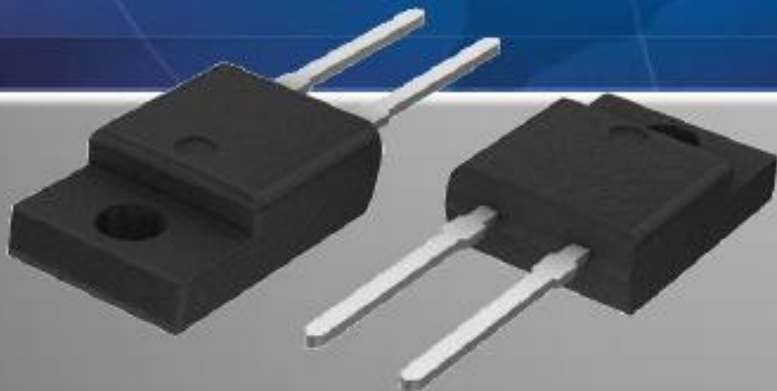


# PFC Diodes Application



Marketing Dept. James Hsieh

<http://www.citcorp.com.tw>

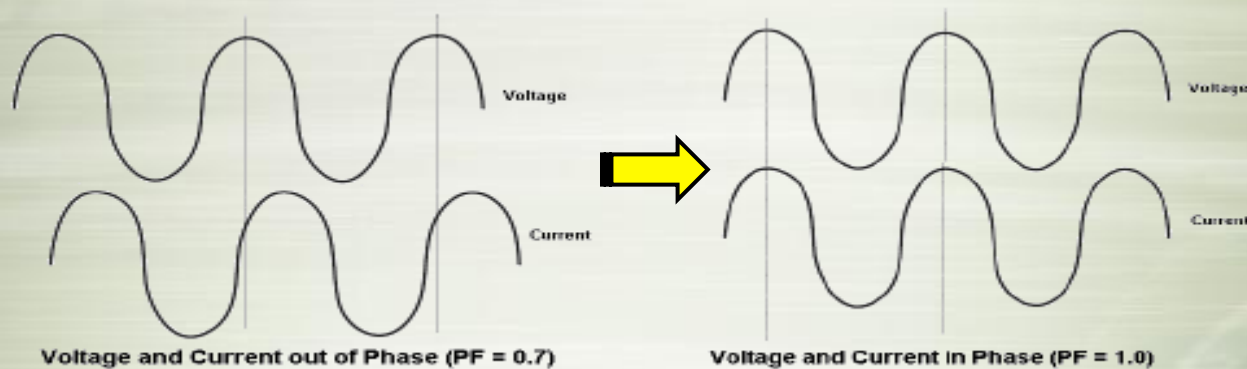
# What is PFC?

功率因素(PFC)指的是有效功率除以總耗電量的比值。

功率因素可以衡量電力被有效利用的程度，當功率因素值越大，代表其電力利用率越高。

交換式電源供應器上的功率因素校正器的運作原理是去控制調整交流電電流輸入的時間與波型，使其與直流電電壓波型儘可能一致，讓功率因素趨近於1。

一般狀況下，電子設備沒有功率因素校正(Power Factor Correction, PFC)時其PF值約只有0.5。



# PFC Circuit

## Without PFC Circuit

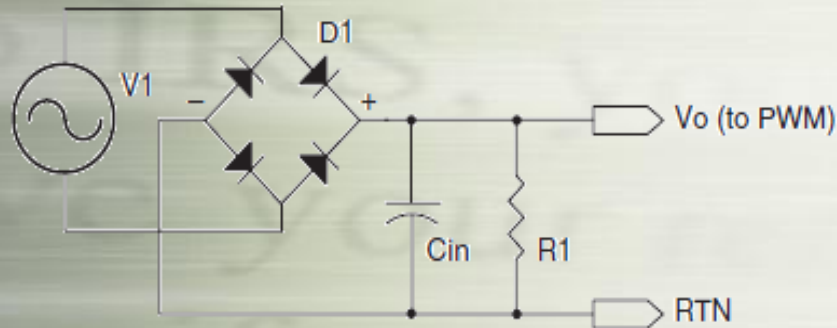
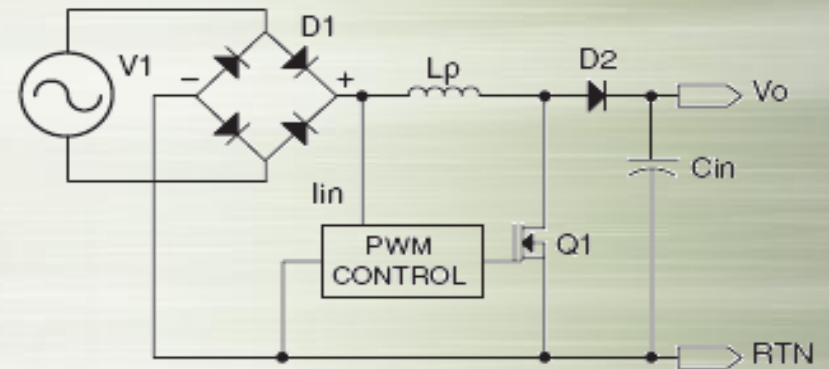


Figure SMPS Input Without PFC

## With PFC Circuit



PFC Boost Pre-Regulator

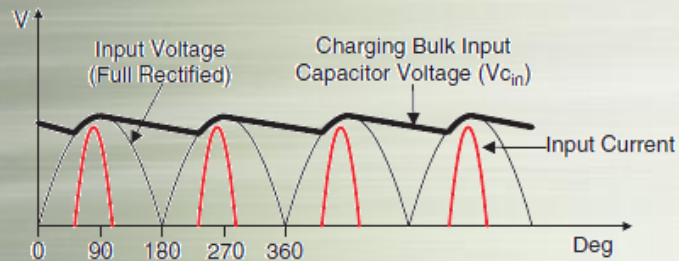
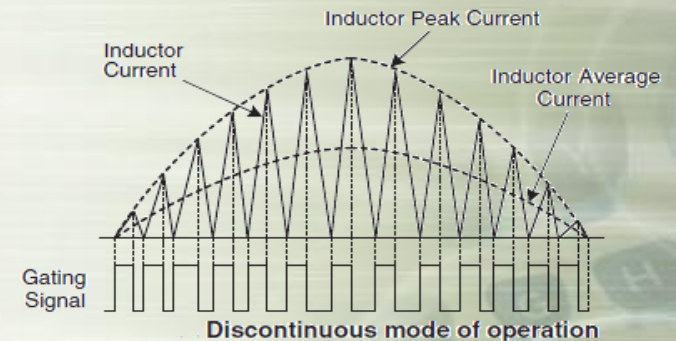
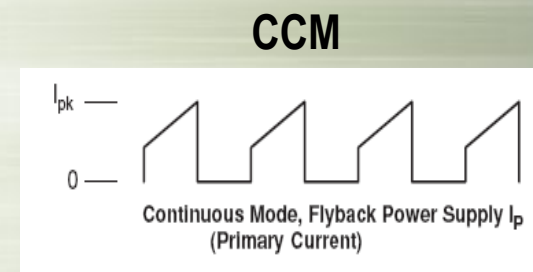
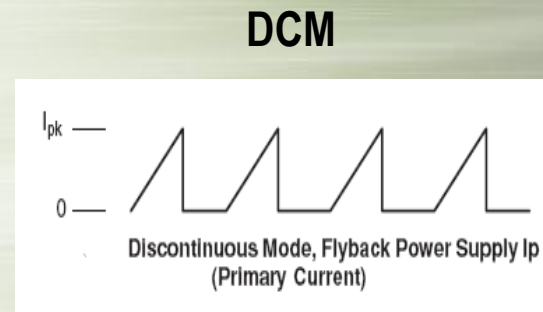
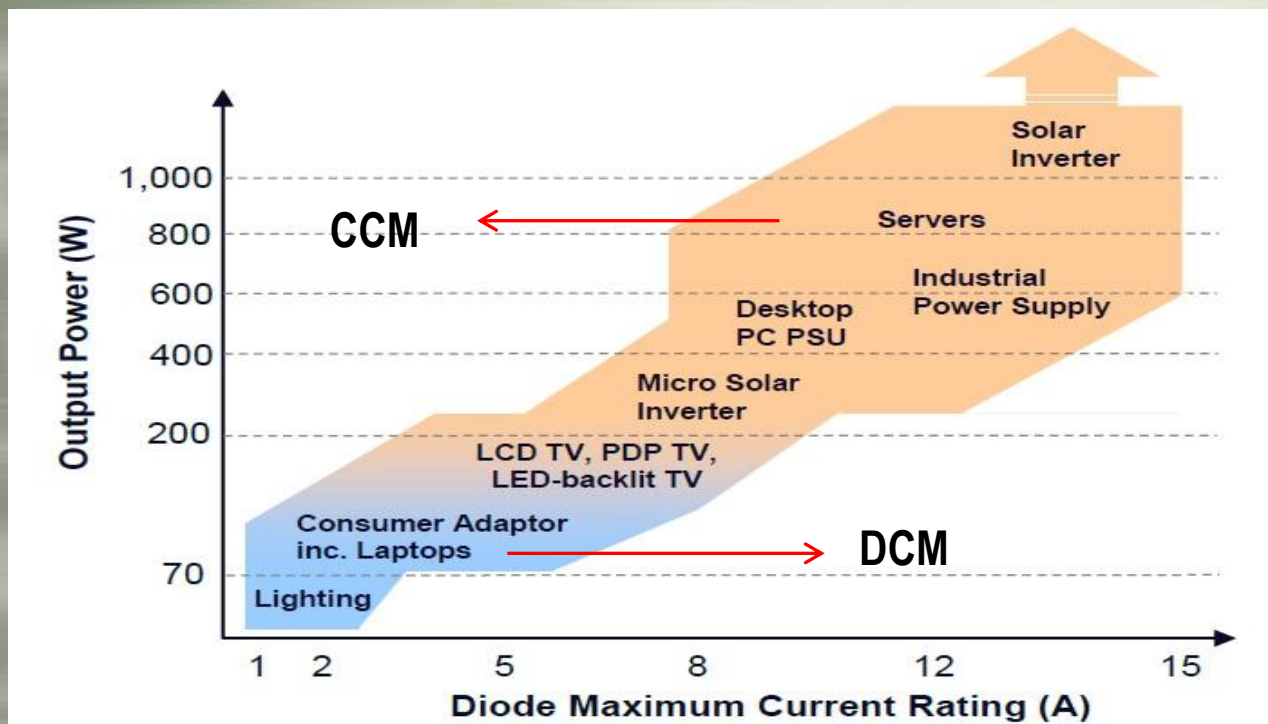


Figure Voltage and Current Waveforms in a Simple Rectifier Circuit





# PFC Circuit Application



PFC電路有以下工作模式：

DCM不連續導通模式 - 較適合用在輕負載的系統或者需要較為省電的情況,不過DCM的output ripple會比CCM來的大很多,功率因數約75%

CCM連續傳導模式 - 較適合在重負載的工作情況,因為它的效率會比較好,如果在CCM下卻用在輕負載,只會浪費效率(功率因數90%以上)

# PFC Diodes 特性要求

## 不同PFC工作模式對BOOST DIODE的要求

### ✓ DCM & CRM (斷續&臨界工作模式) PFC BOOST DIODE關鍵參數

- 低順向工作電壓 $V_F$
- 軟恢復, 低 $Q_{RR}$
- 低漏電流, 高 $D_I/D_T$ 能力
- 高EAS承受能力

### ✓ CCM (連續電流模式) PFC BOOST DIODE關鍵參數

- 低 $T_{RR}, Q_{RR}, I_{RRM}$
- 高 $D_I/D_T$ 能力
- 低漏電流
- 高EAS承受能力

# *CITC PFC Diodes Features*

## **Features**

- 600V rectifier optimized for PFC
- Ultra Fast recovery speed
- Soft reverse recovery to reduce EMI
- High Temperature stability
- $T_{rr}$  ,  $Q_{rr}$  and  $I_{rr}$  comparable to industry

## **Package**

- Industry standard TO-220AC
- Moisture Sensitivity Level (MSL) = 1

## **Ordering Information**

- Standard packaging option in tube with 50pcs/tube



# Spec And Cross Reference

## Product Spec

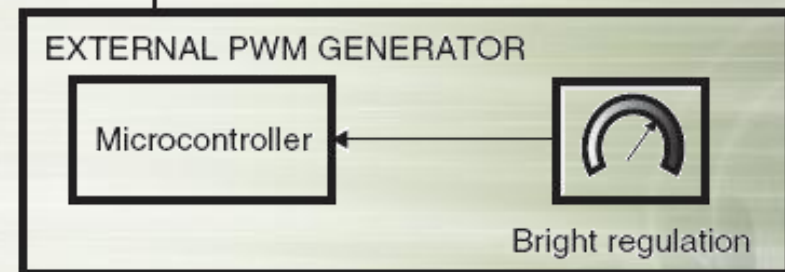
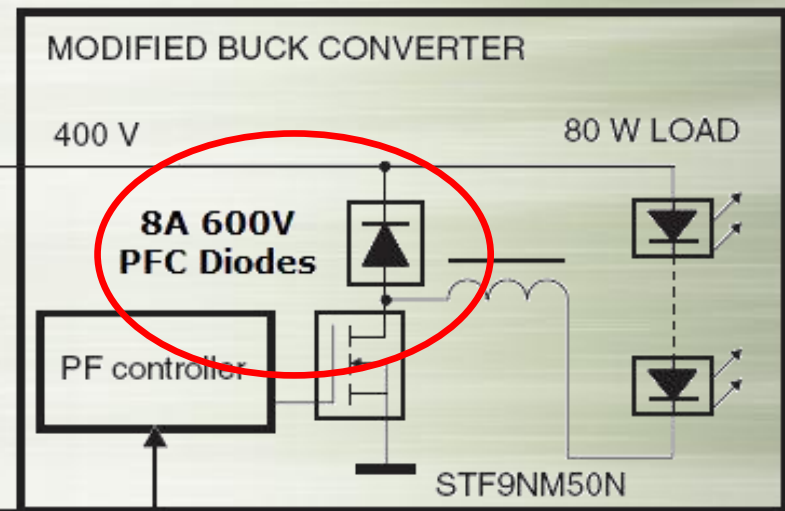
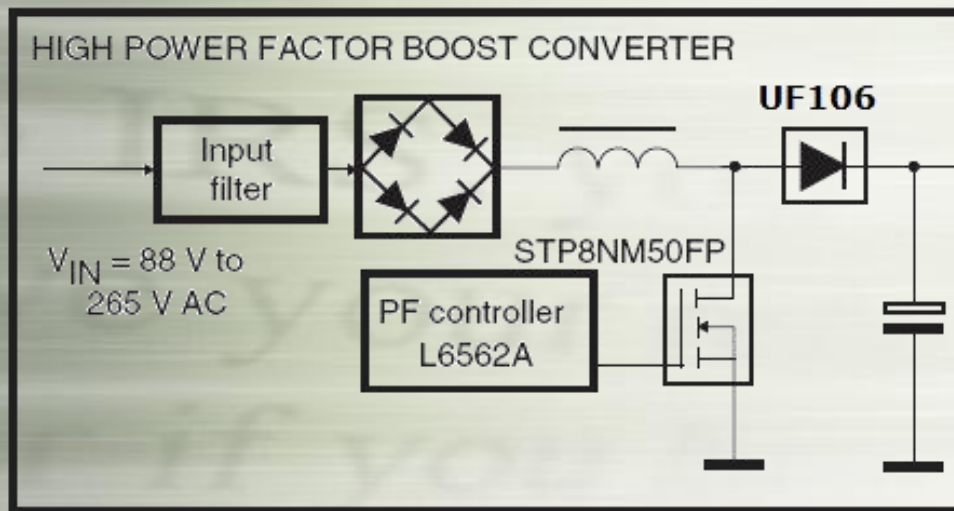
Part Number	Package	I <sub>F</sub> (A)	V <sub>RRM</sub>	VF (V@I <sub>F</sub> )		I <sub>R</sub> (μA@V <sub>R</sub> )		T <sub>rr</sub> (ns)		Eavl (mj)	IFSM (A)
				25°C	125°C	25°C	125°C	Typ	Max		
2CR086AC	TO-220AC	8	600	2.1	1.8	10	150	23	50	20	125
2CR106A8C	TO-220AC	10	600	1.6	1.45	10	150	23	50	20	150

## Cross Reference

CITC	ST	ON Semi	NXP	Vishay	Infineon	QSPEED
2CR086AC	STTH8R06	MSR860G	BYC8-600	VS-8ETL06		LQA08TC600
2CR106A8C	STTH10R06		BYC10-600		IDH10SG60C	



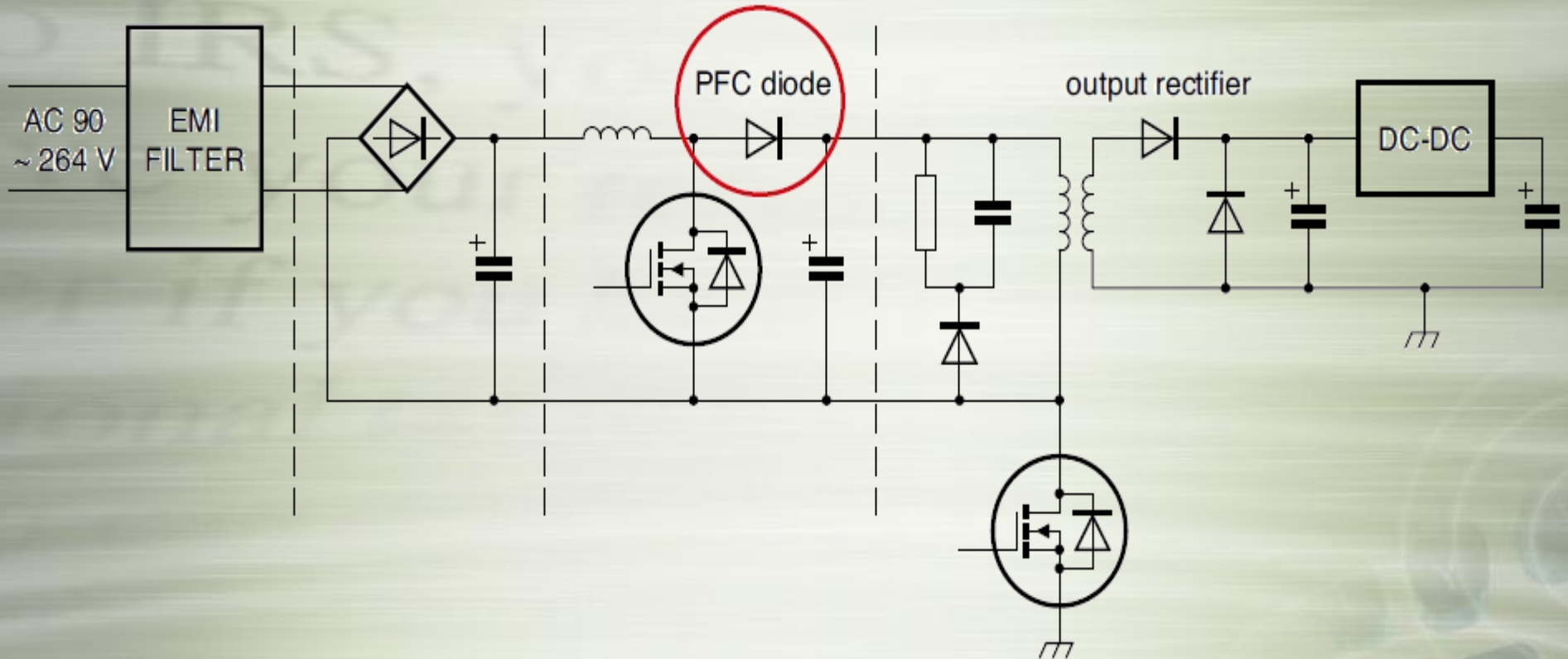
# Application-80W LED Power



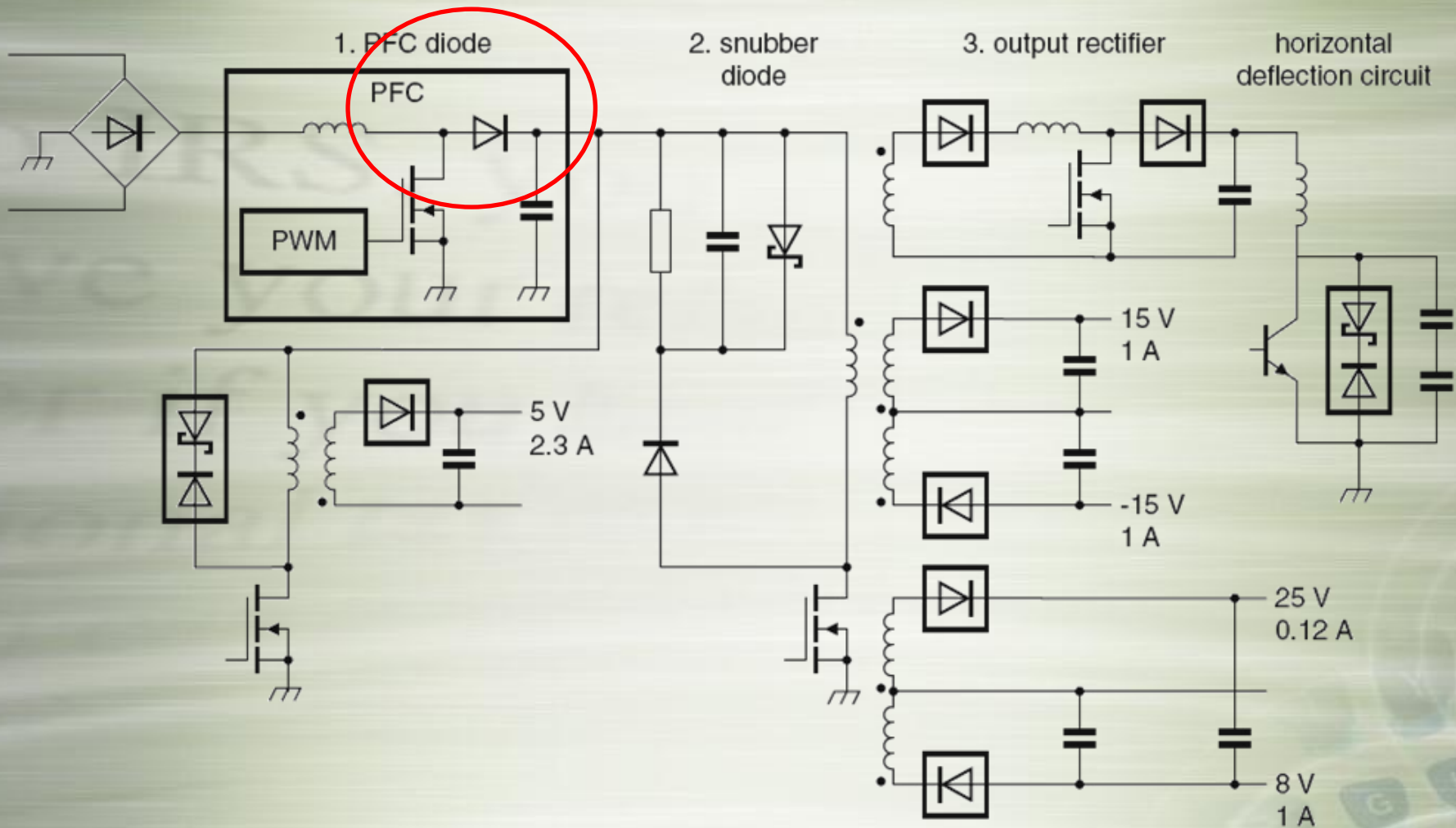
**80W LED**



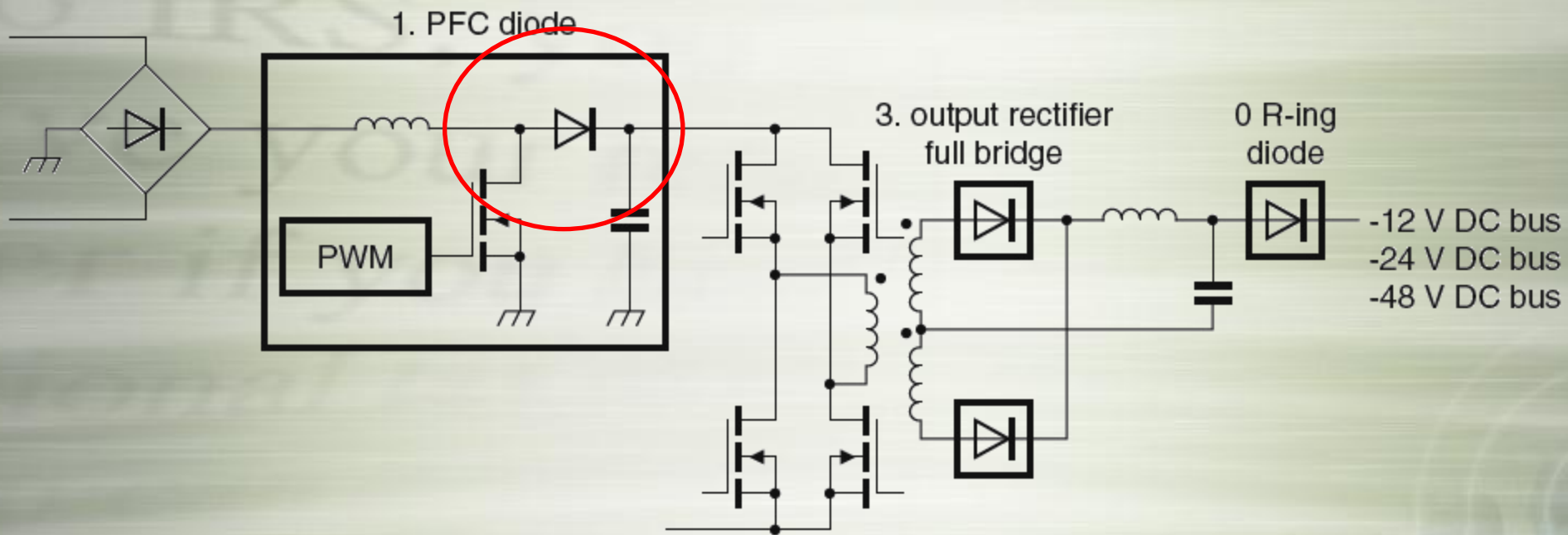
# Application : Adaptor



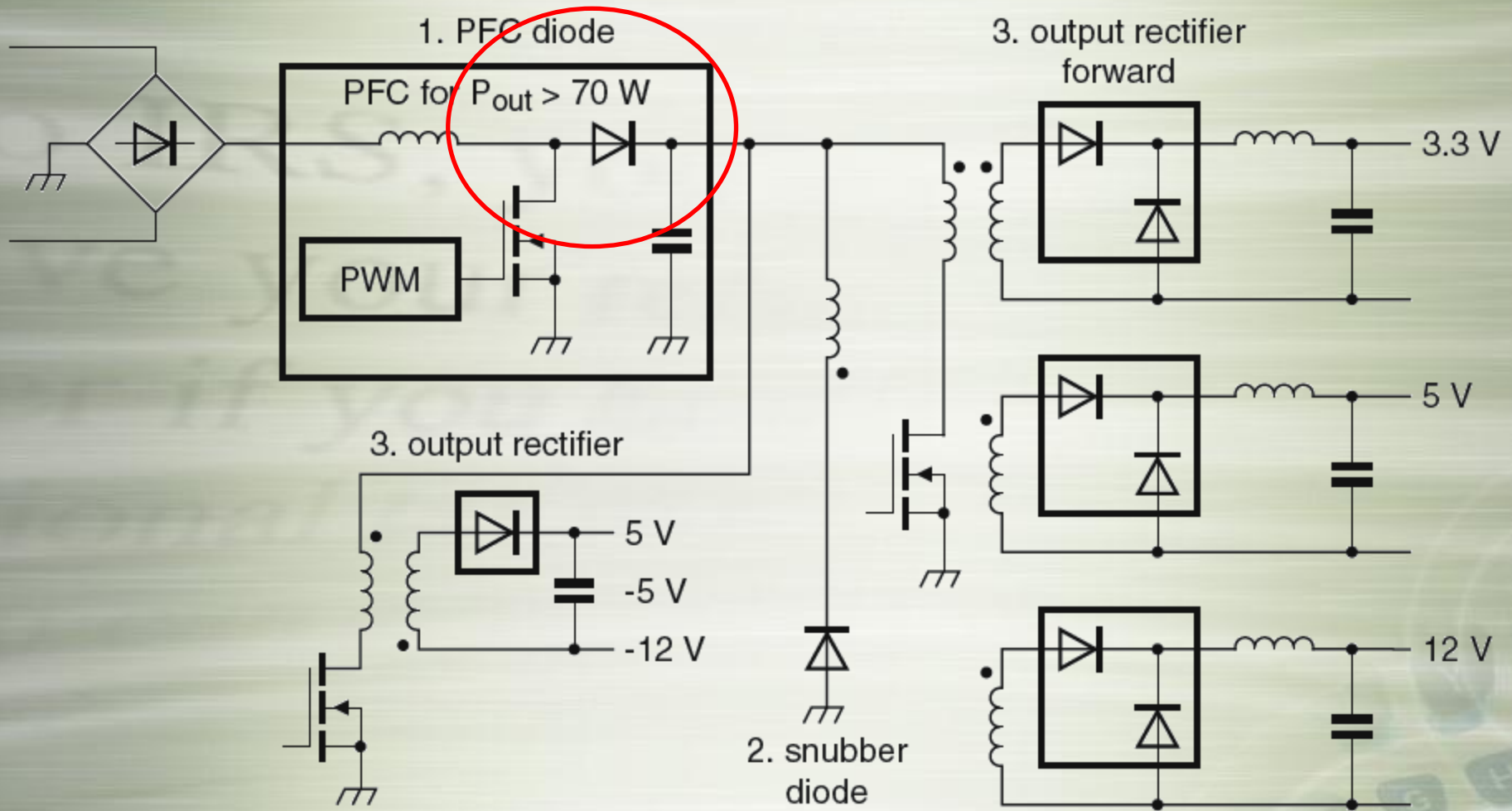
# Application : TV



# Application : AC TO DC Converter



# Application : ATX Power





Q & A

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