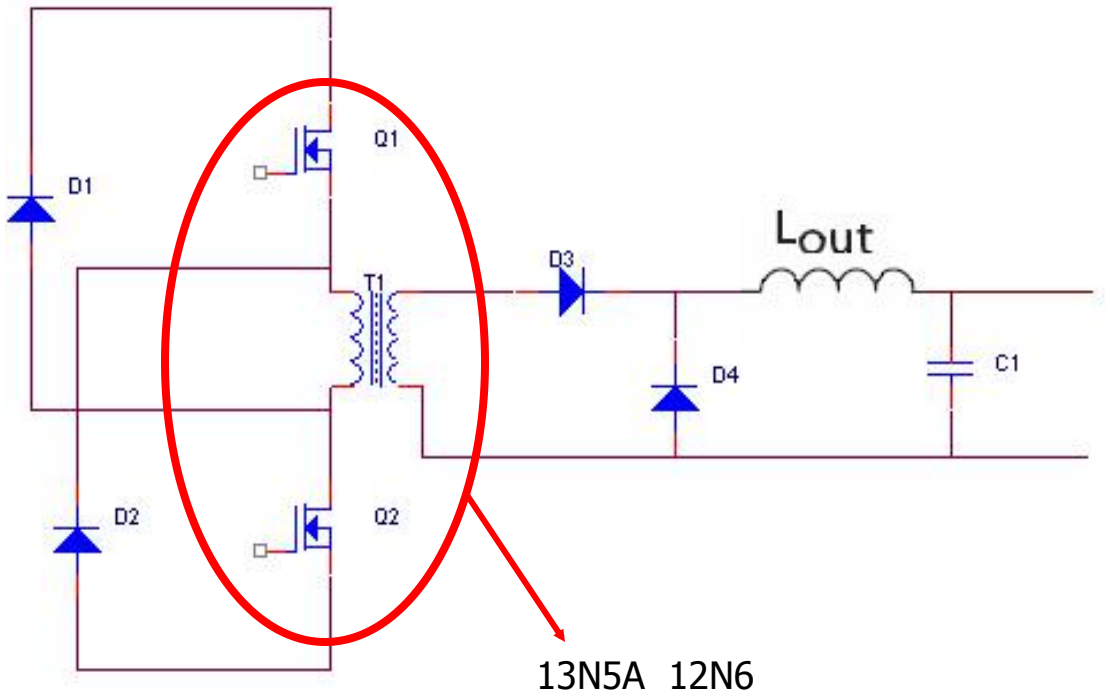
02N6G, 05N65, 07N7,07N65, 02N7G, 04N7G, 10N6, 09N7G

Forward VDSS=2.0 Vin ID= $\frac{(1.5\ P_{out})}{V_{in(min)}}$



02N9,1195,09N9,03N8 ,1186 ,08N8

Two Switch Forward



13N5A 12N6

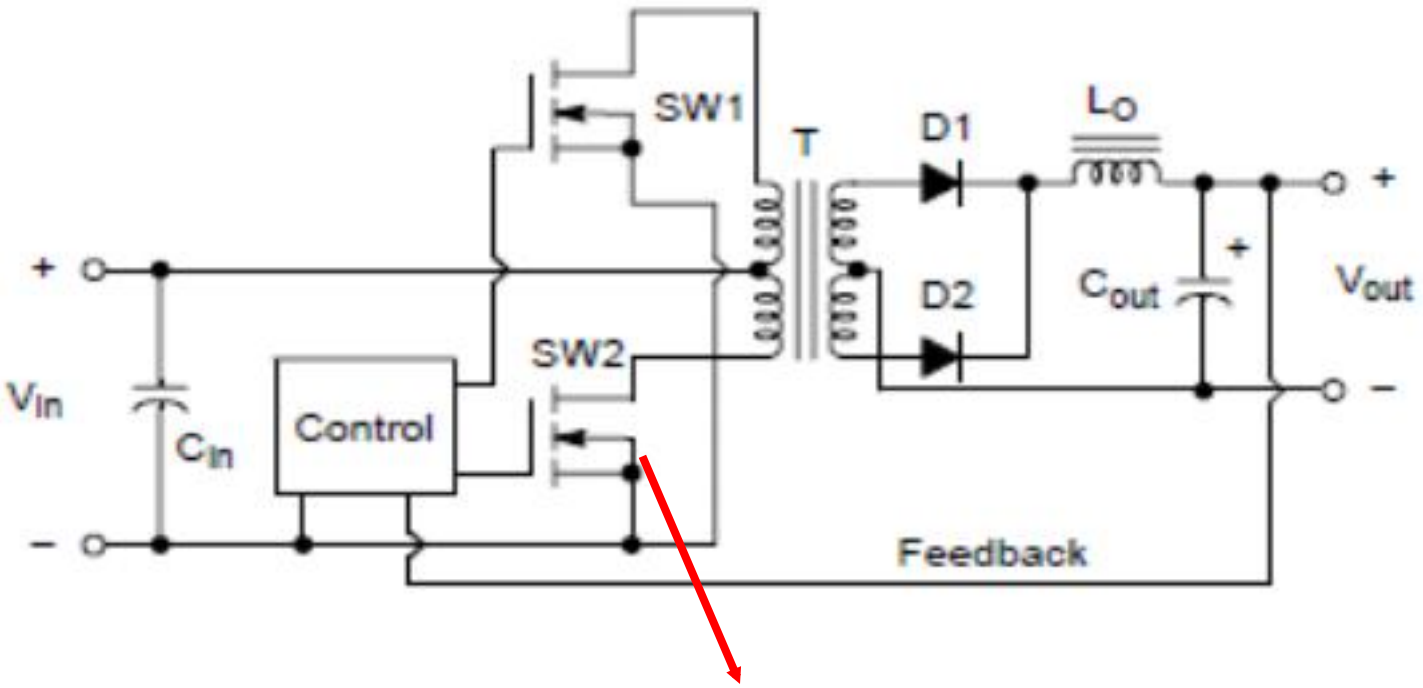
14N5 840G

18N5 840A

Push–Pull

VDSS=2.0 Vin

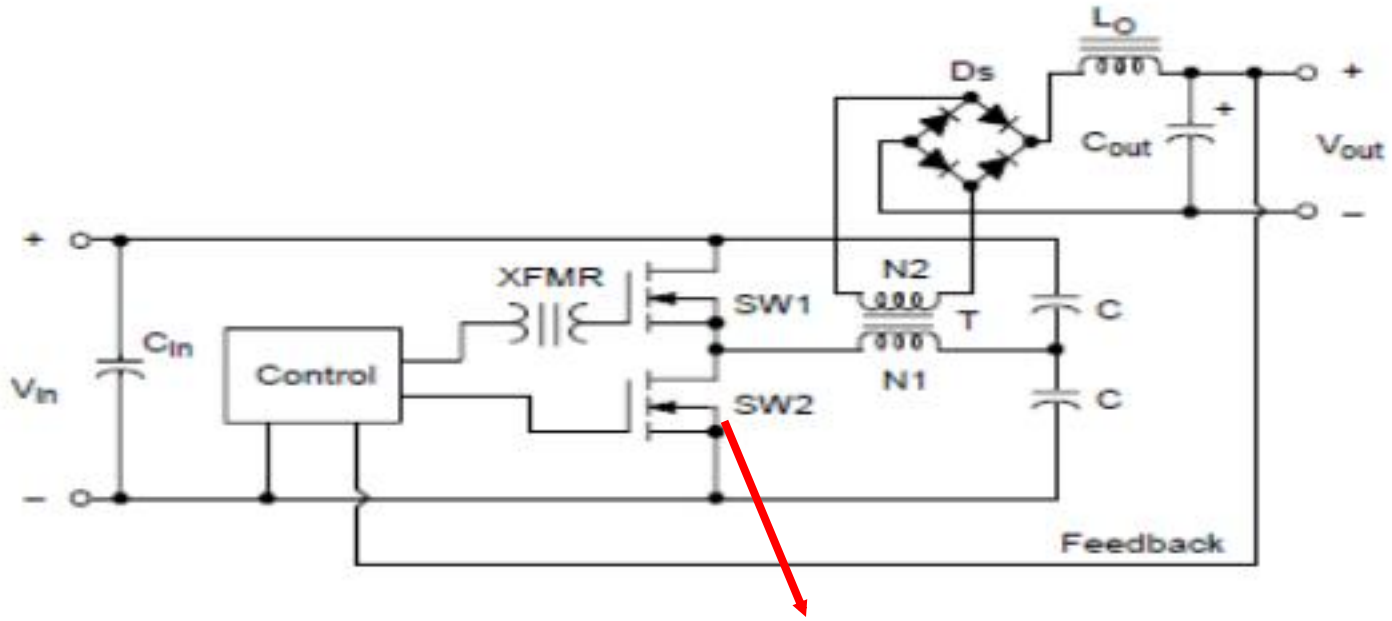
ID= $\frac{(1.2\ P_{out})}{V_{in(min)}}$



02N9,1195,09N9,03N8 ,1186 ,08N8

Half–Bridge

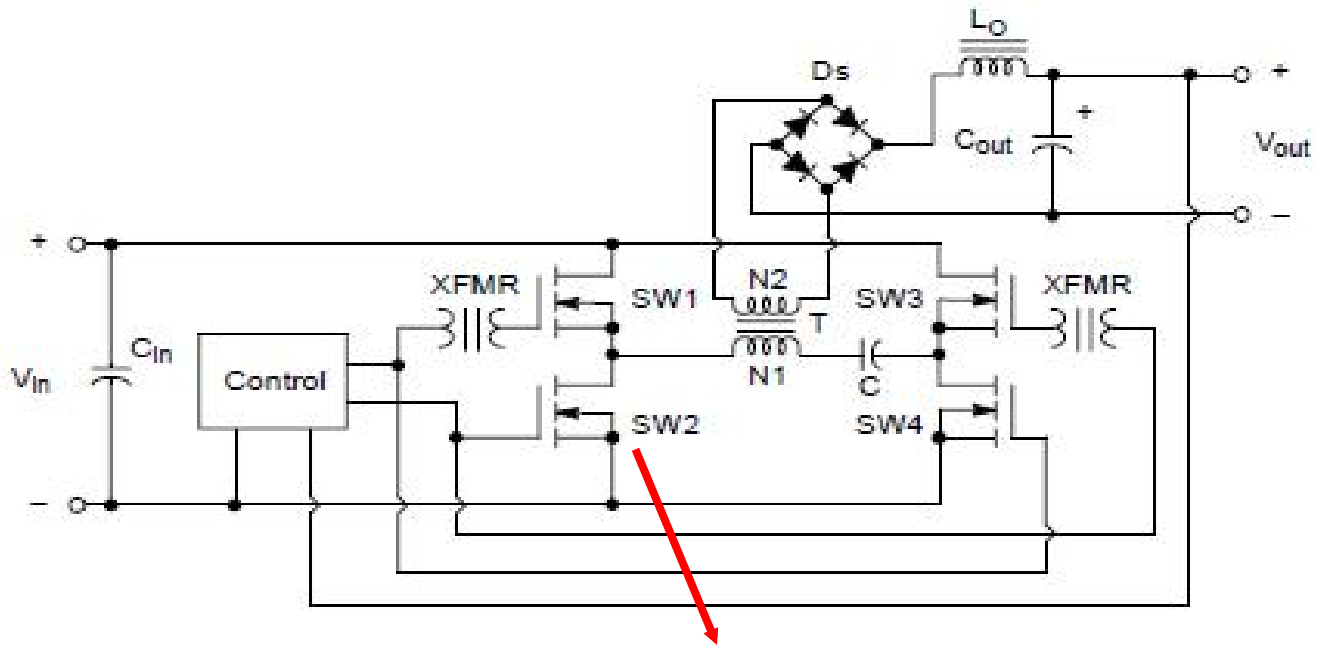
$$VDSS=Vin \quad ID=\frac{(2.0\ P_{out})}{V_{in(min)}}$$



740G,740A , 840G ,840A
18N5,14N5 ,13N5A

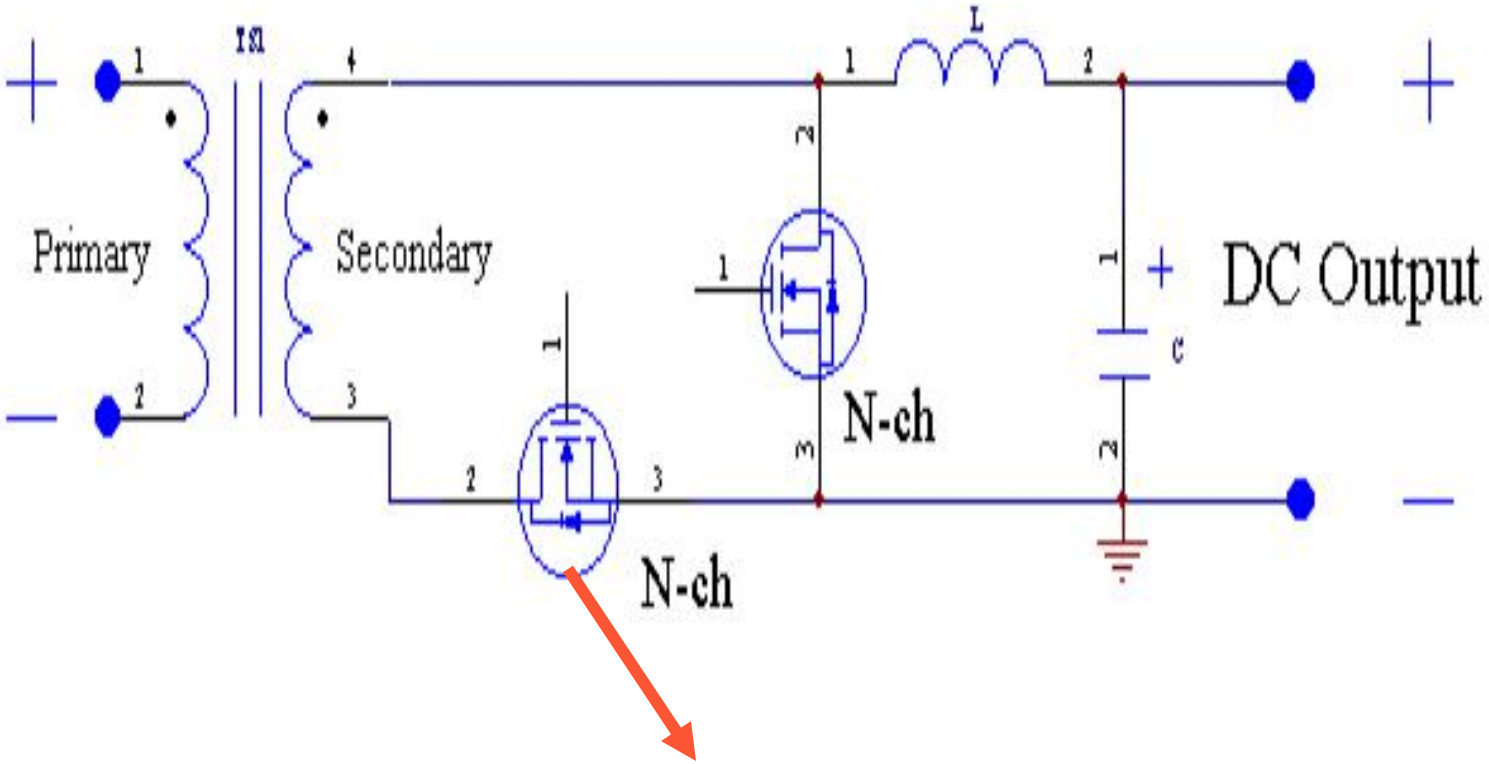
Full–Bridge

VDSS=Vin ID= $\frac{(2.0\ P_{out})}{V_{in(min)}}$



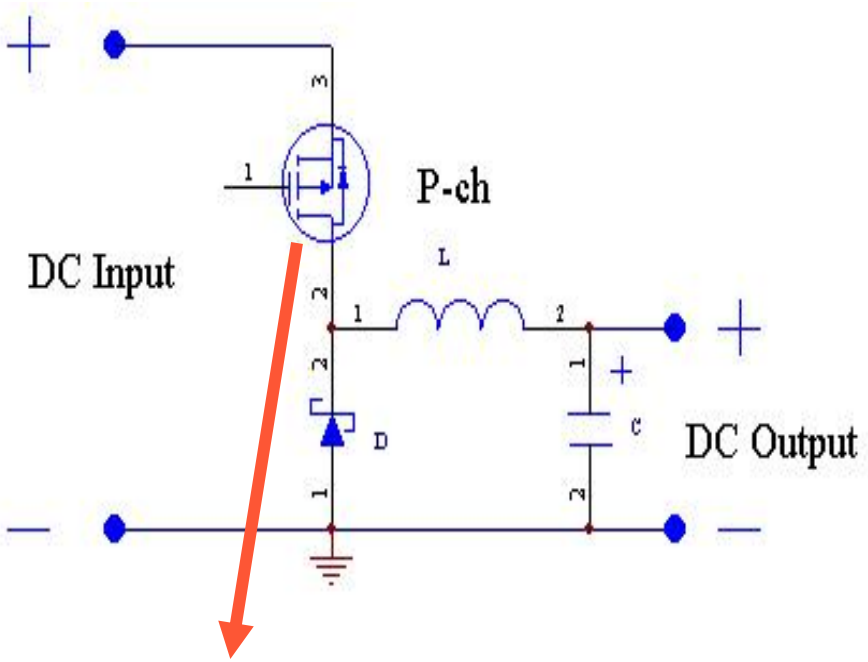
740G, 740A, 840A ,840G
18N5, 14N5 , 13N5A

Synchronous Rectifier

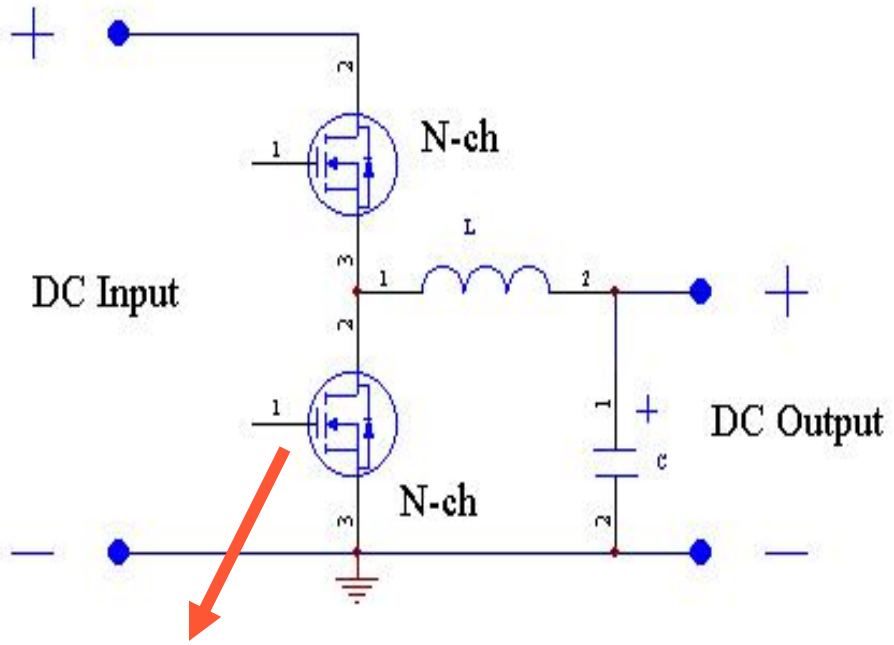


6056, 75N06G,60N06G, 85N75, 60N10

DC/DC Converter

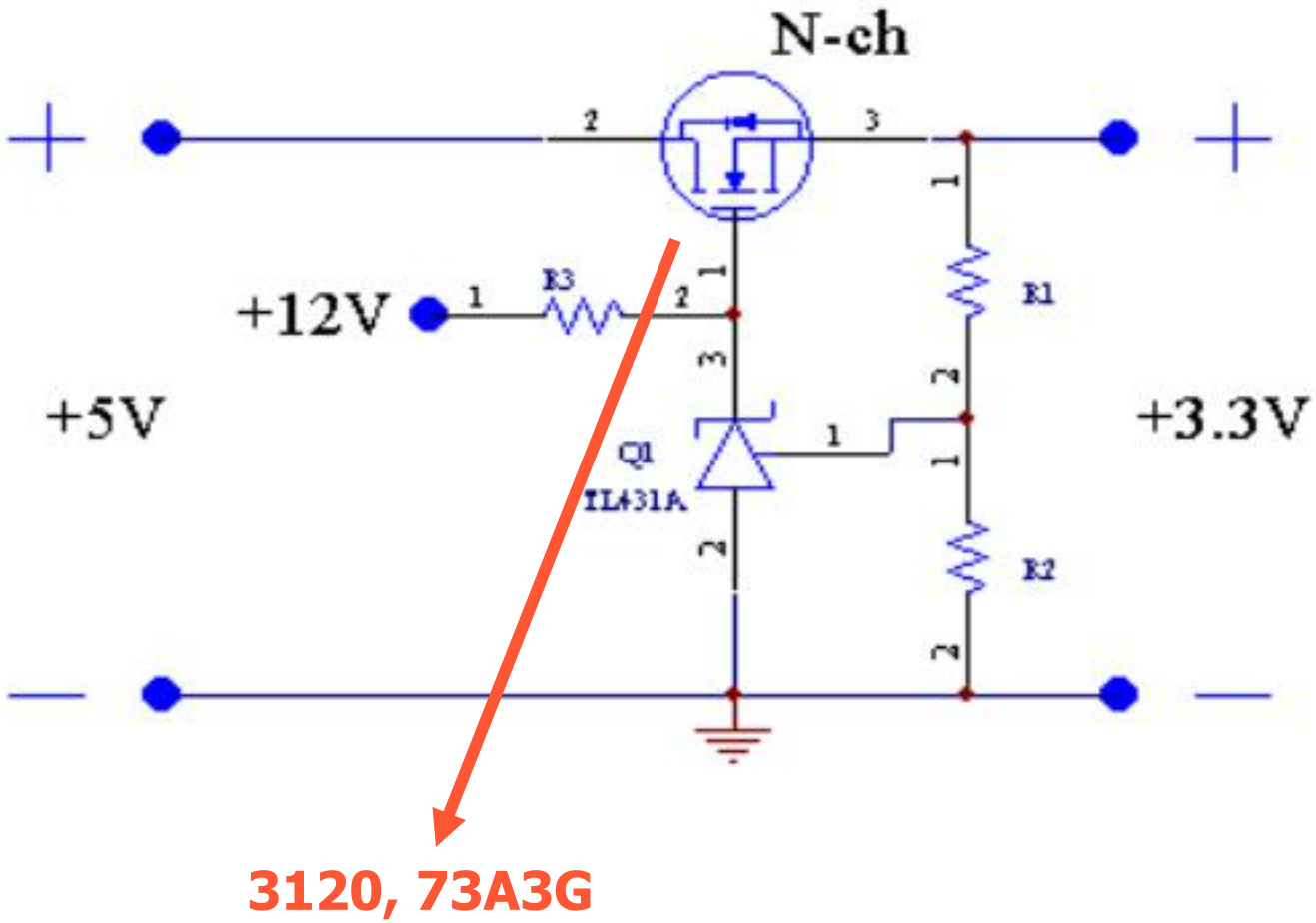


30P03, 50P03

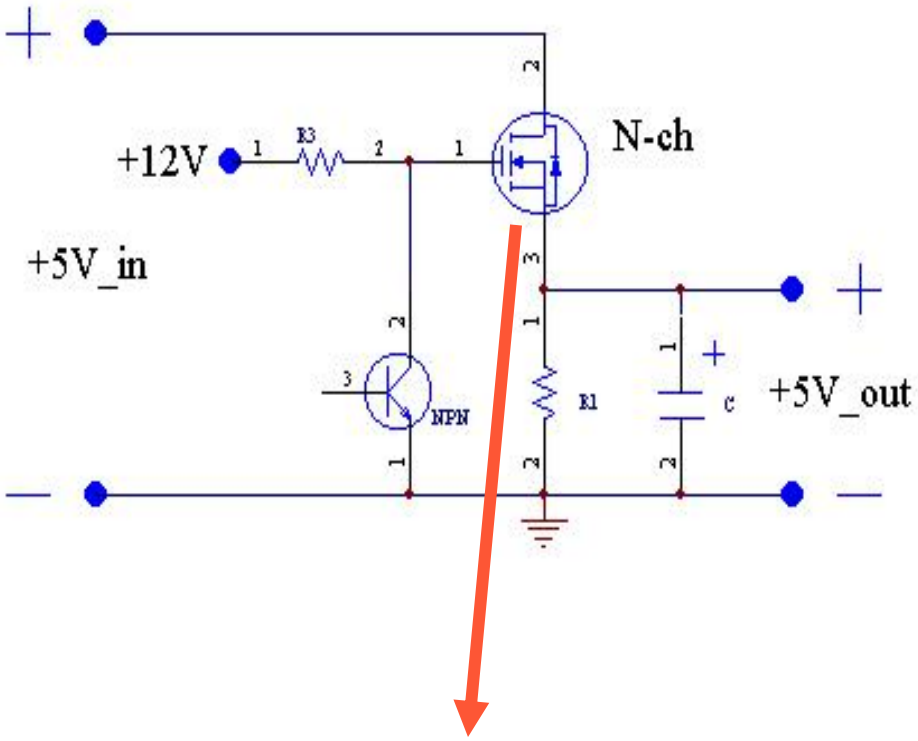


6056, 75N06G, 60N06G

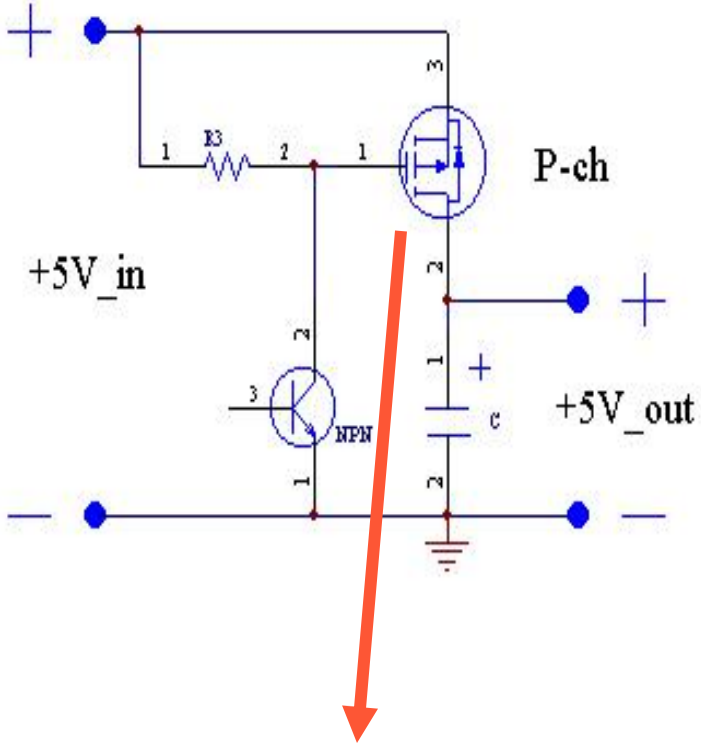
Linear Regulator



Power Switch



3120



30P03 50P03

Products Use for SPS

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	Package
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEP740G	N	400V	550		10	125	35.6		3.1	Single	TO-220
CEP840G	N	500V	850		8	125	33		3.1	Single	TO-220
CEP12N5	N	500V	540		12	166	44.1		3	Single	TO-220
CEP60N10	N	100V	24		57	200	65		2	Single	TO-220
CEP50N10	N	100V	30		50	136	49		3.8	Single	TO-220
CEP3205	N	55V	8.5		108.5	200	102.3		3	Single	TO-220
CEP9060N	N	55V	10.5		90	166	68.1		2.9	Single	TO-220
CEP60N06G	N	60V	16		60	125	52		2.8	Single	TO-220
CEP6060N	N	60V	25		42	88	28.7		2.8	Single	TO-220
CEP75N06	N	60V	12		75	125	67.9		2.8	Single	TO-220
CEP85N75	N	75V	12		86	200	90		3	Single	TO-220
CEP73A3G	N	30V	9	16	62	75	22		1.4	Single	TO-220
CEP50P03	P	-30V	20	32	-47	79	22		-1.6	Single	TO-220
CEP30P03	P	-30V	32	50	-30	50	24		-1.5	Single	TO-220
CEPF640	N	200V	150		19	125	44		2.95	Single	TO-220
CEP630N	N	200V	360		9	78	19		3.1	Single	TO-220
CEP14N5	N	500V	380		14	178	50		3	Single	TO-220
CEP02N6G	N	650V	5000		2.2	60	6.8		3.4	Single	TO-220
CEP12N6	N	600V	650		12	250	51		3.5	Single	TO-220
CEP10N6	N	600V	750		10	166	44		3	Single	TO-220
CEP07N65	N	650V	1300		7	166	32.9		3.1	Single	TO-220
CEP05N65	N	650V	2400		4.5	84	13		3.7	Single	TO-220
CEP02N7G	N	700V	6750		1.9	60	7.5		3.3	Single	TO-220
CEP04N7G	N	700V	3300		4	84	14		3	Single	TO-220
CEP09N7G	N	700V	1000		9	166	46		3.5	Single	TO-220
CEP03N8	N	800V	4800		3	125	16		3	Single	TO-220
CEP1186	N	800V	2300		6	166	29.4		3	Single	TO-220
CEP08N8	N	800V	1550		8	208	39		3	Single	TO-220
CEP02N9	N	900V	6800		2.6	125	16		3	Single	TO-220
CEP1195	N	900V	2750		5	166	29.4		3	Single	TO-220

UPS

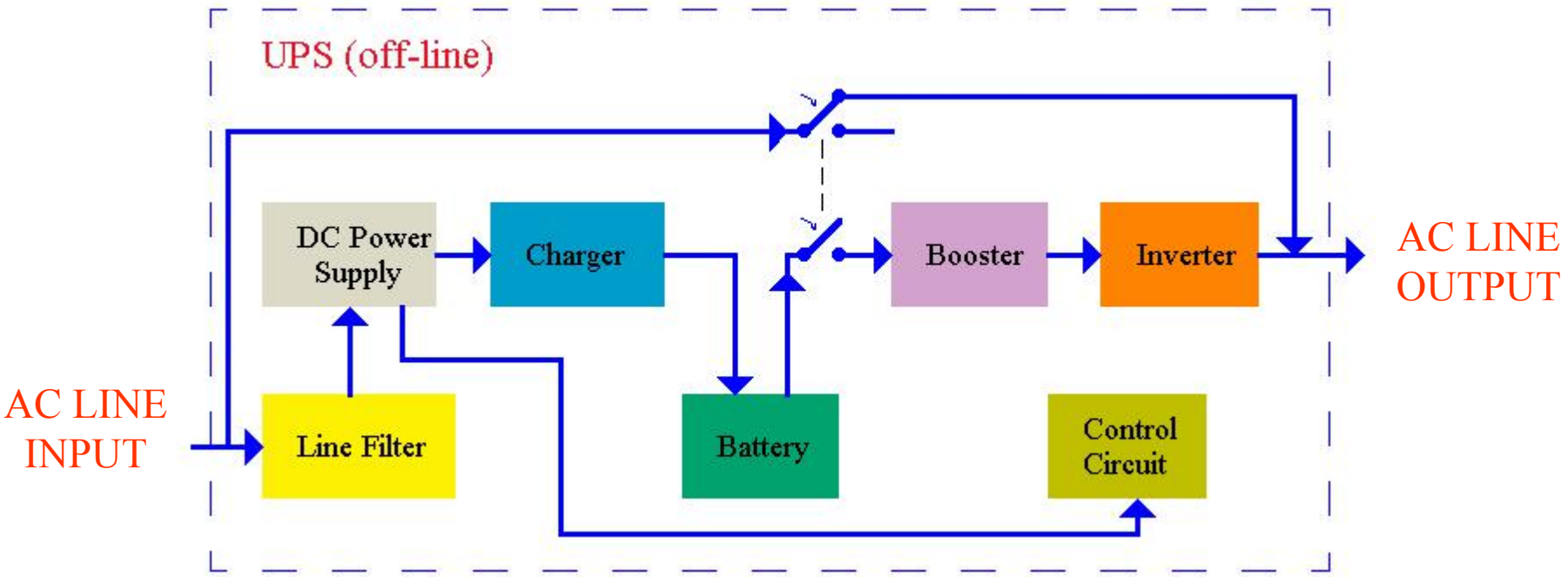
Chino-Excel Technology Corp.
92, Jian Yi Rd., Chung-Ho Dist.,
Taipei City, Taiwan, R.O.C.

OVERVIEW

- UPS Block diagram
- CHARGER
- BOOSTER
- INVERTER
- BOOSTER & INVERTER
- MOSFET Selection Guide

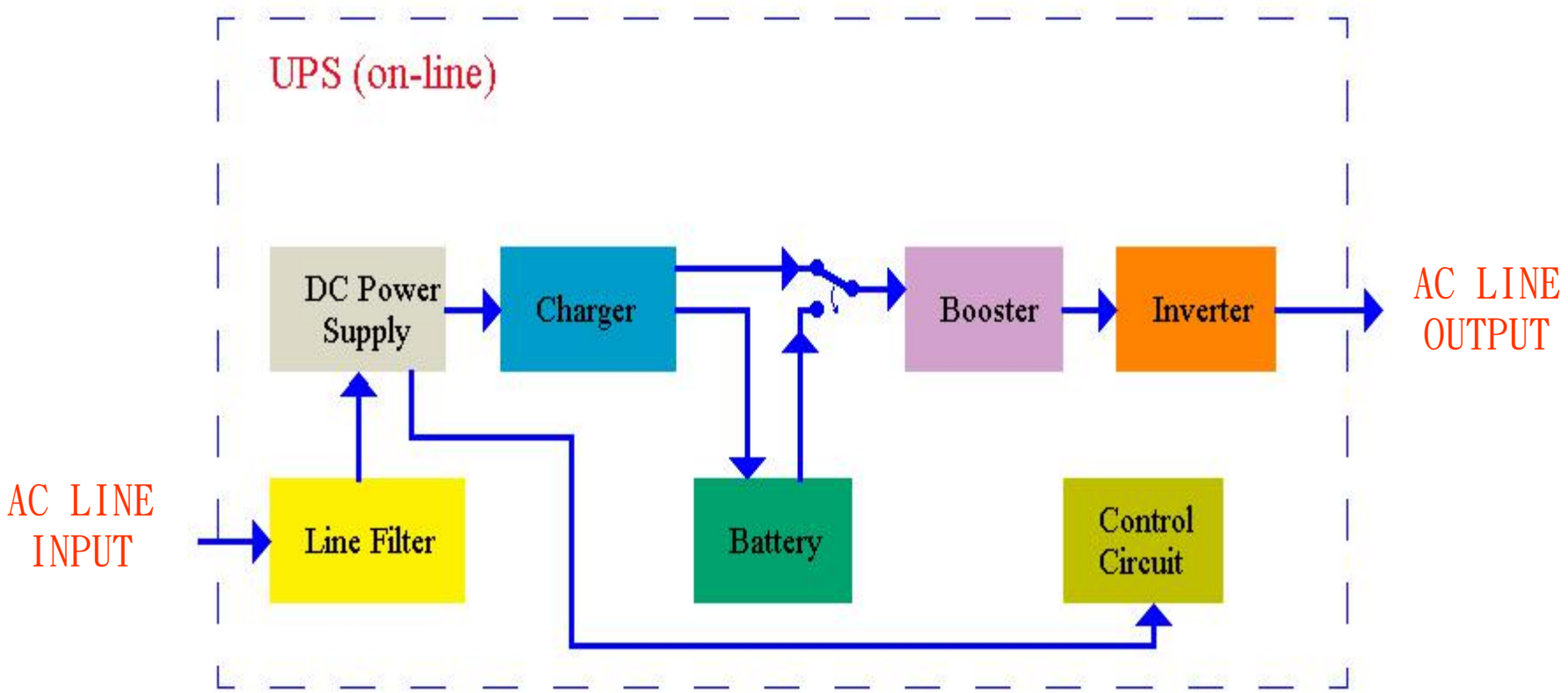
UPS Block diagram

<1>OFF-LINE :



UPS Block diagram

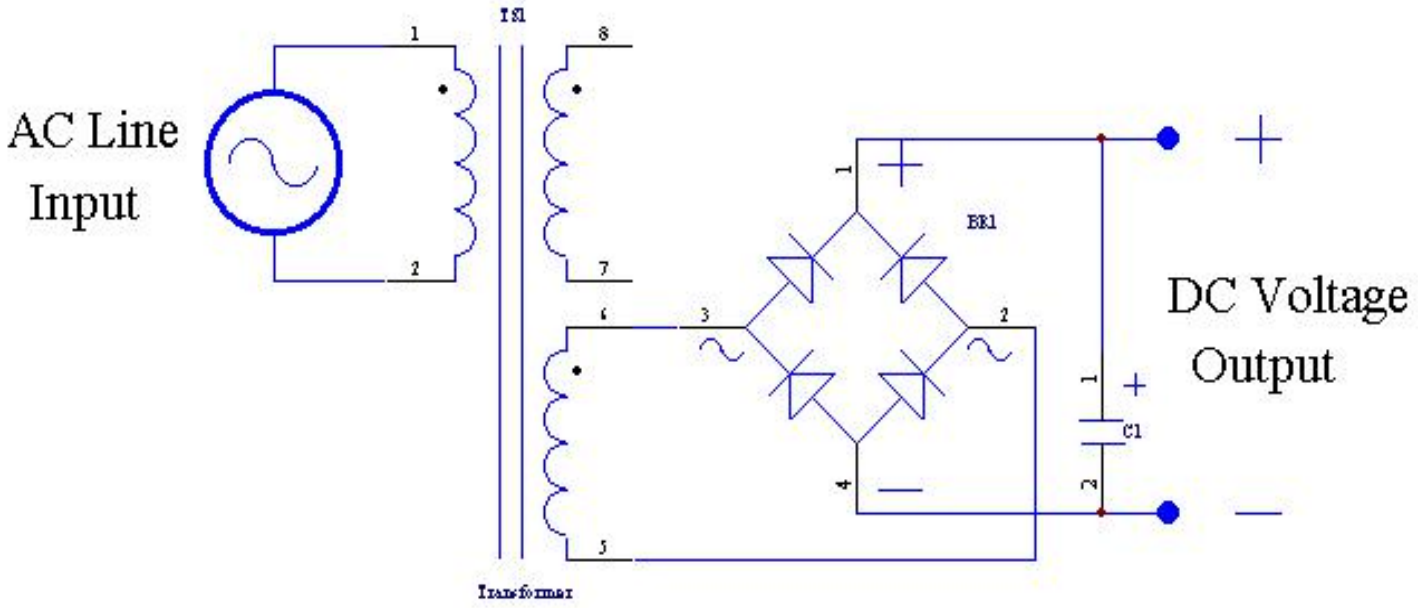
<2>ON-LINE :



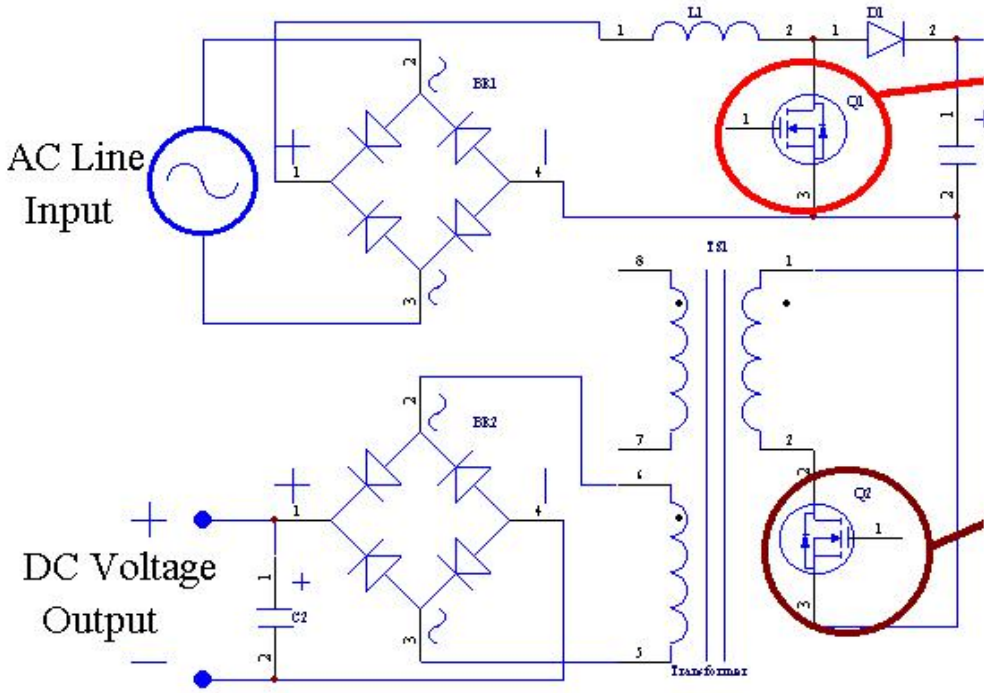
CHARGER

<1>Linear regulator : 1.Designing with a linear regulator is simple and cheap

2. A linear design is considerably quieter than a switcher since there is no high–frequency switching noise

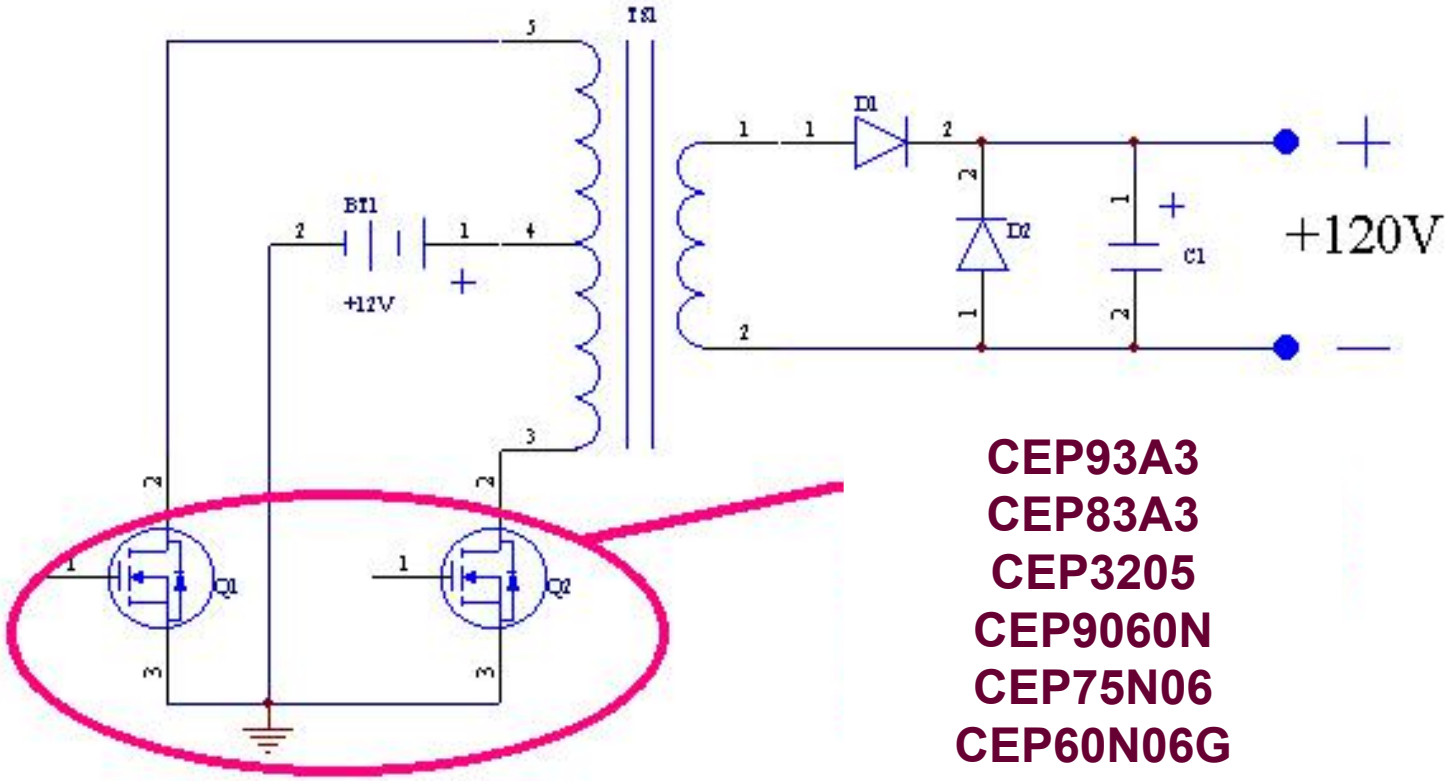


<2> Switch mold : 1. Provide higher efficiencies
2. Provide higher power
3. Steadily reducing the size



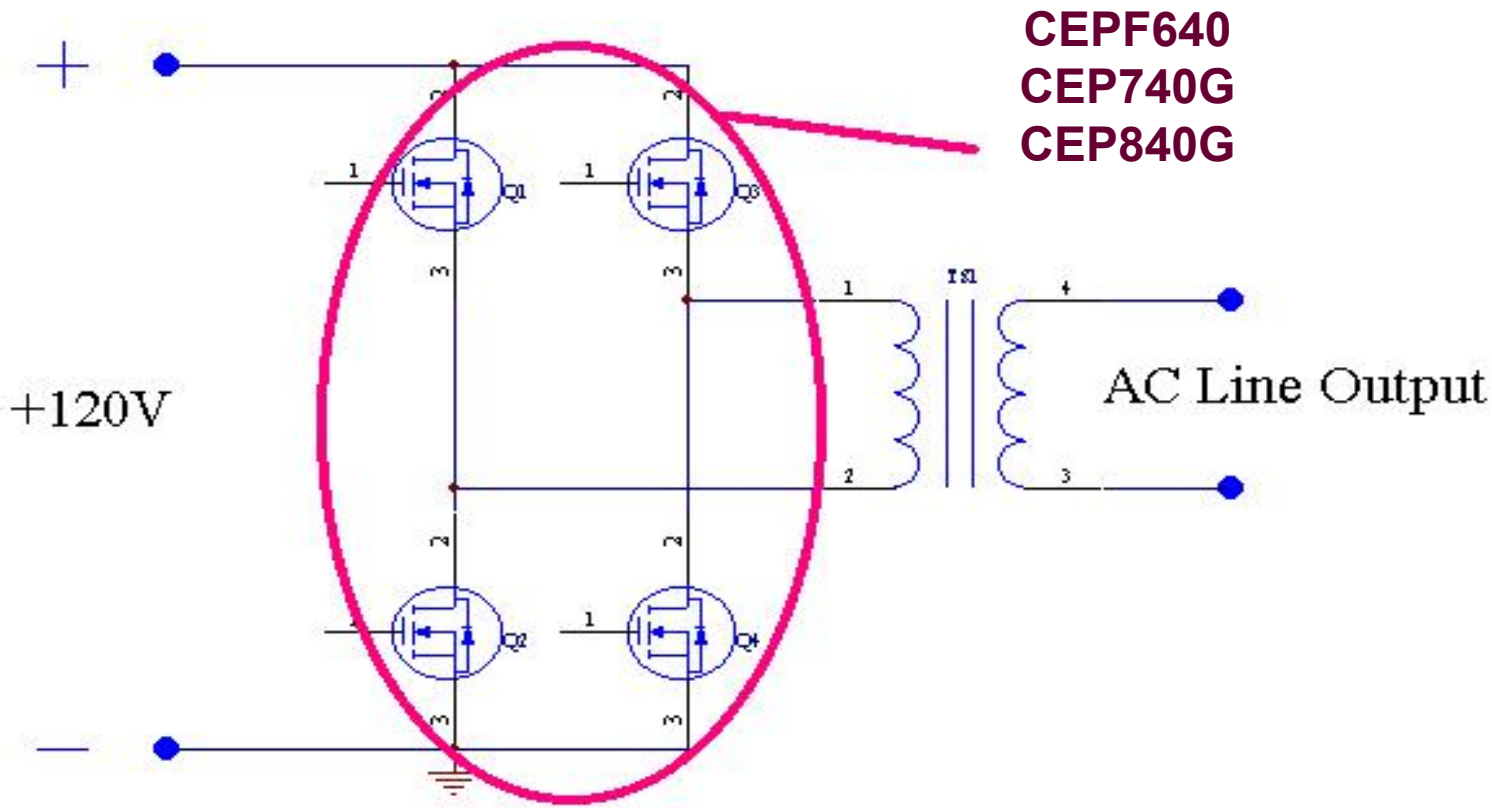
CEP740G
CEP840G
CEP13N5
CEP12N5
CEP10N6
CEP12N6
CEP05N65
CEP07N65
CEP09N7G
CEP07N7

BOOSTER

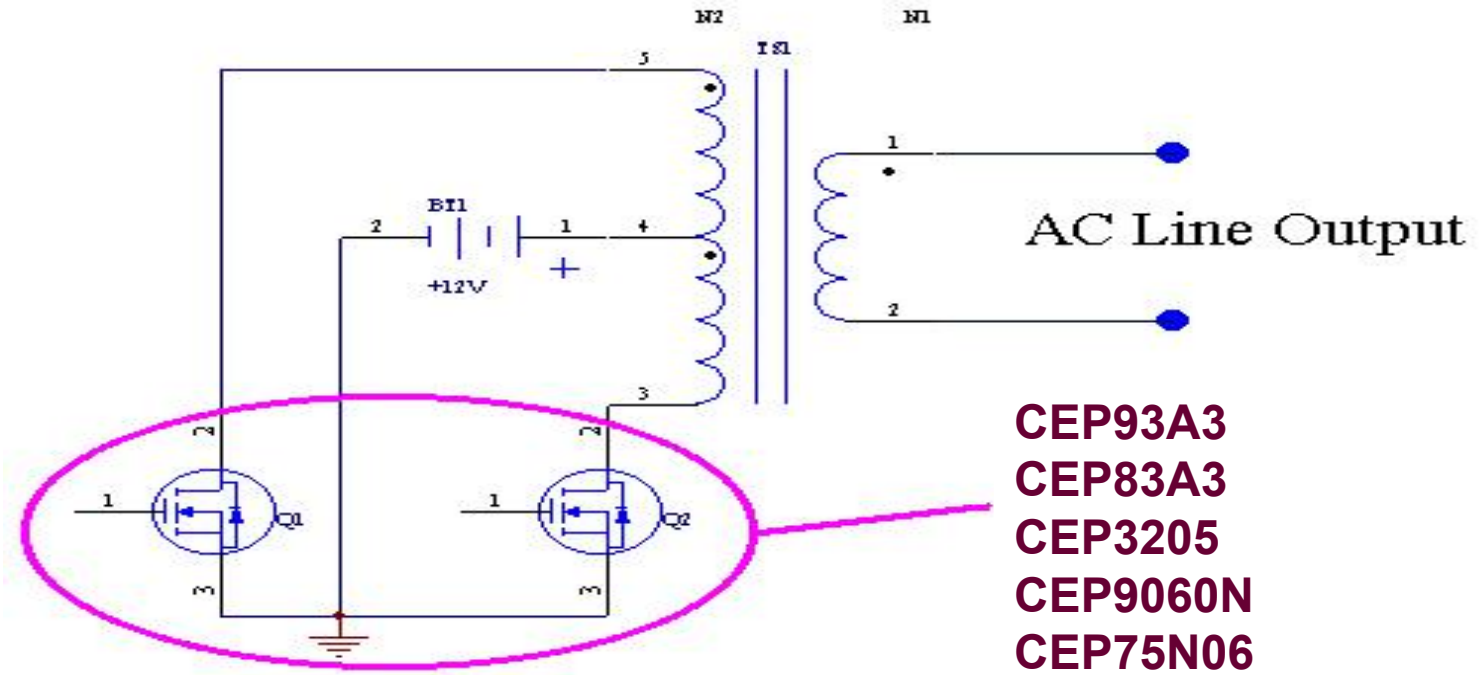


CEP93A3
CEP83A3
CEP3205
CEP9060N
CEP75N06
CEP60N06G
CEP6056

INVERTER



BOOSTER & INVERTER

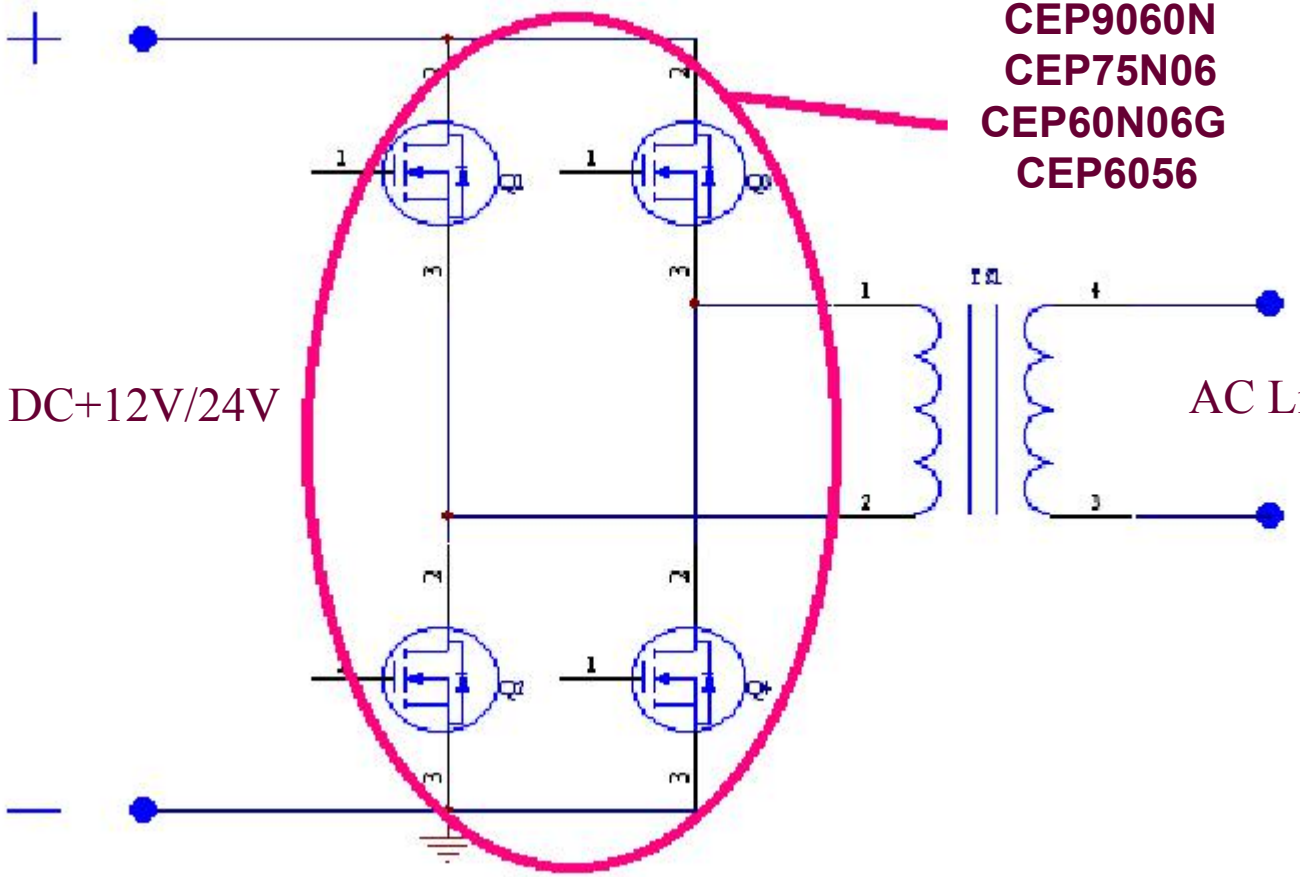


CEP93A3
CEP83A3
CEP3205
CEP9060N
CEP75N06
CEP60N06G
CEP6056

BOOSTER & INVERTER

FULL-BRIDGE

CEP93A3
CEP83A3G
CEP83A3
CEP3205
CEP9060N
CEP75N06
CEP60N06G
CEP6056



Products Use for UPS

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	Package
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEP93A3	N	30	3	6	150	83.3		60	1.6	Single	TO220
CEP83A3G	N	30	4.2	6.2	102	83		37(5V)	1.7	Single	TO220
CEP83A3	N	30	5.3	8	100	100		53(5V)	1.7	Single	TO220
CEP15A03	N	30	4.5		190	200	114.7		2.5	Single	TO220
CEP14A04	N	40	5		180	200	110		2	Single	TO220
CEP3205	N	55	8.5		108.5	200	102.3		3	Single	TO220
CEP9060N	N	55	10.5		90	166	68.1		2.9	Single	TO220
CEP75N06	N	60	12		75	125	67.9		2.8	Single	TO220
CEP60N06G	N	60	16		60	125	52		2.8	Single	TO220
CEP6056	N	60	6.2		100	125	50		2.8	Single	TO220
CEP60N10	N	100	24		57	200	65		2	Single	TO220
CEP630N	N	200	360		9	78	19		3.1	Single	TO220
CEPF640	N	200	150		19	125	44		2.95	Single	TO220
CEPF634	N	250	450		8.1	74	18		3.1	Single	TO220
CEP740G	N	400	550		10	125	35.6		3.1	Single	TO220
CEP840G	N	500	850		8	125	33		3.1	Single	TO220
CEP10N6	N	600	750		10	166	44		3	Single	TO220
CEP13N5	N	500	480		13	214	50		2.8	Single	TO220
CEP12N6	N	600	650		12	250	51		3.5	Single	TO220
CEP07N65	N	650	1300		7	166	32.9		3.1	Single	TO220
CEP09N7G	N	700	1000		9	166	46		3.5	Single	TO220

Power Tool

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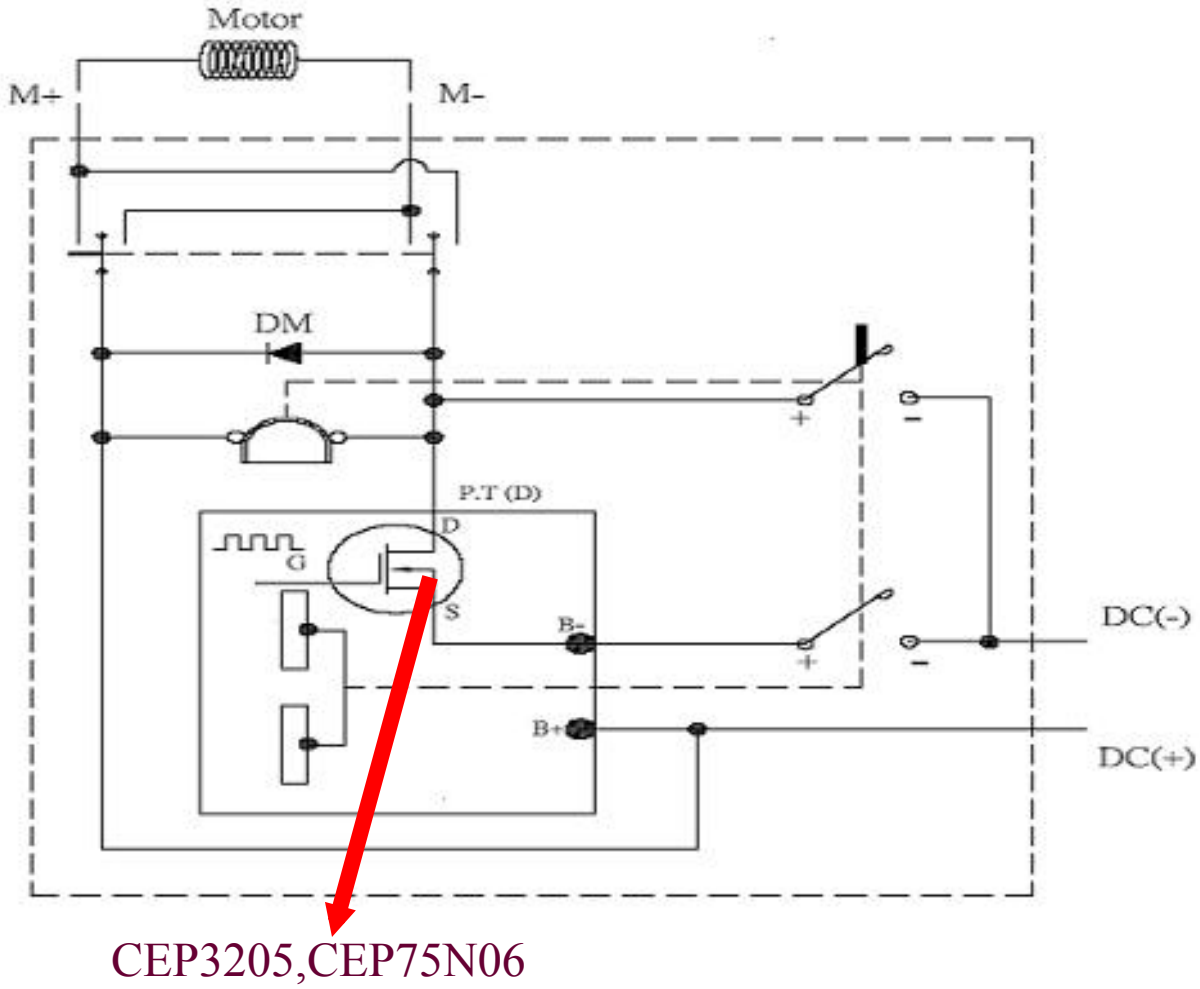
AGENDA

*Block diagram

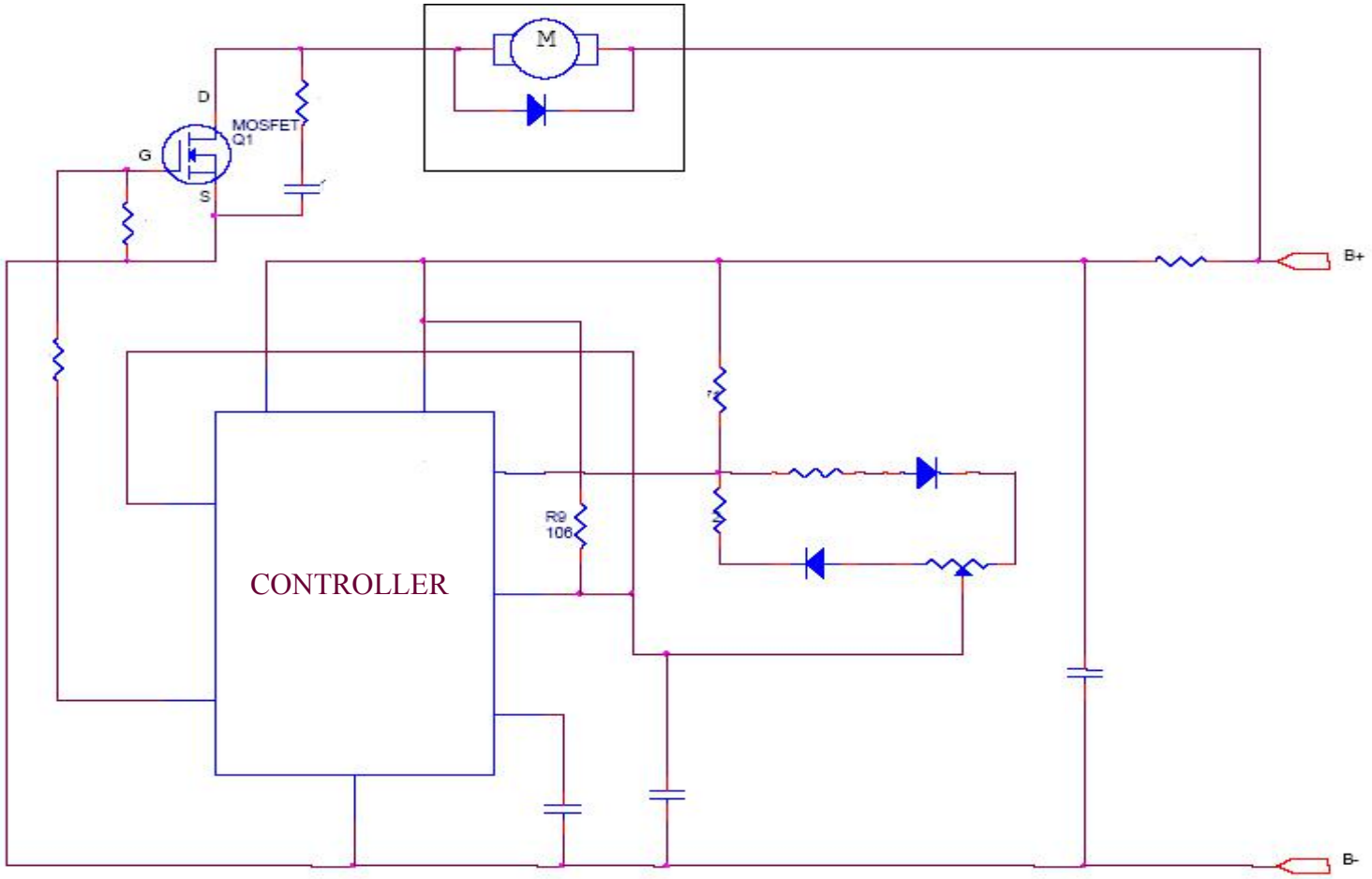
*Circuit refers

*MOSFET Selection Guide

Block diagram



Circuit refers



Products Use for Power Tool

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	Package
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEP14A04	N	40	5		180	200	110		2	Single	TO220
CEP84A4	N	40	5.1	7.8	90	71	67		2	Single	TO220
CEP9060N	N	55	10.5		90	166	68.1		2.9	Single	TO220
CEP3205	N	55	8.5		108.5	200	102.3		3	Single	TO220
CEP6056	N	60	6.2		100	125	77		2.8	Single	TO220
CEP75N06	N	60	12		75	125	67.9		2.8	Single	TO220
CEP60N06G	N	60	16		60	125	52		2.8	Single	TO220
CEP6060N	N	60	25		42	88	28.7		2.8	Single	TO220
CEP6086	N	60	9.2		70	75	50		3	Single	TO220

Notebook

Chino-Excel Technology Corp.
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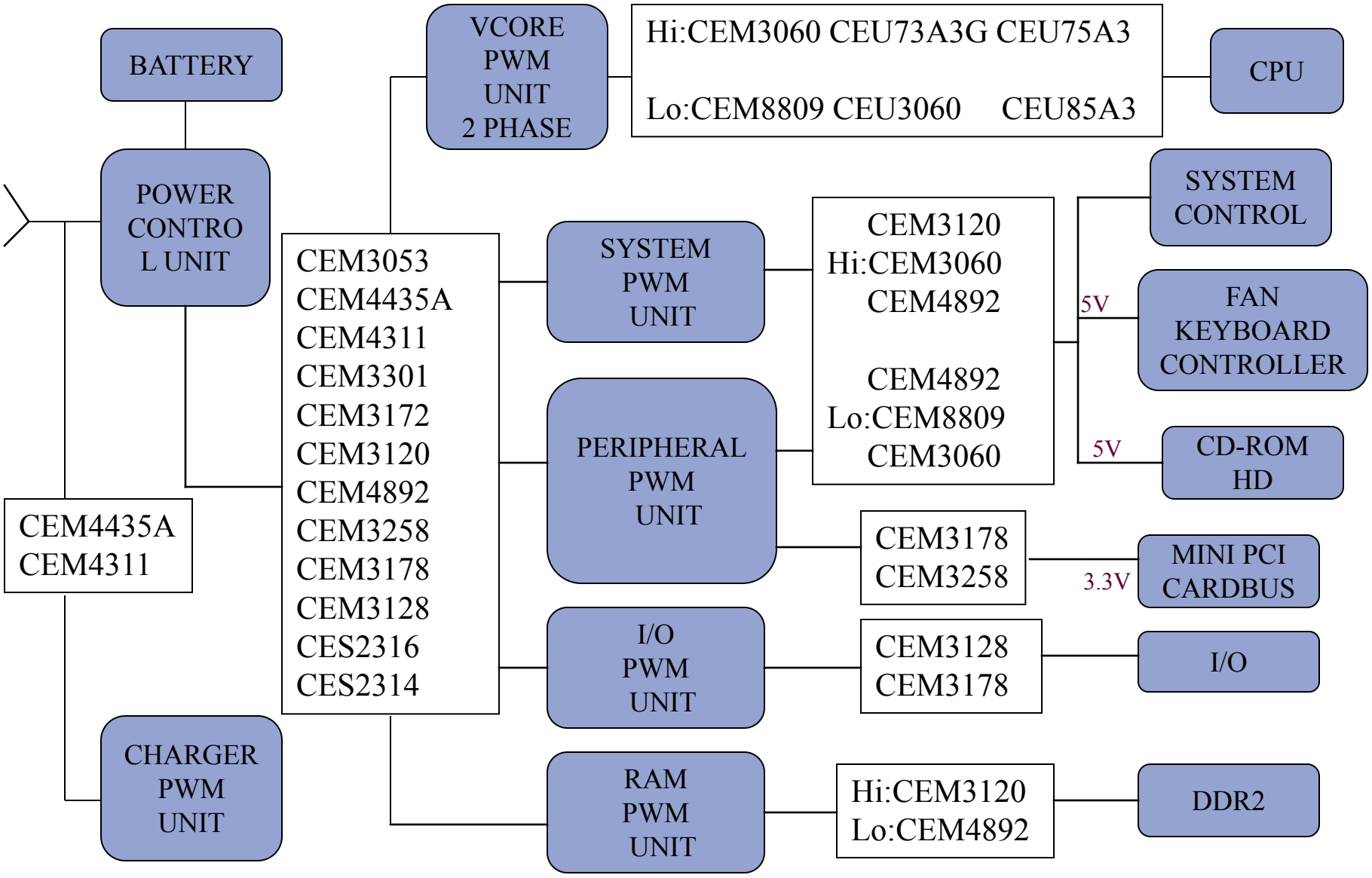
Taipei City, Taiwan, R.O.C.

AGENDA

*Notebook Power solution

*MOSFET Selection Guide

Notebook Power solution



Products Use for Note Book

PART NO	TYPE	BVds	Rds(on) Max(mΩ)		Ids	Pd	Qg(nC)		$V_{GS(th)}$	Config	Package
		(V)	Vgs@10V	Vgs@4.5V	(A)	(W)	Vgs=10V	Vgs=4.5V	(V)		
CEM3053	P	-30	7	13	-15	2.5	148		-1~-3	Single	SO-8
CEM4311	P	-30	18	30	-9.3	2.5		19	-1~-3	Single	SO-8
CEM4435A	P	-30	20	33	-8	2.5		19	-1~-3	Single	SO-8
CEM3301	P	-30	32	50	-7	2.5	19		-1~-3	Single	SO-8
CEM3172	N	30	20	32	8.9	2.5		13	1~3	Single	SO-8
CEM3120	N	30	15	22	10	2.5	15		1~3	Single	SO-8
CEM4892	N	30	11	18	12	2.5		19.7(5V)	1~3	Single	SO-8
CEM3258	N	30	28	40	7	2	12.3		1~3	Dual	SO-8
CEM3178	N	30	22	33	7.6	2		13	1~3	Dual	SO-8
CEM3128	N	30	16	23	9	2.5	14.8		1~3	Dual	SO-8
CES2316	N	30	34	50	4.8	1.25	12.3		1~3	Single	SOT-23
CES2314	N	30	50	70	4	1.25		5.3	1~3	Single	SOT-23
CEM3060	N	30	7.8	11.5	14	2.5		16(5V)	1~3	Single	SO-8
CEM8809	N	30	6	7.5	15.5	2.5	72		1~3	Single	SO-8
CEU3060	N	30	6.6	9.5	75	62.5		15.6(5V)	1~3	Single	TO-252
CEU73A3G	N	30	9	16	65	75	22		1~3	Single	TO-252
CEU85A3	N	25	6	9	80	70		17(5V)	1~3	Single	TO-252
CEU75A3	N	25	9	13	60	56		10(5V)	1~3	Single	TO-252
CEZ3R01	N	30	2	3	160	83			2	Single	Power Pack 5*6
CEZ3R02	N	30	2.3	3.8	135	83	51		2	Single	Power Pack 5*6
CEZ3R03	N	30	4	6	85	48	63		2	Single	Power Pack 5*6

THANK YOU !

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