Fuji Electric

Innovating Energy Technology

FUJI Power Semiconductors

Power Supply Control ICs Selection Guide

AC/DC Power Supply Control ICs

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25A2-E-0007

Green Mode PWM-ICs

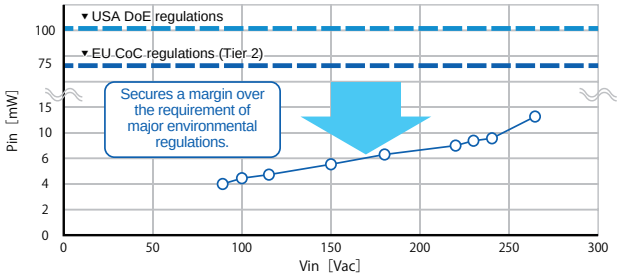
FA8A60N/70N/80N/90N Series

The AC/DC PWM Control IC FA8A80/90 Series offers the best system for flyback circuits.
With a rich variety of functions integrated in the small-sized package of SOP8 it makes excellent cost performance via a compact power supply design that leads to good energy saving at light loads.

1. Achieves low standby power (equipped with power-off mode)

It achieves low standby power with its power-off mode. It is also capable of clearing the energy-saving standards for external power supplies such as DoE*1 and CoC*2 even securing some margin.

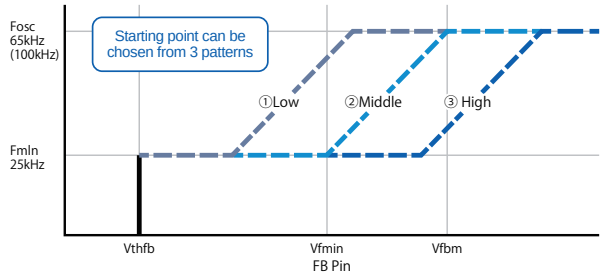
No-load standby power



2. Switching frequency reduction adjustment is available

The frequency reduction starting point can be chosen from three patterns, which makes it possible to improve efficiency for the power supply capacity.

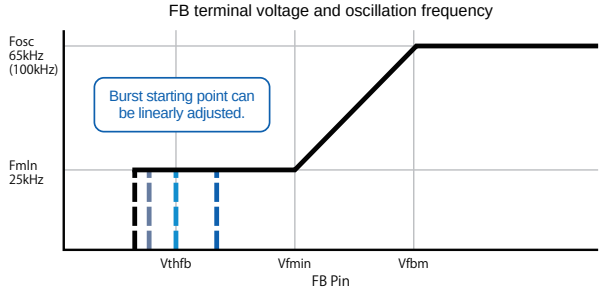
FB pin voltage and oscillation frequency



3. Burst starting point can be adjusted

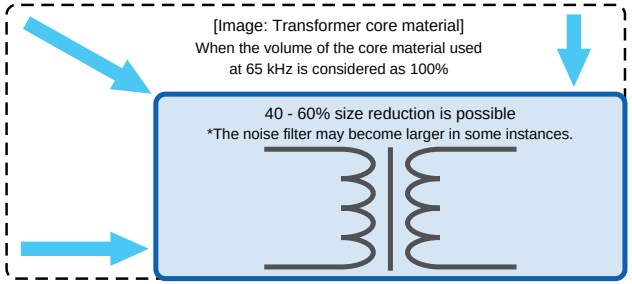
The burst starting point can be continuously adjusted, which makes it easy to improve efficiency at light loads and implement measures for acoustic noise reduction.

FB terminal voltage and oscillation frequency



4. Reduced size of the power supply (100 kHz type)

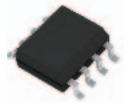
In addition to the 65 kHz type, a 100 kHz type is also available. The high frequency has made it possible to reduce the size of the power supply transformer.



*1 DoE (Department of Energy): The energy-saving regulations in the United States that stand in for the Energy Star program promoted by the United States Department of Energy.
*2 CoC (Code of Conduct): Abbreviation for the EU Code of Conduct. Tier 2 became effective in January 2016 as a replacement of the EuP directive.

■ Applications (for flyback circuits)

Office automation equipment, AC adapters, external power supplies, LCD TVs, etc.



Package: SOP-8

■ Product Line-up

Type	500V Starting circuit	65kHz	FA8A60N	FA8A61N	FA8A70N	FA8A71N
		100kHz	FA8A64N	FA8A65N	FA8A74N	FA8A75N
	650V Starting circuit	65kHz	FA8A80N	FA8A81N	FA8A90N	FA8A91N
		100kHz	FA8A84N	FA8A85N	FA8A94N	FA8A95N
Overload protection (OLP)			Auto-Recovery	Latch	Auto-Recovery	Latch
	Delay time		200ms	200ms	200ms	200ms
	Line correction		Built-in	Built-in	Built-in	Built-in
	Detection level		1 level	1 level	1 level	1 level
X-Cap discharge function			None		Built-in	
Frequency reduction function			Selectable (3 patterns)			
Burst operation point adjustment			Linearly adjustable			
Power-off mode			Built-in			
DSS (Dynamic self supply)			Built-in			
Overvoltage protection			25.5 V (latch)			
Over temperature protection			140°C (latch)			

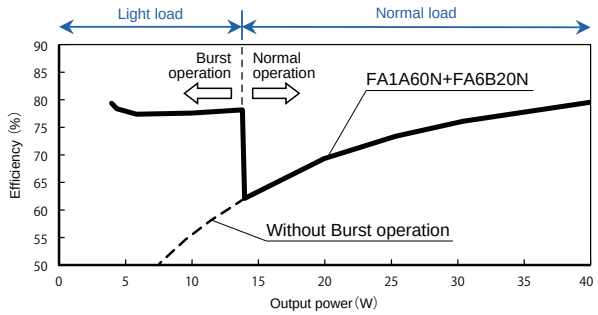
Critical mode PFC control IC and LLC current resonance control IC for high-efficiency power supplies

FA1A60N/FA6B20N

The critical mode PFC Control IC FA1A60N and LLC current resonance control IC FA6B20N provide an optimum system for LLC converters with an output of 75 W or higher. The auto standby function enables the products to be applied not only to internal power supplies but also to adapters that do not have external standby signals.

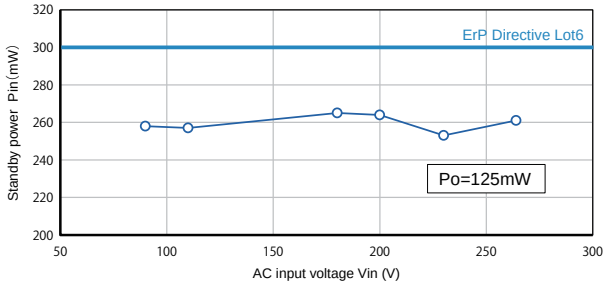
1. Improved efficiency at light load

Efficiency above 75% is achieved at 3% of rated power by providing burst control for both PFC control IC and LLC control IC at light load.



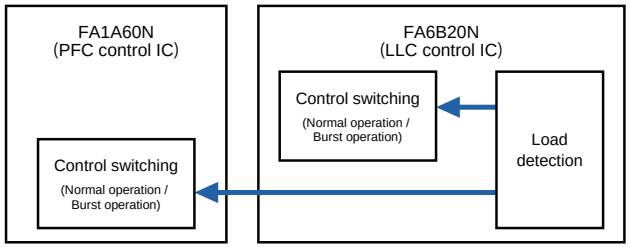
2. Low standby power

Standby power below 260 mW is achieved without standby power supply when input is 230 V AC and output power is 125 mW.
(ErP Directive Lot6*2: 0.3 W or lower)



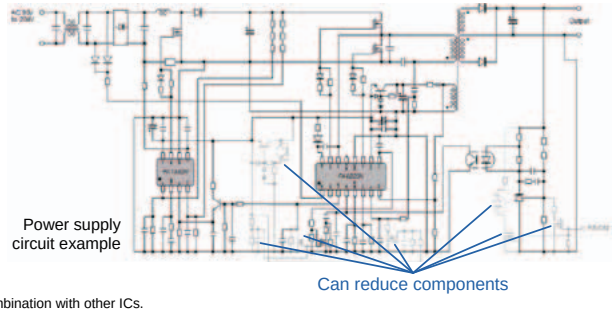
3. Auto standby function

Output power is detected by LLC control IC, and at light load condition, both PFC control IC andLLC control IC are switched from normal operation to burst operation.



4. Reduced power supply components

Because the auto standby function is integrated, an external standby signal is unnecessary. This makes it possible to reduce the number of components by seven, including the photo coupler.



■Application examples

LCD TVs, high power adapters, office automation (OA) equipment, communication power supplies and industrial power supplies

FA1A60N package :SOP-8

FA6B20N package :SOP-16

*1 Use the PFC-IC FA1A60N in combination with the FA6B20N. The FA6B20N can be used alone or in combination with other ICs.
*2 The ErP Directive is also called the Eco Design Directive, the EU regulation that obligates environmentally conscious design.

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No.	Title		Page	Applicable circuit						
				Flyback	Forward	Full-bridge	Half-bridge Current Resonant	Boost	Buck	Inverting
1	Product map		4							
2	AC/DC Power Supply Control ICs	Green Mode PWM-ICs (Current Mode)	6	✓						
3		General PWM-ICs	8	✓	✓			(✓) *1	(✓) *1	
4		Green Mode Quasi-resonant ICs (Current Mode)	10	✓						
5		Power Factor Correction ICs	12	✓				✓		
6		Current Resonant ICs	14				✓			
7	Driver ICs		15			✓	✓		✓	
8	DC/DC Power Supply Control ICs		16	✓				✓	✓	✓
9	Application examples		18							
10	Package		20							

*1: Some products can be utilized depending on the applicable circuit

■ Type nomenclature

FA8A00N (example)

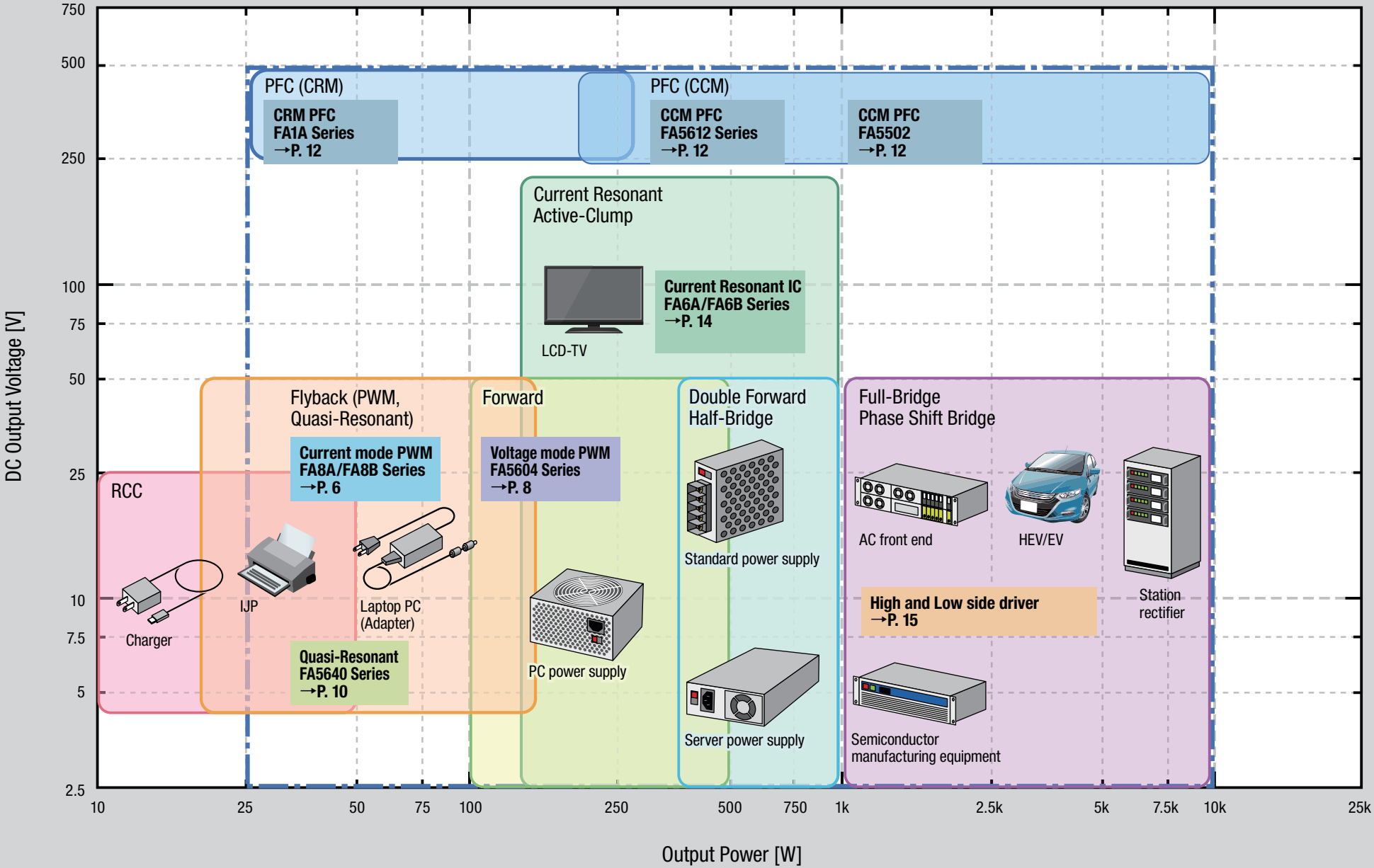
F		A		8		A		00	N	
Company symbol		Control system		Series		Generation		Number	Package code	
F	Fuji	A	Analog	1	CRM PFC	A	1G	Two-digit integer	N	SOP
				6	LLC	B	2G		P	DIP
				8	PWM	C	3G			
						…	…			

FA5590N (example)

F		A		55		90	N	
Company symbol		Control system		Series		Number	Package code	
F	Fuji	A	Analog	3X	AC/DC	Two-digit integer	M/N	SOP
				5X	AC/DC		P	DIP
				7X	DC/DC		V	TSSOP
				13X	AC/DC			

Product Map

Application specific output power/output voltage and applicable ICs



Circuit type (AC/DC)

Circuit type	Product category	Page
Flyback	Green Mode PWM-IC (Current Mode)	6
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	Green Mode Quasi-resonant ICs (Current Mode)	10
Forward	General PWM-ICs	8
LLC (Half-bridge)	Current Resonant ICs	14
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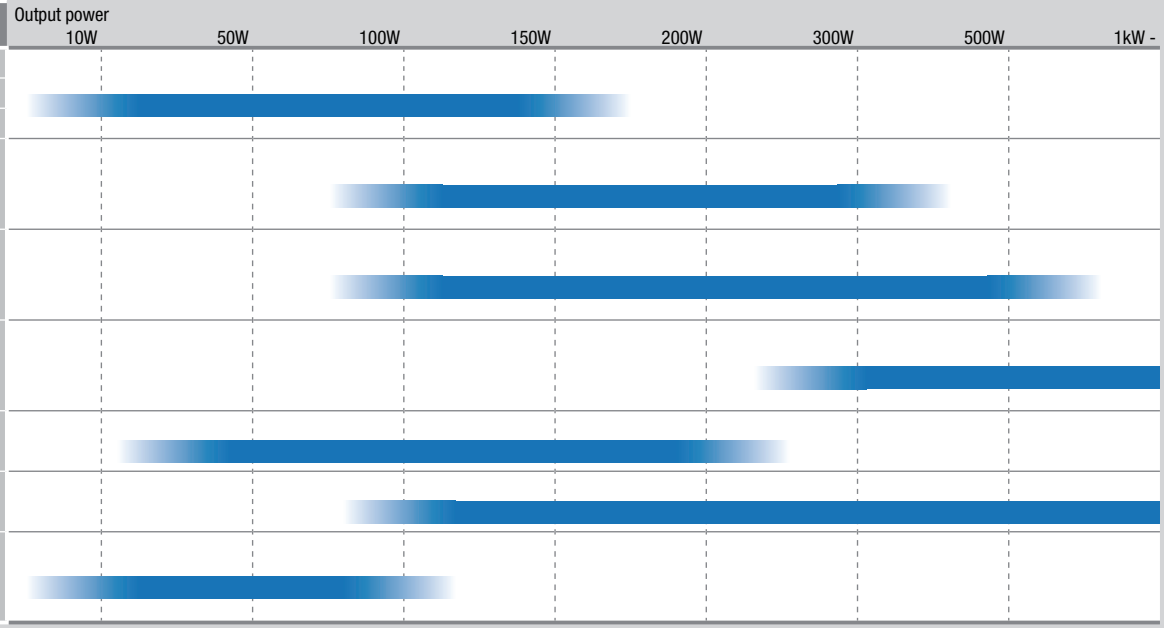
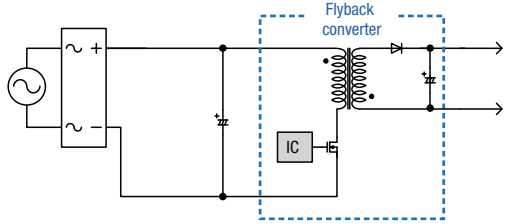
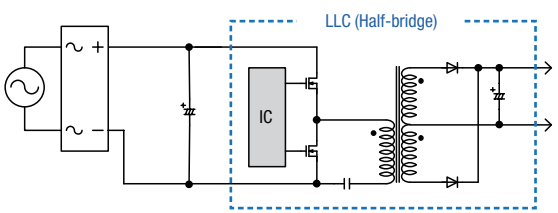
PFC (Boost)	Power Factor Correction ICs (Critical Conduction Mode)	12
	Power Factor Correction ICs (Continuous Conduction Mode)	12
PFC (flyback)	Power Factor Correction ICs (FA1A21N, FA5601N)	13



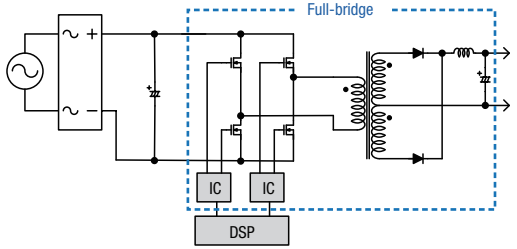
Flyback, PFC (flyback)



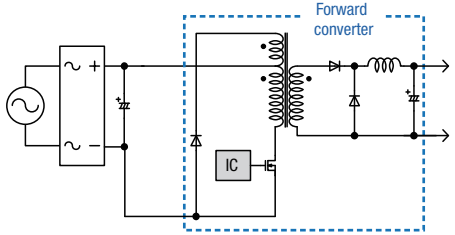
LLC (Half-bridge)



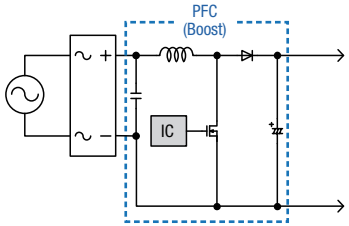
Full-bridge



Forward



PFC (Boost)



■ Green Mode PWM-ICs

Generation	Series	Type name	Control mode	Applied circuit	Built-in start up circuit	X-Cap discharge function	Brown out function	Max Duty	Frequency fsw	Overcurrent detection	Protection mode			Light-load switching	Power supply voltage Vcc	Vcc threshold voltage		Package	Remarks
											Over load	Over power	Overvoltage			ON	OFF		
6th generation	FA8A00 Series (Basic functions version)	FA8A00N	Current mode	Flyback	✓ (500V)	✓	✓ Fixed	83%	65kHz	+ detection	Auto-Recovery	2 Stage (OPP ratio 1:1.4)	Latch Vcc detection	Linerary frequency reduction + Intermittent operation	12-24V	13V	6.5V	SOP-8	
		FA8A01N									Timer-latch Delay 70 ms								
		FA8A40N							100kHz		Auto-Recovery								
		FA8A41N									Timer-latch Delay 70 ms								
		FA8A27N							65kHz		Timer-latch Delay 860 ms	2 Stage (OPP ratio 1:1.8)			10-28V				
		FA8A37N									Timer-latch Delay 1.6 s								
		FA8A39N									Timer-latch Delay 2.5 s								
		FA8A12N					–				Auto-Recovery	2 Stage (OPP ratio 1:1.4)			12-24V				
	FA8A60 Series (Advanced functions version)	FA8A60N			✓ (500V)	–	–	83%	65kHz	+ detection	Auto-Recovery	1 Stage	Latch Vcc detection	Linerary frequency reduction + Intermittent operation (Frequency reduction/burst point adjustable)	10-24V	12.5V	6.5V		
		FA8A61N									Timer-latch								
		FA8A64N							100kHz		Auto-Recovery								
		FA8A65N									Timer-latch								
		FA8A70N				✓			65kHz		Auto-Recovery								
		FA8A71N									Timer-latch								
		FA8A74N							100kHz		Auto-Recovery								
		FA8A75N									Timer-latch								
	FA8A80 Series (Advanced functions, VH high withstand-voltage version)	FA8A80N			✓ (650V)	–	–	83%	65kHz	+ detection	Auto-Recovery	1 Stage	Latch Vcc detection	Linerary frequency reduction + Intermittent operation (Frequency reduction/burst point adjustable)	10-24V	12.5V	6.5V		
		FA8A81N									Timer-latch								
		FA8A83N				✓													
		FA8A84N				–			100kHz		Auto-Recovery								
		FA8A85N									Timer-latch								
		FA8A86N					✓ Fixed				Auto-Recovery		–						
		FA8A87N				✓	–		65kHz		Timer-latch		Latch Vcc detection						OCP,OLP No correction
		FA8A90N									Auto-Recovery								
		FA8A91N									Timer-latch								
		FA8A94N							100kHz		Auto-Recovery								
		FA8A95N									Timer-latch								
	FA8Bxx Series	FA8B16N			✓ (500V)	✓	✓ Fixed	83%	65kHz	+ detection	Auto-Recovery	2 Stage (OPP ratio 1:1.5)	Latch Vcc detection	Linerary frequency reduction + Intermittent operation	12-24V	12.5V	8V		
5th generation	FA5680 Series	FA5680N			✓ (750V)	–	–	85%	65kHz	+ detection	Auto-Recovery	1 Stage	Latch Vcc detection	Linerary frequency reduction + Intermittent operation	11-24V	18V	8V		
		FA5681N									Timer-latch								

Green Mode PWM-ICs

Features

◦ With 500/650 V withstand voltage start up circuit ◦ Green mode functions (Intermittent Switching/Linerary reduced switching frequency)
◦ Protect functions (Over voltage/Brown out/2 stage Over power) ◦ Low EMI noise

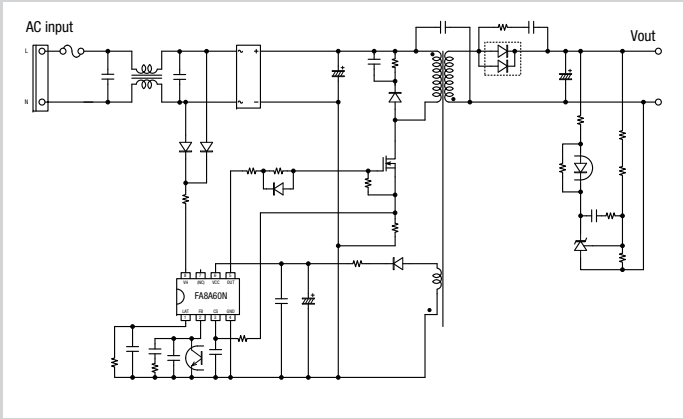
Green mode PWM-ICs with Brown Out function

Green Mode PWM IC										
Brown out function	With									
Current sense	Positive									
Over power protection	2 Stage OPP ratio 1:1.4				2 Stage OPP ratio 1:1.8			2 Stage OPP ratio 1:1.5	1 Stage	
Frequency (kHz)	65		100		65			65	65	100
Overload protection	Auto-Recovery	Timer-latch	Auto-Recovery	Timer-latch	Timer-latch			Auto-Recovery	Timer-latch	Auto-Recovery
OLPdelay time (ms)	70	70	70	70	860	1600	2400	890	200	200
X-Cap discharge function	With	With	With	With	With	With	With	With	With	Without
Type	FA8A00N	FA8A01N	FA8A40N	FA8A41N	FA8A27N	FA8A37N	FA8A39N	FA8B16N	FA8A83N	FA8A86N

Green mode PWM-ICs without Brown Out function

Green ModePWM IC													
Brown out function	Without												
Over power protection	1Stage												2Stage
Current sense	Negative				Positive								Positive
Overload protection	Auto-Recovery	Timer-latch	Auto-Recovery		Timer-latch								Auto-Recovery
Frequency (kHz)	65	65	65	100	65					100			65
X-Cap discharge function			With	With	With					With			With
OCP OLP correction			With							With			
Product type 500V	FA5680N	FA5681N	FA8A60N	FA8A70N	FA8A64N	FA8A74N	FA8A61N	FA8A71N		FA8A65N	FA8A75N		FA8A12N
Product type 500V			FA8A80N	FA8A90N	FA8A84N	FA8A94N	FA8A81N	FA8A91N	FA8A87N	FA8A85N	FA8A95N		

Circuit example (Flyback) : FA8A60N



■ General PWM-ICs

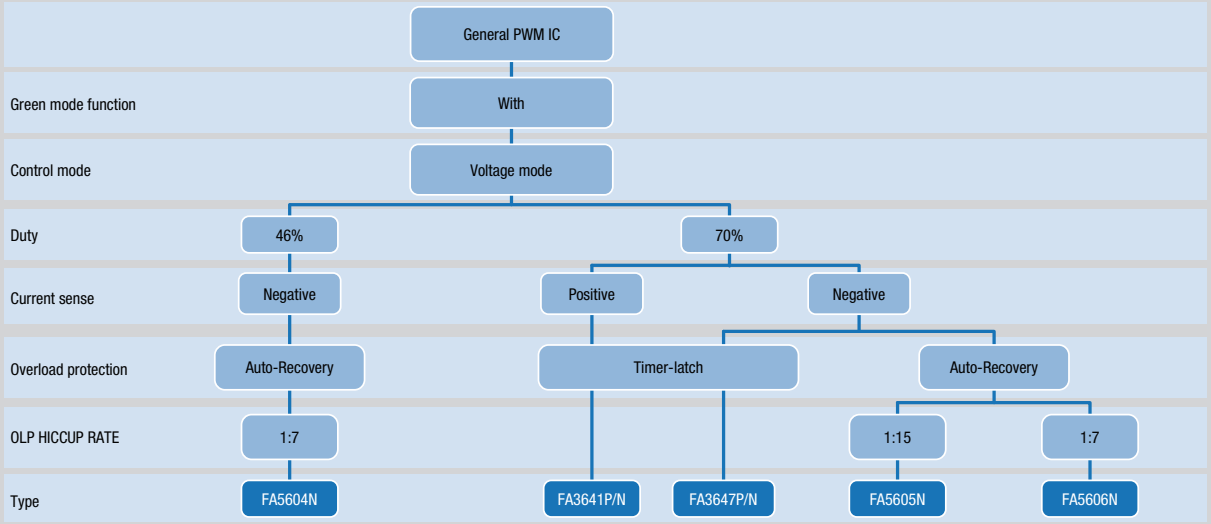
Series	Type name	Control mode	Applied circuit	Max Duty	Frequency fsw	Overcurrent detection	Protection mode		Light-load switch operation	Power supply voltage Vcc	Vcc threshold voltage		Package	Features
							Overload	Overvoltage			ON	OFF		
FA1384× Series	FA13842P/N	Current mode	Flyback	96%	External settings 10-500kHz	+ detection	–	–	–	10-25V	16.5V	9V	DIP-8, SOP-8	384 Series pin compatible, 5 V reference voltage output, With error amplifier
	FA13843P/N										9.6V			
	FA13844P/N		Forward	48%	External settings 5-250kHz						16.5V			
	FA13845P/N										9.6V			
FA5504 Series	FA5504P/N	Voltage mode	Forward	46%	External settings 10-500kHz	+ detection	Timer-latch	CS latch Vcc voltage detection	–	10-28V	16.5V	9V	DIP-8, SOP-8	With error amplifier 5 V reference voltage output
FA551× Series	FA5510P/N		Forward	46%	External settings 10-500kHz	+ detection	Timer-latch	CS latch Vcc voltage detection	–	10-28V	16.5V	9V		5 V reference voltage output
	FA5511P/N		Flyback	70%										
	FA5514P/N		Forward	46%		– detection								
	FA5515P/N		Flyback	70%										
FA364× Series	FA3641P/N		Flyback	70%	External settings 30-500kHz	+ detection	Timer-latch	CS latch Vcc voltage detection	Frequency reduction	10-28V	16.5V	9V		5 V reference voltage output Frequency-reduction function added to FA5511/15
	FA3647P/N					– detection								
FA5604 Series	FA5604N		Forward	46%	External settings 100-300kHz	– detection	Auto-Recovery	CS latch (External detection)	Frequency reduction Start/stop FB voltage 1.8V/1.95V	10-30V	17.5V	9.7V	SOP-8	Overload current drooping Frequency reduction
	FA5605N		Flyback	70%										
	FA5606N								Frequency reduction Start/stop FB voltage 1.55V/1.65V					
	FA5607N								–					

■ General PWM-ICs

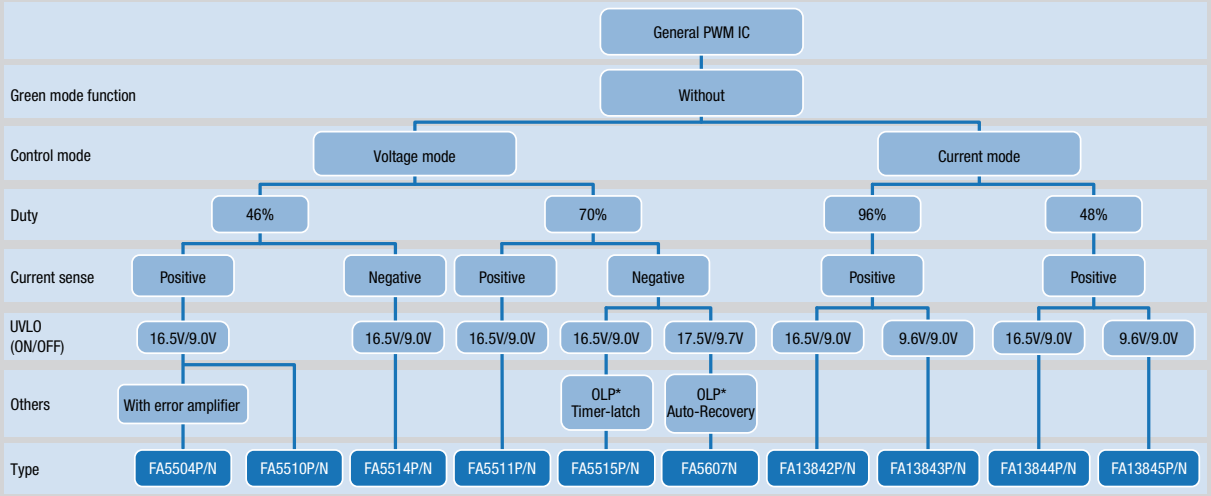
● Features

- ◦ Voltage mode control
- ◦ Operating frequency can be set externally
- ◦ 5 V reference voltage output

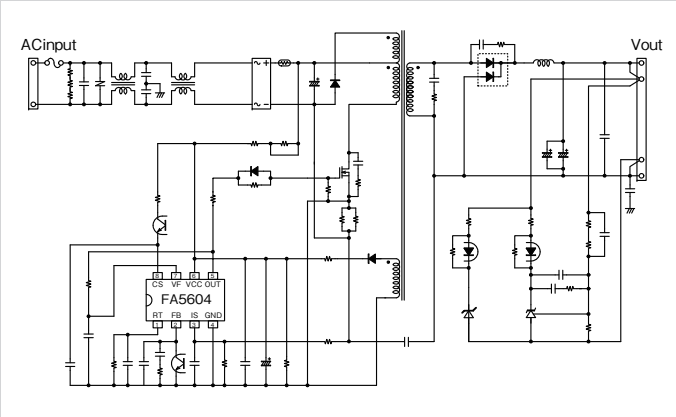
General PWM Control IC Series with Green Mode Function



General PWM Control IC Series without Green Mode Function



● Circuit example (Forward) : FA5604N



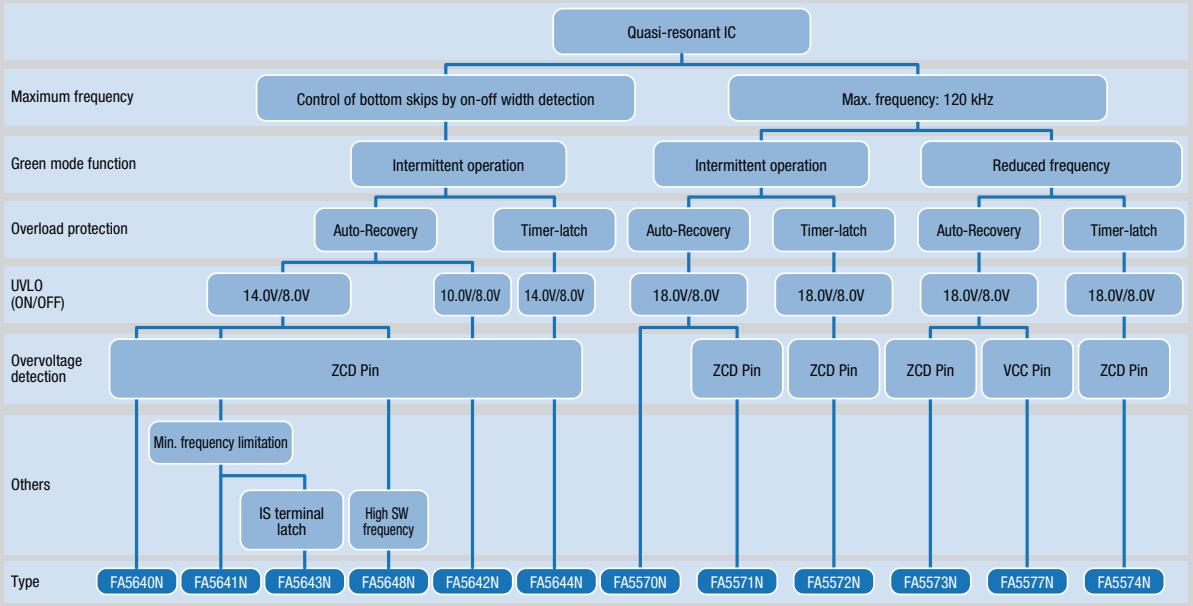
■ Green Mode Quasi-resonant ICs Products

Generation	Series	Type name	Control mode	Applied circuit	Built-in start up circuit	Frequency fsw	Overcurrent detection	Protection mode		Light-load switch operation	Power supply voltage Vcc	Vcc threshold voltage		Package	Features
								Overload	Overvoltage			ON	OFF		
4th generation	FA5640 Series	FA5640N	Current mode	Flyback	✓ (500V)	Bottom skip count control via self-excited on-off width detection, estimated frequency switching from 1st to 2nd bottom 110kHz (FA5648 is 260 kHz)	+ detection +0.5V (AC100V) +0.45V (AC230V)	Auto-Recovery	Latch ZCD voltage detection	Intermittent operation	11-26V	14V	8V	SOP-8	–
		FA5641N													Minimum frequency (25 kHz)
		FA5642N										10V			Vcc on-voltage (10 V)
		FA5643N										14V			IS pin latch stop
		FA5644N						Timer-latch							Overload latch stop
		FA5648N						Auto-Recovery							For High SW frequency
3rd generation	FA5571 Series	FA5570N			✓ (500V)	Self-oscillation Maximum 120kHx	+ detection +1.0V	Auto-Recovery	–	Intermittent operation	10-28V	18V	8V		Without overvoltage protection
		FA5571N						Timer-latch	Latch ZCD voltage detection						Overvoltage ZCD detection
		FA5572N						Auto-Recovery							
		FA5573N						Timer-latch		Linerary frequency reduction					
		FA5574N													
		FA5577N					+ detection +0.5V	Auto-Recovery	Latch Vcc voltage detection						Overvoltage Vcc detection

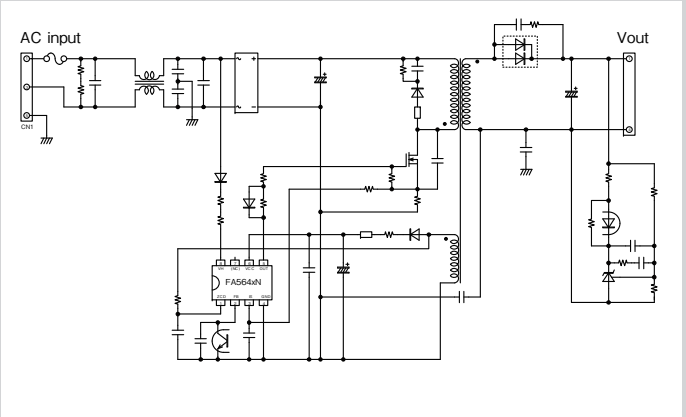
■ Green Mode Quasi-resonant ICs (Current Mode)

● Features

- ◦ Built-in 600 V withstand voltage start up circuit
- ◦ Green mode functions (Intermittent Switching/Linerary reduced switching frequency)
- ◦ Prorect functions (overvoltage/overload, etc.)



● Circuit example (Flyback) : FA5640N



■ Power Factor Correction ICs Products

Critical Conduction mode PFC Control IC

Series	Type name	Control mode	Applied circuit	OVP terminal	Zero current detection	Overcurrent detection	Frequency fsw	Protection mode		FB open/ short circuit protection	Light-load switching	Power supply voltage Vcc	Vcc threshold voltage		Package	Features
								Overload	Overvoltage				ON	OFF		
FA1Axx Series	FA1A00N	Voltage mode	PFC (Boost)	✓	CS pin (Resistance)	– detection	Self-oscillation	Input current limitation (Auto-recovery)	Output current limitation (Auto-recovery)	✓	Frequency reduction	10-26V	9.6V	8.8V	SOP-8	Light-load bottom skip function Output overvoltage double protection
	FA1A01N												12.4V			
	FA1A10N			–									9.6V			Light-load bottom skip function
	FA1A11N												12.4V			
	FA1A50N			✓									9.6V	8.8V		Light-load bottom skip function FA1A00N enhanced version
	FA1A60N										Frequency reduction + Intermittent operation		12.5V	7.5V		Light-load intermittent switching FA6B19N/20N/22N coordinated operation
	FA1A61N									✓ (Open protection only)			12.5V	7.5V		Light-load intermittent operation FA6B21N coordinated operation
	FA1A21N		PFC (Flyback)	–	ZCD pin (Winding)	+ detection	Self-oscillation	Input current limitation (Auto-recovery)	Auto-Recovery Vcc detection	–	Frequency reduction		17.3V	8.8V		For LED lighting Soft start function Overload protection
FA5590 Series	FA5590N		PFC (Boost)	–	IS pin (Resistance)	– detection	Self-oscillation Maximum frequency External settings	Input current limitation (Auto-recovery)	Output current limitation (Auto-recovery)	✓	Max. frequency limitation	10-26V	9.6V	9V		Max. frequency setting (100k~800kHz)
	FA5591N												13V			
	FA5696N			✓												Max. frequency setting Output overvoltage double protection
	FA5601N		PFC (Boost/ Flyback)	–	ZCD pin (Winding)	+ detection	Self-oscillation Maximum frequency External settings	Auto-Recovery	Output current limitation		Max. frequency limitation		13V	9V		For LED lighting (PFC Flyback)

Continuous Conduction Mode PFC Control IC

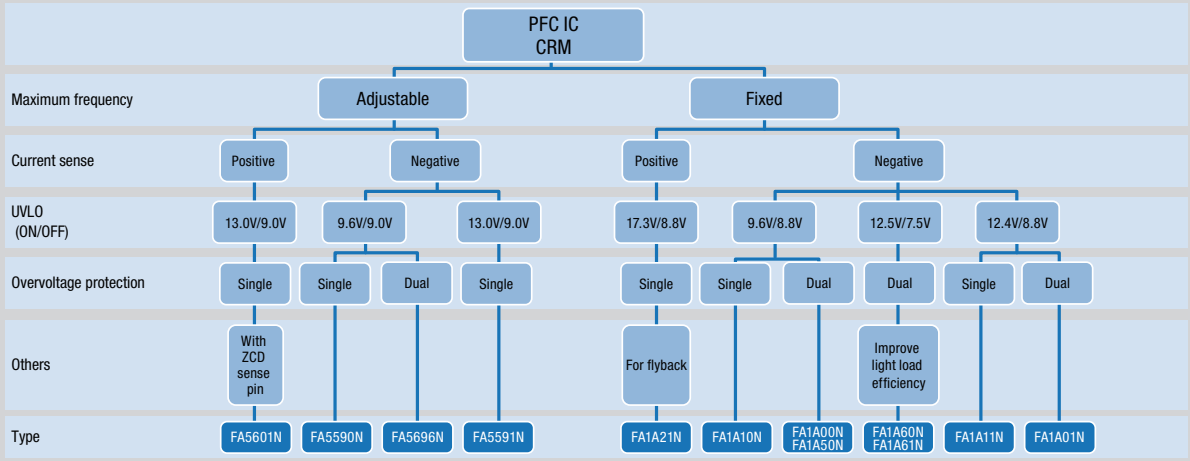
Series	Type name	Control mode	Applied circuit	OVP terminal	Max Duty	Overcurrent detection	Frequency fsw	Protection mode		FB open/ short circuit protection	Light-load switching	Power supply voltage Vcc	Vcc threshold voltage		Package	Features
								Overload	Overvoltage				ON	OFF		
FA5612 Series	FA5612N	Average current	PFC (Boost)	–	94%	– detection -0.5V (AC100V) -0.4V (AC230V)	External selection (50-70 kHz scattered, 60 kHz, 65 kHz)	Input current limitation (Auto-recovery)	Output current limitation (Auto-recovery)		–	10-26V	9.6V	9V	SOP-8	Overcurrent detection level switching Fixed frequency, jitter switching
	FA5613N										–		13V			
	FA5614N			–	94%	– detection -0.5V (AC100V) -0.4V (AC230V)	External selection (114-140 kHz scattered, 120 kHz, 130 kHz)	Input current limitation (Auto-recovery)	Output current limitation (Auto-recovery)		–		9.6V			High SW frequency Overcurrent detection level switching Fixed frequency, jitter switching
	FA5615N										–		13V			
FA5502 Series	FA5502P/M			✓	94%	– detection	External settings 15-150kHz	Input current limitation (Auto-recovery)	Output current limitation (Auto-recovery)	–	–	10-26V	8.9V	8.9V	DIP-16, SOP-16 (M)	ON/OFF pin Synchronous pin

Power Factor Correction ICs

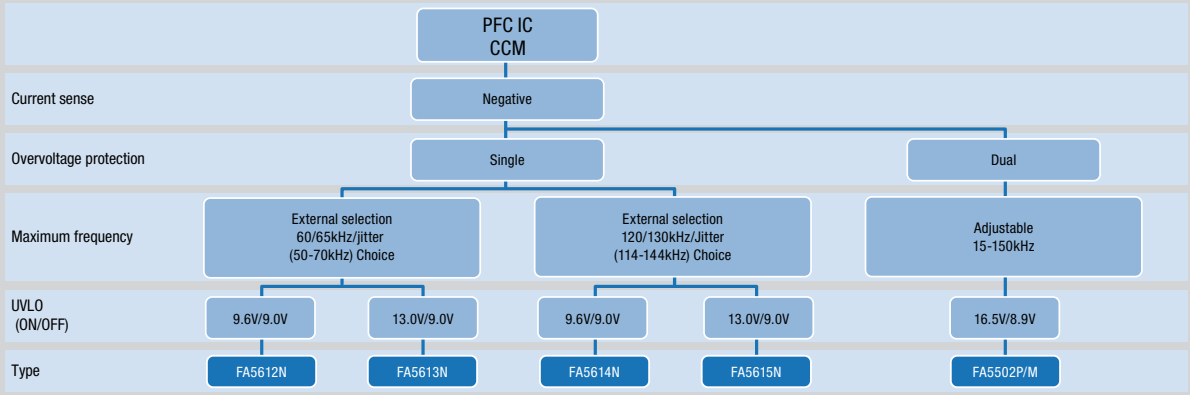
Features

- Wide electric power range (From 75 W to 1 kW)
- Power factor ≥ 0.99
- Protect functions (FB pin open short/Over voltage, etc.)

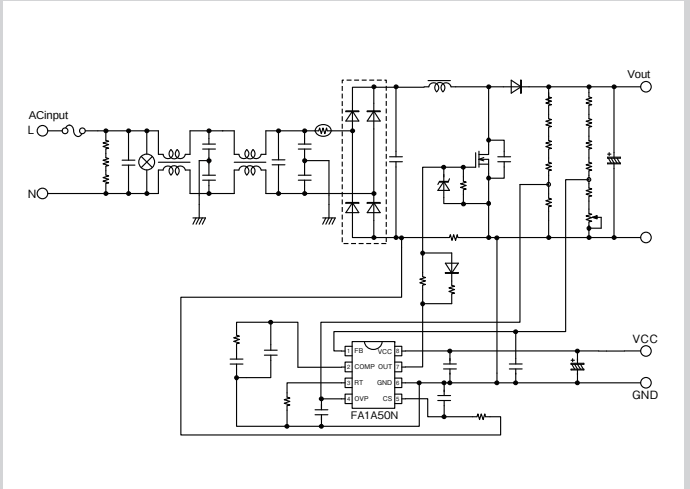
Critical Conduction mode PFC Control IC



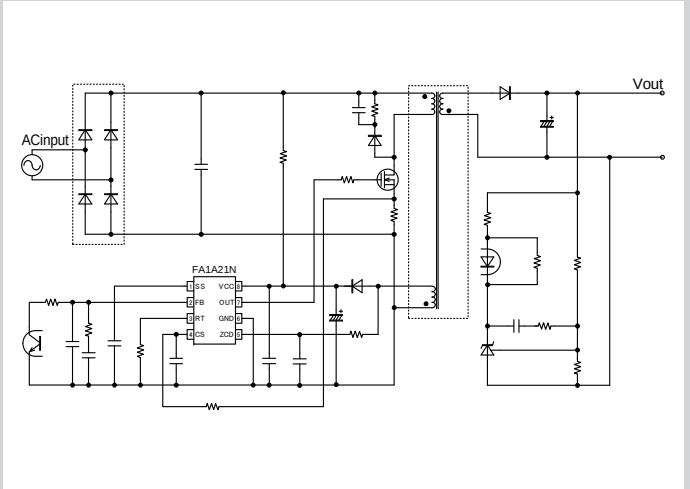
Continuous Conduction Mode PFC Control IC



Circuit example (PFC boost) : FA1A50N



Circuit example (PFC flyback) : FA1A21N

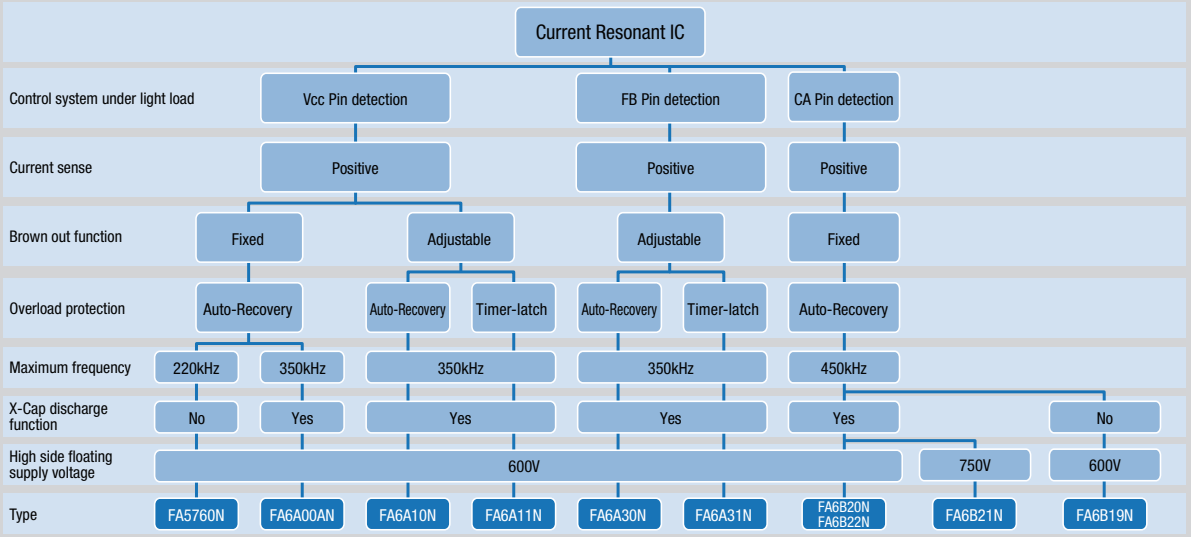


■ Current Resonant ICs Products

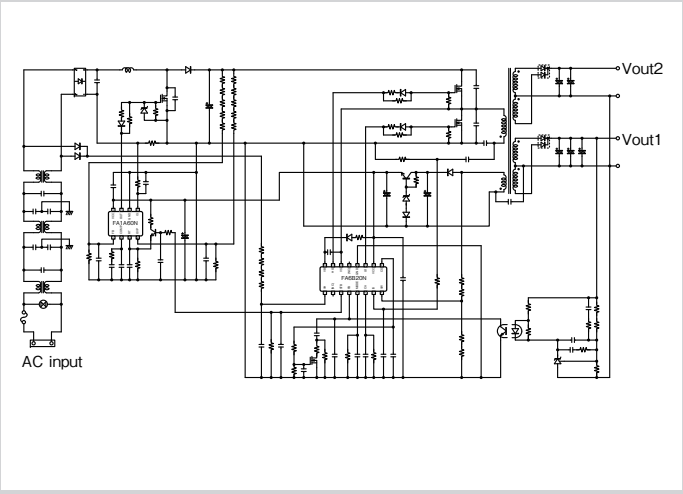
Generation	Series	Type name	Applied circuit	Built-in start up circuit	High side floating voltage	X-Cap discharge function	Brown out function	Low standby mode switching	Duty	Overcurrent detection	Frequency fsw	Protection mode			Light-load switching	Power supply voltage Vcc	Vcc threshold voltage		Package	Features
												Overcurrent	Overload	Overvoltage			ON	OFF		
3rd generation	FA6Bxx Series	FA6B19N	Current resonant LLC (Half bridge)	✓ (600V)	600V	–	✓ Fixed	CA Pin detection Auto switching/ external switching	50%	+ detection	Self-oscillation 25-450kH	Auto-recovery	Auto-Recovery	Auto-Recovery	Burst operation FB pin control	14-29V	14V	9V	SOP-16	Auto standby function State setting function
		FA6B20N																		
		FA6B21N			750V	✓														Transient response improvement Auto standby function
		FA6B22N			600V															B0 detection delay extension type Auto standby function
2nd generation	FA6Axx Series	FA6A00AN		✓ (600V)	600V	✓	✓ Fixed	External switching STB pin	50%	+ detection	Self-oscillation 38-350kHz	Auto-recovery	Auto-Recovery	Timer-latch	Burst operation Vcc pin control	14-27V	12V	9V		Power good signal output State setting function Supports W/W voltage
		FA6A10N					✓ Adjustable					Auto-recovery	Auto-Recovery							Brown out Detection level adjustment State setting function Supports W/W voltage
		FA6A11N										Timer-latch	Timer-latch							
		FA6A30N										Auto-recovery	Auto-Recovery		Burst operation FB pin control					State setting function Brown out Detection level adjustment Supports W/W voltage
		FA6A31N										Timer-latch	Timer-latch							
1st generation	FA5760 Series	FA5760N		✓ (600V)	600V	✓	✓ Fixed	External switching STB pin	50%	+ detection	Self-oscillation 25-220kHz	Auto-recovery	Auto-Recovery	Timer-latch	Burst operation Vcc pin control	10-24V	12V	8.9V		Power good signal output Supports W/W voltage

● Features

- ◦ Realize 1 convertor circuit structure at world wide input power
- ◦ Built-in High side driver
- ◦ Preventing capacitive region operation
- ◦ Protect functions (Over current/Over voltage/Over load/Over heat/Brown out)
- ◦ Green mode function (Intermittent switching)



● Circuit example (PFC + LLC) : FA1A60N, FA6B20N



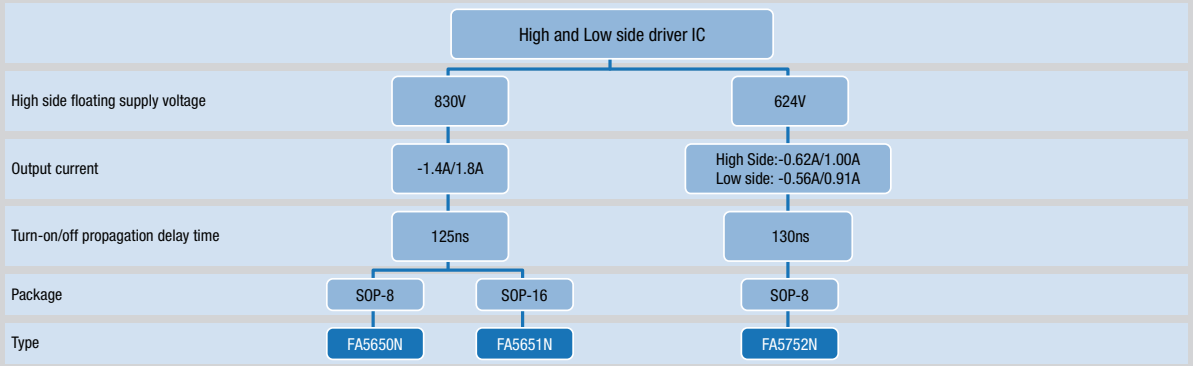
■ Driver ICs Products

High and Low side driver ICs

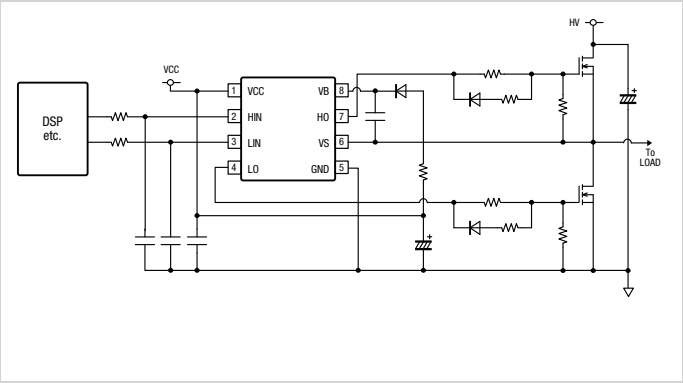
Series	Type name	Number of input/ output terminal	Absolute maximum ratings				Input threshold voltage	Turn-on/off propagation delay	Recommended power supply voltage VCC, VBS	VCC, VBS threshold voltage		Package	Features
			High side floating supply voltage	Output current	Power supply voltage	Maximum frequency				ON	OFF		
FA5650 Series	FA5650N	2	830V	-1.4/1.8A	30V	500kHz	Logic1 2.1V Logic0 1.1V	125ns	12-18V	8.9V	8.2V	SOP-8	High-side and low-side delay time difference 30 ns (max), high-side dVs/dt withstand 50 kV/us, input 3.3 V logic compatible
	FA5651N											SOP-16	
FA575x Series	FA5752N	2	624V	High side IHO: -0.62A/1.00A Low side ILO: -0.56A/0.91A	24V	500kHz	Logic1 2.1V Logic0 1.3V	130ns	12-18V	8.9V	8.2V	SOP-8	

● Features

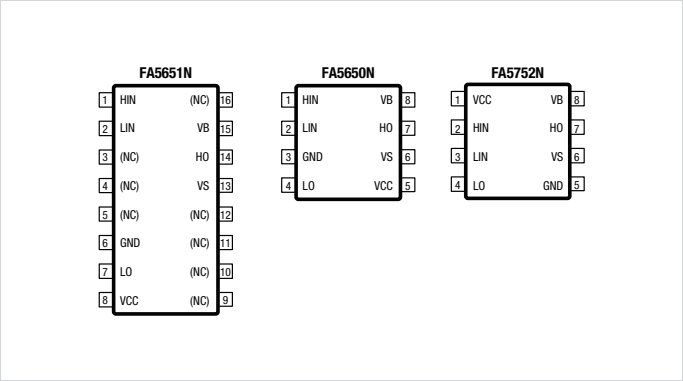
- ◦ High negative transient voltage on VS pin
- ◦ Wide range supply voltage up to 30V (FA5650/5651)
- ◦ 3.3V logic compatible
- ◦ Built-in under voltage lockout
- ◦ Allowable offset supply voltage transient dVs/dt up to 50 kV/us
- ◦ High speed response: Turn on/off delay time 125 ns (Typ) (FA5650/5651)



● Circuit example : FA5752N



● Pin Layout

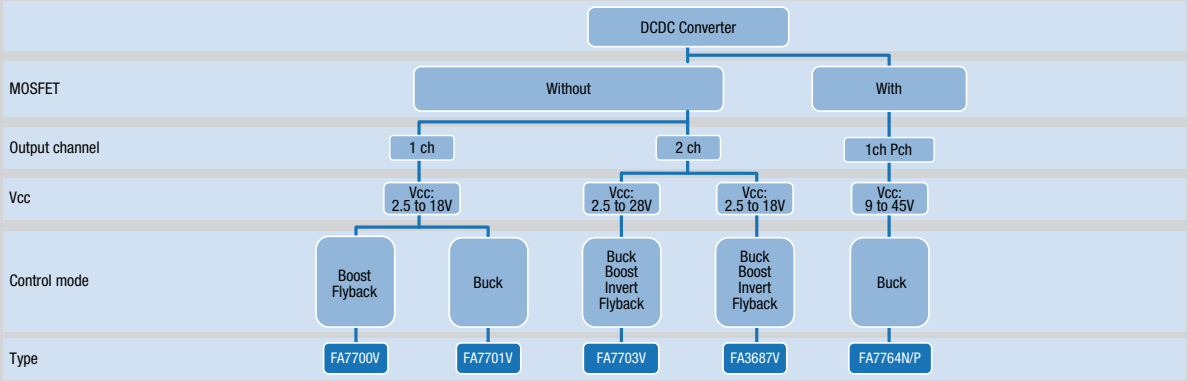


DC/DC Power Supply control ICs

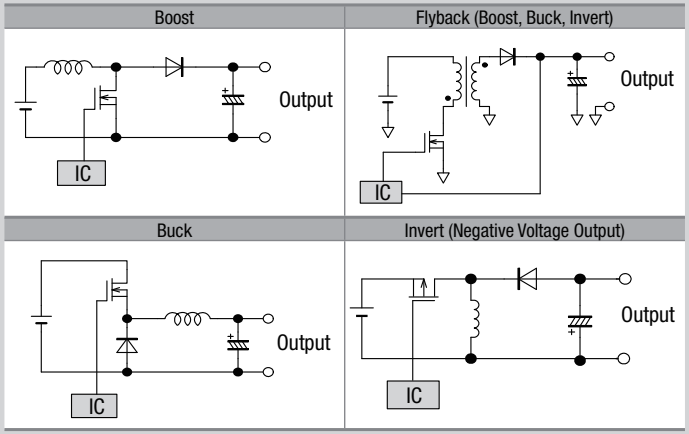
Type name	Output channel	Output stage equipped	Control mode				Frequency	Max Duty	Protection function	Reference voltage	Input voltage Vcc	Vcc threshold voltage		Operating temperature range	Package	Features
			Boost	Flyback	Buck	Inverting						ON	OFF			
FA7700V	1	–	✓	✓			50k-1MHz	80%	Timer-latch Short-circuit	0.88V	2.5-18V	2.07V	1.93V	-30-+85ºC	TSSOP-8	Soft start ON/OFF function
FA7701V	1	–			✓		50k-1MHz	100%	Timer-latch Short-circuit	0.88V	2.5-18V	2.07V	1.93V	-30-+85ºC		Soft start ON/OFF function
FA7703V	2	–	✓	✓	✓	✓	50k-1MHz	External settings	Timer-latch Short-circuit	1.0V	2.5-28V	2.0V	1.85V	-30-+85ºC	TSSOP-16	Max. duty limit setting per ch Soft start
FA3687V	2	–	✓	✓	✓	✓	300k-1.5MHz	External settings	Timer-latch Short-circuit	1.0V	2.5-18V	2.2V	2.1V	-40-+85ºC		Max. duty limit setting per ch Soft start
FA7764N/P	1	✓ 1.5A			✓		30k-400kHz	95%	Overcurrent, Timer-latch Short circuit, over temperature, rectifier diode/open	1.0V	9-45V	8.9V	8.2V	-20-+85ºC	N:SOP-8E P:DIP-8	Soft start ON/OFF function

Features

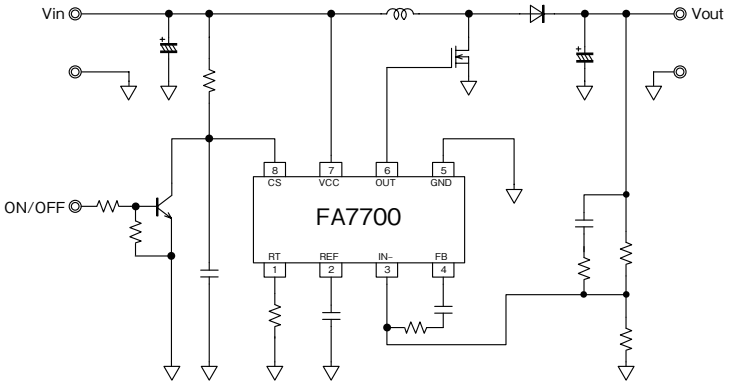
- Supports a wide range of input voltages
- ON/OFF control function
- Soft start, short circuit protection (timer latch), low voltage protection (UVLO)
- Output voltage, operating frequency can be set externally



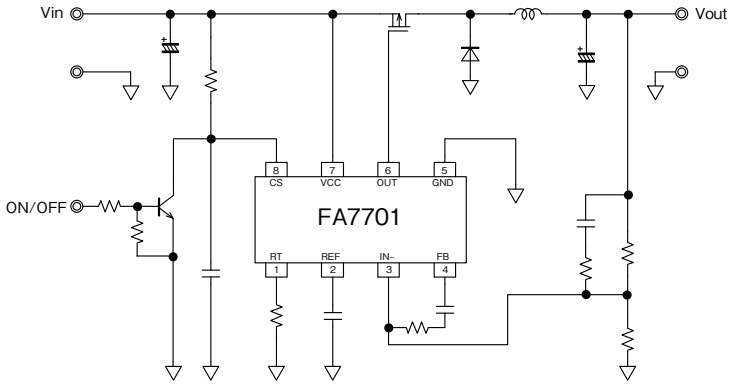
Circuit type (DC/DC)



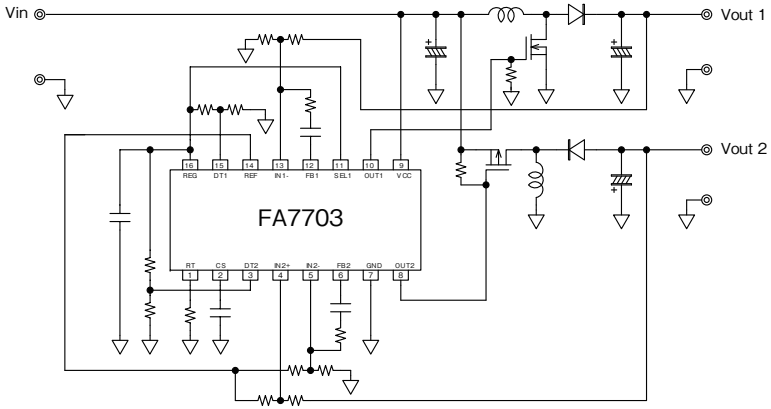
● **Circuit example (Boost) : FA7700V**



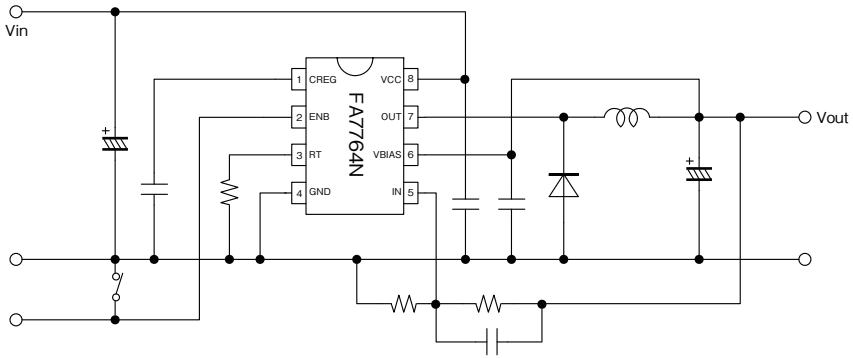
● **Circuit example (Buck): FA7701V**



● **Circuit example (Boost, Invert) : FA7703V**

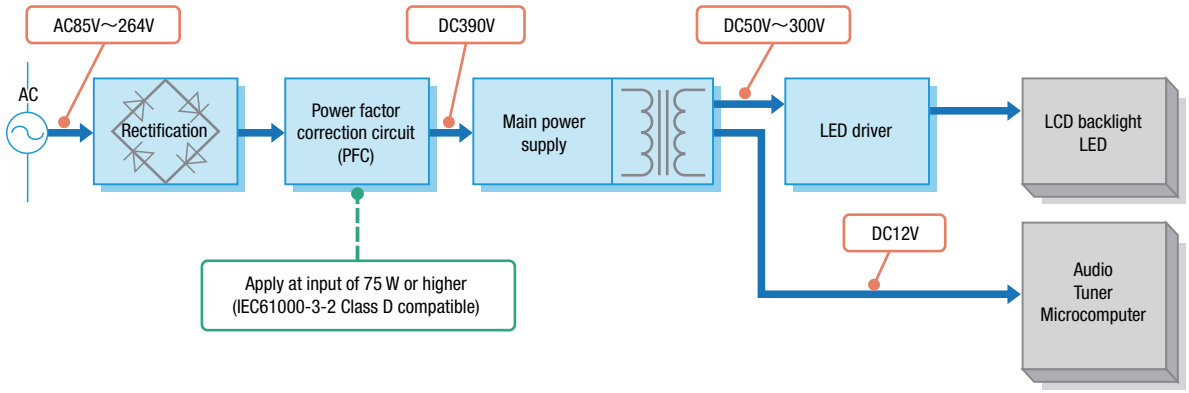


● **Circuit example (Buck): FA7764N**



■ Application circuit example

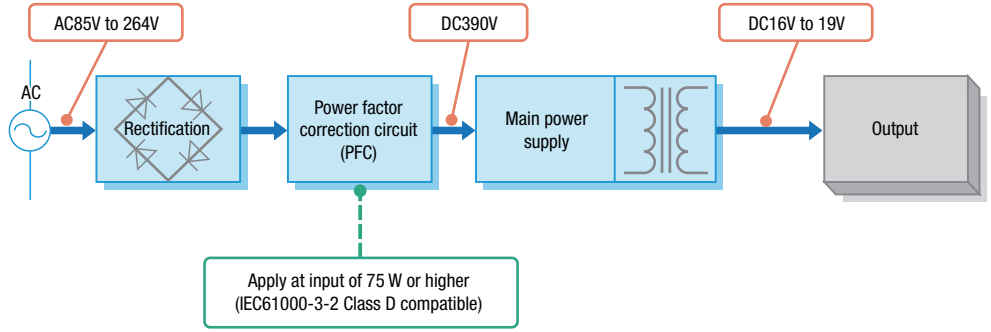
1. LCD TV power supply



■ **Recommended IC**

Circuit	Type	Recommended IC	Page
Power factor correction	PFC (75W-200W)	FA1Axx Series	12
	PFC (more than 200w)	FA561x Series	12
Main power supply	Quasi-resonant	FA564x Series	10
	PWM	FA8A6x Series	6
	LLC	FA6Axx Series	14
		FA6Bxx Series	14

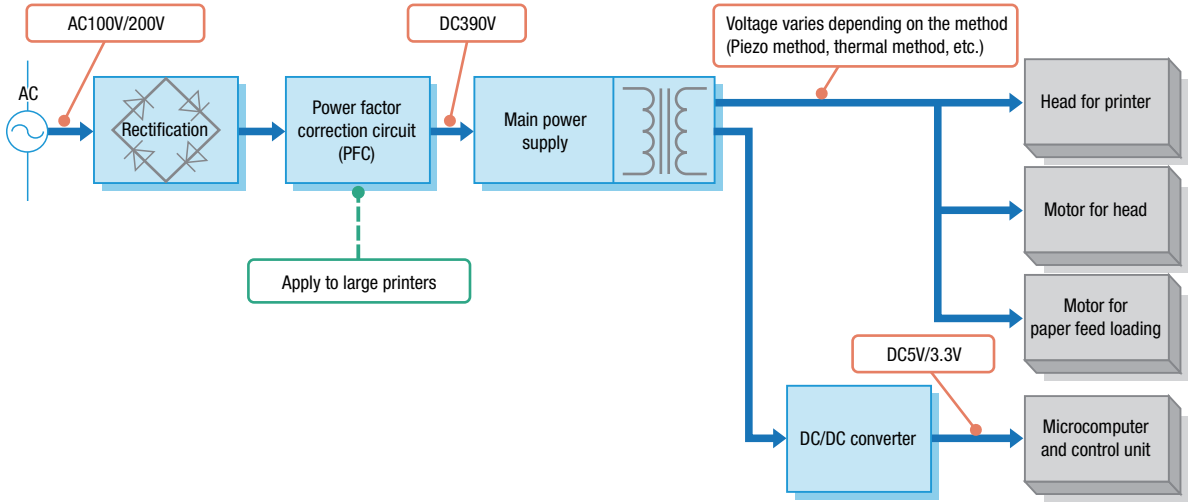
2. Laptop (AC Adapter) Power Supply



■ **Recommended IC**

Circuit	Type	Recommended IC	Page
Power factor correction	PFC (75W-200W)	FA1Axx Series	12
	PFC (more than 200w)	FA561x Series	12
Main power supply	Quasi-resonant	FA564x Series	10
	PWM	FA8A6x Series	6
	LLC	FA6Bxx Series	14

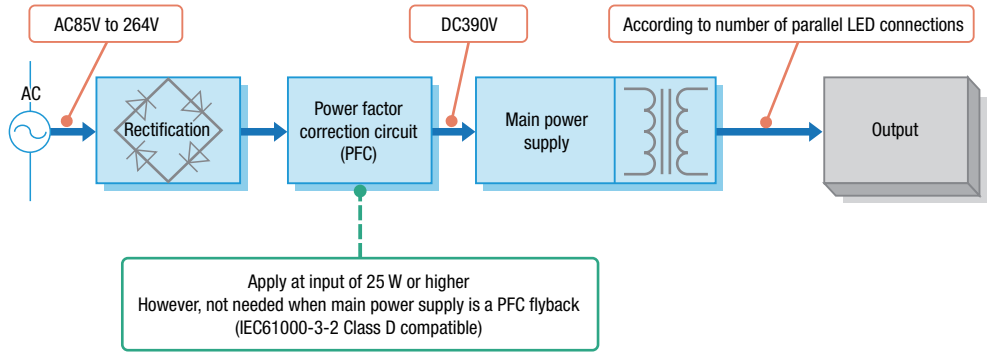
3. Printer (IJP) Power Supply



■ Recommended IC

Circuit	Type	Recommended IC	Page
Power factor correction	PFC (75W-200W)	FA1Axx Series	12
	PFC (more than 200w)	FA561x Series	12
Main power supply	Quasi-resonant	FA564x Series	10
	PWM	FA8A6x Series	6

4. LED lighting Power Supply

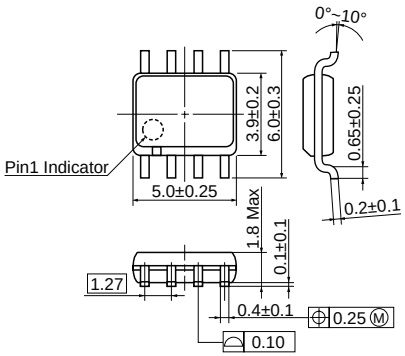


■ Recommended IC

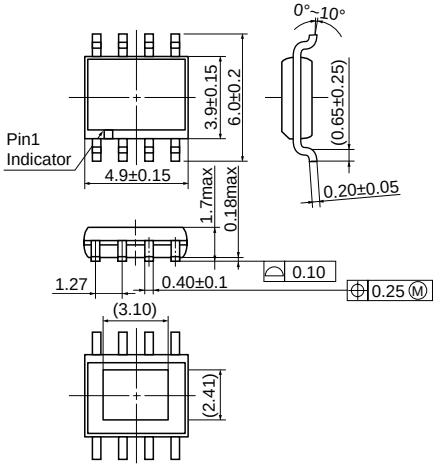
Circuit	Type	Recommended IC	Page
Power factor correction	PFC (25W-200W)	FA1Axx Series	12
		FA5601N	12
	PFC (more than 200w)	FA561x Series	12
Main power supply	Quasi-resonant	FA564x Series	10
	PWM	FA8A6x Series	6
	LLC	FA6Bxx Series	14
	PFC Flyback	FA1A21N	12
		FA5601N	12

Package Outlines, mm

SOP-8



SOP-8E



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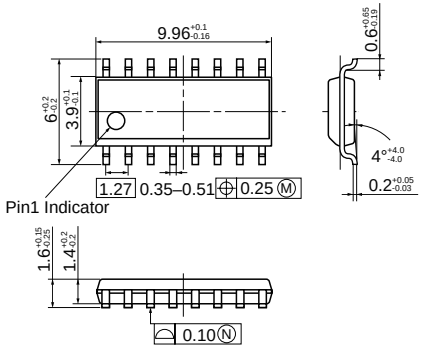

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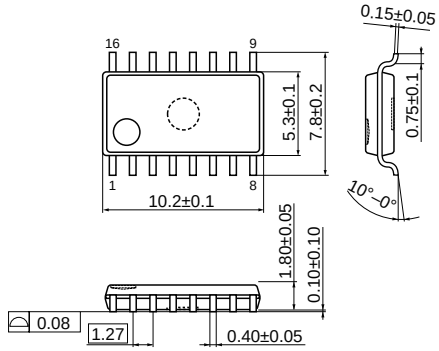
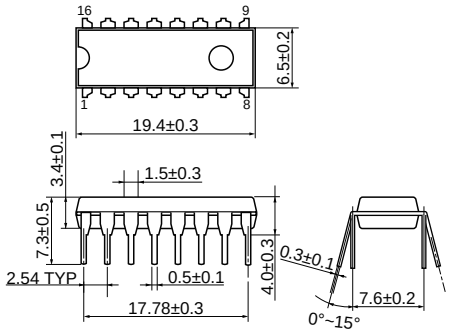
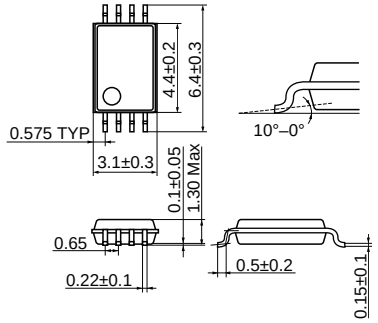


DIP-16



TSSOP-8



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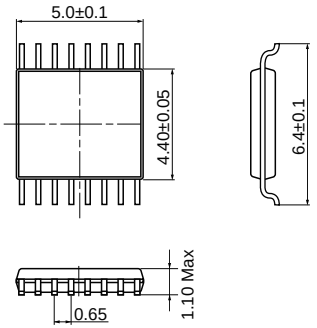
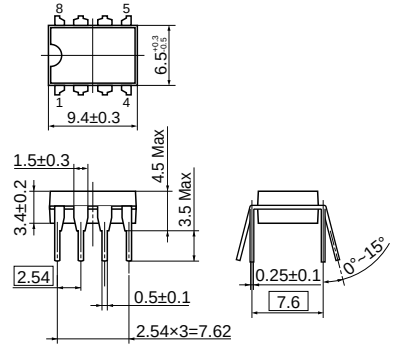


DIP-8



WARNING

1. This Catalog contains the product specifications, characteristics, data, materials, and structures as of March 2019.
   The contents are subject to change without notice for specification changes or other reasons. When using a product listed in this Catalog, be sure to obtain the latest specifications.

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4. The products introduced in this Catalog are intended for use in the following electronic and electrical equipment which has normal reliability requirements.
   - Computers
   - OA equipment
   - Communications equipment (terminal devices)
   - Measurement equipment
   - Machine tools
   - Audiovisual equipment
   - Electrical home appliances
   - Personal equipment
   - Industrial robots etc.

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   - Trunk communications equipment
   - Traffic-signal control equipment
   - Gas leakage detectors with an auto-shut-off feature
   - Emergency equipment for responding to disasters and anti-burglary devices
   - Safety devices
   - Medical equipment

6. Do not use products in this Catalog for the equipment requiring strict reliability such as the following and equivalents to strategic equipment (without limitation).
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   - Aeronautic equipment
   - Nuclear control equipment
   - Submarine repeater equipment

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